FAA › *Safety*

BRIEFING

Aviation Communication

Published six times a year, *FAA Safety Briefing*, formerly
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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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of public funds for printing *FAA Safety Briefing*.

ABOUT THIS ISSUE ...

The May/June 2020 issue of FAA Safety Briefing *focuses
on the importance of proper communication in aviation
and its critical role in furthering safety. Feature articles
include a refresher on the basics of good "aviation"
grammar, how to use correct phraseology to avoid confu-
sion or misunderstandings, and how to best leverage the
technology and equipment at your disposal to maximize
communication efficiency and accuracy.*

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SAY AGAIN?

Editor's note: Production schedule lead times required closing this issue before COVID-19 became a pandemic. We encourage readers to follow CDC guidelines to stay healthy during these challenging times. You can also check FAA.gov/coronavirus.

The single biggest problem in communication is the illusion that it has taken place.
— George Bernard Shaw

We all know the frustration of a failure to communicate. It's tough for both sides. If you are the sender of a message, you know perfectly well what you want to convey and it's *obvious*, so why on earth does the receiver look so confused? Being on the receiving end can be just as tough if, notwithstanding your best efforts to comprehend, the sender seems to be speaking some rare Klingon dialect.

Communication can be challenging even when you are — at least theoretically — speaking the same language to someone standing in front of you. The aviation environment adds the complexities of technical jargon, congested frequencies, and occasional static, to name just a few. Human ego is yet another complicating factor. Nobody wants to sound "stupid" on the party-line radio frequency, so the temptation to pretend complete understanding can be powerful. Put it all together, and it's easy to see how the operating environment for aviation is prime ground for the situation described in the George Bernard Shaw quote.

It's also easy to see how dangerous that illusion can be. If you are engaged in a face-to-face conversation when both sender and receiver are on *terra firma*, misunderstandings can be annoying but rarely (if ever) life-threatening. Not so in aviation. Accident history is full of incidents in which the illusion of successful communication led to tragedy. It happens to aviation professionals and so, regardless of training and experience levels, it seems that no one is immune.

Because the stakes are so high, this issue of *FAA Safety Briefing* offers a refresher on the basics needed for real (not illusory) communication. A few opening tips:

Jargon

As with any technical specialty, aviation has its own idioms. There are also "dialects," given that the words and concepts you hear in airworthiness — my own specialty area — are necessarily different from those used on the operations (pilot) side. For successful communication to occur, you need to become fluent in the language of your own aviation specialty or specialties. Aviation is not the place for linguistic freelancing, so you also need to use well-established and well-understood vocabulary. One of the best tools available to pilots for this purpose is the *Pilot/Controller Glossary*. It's free and it's readily available online, so use it!
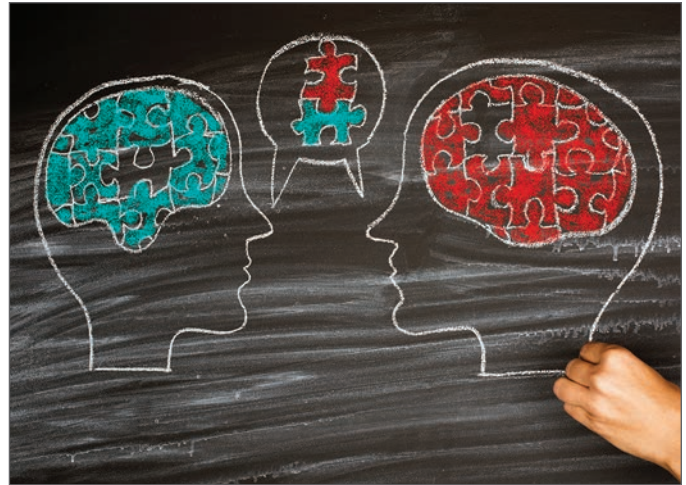
Congested Frequencies

It's no accident that the language of aviation is precise and concise. The underlying rationale is to pack precision into specific words. These concepts existed long before the Twitter bluebird ushered in the era of the microblog. If you are into social media, just remember to think Twitter, not blog, when you transmit. It's also important to listen before you transmit, to avoid "stepping on" a fellow aviator's attempt to communicate. Listening is also a way to learn both the language and the "grammar" of aviation. You don't need an aviation radio either — a wide range of apps will allow you to listen anytime, anywhere, to virtually any frequency.

Confusion

Clarity is critical. Never, ever pretend that you understand a transmission, or make assumptions about what the sender "must have" been trying to say. If you don't understand something, ask the sender to "say again." There is no shame in seeking complete clarity in communications; your fellow aviators will be glad you did — and so will you.

AVIATION NEWS ROUNDUP

Sharing Aircraft Operating Expenses

The FAA recently published Advisory Circular (AC) 61-142 to provide clarity to the public regarding existing requirements for sharing flight expenses with passengers.

This AC discusses the expense-sharing exception contained in 14 CFR section 61.113(c), which permits a pilot to share the operating expenses of a flight with passengers provided the pilot pays at least his or her *pro rata* share of the operating expenses of that flight. Those operating expenses are limited to fuel, oil, airport expenditures, or rental fees. The pilot cannot conduct any commercial operation under part 119 or the less stringent operating rules of part 91 (e.g., aerial work operations, crop dusting, banner towing, ferry or training flights, or other commercial operations excluded from the certification requirements of part 119). AC 61-42 also provides examples of common purpose and holding out. Download the new AC 61-142 at bit.ly/AC61-142.

Weather Camera Program Expands to Colorado

The FAA entered into a cost-reimbursement agreement with the State of Colorado Division of Aeronautics to install weather cameras on 13 Automated Weather Observing Systems (AWOS) in mountainous areas, which was scheduled to begin this past spring.

These cameras build on the success of a 20-year-old program in Alaska that enhances safety by using a network of 230 cameras to provide near-real-time video to pilots. The FAA Weather Camera Program started in 1999, when the FAA sought to give pilots operating under Visual Flight Rules actual views of current weather conditions in remote areas.

The 13 Colorado cameras will be the first to be integrated into the FAA Weather Camera Program outside of Alaska. In addition to the weather information they receive from AWOS, pilots planning to fly above the Colorado Rockies will soon have the ability to see real-time weather conditions along their routes before they depart.

This effort was made possible through a $226,000 reimbursable

agreement between the Colorado Division of Aeronautics and the FAA. Under this agreement, the FAA will assist the state with the camera installations, and the state will own and maintain the cameras. The FAA's weather camera website will display still images that each camera captures (avcams.faa.gov). Please also see our article on the weather camera program in the Mar/April 2020 issue at adobe.ly/2vz5NX1.

NTSB Issues Two New Safety Alerts

The National Transportation Safety Board (NTSB) issued two new Aviation Safety Alerts (SA) in February. SA-080 (bit.ly/SA-080) alerts pilots and mechanics to "stay in the groove" and check the integrity of aircraft ignition switches. The SA warns that over time, key-type ignition switches and associated keys can become worn such that it is possible to remove the key from a switch position other than the OFF position. This can result in switch positioning errors and an unintended engine start. An accompanying video is available at youtu.be/JDnnXjNb2vc.

SA-081 (bit.ly/SA-081) reminds pilots that it is critical to properly maintain control during engine failures in multi-engine aircraft, especially at low altitudes. The SA urges pilots to be thoroughly familiar with the recommended procedures and checklists for one engine inoperative operations — particularly the memory checklist items — in the airplane flight manual and pilot operating handbook. Also be sure to check the FAA's #FlySafe fact sheet on Vmc at bit.ly/2qWhkru.

Call Sign Requirement Changes Affect COMPASSION Call Sign

The COMPASSION call sign is intended to clearly identify routine ambulatory patient transport and other public service missions conducted by volunteers including: animal transport, environmental flights, disaster response, and other non-profit flying that serves the public interest. The call sign provides a measure of safety and security for passengers with special needs, and may help expedite and improve pilot-ATC communications.

Recent changes to FAA and ICAO call sign requirements meant changing the way volunteer pilots use the COMPASSION call sign. The previous filing process using a portion of the aircraft's tail number is no longer valid. The Air Care Alliance (ACA) now issues new discrete COMPASSION call signs to verified pilots of authorized organizations upon request by the pilot.

Pilots of authorized volunteer pilot groups can register for a COMPASSION call sign at bit.ly/CMFcallsign. Once a pilot's member status is validated, he or she will be issued a call sign via email.

Procedures on how to use the COMPASSION call sign can be found at AirCareAlliance.org/CMFprocedures. ACA encourages pilots to become familiar with these procedures and to take measures to avoid a call sign mismatch. A pilot-programmable ADS-B Out transponder is now required for use of the call sign in designated airspace. In order to comply with 14 CFR 91.227(d)(8), pilots must ensure that their ADS-B transceiver is correctly set to the flight ID used on the flight plan and/or flight ID used during ATC communications.

Learn more by going to AirCareAlliance.org/CMF and watch this video on the benefits of using a COMPASSION call sign: youtu.be/kCTF786_W0g.

NTAP Discontinued in June

As part of the Notices to Airmen (NOTAM) modernization effort, the FAA will discontinue the Notices to Airmen Publication (NTAP) effective June 18, 2020. The last NTAP will be published on May 21, 2020.

Effective June 18, 2020, International Notices will be available at bit.ly/NOTAM-Int. Links to International Notices and Graphic Notices will also be available on the FAA NOTAM Search website at notams.aim.faa.gov/notamSearch and on the Air Traffic Plans and Publications website at faa.gov/air_traffic/publications. More information, including notice submission procedures and submission cut-off dates, will be published on the International Notices website when available. Please also see the feature article "Getting to Yes with NOTAMs" in this issue.

If you have any questions, email 9-ATOR-HQ-PubGrp@faa.

Laser Strikes on the Rise

The FAA remains vigilant in bringing awareness of the misuse of lasers pointed towards aircraft. The FAA recorded more than 6,000 incidents in 2019, compared to 5,663 reports in 2018.

Lasers may be appropriate in classrooms or in the workplace, but not near the clouds or when pointed towards the sky. Negligently aiming lasers poses a safety threat to pilots.

The FAA and law enforcement agencies continue to inform the public of the dangers posed by lasers, and the legal consequences.

The FAA strongly encourages people to report laser incidents, whether they are pilots, air traffic controllers, or members of the public at bit.ly/LaserRpt.

FLY SAFE Fact Sheets

Visit **bit.ly/GAFactSheets** *for more information on these and other topics.*

MAY
Safety Wire
Learn more about how to properly secure aircraft components with safety wire.

JUNE
After-market Safety Equipment
Learn how the use of after-market safety equipment can help reduce GA accidents.

HOW DO YOU HEAR?

Good hearing, next to good vision, is a critical capability for the aviator to operate in today's complex airspace. Even a mild hearing loss (HL) can impair communications degrading both the safety and efficiency of the National Airspace System (NAS). The companion article in this issue addresses some of the more common causes of acquired hearing loss and the appropriate prevention/treatment. Not all pilots are born with good hearing and of those who are, not all retain it. This then becomes a regulatory as well as a clinical concern. This article will focus on the evaluation and certification of pilots engaged in aviation activities that require medical certification.

The Aviation Medical Examiner (AME) is usually the first person that a pilot encounters on the path to medical certification. The FAA requires a hearing evaluation at each medical examination, regardless of the class of medical sought. Although a formal audiometric examination is always acceptable, most AMEs opt to utilize a conversational voice test at six feet with the applicant's back turned. Hearing is tested using both ears and the applicant can use hearing aids for the test. However, if hearing aids are necessary, then the use of these in flight activities will be required and so annotated on the medical certificate with "must use hearing amplification." Both external hearing aids and cochlear implants are permissible.

Some conditions have HL as a symptom. Pressure equalization (PE) tubes are frequently used to treat fluid behind the eardrum(s), serous otitis media. As long as there are no complications, medical certification is straightforward. Individuals who do not meet standards even with hearing aids can still request a SODA (statement of demonstrated ability) if the HL is stable. A SODA can be issued for static defects, but may require additional evaluations by an otolaryngologist, a medical flight test (MFT), or a review of operational experience. A MFT is used to ensure that even if unable to perceive auditory cues, the applicant can recognize a power loss or engine failure by a change in vibration and/or instrument indications, recognize an impending stall (buffet), or be alert to warning lights (unsafe gear, caution lights, low rotor RPM, etc.). Other conditions associated with progressive HL such as an acoustic neuroma, vertigo, encephalitis, Meniere's disease, and meningitis may require additional evaluation and specific clearance from the FAA.

> **GOOD HEARING, NEXT TO GOOD VISION, IS A CRITICAL CAPABILITY FOR THE AVIATOR TO OPERATE IN TODAY'S COMPLEX AIRSPACE.**

On occasion, an aviator will be unable to pass the hearing test with or without a hearing aid, but will report that he/she is able to hear adequately in the cockpit with the use of a headset. If the applicant successfully passes a MFT using a headset, then a medical certificate is possible, but with this limitation.

Some pilots are unable to pass any of the above tests due to profound or even complete deafness. Medical certification is still possible and pilot certification up to the commercial level is also feasible, but both have restrictions. The limitation, "Not valid for flying where radio use is required," will be included on both the pilot and medical certificates. Commercial operations that do not require the use of radio communications, such as banner towing, agriculture (spray) operations, or glider towing, are possible. It is currently not feasible to certify a pilot for airline transport privileges if they are completely deaf. However, cochlear implants have brought hearing to thousands who did not benefit from traditional hearing aids and we have certified airline pilots who have cochlear implants.

Other technologies which may be approved include bone anchored hearing aids (BAHA) and implantable hearing aids. Stem cell research is currently not FDA approved or mature enough for favorable aeromedical consideration. On the non-medical side, in-cockpit weather information and digital communications, such as the aircraft communications, addressing, and reporting system (ACARS) provide information visually, reducing the need for oral communications. While currently used to speed and enhance air to ground communications, this technology also holds promise for future expansion of pilot certification for those who are profoundly hearing impaired.

HEARING LOSS

The aviation environment, unfortunately, is noisy and noise can cause hearing loss (HL). Even glider operations expose some individuals (tow pilots, ground personnel, winch operators, etc.) to hazardous levels of noise. Damage can be from both acute and chronic exposure. The Occupational Safety and Health Administration (OSHA) requires individuals to use hearing protection when occupational exposures exceed an average noise level of 85 dB over an 8 hour period. (Note: A dB (decibel) is a logarithmic unit to measure the intensity of sound. A mosquito "buzz" is around 40 dB, normal home is around 60 dB, a lawnmower 90 dB, whereas a jet engine can exceed 150 dB.)

If you attend an aviation safety meeting for pilots, you will probably notice two things: the number of pilots with gray hair, and the number who use hearing aids. Fortunately, you can protect yourself from HL by using both earplugs and/or a headset. Passive headsets provide protection at the higher frequencies, while the active systems provide added protection for lower frequencies. However, they only work if used. Many pilots use a headset in the aircraft, but do not use any protection while walking to or from the aircraft, or during noise hazardous activities away from the airport. Even though the sound intensity from other exposures might be less than in-or-near aircraft, cumulative exposure of lower intensity noise also increases the risk for HL. A rule of thumb: if you experience either short term HL or tinnitus (ringing in the ears) after a noise exposure, or if any underlying tinnitus you have gets worse, the noise was loud enough to cause permanent damage.

> ***ALWAYS* WEAR HEARING PROTECTION IN NOISY ENVIRONMENTS (HEAVY EQUIPMENT, POWER TOOLS, LAWN MOWERS, ETC.), EVEN IF YOU ARE NOT THE OPERATOR OF THE EQUIPMENT OR THE AIRPLANE.**

HL also has other causes besides noise. Congenital HL typically shows up early in childhood, but for many it does not become noticeable until middle age. Ear, nose, or throat infections can cause short-term HL by obstruction of the external ear canal, fluid accumulation behind the eardrum, or obstruction of the Eustachian tubes (preventing middle ear air pressure from equalizing with the external air). Systemic illnesses (hypertension, diabetes) and medications (some antibiotics and cancer treatments) can permanently damage the auditory nerve, which transmits nerve impulses from the ear to the brain. The causes of heart disease and strokes can also affect the blood vessels that supply the auditory nerve. Trauma is common, and using Q-tips to clean the ear is a frequent villain. Another rule of thumb is to put nothing smaller than your little finger in your ear canal. Aging also contributes to HL, although it is not clear how much is due solely to age and how much is secondary to accumulated noise exposure and other risk factors.

Like many other conditions, prevention is best. ***ALWAYS*** wear hearing protection in noisy environments (heavy equipment, power tools, lawn mowers, etc.), even if you are not the operator of the equipment or the airplane. Keep earmuffs near loud equipment (if the hearing protection is not in a convenient place, it is easy to skip use) and carry earplugs. Warning: hearing protection may interfere with your ability to hear audible alerts such as the stall warning in light aircraft, gear up horn, and low RPM alert in rotorcraft.

Maintaining a healthy lifestyle and complying with medications and treatment is always appropriate. Multiple treatment options are available for many causes of HL, though not all are acceptable for flying. You and your doctor can chose the best one for you, but let your doctor know that you are a pilot.

The FAA does authorize the use of hearing aids on a case-by-case basis. Stem cell research and digital communications hold future promise. In the meantime, protect your hearing because once it is gone, there is currently no path back to normal hearing.

Leo M. Hattrup, M.D., received a bachelor's degree from Wichita State University, a master's in public health from Harvard University, and a doctorate from Vanderbilt University. He is retired from the U.S. Air Force in which he spent the majority of his career in aerospace medicine. He is board certified in aerospace and occupational medicine. He is a certificated flight instructor and enjoys flying airplanes, helicopters, and gliders.

By Susan K. Parson

The Importance of

Speaking Plane-ly

Aviation's General Spoken Medium

An early lesson in the "Fundamentals of Instruction" curriculum for flight instructors is that actual communication occurs only when both sender and receiver have an identical understanding of the message being conveyed. Simple, right? Well … not so much. The wonder and woe of language is that even two people from the same cultural background can hear the same word or phrase and reach a different conclusion as to its meaning.

Misunderstandings are bad enough on the ground, but they can be positively dangerous in the aviation environment. That's why it is so important to master "Plane English," and the reason for this issue's focus on aviation communications.

Was that *really* English?

English is the global aviation language — more on that shortly — and it is my native tongue. In my first flight lesson, though, my supposed fluency did nothing to help me understand the static-filled gibberish flowing from the little Cessna's tired comm radios. I could occasionally discern a few individual words that I recognized as English. Overall, though, the words, phrases, rhythms, and cadences were completely foreign to me. I quickly realized

that in addition to learning to fly a plane, I would also be learning to speak in "Plane."

It is no small task. There are more than 1,300 terms in the FAA's 80-page *Pilot/Controller Glossary* (P-CG). Abbreviations and acronyms take the total to around 2,000 words, phrases, or terms that the pilot is expected to correctly understand and use — and to do so in an environment that includes aircraft noise, multi-tasking, and less-than-perfect aeronautical radios.

Lingua Franca

As virtually every foreign pilot observes, the freedom afforded to private and recreational fliers in the U.S. is unmatched. American pilots also enjoy the benefit of having English as the foundational language for aviation communications. But if Plane English is hard for native speakers, consider how challenging both "foundational" English and "Plane" English can be if English is a second or third language.

Complete mastery of English — a complex and complicated language — is not necessary for aviation safety. Still, miscommunication due to lack of English proficiency is a probable cause or contributing factor in many aviation accidents. To address this issue, since 2008 ICAO has

required that air traffic controllers and flight crew members engaged in international flights be proficient in English as a "general spoken medium" (i.e., a specified level of vocabulary and grammatical knowledge along with skills in pronunciation, word stress, rhythm, and intonation).

Learning the Lingo

Regardless of how you acquired proficiency in English as a "general spoken medium," it takes time and dedicated effort first to understand, then to speak, the Plane English dialect. Newbies will fumble, stumble, and mumble though early attempts to speak Plane. Even long-time pilots sometimes find it challenging. But mastering Plane English is critical to safety, and correct use of established aeronautical terms

> **Misunderstandings can be positively dangerous in the aviation environment. That's why it is so important to master "Plane English."**

is a hallmark of good airmanship. Articles in this issue are aimed at helping you achieve both goals. A few basic tips:

- Study the Pilot/Controller Glossary.
- Create a template of the fundamental "who-where-what" sequence used in Plane English.
- Use tools such as the "LiveATC" app and/or a handheld aeronautical radio to enhance your understanding.
- Avoid non-standard terminology. For example, don't "take the runway" or transmit your intentions with respect to "the active" without at least providing a runway number.
- Always aim to speak clearly, concisely, and precisely.
- Efficiency counts, but remember that you aren't in a speed-speaking contest with our fast-talking friends in ATC. A reasonable pace takes less time than repeated "say again" requests.

  Read on for more!

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.

Do You Suffer from
PUSH-TO-TALK PHOBIA?

Improve Your Aviation Communication with Virtual Reality

By Jennifer Caron

D o you get nervous or intimidated when talking on the radio or with air traffic control? Don't worry. You're not alone. Just the sheer amount of information you receive from ATC to get an initial clearance can be overwhelming, let alone having to comprehend what the fast-talking controller just said, and then attempt to read back what you "think" you just heard.

Fortunately, thanks to virtual reality, there are online, real-time, controller-to-pilot platforms and software programs that can help you train for aviation radio communications — all in the comfort of your home. In this article, we'll take a look at four virtual reality platforms that you can use in concert with your home computer or desktop flight simulator, to practice and sharpen your aviation communication skills. The best part is that the skills you master in your virtual aircraft will easily transfer to your real-life cockpit as well.

First, let's talk about the "push-to-talk phobia."

Content disclaimer: Products and services mentioned in this article, and/or external, non-FAA links within, do not constitute official endorsement on behalf of the FAA. This article has been updated; it was originally featured in the Nov/Dec 2017 issue.

"Say Again? … Over"

It's a fact that both student pilots and seasoned aviators have at one time or another experienced what I like to call the "Say What?" syndrome. That's the "huh??" moment that occurs when you can't understand the fast-flowing stream of non-stop aviation lingo blaring from your radio. If you're not familiar with how ATC communicates, it can be very intimidating and downright nerve-wracking to thumb the mic switch and utter those two humbling words, "Say again?"

Do not be shy about making that request! It is critical for safety. Remember that ATC is working to maintain aircraft separation and keep everyone safe. Controllers would much rather have you request a repeat transmission to clarify the instructions than have you act on the basis of what you think you heard. They want you to get it right.

"What's Our Vector, Victor?"

So how do you learn to "speak ATC" and overcome your fear?

Learning the language of aviation is not unlike learning a foreign language, or any other new skill. You'll be hesitant at first, but the best way to overcome your hesitation is through knowledge, training, practice, and

still more practice. The longer you practice hearing and speaking your new aviation language, the more fluent you will become, and the more confident you will be when speaking on the radio.

"Tower, Request Taxi"

When you first start learning to fly, you learn the phonetic alphabet, phraseology, and then you train and practice radio communications with your instructor. Some instructors make it a priority for students to spend some flight time at a towered field to practice ATC communications during flight, or to view first-hand operations inside the tower.

But that's not your only option these days. Whether you're a student looking for more practice or a certificated pilot who normally operates from a non-towered airport, simulation offers a low-cost way to build your aviation communication skills.

"We Have Clearance, Clarence"

Today's pilots have the opportunity to use a range of simulation tools to learn and practice radio and ATC communication skills under surprisingly realistic conditions. Desktop computer programs are not typically FAA-approved, but the skills you can acquire and improve via "sim city" practice readily transfer to "real life" flying.

Let's take a look at a few simulation options.

VATSIM

First up is VATSIM, or Virtual Air Traffic Simulation Network. VATSIM is an online simulation platform that hosts, at no cost, an international network of virtual pilots and controllers so you can practice your "avgeek speak." Real people from around the world simulate flights with thousands of other users in the real-time airspace, all while using their home computer. Users download and install VATSIM's pilot software to connect up with their home flight simulator software.

The VATSIM network presents a flight environment that's as close to reality as possible without being in the actual cockpit. Here, users simulate real air traffic procedures and radio phraseology using any type of aircraft, airframe, or panel. You can either fly as a pilot using flight simulation software, or direct traffic as a controller.

Pilot-to-controller communication is performed using Voice-over-Internet-Protocol (VoIP), or by text message. Controllers and pilots interact real time as you file flight plans, fly to real-life airports, and perform flight following operations. You can learn and practice your aviation phraseology, detect any problem areas that need work, make mistakes, and recover knowing that you're "flying" on the ground without repercussions. The network also features virtual pilot and controller training online.

The skills you pick up in your virtual aircraft will easily transfer to your real-life cockpit.

VATSIM provides an opportunity for students, experienced pilots, and those returning to the cockpit to practice in a fun, non-intimidating environment to increase proficiency and sharpen radio communication skills. VASTIM can be found online at vatsim.net.

Plane English

Next up in the genre of simulation tools is Plane English. Created by two Purdue University aviation alumni, Plane English is an app that you can use on your mobile device to simulate radio communication between you and ATC. It's a self-guided learning experience in a realistic, interactive environment featuring thousands of real world, random scenarios in all phases of flight. Multiple lessons become increasingly complex, presenting challenging situations and dialogues with ATC in each phase of flight to help you improve your skills. You'll get real-time feedback and analysis of your phraseology, speech accuracy, and speech rate performance to build and track your radio proficiency. Plane English can help you practice your way into long-term success the next time you key the mic. It's available for Android and iOS on the AppStore and Google Play at planeenglishsim.com.

The Plane English app

Image courtesy of Plane English and Purdue University

Redbird

You may be familiar with Redbird's flight simulators, available at aviation schools and flight training providers. But did you know that Redbird also makes simulators you can use at home?

The Redbird TD simulator is a table top device that you can use to practice your push-to-talk skills from home. FAA-approved as a basic aviation training device, the TD operates Redbird's optional Parrot software that simulates controller-to-pilot interaction. Using voice recognition, Parrot learns your voice and speech patterns, and also responds to your commands.

As you perform your flight simulations, Parrot is self-aware, meaning that it knows at all times where your aircraft is located, what type of conditions exist during your flight, and which ATIS to read out based on the parameters you've chosen for your flight or location. The Redbird TD performs as a self-directed, real-time air traffic controller, deciding what instructions, clearances, vectors, etc., you will need for guidance during your simulated flight.

Redbird provides even the most novice pilot with an interactive, non-threatening environment to practice radio proficiency. Visit redbirdflight.com for more details.

PilotEdge

PilotEdge is a software program that connects your computer-based, flight simulator software to the PilotEdge voice and data network. With a membership plan, serious pilots can practice a wide range of aviation operations such as IFR and VFR flight, ATC-initiated holds, transitions through multiple airspace types, and emergency procedures.

PilotEdge takes each user's aircraft type, position, heading, etc., uploads it to the servers, and shares that information with the simulators of other virtual pilots nearby. The result is an interactive, real-time display of a shared virtual airspace. You'll see each other's aircraft and have the chance to communicate with other pilots on your frequency.

PilotEdge guarantees ATC coverage and interaction with live, real air traffic controllers (either active-duty FAA air traffic controllers, retired controllers, or enthusiasts) as towered airports are fully staffed and CTAF frequencies are supported at non-towered airports. PilotEdge welcomes pilots who take their flying seriously; but if you misinterpret a call, or read back your clearance incorrectly, live controllers will help you to correct it. If you don't have a strong grasp on ATC communications, PilotEdge features training and workshops as well that can help improve your aviation lexicon. Visit pilotedge.net for more details.

"Tower, Request Landing"

Whichever simulation tool you decide to fly, all are realistic, fun, and interactive. Most important, though, they provide a non-threatening way to learn, stay sharp, and improve your ability to communicate with professionalism, confidence, and skill.

Jennifer Caron is *FAA Safety Briefing*'s copy editor and quality assurance lead. She is a certified technical writer-editor in aviation safety and flight standards.

LEARN MORE

FAA Approved Aviation Training Devices
bit.ly/FAAapprovedATDs

Aeronautical Information Manual's Pilot/Controller Glossary
bit.ly/PCGlossary

FAA Safety Team Radio Communications Phraseology and Techniques
go.usa.gov/xRFvk

Redbird Flight Simulator experience, EAA Pilot Proficiency Center, AirVenture Oshkosh 2019.

From
Paddles
to
PEDs

A User's Guide to Modern Day Aviation Communication Equipment

By Tom Hoffmann

Since the days of Orville and Wilbur's first experiments with powered flight, the ability to communicate in aviation was seen as a critical and obvious next step. This need for effective communication has only intensified over the years as the aviation industry continues to grow and airspace becomes increasingly complex. Thanks to the rapid pace of technological advances, along with a never-cease-to-amaze level of ingenuity and tenacity in the marketplace, we now live in an era of communication capability that earlier aviators would surely covet. Let's take a look at some of what these modern-day communication devices offer and how to harness their full potential.

In the Beginning ...

Given the limited capabilities and lack of electronics in very early aircraft, communications followed a primitive one-way path that relied on visual signals from the ground to the pilot. This system primarily involved the use of colored paddles, signal flares, and hand signals. Two-way radio communication (albeit crude and unreliable) may have started around 1915. AT&T developed the first U.S. air-to-ground radio transmitter in 1917.

Reliability and operating range were limiting factors in these early systems. It wasn't until the 1930s that technology matured enough for a more widespread application in aircraft. These later two-way radios, coupled with the advent of radar, provided a more robust and consistent communication platform for aviators. That basic framework still works well today.

Playing All of Today's Top Transmissions!

Most GA aircraft operate on the Very High Frequency (VHF) airband, which spans 118 MHz to 137 MHz. The lower part of this band (108-117.95) is split into 200 narrow-band channels primarily reserved for navigation aids (VORs) and precision approach systems (ILS). The remainder of the bandwidth is for voice transmissions. Early VHF systems provided for about 140 voice-channels spaced by 100 KHz, broadened to 760 channels in 1990. Thanks to the development of digital radio, radio spectrum was split even further to provide 2,280 channels (but thus far only in Europe).

When starting flight training, new student pilots typically get an immediate introduction to the trainer's panel

The lower part of VHF airband (108-117.95) is split into 200 narrow-band channels primarily reserved for navigation aids, like this VOR station.

mounted nav/com aviation radio stack. While core radio design and operation remain similar across different platforms, it is important to understand display and/or functionality differences. That means reviewing the operations manual and practicing with features while the aircraft is parked. Learn what each knob and switch does, including how to set and properly switch between active and standby frequencies. Know how to set and/or change listening modes too (e.g., headset vs. cabin speaker). It's better to figure out why you can't hear anything on the ground than being NORDO once airborne. Remember to always configure your nav/com system (including standby frequencies) *before* the aircraft moves.

Headset Help

A key part of communication is the ability to properly hear what's being said. Aviation headsets are the go-to device for deciphering the sometimes rapid-fire pace of radio transmissions. Brand and type are personal choices, so it's important to know what matters to you. Some headsets offer passive noise attenuation that uses physical ear cup design to reduce noise. Active noise cancelling (ANC) headsets require a power source to create soundwaves that essentially cancel out intruding ambient sound. While ANC headsets do a better job of reducing cabin noise, there are tradeoffs: greater expense, requirement for batteries, and possible compromise in audio quality. Higher end ANC headsets offer dynamic noise cancellation, which uses digital technology to cancel a wider range of background noise.

Another important factor is comfort. Weight, ear cup construction, and in-ear vs. over-the-ear design are all important features to consider. As with shoe shopping, personal preference matters. Try a variety of types and styles to choose what works best for you.

Just as with nav/com radio setup, get familiar with all of your headset's features. If it has its own volume control, consider turning it up and using your radio panel to con-

> **While aviating and navigating are your top two priorities in any situation, having a solid backup communications plan can make a big difference, especially in emergencies.**

trol volume. If you suspect an audio problem, first check that the jacks are fully plugged in. It's a good idea to unplug them after use so they don't corrode. During preflight, always check the condition of all headset cables. I've seen a few that were worse for wear thanks to encounters with the seat rail. Finally, make sure your headset fits snugly to prevent sliding and position the microphone about one-quarter inch from your mouth.

While headset use is preferred, make sure your overhead cabin speaker and hand microphone are both working properly — you never know when you might need it. Check the integrity of push-to-talk mic switches too. Oil and dirt can collect beneath the contacts and cause a malfunction. Cessna maintenance manuals for the *Skyhawk*, *Skylane*, and *Stationair* call for cleaning the switch every 100 flight hours. A spray contact cleaner works, but check what's recommended for your aircraft.

The Power of PEDs

Personal electronic devices like smartphones and tablets have become an integral part of aviation communication. Many PEDs can be electronic flight bags (EFBs) to help with flight planning, weather, weight and balance, navigation, and more. Gone are the days of having to lug paper manuals and aeronautical charts. Electronic versions can be summoned with a few finger taps.

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Refer to FAA Advisory Circular (AC) 91-21D bit.ly/AircraftPEDs, AC 91-78 bit.ly/AircraftEFBs1, and AC 120-76D bit.ly/AircraftEFBs2 for more information and guidance on the use of PEDs and EFBs aboard aircraft. Part 91 operations — including light GA aircraft flown for business or pleasure — do not require any specific

authorization for EFB operations, as long as the EFB does not replace any system or equipment required by the regulations. In these instances, use of PEDs to replace paper charts is at the pilot's discretion.

A few words of caution: Devices not subject to FAA approval of components or installation are not guaranteed to provide the kind of reliability you expect from certified products. Keep devices fully charged and updated at all times. Remember that devices can (and will) fail without notice, so have a backup plan. And to prevent your PED from sliding under or between the seats at the worst possible time (and you know it will!), use a kneeboard or mount to secure your device.

One last warning: smartphones and cellular service enabled tablets in the cockpit are ubiquitous, but the FCC prohibits cellular telephone operation while airborne (see Title 47 Code of Federal Regulations section 22.925). It's best to use "airplane mode" to disable the cellular connection. That said, use whatever means are necessary to deal with electrical or radio malfunctions or other emergencies.

ADS-B and Me

As an integral part of the FAA's NextGen airspace modernization plan, ADS-B Out/In technology has become another vital communication tool. Using satellite technology to broadcast an aircraft's position (along with other vital information), ADS-B Out gives pilots and controllers an unprecedented level of situational awareness. Pilots equipped with ADS-B In are also able to receive near real-time weather data and traffic alerts via a PED or panel-mounted display.

Another NextGen element, the Data Communications (Data Comm) subsystem, aims to enhance Air Traffic Control (ATC)/pilot communications through digital text-based messages. Initially, Data Comm will be a supplemental means for two-way exchange for ATC clearances, instructions, advisories, and weather-related re-routes. As the system matures, most air-to-ground exchanges will transition to data communications for appropriately equipped users. Data Comm is in use at dozens of airports across the country with full en route capability expected by 2023. This will translate to greater safety as well as efficiency. It is estimated Data Comm has already saved more than 25,000 hours of communication time. Go to bit.ly/FAADataComm for more information on Data Comm.

Flying in the Blind

Aviation communication technology has come a long way. Even so, technology has a tendency to give up the ghost at highly inopportune times. While aviating and navigating are your top two priorities in any situation, having a solid backup communications plan can make a big difference, especially in emergencies. For many, that plan includes

Be sure to periodically review your Air Traffic Control Tower light gun signals in the event you lose radio communications.

keeping a hand-held aviation radio (and fresh batteries) at the ready. You can also use it to get ATIS or check traffic.

Be sure to have lost comm emergency procedures down cold. Follow your specific aircraft's checklist, which should include double checking for correct active frequency, ensuring correct position for com switches, and proper attachment of headset cables. If these steps don't correct the situation, try the last known frequency you communicated on or an alternate frequency. If there is still a problem, squawk 7600 and consider landing as soon as practicable. Review 14 CFR section 91.185 and the Aeronautical Information Manual (AIM) for lost two-way radio communications. The FAA suggests making ATC calls since you may still be transmitting even if not receiving. In this case, though, start and finish these calls with "In the blind ..." At a towered airport, observe traffic, enter the pattern, and wait for light gun signals (which you should periodically review).

The Right Tools for the Job

Good communication is fundamental to the safety and integrity of our airspace and to the growing number and diversity of NAS users. Today's aviation environment has plenty of tools to accomplish this critical endeavor, but keep your communication skills sharp and be sure you know how to use them all.

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

LEARN MORE

"Flying Paper-Less Airplanes," May/June 2010 FAA Safety Briefing, page 17
bit.ly/SBMay10

No-Go
on the
RADIO

What **Not** *to* **Say**

By Susan K. Parson

A few years ago, I occasionally (okay, regularly) found myself watching a now defunct and highly formulaic "reality" show called "What Not to Wear." The fact that it appeared on The Learning Channel assuaged some of the I-shouldn't-be-watching-this guilt (educational, right?). I also rationalized by saying I was learning about better fashion. Sort of.

For those unfamiliar with the show, here's the shtick. Each episode featured a person — almost always a woman — whose family or friends deemed her a fashion disaster. Shows opened with viewing "secret video footage" documenting the poor victim's many #FashionFails, thus setting the stage for a very public intervention by hosts Stacy and Clinton with the TLC camera crew in tow. Stacy and Clinton would show her the error of her ways by having her watch the painful secret video footage. Next they would dramatically discard virtually every item in her existing wardrobe. Then came revelation of The Rules for suitable sartorial selections, a supervised shopping expedition and, finally, the big reveal of the newly minted glamazon to her cheering family and friends.

Ten Rules for the Radio

So, what does a long-gone reality show have to do with GA? Whenever I fly in a GA airplane, I find myself wishing I could adapt the formula to create an aviation-themed educational program called "What Not to Say." In this fantasy, I would secretly tape radio disasters and, like TLC's Stacy and Clinton, pounce on the perpetrators with

an offer to set them on the path to proper and professional-sounding pilot patter. Also like Stacy and Clinton, I would require each audio offender to ditch inappropriate radio habits and to equip them with "The Rules" for proper aviation radio transmissions.

Here's a list of what not to say, with the corresponding rules for radio righteousness.

DON'T: *Make up your own terms.*
DO: *Learn the language!* Plane English has its own grammar, syntax, diction, pace, and vocabulary. Its dictionary, the FAA *Pilot/Controller Glossary*, precisely defines the meaning and proper use of aviation terms. To sound like a pro on the air when you are *in* the air, listen, learn, and practice with apps (e.g., LiveATC, PlaneEnglish) or an aviation-band radio.

DON'T: *Be long-winded.*
DO: *Think Twitter, not blog.* The Prime Directive for aviation communications is brevity. As you work to learn Plane English, practice writing what you might say and make it a personal challenge to cut words to the absolute minimum. Nobody wants to endure an audio blog.

> **The point of aviation radio transmissions is to give and receive useful information.**

DON'T: *Use aviation frequencies for personal conversations.*

DO: *Confine your transmissions to aviation business,* using correct words and phraseology.

DON'T: *Copy the audio mistakes of other pilots,* such as "taking the 'active" or asking "any traffic in the area (to) please advise." However commonly used, neither of these phrases is correct and both are the audio equivalent of tossing litter out the window of your car.

DO: *Use correct phraseology.* The point of aviation radio transmissions is to give and receive useful information. Therein lies the problem with the two transmissions cited above.

In the first example ("the active"), a pilot approaching a non-towered airport for landing should be listening to the Common Traffic Advisory Frequency (CTAF) to build a mental picture of traffic and the traffic pattern. Hearing pilots talk about "the active" tells the incoming pilot nothing about which runway is in use. While it is best to completely delete "the active" from your aeronautical vocabulary, at the very least you should include the runway number (e.g., "departing runway 35").

In the second example ("any traffic in the area please advise"), it is the incoming pilot's responsibility to listen, build a mental picture of other traffic, and transmit intentions. Just imagine what would happen if every pilot at a busy non-towered airport decided to respond separately to this ill-advised request.

DON'T: *Transmit before you know what you need to say.*

DO: *Think before you speak.* The standard formula is short and simple: (a) who you are calling; (b) who you are; (c) where you are in terms of distance, direction, and altitude; and (d) what you want to do. If you are new to aviation or prone to mic fright, consider creating a fill-in-the-blanks template that you can keep on your kneeboard as a script or cue card.

> **The goal is to make your message understandable, ideally with just one transmission.**

DON'T: *Speak before you listen.* I can hardly think of a flight in which I didn't hear someone get "stepped on" or "blocked" because of too many pilots trying to talk at the same time.

DO: *Listen first!* One of the tricks I learned in Toastmasters International is counting to five ("one-thousand ONE, etc.") before starting to speak. It feels like an eternity, but it's not. Rather, it's an opportunity to gather your thoughts so you can start speaking in a calm and measured way as opposed to nervous stammering or babbling. The same idea works in aviation communications. When you change to a new frequency, make it a habit to count to five while you listen to avoid stepping on someone else. If you don't hear

The Prime Directive for aviation communications is brevity.

anybody else, verify that you have entered the correct frequency and — important — that you don't have a stuck mic.

Also remember that controllers often work multiple frequencies. If you have been hearing ATC issue instructions to another aircraft without hearing the pilot's response, keep in mind that you may be hearing only half the conversation and try to time your own transmissions accordingly.

DON'T: *Talk too fast.*

DO: *Use a measured pace.* All pilots "know" about the legendary fast-talking folks in Air Traffic Control. While some controllers — especially those at super-congested airports like Chicago's O'Hare — do indeed use the pace of an auctioneer's patter, it's mostly an urban legend. Either way, though, it's not expected, required, or desirable for you to "compete" as if it were a speed-speaking contest. Always remember that the goal is to make your message understandable, ideally with just one transmission.

DON'T: *Say "roger" or otherwise pretend you understand if something is unclear.*

DO: *Ask the sender to "say again" or ask a clarifying question* if there's something you don't understand.

DON'T: *Hesitate to use the word "unable" if you can't comply with an ATC instruction.*

DO: *Stock your aviation vocabulary with this very useful word.* There is no shame in being "unable" to, say, fly into bad weather or take a "slam-dunk" descent. You don't need to lead with a detailed explanation — ATC will query as needed. Just say "unable" to communicate that essential point right away.

DON'T: *Hesitate to declare an emergency or ask for help when you need it.*

DO: *Speak up!* You've heard it before, but it bears repeating: if you have an emergency, say so. Post-emergency paperwork is uncommon but, even if there is a request, far better to be alive and well to comply. Also, if you need help to avoid an emergency, ask for what you need.

No doubt this list could expand but following these ten rules is a great start to sounding like a pro on the radio.

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Do You Know Where ADS-B Rule Airspace is?

FL 600
18,000 MSL

CLASS A | ADS-B 1090 ES Required

CLASS E | 10,000 MSL and above ADS-B Required
— CONUS Only —

2,500 AGL
ADS-B Not Required

CLASS E

ADS-B Required

10,000 MSL
3,000 MSL

12NM From Coastline

Gulf of Mexico

CLASS C

ADS-B Required

10,000 MSL
Surface

CLASS B

ADS-B Required

10,000 MSL
Surface

30NM

Mode C Veil

ADS-B Required

10,000 MSL
Surface
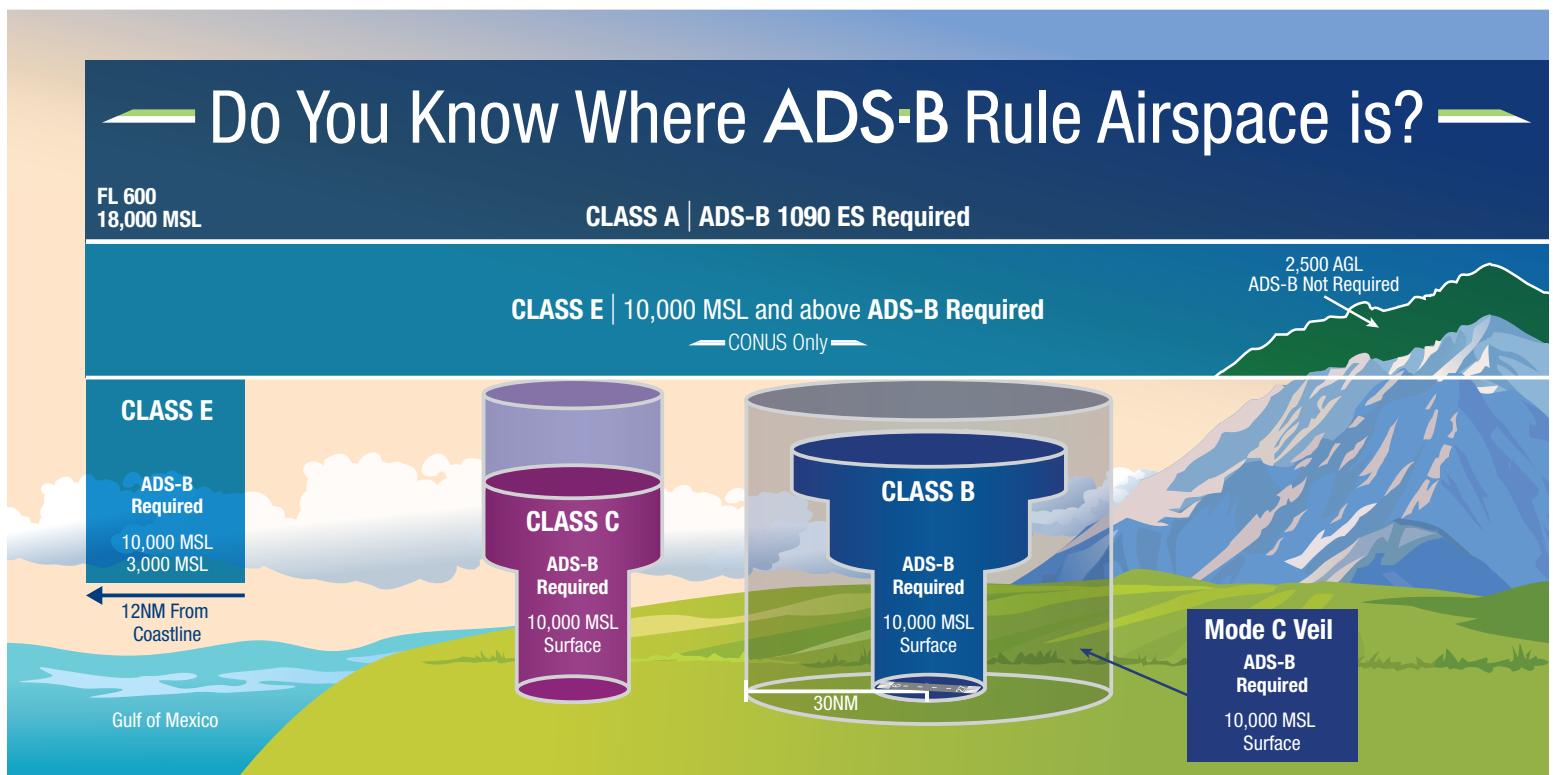
Key

AGL	Above Ground Level
FL	Flight Level
MSL	Mean Sea Level
NM	Nautical Miles

ADS-B Out Requirements

Federal Aviation Administration

THE SOUND OF (MICROPHONE) MUSIC
The ABCs, the One-Two-Trees, and Other Foundations of Aviation Communication

It never hurts to occasionally review the basics, possibly from a new perspective. So here goes.

Do-Re-Mi

One of my all-time favorite films is the 1965 classic "Sound of Music." If you've seen the movie, you might recall the scene where Maria uses a Do-Re-Mi-to-ABC comparison to teach the building blocks of music. In Plane English, which has a full alphabet of "notes," we express letters using the standard phonetic alphabet. Adopted in March 1956 by the International Civil Aviation Organization (ICAO), the ABCs of aviation are: *Alpha, Bravo, Charlie, Delta, Echo, Foxtrot, Golf, Hotel, India, Juliett, Kilo, Lima, Mike, November, Oscar, Papa, Quebec, Romeo, Sierra, Tango, Uniform, Victor, Whiskey, X-ray, Yankee, Zulu*.

Today's version is the last in a series of "spelling alphabets," which started in the International Telecommunications Union in the late 1920s. In 1932, the International Commission for Air Navigation (an ICAO predecessor) adopted a version using (mostly) geographic names: *Amsterdam, Baltimore, Casablanca, Denmark, Edison, Florida, Gallipoli, Havana, Italia, Jerusalem, Kilogramme, Liverpool, Madagascar, New York, Oslo, Paris, Quebec, Roma, Santiago, Tripoli, Upsala, Valencia, Washington, Xanthippe, Yokohama, Zurich*.

In 1941, the United States started using the Joint Army/Navy Phonetic Alphabet, more commonly known as the "Able Baker" version: *Able, Baker, Charlie, Dog, Easy, Fox, George, How, Item, Jig, King, Love, Mike, Nan, Oboe, Peter, Queen, Roger, Sugar, Tare, Uncle, Victor, William, X-ray, Yoke, Zebra*.

The Able Baker version offers a very plausible explanation for how aviators adopted "Roger" as shorthand for "I have received and understood your transmission." In its early days, the fledgling aviation industry adopted customs, procedures, and terms from more established sectors like the telegraph business. In the telegraph business, which then used Morse code, the receiver would transmit "R" to signify successful receipt of a message. Early aviators needed a similar protocol. Since they couldn't transmit a Morse-code "R," they did the next best thing by transmitting the word "Roger."

One-Two-TREE!

Numbers in Plane English are pronounced mostly the same as they are in regular English, with just a few exceptions. In Plane English, three (3) becomes "tree," five (5) becomes "fife," and nine (9) becomes "niner." I'm not so sure about "tree" and "fife," but I have always thought "niner" sounds a lot cooler than a plane (ahem) vanilla "nine."

To offer an example, you properly pronounce the "name" of a U.S.-registered airplane with tail number 1359T as "one-tree-fife-niner Tango." You probably won't hear the "November," the first element in the tail number of any U.S.-registered aircraft. Other countries use a different starting letter (or a combination of letters and numbers) to denote an aircraft on their registry.

The Ws

Aviation transmissions follow a specific sequence: **W**hom you are calling: "Phoenix Approach" or "Falcon Tower;" **W**ho you are, using the aircraft's make, model, and tail number: "*Skyhawk* 1359 Tango;" **W**here you are: "twenty miles west" at "5,500 feet" (read from the altimeter); and **W**hat you want to do: "landing Falcon Field."

Idioms

ATIS (Automatic Terminal Information Service): provides current weather and airport information, such as runways in use. Each successive ATIS recording has an alpha-numeric designator (e.g., ATIS Information Foxtrot) to distinguish it from previous ones.

Squawk: This word refers to the aircraft's transponder code (e.g., 1200). Squawk can be a noun ("say assigned squawk"), an adjective ("squawk code is 2345"), or a verb ("squawk 5423").

Mayday: (emergency): Hopefully you will never have to use this one. If you're wondering, Mayday is a corruption of the French for "help me" (m'aidez).

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Getting to YES with NOTAMS

By Jennifer Caron

Why They Matter and What's In Store

Unlimited visibility, clear skies — the perfect excuse for our $100 hamburger flight — clouded by an unexpected CTAF advisory — "Do Not Land! Airport is NOTAM'd closed today." Well, so much for that hamburger. Our disappointment quickly turned to dread as we realized we might not have enough fuel to make it to the next airport. With just 30 minutes of flying time left, we got lucky: we spotted an airfield west of us and landed safely.

I'm embarrassed that it took such an incident to teach two important lessons. First, always give yourself plenty of wiggle room with fuel in case you need to divert. Second — the fundamental lesson — always check NOTAMs before every flight.

A NOTAM, or Notice to Airmen, is the primary means to communicate time-sensitive information about the abnormal status of some element in the National Airspace System (NAS). NOTAMs address potential flight hazards such as drone (UAS) operations, air shows, temporary flight restrictions (TFRs), and information not yet published on aeronautical charts, construction activity, and runway or airport closures. These are critical details for flight planning.

Yes, NOTAMs Need Help

So why do NOTAMs get such a bad rap? Let me count the ways, starting with sheer volume. The standard briefing for a domestic flight plan might produce hundreds of NOTAMs, and the regulations say that pilots must be familiar with "all available information" prior to departure. The problem is that NOTAMs are targeted to everyone, not individual pilots and their specific flight plans. The system generates around 1.3 million NOTAMs each year and, with the vast amount of information designed to inform all, it's TMI — too much information.

Then there's the outdated, time-consuming format. NOTAMs are written in all caps using abbreviations and shorthand, rather than plain language sentences or graphical depictions. In an electronic world that interprets all caps as SHOUTING, just the appearance is off-putting. Combine the TMI problem with the SHOUTING format, and it's painfully easy for even a conscientious pilot to miss the critical needle in the haystack of irrelevant data.

Less conscientious pilots don't even try. I know pilots who skip flight planning altogether, especially if they're just looking to bore holes in the sky on a clear day. Even for longer jaunts, and even though they know it's the PIC's responsibility to check NOTAMs, they balk at this painful and time-consuming task.

Taking the No Out of NOTAMs

Both the FAA and aviation community providers are on the case. We'll talk about future state in a moment, but we'll start with currently available tools that take the pain out of NOTAMs.

The FAA has created a new NOTAM search site at notams.aim.faa.gov/notamSearch. A fully optimized, interface search tool with digital NOTAMs, this site provides a one-stop shop that lets you customize your NOTAM search. You can use criteria such as time and date, location, flight path, geographic area, latitude/longitude, keywords, and more. You can filter and sort results by location, class, start and end date, condition, and (again) more. You'll also find Letters to Airmen and a link to Airport Construction Notices in pdf format.

Since TFRs are the subject of many NOTAMs, another FAA website resource is tfr.faa.gov. TFRs can pop up quickly and violating one because you didn't feel like checking NOTAMs isn't a winning excuse. The website gets updated in real time, so it provides the most current information on published TFRs nationwide. Please do note that the site includes a disclaimer that when planning a flight, always call 1-800-WX-BRIEF for a more complete listing. Select the state where you're operating or expect to fly. Click the hyperlink under the NOTAM column for details and graphical representation on the time, date, and altitude of effectiveness. The "other information" section names the controlling agency and provides contact details.

The Flight Service Pilot Web portal at www.1800wxbrief.com is another online tool for quick and easy NOTAM searches. A free account enables you to get online preflight briefings, file flight plans, and get automatic notifications and alerts that include flight plan closure reminders, NOTAMs and TFRs, notices of new or adverse weather conditions, or pertinent airport closures. If you want someone to verbally translate NOTAMs, you can call Flight Service at 1-800-WX-BRIEF.

> **Users still need NOTAMs that are easier to read, understand, and find. The good news is that this goal is part of the FAA's phased NOTAM modernization initiative.**

You can also find NOTAMs and TFRs on-the-go with FAA Mobile. FAA Mobile is an easy-to-use website you can use online or on your mobile device for quick access to N-numbers, NOTAMs, Advisory Circulars, airport updates, and more. You can find FAA Mobile at www.faa.gov/mobile.

Last but certainly not least, third-party providers in the aviation community have done a lot to take the pain out of finding and reading NOTAMs. Most of the popular flight planning and flight management apps fish out the NOTAMs relevant to your specific flight plan. They also make it easier to read the information by lowering the shrill volume of ALL CAPS to sentence case.

Knowing the NOTAMs of the Future

These steps help, but users still need NOTAMs that are easier to read, understand, and find. The good news is that this goal is part of the FAA's phased NOTAM modernization initiative. Here are some of the recent and upcoming milestones:

In the future, more airports will use the Federal NOTAM System (FNS) NOTAM Manager website for streamlined NOTAM processing. Plus, with over 1400 airports currently having the ability to issue NOTAMs using NOTAM Manager, more airport managers will have this ability.

	Location	Number	Class	Start Date UTC	End Date UTC	Condition
	DCA	N/A	Aerodrome	09/11/2019 2230	PERM	ON AIRPORT - SEE CONSTRUCTION GRAPHIC
	DCA	02/264	Communi...	02/20/2020 1100	PERM	COM COM FALLS CHURCH REMOTE COM OUTLET 122.2 U/S 2002201100-PERM
	DCA	12/042	Aerodrome	12/03/2017 2049	PERM	TWY N BTN APCH END RWY 15 AND TWY K CLSD TO ACFT WINGSPAN MORE THAN 124FT 1712032049-PERM
	OTT	05/168	Navaid	05/10/2019 1845	PERM	NAV VOR OUT OF SERVICE 1905101845-PERM
	DCA	06/265	Communi...	06/20/2019 0001	PERM	COM REMOTE TRANS/REC 319.1 CHANGED TO 239.25 1906200001-PERM
	DCA	06/266	Communi...	06/20/2019 0001	PERM	COM REMOTE TRANS/REC 269.0 CHANGED TO 360.8 1906200001-PERM
	DCA	08/182	Obstruction	08/15/2019 1000	PERM	OBST BLDG LGT (ASN 2018-AEA-6441-OE) 385213N0770235W (1.2NM NNW DCA) 78FT (67FT AGL) U/S 1908151000-PERM
	DCA	01/185	Airspace	01/15/2020 0008	PERM	AIRSPACE SEE FDC 1/1155, 9/1811, 0/0053, 9/1812, 0/3929 ZDC SPECIAL SECURITY INSTRUCTIONS 2001150002-PERM 2001150008-PERM

Federal NOTAM System (FNS) search website at notams.aim.faa.gov/notamSearch.

> **Take advantage of all available tools to get the benefit of all available information in NOTAMs, so you won't be that pilot or (worse) jeopardize safety of flight for yourself or others.**

In March 2019, the FAA began removing duplicative information in the Chart Supplement (previously known as the Airport/Facility Directory). Permanent (PERM) NOTAMs have also been targeted for reduction in an effort to quell the amount of redundant data by publishing information more quickly on charts and publications.

In November 2019, the FAA established a single governing office for NOTAMs and aeronautical information. In a phased approach, the agency is working to improve the presentation of NOTAM information, prioritize or highlight the most important safety details, and optimize data, technology, and processes to help pilots find and retain the most relevant information.

In February 2020, the FAA retired PilotWeb, the former public interface for searching NOTAMs. Users are now redirected to the friendlier, digital FAA FNS NOTAM Search website.

In June 2020, users with "screen scraper" applications that pull content from Pilot-Web will be transitioned to the FAA's System Wide Information Management (SWIM) interface. SWIM is a single technology gateway that developers can use to enter, process, and retrieve all NOTAM data for distribution to the aviation community.

Also in June 2020 — June 18, to be precise — the FAA will discontinue its Notices to Airmen Publication (NTAP) to streamline the repository of NOTAMs published every 28 days. The last NTAP will be published on May 21, 2020.

FAA Mobile at www.faa.gov/mobile.

Information from the International and Graphic Notices sections of the NTAP will be transferred to new websites, accessible via the FAA NOTAM Search website. Visit bit.ly/NotamPub for more details.

In the near future, domestic NOTAMs will transition to the ICAO format and become more machine-sortable, in human-readable formats. We will have a single NOTAM repository with searching, sorting, archiving, and filtering capabilities, thus improving NOTAM search flexibility.

Say Yes to NOTAMs

As with weather, checking NOTAMs is a critical part of flight planning. A case in point:

During a night cross country flight to an unfamiliar area, a pilot attempted to land his Cessna 170 at an airport in Lake Havasu, Arizona. Construction had changed the airport elevation and, though reported by NOTAM, the new data hadn't yet made its way to the aeronautical chart. The pilot survived a collision with terrain on the base-to-final turn, but his airplane wasn't so lucky.

As noted above, things *are* getting better with the best still to come. Take advantage of all available tools to get the benefit of all available information in NOTAMs, so you won't be *that* pilot or (worse) jeopardize safety of flight for yourself or others.

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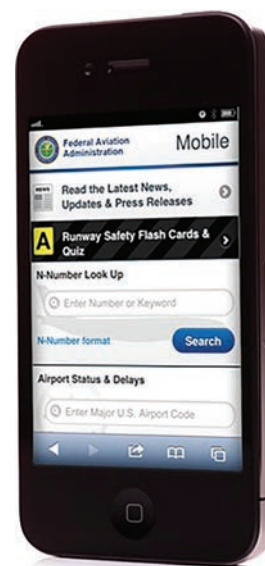
LEARN MORE

FAA NOTAM Search User Guide
bit.ly/NOTAMUser

The **Century** Club

It's Not Your Father's Flight Service

By James Williams

With the design life of a human body landing somewhere between 80 and 100 years, we rightly look upon 100 years as a point of celebration. The same can be said for the aviation industry. Back in 2003, powered flight celebrated its centenary with great fanfare. This summer marks another milestone in the aviation world: Flight Service joins the century club on August 20.

After the first World War transformed the airplane from an intriguing novelty to a functional tool, countries around the world sought to establish routine air mail service. The birth of Flight Service played a key role in accomplishing this goal. The U.S. Post Office Department ordered the creation of air mail radio stations on the route between New York and San Francisco. These air mail radio stations provided services similar to those that their modern descendants offer to pilots today.

Change is the Only Constant

Death, taxes, sharks, and crocodilians are about the only things in this world that seem immune to change. Like any organization that's been around for a century, Flight Service has changed. In fact, Flight Service is now in the midst of perhaps its biggest change ever — and that's saying something for an organization turning 100. I am not *that* old, but just in my lifetime, Flight Service has shifted from in-person briefings at actual physical stations (which I have received from three different Flight Service stations) to

> **Flight Service is now in the midst of perhaps its biggest change ever.**

telephone briefings, and now largely to computer briefings. This signals a significant shift from largely two-way (briefer to pilot) communication to self-briefings that include automation-based information and communication.

The FAA is monitoring this trend, watching Visual Flight Rules (VFR) flight plans filed with a specialist continue to decrease while VFR flight plans filed via web
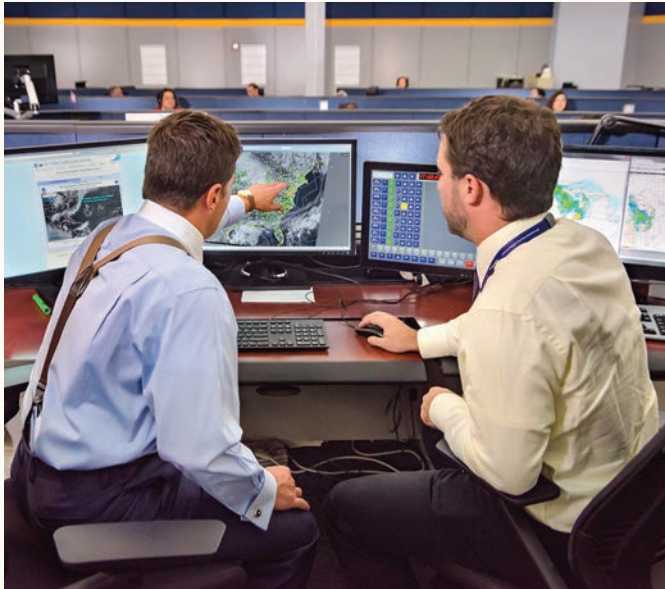
services increase significantly. The data shows a very strong correlation. In the period between 2013 and 2019, specialist filed plans decreased from a high approaching 30,000 per month to less than 5,000. During the same time period, web-filed plans increased from less than 5,000 to a peak of over 40,000.

Of course, this isn't a new trend. Flight Service introduced computer-based briefings and flight plan filing with the Direct User Access Terminal Service (DUATS) program in 1990. But as the internet became ubiquitous, Flight Service faced a critical juncture. DUATS had started as, and for many years continued to be, secondary to the core function of specialist briefings. DUATS has been sunsetted, but Flight Service does provide alternate web-based services for pilots. Change is rarely easy for large organizations and this is a large change for a large organization.

The Future is Now!

"Our challenge was how to provide the best possible service to our users, both today and in the future," explains Chris Henne, Manager of the Flight Service Safety and Operations group in the Air Traffic Organization's System Operations Services. "What can we do today that can not only improve the user experience, but also reduce the government's cost — all without compromising safety? The unique circumstance of pilot preference for online products, combined with modern technology, provided the chance to meet both goals," Henne continues. So the emphasis shifted to improving web services.

> **While the emphasis is on self-briefing, specialists are still available to take your call.**

Today, the FAA continues to directly handle Flight Service in Alaska, while a contract service provider performs these functions in the contiguous United States (CONUS), Puerto Rico, and Hawaii. The Flight Service website (www.1800wxbrief.com) has been enhanced to include a mobile-friendly format, ICAO flight plan support, graphical flight planning, the ability to filter extraneous NOTAMs, and 45-day retention of pilot history data. "In the future we'd like to be able to better link our web briefings and those given by specialists," Henne says. "That way if a pilot has questions about a specific item in a briefing, the specialist can see what the pilot is looking at and answer the questions faster and more directly than simply repeating a briefing the pilot has already received." This could save both the pilot and specialist time and improve the briefing experience.

If you haven't tried www.1800wxbrief.com or if it's been some time since you have, it's worth a visit. You can establish an on-line account with Flight Service that will allow you to obtain enhanced weather and aeronautical information services and be sure to check out the new mobile version.

Briefing Strategy

What should your briefing strategy be? How should you communicate with Flight Service? You have choices! While the emphasis is on self-briefing, specialists are still available to take your call. Start with the Flight Service website or other approved sites/apps. These portals are a great starting point. If you are confident about your grasp on current and forecast conditions, you can file and be on your way in a few clicks or taps. If you have any doubts or questions, just call Flight Service, and tell the briefer what type of forecast you already have in order to help them better answer your

An Airway Radio Station, predecessor of the modern Flight Service.

questions. The specialist can take you on a deeper dive into any particular concerns you might have.

Communication about weather is critical to any flight. But the nature of that communication is up to you. The FAA is focusing on web services because that's where the users are. Also, every enhancement that makes a web briefing better can be scaled across the system without delay or much cost. Telephone briefings are great for discussion of specific concerns, but not so much for broad awareness. Your needs should drive your strategy. "Most times a web briefing will probably provide a great solution, but there are times when you might need a little extra help and that's why we're here." Henne said. To paraphrase an old advertising slogan: "We'll leave the phone on for you."

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

LEARN MORE

One Hundred Years of Flight Service
my.faa.gov/go/fs100

Flight Service
www.1800wxbrief.com

WHAT'S THAT DRONING NOISE?!
Good Communication is Essential to Drone Safety

Communication is key to the safe operation of unmanned aircraft systems (UAS), or drones. Crew Resource Management (CRM) involves good communication between the remote pilot-in-command (RPIC) and the visual observer (VO) for both normal and abnormal operations (e.g., loss of control, fly-offs, or de-confliction with manned aircraft). With the RPIC's attention usually focused on the flight controls and the UAS camera monitor, it is important for the rest of the crew to provide effective communication with the RPIC to improve situational awareness and avoid any possible flight conflicts, thus increasing the overall safety of the operation.

In UAS operations, the one area of communication that can be easily taken for granted is contact between the ground control system (GCS) and the drone. In some cases, a fly away and/or loss of control situation occurs when the GCS has not cap-

tured enough GPS signals, or when radio frequency interference (RFI) is prohibiting or weakening the connection between the GCS and the drone. In your pre-flight checklist, and while operational, ensure that this crucial connection has been made and the signal remains strong.

> **THE FAA PROVIDES NUMEROUS RESOURCES FOR THE SAFE OPERATION OF DRONES IN THE NATIONAL AIRSPACE SYSTEM (NAS).**

It is also important to have good communication with the FAA. The FAA provides numerous resources for the safe operation of drones in the National Airspace System (NAS). This includes what you have to do to fly in the NAS, as well as information about new rules or rule changes. The agency has a dedicated team in the Office of Unmanned Aircraft Systems Integration that works with other FAA offices and serves as a resource to drone operators. You can find specific information about UAS operations at www.faa.gov/uas. You can ask questions about drone operations at uashelp@faa.gov. You can follow us on Facebook (Facebook.com/FAA), Instagram (Instagram.com/FAA) and Twitter (@FAADroneZone). The FAA also produces webinars and other digital and printed media to assist you with safe drone operations.

Don't forget about reaching out to your local DronePros. DronePros are volunteers who support the FAA

Safety Team (FAASTeam) and play a vital role in accomplishing the FAASTeam mission. DronePros serve the drone community by sharing their time, resources, and professional experience in order to create a positive safety culture. DronePros also regularly host informational webinars that you can enroll in here: bit.ly/DroneProsWeb.

In summary, good (meaning effective!) drone communications involves three essential areas:

1. **Good person-to-person (RPIC – VO) communications.**
   Tip: Use effective communications during a UAS operation to ensure that there are no misunderstandings when it comes to risk, and/or the actions the team needs to take to reduce that risk.

2. **Good communications between the GCS and the drone.**
   Tip: Make sure the connection between your GCS, the drone, and other outside signals (GPS/Wi-Fi, etc.) is strong enough to conduct a safe operation.

3. **Good communications with the FAA.**
   Tip: Use FAA resources to keep up with the latest information on how to safely operate your drone.

Good communication is critical to ensuring safe operation in the NAS … and good communication continues to be the best way to collaborate with the FAA on safety!

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GET TO KNOW YOUR MECHANIC

Pilot: "DME volume unbelievably loud."
Mechanic: "DME volume set to a more believable level."

Maintenance and inspection of an aircraft is a team effort between you and your aviation maintenance technician (AMT). Good communication skills and constant contact with your mechanic and repair shop are essential to the safe condition and operation of your aircraft. Be proactive in your approach. Here are seven questions to get the conversation started.

1) Is my AMT Certified with Inspection Authorization?

If your mechanic has an Inspection Authorization (IA), ask to see his/her IA card and find out if they have met the qualifications for renewal during the non-renewal year. The IA expires every odd-numbered year on March 31, but an IA-holder must meet renewal requirements every year to stay current. The IA is needed for approval of return to service of major repairs and alterations. Minor repairs can be accomplished and returned to service by the A&P, along with 100-hour inspections.

2) How thorough is my AMT?

Tool organization tells a lot about a mechanic when it comes to thoroughness and accuracy. Although not required by regulation, check to see if

> **MAINTENANCE AND INSPECTION OF AN AIRCRAFT IS A TEAM EFFORT BETWEEN YOU AND YOUR AMT.**

tools are shadowed to allow for quick inventory of all equipment before closing up panels. It's an indicator of a mechanic who goes beyond the minimum. Also ask if they have the proper, calibrated tools to do the job according to manufacturer recommendations.

3) How knowledgeable is my AMT on my aircraft type?

Check your AMT's qualifications for working on your aircraft. Does he/she have adequate training for your aircraft type or installed equipment? If your aircraft is newer/high tech or made of composite materials, do they have the right skills to properly repair and/or maintain it?

4) Does my AMT use Current, Relevant, and Approved Data?

Ask if your mechanic has the current manual for your specific make and model of aircraft. One serial number can make a huge difference between doing the job correctly or not. If they are performing a major alteration or repair, did they get all of the approved data?

5) Does my AMT use Approved and Traceable Parts?

Maintenance personnel are required to use parts that are traceable, have a known history, and carry some sort of service tag when the mechanic receives them. Parts Manufacturer Approval (PMA) parts are not original man-

ufacturer's parts, but they have FAA approval for installation on certain models of aircraft. Click here for the list: bit.ly/PMAParts and read the article, "Be a 'Part' of Improving Aviation Safety, A Look at Suspected Unapproved Parts," at adobe.ly/2DDlu09. Be aware that not all lubricants and sealers are the same. Ask if your AMT has the proper materials to lubricate your aircraft type.

6) Are Logbook Entries Correct?

Your logbook must contain a proper description of the work performed. Although not required, ask your AMT to include the part number/serial number removed, and the part number/serial number installed, for components removed and replaced. Take the time to discuss all issues found during any inspection or repair, especially major repairs or alterations. Ask questions: What was touched, repaired, or replaced?

7) Does my AMT Work in a Clean, Neat, and Well-lit Shop?

Parts and materials should be stored correctly. Dust and humidity, for example, can affect the airworthiness of certain items. Adequate lighting is also key. If the shop is not well lit, your AMT could miss potential problems.

Remember, maintenance and inspection of an aircraft is a team effort. An open dialogue with your AMT and repair shop will help you develop familiarity and trust that your aircraft is in the right hands.

LEARN MORE

FAA IA Information Guide
bit.ly/IAInfoGuide

AVIATION ENGLISH, PLEASE

On a cold, Midwest morning in early January, a student pilot taxied a Cessna 150 to the active runway at his local airport and radioed ATC that he was ready for departure. ATC issued instructions to hold short of the runway while the tower dealt with two inbound aircraft. Seconds after the tower sequenced those aircraft, and despite the clear instruction to wait, the pilot taxied out and began his takeoff roll with landing traffic only a quarter-mile behind.

Less than a month later, the pilot of a twin turboprop departing a busy west coast airport flanked by mountains flew in the wrong direction after being cleared for a standard instrument departure. ATC issued a low altitude alert and directed an emergency climbing turn to avoid terrain. According to ATC, the pilot's readback during the departure clearance was difficult to understand. It was believed that the pilot may have misconstrued a heading assignment with a concurrently issued wind advisory.

The common thread for both incidents: inability to clearly understand and follow ATC instructions. This problem can be particularly acute when English is a second language that is further complicated by the highly specialized aviation lexicon. In fact, since 2018, approximately 60 pilot deviations — some with deadly potential — have been attributed to English language and terminology issues. With more than 40,000 foreign pilots enrolled in U.S. flight schools, the FAA is working to address this safety issue.

In general, regulations state that to be eligible for an FAA certificate or additional aircraft rating, an applicant must be able to read, speak, write, and understand the English language. That

includes flight engineers, dispatchers, parachute riggers, and remote pilots.

To provide a consistent baseline application of the regulation, the FAA adopted the Aviation English Language Standards (AELS), which mirror the International Civil Aviation Organization's (ICAO) Operational Level 4 standards for English language proficiency. The AELS/ICAO standard encompasses six main elements: Pronunciation, Structure, Vocabulary, Fluency, Comprehension, and Interactions. For more on each element, see ICAO Document 9835 bit.ly/Doc9835.

Individuals seeking an FAA certificate or rating must meet the AELS standard to be considered English proficient. It is not a "one and done" achievement for airmen; they must be able to continuously demonstrate mastery. "It is incumbent on flight and ground instructors, designated examiners, and air traffic personnel to report any observed English language deficiencies," says Joe Foresto, an Aviation Safety Inspector (ASI) with the FAA's General Aviation and Commercial Division. "Failure to take action may add unwanted risk to the National Airspace System (NAS)."

To help determine if an applicant or FAA certificate holder meets

AELS, instructors and examiners can review Advisory Circular 60-28B (go.usa.gov/xdQyT). In addition to helpful guidance on AELS criteria, the AC also breaks down the assessment process. Another good resource is ICAO's rated speech sample page, which provides audio samples of pilots at varying levels of performance (cfapp.icao.int/rssta).

The FAA is also using education and training. "We provide volumes of information in the Aeronautical Information Manual (AIM) and the Pilot/Controller Glossary, which airman should be more aware of," says Foresto. "However, none of it discusses what your ears and mouth should be doing when the mike is keyed." In that vein, Foresto is spearheading work on new content for FAA handbooks and manuals to provide information on what to say, and how and when to say it. In the meantime, consider reviewing the resources listed below to better understand what's expected of you and what you should expect from fellow NAS users with regard to English proficiency and ensuring effective communication with ATC.

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

LEARN MORE

FAA Order 7110.65, Air Traffic Control
go.usa.gov/xdpdv

Airman Certification Standards
faa.gov/training_testing/testing/acs

FAASTeam Notice on Aviation English Language Standards
go.usa.gov/xdpdS

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CREW COMMUNICATIONS

NASA photo

The 1995 "Apollo 13" movie lets viewers relive one of American aviation's most stirring events. It tells the story of how NASA personnel improvised solutions to bring the three astronauts safely home after an explosion caused severe damage. Because it shows how teamwork, effective communications, and imagination came together, the film and the real event that inspired it underscore the long-held premise that multiple viewpoints improve safety.

The U.S. Helicopter Safety Team (USHST), an industry-government safety advocacy group, has brought this kind of thinking to rotorcraft. The 22 helicopter safety enhancements released in 2017 include this one:

Develop and promote recommended practices for pilot and nonflying crew members to: 1) Detect increased risk levels during the course of a flight, 2) Effectively communicate the increased risk level to each other, and 3) Make a decision on the appropriate risk mitigation.

Put simply, we are encouraging nonflying crew members (e.g., flight nurses) to support the pilot in maintaining safety. "The [above cited safety] enhancement stems from a review of accidents that might have been prevented if crew members had trained together with the pilot in crew resource management," said Stephen Earsom, a

biologist/pilot with the U.S. Fish and Wildlife Service, and a USHST member. "The first priority of any flight is for everybody to go home at the end of the day," he noted. "That's why we're trying to reach out and help pilots to understand they've got crew members they can draw on; and just as importantly, to help crew members understand that they play a role in safety."

A USHST study group recommends the following:

1. Companies with single-pilot operations should provide classroom training for all pilots and crew members in crew resource management. The companies should use scenario-based training where pilots work together with crew members to solve problems.

2. Companies should develop documents and briefing cards for each crew member describing his or her role aboard the aircraft. Crew members should review and sign the documents.

3. If the workload during flight permits, pilots and crew members should create and go through scenarios in real time.

The FAA recommends that everyone aboard a helicopter contribute to flight safety. Passengers can help in a number of ways:

Watch for traffic: Passengers can look out for other aircraft, birds, towers, and other potential obstacles, and notify the pilot.

Run checklists: Passengers can read checklist items to pilots, and then watch to ensure they complete the required tasks. Besides helping pilots, this task boosts a passenger's knowledge of the aircraft and safety-related aviation procedures.

> **WE'RE TRYING TO HELP PILOTS TO UNDERSTAND THEY'VE GOT CREW MEMBERS THEY CAN DRAW ON, AND TO HELP CREW MEMBERS UNDERSTAND THEY PLAY A ROLE IN SAFETY.**

Set/monitor radios: A flying companion can help the pilot by setting and changing radio frequencies and the transponder code. A passenger can also learn to perform basic functions on installed or hand-held moving map navigator(s).

Assess the pilot's health: A frequent flying companion can often tell if the pilot looks tired or ill. If that is the case, the passenger can help the pilot decide whether he or she is fit to fly.

Assess the weather: A pilot may feel compelled to fly in stormy or foggy weather without having the necessary equipment, experience, or instrument flying skills. A passenger can release that perceived pressure by advocating a no-go decision, a diversion, or a precautionary landing.

The bottom line is that anyone aboard an aircraft can contribute to safety by clearly communicating observations and concerns. It could mean the difference between a safe flight and catastrophe.

Gene Trainor is an FAA communications specialist. He was previously a technical writer for the FAA Rotorcraft Standards Branch in Fort Worth, Texas.

Here's a fantastic example of GA Safety Facebook Group members supporting and helping each other. **Facebook.com/groups/GASafety**

If you're not a member, we encourage you to join in on the discussions and post relevant GA content that makes the National Airspace System safer.

What Exactly is a "Supervised Solo?"

When did a supervised solo become an accepted thing? I thought solo was a single occupant in an aircraft.
— Brent

Hmm ... I always thought "supervised solo" was when the CFI stood on the ramp with his handheld radio, listening and watching the student after climbing out and saying, "ok, give me two good landings then meet me back here."
— Ken

Here's the FAA's Posted Response on the GA Safety Facebook's page:

The term "supervised solo" does not have a legal definition. It is sometimes referred to when an instructor watches their student in the pattern on their first solo. There is no prohibition for instructors being able to talk to the student on the radio. Solo means the sole occupant of the aircraft. However, there is an option to have an authorized instructor in the aircraft for commercial (not private) multiengine under 14 CFR 61.129(b)(4).

From Our Twitter Channels

TEM Team

Interesting article, "Good Decisions on the Fly: Putting TEM on Your Safety Team," in the Nov/Dec 2019 FAA Safety Briefing (@FAA Safety Brief). Introduced a new (to me) term of TEM (Threat and Error Management). Emphasis on the idea that we are both the problem and the solution. Good read!
— Jeff

Thanks, Jeff, we appreciate your feedback! Readers can check out the article online at bit.ly/FAA-TEM.

The Heads Down, Eyes Out Balance

Greetings,
Your article "No Surprises," [in the Jan/Feb 2020 issue] was well done. Just wanted to say thank you. [It's] a great reminder and heads up to get a handle on our cockpit magic. A learning experience in the clouds is never a good feeling.
— Ed

Thanks so much for taking the time to write, and we're so glad that it helped you. The subject of the "Post-flight" column in that issue is similar ... just a bit of a different take on the issue. It's interesting to see how much that topic resonates with people, but we are all struggling with the balance these days.

Say It As You Do It

When I opened the FAA Safety Briefing, "NO SURPRISES! Keeping Control of Avionics and Automation" jumped right out at me. As a flight instructor, I find this subject to be one of the most complex to teach.

In your article, you require a student or pilot to call out their entry on an auto pilot. I really like that and will add that to my teaching from now on. Also, I will require a student or pilot to call out every entry on their GPS navigator. Too many times I have flown with pilots with the Garmin 430 or 530 and they are trying to enter their flight plan while taxiing to the departure runway. I say, STOP. Enter the flight plan here, then taxi. They may not like me for that, but running off the taxiway would be worse. And now I will add that they must speak out each entry into the system as they are doing it. I can't really tell what they are entering or if an error in entry happened as a passive passenger.

Thanks for a great article, and a good writing style. I will look forward to more.
— Howard

Thanks so much for the lovely note and for taking the time to reach out and share your experience. We're delighted to hear that you found the article helpful — that always seems to be a popular topic. Thanks as well for sharing your idea of adding GPS navigator callouts along with those for the autopilot — excellent advice.

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 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.

WHEN SILENCE IS GOLDEN

Silence is true wisdom's best reply.
— **Euripides**

It might seem odd to close an issue on aviation communications with a piece about the value of silence, but please hear me out (ahem).

You don't have to be involved in aviation very long to learn the Aviate - Navigate - Communicate mantra. As we have often stressed in these pages, the sequence is important. The first, last, and indeed constant priority is to fly the airplane (aviate). Second is to ensure that you aim the aircraft in a useful direction. Then, and only then, do you turn your attention to the task of communicating with those outside the confines of the cockpit. If you need a witty way to follow this precept, just remember that you should never drop the airplane in order to pick up the microphone. Having a push-to-talk switch on the yoke doesn't make this idea less valid: the method of launching a transmission doesn't relieve your brain of the multitasking burden that communication imposes.

Patter Can Be Perilous

Let's briefly review the perils of multitasking. Many states now have laws that prohibit texting-while-driving (truly a menace) and/or statutes that limit cellphone use to hands-free operation. After all, diverting your hands and your eyes to "dial" a number is just another form of texting. A psychologist acquaintance of mine, a pilot who has devoted his professional research to aviation safety matters, argues that hands-free requirements don't go far enough. As he once put it to me — quite emphatically — the "movie screen" of the

human mind can only show one thing at a time. If you are having a hands-free telephone conversation while you drive, you may think that since your eyes are still on the road, all is well. In fact, however, your attention is at least partially, if not mostly, allocated to the particulars of the phone conversation. Being thus distracted, you probably won't react as quickly as you should to the constant changes and challenges inherent in driving.

It doesn't take an extensive search to expose the myth of multitasking. As I reviewed some of the readily available literature on the subject, three elements struck me as being especially applicable to the aviation environment. First, multitasking reduces mental performance because each shift in attention imposes a "cognitive cost" that reduces brain resources and energy. Second, multitasking trains the brain to lose focus and makes it increasingly susceptible to distraction. Third, multitasking increases stress and anxiety by

increasing the brain's production of cortisol. Given that some pilots already find it stressful to talk on the radio, it's not hard to see how an overloaded pilot could inadvertently let the "communicate" task push the far more critical "aviate" and "navigate" functions into the background.

Need a Moment?

Remember the "need a moment" candy bar commercial? It promotes the product by showing how someone in a conversational bind buys time by biting into the chocolate and "thoughtfully" chewing. Since giving ATC the silent treatment for an extended time could increase the number of their transmissions and thus add to your stress, the Pilot/Controller Glossary offers a lovely phrase for those need-a-moment occasions: *stand by*. When you need to attend to the priority work of aviating or navigating, tell ATC to "stand by." Used on both sides of the mic, this simple transmission quickly conveys two things: first, that the radio hasn't malfunctioned and, second, that there is a need to prioritize other tasks.

As the flying season gets into full swing, we also urge you to take a moment to review all the basics of aviation communication presented in this issue — you'll be glad you did.

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.

SARAH PATTEN

Air Traffic Control Specialist, Potomac TRACON

Sarah Patten had never even considered a job as an air traffic controller — until the day she got hired. Her first foray into aviation as a pilot was on an impulse too.

"I thought flying a plane sounded fun, so I took an intro flight the summer before my senior year of high school," explains Sarah. "Turns out it was fun, so I kept going back for more lessons."

Now, a little more than 20 years later, she is still flying. Over the years, Sarah worked a few odd jobs around aviation whenever possible, including being a full-time flight instructor.

In 2008, the FAA started its "off-the-street" hiring of air traffic control specialists without any prior ATC experience. A mentor convinced Sarah that she should apply. She did.

"I'm so glad I took a chance and applied! The job has been so interesting, and I've had some incredible opportunities along the way," she said.

Sarah now works at the Potomac Consolidated Terminal Radar Approach Control (TRACON), which provides air traffic control service to the Baltimore-Washington and the Richmond-Charlottesville areas. The facility also handles the Washington DC Special Flight Rules Area (SFRA), which means working with all general aviation (GA) aircraft that fly through this airspace.

"The increased security of the airspace can be a bit intimidating to pilots, but once you know how it works, it's really not that scary," Sarah observes.

To make it all even less scary, Potomac TRACON is in the planning stages for a spring 2020 version of Operation Raincheck. If you aren't familiar with the term, Operation Raincheck allows pilots facilities so they can learn more about what happens on the other side of the microphone.

Sarah really wants pilots to know that it is not just okay, but essential, to clarify an instruction from ATC if it's not understood. It's safer to be on the same page rather than do something unexpected. Also, she advises that you should not keep secrets from ATC if you're running into any sort of difficulty on a flight.

"If you're getting low on fuel, you're not quite sure where you are, the weather starts to deteriorate, or your engine suddenly starts running rough, just tell us," she implores. "We have many resources available to help you get safely back on the ground. We can help you find nearby airports, better weather conditions, and move other aircraft out of your way in an emergency situation to name just a few." Help is only a mic click away.

If you find yourself in the D.C. area airspace, you are likely to find Sarah either on the air or in the air. In her off duty time, Sarah is usually either flying her 1947 Cessna 120 or 1979 Cessna 172, or in the hangar building a Vans RV10.

Paul Cianciolo is an associate editor and the social media lead for *FAA Safety Briefing*. He is a U.S. Air Force veteran, and a rated aircrew member and volunteer public affairs officer with Civil Air Patrol.

*Look Who's Reading
FAA Safety Briefing*

Air racer and aerobatic pilot Vicky
Benzing dives into the latest safety info
with *FAA Safety Briefing.*

faa.gov/news/safety_briefing

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