

May/June 2021



FAA Safety BRIEFING



SHARING THE SKIES SAFELY



Federal Aviation Administration

7 Who's New in the Neighborhood?

13 Rolling Out the Rules

16 Don't Fear the Drone!



U.S. Department
of Transportation

Federal Aviation Administration

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ABOUT THIS ISSUE ...



The May/June 2021 issue of *FAA Safety Briefing* focuses on the FAA's integration strategies for new entrants and emerging aviation technologies in the National Airspace System (NAS). Articles cover some of the regulatory changes and technological solutions that will help enable the safe and seamless operation of these new NAS entrants as they share the skies with traditional airspace users. We'll also look at how the FAA is helping to inform, educate, and inspire the next generation of NAS users.

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FAA **BRIEFING** Safety

The FAA Safety Policy Voice of Non-commercial General Aviation



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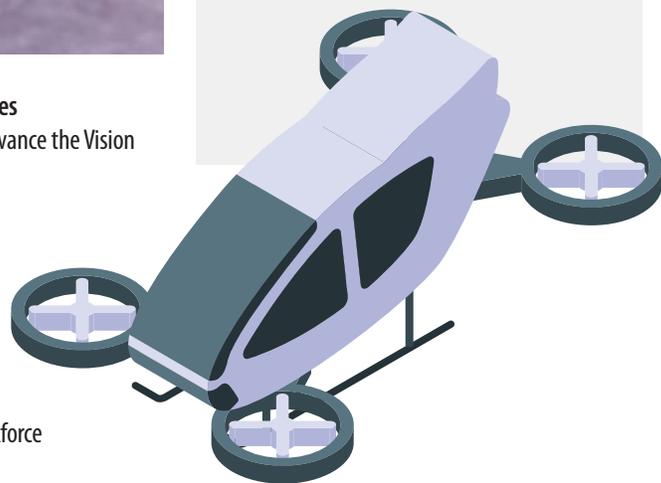
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UTILITY, ACCESSIBILITY, SAFETY

Officially known as Unmanned Aircraft Systems (UAS), drones are everywhere. The first two words in the title of this article offer a succinct summary of their selling points. The utility is obvious: drones enable an astonishing range of operations and activities, with more added all the time. The accessibility advantage is also clear. Virtually anyone can fund the modest cost of training for a remote pilot certificate and find a drone at the desired price point.

Now let's talk about that third word, "safety" — which, of course, is the FAA's top priority. As UAS increase in number, technical complexity, and sophistication, interest in their utility and accessibility expands. This expansion has created regulatory and technical challenges for the FAA and its parent organization, the Department of Transportation.

Yes to Building Blocks — No to Roadblocks

As it has done since the dawn of the drone age, the FAA seeks to enable maximum exercise of UAS utility and accessibility, and to do that in a way that assures maximum safety for everyone in the U.S. National

Airspace System (NAS). Virtually from the start, the FAA took the

We have made a solid start toward the ultimate goal of maximizing the utility, accessibility, and safety of UAS.

position it holds today: UAS are aircraft. The ultimate goal is to fully integrate them into the NAS so they can safely and seamlessly operate side-by-side with manned aircraft, occupying the same airspace and using many of the same air traffic management systems and procedures.

As the saying goes, you don't know what you don't know when you begin working with a new technology. That's why the story of UAS integration has included a series of practices that largely rely on operational segregation to maintain safety. The driving idea is that incremental introduction via accommodation practices can provide "training wheels" while we learn.

So we selected several UAS Test

Sites in 2013 to conduct research and help identify the right questions. Another important step was promulgation of the first two FAA rules specifically for UAS: an Interim Final Rule on Registration and Marking Requirements for Small Unmanned Aircraft (14 CFR part 48) in December 2015, and the Small

UAS regulation (14 CFR part 107) in June 2016. The regulatory structure now includes 14 CFR part 89, Remote Identification of UAS, and an amendment to 14 CFR part 107, both effective in 2021.

Through the experience gained under these rules, and also through several innovative partnerships between the FAA and aviation community partners, we collectively learned a lot about which questions to ask. We also started to formulate a few answers and, as noted above, we have used this knowledge to add a few more building blocks to the regulatory structure for UAS. The Remote ID rule provides a safety and security foundation for more complex drone operations. The amended part 107 rule allows operators of small drones to fly over people and at night under certain conditions.

More Integration Strategies and Tools

The FAA also has a number of integration projects underway. In this issue, you'll learn about efforts to enable beyond visual line of sight operations and complex activities involving multiple drones beyond visual line of sight. You will read about the Collegiate Training Initiative program for UAS, and the highly innovative work on development of a UAS Traffic Management (UTM) ecosystem. We'll also take a look at Advanced Air Mobility (AAM), the vision for using highly automated aircraft to transport passengers or cargo for hire.

We've done a lot — with clearly a lot still to do. But we have made a solid start toward the ultimate goal of maximizing the utility, accessibility, and safety of UAS.



AVIATION NEWS ROUNDUP

Laser Strikes Increase Even with Fewer Planes Flying

Laser strikes against pilots increased in 2020, even with the overall decrease in air traffic operations. In 2020, pilots reported 6,852 laser strikes to the FAA. That constitutes an increase from the 6,136 laser strikes reported in 2019 and is the highest number reported to the agency since 2016.

The FAA remains vigilant in raising awareness about misuse of lasers that are pointed toward aircraft. Intentionally aiming lasers at an aircraft poses a safety threat to pilots and violates federal law. Many high-powered lasers can incapacitate pilots who may be flying aircraft carrying hundreds of passengers.

The FAA works closely with federal, state, and local law enforcement agencies to pursue civil and criminal penalties against people who purposely aim a laser at an aircraft. The agency can impose civil penalties of up to \$11,000 per violation and has imposed penalties as high as \$30,800 for multiple laser incidents.



Application Period for LAANC Announced

The application period for entities to become FAA-Approved UAS Service Suppliers of the Low Altitude Authorization and Notification Capability (LAANC) opens on May 3, 2021.

LAANC is a collaboration between the FAA and the drone industry that



directly supports the safe integration of drones into the nation's airspace. Launched in 2017, the capability covers 80% of controlled airspace at 400 feet or below and expedites the time it takes for drone pilots to receive near-real time authorizations to fly in this space. All drone pilots operating in LAANC-enabled areas under the FAA's small drone rule, or under the exception for limited recreational operations, can access the capability through FAA-Approved LAANC Service Suppliers.

Information on requirements and the onboarding process can be found at bit.ly/LAANCapp.

New Wrong Airport Landings Video

Even with today's highly accurate and readily available technology, pilots are still misidentifying their airport of intended landing, often making an approach to or landing at an airport other than their planned destination. The problem occurs with pilots operating under both VFR and IFR.

The FAA's From the Flight Deck video series helps pilots avoid this costly and potentially catastrophic error. The newest video in the series, Wrong Airport Landings, uses cockpit mounted cameras to capture runway and taxiway footage, in combination with diagrams and visual graphics, to clearly identify hot spots

and other safety-sensitive items. Watch the video at youtu.be/nrbzhBn_HnU.

The 2020 WINGS Sweepstakes Winners

The WINGS Industry Network (WIN), previously known as the WINGS Industry Advisory Committee, recently announced the winners of the 2020 Paul and Fran Burger

\$10,000 WINGS Sweepstakes. Ten flight instructors and pilots won cash prizes ranging from \$500 to \$1,500. In its third year, the sweepstakes has garnered strong support from the FAA Team, industry, and individuals dedicated to GA safety.

The 2020 winners include:

- Christian Jon Chandler, Mass.
- Nicholas John Maliniak, Va.
- Mitchell Crocker, Fla.
- Adam David Rosenberg, N.C.
- Andrew Donovan Dow, Ill.
- Victoria Stevens, Okla.
- Richard Funcheon, Fla.
- Kuan Tung Chen, Fla.
- Victoria Kuo, R.I.
- Ed Whitehead, Ariz.

The \$10,000 Sweepstakes will continue in 2021 with new ways to win. In the meantime, WIN is in the early stages of development to introduce many more ways to attain the highest safety levels possible. For information on the 2021 WINGS Sweepstakes, visit MyWINGSInitiative.org.

Get Your Part 135 Certification

Are you a 14 CFR part 91 pilot who wants to fly your aircraft for compensation or hire? A new FAA video series will help guide you through



each phase required to achieve 14 CFR part 135 certification.

The certification process utilizes a phase and gate system that has five distinct phases and three gates. All items in a phase must be successfully completed prior to continuing past a gate and into the next phase of the process. An applicant will not be certificated until the FAA is confident that the prospective certificate holder is capable of fulfilling the required responsibilities and will comply with the 14 CFR requirements in an appropriate and continuing manner.

Go to bit.ly/Get135 to watch the videos.

FAA Expands Weather Camera Program to Hawaii

The FAA's Weather Camera Program is coming to Hawaii to enhance aviation safety and pilot decision-making. These cameras, already installed in Alaska and Colorado, improve safety by providing pilots with near-real time video of weather conditions at their destinations and along their intended flight routes.

The Hawaii project will install 23 camera facilities throughout the islands. The FAA has completed engineering surveys and site selections on Kauai, Lanai, Maui, and Molokai, and began surveys on Oahu and the Big Island this past March. Each facility can accommodate up to four cameras and the images can be viewed at WeatherCams.faa.gov.

The FAA plans to begin camera installations on Kauai and will move

to the other islands as the agency develops engineering plans, obtains leases and permits, and procures the equipment. The agency expects images from the Kauai cameras will be on its weather camera website in mid-2021.

The FAA established working groups of aircraft operators and FAA experts on each island to identify prime locations for camera installations and to ensure robust communication between pilots and the agency about the project's progress. The FAA is basing site locations on flight routes and areas where weather conditions commonly affect and interrupt flight operations.

Weather cameras in Alaska have been successful for 20 years. Last year, the FAA helped the Colorado Department of Transportation implement a weather camera program to improve pilot awareness of weather conditions above the Rocky Mountains.

Five Airports to Test and Evaluate Unmanned Aircraft Detection and Mitigation Systems

The FAA selected five host airports to evaluate technologies and systems that could detect and mitigate potential safety risks posed by unmanned aircraft. The effort is part of the agency's Airport Unmanned Aircraft Systems Detection and Mitigation Research Program.

The FAA selected the following airports:

- Atlantic City International Airport in Atlantic City, N.J.

- Syracuse Hancock International Airport in Syracuse, N.Y.
- Rickenbacker International Airport in Columbus, Ohio
- Huntsville International Airport in Huntsville, Ala.
- Seattle-Tacoma International Airport in Seattle, Wash.

These airports meet FAA requirements for diverse testing environments and represent airport operating conditions found across the United States.

The research will lead to the implementation of new technologies that will make airports safer for passengers and manned aircraft and will create standards for future unmanned aircraft detection and mitigation technologies at airports around the country.

Researchers plan to test and evaluate at least ten technologies or systems at these airports. Testing will begin later this year and continue through 2023.

The FAA Reauthorization Act of 2018 requires the agency to ensure that technologies used to detect or mitigate potential risks posed by unmanned aircraft do not interfere with safe airport operations. The FAA does not support the use of counter-UAS systems by any entities other than federal departments with explicit statutory authority to use this technology, including requirements for extensive coordination with the FAA to ensure safety risks are mitigated.

SAFETY ENHANCEMENT TOPICS

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



MAY

Pilot/Owner/Mechanic Communication

Understanding airworthiness responsibilities and the value of good communication and maintenance documentation.



JUNE

Regulatory Roadblock Reduction

How streamlining the certification/approval of GA safety equipment can help owners adopt these technologies.

THE FLIGHT PATH TO TRANSPARENCY

Every new Federal Air Surgeon has goals they wish to accomplish during their tenure. My predecessor, Dr. Michael Berry, focused on consistency, increasing the number of conditions eligible for CACIs (Conditions an AME [aviation medical examiner] Can Issue), and an increased emphasis on evidence-based decision making. He was successful in all. In fact, the latter enabled us to authorize Class I and II medical for individuals with insulin-dependent diabetes.

One of my major goals is to increase accessibility to our offices and transparency in our decision-making process. While an airman/controller walks out of the AME office with a certificate in hand 95% of the time, we (aerospace medicine) are aware that there is frustration with how we process medical applications, and we are taking steps to improve.

Last fall, many members of the FAA medical team met to identify the top concerns. We invited representatives of the various advocacy groups including AOPA, EAA, and the Aviation Medicine Advisory Service (which represented the concerns of ALPA and several other unions). After this meeting, we outlined two overarching goals. First, issue a reliable, consistent, quality aeromedical decision within 60 days from when an airman or Air Traffic Control Specialist (ATCS) presents for medical certification. Second, when someone does not meet standards for aeromedical certification, use the most effective means feasible to determine if we can still safely certify the airman/ATCS.

We meet regularly with our stakeholders and have identified multiple

areas for improvement. Here's an update on our progress.

It came through loud and clear that processing time, when FAA review was necessary, took too long. To reduce this, we have increased overtime hours as needed, and seek to hire additional personnel. We are also working with advocacy groups to educate airmen/ATCSs on sending all the information needed (outlined in the AME Guide and/or a letter from the FAA) and only the information needed. Extraneous material and duplicative records slow everything down. Also note that over 90% of the denials we issue result from failure to provide the requested information.

Another major source of frustration is the inability of an individual to track the progress of their application package through the system. We are working to enable this tracking. In addition, we want the airman or AME to be able to directly upload documents to the individual's file. We made some progress in this area for the Human Intervention Motivation Study (HIMS) program, but it is labor intensive. Expanding these capabilities while protecting privacy and security is challenging, but worthwhile.

For conditions that do not meet medical standards, we have identified several new CACI candidates. We recently expanded the AASI (AME Assisted Special Issuance) list to include selected cardiac conditions for Class I and II applicants; previously, these were restricted to Class III medical applications. Additionally, we have engaged several outside organizations to increase the number of AMEs and improve access.



Multiple working groups are addressing specific issues. These include developing pilot videos analogous to the AME minutes and the FAA Safety Team's "57 Seconds to Safety" videos. We are reorganizing both the FAA Aerospace Medicine website and AME Guide to make navigation more user friendly. We are expanding the frequently asked questions pages to reduce the need to call the help desk. We reviewed the letters that we routinely send and rewrote thirteen of those which were thought to be the least friendly. While the primary intent of these letters is to inform the airman, they are also legal documents; therefore, we are coordinating them with the FAA's Office of the Chief Counsel.

We remain committed to the "pathway to yes." Our goal is to certify as many airmen and ATCSs as we safely can, and to do so as quickly as feasible.

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



SARS-CoV-2 VACCINES

At the beginning of 2020, many viewed COVID-19 as a distant problem. Our world is now very different and how long the “new normal” will last is unknown. However, we have made considerable scientific progress this past year. Medical authorities quickly realized that we needed to develop and approve a vaccine quicker than usual to prevent spread and to minimize transmission.

Vaccines are created in various ways. Live, but attenuated, infectious vaccines such as measles or chickenpox are very effective, with low risk of actually causing the disease. Inactivated/killed agent vaccines are slightly less effective, but do not risk the disease. Many influenza vaccines utilize this approach. Vaccines such as tetanus and diphtheria introduce the inactivated toxin. These prevent the adverse effect. The COVID-19 vaccines include a subunit of a protein found on the surface of the virus. This protein cannot cause an infection from the virus, but will help our body build an immunity against the virus.

When necessary for public health, the Food and Drug Administration (FDA) has the authority to make emergency use authorization (EUA) decisions on vaccine effectiveness and safety prior to obtaining all the normally required data. The FDA closely monitors available data and updates authorizations when necessary. After FDA approval, the CDC gives clinical and general recommendations. These usually start conservative and liberalize as the CDC analyzes additional data that confirm safety and efficacy.

In just one year, over 200 COVID-19 vaccines are in development around the world. At this writing, at least 10 are currently in use worldwide

with three available in the U.S. Since granting the first EUA in December 2020, the FDA approved use of two additional COVID-19 vaccines. Over 75 million doses have been administered (as of March 1) in this country alone. By the time you read this, the expectation is for double that number, which is truly remarkable.

In general, the FAA does not review a new medication or treatment until one year after full FDA approval. This allows sufficient time for uncommon, but significant, adverse effects to manifest. After careful review of the available data regarding safety profiles, the FAA Office of Aerospace Medicine (AAM) determined it could safely shorten this observation period for the EUA-approved COVID vaccines. Thus far, the clinical data show that both the Pfizer and Moderna vaccines are safe and effective. The immune system begins to make antibodies after one dose of any of the vaccines. Risk of serious illness and hospitalization is negligible and the vaccines have been 95% effective against death from COVID-19. From the Pfizer or Moderna vaccine, the CDC notes that about 70% report a sore arm at the injection site. Over 20% report fatigue after the first dose and almost 50% do after the second dose. Other common side effects include headache, fever, muscle aches, and chills. Data has shown that side effects start approximately 1-2 days after vaccination and last for about 1-2 days after the symptoms first begin.

The FDA recently granted EUA to the vaccine developed by Johnson & Johnson (Janssen). This vaccine uses a different method, but remains non-infectious and has the advantage



of requiring only a single dose. The FAA allows airmen to use the Pfizer, Moderna, and J&J/Janssen EUA COVID vaccines, but mandates a minimum 48-hour grounding after any of these (note: 14 CFR section 61.53 still applies). The FAA will continue to monitor patient response to each vaccine and may adjust this policy as necessary to ensure aviation safety. We will evaluate additional vaccines when an EUA is issued.

With over 100 million cases worldwide, it is not surprising that there are multiple new SARS-CoV-2 variants. Fortunately, the vaccines in use appear to significantly reduce the likelihood of hospitalization and death and reduce community transmission from these variants. Also, simply reducing disease prevalence will decrease the number of additional new variants. The scientific community and industry are evaluating the need for modification of the current vaccines and/or a booster, similar to what is already done for the influenza vaccines annually. Meanwhile, wear a mask, practice social distancing, get vaccinated, and fly safe.

LEARN MORE

[faa.gov/coronavirus/guidance_resources](https://www.faa.gov/coronavirus/guidance_resources)

Who's NEW in the NEIGHBORHOOD?

Ushering in a New Era of Safety and Innovation in the NAS

By Tom Hoffmann



NASA image

“Man must rise above the Earth — to the top of the atmosphere and beyond — for only thus will he fully understand the world in which he lives.”

– Socrates

The FAA's continuing mission is to provide the safest, most efficient aerospace system in the world. Although it's succinctly stated, the FAA's mission statement is far from being a simple endeavor. Today's National Airspace System (NAS) is in fact far more complex than ever before, and it needs to continually evolve to accommodate the ever-changing landscape of the aerospace industry. It's not an overstatement to say we're at the crossroads of an entirely new era in aviation. We're in the “now” stage of transformative changes — changes that will encourage exploration and entrepreneurship to new heights (literally and figuratively), but also challenge government and industry to develop a framework that maintains harmony and safety across the broadening spectrum of NAS users.

This Just In ...

We're already starting to see how the confluence of these new NAS entrants intermixing with traditional airspace users is playing out. Adding to that challenge is the near breakneck speed at which these changes are occurring. Hardly a week goes by these days without game-changing innovations or ideas in the aerospace industry being

heralded in the news. Just as we worked on this issue, United Airlines announced plans to research the use of electric vertical takeoff and landing (eVTOL) vehicles to shuttle passengers to and from hub locations — a technology that not only offers a cleaner, quieter, and more efficient means of transportation, but also promises to transform how people get around in major cities. Helping make this concept of advanced air mobility a reality is California-based Joby Aviation's new partnership with NASA, which will begin developmental testing of eVTOL prototypes this spring, and a certification agreement with the FAA that will lay the groundwork for commercial operations.

Another recent milestone moment occurred with American Robotics' historic announcement of autonomous beyond visual line of sight (BVLOS) operations with its Scout system, a network of remotely sited “drones-in-a-box.” Sporting cutting-edge artificial intelligence and acoustic sensor technology to help detect and mitigate potential conflicts, these drones may help create pathways towards other types of ground-breaking commercial applications for UAS.

Supersonic travel has also surged in recent headlines, buoyed by the FAA's final rule in January to facilitate the safe development of civil supersonic aircraft. The rule streamlines and clarifies procedures to obtain FAA approval for supersonic flight testing, a landmark step for allowing industry to bring viable and safe products to the



NASA image.

market. The rule also helps set the stage for an announcement of a newly expanded agreement between NASA and Aerion Supersonic to continue researching propulsion technologies that may one day allow a new generation of commercial aircraft to travel at speeds between Mach 3 and Mach 5. The vision of this ultra-high-speed global mobility solution would be to transport a person from one point to another, anywhere on the globe, in under three hours.

Heading a bit higher in the atmosphere, the FAA licensed 41 commercial space operations (launches and reentries) in 2020, the most in the agency's history. Those operations included a record 39 launches, including the first-ever NASA crewed mission to be licensed by the FAA. For 2021, the FAA is forecasting the number of licensed operations could reach 50 or more. Some estimate 100 or

more per year in the not-too-distant future once space tourism really takes off.

A Balanced Approach

Space exploits aside, there's no doubt we're in the midst of something special, exciting, and quite literally, life-changing here in our own atmosphere. Technology and innovation are enabling ways of envisioning and leveraging the NAS like we've never seen before. Whether facilitating infrastructure changes required for this type of sea change, or helping develop the technological and design solutions that will enable these systems to operate safely and harmoniously, the FAA is uniquely poised to provide the strategic direction that will propel these innovations forward.

Key to this strategy will be the FAA's ability to remain nimble in how it manages regulations and policy. This includes keeping an eye towards performance-based requirements and risk/data-driven decisions. These forward-thinking philosophies, coupled with a reliance on thorough research and development, will allow the FAA to continue taking incremental steps towards achieving a NAS that is open to new entrants, but with the necessary guardrails to ensure safety for all.

A Pathway to Success

The recent Remote Identification (RID) and Operations Over People rules (discussed in more detail in this issue) are prime examples of the building block regulations that are crucial to UAS integration efforts and to the safety and security groundwork necessary for more complex operations. In that same vein are the agency's collaborative efforts with government, industry, and academia in developing UAS Traffic Management (UTM) capabilities that aim to safely and efficiently manage low altitude national



Image courtesy of Aerion.

An artist's concept of a supersonic business jet.



airspace. Through its work in the UTM Pilot Program, the FAA is exploring ways to advance safety, innovation, and accessibility for all NAS users while also providing a basis for future policy and standards development. (See the article “Sharing the Skies Safely” for more on UTM.)

We see the same balanced approach with safety and innovation in how the FAA recently streamlined its regulations governing commercial space launch and reentry licensing. The new rule facilitates greater growth and progress in the aerospace industry, while maintaining public safety. This new regulatory landscape, together with the Department of Transportation’s role in the National Space Council, is evidence of a strong commitment toward advancing America’s space policy and strategy, but also an acknowledgement of the need for collaboration and incremental growth. (See the article “Dreaming of Space” for more details on this growing sector.)

Collateral Improvement

While safety is paramount for the FAA in all of its endeavors, it’s important to not lose sight of the many benefits and efficiencies that are being realized as a result of these innovations, particularly in the vastly expanding UAS arena. Just a few examples of positive applications include the ability to assist with search and rescue operations during natural disasters, provide aerial thermography reconnaissance for forest fires, and more recently, facilitate the delivery of COVID-19 vaccines and at-home test kits. Despite fears that drones will hurt the job market, these new NAS entrants are in many cases additive to the industries they support. They help bring new perspectives to getting a job done more safely and efficiently and provide opportunities for robust economic growth and job creation.

(See the article “Don’t Fear the Drone!” for more perspective on this.)

Finally, the ability to support these NAS-expanding innovations and ideas requires inspiring a new generation of thinkers and doers. Through its new Collegiate Training Initiative (CTI), the FAA is able to work with certain colleges, universities, and technical schools to prepare students for a career in UAS. These schools, which must apply for this CTI recognition, will have access to FAA resources and materials, share best practices and curricula with other schools, and, through industry networking opportunities, allow students to apply for internships to advance their careers in UAS. (See the article “Engaging with Academia” for more about CTI.)

The Future Is Here

While we are nowhere near *Blade Runner* proportions of airspace technology advancement, we are nonetheless at a pivotal moment in history that is setting the stage for a future world limited only by ambition and imagination. Whether it’s supporting a cargo resupply mission with a 20-ton space exploration vehicle, a family photo shoot with a 20-ounce recreational drone, or an autonomous commuter flight with a 20-passenger eVTOL, today’s NAS must be nimble enough to accommodate the growing diversity and volume of new entrants while being mindful of more traditional users. It’s not an easy task. But with the proper foresight, planning, and collaboration, the FAA will be well positioned to help usher in an entirely new era of safety and innovation in the NAS. ▶

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

SHARING THE SKIES

SAFELY

An Overview of Unmanned Traffic Management

By Peter Sachs



Picture this: It's 2030, and your flying club has a fully electric plane you can take on \$100 hamburger runs. Many of your neighbors have electric cars, and you notice delivery drones overhead at least once a day. But when you climb into the cockpit for that hamburger run, how do you know whether there are any unmanned aircraft systems (UAS) in your path? That needs to be just as seamless as ordering your takeout dinner with the drone delivery option. The traffic page on your multi-function display (MFD) or your tablet includes a few more icons representing UAS, color-coded to differentiate them from other manned aircraft nearby. Don't worry, there are advanced algorithms running in the background that only show you the closest UAS that may be a collision risk, with plenty of time for you to change course. Many other UAS aren't pictured — not only because that would fill your screen with hundreds of icons, but because those vehicles know about you, and are proactively changing their trajectories so that you never have to worry about them.

Does this sound like science fiction? Maybe you're breaking out in a sweat thinking about how much those avionics upgrades will cost. But many of these ideas already exist, and they're built on existing technology that has been demonstrated in the real world. Most likely, low-cost software and receiver updates will be all that you need to worry about. The glue that enables this kind of situational awareness is called UAS Traffic Management, or UTM.

The Future That's Here Now

UTM is one of the crucial ingredients for enabling these types of missions. Think of everything you do as a pilot on a typical VFR flight: preflight briefings and walk-arounds, reviewing your charts and NOTAMs, checking the weather — and that's before you even start the ignition. You perform a runup, maybe activate your flight plan. Even if you're just flying to pick up a hamburger, you've got a route in mind that avoids terrain that's too high and gives you a view of your favorite landmarks. Of course you're always scanning for traffic, and as you approach your destination, air traffic controllers give you a landing sequence.



MASA image

How many times have you flown into a non-towered airport, trying to discern from the common traffic advisory frequency (CTAF) who else is flying nearby, and making your own sequence? You can think of that as pilot-to-pilot negotiation, and it keeps everyone safe in the traffic pattern. UTM relies on continuous information sharing and data exchange to keep UAS safely apart from each other and from manned traffic.

Because with UTM, there are no air traffic controllers like today. Instead, advanced software services, powered by dynamic algorithms, handle many of the functions that you perform as pilot-in-command today.

UTM isn't a monolithic tool run by the FAA. It's federated, meaning that many companies provide a suite of services that UAS operators can sign up for based on their needs. The FAA will oversee those services, provide certain types of data (like airspace information), and ensure overall airspace safety. UAS operators will rely on UTM services to help them plan routes, avoid weather, and find safe landing sites during emergencies. Services communicate with each other to safely avoid other UAS through a process called strategic deconfliction. Those services also use vast amounts of surveillance information to avoid manned traffic, making real-time course changes driven by detect-and-avoid systems.

Maybe at this point you're wondering why such a complex system is even necessary. After all, today's UAS pilots can safely access controlled airspace through the FAA's Low Altitude Authorization Notification Capability (LAANC). Most of these UAS are just a few pounds, and they are intended to be flown by recreational flyers or commercial



A visualization of one of the FAA's UTM Pilot Program (UPP) scenarios shows the routes and areas where several UAS are operating (yellow shapes) and an area known as a UVR, or UAS Volume Reservation, in red. UVRs may be created by approved public safety entities to limit the kinds of UAS that are allowed to fly over the locations of emergencies and natural disasters. UAS operators are expected to change their routings to avoid UVRs, similar to how pilots of manned aircraft must avoid Temporary Flight Restrictions.

operators that fly close to where they're standing with the controls. This is called visual line of sight, or VLOS.

Aside from making eye-catching aerial videos for real estate listings and weddings (remember those?), small UAS operating VLOS can also help first responders. Equipped with infrared sensors, fire departments use them to see through the smoke above active conflagrations, and search crews rely on them to help find lost and stranded hikers. Even small UAS have advanced autopilot functions and cameras that automatically navigate around obstacles, so it can be much easier — and less expensive — to deploy a UAS from its case in the trunk of a car, compared with calling in a helicopter.



The Future That's Coming Soon

But UAS operators have much more ambitious plans, involving many more vehicles flying with minimal human oversight, and without a pilot and remote controller nearby. These flights are known as beyond visual line of sight, or BVLOS. That means the remote pilot or operator isn't watching the UAS from the ground. They could be hundreds or thousands of miles away, and they may even be monitoring several flights at once from a computer screen. Package delivery flights will transport everything from books and sandwiches to medical supplies. Energy and transportation companies must inspect their infrastructure regularly, typically by driving or flying alongside electrical transmission lines, railroad tracks, and pipelines. But UAS can do those same tasks even better, using advanced image recognition to identify even a single bolt that's out of place — details that even the best trained human driver or pilot wouldn't be able to catch. BVLOS flights can also help with agriculture, airport inspections, construction, and other jobs by making repeated, fully automated flights to capture up-to-date imagery and other information.

A few basic UTM capabilities are already available or coming in the near future. The FAA's DroneZone allows all operators to register their UAS, just as owners must register their manned aircraft. Building off that, most UAS will be required to transmit a digital license plate by late 2023 using a set of technologies called Remote ID. This allows members of the public, law enforcement, and public safety officials to verify whether a UAS they see flying near them is actually authorized to be in the air. This is critical to

building trust in UAS operations, and it's a building block that will enable some of the more advanced UTM capabilities that are coming.

Recent rules that streamline UAS operations over people and flights at night are building on the FAA's experience to ensure these flights can happen routinely and safely. Through efforts like the UTM Pilot Program and the BEYOND program, companies have been testing their capabilities in low-risk settings around the United States. These programs are critical to getting everyone in the same sandbox, including operators that fly inspection or delivery vehicles, and the UTM services they rely on for flight planning and monitoring.

UTM won't appear overnight. But parts of it exist today, and over time you'll see a growing set of services for many different types of operations. ▶

Peter Sachs is a UTM program manager in the FAA's UAS Integration Office and previously worked as an air traffic controller at the San Francisco Tower (SFO) and the Chicago Executive Tower (PWK).

LEARN MORE

UTM Pilot Program

bit.ly/FAAUPP

FAA's BEYOND Program for UAS Integration

bit.ly/FAABeyond

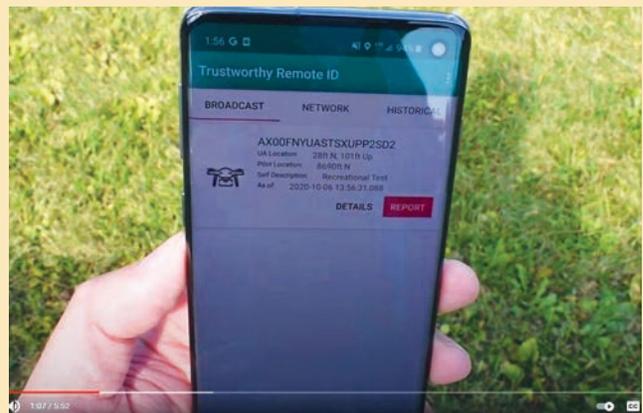
FAA's UAS Data Exchange (LAANC)

bit.ly/UASLAANC

UTM Pilot Program (UPP)

Established in 2017, the Unmanned Traffic Management Pilot Program (UPP) worked to define an initial set of industry and FAA capabilities required to support UTM operations and make routine use of drones a reality. Through two phases of trials at test sites across the United States, the UPP was successful in identifying services, roles and responsibilities, information architecture, data exchange protocols, software functions, and performance requirements for managing low-altitude drone operations without intervention by air traffic control facilities. The UPP trials brought numerous companies providing UTM services together and showed how they could successfully plan missions and exchange information. Efforts focused on strategic deconfliction — which builds routes free of conflict from other UTM operations — and on deploying Remote Identification (RID) capabilities to help authorized entities verify whether UAS are allowed to be flying in a particular location.

The results of the UPP trials will be compiled in a final report that is expected to be issued later this year, and they will inform the FAA's strategic plans and roadmap for enabling the deployment of widespread



A screenshot from the latest FAA UPP video which demonstrates public identification of a UAS via remote identification services in Rome, New York. To access this and other UPP videos, go to youtube.com/watch?v=ixFsUMTucUg.

UTM services in the National Airspace System. For more details on UPP, go to bit.ly/FAAUPP.

Rolling Out the RULES

New Drone Rules Advance the Vision

By Alina George



Editor's Note: This article has been revised from the print version to help correct and clarify certain sections.

The FAA published two new drone rules, Remote Identification and Operations Over People, on Jan. 15, 2021. Both are part of a broader vision for full integration of drones into the National Airspace System (NAS) and Advanced Air Mobility. The intent of these rules is to keep everyone safe while ensuring flexibility for all kinds of drone operations. Both rules took effect April 21, 2021, but compliance dates differ. Remote ID requires manufacturers to produce standard remote ID drones by September 2022, and drone pilots must broadcast remote ID information by September 2023. We encourage pilots to comply earlier though, once broadcast modules are available (more on that later). Operations Over People was also effective April 21, 2021.

Both rules are performance-based, which means they make room for manufacturers and industry to come up with innovative solutions. You might also note that the FAA considered and addressed all 53,000-plus comments on the Notice of Proposed Rulemaking (NPRM) for Remote ID. For example, the NPRM did not include educational institutions among the Community Based Organizations eligible to apply for a FAA-Recognized Identification Area (FRIA). Based on public comments, they were included in the final rule.

To help you better understand the rules and how they may affect drone flying, here's a review of the main points.

What is Remote Identification?

Think of Remote ID as a “digital license plate” for drones. It provides the FAA, law enforcement, and other federal agencies with identification and location information. Remote

ID is a necessary step to achieve the goal of Advanced Air Mobility (AAM), which is the vision for complete integration of drones into the NAS. For AAM, think short-range air transportation, à la the Jetsons! Remote ID will be required on most drones in the NAS. It will provide specific information on the drone's flight (serial number of drone, location and altitude of the drone, and the position of the control station or take-off location). This information will be transmitted from the drone. In keeping with the “digital license plate” analogy, the scope of Remote ID transmission is like seeing a license plate on a car nearby.

Here are some of the most important takeaways of Remote ID (RID):

- RID compliance becomes mandatory **September 16, 2023** (September 16, 2022 for manufacturers) for all pilots who are required to register their drone. Some pilots may start complying sooner as broadcast modules and standard remote ID drones are approved.
- There are three ways drone pilots can meet the RID requirements:
 1. Operate a Standard RID Drone — the drone will be built with RID embedded.
 2. Operate a drone with an RID broadcast module — the module is a separate device to be attached on the drone.
 3. Operate without remote ID in a FAA-Recognized Identification Area (FRIA). (See FRIA graphic on p. 15.)
- Manufacturers will start producing broadcast modules and/or producing drones with RID embedded into the system.
- When available, drone owners must enter the remote ID serial number in their FAADroneZone

(faadronezone.faa.gov) registration account.

- Recreational flyers have the option to move their broadcast module from one drone to the next, so long as the drone is listed with the same registration number.
- If the pilot uses a RID broadcast module, the module's serial number must be associated with their registration.
- Only law enforcement and federal agencies will be able to see Personally Identifiable Information (PII) such as name, address, and phone numbers.
- FRIAs are areas operated by Community Based Organizations (CBOs) or educational institutions approved by the FAA. CBOs can be organizations such as model aircraft groups or schools.
- The FAA will start accepting FRIA applications on

September 16, 2022. Approved authorizations will be valid for 48 months and may be renewed. FRIAs may be terminated by the FAA for safety or security reasons.

What is Operations Over People?

The Operations Over People (OOP) rule is another step towards AAM. This rule allows routine operations over people and at night under certain conditions. As with all FAA rules, it balances safety with the need for expanded and more complicated operations.

Here are some important takeaways for OOP:

OOP became effective April 21, 2021.

There are four drone Categories for OOP:

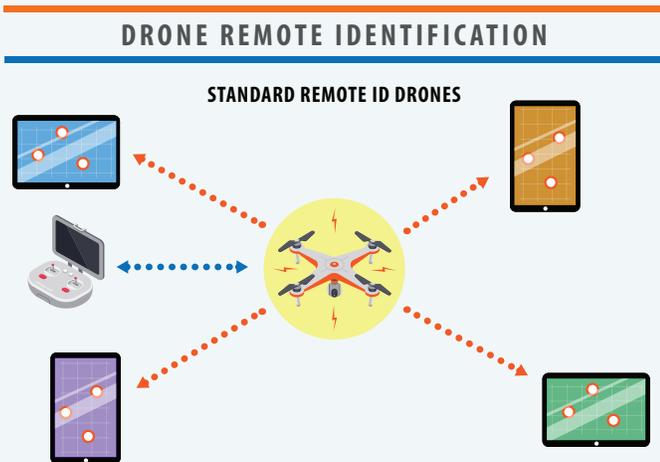
1. Category 1:

- 0.55 lbs or less
- No exposed rotating parts that would cause skin lacerations
- Requires RID if operating sustained flight over open-air assemblies of people

2. Category 2:

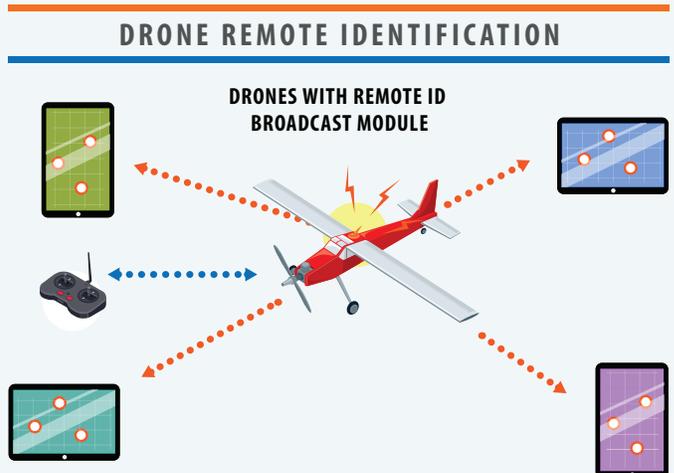
- Performance based eligibility and operating requirements

Remote ID Rule Timeline	
Final Rule Posting on FAA.gov	December 28, 2020
Final Rule Published in Federal Register	March 10, 2021
Final Rule Effective Date	April 21, 2021
UAS Manufacturing/Production Compliance Date	September 2022 (Effective Date + 18 months)
FAA Accepting FRIA Applications	September 2022 (Subpart C effective 20 months after publication date)
Operating Compliance Date	September 2023 (Effective Date + 30 months)



Remote ID capability **built into** the drone broadcasts (takeoff to shutdown):

- Drone ID
- Drone location and altitude
- Drone velocity
- Control station location and elevation
- Time mark
- Emergency status



Remote ID capability through a module **attached to** drone is limited to visual line of sight operations and broadcasts (takeoff to shutdown):

- Drone ID
- Drone location and altitude
- Drone velocity
- Takeoff location and elevation
- Time mark

- b) Requires RID if operating sustained flight over open-air assemblies of people

3. Category 3:

- a) Performance based eligibility and operating requirements
- b) Can only operate over people if the operation is within or over a restricted access site and everyone is aware the drone will be flown over them
- c) No sustained flight over people, unless that person is participating in the operation, or is reasonably protected (tent, vehicle, etc.)

4. Category 4:

- a) Small unmanned aircraft can be issued a part 21 airworthiness certificate to operate over people
- b) Need to be compliant with RID during sustained flight over open air assemblies

Operations over Moving Vehicles:

- a) Must meet category 1, 2, 3, or 4
- b) The small unmanned aircraft must remain within or over a closed/restricted-access site, and all people inside a moving vehicle within the closed/restricted-access site must be on notice that small unmanned aircraft may fly over them; or

- c) The small unmanned aircraft does not maintain sustained flight over moving vehicles

Night Operations:

- a) Effective April 21, 2021
- b) The pilot-in-command (PIC) must complete the updated knowledge test or new recurrent training
- c) The small unmanned aircraft must have lighted anti-collision lighting visible for at least three (3) statute miles that has a flash rate sufficient to avoid a collision

New Test and Training:

- a) The remote pilot test has been updated to include operations at night
- b) The new training is available on www.faa.gov and is required for all remote PICs who want to fly at night

Remote ID and Operations Over People are the next step into a wider world of AAM. They set the stage for safe and complex operations, and are a path to flying Beyond Visual Line of Sight (BVLOS). BVLOS will be necessary for reaching AAM and full integration.

FAA-RECOGNIZED IDENTIFICATION AREA [FRIA]

DRONES WITHOUT REMOTE ID



Drones without Remote ID can operate **without** broadcasting within a FRIA:

- Drones **without** Remote ID must operate within visual line of sight and within a FRIA.
- Any drone with or **without** Remote ID broadcasting capabilities can fly within a FRIA.

Operations Over People Timeline	
Final Rule Posted on FAA.gov	December 28, 2020
Final Rule Published in Federal Register	March 10, 2021
Night Training Available	April 6, 2021
Rule Effective Date	April 21, 2021

We're getting there, one step at a time! Full integration is getting closer every day, and these two new rules will help keep the NAS, people on the ground, and aircraft safe. ▶

Alina George is a project specialist in the Operational Programs Branch of the FAA's Office of UAS Integration

LEARN MORE

Check out the Remote ID Toolkit
bit.ly/RIDToolkit

Final Rule on Remote ID for Unmanned Aircraft
bit.ly/RIDFinal (PDF)

Don't **FEAR** the Drone!

Let's Reap the Benefits that Drones Have to Offer

By Jennifer Caron



If I asked you to name one noteworthy event from the year 2009, what would it be? For some, it might be the “Miracle on the Hudson,” Captain Sully Sullenberger’s heroic action in safely ditching US Airways Flight 1549 into the icy-cold waters of the Hudson River. Who could forget the image of its passengers perilously perched on the wings, safe and waiting to be rescued?

But how many of us would remember 2009 as the year when two entrepreneurs created Uber — the ridesharing platform that would ultimately define a new way of conveying passengers from one location to the next? Applauded by riders for its convenience, flexibility, and cheaper prices, this new entrant to our roadways was initially perceived as a threat by traditional taxi drivers. In their view, Uber drivers were getting a “free ride,” by not being held to the same regulations as their well-established counterparts.

Characterized by a famous comedian as “hitchhiking with your cell phone,” Uber was scorned as a safety hazard by anxious cabbies who feared that this popular new service would eventually take away their jobs and livelihoods.

Share the Road

Notwithstanding these dire predictions, Uber now drives (ahem) a wide range of valuable services to the public. It provides options and greater access to transportation, reduces the number of household vehicles on the road, adds mobility for persons with disabilities, and supports the traditional taxi network with beneficial services such as food delivery, pet transport, and sober rides that help keep drunk drivers off the road. Uber and similar ride-sharing companies serve as a supplement to existing transportation services, creating new, free-market gig economy

driver jobs and countless small business opportunities that are profitable and sustainable, adding growth to the U.S. economy. Ride-sharing companies are here for good, and for our good, delivering value to everyday lives. As lawmakers work towards consistency in regulations for taxi and ride-sharing services, the objective is to safely integrate both operations to share the road safely.

Rise of the Drones

When it comes to unmanned aircraft systems (UAS), commonly referred to as drones, we're in a familiar place with familiar rhetoric. Drones bring significant commercial value to our lives by revolutionizing activities like package delivery, pipeline inspection, and emergency response. By 2024, we could have as many as 800,000 registered commercial drones. That's twice the number of commercial drones we had last year. But if we're going to realize the vision of expanded drone operations, just like traditional aviation, this industry must show that it can be safely integrated into the National Airspace System (NAS).

Traditional pilots of manned aircraft have expressed concerns about the potential safety risks posed by these new entrants to the skies. Not unlike the case for the taxi drivers, drones are perceived as more of a nuisance than an aircraft. There are reports of drones flying where they shouldn't be, around aircraft, on runways, and potentially interfering with safe airport operations.

To address these concerns, the FAA created the part 107 small UAS rule to increase safety and minimize operating risks. New regulations were created for recreational drone users, including the requirement to pass The Recreational UAS Safety Test (TRUST), to demonstrate their understanding of aeronautical safety knowledge and rules before takeoff. The agency also published the Remote ID rule, requiring drones to provide identification, altitude, and location information (a digital license plate) to support the finalization of other rules for expanded drone operations such as package delivery, operations over people, and night operations. But to do this safely, the FAA is working with industry to research detect and avoid capability either onboard the UAS, with ground-based systems, or from a third-party provider, to enable the safe integration of more complex drone operations with traditional, manned flights.

Air Support Tools

As we safely integrate, not segregate, these new entrants into the NAS, we can seize the benefits that drones provide as useful air support tools to not only perform jobs more safely and efficiently, but to increase situational awareness in dangerous conditions where we wouldn't want to send a manned aircraft. We currently use drones to help and even save lives in a variety of situations such as public safety, law



enforcement, search and rescue, damage assessments after weather events, crop monitoring, and disaster response.

Drones are making the public and first responders safer. They're plunging into active hurricanes to measure wind speed and capturing the after-effects of forest fires and tornadoes. In 2018, State Farm Insurance operated over people and beyond visual line of sight (BVLOS) to conduct damage assessments following hurricanes Florence and Michael. As part of the FAA's UAS Integration Pilot Program (IPP), a three-year effort to advance more complex drone operations, the Chula Vista Police Department started using drones to enhance the safety of its officers and the community by providing a pre-arrival assessment of the situation when they respond to 911 calls. For the first 1,000 missions, average on-scene response time was reduced from about six minutes to 2.2 minutes for priority calls. The drones also provided information for dispatchers to determine the number of units to deploy, pinpoint the location of a suspect's discarded firearms, and follow vehicles under pursuit throughout the city.



Photo courtesy of the Chula Vista Police Department

A Chula Vista Police Department officer with one of the department's drones.



As we navigate through the COVID-19 public health emergency, drones are helping people by delivering vaccines, medical equipment, and PPE to frontline workers. On-demand drone delivery companies like Flytrex and Zipline are supporting COVID-19 response efforts in North Dakota and North Carolina.

Hey Google, Did Alexa “Move My Cheese?”

Even with all the benefits that drones provide in the public realm, the “buzz” is all about the negative effect they could have on the aviation job market. To borrow an analogy made famous by the book, “Who Moved My Cheese,” a best-selling guide to dealing with change in the workplace, traditional pilots fear that drones will “move their cheese.” In other words, there is a false belief that drones will eventually replace traditional pilots with faceless robotic automatons. But even as tech advances and changes, aviation remains a people-oriented business. Take the autopilot, for example. It’s a useful support tool designed to automate tasks and reduce a pilot’s workload, but it still needs a skilled human to monitor and operate it. Try asking Alexa to make a go/no-go decision! She (it) can’t think on her own or match human experience and decision-making.

The reality is that drones are not performing the same jobs as traditional pilots. They’re creating entirely new ways to solve practical problems that might otherwise be insolvable or dangerous for people and pilots to perform. They provide new pathways to pilothood, both for those with existing pilot qualifications and for people who are just stepping into the world of aviation. New and exciting job opportunities, such



as aerial photography and videography, bridge, rail, and utility inspection, wildlife management, and public service and rescue have opened up that have never before been considered or even thought possible.

Through the FAA's IPP program, United Parcel Service and WING became the first FAA-certified air carrier operators for drone package deliveries in the United States. WING is partnering with local business to deliver products to people's homes in Christiansburg, Va. They also partnered with a school this past summer to deliver library books to kids staying at home. And UPS Flight Forward is delivering prescription medications to residents of a large retirement community in central Florida so that residents with a high risk of complications from COVID-19 do not have to go out. Amazon's Prime Air part 135 certification was recently approved for drone delivery operations. Soon, we will fully realize the potential of Advanced Air Mobility, where a highly automated unmanned aircraft could transport a person or cargo across town or even between cities.

There's no shortage of innovation when it comes to drones. The technology is not only having a positive impact on society, but it's also providing a huge boost to the U.S. economy. Estimates indicate it could generate \$84 billion and create more than 100,000 new jobs over the next 10 years. Drones are here for good, and for our good, so we must continue to safely reap the many benefits that drones have to offer. ▶

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

LEARN MORE

Check out the FAA's "The Air Up There" Podcast episodes on:

Drones for Good
bit.ly/AirUpThereFAA

Drone Package Delivery
bit.ly/DronePackageDelivery

FOR
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Administration

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ENGAGING WITH

ACADEMIA

Students from Palomar College (above) and Idaho State University's UAS program (bottom right) gather for group photos. Both schools are participants in the FAA's new Collegiate Training Initiative that prepares students for careers in UAS-related fields.

How the FAA is Helping Prepare Tomorrow's UAS Workforce

By Diana Robinson

Are you a college student interested in pursuing a career in the drone industry? Thanks to the FAA's new Unmanned Aircraft Systems Collegiate Training Initiative (UAS-CTI), students participating in this initiative through their institution will have FAA expertise and backing for a career in unmanned aircraft systems, also known as drones. Launched on April 30, 2020, the UAS-CTI initiative is one of three FAA Collegiate Training Initiatives — a network of FAA-recognized relationships with educational institutions that prepare students to pursue an aviation career with the FAA. The goal of the UAS-CTI program is to ensure that UAS-CTI graduates have the knowledge and skills needed to pursue a successful career in a UAS-related field. The UAS-CTI program aims to address workforce development and build a pipeline of UAS qualified professionals to meet the increasing demand in this growing industry. In addition to providing experienced remote pilots, the UAS-CTI supports the FAA's goal of safely integrating new entrants into the National Airspace System.

Thanks to the FAA's new Unmanned Aircraft Systems Collegiate Training Initiative (UAS-CTI), college students will have FAA expertise and backing for a career in unmanned aircraft systems.

As of the time of this writing, 71 schools participate in the UAS-CTI and over 135 have requested to join. Public two-year colleges that become a UAS-CTI school will be designated as members of the Consortium for Small Unmanned Aircraft Systems Technology Training. A kick-off meeting occurred in September 2020, and a meeting of the Consortium, which is made up of the two-year and technical colleges, took place in November. To bolster diversity in the program, UAS-CTI co-administrators Alina



Megan Click is the UAS-CTI point-of-contact and a professor for Mountwest Community and Technical College in Huntington, West Virginia.

George and I, from the FAA's Office of UAS Integration, reached out to Minority Serving Institutions such as the Hispanic Association of Colleges and Universities (HACU), Historically Black Colleges and Universities (HBCU), and Tribal Colleges and Universities (TCUs). Several of these institutions are now a part of the UAS-CTI program.

"It is truly remarkable to watch this program grow and to see action items that were generated from initial UAS-CTI meetings being completed," said Nicole Hartman, Management and Program Analyst in the FAA's Unmanned Integration Office. Recent engagement activities include two February webinars. The first webinar explained how to start, develop, and maintain a UAS program for colleges and universities. During this webinar, attendees brought up a concern about the lack of UAS job data from the Bureau of Labor Statistics (BLS). Without this data, establishing and continuing school UAS programs could be in jeopardy. This information propelled creation of a partnership involving the U.S. Departments of Labor, Transportation, and Education. Additionally, a BLS Specialty Job Classification work group was created to work with partnering federal agencies to modify current job codes and create new ones. The second webinar included an FAA-led discussion of new UAS rules, and addressed their effect on educational institutions.

New UAS-CTI schools will support the FAA's efforts to expand the aviation workforce of the future while providing additional opportunities for Science Technology Engineering and Math (STEM) students. The relationships between the UAS-CTI schools, local governments, industry, associations, organizations, and the FAA are an important engagement milestone for this program, and one that will help sustain future success.

To learn more about the UAS-CTI program, visit bit.ly/UASCTI. ▶

Diana Robinson is a project specialist in the Operational Programs Branch of the FAA's Office of UAS Integration.



You're Not Alone with Your Drone

Building Safer Skies Through Education

By Paul Cianciolo



The FAA doesn't want to stand in the way of progress, especially when it involves the fun side of flying. Everyone has a right to use our nation's shared airspace within the confines of aviation regulations, and the FAA is there to make sure everyone shares it safely and efficiently. With so many new players in the airspace, it takes a team of dedicated citizens to build safer skies through education.

Connecting to You

The Cross Organizational NetworkiNg, Education, and Communications Team for Unmanned Aircraft Systems (UAS) — or **connectU** for short — was formed in 2016 as an interdependent outreach group for both internal and external stakeholders, managed under the FAA Safety Team (FAASTeam) in the FAA's Aviation Safety Organization. Its 12 members span the agency to include experts from compliance and enforcement, legal, communications, air traffic, and UAS integration.

ConnectU has helped pioneer new approaches to communication and outreach for the drone community, which

generally has a younger demographic than general aviation. The rapid UAS growth in recent years, with more than a million registered drones in the U.S., challenged the FAA's resources in providing public understanding of the operational rules for exempt recreational flyers and public operators, or for remote pilots flying under 14 CFR parts 91, 107, and 135. Those who want to fly outside the rules require a waiver, an exemption, or a certificate of authorization, and that process can be complicated — especially for remote pilots who are new to the regulatory landscape for aviation.

Conventional approaches used for traditional aviation did not produce improvement, so the agency needed a new direction. In 2018, connectU launched an advertising campaign for a series of webinars aimed at helping the UAS community understand the waiver application process. These webinars included a live question and answer session with a team of subject matter experts. The webinars, which were initially dedicated to waivers that enable specific operations, became so successful that topics expanded to include the small UAS (sUAS) operational rules and



authorizations for drone operations at night, beyond visual line of sight (BVLOS), in certain airspace, from a moving vehicle or aircraft, with multiple sUAS, right of way, and flights over people.

ConnectU also created a social media campaign to zero in on the UAS community at large about the waiver application process. The campaign itself resulted in 167,353 video views and 218,970 clicks to more detailed content.

Aviation Safety Inspector Guido Hassig is the connectU group's team lead. You can read more about him in the FAA Faces department in this issue. He stressed that creativity and passion for the work was critical to successful estab-

FAA's UAS Support Center
"When in doubt,
give us a shout."
1-844-FLY-MY-UA

lishment of an effective training tool, one that earned internal FAA recognition as

the most effective team in 2019. Innovative, outside-the-box thinking, combined with a passion for improving UAS safety in the National Airspace System (NAS), led to success.

ConnectU continues its outreach with regularly scheduled General Aviation Safety Assurance (GASA) training webinars, which recently included a "deep dive" into the rules and regulations. Interdependence with other FAA lines of business and critical thinking shape answers to stakeholder questions, and contribute to effective rulemaking and helpful guidance.

Proactive Pros

Understanding the differences between traditional and remote aviators has been one of the biggest challenges for the FAAS Team. Communicating with a new demographic requires new thinking, because UAS operators sometimes struggle to understand established aviation terminology and the need for a regulatory environment. Advisory Circulars (ACs) — well known to traditional pilots — have not always reached or been understood by the UAS community.

Consequently, the FAAS Team created a new category of FAAS Team Representatives called DronePros. DronePros are talented volunteers within the UAS community who possess expertise in UAS operations and share the

FAAS Team's passion for aviation safety education. They are selected based upon their expertise, professional network, and communication resources. DronePros are a force multiplier for the FAAS Team's UAS safety outreach and communication efforts. Their personal and professional networks enable wide dissemination of UAS safety-related information, regulation, policy, and guidance.

DronePros play a vital role accomplishing the FAAS Team's mission of lowering the nation's aviation accident rate by conveying safety principles and practices through training, outreach, and education, while establishing partnerships and encouraging the continual growth of a positive safety culture within the aviation community. DronePros serve the UAS community by sharing their time, resources, and professional experience to create a positive safety culture.

Due to the fast-paced and dynamic environment of drone guidance, policies, and procedures, DronePros have a direct link to the FAA so they can keep their professional networks in the know. For example, DronePro quarterly webinars cover subjects contained in the newly published FAA regulations like remote identification, testing and recency, and operations over people and moving vehicles.

A key characteristic for a successful DronePro is the ability to influence members of the UAS community and effectively communicate safety information to a large number of operators. The FAA is seeking DronePros with any of the following characteristics:

- Individuals with an established YouTube channel featuring best practices and procedures for safe recreational flyer operations with thousands of subscribers.
- Owners of a successful online model aircraft and drone supply business who routinely interact with customers.
- Instructors with a drone training academy that serves future remote pilots and public safety organizations.
- Drone consultants who specialize in assisting remote pilots and companies in preparing applications for operational waivers, exemptions, or authorizations.

To become a DronePro, the first step is to contact a FAAS Team Program Manager (for operations) at your local FAA Flight Standards District Office (FSDO). Go to FAASafety.gov, click the Resources tab, and then FAAS Team Online Directory. Click on the applicable state and look for "program manager" in the list. FAAS Team Program Managers are a DronePro's personal connection to the FAA.

To see if there are any other DronePros near you, type in "DronePro" in the keywords box.

The FAAS Team, with their connectU group and DronePros, serve as a beacon of safety in the NAS. They are dedicated to building safer skies through education. ▶

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



HOW DO I ... ?—FAA RESOURCES FOR UAS

Whether you are a traditional pilot looking to expand into piloting drones, or a newcomer attracted to the utility and accessibility (not to mention the fun) of Unmanned Aircraft Systems (UAS), you might be a tad uncertain about options, procedures, and requirements. The FAA website’s UAS Portal is here to help. When you enter the portal (see

The very top of the FAA website’s UAS landing page provides links to information on the newest regulations for UAS.

Learn More for link), you will find a landing page with links to a full range of resources. For those starting from scratch, the screenshot shows the decision tree — and, as the text at the bottom indicates, we can help you figure out which category you need to explore.

WHAT TYPE OF DRONE FLYER ARE YOU?

Not sure? We'll help you figure it out.

Clicking on the “not sure” link uses a simple set of questions to pinpoint precisely what you need for the purpose you have in mind.

In addition to the decision tree, the FAA website’s UAS landing page offers quick links to everything from the B4UFly app to the “Drone Zone,” along with information about keeping your remote pilot certificate current. The information is also available in Spanish.

Remote ID

The very top of the FAA website’s UAS landing page provides links to information on the newest regulations for UAS. You will want to read the information carefully, but you might find the graphic summary on the Remote ID overview page particularly helpful. It summarizes the three ways that a remote pilot can comply with the new requirements.

New Advisory Circular 107-2A

Hot off the press, as this issue of *FAA Safety Briefing* goes to print, is the updated version of the FAA’s Advisory Circular on Small UAS. Issued

on Feb. 1, AC 107-2A is intended to provide guidance for conducting small UAS operations in the National Airspace System in accordance with 14 CFR part 107. Even if you’re familiar with the original version of this AC, it’s never a bad idea to refresh your knowledge. This version also includes new material on part 89, the Remote ID rule, starting in section 5.17. As the text indicates, the FAA is providing further information on Remote ID in two additional ACs: AC 89-1, *Means of Compliance Process for Remote Identification of Unmanned Aircraft*; and AC 89-2, *Declaration of Compliance Process for Remote Identification of Unmanned Aircraft*.

Keeping Current

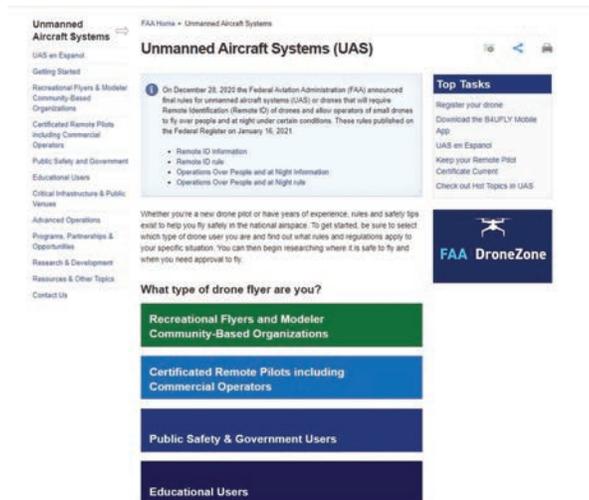
The FAA website’s UAS portal also includes information on keeping your remote pilot certificate current. (Note: In addition, the FAA website’s Airman Testing page offers links to the Airman Certification Standards for Remote Pilot Certification.) There’s a lot more information on the UAS portal, so it’s worth spending some time to get acquainted with the full range of options for expanding your aeronautical repertoire. Enjoy!

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.

LEARN MORE

FAA UAS Portal
[faa.gov/uas](https://www.faa.gov/uas)

AC 107-2A —
Small Unmanned Aircraft System (UAS)
[bit.ly/SmallUAS](https://www.faa.gov/regulations_policies/advisory_circulars/107-2a) (PDF)



Dreaming of SPACE

**How the FAA is Enabling a
Ticket to the Final Frontier**

By James Williams

We often view space, and space transportation, as a descendant of aviation, but in reality both are a story of parallel evolution. In the same year (1899) that the Wright Brothers began to test wing warping, Robert Goddard set his goal of space flight. While the Wrights would meet success only a few years later, Goddard would have to wait a couple of decades to make his first successful flight in 1926. The Wrights saw their accomplishment move to large scale operational use, and more importantly, rapid development, during World War I. Goddard's work, on the other hand, would have to wait until World War II to be developed, and then ironically not in his own country.

The Germans and Soviets put rockets into wide-scale operational use as ersatz artillery. From there, other applications of rockets included air to air/ground rockets and anti-tank weapons. But the Germans would embrace Goddard's liquid fueled rocket concept most directly, producing both the world's first long-range ballistic missile, the (A-4/V-2), and the only operational rocket plane (Me-163). The Second World War showed without a doubt that rocketry could be employed at scale and that the technology to fulfill Goddard's dream was close at hand.



Robert Goddard in March 1926 next to his early liquid-fueled rocket which would make its first successful flight days later.

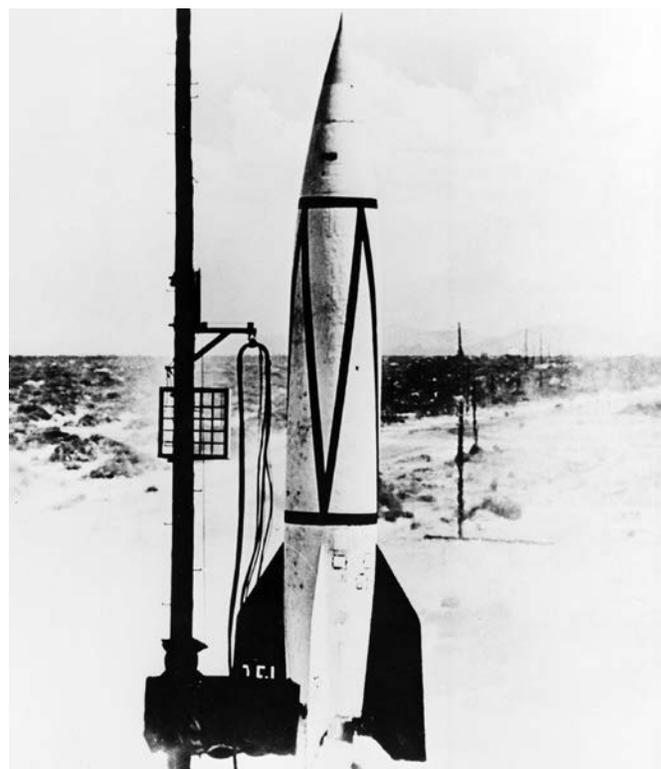
The Technology Cycle of the Final Frontier

Despite Goddard's pioneering work on rocketry, the United States entered and even exited World War II as a laggard in the technology. The Germans proved that major government support and resources would be required to make the kind of advancements that Goddard dreamed of and the United States would later achieve. Almost all of Goddard's support came from private donations and sponsorships. The rest of the Space Race history is well told elsewhere. Today, spacecraft are turning back to private ownership and operation. While still very sophisticated and expensive, the technology is now at the point where private companies are taking up the role of space transportation.

But What Does That Have To Do With The FAA?

"Nobody wants to be regulated," explains Wayne Monteith, the FAA's Associate Administrator for Commercial Space Transportation, on a recent episode of "The Air Up There" Podcast (faa.gov/podcasts). "But understand why we need traffic signals ... you expect that a car with a red light will stop and probably 99.8% of the time they do stop. But sometimes they make a risk calculation, it's yellow, maybe orange, and push it just a bit," he continued. "Most of the time when they go through that light nothing bad happens, but occasionally something does. So our job is to make sure that the operator understands what the regulations are and that they don't push that extra bit of risk when something can go terribly wrong."

NASA photo.



NASA photo.

A captured A-4 rocket being test launched by the U.S. Army at White Sands, New Mexico in 1946.

Directing Traffic to Space

The first challenge to commercial space operations is one of airspace. Any expansion beyond traditional government space launches and launch sites would require new procedures. Especially after 9/11, space launches could massively impact aviation operations. The post 9/11 shuttle launch restrictions basically shut down my home airport in Melbourne, Fla. for days at a time. So increasing the tempo of launches, and the number of launch sites, means that ad hoc methods used in the past to separate air and space traffic were no longer going to be an effective solution. Today, the FAA has licensed domestic launch sites in Florida, Alaska, California, Texas, New Mexico, Colorado, Oklahoma, and Virginia with many more planned in the future.

In “The Air Up There” Podcast, Duane Freer, the FAA’s manager for space operations, explains how it works. “At the FAA, when a rocket launches, we have to build a hazard area around it to protect both the public on the ground and the public in the air. We work with the air operators and the launch operators to move traffic and aircraft and to clear airspace around the rocket so it can get to space safely. This is called NAS (National Airspace System) integration. The goal is to move the traffic out of and back into the area as efficiently as possible around the space operation.”

To do that successfully requires both collaboration and innovation. “We’ve got new processes, such as time-based launch procedures and dynamic launch and reentry windows,” says Freer. “We’re trying to take a time-based

solution to managing the traffic and gaining efficiency. Dynamic launch windows allow us to take advantage of triggers within the launch operator’s missions that we can use to be even more efficient.”

One process in particular that has caught Freer’s excitement is the Space X operations procedure that uses a liquid oxygen load. “They fuel their Falcon 9 rocket about 40 minutes prior to launch, and once we get that liquid oxygen load, they are committed to a T0 [launch] and we can start moving traffic based on that trigger,” he explains. “We’re doing that in other places, and it’s a really exciting collaborative effort that we’ve worked out with the launch operators.” It minimizes the time that airspace is restricted and other NAS operations are impacted. This improves on the previous process which relied on blocking airspace for the entire launch window until the spacecraft launch was completed or the mission was officially scrubbed.

Another system Freer highlighted was the Space Data Integrator (SDI), which allows launch operators to share telemetry data from the spacecraft with the FAA directly to monitor the status of their mission. The goal is to have the SDI operational by the time you read these words (in Spring 2021). The SDI will allow even more tailoring of operations around space launches in real time with access to high quality data. The FAA currently has deals with several launch operators and is looking to add more as the SDI comes online.



NASA photo by Kim Shifflett.

NASA employs a small fleet of airplanes, helicopters, and boats to coordinate launch activities and escort intruding aircraft out of the launch area.

A Ticket to Space

While airspace is an obvious area of concern for the FAA, the agency must also handle the licensing of launch and reentry operations and spaceports. It might initially seem that the National Aeronautics and Space Administration (NASA) would be the agency charged with such responsibility, but NASA is primarily a research and development agency, not a regulatory one. So while they have great expertise in spacecraft operations, they are not charged

Last year saw the first-ever NASA-crewed mission to be licensed by the FAA with more to come in the future.

with regulating new entrants to the NAS. As commercial space operations expand, safe integration into the NAS is key. That's where the FAA's experience really shines. The FAA has decades of experience certificating airports, air carriers, and air operators that can be translated into this area in collaboration with NASA. The agency also has authority to issue safety approvals under the Commercial Space Launch Act for many aspects of commercial space activities. For more details on how this works you can check out "Spaceports Launch the Next Frontier in Flight" from our May/June 2016 issue (bit.ly/FAASB-Arc). It also mirrors the FAA's surveillance operations including Safety

Inspectors who ensure that launches are being conducted in accordance with regulations. One key difference is that under Title 51 of the United States Code, the FAA is also tasked with enabling the nascent industry while still protecting the public.

The goal is to provide a clear framework for all operators to use. It should provide room for new entrants while easing the path for existing operators to expand their operations. The FAA's job is to provide a safety standard to protect the public. To that end, last year saw the first-ever NASA-crewed mission to be licensed by the FAA with more to come in the future. This approach allows the FAA to focus on public safety while NASA focuses on the mission. It is also a stepping stone to future commercial space operations with space flight participants.

With several space flight operators seeking to put civilian participants in space this year, the time for Goddard's dream to become reality for the general public is coming. The FAA's mission is to make sure that it can be done safely. Fusing these two disparate users into one safe NAS is the key to growing commercial space operations to the point where one day space travel might be available to almost anyone. With a set of straightforward rules and regulations, combined with the competition of innovative minds, we are taking important steps in that direction. ▶

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



NASA photo by Bill Ingalls.

NASA astronauts Bob Behnken, left, and Doug Hurley in a mockup of the cockpit of a commercial launch vehicle.

THE AIR UP THERE



A podcast for people who are curious about the wide world of aviation. Join the FAA as we nerd out about the future of flight, drones, and ways to make the National Airspace System safer, smarter, and more efficient. For details on how to listen and subscribe, visit:

faa.gov/podcasts



WHAT'S IN A NAME?

“That which we call a rose by any other name would smell as sweet.”

— William Shakespeare

Shakespeare’s Juliet offered those famous words to profess love for Romeo and assert that a name is just that — a label. A name doesn’t change anything about the rose.

So how do these words apply to an unmanned aircraft system (UAS)? You’ve probably noticed already that there are many names for UAS. A UAS can be called a drone, or a worker bee, or even a quadcopter. What about an unmanned aerial vehicle or UAV? Is there a “correct” term?

Let’s start at the beginning. The overarching colloquial term for all remotely piloted aircraft is **“drone.”** The FAA adopted this industry designation to complement the agency’s initial UAS term and describe any aircraft without a pilot onboard, regardless of size, shape, or capability. Beneath this umbrella term are several interchangeable terms (e.g., UAS, RPA, or UAV). Others denote categories (e.g., first-person-view or model aircraft). Each has a slightly different use and connotation. Now for a closer look:

“Unmanned Aircraft System” (UAS) is used interchangeably with “drone,” although a UAS is a “system” of three parts, with “drone” referring to the aircraft itself. In addition to the drone (aircraft), the UAS includes the control station and the communication link between the control station and the aircraft. A UAS can employ a fixed-wing or rotor. It is piloted by a person not in the aircraft and generally located on the ground. The FAA’s rule, following the statute, requires that the remote pilot-in-command



A quadcopter UAS.

(RPIC), or a visual observer, be able to see the UAS at all times while the aircraft is in the air.

“Unmanned Aerial Vehicle” (UAV) is used by industry interchangeably with UAS; however, the FAA has chosen under the newly published regulation 14 CFR part 89 to define the term “unmanned aircraft” (UA) as the aircraft itself, to distinguish the system from the aircraft. Industry’s UAV term and the

FAA’s UA term are really just part of a UAS. Either term can refer to fixed wing UAs, which look like airplanes, or rotorcraft such as quadcopters or other multirotor aircraft. The term UAV is mostly associated with military aircraft, but can be used for a variety of other functions. UAV can also be semi-autonomous, meaning that the aircraft performs using sensors, a ground control system, and specific software programming.



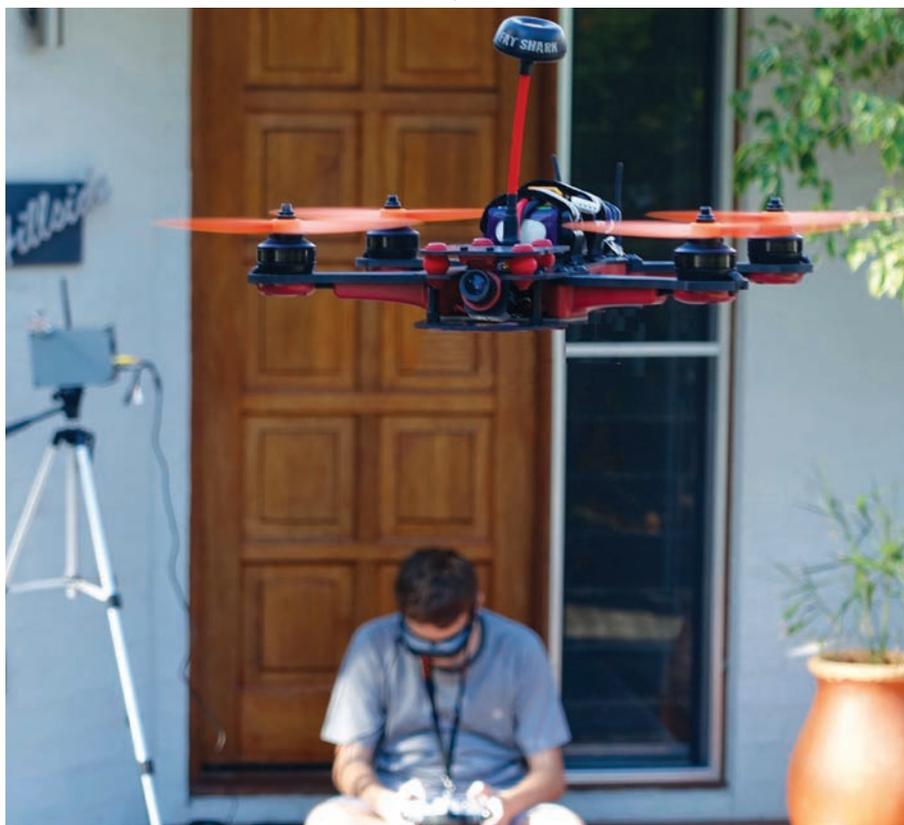
A General Atomics Predator C/Avenger UAV.



One example of the controls of a Remotely Piloted Aircraft System.

“Remotely Piloted Aircraft System” (RPAS) is the preferred international term for UAS. Aviation agencies such as Eurocontrol, the International Civil Aviation Organization (ICAO), and the European Safety Agency (EASA) use RPAS. It does not apply to autonomous aircraft, which would still be called UAVs.

“First-Person View” (FPV) is a subcategory of UAS. Though remotely positioned, the remote pilot still has an onboard-the-aircraft view via a camera feed sent to goggles or a monitor. Both fixed wing and multi-rotor aircraft can have FPV, which is known for its precise flying and used frequently in drone racing.



A First-Person View UAS.

Model aircraft were around before airplanes were invented; in fact, the first model aircraft, dating back to 200 BCE, was found in Egypt in 1898. Model aircraft are made from a variety of materials and use a variety of propulsion methods. Flying models are typically radio controlled, flown for recreation only and, since the FAA Reauthorization Act of 2018, defined by the FAA as unmanned aircraft. Static models are generally used as decorations. Model aircraft can differ from drones in their communication and control systems and functions.



A model aircraft.

By Any Other Name

With interest growing in gender-neutral language across the aviation industry, the FAA has asked its Drone Advisory Committee for recommendations on terms that promote inclusion. Regardless of the eventual conclusion, though, Shakespeare had the right idea: by any name, these aircraft are useful, interesting, and fun.

Alina George is a project specialist in the Operational Programs Branch of the FAA's Office of UAS Integration.



AIRCRAFT MUFFLERS — THE HIDDEN DANGER YOU NEED TO KNOW

What if I said that the exhaust system muffler on an airplane is just as critical as the main rotor retaining nut on a helicopter? Would you agree? There is no doubt that if that nut fails, the rotor will lift off the shaft and your next stop is likely the pearly gates. But did you know that if the exhaust muffler is faulty or fails, the consequences can be equally catastrophic? In fact, this is one of the components on an airplane where just a single point of failure could result in fatalities, serious injuries, and/or a total loss of the aircraft. Leaks, metal fatigue, or structural failure in the muffler can cause either a partial or complete engine power loss, a fire, or allow the “silent killer,” carbon monoxide, to find its way into the cabin heating system and poison all aboard.

The FAA is taking a closer look at what appears to be an increasing rate of fatalities and injuries attributed to failures in general aviation (GA) exhaust system mufflers. “We identified 23 accidents/incidents, from 2011 to 2019, where faults or failures in GA exhaust systems were a causal factor,” says Michael Bartron, Aerospace Engineer in the FAA’s Safety Program Management branch. “What we’re finding is wear and damage on the inside of the exhaust system. The muffler may be failing in a way that’s not readily visible to a pilot or a mechanic who’s only looking on the outside,” he explains.

Internal muffler failures account for nearly 20% of the total number of exhaust system failures with erosion and carbonizing as the primary cause. If there’s damage starting from the inside out, you have no way of catching it until there’s a rapid failure and then it’s too late.

If you are an owner/operator, removing exhaust system components is not preventive maintenance; however, you should acquaint yourself with the configuration, pieces, and parts that make up the exhaust system on your airplane. This will help you to identify abnormal areas or areas that may have changed since the last inspection. You are primarily responsible for ensuring that defects are repaired between required inspections.

Have your mechanic take the exhaust system off and look inside. Mechanics should remove the heat shroud and inspect the heat exchanger and ducting connections. The FAA recommends that exhaust stacks, mufflers, and tailpipes be replaced rather than repaired, since special tools and welding skills are needed. When exhaust system repairs are necessary, the FAA strongly encourages consultation with an FAA-certificated repair station. “Yes, it may be time consuming, and owners/operators may not consider it to be the most important system on the aircraft,” says Bartron, “but they need to be fully aware of the life-saving and cost benefits of taking a look on the inside.” Bartron adds that there are simple, non-destructive ways for mechanics to improve their visual evaluations. “You could use a borescope inserted into one end of the removed muffler,” says Bartron.



Photo by Adrian Eichhorn.

Inspections, checks, and inspection processes should be accomplished in accordance with the manufacturers’ recommendations. Additionally, FAA Advisory Circular 43.13-1B provides guidance on pressure testing exhaust system components for both installed systems and for removed components.

If you, or other mechanics in your shop, see either brand new issues or “that same old problem” with an exhaust system component, please report it — file a Malfunction/Defect Report (MDR) at av-info.faa.gov/sdrx. You’ll find it under the Public Functions tab. It’s confidential — you can remain anonymous if you choose — and there are no consequences for reporting. “We rely on voluntary feedback from maintenance professionals like you, on the front lines of the industry, to help us collect data, understand trends, and catch problems early,” says Bartron.

To learn more about inspection techniques for GA aircraft exhaust systems, take the AMT Core Course, Aircraft Exhaust Systems (ALC-498) at FAASafety.gov.

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

LEARN MORE

FAA Advisory Circular 91-59A, *Inspection and Care of GA Aircraft Exhaust Systems*
bit.ly/GAExhaustSystems (PDF)

FAA Advisory Circular 43.13-1B, *Acceptable Methods, Techniques, and Practices – Aircraft Inspection and Repair*, (pp. 8-45 to 8-51)
bit.ly/ExhaustSystemInspection (PDF)

AMT Handbook-Powerplant Vol.1, FAA-H-8083-32A, (pp. 3-22 to 3-26)
bit.ly/AMTHandbook8083-32A

GETTING THE BIG PICTURE ON GA ACTIVITY

“Would you recommend this product to a friend?”

“How satisfied were you with your order?”

“Please state your level of agreement with the following ...”

With so many survey requests bombarding us these days, I might be inclined to add them to the proverbial list of guarantees in life, alongside death and taxes. Despite their pervasiveness in nearly every aspect of our lives, today’s era of online and automated transactions has made surveys an increasingly essential way of life for most organizations. Although I may occasionally lament a survey popping up via my phone or email, I understand the value they offer to not only the requesting entity in terms of data collection, but to others who may rely on my candid feedback to make their own personal decisions. I also understand that by not providing information about a particular product, service, or viewpoint eliminates an important opportunity to have my voice heard and gives way to having an unwanted or negative experience more likely to recur.

Of course the aviation sector is no stranger to surveys. They are excellent

tools for gathering data about what pilots think or want when it comes to new products, services, or policy changes. But there are surveys that do more than just inform. Some can significantly impact aviation infrastructure and program funding, affect staffing and service levels, and provide insightful data that could improve safety for all National Airspace System users. The survey that claims *d) all of the above* is the annual General Aviation and Part 135 Activity (GA) Survey. This important survey, now in its 43rd year, is the FAA’s singular source of information on the GA fleet, the number of hours flown, and the ways people use GA aircraft.

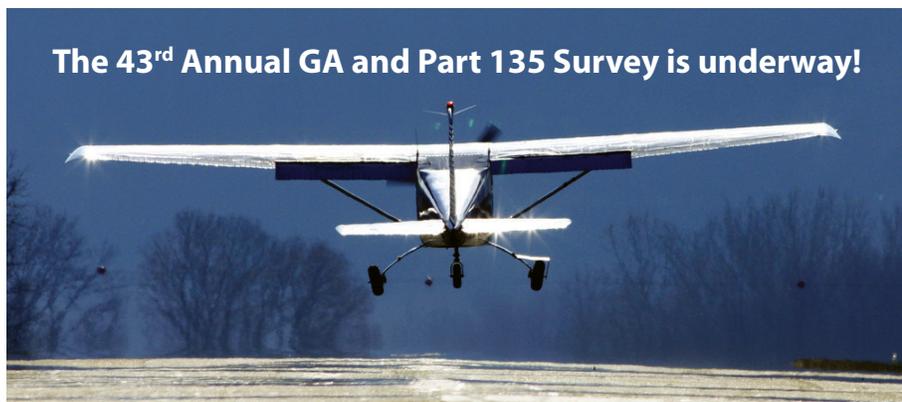
Perhaps you received the survey postcard in the mail and thought — eh, I don’t have time now, but I’ll get to it later (and then didn’t). Or, maybe since you didn’t really fly much (or at all) last year, you might think, why bother? Whether you flew a lot, a little, or not all, the FAA is still relying on you to respond so that all types of activity are represented. If time is a factor, know that the survey can be completed online in about ten minutes. Prefer paper? We got you covered; a hard copy version will be mailed to you with prepaid postage.

“We’re here to help,” says Peg Kreckler, project manager with Tetra Tech, the firm contracted by the FAA to conduct the survey. Peg encourages anyone to call or email if they run into any problems or if they receive separate surveys for multiple aircraft. “We can work with these larger fleets by using a shorter survey form, or by conducting the survey over the phone,” says Peg. For anyone concerned about confidentiality, Peg assures that responses are only reported in highly aggregated form (e.g., by aircraft type or region) and can never be traced back to an identifiable individual.

But there’s still the matter of why this survey is so important. According to the FAA’s Office of Accident Investigation and Prevention, statistics derived from the final GA Survey help provide a basis for analytical work performed throughout the agency, which in turn provides several direct benefits to the GA community. For example, the FAA uses hours flown and active aircraft information by type of flying for safety analyses, forecasting, and planning. The data also helps the FAA and NTSB calculate accident rates, spot trends, and determine safety performance among different aircraft types and configurations. Another benefit is the ability to use lifetime airframe hours in aircraft fatigue studies to determine mean time failures and aircraft maintenance cycles.

So there’s a few good things to consider when you see that GA survey postcard arrive in the mail. For detail on the GA Survey, or to review results from previous years, go to bit.ly/GenAvSurvey.

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





HELICOPTERS AND DRONES

Go to any park nowadays and you will likely see drones, or unmanned aircraft systems (UAS). It all seems so normal. Just 10 years ago, the skies were largely free of UAS. Now, however, the surging popularity of drones presents some challenges to the helicopter community. To help foster safe integration, the FAA has developed rules to help remote pilots navigate the skies safely. Over the next two years, UAS operators and manufacturers face deadlines to install remote identification technology that will help authorities better track UAS.

Readers of this column may recall *FAA Safety Briefing's* May/June 2017 issue about some specific UAS airspace conflicts ([bit.ly/FAASB-Arc](https://www.faa.gov/air_traffic_safety/briefings/2017/05-06-2017)). These prevented public safety helicopter teams from firefighting and conducting a rescue in California, and UAS interferences resulted in cancellation of medical flights in Texas.

Such incidents persist. In November, the FBI arrested a man after his UAS crashed into a Los Angeles Police Department helicopter. The helicopter was responding to a crime scene when the collision occurred, forcing an emergency landing. The drone damaged the helicopter's nose, antenna, and bottom cowling. A vehicle was also damaged as the drone fell from the sky.

The FAA receives more than 100 sightings of improper drone operations each month. The FAA has warned that operating drones around airplanes, helicopters, and airports is dangerous and illegal and that violators face stiff fines and criminal charges.

Identifying violators will get easier. On Jan. 15, the FAA issued a final rule that requires all UAS weighing over 0.55 pounds to have remote identification (Remote ID) technology



installed, unless the drone is operated at an FAA-Recognized Identification Area (FRIA) sponsored by a community-based organization or educational institution ([bit.ly/FAAFRIA](https://www.faa.gov/air_traffic_safety/briefings/2017/05-06-2017)). Remote ID allows the FAA and other authorities to identify a UAS, its location, the time of operation, and assists in determining whether the drone poses a security risk. UAS manufacturers must install this technology no later than September 16, 2022. No UAS that is required to have Remote ID can operate in the United States after September 16, 2023 without this technology installed, unless the UAS is flown in a FRIA.

“In its most basic form, Remote ID can be described as a ‘digital license plate’ for UAS,” says Ann Cihon, a program manager with the FAA's UAS Integration Office. “Remote ID is necessary to address aviation safety and security issues regarding UAS operations in the National Airspace System.”

Drones clearly offer many benefits. The government-industry United States Helicopter Safety Team (USHST) studied five fatal accidents involving cattle mustering, frost protection, cherry orchard drying, and low-altitude law enforcement search operations and concluded that UAS could supplement helicopter operations in these areas and help reduce the risk for manned operations. The USHST also recommended UAS for

some aerial applications, transmission line inspections, pipeline patrols, and wind turbine inspections.

Here are some tips from the USHST to avoid airborne conflicts with a UAS.

- Use available helicopter lighting to increase visibility for UAS operators.
- When climbing, consider a cruise climb that maximizes visibility. Helicopters are particularly vulnerable to a UAS strike when they lift off or land.
- Listen to radio reports, including on 121.5 MHz, of UAS sightings.
- Conduct a high reconnaissance flight at off-airport landing locations to provide a visual and aural warning to nearby UAS operators.
- Keep airspeeds at or near the best autorotation speed when flying low; flying higher improves safety margins.
- If you need to move quickly to avoid colliding with a drone, note that windscreens, jet intakes, and rotor systems are particularly vulnerable to drone strikes. You could actually increase risk of a strike, depending on how you maneuver to evade a drone.
- Report UAS collisions or near misses to an FAA Flight Standards District Office ([bit.ly/FAAFSDO](https://www.faa.gov/air_traffic_safety/briefings/2017/05-06-2017)) or the appropriate Air Traffic Control facility.

For a more complete list, visit [bit.ly/USHSTDronBulletin](https://www.faa.gov/air_traffic_safety/briefings/2017/05-06-2017) and scroll down to BULLETIN Drones 4.

Gene Trainor is a communications specialist/technical writer with the FAA Compliance and Airworthiness Division and a Rotorcraft Collective team member.



Check out our GA Safety Facebook page at [Facebook.com/groups/GASafety](https://www.facebook.com/groups/GASafety)

If you're not a member, we encourage you to join the group of over 14,000 participants in the GA community who share safety principles and best practices, participate in positive and safe engagement with the FAA Safety Team (FAASafetyTeam), and post relevant GA content that makes the National Airspace System safer.

Getting Your Package Delivered By Drone?

It could happen sooner than you think! Listen to 'The Air Up There' to learn more about how FAA BEYOND participants, UPS and Wing, use drones to deliver goods. Full episode at bit.ly/DronePackageDelivery.

"See"-FIT to Avoid Terrain

Great job on your CFIT article in the Nov/Dec 2020 issue (medium.com/faa/look-up-look-out-437a0214f43b). You bring up some very good points for our pilots to use to defend themselves against this silent and insidious killer. While flying in Alaska for 35 years, I saw many mountain passes littered with aluminum. Most of them were VFR flights in very marginal weather. These graveyards have decreased with the use of weather cams installed at many of the passes

throughout Alaska which allows for more adequate preflight weather analysis by the airman. Thanks again for what you do for aviation accident prevention.
— Charlie

Thanks for the kind feedback and for sharing your story about how tough CFIT is in Alaska. It's very sad to hear about these accidents, especially the ones where VFR into IMC is the factor. We always think that would never happen by us, but when you throw in the pressure of "get-there-itis" for example, it can be hard to overcome. Our FAA Safety Briefing team works hard to give readers some food for thought, so that maybe one of these ideas/safety tips winds up improving flying skills, or best case, ends up saving a life. That's what counts, and that's what motivates us to push on!



Check out our new blog on Medium at medium.com/FAA.

On the Plane, Snow is Glistening ...

Wet Snow can freeze on contact with aircraft surfaces and pose a hazard for structural, engine, and windshield ice accumulation. Read medium.com/faa/on-the-plane-snow-is-glistening-575dacafbc1 to learn more.

I've never seen snow that didn't bring visibilities down to either IMC, or low enough that novice pilots should definitely avoid.
— Mark

So Things Don't Go Bump on a Clear, Night Flight

Even experienced pilots can miss something as big as a mountain at night. Read the story of how an

altitude hold set just 300 feet higher could have saved a life at medium.com/faa/so-things-dont-go-bump-in-the-night-ef5c1bcb6751.

Really great article!
— Malcolm

Big Data, Little Team — How You Benefit from the FAA's Surface Safety Metric

Don't be careless or overconfident just because you're on the ground. Treat the surface just like the sky; "aviate" by taxiing with caution, "navigate" by reference to an airport diagram, and "communicate" with ATC when you need time, clarification, or a little more assistance. Learn more at medium.com/faa/big-data-little-team-994501057ff.

Let us hear from you! Send your comments, suggestions, and questions to SafetyBriefing@faa.gov. You can also reach us on Twitter @FAASafetyBrief or on [Facebook at facebook.com/FAA](https://www.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.



RUMINATIONS ON REMOTENESS

A love/hate relationship with certain words is possibly an occupational hazard for those in the word-wrangling profession. I have a weird distaste for the word “remote,” which might seem even more strange in view of the way I gleefully use the “Home” app on my iPhone to remotely (ahem) control virtually every light in my house. So why do I cringe to read about “remote” employees and, yes, “remote” pilots? Let me explain.

What’s in a Name?

According to the dictionary, the word “remote” means “having very little connection with or relationship to” something. When it comes to school, work, or flying aircraft, though, using “remote” because of physical distance is at best misleading. Years ago, I earned a graduate degree as a “remote” student. It was convenient to attend class from home and on my schedule, but I quickly learned the truth in the wry observation that clicks are much tougher than bricks. When I took face-to-face college courses, I simply went to class, took notes on the lecture, nodded to my classmates, and dashed off to the next one. In the “clicks” environment, though, I had far more connection and relationship to school because it took a lot more time and active effort to participate at all — never mind the time for all the reading and homework. Having been a “remote” employee (full-time telework) for several years, I knew even before COVID-19 forced telework on everyone that it requires more effort — not to mention more hours — to stay in the loop. Modern communication technologies — Zoom meeting, anyone? — keep us more connected than ever. That’s why I shun the use of

“remote” to describe full-time telework in favor of more accurate terms like “distributed” or “virtual” workforce.

Words Matter

It doesn’t really work to say that a drone pilot is a “distributed” pilot, and we are probably stuck with the official certification title of “remote” pilot. My hope, though, is that we don’t fall into the trap of thinking that piloting a drone is a distant, no-brainer kind of activity. Since we debuted the Drone Debrief department in *FAA Safety Briefing* a few years ago, I have learned that drone flying is anything but simple. Just like traditional pilots, drone pilots have to understand their aircraft — what it can do, and what is beyond its performance capabilities. Drone pilots have to have knowledge of airspace, weather, and operating rules. They must have skill in operating the drone. I haven’t done much drone flying, but I have done enough to know that it’s a lot harder than it

looks. In some cases, especially for the more sophisticated drone operations, the drone pilot has complex crew resource management (CRM) responsibilities for a multi-member crew. As you have read in these pages, the proliferation of drones and other new technologies has also required the development of new, more sophisticated traffic management technologies and procedures. So called “remote” pilots need to be closely dialed in to what that emerging technology will (and won’t) do. The evolving regulatory structure is another challenge requiring the drone pilot’s close and continuing attention.

Bottom line: there is nothing “remote” about safely piloting a drone, and all pilots would do well to stay closely connected to everything it takes to excel at our aircraft flying craft.

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GUIDO HASSIG

Aviation Safety Inspector, *FAA Safety Team*

Growing up in a small town in upstate New York, Guido Hassig took his first airplane ride when he was 12. The life-changing flight was with a family friend who owned a Piper *Cherokee* and a private grass airstrip. That spark ignited his love for aviation.

After earning a shiny new bachelor's degree in philosophy, Guido quickly realized that there were not a lot of jobs for philosophers. That realization fanned the old aviation spark from earlier years back into flame. He figures that if Aristotle said that "happiness is the highest good," then aviation must be the highest calling.

Following years of training, Guido worked in the aviation industry both as a pilot and maintenance technician. While attending an FAA safety seminar at the local Flight Standards District Office (FSDO), Guido decided to volunteer as a safety counselor (the



original title for a FAA Safety Team Representative) and began writing an aviation safety program newsletter. This work eventually led to a job as an aviation safety inspector with a FSDO in North Carolina.

Guido now works with the national FAA Safety Team (FAASTeam) serving as team lead for the **connectU** group — or Cross **O**rganizational **N**etworking, **E**ducation, and **C**ommunications **T**eam for **U**nmanned Aircraft Systems (UAS). Only a philosopher could come up with that kind of acronym!

The connectU group includes four subject matter experts who specialize in UAS, also known as drones. Responsibilities include supporting the FAASTeam's mission as it relates to UAS outreach, and providing UAS performance support to the FAA's Office of General Aviation Safety Assurance (GASA).

"The biggest challenge in reaching out to the UAS community is that drone language is not the same as with traditional aviation," said Guido. "Communicating with new groups of people requires new thinking because UAS operators sometimes struggle to understand established aviation terminology."

For example, Advisory Circulars (ACs) — well known to traditional pilots — have not always reached the UAS community. Unique approaches to educate these new operators, combined with a passion for improving UAS safety in the National Airspace System (NAS), is the focus of the connectU group.

One recent connectU achievement is the designation of qualified third-parties to administer The Recreational UAS Safety Test (TRUST).



This effort will make the exam accessible to all recreational drone flyers and provide information on best practices and educational resources to ensure safe drone operations. The test was developed with input from the drone community to demonstrate a recreational flyer's understanding of aeronautical safety knowledge and rules for operating unmanned aircraft.

Aviation safety has always relied on effective communication between pilots, technicians, air traffic controllers, airports, dispatchers, and many others.

"Now that remote pilots have been added to the equation and share some of the same airspace used by traditional aircraft, effective communication between this new community of aviators and traditional users of the NAS is equally important," Guido explains.

In keeping with Guido's philosophical roots, here's one question he enjoys asking his fellow airmen:

"There's a big difference between a pilot and an aviator. One is a technician; the other is an artist in love with flight." Which one are you?

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



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