



7-1-2016

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Recommended Citation

Frazier, Alan. (2016). An sUAS Revolution Within the FAA and that Pesky Data Problem. *Airbeat Magazine*, July/August 2016, 26-28.

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An sUAS Revolution Within the FAA and THAT PESKY DATA PROBLEM

By Alan Frazier, Deputy Sheriff, Grand Forks (ND) County Sheriff's Office, Associate Professor, University of North Dakota's John D. Odegard School of Aerospace Sciences

For the last five years, a few pioneers in the use of small unmanned aircraft systems (sUAS) in law enforcement have been petitioning the Federal Aviation Administration for full recognition of public safety sUAS as "public aircraft." The benefits of operating a public aircraft include the

aircraft not being required to have an airworthiness certificate and the pilot not having to possess an FAA pilot certificate or FAA medical certificate.

FAA has been adamant that certificate of authorization (COA) applications submitted by public safety agencies wishing to use sUAS include a letter from the agency head

declaring the use as public. Despite it seeming clear that public safety sUAS would be public aircraft, FAA has consistently insisted that sUAS pilots hold an FAA pilot certificate or (for daytime Class G operations only) pass the FAA Private Pilot Knowledge Exam. In addition, FAA maintains sUAS pilots and visual observers must hold FAA 2nd Class Medical Certificates.

Well, help has arrived in the form of a UAS revolution within FAA. The administration recently revised FAA Order 8900.1 Volume 16. 8900.1, which is the guidance document related to UAS operations. Lacking much in the way of regulations related to UAS (14 CFR Part 107 is still pending issuance)*, FAA has

utilized a long list of guidance documents to frame their approach to management of UAS activities.

Order 8900.1 reflects a major paradigm change because it specifically excludes UAS operated as public aircraft from many of the requirements imposed on civil UAS. What does this mean to current and future COA holders? Government public safety agencies may now self-certify their UAS pilots' proficiency and physiological fitness. In addition, those agency-certified UAS pilots may operate in any airspace with proper coordination with affected air traffic control facilities.

This paradigm change is a double-edged sword. On one hand, it gives agencies more flexibility in UAS pilot selection. On the other, it raises the bar for law enforcement to be responsible and prudent in the operation of UAS and to thoroughly document sUAS pilot certification. As an airborne law enforcement community, we must establish and implement our own standards for safe and efficient UAS operation.

BLANKET COAs

Additional welcome news from FAA is the creation of an expedited "blanket COA" process. Introduced in March 2016, the blanket COA is intended to allow public safety agencies to operate sUAS anywhere in the U.S. The normal COA online application is the mechanism for applying. However, the estimated review and issuance period has been reduced to from 60 to approximately seven days.

When the blanket COA was introduced, it was accompanied by the following

UAS Registration Instructions

To begin the registration process, the following must be sent to the Aircraft Registration Branch (AFS-750):

1. **Aircraft Registration Application, AC Form 8050-1.** An original Aircraft Registration Application (AC Form 8050-1) is required. Photocopies or computer-generated copies of this form are not acceptable. Aircraft Registration Applications may be obtained from the Aircraft Registration Branch or your local FAA Flight Standards District Office (FSDO). For your convenience, a blank registration form is attached.
2. **Evidence of ownership.** A Bill of Sale or Affidavit of Ownership is required. The purchaser under a contract of conditional sale is considered the owner for the purpose of registration. The first time a new aircraft is registered, the manufacturer must complete and submit Aeronautical Center Form 8050-88, Affidavit of Ownership for Experimental Aircraft Including Amateur-Built Aircraft and Other Non-Type Certificated Aircraft (AC Form 8050-88), selecting the third box for build type. The first time a used aircraft is registered, the applicant must complete AC Form 8050-88, selecting the fourth box for the build type and the sub-box indicating the type of evidence of ownership enclosed with or attached to the form.
3. **Registration fee.** A \$5.00 registration fee is also required, payable to the Federal Aviation Administration.

Your application for aircraft registration must include the typed or printed name of each applicant with their signature in the signature block. Applications that do not include the printed or typed name of the signer will be returned.

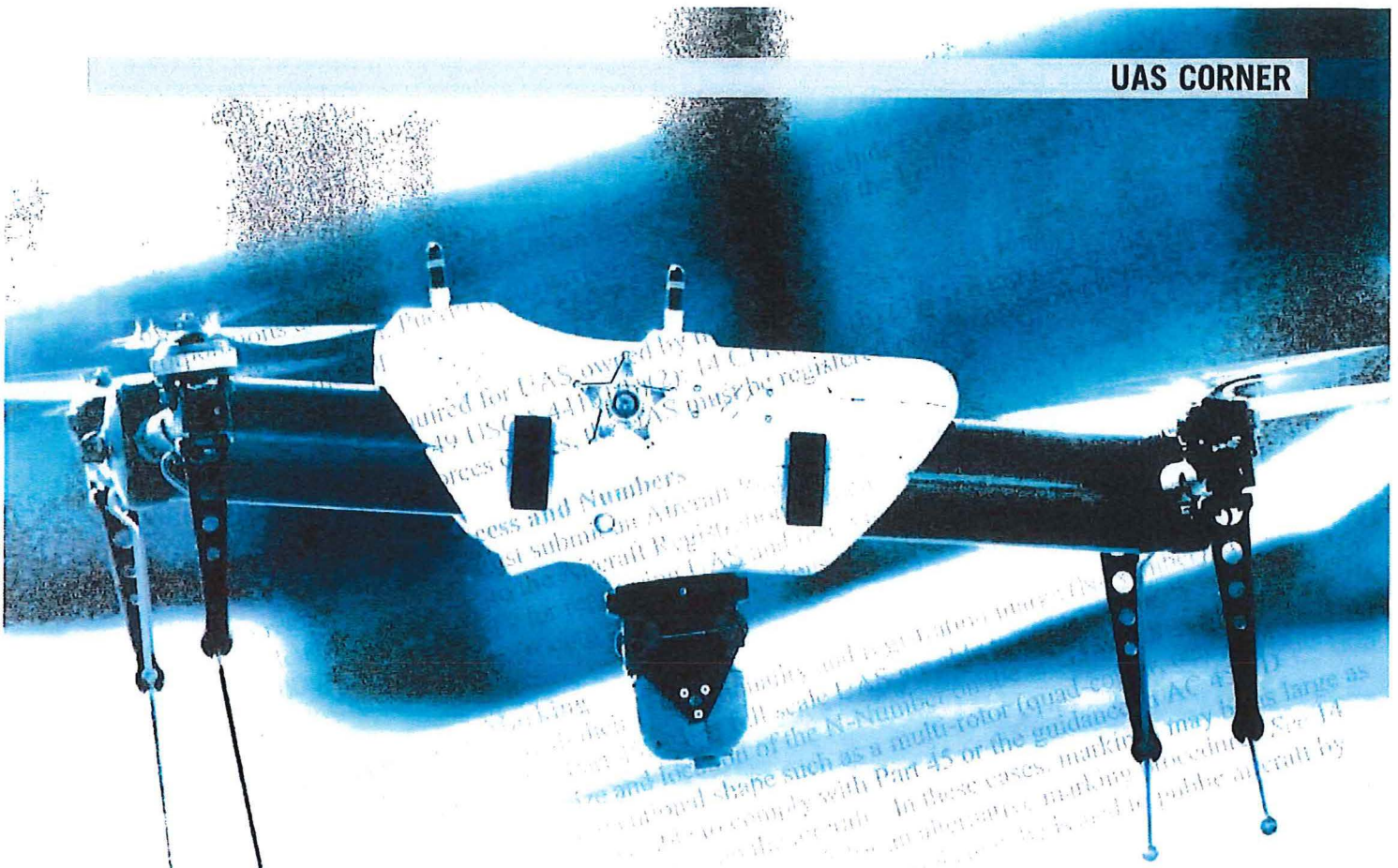
All U.S. aircraft registration numbers are prefixed by an N. The registration number, apart from the N prefix, is made up of one to five symbols, the last two of which may be alphabetical. This alphabetical suffix must be preceded by at least one numerical symbol. The lowest possible number is N1. A zero never precedes the first number. For example:

N1 through N99999, all symbols are numeric
 N1A through N9999Z, single alphabetical suffix
 N1AA through N999ZZ, double alphabetical suffix

A custom registration number may be reserved, if available, for 1 year by using the FAA online N-number reservation request application. There is a \$10.00 reservation fee (waived for Government offices).

All completed applications should be mailed to:

U.S. Postal Service, Regular and Priority Mail: FAA Aircraft Registration Branch, AFS-750 P.O. Box 25504 Oklahoma City, OK 73125-0504	Commercial Delivery Services: FAA Aircraft Registration Branch, AFS-750 Registry Building Room 118 6425 South Denning Oklahoma City, OK 73169-6937
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restrictions: daytime only operations in Class G airspace below 400 feet AGL. Operations are required to be outside of the following radii:

- Two nautical miles from the center of a heliport or uncontrolled airport with no published instrument approach procedure.
- Three nautical miles from the center of an uncontrolled airport with a published instrument approach procedure.
- Five nautical miles from the center of a controlled airport.

Operators are required to have passed the FAA Private Pilot Knowledge Exam within the previous 24 calendar months or possess an FAA Private Pilot Certificate or higher.

At press time, ALEA was awaiting formal word from FAA regarding the effect of the "public aircraft recognition issue" on the listed limitations of the blanket COAs. Presumably, the pilot requirements will be modified to an agency certification standard. It remains to be seen what will happen with the airport and heliport specified standoff distances.

The Grand Forks County (ND) Sheriff's Department GFSD) UAS Unit experienced a blanket COA success story in April. As a

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holder of four area COAs permitting day and night operations in 18 North Dakota and Minnesota Counties, GFSD was interested in obtaining a blanket COA to enable expedited responses to public safety incidents outside the existing COA area. GFSD submitted a blanket COA online application on the afternoon of April 14. The blanket COA was issued 18 hours later. GFSD exercised the blanket COA just over a week later when the UAS unit was forced to drive 130 miles east of Grand Forks—well

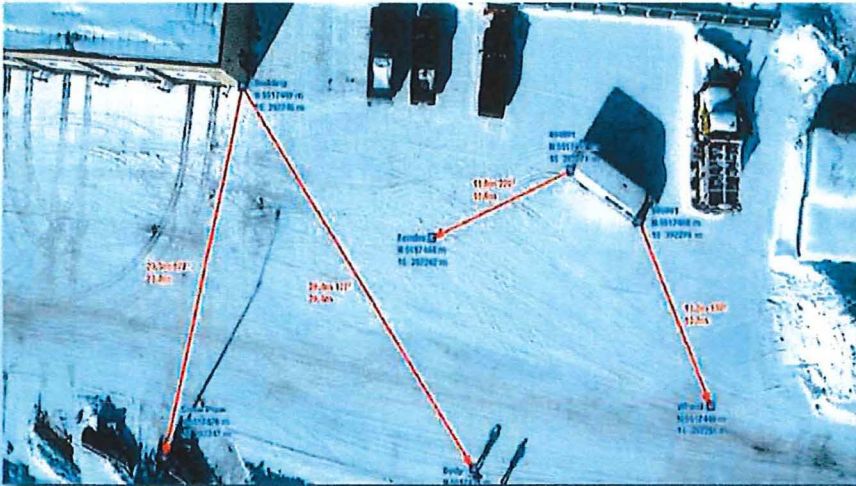
outside the area COA boundaries—to locate VFR weather capable of supporting OEM factory training being administered to five new GFSD AeroVironment Qube pilots. Had GFSD not had the blanket COA, the training would have been cancelled.

DATA & STORAGE

At their core, sUAS are flying camera platforms. They gather extensive video and photographic data that could be misused if not properly safeguarded. The good news is that processing an outdoor crime scene or traffic collision scene rarely results in more than 3-4 gigabytes of video and photographs. Compared to the task of archiving high-definition body camera footage from potentially hundreds or thousands of officers within an agency, the storage and safeguarding of sUAS-derived images is a manageable problem requiring a relatively small amount of data storage capability.

First and foremost, law enforcement officers must keep in mind that the images they capture at crime, disaster and accident scenes are usually sensitive and often contain intimate details of a victim or suspect's life. It is incumbent upon us to treat those images with respect and sensitivity. Agencies should ensure their sUAS unit policies and procedures manual contains language that emphasizes the need to safe-

UAS CORNER



guard images and outlines the process for handling them.

When conducting flight operations, sUAS operators should avoid aiming cameras at areas unrelated to the incident or training mission. At least one sUAS (the AeroVironment Qube) has a feature that allows the operator to pre-designate areas that should not be captured via video or photographs. Dubbed the "privacy shield" by AeroVironment, the feature allows the sUAS operator

to designate the zone inside or outside four points as protected from video recording and photographs. Whenever the camera is pointed at an area within the protected area, the video recording ceases and the camera's ability to take photos is disabled. The operator is still able to view real-time video for navigation and situational awareness. When the camera is directed away from the protected area, video recording and the ability to take photographs is restored.

Similar to any piece of evidence, sUAS video and photographs should be safeguarded and documented via a written chain-of-custody record. sUAS capture video and photographs by one of two methods: directly to an SD card carried aboard the aircraft's camera or stored on the ground control station (GCS) computer after radio/digital transmission. In case of a camera SD card, it is best to transfer the images to a robust password protected computer for analysis, after which the original SD card should be booked into evidence. A fresh SD card should then be installed in the camera.

When images are transmitted to and stored on the GCS computer, all such images should be transferred to portable media, such as a memory stick or SD card. The images should then be deleted from the GCS computer and the memory stick or SD card handled in the same manner as previously described. Agencies with established digital evidence protocols should assimilate sUAS derived images into that existing system. 🍷

**Editor's note: The submission deadline for articles for this issue was prior to the release of Part 107 by the FAA.*

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