

Law Enforcement Tools, Not Toys

Unmanned aerial vehicles are quickly becoming a viable law enforcement tool.

By Gregg H. Weitzman, Santa Barbara (CA) Sheriff's Office

My first model airplane was a string-controlled Cox PT-22 with a gas engine. One person would start the plane, and then the pilot would hang onto the control handle. When the plane was ready for flight, it was thrown into the air and flown in a circle. The flight would last until the airplane ran out of gas or the pilot got dizzy and fell to the ground.

In my later years, I progressed to model rockets with parachutes and even remote controlled airplanes and gliders. I never imagined that there would be a day when cameras would be small enough to become the payload of such remote controlled aircraft. However, that day has come, and a whole new dynamic form of surveillance has emerged. These toys of our childhood have become tools of the airborne law enforcement industry.

Cinematographers used some of the earliest forms of these unmanned aerial vehicles (UAVs). Remote controlled helicopters became one of the most popular choices of movie directors looking for that absolutely incredible, over-the-edge video. Most aviators will recognize these shots because they are just not possible in a real airplane or helicopter.

In 1994, the Department of Defense (DoD) began using one of the most recognized forms of UAV. Nicknamed the Predator, the first version of this UAV was well beyond the days of the simple drone. Early drones were basically large, remote controlled planes, and DoD has used them for the past 40 years. But with the advent of the UAV and unmanned aerial systems (UAS), these aircraft are now becoming serious fighting machines. The Predator was capable of aerial surveillance and launching Hellfire missiles. It did so with a maximum gross weight of 2,250 pounds and an overall length of 27 feet. Yet, its service ceiling was only 25,000 feet, and its cruise speed was a mere 81 mph. So when the Predator's big brother, the Reaper, was put into service, it came with a maximum gross weight of 10,000 pounds and an overall length of 36 feet. Its service ceiling went up to a staggering 50,000 feet while cruising at 250 mph.

The DoD has had great success with the UAS/UAV. Since early 2006, the U.S. military has jointly logged well over 100,000 hours of unmanned aerial time in Iraq alone.

One of the biggest problems for the UAV/UAS program is the ability to inject “smart intelligence” into the brain of the aircraft. This ability allows a UAV/UAS to think for itself. Designers and engineers describe the ability as autonomous flight, and it would mean that a UAS would be able to interpret ground obstructions and other threats. It would also allow for safer landings. Many current operators describe the landing as a controlled crash.

Another goal is sensor fusion, which would allow a UAS to interpret motion planning. Current versions allow UAVs to be completely programmed for an entire flight. With anticipated upgrades, these aircraft would be able to start making mission-critical decisions for themselves.

During times of war, many new products and ideas are put to the ultimate test. In September 2005, the U.S. Customs and Border Protection (CBP) began experimenting with the Predator to monitor the U.S.-Mexico border. Blocks of high altitude airspace were given to the CBP, and UAS flights gradually increased. The Federal Aviation Administration (FAA) quickly began to take notice, but said nothing for a few years, as the CBP operated their UASs as protectors of homeland security. The CBP was also granted a certificate of authorization (COA). But when local law enforcement agencies took an interest in operating UAVs, things changed.

The Los Angeles County Sheriff’s Department (LASD) purchased a small UAV and began experimenting with it in 2006. The department operates one of the largest fleets of helicopters and airplanes in the country, yet they were looking at operating a UAV that was only three feet long. It took some convincing, but soon most people realized that the UAV had some very important applications. It is almost silent, it transmits a picture to ground sources and it can be placed in very critical incidents with no threat to human life. The cost of operating this remote controlled plane is extremely low. LASD was not the only law enforcement agency to experiment with remote controlled aircraft, but they soon found themselves in a very touchy situation with the FAA.

In April of 2006, LASD announced it was considering the use of unmanned, remote controlled airplanes. This release perked the ears of the local FAA office, and soon LASD was faced with the issue of obtaining a COA. Since that time, LASD has not been able to operate their UAV. According to LASD Commander Sid Heal, the unit has been frustrated with the FAA process. They were just getting started with their program when they were

told to stop flying. It became very difficult for them to test their UAV because of the FAA's COA requirement. Heal said they were about to start testing a traffic collision avoidance system, a stabilized camera and a parachute recovery system.

"With the order to stop flying, we were not able to test these new systems," Heal said. So for now, LASD's UAV program is on hold until the FAA can figure out what it will require for an agency to operate or until they grant a COA.

Many of the restrictions that Commander Heal has been up against are outlined in recent "Rules and Regulations" published in the Federal Register on Feb. 13, 2007. This FAA document is titled "Unmanned Aircraft Operations in the National Airspace System" and goes over the FAA's current policy for UAV operations. The document is two pages of small print that essentially states that if you use a remotely controlled aircraft for recreation, then this document and its attached rules do not apply. For recreational use, operators are encouraged to follow Advisory Circular 91-57. But if you use this aircraft for public, civil or commercial purposes, then you must follow the rules as written.

The FAA first published UAS Policy 05-01. This document said that in order to keep people in the air, and people and property on the ground safe, you must apply for a COA for your aircraft. The operator would then have to establish the airworthiness of the UAV/UAS by either proving airworthiness to the FAA, providing a DoD airworthiness statement, or "other approved means." This is for operations as a public aircraft. The operator would also have to provide a pilot and an observer. There are some other requirements for high altitude flights as well. According to their document, the FAA has issued more than 50 COAs in the past two years. However, the FAA failed to define "other approved means" or the requirements for a pilot in command.

In addition to the COA, the operating agency would have to obtain an airworthiness certificate if they wanted to operate their UAV as a civil aircraft. The FAA is only issuing special airworthiness certificates under the "experimental" category for UAV/UASs for those operators that plan to operate them as a civil aircraft. This creates a whole new round of confusion, because under 14 CFR 91.319, there are operating limitations that must be followed with experimental aircraft. One of those restrictions is that aircraft registered under an experimental airworthiness certificate would have to avoid flying over populated areas.

As previously mentioned, the FAA doesn't outline the pilot in command concept for the operation of UAV/UASs. Even further documentation is

needed, because there is a mention of a pilot and an observer and the need for minimum qualifications and currency. But those qualifications are not mentioned in this document, nor does it refer the reader back to the appropriate Federal Aviation Regulations.

ALEA Education Program Manager, Jim DiGiovanna, expressed many of the same concerns outlined here. He agreed that this FAA document appears to be a work in progress with many issues that still need to be resolved. The COA and airworthiness requirements for UAV/UAS aircraft are different than those for surplus military aircraft. Would this mean that operators of surplus military aircraft would now have to somehow create airworthiness certificate for their aircraft? No one knows at this point. DiGiovanna recently attended a UAS Conference in Las Vegas where many of these issues were brought up. He encouraged participants to continue dialog with all affected organizations to create a policy that is safe and fair to all involved. DiGiovanna believes that air support units and UAV Units within a law enforcement agency can function together. They both have important roles; however, something needs to be done to get the policy issues worked out so that everyone is in compliance. It is anticipated that more discussions will take place and more changes to the current policy will follow.

So what is the future of UAV/UASs? We can look forward to engineering and technological breakthroughs that will allow for aerial refueling, collision avoidance and intelligent navigation. There is also a full-size rescue UAV helicopter currently being built that is going to be capable of hoist rescues at altitudes beyond 30,000 feet. These aircraft are useful, but we need to concentrate on working with the FAA to develop a process for integrating these tools into the law enforcement arena. So for now, enjoy an afternoon in the park with your favorite remote controlled airplane, but please don't attempt any rescues.

Editor's Note: Gregg Weitzman is a Sergeant with the Santa Barbara Sheriff's Dept. (CA). He is also the Western Region Director for ALEA and a CFI for both airplanes and helicopters.