

**The Bill Blackwood
Law Enforcement Management Institute of Texas**

Unmanned Aircraft: A Modern Day Must

**A Leadership White Paper
Submitted in Partial Fulfillment
Required for Graduation from the
Leadership Command College**

**By
Melvin Franklin**

**Montgomery County Sheriff's Office
Conroe, Texas
February 2014**

ABSTRACT

Unmanned Aircraft Systems (UAS) is a modern day piece of equipment that can be and will be an effective tool to law enforcement agencies around the country. The mere fact that UAS technology is affordable to purchase, maintain, and operate gives practically any law enforcement agency the ability to start and effectively operate an unmanned aircraft unit that provides many of the same benefits as a manned aircraft unit. The position of the researcher is that an unmanned aircraft system is effective, efficient, and should be used as a modern law enforcement tool. Information used to support the research were aviation internet sites, reports published by the Federal Aviation Administration, and published articles related to unmanned aircraft systems. The conclusion drawn is that there is no comparison between manned aircraft and unmanned aircraft. A UAS for law enforcement purposes is not intended to replace a manned aircraft; however, some of the same benefits will be available by using a UAS versus using a manned aircraft at a much higher purchase and operating cost. The safety and regulations regarding UAS usage is of great concern to not only governmental agencies such as the Federal Aviation Administration (FAA), but also to civil liberty groups such the ACLU. Great effort has been put forth by the FAA to ensure the legal and safe operations of UAS's across the country.

TABLE OF CONTENTS

	Page
Abstract	
Introduction	1
Position	2
Counter Position	6
Conclusion.....	9
References	14

INTRODUCTION

With the technology that currently exists and with the inception and development of unmanned aircraft by military and governmental entities, this technology has flowed over into the civilian market and created a new outlook on law enforcement agencies owning and operating aircraft to help accomplish their agencies mission. As this technology continues to grow and as law enforcement and other governmental agencies throughout the country become educated on the deployment of unmanned aircraft as a public use aircraft, they will become a recognized tool. Public service entities/agencies will need to take a look around them and evaluate their abilities/resources and needs to ensure the agencies are keeping up with the times, not only for citizen and public servant safety, but also for the sake of keeping a proactive lead on the crime and criminals that occupy today's society.

In many areas of the country, there is the potential for vehicle or foot pursuits, crowd evaluation or control problems and the need for narcotic or tactical team surveillance. There are also the potential for emergency management scenes and depending on the areas of the country an agency is geographically located, the great potential of situations such as lost persons and other search and rescue situations exist. A positive and effective way many larger law enforcement agencies throughout the county do this is by utilizing manned aircraft support for things such as surveillance, search and rescue, criminal apprehension and emergency management situations; however, these agencies are small in percentage numbers (Solosky, 2009). Unfortunately, there are many more law enforcement agencies throughout the country

that do not have an air support unit due to the financial burden it would incur to purchase, maintain and operate a manned aircraft (<http://www.fbi.gov/ucr/ucr.htm>).

In order for an agency to deploy a manned aircraft for law enforcement missions, the cost can be significant. Depending on the agencies needs and external factors, such as geographical sea level altitude and average annual weather patterns, will determine the type of aircraft the agency would have to purchase. At a minimum, an agency could purchase a small fixed wing aircraft that is capable of accomplishing all the tasks earlier mention and capable of carrying two to four personnel. On a more extreme end of the spectrum, an agency that would be more fitted for a manned rotor wing aircraft that is capable of hovering over a target would be more costly than the fixed wing. An unmanned aircraft in many situations can do the same things as a manned aircraft. The technology that currently exists regarding unmanned aerial vehicles (UAV) or also known as unmanned aircraft system (UAS), gives the ability to fly a great distance from the station where it is being launched; as well as, the aircraft can video and record real time in both normal view and in infrared (heat seeking). Understanding that an unmanned aircraft can be used in most of the same applications as a manned aircraft and that one could be purchased and operated at a much lower cost than a manned aircraft, an unmanned aircraft is effective, efficient and should be used as a modern law enforcement tool.

POSITION

The continuing advancements in computer, GPS, and aeronautical technology has given private companies the opportunity to get involved in the UAV business and give law enforcement agencies throughout the Unites States, as well as other areas of

the world, the opportunity to benefit from an air/aviation unit. Having the ability for real time video as well as the potential for infrared video/monitoring and GPS that can be programed into the UAV's computer that provides accurate location information at all times gives smaller law enforcement agencies the ability to have the benefit of air support, as does approximately 800 law enforcement agencies throughout the country (Solosky, 2009; <http://www.gps.gov/>). In comparison, there are thousands of law enforcement agencies in the country that do not have any air support (<http://www.fbi.gov/ucr/ucr.htm>).

With the technology that has been dedicated and engineered into the UAV's being utilized by law enforcement and other agencies in the United States, the ability to be transported and launched from a desirable location is one of the things that makes a UAV a very effective tool for law enforcement. The technology also gives the pilot an easy task in programing a flight plan in to the computer by pointing and clicking way points on the computer screen the pilot is looking at. As the UAV's fly, the GPS corrects for variables such as wind and thermals to keep them stable as they fly. While flying a mission, UAV's can be programmed to follow a suspect or a vehicle by using lock on features programed in the computer and video system. If for some unknown reason the UAV ground station computer loses link or communication with the UAV, it can be programed to climb to a higher altitude until a link/communication can be re-established and then continue on its mission. UAV's can also be flown and handed over to another ground station, increasing its capabilities and effectiveness (Paumgarten, 2012).

In June 2011, in a town located outside Lakota, North Dakota, a dispute started between a farmer and a neighbor after the neighbor found his cows had wandered on to

the farmers land. The farmer and his family were believed to be part of an anti-government group called the Sovereign Citizens Movement and when law enforcement officers went on the farmer's property with an arrest warrant, they were greeted by family members who threatened the police with firearms. Law enforcement decided to retreat and later called a SWAT Team and an unmanned aircraft to assist. The unmanned aircraft navigated to the ranch and circled at ten thousand feet using infrared imagery to track the suspects as they moved about the ranch with their guns. As the surveillance continued into the next day, the UAV monitored the then unarmed suspects riding four wheelers on their ranch and after relaying that information to the SWAT team on the ground, they were able to execute an arrest resulting in five felony charges and the seizure of numerous weapons (Paumgarten, 2012).

An example like mentioned above is one of many different scenarios where an unmanned aircraft can be utilized to accomplish the same task as a manned aircraft. Understanding and knowing the type of application an agency would be utilizing a UAV would determine the size of the aircraft and would in turn determine the cost associated with the UAV. UAV's are more portable, cheaper, and safer than manned aircraft (Paumgarten, 2012). In comparison, a manned aircraft, in a rural area where the primary function may be air patrol of a scene or of a crowd congested area or simply patrolling a forest area watching for forest fires, a fixed wing aircraft would be a sufficient type of manned aircraft to use. An aircraft that would meet the specifications needed to perform this task can cost as much as six hundred thousand dollars (\$600.000). In addition to the purchase cost of a fixed wing, operating and maintenance cost must be figured in to the bill and can be in the dollar range of \$210.00 per hour to

operate, not including the cost of the personnel to fly it (Cessna, n.a.). If law enforcement agencies' needs were for a rotor wing manned aircraft, a piece of equipment such as that can have an average cost of one million dollars, not including an operating cost that is much greater than that of a fixed wing aircraft (TransGlobal Aviation, 2012). The operating cost of a rotor wing can easily be in excess of \$1,000.00 (Conklin & de Decker, 2012).

An unmanned aircraft that could be launched and accomplish the same task as the manned fixed wing aircraft can cost anywhere starting from \$25,000 and move up in price from there (Finn & Wright, 2012). A rotor wing UAV having many of the same capabilities as a manned rotor wing aircraft and has video/infrared and GPS programming is the Vanguard Industries ShadowHawk UAS. This UAS can cost up to \$500,000 but offers the same flight characteristics as a manned rotor -wing. The ShadowHawk is completely computer controlled giving the ability to enter a complete flight plan and the option to program no fly areas into the system. Though this UAS is significantly more costly than some of the fixed wing UAV's, the operating cost is that of the hourly rate of the personnel operating it and the price of fuel is generally less than one gallon per hour depending on the aircraft engine and atmospheric conditions (<http://www.vanguarddefense.com/productservices/uavs/>).

As UAV technology has grown in the United States, the Federal Aviation Administration (FAA) is taking great efforts to control the use of UAV's and regulating their access in national and civil airspace. This is one of the things that helps ease doubt and questions regarding the use of UAV's for law enforcement and other security uses. Effective safety regulations is something that the FAA and citizens alike need not

be concerned with because greatly needed oversight and safety standards are being implemented so the UAV industry can safely continue to grow and UAV's can operator in civil airspace. After UAV's were introduced in the United States, Certificate of Airworthiness Certificates (COA) and proposed approaches to limitations are being evaluated; as well as, more structured COA regulations are being implemented (Finn & Wright, 2012). One of the very first regulations or guidelines that was issued by the FAA regarding the use of unmanned aircraft was an Advisory Circular regarding the use of Model Aircraft Operating Standards. The advisory indicated permission to operate at sites distant from populated areas and noise sensitive areas such as parks, schools, hospitals, and churches. The UAV was allowed to fly at 400 feet above the surface or below and if flying within three miles of an airport, the operator had to notify the airport operator of control tower of the operation (Federal Aviation Administration, 2008).

COUNTER POSITION

With the introduction of UAV use in the United States, there have been many successful applications to date, but there is also the perception and mindset that UAV's are being used for the wrong reason and that they are being used to spy on U.S. citizens. Many think that thousands of unmanned aircraft will soon be patrolling the skies of the national airspace and "Big Brother" will be watching every move citizens make, looking in homes and in the backyard of every residence in the country (Lowy, 2012). This mindset first started from some political arenas, but has spilled over to ordinary people feeling this way, creating distrust in the government and great concern; in fact, civil liberty unions report that when they are speaking, unmanned aircraft issues usually become the main topic regarding civil right issues. The belief and concern of

many of the civil right groups regarding the number of unmanned aircraft being flown overhead in the future, is that there could be as many as 30,000, all of which would be armed and used against U.S. Citizens. This number is in addition to military drones being used to spy on farmers and farm land in the United States. There are many civil liberty advocates who believe that government and privately owned UAV's will be used to obtain personal knowledge of citizens without their knowledge (Lowy, 2012).

Recently, a foundation that addresses civil liberty issues and the spying on people by digital means obtained records from the FAA detailing all of the law enforcement agencies and other entities that have been awarded permission to operate unmanned aircraft. Knowing the use of UAV's are on an increase has the American Civil Liberties Union (ACLU) feeling that the U.S. is moving closer to a "surveillance society," and every move will be watched and monitored. Legislation has been introduced to try to prohibit UAV's from obtaining information related to criminal activity unless a warrant has been obtained (Lowy, 2012).

In December 2011, the ACLU indicated that with the advancing technology of UAV's and the fact that they are becoming cheap, compact, portable, and easily launched from remote locations allows for intrusive monitoring and videoing as police go on fishing expeditions and abuse their authority as they spy on citizens taking away their abilities to move about freely (Crump, 2011). Many believe that individual's expression of freedom could be hindered due to a "chilling effect" discouraging participation in assemblies and other individual acts of freedom.

Past history has shown that there have been concerns of Fourth Amendment issues regarding the use of manned aircraft doing surveillance and video surveillance,

which is no different than unmanned aircraft. John Villasenor, an expert on unmanned aircraft information, indicated that he would be surprised if court cases are overturned based on the complaint of fourth amendment issues because he agrees, the use of the UAV is no different than using a manned aircraft. There are two specific Supreme Court cases, *California v. Ciraolo* (1986) and *Florida v. Riley* (1989), that allow law enforcement the right to use public airspace to gather evidence to make an arrest and acknowledge that just because it is a UAV does not make it any different (Koebler, 2012).

As the number of unmanned aircraft increase in the United States, so does the concern for safety of persons and property. Opponents of unmanned aircraft argue that there are no restriction in place that will protect the public from being harmed because without restrictions, there is no sence of responsibility. Opponents also indicate that the FAA has not evaluated the impact and level of risk that could effect U.S. citizens or general and commercial air traffic operating in the vacintaty of unmanned aircraft operations (Weibel, 2005).

In 2008, the FAA created the Aviation Safety Unmanned Program Office (UAPO) that provides guidance in the Unites States to determine if unmanned aircraft systems should be allowed to operate and conduct flight in the national airspace. This system allows air traffic organizations to evaluate applications for COA's submitted to an online website to determine approval of the request. This process was created to simplify the COA process. When applying for the COA, information must be submitted and confirmed that certain things will and will not be done if a COA is approved. Locations of the areas where the UAV will be operating and the intended altitude(s) must be

depicted. Information regarding the pilot and observer as well as the distance the observer will be from the pilot while the UAV is in operation must be explained. If the observer will be out of voice range from the pilot, the form of communication the pilot and observer will use has to be explained and mention of any back up communication in case of the main form of communication is lost. The FAA requires that an observer watches the aircraft at all times regardless of the distance from the pilot or ground station.

If approved, this can often require multiple observers “daisy chaining” so that the UAV stays in constant sight. Explanation of lost link or communication procedures have to be explained in detail to confirm lost communications will not result in an accident causing injury or property damage (Federal Aviation Administration, 2008). The fact that the FAA has implemented procedures to ensure UAV’s are operating safely and within established guidelines makes them a useful law enforcement tool.

CONCLUSION

Many critics argue that the use of unmanned aircraft is a waste of money and cannot be compared to a manned aircraft and cannot be effective. Understanding the fact that there is no comparison between the two is the one thing critics and proponents of unmanned aircraft do have in common. The unmanned aircraft built and utilized for law enforcement was not intended to replace a manned aircraft, but to get some of the same benefits a manned aircraft provides, such as video, infrared and the capability to view a crime or crime scene from a bird’s eye view like the many other law enforcement agencies around the country (Solosky, 2009). Simply having the ability to be mobile and to launch an unmanned aircraft from remote locations, most of the time very close

to a scene of interest, is one of the things that makes UAV's effective. The GPS technology and having the ability to program a GPS waypoint in to the computer system resulting in the aircraft flying direct to it and doing whatever you command it to do, is another. While flying, UAV's are stable in flight as its computer is in constant contact with a ground station computer working in coordination with the GPS on board to compensate for winds and wind shear, ensuring the aircraft maintains altitude and heading (Paumgarten, 2012).

The one example used to show the effectiveness of unmanned aircraft was the June 2011 incident where an unmanned aircraft was used for surveillance purposes of suspects located on a farm. The suspects were armed and threatened law enforcement with weapons. The UAV orbited overhead keeping a watchful eye on the suspect until it was determined it was safe for law enforcement to enter the property and execute the arrest warrants. With the help from the UAV, the suspects were arrested without having to utilize force or deadly force which would most likely not been the scenario without the UAV (Paumgarten, 2012).

Starting an aviation unit is a costly burden to any agency that decides they want to have air support. A manned single engine aircraft that would be suitable for law enforcement can cost as much as \$600,000 and have an operating cost as much as \$210.00 per hour (Cessna, n.a.). A rotor wing aircraft meeting the same qualifications can cost one million dollars and cost \$1,000.00 an hour to operate (Conklin & de Decker, 2012; TransGlobal Aviation, 2012). An agency wanting to start an aviation unit, but not able to afford a traditional aircraft, can introduce an unmanned aircraft cost effectively for a fraction of the cost. Fixed wing UAV's can be purchased at a starting

price of approximately \$25,000 (Finn & Wright, 2012). If a rotor wing UAV better fits an agency's needs, one could be purchased for as much as approximately \$500,000 (<http://www.vanguarddefense.com/products/services/uavs/>). Knowing that there are alternatives to expensive manned aircraft and understanding there are limits, many of the same objectives can be met, and many more agencies throughout the country can benefit from unmanned aircraft.

Due to the fact that there will be an increase in UAV traffic in the near future, guidelines and regulations are a must to ensure safe operations and the successful results of launched missions. Certificate of Airworthiness Authorizations are now required by regulation to operate UAV's and those COA's have become very structured and rigorous to obtain (Finn & Wright, 2012). For a long period of time, the only rules for UAV operations was that of an FAA Circular depicting guidelines for remote control hobby grade aircraft. This kept the UAV from flying in areas of schools, hospitals, and airports. It also limited UAV's from flying above 400 feet above the ground; the same rules that still apply to remote control aircraft. The current COA process gives the requesting entity the ability to tailor the COA to compensate for things such as controlled air space, populated areas, and higher altitudes to avoid structures such as towers and tall buildings. Procedures for emergencies like lost communication or link also have to be explained in the COA process to ensure there is a plan and back up for all situations (Federal Aviation Administration, 2008).

The FAA and other governmental agencies are concerned about the safety of UAV use and is the reason why regulations are being implemented to ensure that safety to persons and property and UAV operators share the same thought process. It is

imperative that law enforcement agencies using UAV's maintain a positive relationship with those governmental agencies so that positive results will come ensuring the safety to all concerned. Divisions such as the Aviation Safety Unmanned Program Office (UAPO) are responsible for making the decisions on whether UAV's are safe to operate and if approval should be granted for operation by way of the COA process. Having the ability to file for the COA by an on line application and providing the FAA with all the rigorous information they require proves that UAV operation is safe and safety is a primary concern (Federal Aviation Administration, 2008).

Opponents of UAV operations say that the technology is being used to spy on U.S. citizens and the use is a gross violation of peoples civil rights. The thought process of many is that thousands of UAV's will be patrolling the skies of the national airspace over the U.S. in the near future, watching every move citizens make (Lowy, 2012). UAV use, other than the manner in which it is flown, is no different than a manned aircraft. Two U.S. Supreme Court cases give law enforcement the right to use public airspace to gather evidence and make an arrest, without warrant. Just because the aircraft is unmanned, there is no difference compared to a manned aircraft (Koebler, 2012).

Understanding the supported information makes one realize that the use of unmanned aircraft are mission effective, cost effective, and regulated to ensure the safety of all involved. The information also supports the fact that there is no civil right violation or intent of civil right violation by utilizing a UAV in a law enforcement capacity, and the regulations being implemented by the FAA suggests that safety is a great

priority. With this, UAV's are effective, efficient, and safe and should be utilized as a modern law enforcement tool.

REFERENCES

California v. Ciralo, 476 U.S. 207 (1986)

Cessna Aircraft Corporation. (n.a.). *Specifications*. Retrieved June 24, 2012,
from <http://www.cessna.com/single-engine/turbo-stationair>

Conklin & de Decker. Helicopter variable cost data. Retrieved from
<http://www.conklindd.com/Page.aspx?cid=1118>

Crump, J. S. (2011, December). *Protecting privacy from ariel surveillance*. Retrieved
from <https://www.aclu.org/files/assets/protectingprivacyfromaerialsurveillance.pdf>

Federal Aviation Administration, Aviation Unmanned Program Office. (2008, March 13).
Interim operational approval guidance 08-01. Retrieved from
http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/systemops/aaim/organizations/uas/coa/faq/media/uas_guidance08-01.pdf

Finn, R. & Wright, D. (2012). Unmanned aircraft systems: Surveillance, ethics and
privacy in civil applications. *Computer Law and Security Review*, 28(2), 184-194.

Florida v. Riley, 488 U.S. 109 (1989)

Koebler, J. (2012, April 13). Police look to drones as a tool. *U.S. News Digital Weekly*.
Retrieved from <http://www.usnews.com/news/articles/2012/08/23/docs-law-enforcement-agencies-plan-to-use-domestic-drones-for-surveillance>

Lowy, J. (2012, June 19). Talk of U.S. drones sparks anxiety. *Law Officer*. Retrieved
from <http://www.lawofficer.com/article/news/talk-us-drones-sparks-anxiety>

Paumgarten, N. (2012, May 14). Here's looking at you. *New Yorker*, 13, 46 - 59.

Solosky, K. (2009, February). Your eye in the sky – keys to success when starting a
law enforcement aviation unit. *Law Officer*, 5, 38 – 43.

TransGlobal Aviation. (2012). *Bell aircraft for sale*. Retrieved June 14, 2012 from
<http://www.transglobalaviation.net>

Weibel, R. E. (2005, June). *Safety considerations for operation and different class
unmanned ariel vehicles in the national airspace system*. Boston, MA:
Massachuettes Institute of Technology.