

⁰⁴ April 2014

(U) Increased popularity of recreational UAVs creates problems for policy and enforcement

(U) Overview

(U//LES) The expansion of Unmanned Aerial Vehicle (UAV) operations for military purposes in the last decade has driven growth in the commercial UAV industry where the casual enthusiast can now purchase a ready-to-fly system for less than \$300. These UAVs can be accessorized for varied purposes such as cinematography, agricultural monitoring, wildlife tracking, site surveillance, and potentially even for kinetic attacks with a firearm or improvised explosive. This Advisory Bulletin addresses an observed increase in UAV use by ordinary citizens, outlining capabilities and implications for the law enforcement community. *The NCRIC has not received any specific or credible UAV threats in our 15-county AOR and presents the following information for situational awareness purposes.*



(U) Key Findings

- UAVs are becoming more popular among ordinary citizens and commercial enterprises.
- Until the FAA establishes its policy to integrate UAVs into the national airspace in 2015/2016, UAV operators will
 continue to fly their devices in a legal "gray area" for law enforcement whereby intent must be evaluated on a caseby-case basis.
- Most instances of UAV activity involve hobbyists and are not necessarily indicators of criminal or terrorist activity.

(U) Policy

(U) The FAA classifies unmanned aircraft^a into three operating categories: Public aircraft, civil aircraft, and model aircraft.¹ A public aircraft is operated by a governmental user such as a federal, state, or local agency.² A civil aircraft refers to an unmanned aerial system operated for any non-governmental purpose including private sector and commercial use.³ Model Aircraft are operated exclusively by hobbyists.⁴

^a (U) This bulletin uses the Federal Aviation Administration (FAA) definition of "unmanned aircraft" to refer to a "device used or intended to be used for flight in the air that has no onboard pilot. This includes all classes of airplanes, helicopters, airships, and translational lift aircraft that have no onboard pilot." For ease of reading, the term "unmanned aircraft" will be used interchangeably with the term UAV.

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(U) Current FAA policy requires a UAV operator to obtain authority for operations under one of three programs. For a UAV operating as public aircraft the authority comes from a Certificate of Waiver or Authorization (COA).⁵ For UAVs operating as civil aircraft, authority is derived from a Special Airworthiness Certificate and covers only research or training operations.⁶ Model Aircraft flights are governed by the Model Aircraft Operations Standards Advisory Circular 91-57.⁷ The FAA targets full integration of UAVs into the National Airspace System by September 30, 2015.⁸

(U) Due to the complexities and narrow criteria required to obtain a Special Airworthiness Certificate for civil operations, an ordinary citizen will most likely operate a UAV under the guidelines outlined in Model Aircraft Operations Standards Advisory Circular 91-57 (AC 91-57). While this document does not place limits on aircraft size, the advisory applies only to recreational and hobby uses. AC 91-57 includes provisions for maintaining line-of-sight communications with the craft, flying below 400 feet, and also prohibits commercial gains from any model aircraft operations.⁹ The standards in AC 91-57 state that operators should select a flight zone that is of sufficient distance from populated areas and that flying a model craft within three miles of an airport requires notification of the airport operator or air traffic controller.¹⁰ It should be noted that AC 91-57 does not carry the weight of law and only encourages voluntary compliance.¹¹

(U//FOUO) The recent disposition of the first case in which the FAA prosecuted a civil operator of a model airplane with a camera attached shows the Administration's weak enforcement authority. In 2011 Raphael Pirker was flying his Rightwing Zephyr model aircraft to take pictures of the University of Virginia Medical Center, a task for which he was paid. The FAA would typically send Pirker a "cease and desist" letter as it usually does to entities operating UAVs for commercial purposes. However in this case, the FAA sought to assess Pirker a civil penalty of \$10,000 for violating Section 91.13(a) of the Federal Aviation Regulations (FAR) which states that "no person may operate an aircraft in a careless or reckless manner so as to endanger the life or property of another."¹² Pirker asserted that he was operating a model aircraft rather than a UAV and filed a Motion to Dismiss the charges against him based on the fact that Federal Aviation Regulations do not have authority over model aircraft flight operations.¹³ On March 6, 2014 a judge from the National Transportation Safety Board –the agency charged with investigating and prosecuting all civil aviation-related incidents– granted Pirker's Motion to Dismiss. The judge found that there does not exist an enforceable FAA rule or FAR that applies to model aircraft or for classifying model aircraft as a UAV.¹⁴ The dismissal of the Pirker case may embolden commercial UAV operators who interpret the ruling to mean that they can fly with impunity.

(U) Capabilities

(U) Out-of-the box UAV systems are freely available for purchase on manufacturer websites or through online retailers. Platforms range in quality from battery-operated toys mounted with cameras to diesel-powered craft capable of handling 20-pound payloads. Fixed-wing and multi-rotor devices can fly pre-programmed routes or via data link with flight times ranging from 5 minutes to 54 hours. The motion stability of multi-rotor systems is particularly attractive for collecting high-quality video. Typical WiFi data link range is line-of-sight or about 1000 feet. Transmitter, receiver, and antenna upgrades on radio controlled models can extend the range up to 3 miles.¹⁵ It should also be noted that most small UAVs run on electric power and do not generate much noise, making them difficult to detect.



(U) AR.Drone by Parrot with camera retails for \$299 on Amazon and is controlled remotely to fly for 12 minutes to an altitude of 165 feet¹⁶ Northern California, Pasional Intelligence: Center



(U) LA100 by Lehmann sells for \$1300, not including camera, and flies 5-minute pre-programmed routes to a ceiling of 300 feet¹⁷

UNCLASSIFIED//LAW ENFORCEMENT SENSITIVE Page 2 of 6 Form # 7903da52-3690-4506-94f9-78f7f0652c8e (U//LES) UAVs have been used in the vicinity of critical infrastructure to gather visual information. The following examples demonstrate that commercially available (sometimes homemade) systems have the capability to conduct surveillance on protected assets.

(U//LES) **USCG Station Golden Gate, CA**: On 15 January 2014, Coast Guard Station Golden Gate reported a UAV flying around their docks at Fort Baker in Sausalito, CA and in the vicinity of the Golden Gate Bridge. The National Park Service (NPS) dispatched a Ranger who made contact with six individuals operating the UAV from within Golden Gate National Recreation Area. The operators controlled the craft with a tablet and claimed affiliation with a start-up company based in San Francisco, CA. Their UAV was equipped with a sophisticated camera system (valued at \$33,000). Review of the camera data revealed no conclusive photography of sensitive Coast Guard or Golden Gate Bridge infrastructure and the camera was returned to the operator.¹⁸ Two of the individuals involved were issued violation notices for operating a remote controlled device in an activity-restricted area of National Park property.¹⁹ A violation notice requires a mandatory appearance in federal court which may result in a fine. This incident shows the complexity involved when law enforcement officers confront UAV operators because once legitimate recreational use has been distinguished from countersurveillance activities, the legal framework for enforcement varies across jurisdictions.

(U) Levi Stadium, Santa Clara, CA: In a YouTube video posted on December 9 2013 an operator used a DJI Phantom 2 Vision Quadcopter with integrated camcorder to conduct an overflight of the new Levi Stadium in Santa Clara, CA.²⁰ The UAV system (equipped with a 14 Mega Pixel camera and 1080p video recording capability) retails for \$1,199 on Amazon. Key capabilities of this platform include a 25-minute battery life and Wi-Fi streaming to an iOS or Android device up to 980 feet away.²¹ Considering that the stadium stands 175 feet tall with lighting banks at 200 feet, the UAV in the video appears to be operating at 250-300 feet.²²

(U//FOUO) **Financial District, San Francisco, CA:** On November 17, 2013 a security officer observed an unidentified subject flying a remote controlled hexacopter near an iconic high-rise building in San Francisco. The hexacopter was equipped with a high-quality video camera that transmitted video footage to a monitoring system held by the subject who was standing next to the building. A security officer questioned the subject about the activity, and the subject stated he wanted video footage of the top of building. The subject and his unidentified female companion left the area after being questioned by the security officer. While photography is a routine activity, taking video footage using a hexacopter is not. The reporting party believed that this activity could be indicative of preoperational surveillance.²³



(U//FOUO) Hexacopter from San Francisco incident²⁴



(U) SceneTap blimp outside of AT&T Park 18 May 2012²⁵

(U//LES) **AT&T Park, San Francisco, CA:** A remote-controlled blimp measuring 12'x6' was observed flying over AT&T Park during a San Francisco Giants baseball game on May 18, 2012. When the blimp flew over the field, Park Operations stopped the game for a short time due to security concerns. Model Aircraft Operations Standards Advisory Circular 91-57 provides the following guideline regarding such operations: "Select an operating site that is of sufficient distance from populated areas. The selected site should be away from noise sensitive areas such as parks, schools, hospitals, churches, etc."²⁶ While 91-57 only encourages compliance, FAA Notice to Airmen (NOTAM) 9/5151 carries the weight of federal law and prohibits all aircraft operations within a three nautical mile radius up to 3000 feet above ground level of

Northern California Regional Intelligence Center

UNCLASSIFIED//LAW ENFORCEMENT SENSITIVE

any stadium hosting an event with a seating capacity of 30,000 or more.²⁷ In this case the FAA considered the vehicle a toy and did not press federal charges against the operator for a violation of 9/5151. Anyone wishing to report a UAV allegedly operating contrary to the longstanding NOTAM 9/5151 should contact the local FAA Flight Standards District Office (FSDO) with a detailed description of the incident.^b

(U) In January 2011 a Dallas, Texas-area model airplane hobbyist accidentally captured still photographs of blood flowing from a meatpacking plant into a tributary of the Trinity River while he was taking photos of the public waterway.²⁸ The images contributed to a Dallas County Health and Human Services investigation of the plant resulting in 12 indictments against the company and its owner for water pollution.²⁹ This incident highlighted the privacy implications of recreational UAV use and the role of state legislation in controlling UAV operations. On September 1, 2013 Texas became one of 9 states to enact a UAV law when it passed the Texas Privacy Act (House Bill 912).³⁰ The Act classifies illegal use of unmanned aircraft to "capture an image of an individual or privately owned real property in this state"³¹ as a Class C misdemeanor punishable by a fine of \$500 and civil penalties of up to \$10,000.³²



(U) Photo from a search warrant affidavit in the investigation of Columbia Packing Co. showing blood flowing into east Oak Cliff Creek in Dallas TX³³

(U) Threat Potential

(U//FOUO) As a result of increasing availability and system sophistication, malicious actors may use UAVs for preoperational surveillance or as weapons.

(U) On September 28, 2011 FBI agents arrested Rezwan Ferdaus for plotting to attack the Pentagon using a UAV.³⁴ Ferdaus had informed undercover agents, whom he believed to be members of al Qaeda, that he planned to obtain a UAV, fill it with explosives, and fly the device into the Pentagon using a built-in GPS system.³⁵ This example demonstrates that existing UAV system capabilities could be used to execute criminal intent.

(U//FOUO) For recreational models, the threat of weaponized UAVs is partially mitigated by payload limitations. Out-ofthe-box 2-pound systems cannot support a significant quantity of explosives. With more expensive mid- and high-end systems there is greater potential for modification as larger models can support payloads of up 20 pounds. This quantity of explosives would not be sufficient to cause significant structural damage to a building, however it could cause injury or loss of life if detonated in a large crowd.³⁶ For this reason, the threat of a weaponized UAV in crowded venues such as sporting events is particularly concerning. In addition to traditional kinetic attacks, UAVs could hypothetically operate as dispersal mechanisms for biological or chemical agents, although such an attack would present additional challenges for a would-be terrorist to overcome.³⁷

(U) Conclusion

Northern California Regional Intelligence Center

^b The FAA FSDO for Del Norte, Humboldt, Mendocino, Sonoma, Marin, San Francisco, Alameda, and Contra Costa counties is Oakland and can be reached at 510-748-0122. The FSDO for San Mateo, Santa Clara, Santa Cruz, Monterey and San Benito is San Jose at 408-291-7681. The FSDO for Lake and Napa counties is Sacramento at 916-422-0272.

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(U//FOUO) The increasing popularity of UAVs by recreational users raises security and privacy concerns that will likely result in more suspicious activity reports and calls-for-service. The Coast Guard Golden Gate Bridge incident highlights the inherent cross-jurisdictional enforcement problems for UAV systems. The Texas meatpacking case shows that infrastructure assets are particularly vulnerable to surveillance by UAV systems because it is sometimes difficult to separate private property from public areas. It should be noted that most instances of UAV activity involve hobbyists and are not necessarily indicators of criminal or terrorist activity.

(U//FOUO) UAVs operating as model aircraft pose an enforcement problem for public safety officers. States have taken the lead in enacting UAV legislation because the FAA has not yet developed a comprehensive system of regulations. At this time the common-sense suggestions outlined in Model Aircraft Advisory Circular 91-57 are not enforceable, they merely suggest that model aircraft not be used around sporting events, large crowds, and airports. Until the FAA establishes its policy to integrate UAVs into the national airspace in 2015, UAV operators will continue to fly their devices in a "gray area" for law enforcement whereby intent must be evaluated on a case-by-case basis.

Report urgent threat information to local Law Enforcement or the FBI-JTFF at (415) 553-7400.

Report suspicious activity to the NCRIC online at http://www.ncric.org.

http://uas.usgs.gov/pdf/uas_guidance08-01.pdf

³ (U) Federal Aviation Administration. "Integration of Civil Unmanned Aircraft Systems (UAS) in the National Airspace System (NAS) Roadmap." (Washington, DC: 2013), 7. <u>http://www.faa.gov/about/initiatives/uas/media/uas_roadmap_2013.pdf p4</u>

⁴ (U) FAA. "Unmanned Aircraft Operations in the National Airspace System," 5.

https://www.faa.gov/aircraft/air_cert/airworthiness_certification/sp_awcert/experiment/sac/

" (U) <u>Ibid.</u>

⁷ (U) FAA. "Unmanned Aircraft Operations in the National Airspace System," 5.

⁸ (U) September 30, 2015 is the "No later than date" for safe integration of civil UAS into the NAS. Required by Title III Section 332(a)(3) of the FAA Modernization and Reform Act of 2012. "Integration of Civil Unmanned Aircraft Systems into National Airspace System" (PL 112-95, Feb 14, 2012), 73. <u>http://www.faa.gov/regulations_policies/reauthorization/media/PLAW-112publ95[1].pdf</u>
 ⁹ (U) FAA. "Unmanned Aircraft Operations in the National Airspace System," 5.

¹⁰ (U) Federal Aviation Administration. "Model Aircraft Operating Standards (Advisory Circular 91-57)," Jun 9, 1981. http://www.faa.gov/documentLibrary/media/Advisory_Circular/91-57.pdf

¹¹ Marshall, Douglas M. "US Aviation Regulatory System," in *Introduction to Unmanned Aircraft Systems*, Barnhart, R.K., et al. eds., (CRC Press: Boca Raton, FL) 2012, 48.

¹² (U) U.S. National Transportation Safety Board Office of Administrative Law Judges, Decisional Order Docket CP-217, 2, Mar 6, 2014, 2. <u>http://www.ntsb.gov/legal/Pirker-CP-217.pdf</u>

¹³ Ibid.

¹⁴ (U) U.S. National Transportation Safety Board Office of Administrative Law Judges, Decisional Order Docket CP-217, 8, Mar 6, 2014, 8. <u>http://www.ntsb.gov/legal/Pirker-CP-217.pdf</u>

¹⁵ (U) Turbo Ace. "Infinity 9 Octocopter Features and Options," 2014.

http://www.turboace.com/infinity 9 octocopter/bundle gimbal.aspx

¹⁶ (U) Verizon Wireless. "Parrot AR.Drone Tech Specs," 2013. <u>http://www.verizonwireless.com/accessories/parrot-ar-drone-2-0/</u>
 ¹⁷ (U) Lehmann Aviation. "LA100," 2014. <u>http://www.lehmannaviation.com/la100.php</u>

¹⁸ (U//LES) COAST GUARD FIR - UNMANNED AERIAL VEHICLE (UAV) OVER FLIGHT OF STATION GOLDEN GATE AND GOLDEN GATE BRIDGE - 066/2014 15 JANUARY 2014.

Northern California Regional Intelligence Center

¹ (U) Federal Aviation Administration. "Unmanned Aircraft Operations in the National Airspace System," Docket No. FAA-2006-25714 (Washington, DC: 2007), 2. <u>http://www.faa.gov/about/initiatives/uas/reg/media/frnotice_uas.pdf</u>

² (U) Federal Aviation Administration, Aviation Safety Unmanned Aircraft Program Office AIR-160. "Interim Operational Approval Guidance 08-01: Unmanned Aircraft Systems Operations in the U.S. National Airspace System," (2008), 3.

⁵ (U) Federal Aviation Administration. "Special Airworthiness Certification: Certification For Civil Operated Unmanned Aircraft Systems (UAS) and Optionally Piloted Aircraft," 2011.

¹⁹ It is a violation of 36 CFR 1.5(f) to operate a remote controlled aerial device in the Fort Baker area of Golden Gate National Recreation Area.
 ²⁰ (U) Youtube. "Levi's Stadium Aerial View Using DJI Phantom Vision 2," Dec 9, 2013.

http://www.youtube.com/watch?v=B0gOwKz 9HE#t=17

²¹ (U) DJI. "Phantom 2 Vision Tech.Spec," 2013. <u>http://www.amazon.com/DJI-Phantom-Quadcopter-Integrated-Camcorder/dp/B00FW78710/ref=cm_cr_pr_product_top</u>

²² (U) City of Santa Clara. "Final Environmental Impact Report 49ers Santa Clara Stadium Project," Nov 2009, 38. http://santaclaraca.gov/ftp/csc/pdf/49er-stadium-FEIR/49ers-feir.pdf.

²³ (U//FOUO) NCRIC PUB FOUO 13-249, Nov 22, 2013.

24 Ibid.

²⁵ (U) Twitter. "@SceneTap blimp outside of AT&T park! #blimp #scenetap," May 18, 2012. pic.twitter.com/dy8w1yJn

²⁶ (U) Federal Aviation Administration. "Model Aircraft Operating Standards (Advisory Circular 91-57)," Jun 9, 1981." <u>http://www.faa.gov/documentLibrary/media/Advisory_Circular/91-57.pdf</u>

²⁷ (U) Federal Aviation Administration. "Notice to Airmen FDC 9/5151," Feb 10, 2009.

http://tfr.faa.gov/save_pages/detail 9 5151.html

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²⁸ (U) Boyle, Rebecca. "Even Hobby Drones Could be Made Illegal in Texas," *Popular Mechanics*, Feb 12, 2013. http://www.popsci.com/technology/article/2013-02/privacy-and-drones

²⁹ (U) Wolke, Alice. "Columbia Packing Co. Indicted for Pigs' Blood in Trinity River," Fox 4 News Dallas, Dec 26, 2012. http://www.myfoxdfw.com/story/20428259/columbia-packing-co-indicted-for-pigs-blood-in-trinity-river#ixzz2GKCH098h

³⁰ (U) The 9 states to enact UAV legislation are Oregon, Idaho, Montana, Texas, Illinois, Tennessee, Florida, North Carolina, and Virginia. Bohm, Allie. "Status of Domestic Drone Legislation in the States," American Civil Liberties Union, Jan 22, 2014. https://www.aclu.org/blog/technology-and-liberty/status-domestic-drone-legislation-states

³¹ (U) Texas House Bill 912, May 26, 2013. http://www.legis.state.tx.us/tlodocs/83R/billtext/pdf/HB00912I.pdf

³² (U) Patty, Laura, "The Sky is the Limit: Regulating the Next Generation of Privacy Invasion," *Golden Gate University Law Review*, Nov 29, 2013. http://ggulawreview.org/2013/11/29/the-sky-is-the-limit-regulating-the-next-generation-of-privacy-invasion-2/

³³ (U) Selk, Avi. "Dallas County Grand Jury Indicts Columbia Packing, executives in Trinity pig-blood dumping case," Dallasnews.com, Dec 26, 2012. <u>http://www.dallasnews.com/news/community-news/dallas/headlines/20121226-slaughterhouse-executives-face-prison-time-in-pig-blood-dumping-charges.ece</u>

 ³⁴ (U) Federal Bureau of Investigation, "Press Release: Man Sentenced in Boston for Plotting Attack on Pentagon and U.S. Capitol and Attempting to Provide Detonation Devices to Terrorists," Nov 1, 2012. <u>http://www.fbi.gov/boston/press-releases/2012/man-</u> <u>sentenced-in-boston-for-plotting-attack-on-pentagon-and-u.s.-capitol-and-attempting-to-provide-detonation-devices-to-terrorists</u>
 ³⁵ (U) <u>lbid.</u>

³⁶ (U) Cruickshank, Paul and Tim Lister. "Analysis: Model Planes as Weapons of Terror," CNN Security Clearance Blog, Sept 29, 2011. http://security.blogs.cnn.com/2011/09/29/analysis-model-planes-as-weapons-of-terror/

³⁷ (U) Condron, Stephanie and Christopher Leake. "Poison Drones Carrying Biological Weapon are New Olympic Threat Warns Colonel in Charge of Keeping London Calm," UK Daily Main Online, May 5, 2012. <u>http://www.dailymail.co.uk/news/article-</u> 2140173/Poison-drones-new-Olympic-threat-warns-Colonel-charge-keeping-London-calm.html#ixzz1u450JnEV