VIRGINIA'S FIRST USE OF UAS:

Technology and Searchers Come Together For Common Cause

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In the first week in October 2014, I was able to witness the use of an unmanned aircraft system (UAS) in the exhaustive search effort by law enforcement and volunteers for the University of Virginia student Hannah Graham, who disappeared from Downtown Charlottesville. The effort marked the first time law enforcement agencies had used a UAS with FAA approval in Virginia history.

Authorities were offering a $100,000 reward for information leading to the safe return of the 18-year-old, a second-year student at the university. "More than 3,000 tips to Graham's possible whereabouts have poured in," Carter Johnson, an Albemarle County Police spokeswoman, said at the time.

The process began in the last week of September 2014 with the lead search agency, the Albemarle County Police Department, accepting assistance from the Mid-Atlantic Aviation Partnership's Aeryon SkyRanger UAS, equipped with recordable stabilized, simultaneously streaming dual electro-optical color and infrared high resolution video cameras. Virginia Tech's unmanned aircraft systems test site, one of only six federally authorized programs in the nation, was declared fully operational by the Federal Aviation Administration just a month before, in August 2014. More than 100 industry partners, along with academic partners Rutgers University and the University of Maryland, are part of the Mid-Atlantic Aviation Partnership.

John Coggin, chief engineer for the group, arrived the morning of Oct. 1 with his team and a certificate of authorization to conduct search operations within the National Airspace. "It's our hope this will give us a perspective you can't get from the ground, allow us to cover more area, and hopefully bring this to conclusion sooner," Coggin said during a brief press conference.

Police were hopeful the UAS would allow them to cover new ground in the search for Graham. Several target areas were difficult to search from the air or ground due to wires, towers, ravines and heavy tree canopy. It was in these areas that the UAS excelled in complementing the search effort due to its unique capabilities from the ground to the FAA-approved 500-foot ceiling.

"The UAS is invaluable for searching these areas as effectively as we can," said Colonel Steve Sellers of the Albemarle County Police Department.

Sellers had the honor of serving on a committee which was tasked by the Virginia legislature to develop Virginia's Model Policy on the use of UAS. The committee, hosted by the Virginia Department of Criminal Justice Services and the Office of the Attorney General, developed UAS guidelines for Virginia law enforcement agencies. One of the first recommendations in the Model Policy is the community engagement process. On May 19, 2014, the Albemarle County Police Department began the community engagement process and sponsored a community forum on UAS.

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Citizen participants, comprised of members of Albemarle County's Crime Prevention Council, participated in the discussion of the pros and cons of UAS use, saw a demonstration and reviewed case studies. While many were leery of the technology at the beginning of the forum, virtually all accepted the technology at the conclusion of the forum, as long as the Model Policy was followed.

When UAS were brought in to assist in the search for Graham, Mark Eggeman of the Virginia Department of Emergency Management said, "This is probably one of the greatest search efforts the commonwealth has ever seen."

Searching With the UAS

At the start of the search, Sellers informed citizens the UAS would only be deployed over property after obtaining permission from landowners.

"There is some severe terrain, declines and inclines, within our search patterns that will prove difficult for helicopters to get into and very difficult for ground crews to get into, even with ATVs, along with tree cover that we can't look underneath unless we bring this UAS into focus down below the tree cover," Sellers said. "It can help direct our grounds troops to specific locations to recover anything that needs to be recovered."

I deployed with Coggin and his UAS team pilots J.P. Stewart and Chris Morrell over the next few days. Officers were assigned to accompany us to provide their knowledge of the areas to be searched, view the critical footage streamed directly to their laptops

from the UAS and provide security around the launch and recovery area.

Upon arrival at the search sites, the team would immediately survey the area, find the optimal launch and operations zones (normally an elevated spot to provide the best line of site to the UAS) and begin clearing brush or any obstructions, if needed. Once the site was ready, unpacking and setting up all necessary equipment and communications commenced. A myriad of official forms pertaining to conditions, entities to be contacted, including the Charlottesville airport air traffic control, checklists and well thought out safety briefings to all at the site were performed prior to each launch.

All launches and recoveries were uneventful. The quiet hum of the launched quad-propelled system soon vanished as the height and distance from us increased. The UAS proved extremely valuable for scouring areas that were not readily accessible or able to be seen by ground or helicopter searcher's eyes. Video was streamed to the officers' laptops, and any area of interest was able to be easily reconnoitered by the team. When needed, Coggin directed the UAS pilot to lower the airborne asset in increments for closer looks at areas of interest, even snapping digitally zoomed shots detailing the area in question for later review. Any questionable areas were investigated by the officers prior to continuing to the next site. The footage was also critiqued by other search personnel and officials upon return to the command post at the completion of the day's missions.

Policy and Public Mindset

While the use of UAS, or drones, has been quite controversial, engineers, search and police officials and many in the community have expressed hope that Virginia's UAS use in the Hannah Graham search effort will show there are positive uses for the technology.

Legal limits on unmanned aircraft use by state and local law enforcements were instituted by the Virginia state legislature in February 2013, earning the support of civil liberties proponents and marking a historic first across the nation. Sellers was a member of the State of Virginia's Department of Criminal Justice Services committee that drafted the protocols for the use of UAS by law enforcement agencies.

The UAS deployment in this search, while legal, highlights an ongoing political debate at the federal, state and local level about whether the aerial technology violates civil liberties. "Drones will spy on us without our permission in violation of our constitutional rights under the Fourth Amendment," said David Swanson, an activist who brought an anti-drone resolution to the Charlottesville City Council in February 2012.

Brendan Schulman, who represents UAS operators as special counsel at Kramer Levin Naftalis & Frankel LLP, pointed out that privacy concerns are often overblown given state laws which prohibit invasions of privacy. Instead, he said, UAS opponents should consider their financial and safety benefits.

"There is absolutely no question that using a battery powered small drone is much more cost effective than a manned helicopter," he said. "In some circumstances, unmanned aircraft can replace as many as 100 ground-based volunteers."

Even civil liberties group The Rutherford Institute agrees. "The Rutherford Institute has long recognized that there are beneficial uses for drones, such as tracking wildfires or locating missing persons," institute founder John Whitehead said. "We are all concerned about what has happened to Hannah Graham, and if using aerial drones can find her or at least provide some leads to law enforcement, all the better."

And the city of Charlottesville, which eventually published legislation against UAS use, along with taking a vote to outlaw the use of

UAS beyond the restrictions of the state moratorium, found that assistance from such an aircraft was welcome and useful in the search for Graham.

"On Oct. 2, while the search for Hannah Graham was in full motion in Albemarle County, the opportunity to use this new technology took root," Sellers said. "Thanks to strong community support, the use of this technology for the Hannah Graham search effort was easily accepted in the Charlottesville community. This will no doubt help pave the way for similar uses by Virginia law enforcement and by the community that I serve."

The Good, the Bad and the Good of It All

On Oct. 18, 2014, human remains were discovered on an abandoned farm 10 miles from where Graham was last seen. Six days later, the Office of the Chief Medical Examiner confirmed the remains were Graham, thus ending the largest missing person search in Virginia's history.

On Nov. 18, the Medical Examiner's report concluded Graham was murdered. Police charged 32-year-old Jesse Matthew with abduction and intent to defile or sexually assault. He's now being held in a Charlottesville jail after being apprehended on Sept. 24 near the U.S.-Mexico border on a beach in Galveston, TX, with a passport on hand in a suspected attempt to flee the country and prosecution.

Virginia State Police soon thereafter issued a statement confirming that a "new forensic link" to Matthew provided a significant break in the case of missing 20-year-old Morgan Harrington, a Virginia Tech student from Roanoke who was abducted and killed after leaving a concert in Charlottesville in 2009. Harrington was found dead a few months later, close to where Graham's remains were discovered. Fairfax County indicted Matthew with yet another attack on a woman in an attempted capital murder and abduction relating to a 2005 sexual assault. According to the indictment, DNA links Matthew to the Fairfax attack, and a witness is willing to testify against him. Matthew has been investigated for sexual assaults at two universities in the past.

"I want to thank everyone who gave up their days, their nights and their weekends", Charlottesville Police Chief Tim Longo said at a Nov. 14 press conference. "I want to thank all of those people because today would not have been possible without their prayers, their encouragement and their help."