



## UAS and SmallSat Weekly News

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23Mar19

### China Develops New Hydrogen Fuel Battery Powered UAV The LQ-H March 20, 2019 News



The China-developed new energy battery-powered demonstration unmanned aerial vehicle, known as LQ-H, has conducted a **successful maiden flight**, according to its developer Wednesday.

Powered by a hydrogen fuel battery, LQ-H had a smooth flight with all systems in good condition. And its battery power system has been fully validated, COMAC said. With a wingspan of **6 meters**, LQ-H uses a hydrogen fuel cell for its main power and a lithium battery as supplementary power.

The aircraft includes four configurations, which have fixed and retractable landing gears and three empennage types. The **endurance** of the LQ-H aircraft is expected to reach **24 hours**. It was jointly developed by a research team from subsidiaries of COMAC and State Power Corporation Limited, generating professional and technical resources from a domestic university and several companies. <https://uasweekly.com/2019/03/20/china-develops-new-hydrogen-fuel-battery-powered-uav-the-lq-h/>

### Silent Falcon UAS Technologies Provides Overwatch During the 2019 Port of Spain Carnival March 19, 2019 News



The Silent Falcon™, a **solar electric**, fixed wing, long endurance, long range Unmanned Aircraft System, was selected by the Trinidad and Tobago Police Service to assist with policing strategies in maintaining safety and security during the Port of Spain Carnival celebration, one of the largest Carnival celebrations in the world.

It was used for security operations during the Carnival, providing continuous information and city-wide situational awareness to the operational command center, giving visibility and access to otherwise hard to capture situations.

The platform has been used in various Intelligence, Surveillance, Reconnaissance, Search and Rescue and long-range border patrol missions across the globe including assisting the US



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Department of Interior in wildfire-fighting operations. Its long-range, long-endurance attributes, as well as its portability and very small operational footprint, proved to be key factors contributing to the success of these missions. <https://uasweekly.com/2019/03/19/silent-falcon-uas-technologies-provides-overwatch-during-the-2019-port-of-spain-carnival/>

### The Talon Amphibious Waterproof UAS Solves Mapping and Inspection in Marine Areas

March 19, 2019 Mapping and Surveying



The Aeromapper Talon Amphibious is the **only** truly affordable fixed wing UAV system that can be used for inspection and mapping in marine environments. It delivers high resolution georeferenced imagery as well as video feed from up to 30 kms from the operators. After completing its mission the UAV later returns and lands on the water, adequately serving **maritime Beyond Visual Line of Sight** operations.

By design, the UAV can stay indefinitely afloat on the water, and even sustain full immersion without any damage or water intrusion, even in salt water. To reach this level of dependability engineers spent more than a year of lab work and field testing, experimenting with different materials, compounds, techniques and components to ensure a high level of reliability. The base model is the well-known Aeromapper Talon, which has been the flagship for the company since 2014.

As of this writing, a couple of Amphibious Talon units have been successfully operating during a 4 week expedition on an undisclosed remote atoll in Belize, as part of a series of very important efforts for conservation & ecology and enforcement and control of illegal fishing activities over protected areas. The type of terrain offers little or no land to operate from so only truly amphibious drones are usable. They have been launched from both beaches and small boats and landed **autonomously** on the water. <https://uasweekly.com/2019/03/19/the-aeromapper-talon-amphibious-waterproof-uas-solves-mapping-and-inspection-in-marine-areas/>

### Drone paid for itself “10 to 20 times over” on Indiana farm

Haye Kesteloo Mar. 22nd 2019



This is an interesting article about how a drone paid for itself “10 to 20 times over” on an Indiana farm. The article lists the various ways in which farmers can benefit from using drones, various models and





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- Nearly 1,350 of the platforms analyzed can assist in search and rescue operations after natural disasters. These platforms have greater than average speed and endurance capabilities to help improve the success of their searches for survivors.

“The development of UAS platforms is crucial, but the huge commercial value lies in their integration with other advanced technologies,” added Sig Sørensen, Senior Specialist at Danish Technological Institute. “A camera is still the most common piece of equipment and is used by photographers and others to record films and take photos. However, it is **integration** with smart technologies, such as sensors, connection to the internet, use of artificial intelligence and managing tools that can create serious **value**.” <https://uasweekly.com/2019/03/21/new-report-demonstrates-exponential-growth-of-global-uas-industry/>

**24Mar19**

### **DBUS2 and VIO: A First Step toward Autonomous Flight** Press 21 March 2019



software.

Today there is an exciting new technology for drone navigation, one that looks toward the ground, not the sky: visual inertial odometry (VIO). It's the first step on the road toward autonomous flight. And it's here now, in the DBUS2. The building blocks for the system are a single 160° camera, inertial motion sensors and a lot of sophisticated

VIO systems use a camera to take an image of what it sees ahead and below. For selected frames, image processing software builds a point cloud around the edges of each meaningful shape in the frame, marking where it is in the frame. At the same time, VIO uses the drone's inertial motion unit to track its movement in space. These sensors know just where the drone is relative to itself and its travel millisecond to millisecond.

The system then processes another image. Now we have two images, with the objects in each frame grouped together relative to each other but shifted left or right, up or down because of the different camera angle given the drone has moved. VIO algorithms use the elapsed time between two images, the differences in the drone's position relative to itself and its travel, and the differences between how the group of objects in the two images has shifted, to figure out where the drone is in relation to its environment. It's a lot of math that keeps the DBUS2 remarkably on course: less than 5% drift over a 300 m (984 ft.) flight path.

Along with collision avoidance (via VIO, LIDAR, sonar and/or radar) and data from magnetic sensors and radio navigation, this is a formidable suite of smarts to enable drones to fly on their



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own, whether it's delivering a package, saving a life or inspecting a bridge.

[https://www.suasnews.com/2019/03/dbus2-and-vio-a-first-step-toward-autonomous-flight/?utm\\_source=DroneNewsDailyEmailMore&mc\\_cid=b5cd587e55&mc\\_eid=206e234265](https://www.suasnews.com/2019/03/dbus2-and-vio-a-first-step-toward-autonomous-flight/?utm_source=DroneNewsDailyEmailMore&mc_cid=b5cd587e55&mc_eid=206e234265)

25Mar19

### Drone Sighting Prompted 30-Minute Air Traffic Stoppage at Frankfurt Airport

Reuters March 22, 2019

FRANKFURT — A spokeswoman for Germany's state-owned DFS air traffic controller said federal police searched the air space with helicopters before deciding to reopen it after 30 minutes.

A federal police spokesman confirmed that a drone sighting had been reported, but the police had so far been unable to confirm there was a drone. No suspects had been identified and the investigation was continuing, he said.

Thilo Vogt, a senior official with DFS, last month said drone sightings reported by pilots nearly **doubled to 158 in Germany in 2018**.

<https://www.nytimes.com/reuters/2019/03/22/world/europe/22reuters-germany-drones-fraport-airport.html>

### Rolls-Royce successfully tests hybrid version of M250 gas turbine NEWS CARLY

HACON MARCH 25, 2019



The M250 gas turbine engine has powered more than 170 varieties of fixed-wing military, civilian aircraft and helicopters since its initial development. The tests are part of one of the sectors' most comprehensive hybrid aerospace turbine engine development and integration programs and pave the way for experimental flights on aircraft in 2021.

The M250 hybrid is planned to be used as a propulsion plant with power ranging from 500kW to 1MW and has the potential to transform aviation power. The system will be used across a range of transport platforms to enable **distributed electric propulsion**, including EVTOLs, general aviation aircraft and hybrid helicopters.

This would support the Rolls-Royce EVTOL concept which was unveiled during the Farnborough Air Show in the UK last year as well as meeting many other customers' requirements.

<https://www.commercialdroneprofessional.com/rolls-royce-successfully-tests-hybrid-version-of-m250-gas->



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[turbine/?utm\\_source=Email+Campaign&utm\\_medium=email&utm\\_campaign=45819-296337-Commercial+Drone+Professional+DNA+++2019-03-25](https://www.axcelinnovation.com/news/turbine/?utm_source=Email+Campaign&utm_medium=email&utm_campaign=45819-296337-Commercial+Drone+Professional+DNA+++2019-03-25)

### Here Are the Winners of SkyPixel's 2018 Aerial Storytelling Contest Malek

Murison March 22, 2019

Aerial photography platform SkyPixel has announced the winners of its 2018 Aerial Storytelling Contest. The competition was run with help from DJI and attracted more **than 30,000 submissions from 141 countries**.

These contests always produce an eclectic mix of aerial creativity, pitting enthusiasts against professionals and consumer gear against top-tier equipment.



The grand prize winner in the Video Category was Ain Raadik, who [shared](#) a collection of adventures from his travels across New Zealand, Japan and Australia. You can watch the full video by clicking on the image

The grand prize winner in the Photo Category was Deryk Baumgartner. He used a Mavic Pro to capture a monastery rising out of fog on Mont Saint Michel in northern France.



"I was sitting on a rock fighting with stubborn wind and thick rain for the whole morning. The sun came up when I was just about to stand up and go home," Baumgartner said.

Aside from the Grand Prize Winners, there were prizes across the categories of travel, sports, urban life, nature and creativity categories. From football match on Lofoten islands to morning prayer in Bagan to the dazzling traffic in Bangkok, the winning submissions captured amazing stories that took place in different parts of the globe. You can view them [here](#).

The 2018 contest was the first time SkyPixel has combined aerial photography and videos in a single event. <https://dronelife.com/2019/03/22/skypixel-announces-winners-2018-aerial-storytelling-contest/>



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**Drones Are Doing More In U.S. Than You May Know, As These 3 Companies Show** Mar 18, 2019  
Colin Snow



*Attendees take pictures of the Scientific Cal Ag Gen 6 prototype drone during the World Agriculture Expo in Tulare, California, U.S., on Wednesday, Feb. 13, 2019*

Five years ago, the pundits predicted that by now we would be seeing tens of thousands of drones buzzing over our heads delivering everything from pizzas and burritos to the latest “must-have” item from Amazon. So what happened? Commercial drones fly in remote areas or over private property every day by the thousands. They’re performing work on farms, powerlines, construction sites, cell towers, and oil pads, especially in the U.S. where there are more than **118,000 FAA-certified remote pilots**. Compare that to the U.K., where there are just under 5,000.

**PrecisionHawk** Founded in 2010 and headquartered in Raleigh, N.C., [PrecisionHawk](#) was one of the first vendors to offer a drone aircraft with advanced sensors, software, analytics and contracted services for inspecting things like oil well pads and utility lines and more. With over \$107 million in investment and more than 180 employees, the company has some large customers, including ExxonMobil, John Deere, Monsanto and Verizon. They offer services in more than **150 countries** and have a network of **15,000 pilots**.

**DroneDeploy** San Francisco-based [DroneDeploy](#) provides software that controls drone flight plans and workflows as well as processes the images they collect. They have more than **4,000** global **customers** mapping and assessing everything from construction progress, to disaster recovery, to agricultural crop vigor. Having raised \$56M in funding, DroneDeploy started by selling software directly to pilots and later added selling through the channel that supplies mid-size companies and then added direct sales to enterprises and resellers.

**SkySkopes** This last company provides drone services.. Based in Grand Forks, N.D., SkySkopes started in 2014 and has grown from a small startup with four part-time employees to over 18 full-time employees and four offices across the upper Midwest. It has refined its focus to providing aerial services for the **energy industry** and now has operations in California, Texas, Minnesota, Florida, and Europe.

Together, these three companies **encapsulate** the present state of the growing industrial use of drones. <https://www.forbes.com/sites/colinsnow/2019/03/18/three-companies-illustrating-what-you-may-not-know-about-drones/#526f28179fb4>





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### OSU receives first FAA approval for drone swarm operations in national airspace

March 25, 2019 Philip Butterworth-Hayes UAS traffic management news



Oklahoma State University reports its Unmanned Systems Research Institute (USRI) has received its certificate of authorization from the Federal Aviation Administration to permit flights of a fixed wing aircraft swarm within national airspace, making it the **first** organization in the country to receive this authorization.

"This flight authorization will permit a single pilot, along with visual observers for safety considerations, to operate a swarm of up to **20 fixed wing aircraft**. The unique configuration developed by OSU researchers creates a "swarm of swarms" where groups of unmanned aircraft fly within smaller flocks as part of a larger swarm, communicating with a local group leader which then coordinates flights with the overall swarm formation."

"This research into swarming unmanned aircraft will advance unmanned aircraft capabilities into safe operation of autonomous vehicles within the national airspace and will find direct application into ongoing OSU **research** in weather, environmental and infrastructure monitoring, agriculture, security, and airspace operations."

"**Swarms are the future of autonomous flight**," said Jamey Jacob, professor of mechanical and aerospace engineering and director of the Unmanned Systems Research Institute at OSU. "This unique approval takes us one step closer to demonstrating for the first time the safe and efficient autonomous flight that will be common place in years to come."

<https://www.unmannedairspace.info/uncategorized/osa-receives-first-faa-approval-for-drone-swarm-operations-in-national-airspace/>

### Landmark Gulf of Finland complex UTM trials to start soon

March 25, 2019 Philip Butterworth-Hayes UAS traffic management news



The Gulf of Finland U-space demonstration project members have announced more details of the **ambitious** trials they will run in the coming months. Funded by the SESAR Joint Undertaking, the demonstration, taking in Estonia and Finland, will showcase how U-space can serve **both** unmanned and manned aviation.

"The demonstration brings together a broad consortium with **19 members**, including three world-leading UTM (Unmanned Traffic Management) technology vendors, two air navigation services providers as well as ATM experience in developing interoperability and data-sharing



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solutions aligned with SESAR's overall U-space architecture. A pre-operational authority SWIM-based Flight Information Management System (FIMS) integrates existing commercial off-the-shelf UTM components.

"Seven drone operational scenarios, including both manned and unmanned aircraft in shared airspace, demonstrate many of the most attractive use cases, relying on U-space services to be safe as well as cost-effective with the aim to accelerate the realization of a shared U-space in Europe, starting with low-level airspace. "The seven trials include ten drone operators in addition to manned aircraft: International parcel delivery between Helsinki and Tallinn, dense urban drone fleet operations in Helsinki with Police intervention and also in Tallinn in controlled airspace, 100km+ beyond-visual-line-of-sight multisensory inspection flights in forestry and utility inspection, co-operation with general aviation and recreational users at uncontrolled airfields, maritime search-and-rescue with drones and helicopters, and an electrical vertical take-off and landing Volocopter Air Taxi flight from Helsinki-Vantaa airport to Helsinki.

<https://www.unmannedairspace.info/latest-news-and-information/landmark-gulf-of-finland-complex-utm-trials-to-start-soon/>

**26Mar19**

### **Marines increase ways to detect and kill air threats, from hobby drones to cruise missiles** Todd South



With the GBAD, Marines can detect and launch the missiles from a variety of vehicles, from a Mine Resistant Ambush Protected All-Terrain Vehicle or M-ATV or smaller units can divide the equipment between two small off road vehicles like the MRZR for an even lighter footprint.

The first counter-drone iteration coming in 2020 for the Joint Light Tactical Vehicle will soon be followed by an increment in 2021 that will extend GBAD ranges and incorporate both kinetic (think missiles) and non-kinetic (think jammers and lasers). The Corps spent \$176 million in 2018 acquiring the GBAD and plans to spend nearly another **\$1 billion** through 2024 buying the systems.

The GBAD can operate standalone, but by 2021 the Corps hopes to tie into the G/ATOR, an advanced radar system that replaces five systems that do everything from air defense to air traffic control to target acquisition and tracking. They also want it to work with the Command Aviation Command and Control System, which helps all of the radar systems talk with each



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other and with tactical operations and command centers for a full-range, shareable operating picture. <https://www.marinecorpstimes.com/news/your-marine-corps/2019/03/25/marines-will-field-counter-drone-missiles-for-jltv-and-a-single-radar-that-replaces-five-others/>

### Drone ID and Tracking Technology Selected for UTM Trials 26 Mar 2019 Mike Rees



[RelmaTech](#), a developer of spatial tracking solutions, has announced that it has become a member of both the State of Nevada team selected by NASA to conduct their Unmanned Aircraft Systems Traffic Management (UTM) Technical Capability Level (TCL) 4 program and the State of Nevada team selected by the FAA to conduct the UTM Pilot Program (UPP).

The FAA-designated Nevada UAS Test Site was the only site selected to execute NASA UTM TCL4 and one of three sites selected for the FAA UPP. Both selections were the result of intensely competitive processes with six other states. All of the UAS to be flown in the Nevada test scenarios will be fitted with RelmaTech's Secure Integrated Airspace Management (SIAM) technology.

The TCL4 program, which involves UAS flying in high-density urban areas, will be conducted over several months in downtown Reno, Nevada. It will be the first time in U.S. aviation history that such flights will be performed in a metropolitan area under beyond-visual-line-of-sight conditions. The UPP was established for identifying the initial set of industry and FAA capabilities required to support UTM operations and safely integrate drones into the National Airspace System. [https://www.unmannedsystemstechnology.com/2019/03/drone-id-and-tracking-technology-selected-for-utm-trials/?utm\\_source=Unmanned+Systems+Technology+Newsletter&utm\\_campaign=5d0cceb7a3-eBrief\\_2019\\_Mar\\_26&utm\\_medium=email&utm\\_term=0\\_6fc3c01e8d-5d0cceb7a3-111778317](https://www.unmannedsystemstechnology.com/2019/03/drone-id-and-tracking-technology-selected-for-utm-trials/?utm_source=Unmanned+Systems+Technology+Newsletter&utm_campaign=5d0cceb7a3-eBrief_2019_Mar_26&utm_medium=email&utm_term=0_6fc3c01e8d-5d0cceb7a3-111778317)

### Heavy-Lift VTOL Crop-Spraying UAV to be Developed 25 Mar 2019 Mike Rees



[ADAMA Ltd.](#), a global crop protection company, has announced that it has partnered with aerospace company [Tactical Robotics Ltd.](#) to perform a joint feasibility study for a high-payload unmanned aerial vehicle for high-capacity aerial agricultural spraying.

Tactical Robotics has developed the Cormorant, a multi-role, compact, high payload, unmanned Vertical-Take-Off-and-Landing aircraft with unique capabilities. The Cormorant can carry an



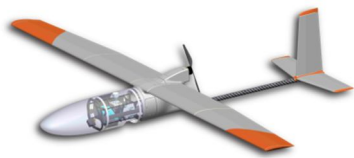
## UAS and SmallSat Weekly News

effective **payload of more than 500 KG**, it does not require an airstrip and can be transported by truck.

With a relatively low acoustic signature and **24/7 flying capabilities**, it will significantly increase the available window for application. Its ability to adjust flight height and speed according to the mission in combination with unique aerodynamic properties enables better canopy penetration, drift reduction and variable rate application capabilities.

[https://www.unmannedsystemstechnology.com/2019/03/heavy-lift-vtol-crop-spraying-uav-to-be-developed/?utm\\_source=Unmanned+Systems+Technology+Newsletter&utm\\_campaign=5d0cceb7a3-eBrief\\_2019\\_Mar\\_26&utm\\_medium=email&utm\\_term=0\\_6fc3c01e8d-5d0cceb7a3-111778317](https://www.unmannedsystemstechnology.com/2019/03/heavy-lift-vtol-crop-spraying-uav-to-be-developed/?utm_source=Unmanned+Systems+Technology+Newsletter&utm_campaign=5d0cceb7a3-eBrief_2019_Mar_26&utm_medium=email&utm_term=0_6fc3c01e8d-5d0cceb7a3-111778317)

### **BST Tests Autonomous Navigation Sensors on Fixed-Wing UAV** 21 Mar 2019 Mike Rees



[Black Swift Technologies](#) (BST) has announced that it has completed the first phase of a **NASA-funded** project to demonstrate the effectiveness of fusing a host of onboard sensors to develop a terrain-following fixed-wing unmanned aircraft system using BST's Black Swift S2 UAV.

BST's understanding and integration of artificial intelligence (AI) and machine learning can help serve as a catalyst for accelerating UAS growth and adoption, industry-wide. Through autonomous, active navigation around obstacles and over rugged terrain by a fixed-wing UAS,

Fixed-wing aircraft low altitude sensing is not without its challenges. Avoiding obstacles such as trees and towers along with terrain variations that can exceed the climb capabilities of the aircraft are some of the inhibitors to their widespread use for scientific and commercial data gathering operations.

BST's solution **fuses machine vision technologies with sensors**, including lidar and radar, into a modular subsystem enabling a fixed-wing UAS to operate safely in a variety of theaters and weather conditions. [https://www.unmannedsystemstechnology.com/2019/03/autonomous-active-navigation-technology-for-uas-under-development/?utm\\_source=Unmanned+Systems+Technology+Newsletter&utm\\_campaign=5d0cceb7a3-eBrief\\_2019\\_Mar\\_26&utm\\_medium=email&utm\\_term=0\\_6fc3c01e8d-5d0cceb7a3-111778317](https://www.unmannedsystemstechnology.com/2019/03/autonomous-active-navigation-technology-for-uas-under-development/?utm_source=Unmanned+Systems+Technology+Newsletter&utm_campaign=5d0cceb7a3-eBrief_2019_Mar_26&utm_medium=email&utm_term=0_6fc3c01e8d-5d0cceb7a3-111778317)



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### Singapore Company Launches One-Stop-Shopping Drone Service Center Jason

Reagan March 25, 2019



Singaporean company Drone Solution Services will soon be offering a new altitude of support for UAV operators with the launch of the Centre of Drone Excellence.

“The Centre — staffed with engineers from a myriad of drone related disciplines including mechanical, electrical, mechatronics, AI, acoustics/sonar and robotics engineering — represents the local interests of international companies having advanced aerial, undersea and terrestrial based drone technologies and associated products; providing them with marketing, sales, technical presence and engineering support in greater Asia.”

The Centre’s staff will provide product and technical presentations, lead demos and conduct product training and support. Members will also receive legal and government-relations services via the Centre.

The Centre also provides:

- Full administrative infrastructure and support staffing including office space, meeting/conference/demo and board rooms;
- Member trade fair coordination — infrastructure and staffing as and where necessary;
- **Multi-lingual staff** with Mandarin, Cantonese, Japanese, Bahasa Melayu, Bahasa Indonesia, Korean, Thai, Burmese, French, Italian, German, Dutch and English fluency.

<https://dronelife.com/2019/03/25/singapore-company-launches-one-stop-shopping-drone-service-center/>

### PRECISIONHAWK USES DRONE TECHNOLOGY TO HUNT FOR BURIED TREASURE IN THE PHILIPPINES AUVSI NEWS MAR 26, 2019



Buried treasure is often the stuff of legend, but that didn’t stop PrecisionHawk from recently traveling more than 7,000 miles to hunt for buried treasure in the Philippines left by the Japanese during World War II. Working alongside the History Channel on a show called [Lost Gold of World War II](#), a production company called Ample Entertainment needed a partner that could use lidar-equipped drones to penetrate the deep vegetation to map ancient trade paths across more than 70 acres of rainforest in the Philippines.

A high-fidelity digital elevation model loaded into PrecisionFlight Pro allowed the team to fly the UAS “such that it safely “followed” the terrain at a consistent distance above ground level.



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The team penetrated the thick canopy and dense fog to sense the jungle floor using its drone-based lidar. It took the team just **half a day** to capture the necessary data, despite the rain and other factors.

Processing the data became a visualization tool to help the crew find areas of interest they might not have seen exploring by foot. These "areas of interest" could hold clues helping to solve the mystery. The final lesson that PrecisionHawk took away from this mission might resonate with fans of a classic film franchise. "There are still Indiana Jones-like adventures out there, even for us geospatial scientists," Young says.

<https://www.auvsi.org/industry-news/precisionhawk-uses-drone-technology-hunt-buried-treasure-philippines>

**27Mar19**

### **Hospital using drones to fly blood samples between buildings** JONATHAN DREW

March 26, 2019 Features Associated Press



The short trips between WakeMed buildings in Raleigh mark the **first time** the Federal Aviation Administration has allowed **regular commercial flights** of drones carrying products, according to UPS and drone company Matternet, which partnered with the hospital on the program. The FAA confirmed in a statement Monday that it hadn't previously allowed drones to make routine commercial package deliveries, known as revenue flights.

The WakeMed program will start by flying patients' medical samples one-third of a mile from a medical park to the main hospital building for lab testing at least **six times a day five days a week**. Vials of blood or other specimens will be loaded into a secure box and carried to a drone launching pad, where they will be fastened to the aircraft and flown to another building. He said the flights will technically be within sight of operators on either end of the route, and they are authorized to fly above people. The aim is to cut down on the time it takes to transport the time-sensitive samples typically driven on the ground. <https://www.foxbusiness.com/features/hospital-using-drones-to-fly-blood-samples-between-buildings>



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### A.I. Is Flying Drones (Very, Very Slowly) Jake Swearingen March 26, 2019



At the [International Conference on Intelligent Robots and Systems](#) in Madrid last October, the autonomous drone, which navigates using artificial intelligence, raced through a complicated series of turns and gates, buzzing and moving like a determined and oversized bumblebee. It bobbed to duck under a bar that swooshed like a clock hand, yawed left, pitched forward and raced toward the finish line. The drone, small and covered in sensors, demolished the competition, blazing through the course twice as fast as its nearest competitor. Its top speed: **5.6 miles per hour**.

A few weeks earlier, in Jeddah, Saudi Arabia, a different drone, flown remotely by its pilot, Paul Nurkkala, shot through a gate at the top of a 131-foot-high tower, inverted into a roll and then dove toward the earth. Competitors trailed behind or crashed into pieces along the course, but this one swerved and corkscrewed through two twin arches, hit a straightaway and then blasted into the netting that served as the finish line for the [Drone Racing League's world championship](#). The winning drone, a league-standard [Racer3](#), reached speeds over **90 miles per hour**, but **it needed a human to guide it**. Mr. Nurkkala, known to fans as Nurk, wore a pair of goggles that beamed him a first-person view of his drone as he flew it. <https://www.nytimes.com/2019/03/26/technology/alphapilot-ai-drone-racing.html>

### Money Continues to Flow into Drone Delivery Companies Harry McNabb March 27, 2019



The investment community continues to show their faith in the future of drone delivery. [Drone Delivery Canada](#) (DDC) announced that it has closed a financing deal for about **\$7.5 million USD**. The deal follows the recent announcement of DDC's development of a [large cargo drone](#), introduced last month. The single-rotor vehicle, called the Condor, offers a payload of 400 pounds and can travel up to 124 miles on a tank of gas.

Tony Di Benedetto, CEO of Drone Delivery Canada, commented about the new drone last month: *"The global application for the Condor is virtually limitless. As such, the Condor is a big part of the future of DDC's commercial operations. Having the ability to move heavy cargo long distances is a significant milestone for us that opens up many potential commercial opportunities in both Canadian as well as international markets."*



## UAS and SmallSat Weekly News

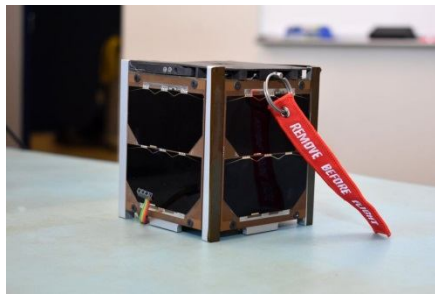
DDC have also been instrumental in proving the safety case for drone delivery, participating with the Drone Integration Pilot Program as partners in [delivery to the Moose Cree First Nation](#).

Drone Delivery Canada (DDC) issued 8.35 million units priced at C\$1.20, underwritten by GMP Securities, Canaccord Genuity and Echelon Wealth Partners.

<https://dronelife.com/2019/03/27/money-continues-to-flow-into-drone-delivery-companies/>

### **ODU students put finishing touches on satellites headed to space** By Trevor

Metcalfe Staff writer Mar 25, 2019



CubeSat satellites are about as big as a softball and each weigh three pounds. Once in space, they will send back atmospheric data to the teams in Virginia. In addition to ODU, teams from Virginia Tech and the University of Virginia also participated in the CubeSat program.

Crews with the Virginia CubeSat Constellation project are making the final preparations to launch three nano-satellites, each the size of a softball, into orbit. The project, more than three years in the making, will send the three objects outside the Earth's atmosphere, where they will send data back down to Virginia.

The project got its start with the Virginia Space Grant Consortium back in 2015, said ODU faculty adviser Dimitrie Popescu. After beginning work in the summer of 2016, the ODU team submitted its satellite to a private launch company in Houston on Feb. 26. From there, the cubes will be shot into space and then deployed via the International Space Station.

As they fall back down to the planet, satellite instruments will measure how the atmosphere affects their decaying orbits. The ODU cube will decay faster due to a drag brake, remaining in space for up to four months. The other two satellites should stay in orbit for up to two years.

Students, faculty and other partners will get to watch and celebrate as the satellites launch from the Mid-Atlantic Regional Spaceport on Wallops Island. The launch is planned for **April 17**. [https://pilotonline.com/inside-business/news/continuing-education-work-development/article\\_35886cea-4f3d-11e9-a990-4f2951bd1504.html](https://pilotonline.com/inside-business/news/continuing-education-work-development/article_35886cea-4f3d-11e9-a990-4f2951bd1504.html)





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### DJI shifts focus to agriculture as consumer drone sales slow Haye Kesteloo Mar. 26th 2019



China's DJI, the world's leading commercial drone company, **doubled** domestic sales of agricultural drones last year and is now increasing spending on promoting its products to Chinese farmers as the consumer market is projected to slow.

DJI **sold 20,000** agricultural drones for spraying pesticides in China **last year** and about 2,000 in Japan and South Korea.

Sales of commercial drones used for photography made up the bulk of the company's sales of **375,000 units in 2017**, according to consultancy IDC.

Chinese media reported last year that DJI believed growth of the global market for consumer drones would slow to below 10 per cent after 2020, while **industrial** drone sales would **continue to double annually**. <https://dronedj.com/2019/03/26/dji-agriculture-consumer-drone-sales-slow/>

**28Mar19**

### USAF Research Lab looks for Skyborg prototype drone 27 MARCH, 2019

FLIGHTGLOBAL.COM GARRETT REIM LOS ANGELES



The US Air Force's artificial intelligence Skyborg program is working on fielding an unmanned combat air vehicle testing platform with an operational capability in 2023.

The office of Strategic Development Planning and Experimentation, part of the US Air Force Research Laboratory, issued a Capability Request for Information to the aerospace industry on 15 March. It's looking for market research and concept of operations analysis to identify technologies available for its **artificial intelligence initiative**.

"The primary goal of the program is to deploy a modular, fighter-like aircraft that can be used to quickly update and field more complex autonomy," says the AFRL. It is running in parallel with the AFRL's Loyal Wingman program to develop small, high-performance, low-cost combat drones to fly alongside manned fighter aircraft. Skyborg is not designed for any particular aircraft, but will have open systems architecture with modularity in its sensing capabilities and



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mission systems. <https://www.flightglobal.com/news/articles/usaf-research-lab-looks-for-skyborg-prototype-drone-456953/>

### Don't Miss The FAA UAS Symposium – June 3-5 – Baltimore, MD.

Join 1,000+ attendees from all sectors to discover how the FAA establishes partnerships and identifies the education and tools you need to be successful in your role. Also, hear the buzz about what's next in drone technology and learn how the FAA is making continuous progress toward safely integrating drones into the National Airspace, helping you conduct more complex operations that will bring economic growth to your business and our communities. Register now at [www.faauas.auvsi.net](http://www.faauas.auvsi.net).

### Researchers Launch Extensive Severe-Storm Study Using Drones Betsy Lillian March 27, 2019



A drone-based investigation of severe storms will soon be [launched](#) by the University of Nebraska–Lincoln, Texas Tech University, the University of Colorado Boulder, and the National Oceanic and Atmospheric Administration's National Severe Storms Laboratory.

More than 50 scientists and students are making final preparations for the May 15 start. Fieldwork for the project will continue until June 16 and will cover a 367,000-square-mile area of the Great Plains.

The project – Targeted Observation by Radars and UAS of Supercells, or TORUS – will exceed **\$2.5 million**, with the National Science Foundation awarding a three-year, \$2.4 million grant and NOAA providing additional financial support.

“To understand how tornadoes are formed, we need to study their ‘parent’ storms, called supercells,” explains Chungu Lu, a program director in NSF’s Division of Atmospheric and Geospace Sciences, which is funding the project. It is the **largest-ever study of its kind** based on the geographical area covered and the number of drones to be deployed. It will involve four unmanned aircraft systems, a NOAA P3 manned aircraft, eight mesonet trucks equipped with meteorological instruments, three mobile radar systems, a mobile LIDAR system and three balloon-borne sensor launchers.

The goal is to collect data to improve the conceptual model of supercell thunderstorms, the parent storms of the most destructive tornadoes. <https://unmanned-aerial.com/researchers-launch->



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[extensive-severe-storm-study-using-drones?utm\\_medium=email&utm\\_source=LNH+03-28-2019&utm\\_campaign=UAO+Latest+News+Headlines](https://www.axcelinnovation.com/news/2019/03/27/infrared-cameras-inc-develops-multi-sensor-uav-payloads-for-industrial-inspections)

### **Infrared Cameras Inc. Develops Multi-Sensor UAV Payloads for Industrial Inspections** Betsy Lillian March 27, 2019



Infrared Cameras Inc. is releasing a line of multi-sensor payloads designed for the unmanned inspection market. Industries include petrochemical (upstream, midstream and downstream), power distribution, alternative energy, and infrastructure.

ICI has developed sensors across several regions of the electromagnetic spectrum including ultraviolet, visible, near-infrared, short-wave infrared, mid-wave infrared and long-wave infrared. A Tunable Diode Laser Absorption Spectrometer, tuned specifically to the spectral absorption of methane, can be bundled with the package, delivering methane identification and concentration data in real time. [https://unmanned-aerial.com/infrared-cameras-inc-develops-multi-sensor-uav-payloads-for-industrial-inspections?utm\\_medium=email&utm\\_source=LNH+03-28-2019&utm\\_campaign=UAO+Latest+News+Headlines](https://unmanned-aerial.com/infrared-cameras-inc-develops-multi-sensor-uav-payloads-for-industrial-inspections?utm_medium=email&utm_source=LNH+03-28-2019&utm_campaign=UAO+Latest+News+Headlines)

### **Advanced Aircraft Company Conducts Flight Experimentation with US Army**



*Kneeling are the soldiers who are piloting HAMR. William Fredericks (blue shirt) is supervising as safety pilot*

Advanced Aircraft Company (AAC) performed flight experimentation with the US Army in an event called Army Expeditionary Warrior Experiment (AEWE) conducted at Ft. Benning, GA. AAC's Hybrid

Advanced Multi-Rotor (HAMR) UAS was employed by a Reconnaissance Section during the exercise. Initial feedback was very positive. They employed HAMR to locate an enemy squad in the woods, which they then used the intelligence gathered to call for an artillery fire mission to neutralize the enemy. They thought the combination of an easy-to-use multi-rotor that performs vertical takeoffs and landings (VTOL) that can fly multiple hours solved a unique problem for the war fighter. Additionally, it was said by two different soldiers that HAMR provided the **best video feed** they have ever seen from a small UAS.



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29Mar19

### In the Sky and on the Ground, Collaboration Vital to DARPA's CODE for Success

March 27, 2019 Military



On a brisk February morning in the Yuma, Arizona, desert, a **swarm** of unmanned aerial vehicles equipped with DARPA's Collaborative Operations in Denied Environment system, or **CODE**, successfully carried out mission objectives, even when **communications were offline** and **GPS was unavailable**.

One-by-one, **six** RQ-23 Tigersharks lifted off, fitted with an array of sensors onboard. Next to the runway at the U.S. Army's Yuma Proving Ground, the mission team inside a small operations center tracked the aircraft and as many as 14 additional virtual planes on an aerial map. The capstone demonstration paired Raytheon's software and autonomy algorithms and Johns Hopkins University Applied Physics Laboratory's White Force Network to create a realistic, live/virtual/constructive test environment. During four demonstration runs, the team activated a variety of virtual targets, threats, and countermeasures to see how well the Tigersharks could complete their objectives in suboptimal conditions.

[Scott Wierzbanski](#), the DARPA program manager for CODE in the [Tactical Technology Office](#) said, "Current procedures require at least one operator per UAV in the field. Equipped with CODE, one operator can command multiple aircraft; and in a denied environment, the aircraft continue toward mission objectives, collaborating and adapting for deficiencies."

Before, if operators lost communications with a UAV, the system would revert to its last programmed mission. Now, under the CODE paradigm, teams of systems can **autonomously** share information and collaborate to adapt and respond to different targets or threats as they pop up. <https://uasweekly.com/2019/03/27/in-the-sky-and-on-the-ground-collaboration-vital-to-darpas-code-for-success/>

### FAA authorizes Oklahoma State University to fly drone swarms

Oklahoma State University March 28, 2019



Oklahoma State University's Unmanned Systems Research Institute (USRI) in Stillwater recently received a certificate of authorization from the Federal Aviation Administration (FAA) to permit flights of a fixed-wing aircraft swarm within the national airspace, making it the first in the country to receive this authorization.

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This flight authorization will permit a single pilot, along with visual observers for safety considerations, to operate a swarm of up to 20 fixed-wing aircraft. The unique configuration



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a fixed-wing aircraft swarm within the national airspace, making it the first in the country to receive this authorization.

This flight authorization will permit a single pilot, along with visual observers for safety considerations, to operate a swarm of up to 20 fixed-wing aircraft. The unique configuration developed by OSU researchers creates a “swarm of swarms” where groups of unmanned aircraft fly within smaller flocks as part of a larger swarm, communicating with a local group leader which then coordinates flights with the overall swarm formation.

This research into swarming unmanned aircraft will advance unmanned aircraft capabilities into safe operation of autonomous vehicles within the national airspace and will find direct application into ongoing OSU research in weather, environmental and infrastructure monitoring, agriculture, security, and airspace operations.

“Swarms are the future of autonomous flight,” said Jamey Jacob, professor of mechanical and aerospace engineering and director of the Unmanned Systems Research Institute at OSU. “This unique first-of-its-kind approval just takes us one step closer to demonstrating for the first time the safe and efficient autonomous flight that will be common place in years to come.” <http://www.uasmagazine.com/articles/2008/faa-authorizes-oklahoma-state-university-to-fly-drone-swarms>