



UAS and SmallSat Weekly News

Contents

- 2 **Google Spinoff Combines UTM and Drone Delivery for Maximum Benefit in Australia**
- 2 **Lincolnshire Police expects UAVs to takeover policing from above**
- 3 **FAA shakes up leadership team**
- 4 **How Amazon is primed and ready for the future of drone delivery**
- 5 **UAVOS tests flight algorithm glider for its VTOL UAV**
- 5 **Intel drone swarm takes center stage in spectacular New York Christmas show**
- 6 **Amazon's plan to profit from space data**
- 7 **Top flight: Japan's drone racers are go!**
- 8 **Lockheed Martin wins US Army airborne counter-UAS contract**
- 8 **First Responders Testing Volocopter**
- 9 **AI and drones turn an eye towards UK's energy infrastructure**
- 9 **Google's drone delivery spin-off 'Wing' aims to be operational in 2019**
- 10 **ALTI UAS Launches Search and Rescue Version of VTOL UAV**
- 10 **Vodafone Completes Drone Trials with EU Mobile Networks**
- 11 **DroneDeploy work highlights drones as crucial tool for future forest fire fighting**
- 12 **What makes the Force1 Scoot the best-selling drone on Amazon?**
- 12 **NYPD buys batch of DJI enterprise drones to front new safety program**
- 13 **DARPA showcases advanced awareness, coordination for small combat units**
- 14 **Startup wins funding for energy harvesting drone**
- 14 **Cubesats Relay Live Entry, Descent and Landing Telemetry from Mars**
- 15 **Tiny Satellites Pose a Swarm of Opportunities — And Threats**
- 15 **Intel Brings in Drones for Bridge Inspections**
- 16 **North Dakota Governor Proposes \$30 Million for UAS Infrastructure**
- 16 **Ameren Completes 60-Mile Drone Flight Beyond Line-of-Sight**
- 17 **AirMap Rolls out Real-Time Geofencing Alerts**
- 18 **AeroVironment UAS Aids National Park Recovery Efforts from Woolsey Fire**
- 19 **Are You Ready for Integrated Skies?**
- 19 **What Does it Mean to Build and Enable MaaS (Mobility as a Service)?**
- 20 **Successful test for Harris Corp.'s 'small' satellite technology**



UAS and SmallSat Weekly News

1Dec18

Wing: Google Spinoff Combines UTM and Drone Delivery for Maximum Benefit in Australia

Miriam McNabb November 30, 2018



In the last nine months, Wing – graduated from Project X and now independent under parent company Alphabet – has worked on a widespread test of drone delivery in a suburban community of Australia.

Wing isn't just testing the safety and utility of their delivery drone and logistics process, but the viability of their UTM platform, which they hope to make available to 3rd parties.

Wing's **customer is the consumer**. Customers in the test area can request drone delivery from a number of different local businesses: first they order an item from a business, like a package of children's aspirin from a local pharmacy. Wing then dispatches a drone – empty – from a launch area, and travels to the airspace around the pharmacy, without landing. The drone lowers a winch, and the pharmacy attaches the package of aspirin. Wing then flies to the customers home – or the nearest viable and safe delivery point, which the customer may choose from – and lowers the package to them, again without landing: which means that customers and businesses only interact with the package, not the drone.

It's a service that has proved more popular than Wing imagined. Customers have used the service more than anticipated, **with over 2500 customer flights completed**. Having already moved from more rural areas into the suburbs, next year Wing plans to move the service to more populated urban areas. <https://dronelife.com/2018/11/30/wing-google-spinoff-combines-utm-and-drone-delivery-for-maximum-benefit-in-australia/>

Lincolnshire Police expects UAVs to takeover policing from above

APPLICATION CRIME DJI EXCLUSIVE HEADLINE NEWS MAGAZINE ALEX DOUGLAS NOVEMBER 29, 2018



Project lead within the force, Sgt Ed Delderfield, thinks the progressive nature of the team in Lincolnshire has helped them integrate drones into policing quickly and effectively, something which the community is already seeing a benefit from.

Delderfield explained: "Drones provide a more flexible and cost-effective air asset compared with the helicopter alternative."



UAS and SmallSat Weekly News

“In Lincolnshire, we are very lucky to have a chief officer team, from the chief constable down, which is overwhelming supportive of drone use. Policing faces significant financial pressures, and funding the latest aircraft and camera payloads is a real challenge despite the operation and efficiency benefits they bring.”

Stories on how they were able to use one of their DJI drones to locate a stranded rape victim and catch deer hunters were all well received, but Delderfield recalls the way in which the drone saved a life as its **biggest triumph** so far.

“Our biggest success was saving a man’s life in February 2018. Following a traffic collision, the victim staggered from his car and fell into a water-filled ditch six feet deep. It was 2am and sub-zero temperatures. The ditch and surrounding area had been searched by officers with torches and firefighters with handheld thermal cameras. Only when the thermal camera-equipped drone arrived on scene was the victim’s faint heat signature seen. Officers were guided in and rescued him — he was hypothermic and unconscious.”

https://www.commercialdroneprofessional.com/exclusive-lincolnshire-police-expecting-uav-takeover-when-policing-from-above/?utm_source=Email+Campaign&utm_medium=email&utm_campaign=45819-284760-Commercial+Drone+Professional+DNA+-+2018-12-01

FAA shakes up leadership team BUSINESS HEADLINE NEWS ALEX DOUGLAS NOVEMBER 30, 2018



Jay Merkle, current deputy vice president for ATO Program Management, will replace Earl Lawrence who is moving on from the role. Merkle will be responsible for coordinating the development of regulations, policies, programs, and procedures to enable the safe integration of UAS into the National Airspace System.

Effective from December 9, Lawrence will become Executive Director for Aircraft Certification as incumbent Dorenda Baker retires. The FAA’s Acting Administrator, Dan Elwell, said: “As longstanding FAA advocates for safety, Earl Lawrence and Jay Merkle are the right selections at a critical time for emerging aviation technologies. Their extensive experience will help ensure a safe transition as these new technologies mature and enter our country’s national airspace.”

Merkle will bring more than 25 years of engineering and program management experience to the role after holding previous positions in both the FAA and defense industry.

<https://www.commercialdroneprofessional.com/faa-shakes-up-leadership-team/>



UAS and SmallSat Weekly News

How Amazon is primed and ready for the future of drone delivery BUSINESS

EXCLUSIVE HEADLINE NEWS REGULATION RESEARCH ALEX DOUGLAS NOVEMBER 30, 2018



Earlier this year, Amazon submitted a request for an airborne fulfillment center (AFC) and the use of UAVs to deliver items from the AFC to users.

The patent describes how the AFC may be an airship that remains at a high altitude and delivery UAVs may be deployed from the AFC to deliver ordered items to user-designated delivery locations. As the UAVs descend, they can navigate horizontally toward a user-specified delivery location using little-to-no power, other than to stabilize the UAV and guide the direction of descent.



The patent goes on to explain that after completing an item delivery, the UAV may navigate to a nearby ground-based materials handling facility or a shuttle replenishment location.

Because of the high altitude of the AFC, navigation by a UAV back to the AFC may not be feasible, or an efficient use of power. By utilizing an AFC for the storage and delivery of items using UAVs, the power required to complete an item delivery is substantially reduced.

Rather than the UAV having to operate at power from the time it departs the materials handling facility to the delivery location and back to the materials handling facility, the UAV may be deployed from the AFC and descend under the forces of gravity towards a delivery location using little-to-no-power. Only as the UAV approaches earth does it need to fully engage the UAV motors to maintain flight and complete delivery of the item, according to the details described in the patent. https://www.commercialdroneprofessional.com/special-report-how-amazon-is-primed-and-ready-for-the-future-of-drone-delivery/?utm_source=Email+Campaign&utm_medium=email&utm_campaign=45819-284752-Commercial+Drone+Professional+DNA+-+2018-11-30



UAS and SmallSat Weekly News

2Dec18

UAVOS tests flight algorithm glider for its VTOL UAV INTERNATIONAL MANUFACTURER NEWS RESEARCH TECHNOLOGY ALEX DOUGLAS NOVEMBER 30, 2018



In case of failure of the power plant in flight, the mode allows the helicopter to automatically switch into auto-rotation mode when the engine fails and can protect the power unit from overloads during critical flight conditions.

The basic principle of the new algorithm is based on the priority of maintaining the revolutions of the main rotor to the detriment of maintaining a preset altitude in critical situations.

Aliaksei Stratsilatau, UAVOS chairman of the board and lead developer, said: "The new flight algorithm GLIDER gives the UAV's Automatic Control System operator additional time to launch an emergency parachute or select an emergency landing site. In addition, the helicopter can be diverted from habitable areas or man-made objects. The algorithm allows operations without a significant power reserve which affects the duration of the mission and the amount of on-board fuel." https://www.commercialdroneprofessional.com/uavos-tests-flight-algorithm-glider-for-its-vtol-uav/?utm_source=Email+Campaign&utm_medium=email&utm_campaign=45819-284752-Commercial+Drone+Professional+DNA++2018-11-30

Intel drone swarm takes center stage in spectacular New York Christmas show December 2, 2018 Feilidh Dwyer



Every year, the Rockettes put together a glitzy 'Christmas Spectacular' show. The finale of this year's performance features 100 Intel shooting star LED drones moving in harmony with the dance troupe.

The 100 Shooting Stars follow preprogrammed routes, and with each drone fitted with LED lights, they move to form spectacular 3-dimensional shapes or to simulate stars, explosions or patterns. Impressively, it takes just one Intel staff member to oversee the entire drone performance. They follow a complex routine involving 3D shapes, flying towards the audience and integrating with the 36 Rockettes on stage.



UAS and SmallSat Weekly News



Unfortunately, I wasn't able to find any truly great photos of the drones in action, so here's a photo of one of their previous performances – to give you an idea of the kind of scale of things.



This performance is particularly special, given that it is the **first time** Intel drones have taken part in an indoor show. As such, they designed these Shooting Stars to be more compact, lighter, and with smaller props.

<https://www.wetalkuav.com/intel-drone-swarm-takes-center-stage-in-spectacular-new-york-christmas-show/>

3Dec18

Amazon's plan to profit from space data Aaron Gregg November 30



Amazon Web Services, the cloud computing unit of the Jeff Bezos-founded Amazon, is branching into satellite data processing.

In recent years, Amazon.com has pressed beyond its e-commerce roots to plant a flag in cloud computing, groceries and entertainment, disrupting established players along the way. Next, it is eyeing an emerging market in space.

At a conference in Las Vegas on Tuesday, the company announced a new business unit called AWS Ground Station, which is focused on helping organizations rapidly process the massive streams of data that are beamed back to Earth every day by satellites. Rather than build its own satellite dishes and ground stations, the company has brokered an exclusive "multiyear strategic business agreement" with Bethesda-based defense contractor **Lockheed Martin**, which manufactures and operates satellites for the U.S. military.

The goal, executives say, is to make it cheaper for businesses to access space. Building the ability to capture data from those satellites as they zip overhead is extremely expensive, something that makes it hard for start-ups to get a foot in the door. The market research firm Bryce Space and Technology [estimates](#) space companies have attracted a collective \$13.9 billion from investors since 2000. The start-ups are enabled by new, smaller satellites known as "**CubeSats**," which can be as small as shoe boxes.



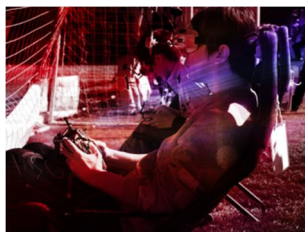
UAS and SmallSat Weekly News

Amazon and Lockheed are hoping to lessen that load by operating a **global ground station** network of their own and **renting it out** to organizations of all sorts. Amazon brings to the table its global network of data centers and the processing power enabled by its complex cloud-computing algorithms, and Lockheed has an extensive network of satellite ground stations courtesy of its government-funded space business.

AWS chief executive Andy Jassy said at a conference this week that the Ground Station service would reduce the amount of time it takes to transfer data from a satellite to a data center from **“a matter of hours or days to a matter of seconds.”**

https://www.washingtonpost.com/business/2018/11/30/amazons-plan-profit-space-data/?noredirect=on&utm_term=.bc77e8dcdb3e

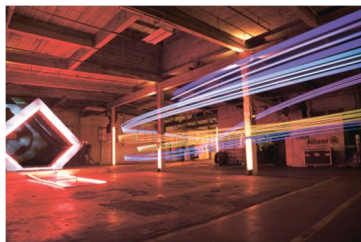
Top flight: Japan’s drone racers are go! ANDREW MCKIRDY STAFF WRITER DEC 1, 2018



In the zone: Pilots take part in a Japan Drone League race in Chiba Prefecture in October

The tranquility of a warm autumn morning in Chiba Prefecture is broken by three shapes streaking through the sky above a rugby field. They move so fast it is difficult for the eye to follow, flitting like angry dragonflies and filling the air with **high-pitched shrieks**.

The sport of drone racing first appeared in Australia earlier this decade and has since grown in popularity around the world. Rules and equipment vary, but the basic aim is to race a drone around a set course in competition with other pilots.



Drones race around a Drone Racing League Biosphere course in Tuscon, Arizona, earlier this year.

Pilots fly drones equipped with cameras that transmit real-time video footage to screens inside their goggles, giving them a first-person view of the flight. The **world speed record** for a racing drone currently stands at an eye-watering **163.5 miles per hour** although speeds of 80 miles per hour are more common during competition.

The sport has been described as a video game brought to life. Several drone race organizations have emerged over the past few years, including the Japan Drone Racing Association and the Japan Drone League.



UAS and SmallSat Weekly News

"Each of our races usually has about 60 entrants," says Toru Takahashi, one of four organizers in charge of JDL, which holds a series of competitions around the country over the course of a season to crown an overall champion and was founded in November 2016.

<https://www.japantimes.co.jp/life/2018/12/01/digital/top-flight-japans-drone-racers-go/#.XAVOAdtKh0w>

Lockheed Martin wins US Army airborne counter-UAS contract December 3, 2018 Philip Butterworth-Hayes Counter-UAS systems and policies



The US Department of Defense on 29 November announced that an Indefinite Delivery Indefinite Quantity contract has been awarded to Lockheed Martin for **high-powered-microwave** airborne counter unmanned aircraft systems including development, integration and support required to meet the government's performance requirements to field UASs with payloads capable of negating adversary UASs in a timely and efficient manner.

Payloads under consideration include explosives, nets, entanglers/streamers, and high-powered-microwave sources. <https://www.unmannedairspace.info/counter-uas-systems-and-policies/lockheed-martin-wins-us-army-airborne-counter-uas-contract/>

First Responders Testing Volocopter KATE O'CONNOR



Air rescue organization ADAC Luftrettung will be conducting a feasibility study on the use of a manned version of the Volocopter VTOL multicopter in air rescue and emergency service operations. The project will start with computer simulations and move to research flights within a few months, with a focus on whether the Volocopter can get emergency personnel to patients faster than current rapid response vehicles. ADAC, which is based in **Munich, Germany**, plans to begin testing in spring 2019.

"The Volocopter is based on a technical platform permitting its diverse and reliable use as an air taxi, heavy lifting drone or in rescue missions," said Volocopter CEO Florian Reuter. "I firmly believe in the Volocopter's potential for large-scale use as an air shuttle for emergency doctors, and I look forward to our joint validation with ADAC air rescue." The study is scheduled to last for a year and a half and cost approximately \$570,000.

<https://www.avweb.com/eletter/archives/101/4203-full.html?ET=avweb:e4203:2565185a:&st=email#231929>



UAS and SmallSat Weekly News

4Dec18

AI and drones turn an eye towards UK's energy infrastructure Adam

Vaughan @adamvaughan_uk 4 Dec 2018



[National Grid](#) has turned to artificial intelligence to help it maintain the wires and pylons that transmit electricity from power stations to homes and businesses across the UK.

The firm has been using [six drones](#) for the past two years to help inspect its **7,200 miles** of overhead lines around England and Wales. Equipped with high-res still, video and infrared cameras, the drones are deployed to assess the steelwork, wear and corrosion, and faults such as damaged conductors. Historically, such work was undertaken by engineers climbing up pylons or using helicopters.

But John Pettigrew, National Grid's chief executive, said the firm had now taken a further step and started applying **machine learning** to analyze the drone footage and cut the volume of material a human operator needs to review.

National Grid partnered with UK startup [Keen Ai](#) for the technology, and is now trying to hone the system to better identify problems. "The results improve greatly as we supply more images to the application," the firm said. <https://www.theguardian.com/business/2018/dec/02/ai-and-drones-turn-an-eye-towards-uks-energy-infrastructure>

Google's drone delivery spin-off 'Wing' aims to be operational in 2019 EUROPE

HEADLINE NEWS MANUFACTURER REGULATION
TECHNOLOGY ALEX DOUGLAS DECEMBER 4, 2018



The firm, which has already been used to deliver burritos in Australia, has said it will begin a test phase in the spring with the hope of being fully functioning by the end of 2019.

It will start with small service testing trials in **Helsinki** with plans to scale up to full operation if the development phase is successful. Wing says its drones can pick up a package from a business or home, fly to a designated destination, and gently lower the package to the ground in a precise location.

The company's own UTM will be used to plan and manage the drones' flight path from take-off to landing and make sure they plan routes around each other along with buildings, trees, and



UAS and SmallSat Weekly News

other obstacles.

This week, **Amazon** has said despite failing to have its Prime Air service up and running by 2019, it is still working to implement it as soon as it can.

https://www.commercialdroneprofessional.com/googles-drone-delivery-spin-off-wing-aims-to-be-operational-in-2019/?utm_source=Email+Campaign&utm_medium=email&utm_campaign=45819-285050-Commercial+Drone+Professional+DNA+-+2018-12-04

ALTI UAS Launches Search and Rescue Version of VTOL UAV 30 Nov 2018 Mike Rees



The ALTI Transition SAR 'Orange' is designed for search and rescue missions. It includes a vibration damping mount for the combustion engine, allowing up to **12 hours** of endurance per flight with a **900km range**. It supports a wide range of payloads with a capacity of up to 1.5kg.

Duran De Villiers, Owner & Director at ALTI UAS commented: "It has been designed for search and rescue missions with thermal cameras allowing fire crews to **see through smoke**, see where hot spots are and relay this information to the right people. It can fly when it's too dangerous for manned aircraft to fly."

https://www.unmannedsystemstechnology.com/2018/11/alti-uas-launches-search-and-rescue-version-of-vtol-uav/?utm_source=Unmanned+Systems+Technology+Newsletter&utm_campaign=42e44addb2-eBrief_2018_Dec_04&utm_medium=email&utm_term=0_6fc3c01e8d-42e44addb2-119747501

Vodafone Completes Drone Trials with EU Mobile Networks 30 Nov 2018 Mike

Rees



[Vodafone Group](#) has announced that it has successfully demonstrated how mobile networks could support the European Commission's vision of safe long distance drone flights.

Vodafone's Radio Positioning System (RPS) uses a 4G modem and SIM attached to a drone, enabling **a self-learning artificial intelligence system** to calculate the position of the drone.

The trial demonstrated that existing 4G networks, which are optimized for ground-based users, could **simultaneously** be used to monitor drone flights at up to 120 meters above ground level. This confirmed that RPS could be used as a **back-up to GPS** location, which is easier to disable or spoof than mobile technology supported by secure SIM cards. Conventional radar does not



UAS and SmallSat Weekly News

work with small devices like drones.

For the first time Vodafone also showed that it was possible **to identify two drones in close proximity and manage them separately**. In future this could be done at mass scale with SIM cards in drones serving a similar function to aircraft transponders.

The 4G mobile network also supported a live video stream and image transfer at an average download speed of more than 9 megabits per second, which will support several commercial use cases. https://www.unmannedsystemstechnology.com/2018/11/vodafone-completes-drone-trials-with-eu-mobile-networks/?utm_source=Unmanned+Systems+Technology+Newsletter&utm_campaign=42e44addb2-eBrief_2018_Dec_04&utm_medium=email&utm_term=0_6fc3c01e8d-42e44addb2-119747501

DroneDeploy work highlights drones as crucial tool for future forest fire fighting

EMERGENCY SERVICES HEADLINE NEWS UNITED STATES ALEX DOUGLAS DECEMBER 4, 2018



In response to the fire in California, the Butte County Sheriff's office partnered with DroneDeploy to coordinate what it claims is the **largest drone disaster response in history**.

As part of the work, aerial data was able to identify areas of concern for key responders in planning and responding to the mudslides that resulted from the fires.

The processing speed of a drone in comparison to humans also accelerated response times to speed up search and rescue efforts and issue FEMA relief funds to families more quickly. Efficient data collection also meant human surveyors were freed up, enabling them to assess damage faster and get wildfire victims back on their feet.

Drones used in this way will pave the way for future use in not only fire-fighting but also in other emergency service aid. https://www.commercialdroneprofessional.com/dronedeploy-work-highlights-drones-as-crucial-tool-for-future-forest-fire-fighting/?utm_source=Email+Campaign&utm_medium=email&utm_campaign=45819-285050-Commercial+Drone+Professional+DNA+-+2018-12-04



UAS and SmallSat Weekly News

What makes the Force1 Scoot the best-selling drone on Amazon? Jack Towne Dec. 2nd 2018



Right now the [best selling drone on Amazon](#) costs \$50 and fits in the palm of your hand. It flies autonomously and doesn't use a remote. It is a tiny drone called the Force1 Scoot.

It is a unique remote-free drone. It uses sensors on the sides and bottom of the drone to help it fly.



You toss it in the air to get started, and it will hover and spin until it senses an object. Then it will fly in the opposite direction of that object. When it senses another object it will reverse direction again. It is pretty simple and actually works quite well.

This drone was **built for kids**. It is a toy and an exceptional one for any drone-loving child. The bumper guard keeps fingers safe and it isn't a major danger to most things around the house.

It is more than a gimmick. My children really do love flying it. They love chasing it with their friends. They love tossing it in the air. They love the [Scoot](#), and I love that I have found a drone that they enjoy and can play with without me worrying it will fly away or break something. I'm tempted to put this on [the list of my favorite drones](#). <https://dronedj.com/2018/12/02/force1-scoot/>

5Dec18

NYPD buys batch of DJI enterprise drones to front new safety program

APPLICATION BUSINESS DJI HEADLINE NEWS ALEX DOUGLAS DECEMBER 5, 2018



The force will train and license officers in its Technical Assistance Response Unit to operate drones in a move to keep the New York community safe.

Initially, the organization is planning to incorporate 14 DJI drones into its operations to assist with surveillance video footage, recording of large scale demonstrations and arrest situations and live video to incident commanders during emergency situations. A spokesperson for the police



UAS and SmallSat Weekly News

force expressed the importance of using drones in emergency work and said: “Frankly, it would be negligent for us not to use this technology.”

11 Mavic Pro Quadcopters will be used for small tactical operations while two M210 RTK quadcopters will be made available for large scale operations where weather and distance may be an issue. NYPD will also have one Inspire quadcopter at its disposal which will be primarily used for training and testing purposes.

The police team is hoping the UAS program can help it gather crucial information as situations unfold without putting officers at risk and lessen harm and danger to civilian bystanders and other involved parties. https://www.commercialdroneprofessional.com/nypd-buys-batch-of-dji-enterprise-drones-to-front-new-safety-programme/?utm_source=Email+Campaign&utm_medium=email&utm_campaign=45819-285191-Commercial+Drone+Professional+DNA+-+2018-12-05

DARPA showcases advanced awareness, coordination for small combat units through first Squad X test December 4, 2018 Chris Galford



The Defense Advanced Research Projects Agency successfully conducted a test of the Squad X Experimentation program last week, pairing Army and Marine units with autonomous technology.

Squad X involves an integrated system that boosted the coordination, threat detection and combat effectiveness of Marine squads in the field. Squad members were put through a series of scenarios in which they utilized **autonomous** air and ground vehicles to detect physical, electromagnetic and cyber threats.

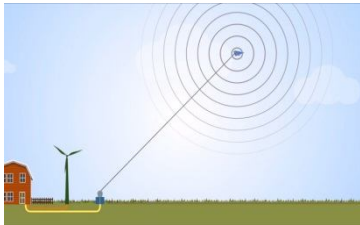
Lt. Col. Phil Root, program manager for Squad X Core Technologies, said “By the end, they were using the **unmanned ground and aerial systems** to maximize the squad’s combat power and allow a **squad** to complete a mission that normally would take a **platoon** to execute.”

Squad X is built on the understanding that modernization demands manned-unmanned cooperation. Lockheed Martin Missiles and Fire Control, as well as CACI’s BIT Systems, have followed the same approach, developing unique programs to enhance warfighters’ capabilities. For Lockheed this has taken the form of autonomous robots with sensor systems, while CACI created the BITS Electronic Attack Module, allowing soldiers to detect, locate and attack threats through radio frequency and cyber domains. <https://homelandprepnews.com/stories/31589-darpa-showcases-advanced-awareness-coordination-for-small-combat-units-through-first-squad-x-test/>



UAS and SmallSat Weekly News

Startup wins funding for energy harvesting drone BUSINESS FINANCIAL INVESTMENT NEWS ALEX DOUGLAS DECEMBER 5, 2018



US drone company, eWind solutions, has won funding for its alternative energy drone. The \$600,000 investment has been given to the Oregon-based firm as part of a federal grant.

According to a report by Katu, a local news outlet, the funding will be used to help develop its energy harvesting tethered drone.

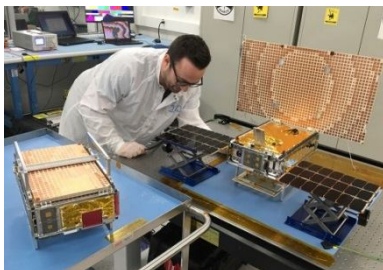
The technology's principle is similar to that of a kite and, connected to the ground, the drone collects energy in the air when the wind speeds are higher. The company has said its objective is to power 45,000 kilowatts per year, an amount which equates to the power of around **five homes per drone**. https://www.commercialdroneprofessional.com/startup-wins-funding-for-energy-harvesting-drone/?utm_source=Email+Campaign&utm_medium=email&utm_campaign=45819-285191-Commercial+Drone+Professional+DNA+-+2018-12-05

Cubesats Relay Live Entry, Descent and Landing Telemetry from Mars Nov 30, 2018 Irene Klotz | Aviation Week & Space Technology

It could have taken up to 3 hr. for [NASA](#) to learn if its InSight spacecraft survived the do-or-die plunge into Mars' atmosphere, supersonic parachute descent and retrorocket landing near the planet's equator. Instead, an **\$18 million pair of cubesats** served as communications relays to provide flight controllers with InSight entry, descent and landing data in near real time.

The 6U, briefcase-size satellites, collectively known as Mars Cube One were bolted to the underside of the United Launch Alliance Atlas V Centaur upper stage that lifted off on May 5 from Vandenberg AFB in California. The cubesats were deployed 90 min. after launch **to fly independently** to Mars.

Flight controllers experimented with flying the satellites in different orientations, using the deployed solar panels and high-gain antennas to basically reverse the effects of solar radiation pressure. "We kind of sailed our way to Mars," Marinar says.



Communicating from deep space also proved to be relatively straightforward. Each satellite has a softball-size, radio called "Iris," a solid-state power amplifier, a low-noise amplifier and six antennas. The plan was to orient each satellite so that its UHF antenna was pointed down toward InSight as it landed on Mars,



UAS and SmallSat Weekly News

and their high-gain X-band antennas were pointed back toward Earth.

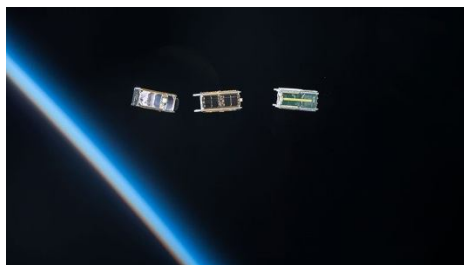
Each satellite picked up the transmission, formatted it and relayed it toward Earth in near real time, without a single data dropout.

The MarCO satellites will continue to transmit engineering data for two weeks so engineers can learn more about the state of the spacecraft themselves during the Mars flybys.

Analyzing changes in the satellite's radio transmissions as they passed through the planet's atmosphere could provide additional information about conditions during entry. "We're actually doing atmospheric science as we're passing by Mars, and we'll be digging through that data as well," Klesh says. http://aviationweek.com/space/cubesats-relay-live-entry-descent-and-landing-telemetry-mars?NL=AW-05&Issue=AW-05_20181205_AW-05_91&sfvc4enews=42&cl=article_5_2&utm_rid=CPEN1000003332045&utm_campaign=17655&utm_medium=email&elq2=4e1b7ddfd4434aa0a374195c01c59877

6Dec18

Tiny Satellites Pose a Swarm of Opportunities — And Threats Meghan Bartels,
Space.com Senior Writer | December 5, 2018 07:30am ET



Cubesats are currently the standard small satellite, but some spacecraft designers are pushing their creations ever smaller.

Spaceflight favors big rockets and small technology — but when [technology gets small enough](#), it may act very differently from traditional satellites and spacecraft.

And that tipping point may not be all that far away, with engineers having already flown [tiny satellites](#) that stretch just 1.3 inches (3.5 centimeters) across. With these tiny satellites come the potential opportunity to produce **hordes** of them, turning one large device into a host of smaller, cheaper ones.

"Right now these things are toys, but if folks decide to work on it, we can turn them into tools — it just takes effort," Pete Klupar, director of engineering for [Breakthrough Starshot](#), the initiative to send a credit-card-size satellite to a neighboring solar system at incredibly fast speeds, told Space.com. "We have to do a lot of work to get them to the level of reliability and technology that they're actually valuable." But he said the Breakthrough Institute is excited to



UAS and SmallSat Weekly News

be pursuing these tiny satellites, and he expects more and more company in that work.
<https://www.space.com/42621-tiny-satellites-offer-opportunities-and-threats.html>

Intel Brings in Drones for Bridge Inspections Betsy Lillian December 5, 2018



The Intel Falcon 8+ Drone at the Daniel Carter Beard Bridge

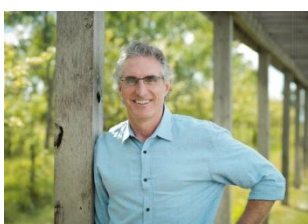
Intel has announced two separate collaborations with the Kentucky Transportation Cabinet and the Minnesota Department of Transportation to improve bridge inspections by using drones.

In partnership with KYTC and Michael Baker International, Intel recently used its drone technology to help inspect and analyze the Daniel Carter Beard Bridge, an eight-lane interstate that crosses the Ohio River. Between lift-off and landing, the automated inspection with Intel's Falcon 8+ drone technology enabled the bridge to remain open and be fully functional while the team completed the assignment.

For this inspection, the Intel drone captured about 2,500 high-resolution aerial images, generating 22 GB of data that was uploaded into the Intel Insight Platform. Using the images, a 3D model – or a digital twin of the structure – was generated to aid with analyses and visualization, which could also be applied to monitoring the paint deterioration and cable stability of the bridge over time.

Separately, working with MnDOT and Collins Engineers, Intel helped expedite an inspection of the Stone Arch Bridge, a pedestrian and bicycle bridge in Minneapolis. While most bridges are inspected every 24 months, officials inspect the Stone Arch Bridge annually due to the complex nature of the structure's aging masonry and a fractured steel span. MnDOT and Collins Engineers reduced work hours by 28%. The work resulted in an inspection **cost-savings** of approximately **40%**, which could save taxpayers an estimated \$160,000 over the next 10 years, according to the partners' estimates. https://unmanned-aerial.com/intel-brings-in-drones-for-bridge-inspections?utm_medium=email&utm_source=LNH+12-06-2018&utm_campaign=UAO+Latest+News+Headlines

North Dakota Governor Proposes \$30 Million for UAS Infrastructure Betsy Lillian December 5, 2018



Gov. Doug Burgum, R-N.D., has [announced](#) a \$30 million proposal to build out infrastructure that would support beyond-visual-line-of-sight operations for unmanned aircraft systems across North Dakota.

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com



UAS and SmallSat Weekly News

Burgum made the announcement at the annual State of Technology Conference in Fargo. The proposal is part of the governor's executive budget recommendation for the 2019-21 biennium. Funding would come from earnings from the state's legacy fund. The investment would establish a statewide BVLOS network for state agencies, local communities and the commercial sector. It would supply the infrastructure required for the command and control of drones and surveillance equipment to integrate manned and unmanned aircraft into national airspace.

Subject-matter experts within the state, including at the [Northern Plains UAS Test Site](#) at Grand Forks, would work with federal agencies to ensure regulatory compliance. The budget also proposes **\$3 million** to upgrade infrastructure at the [Grand Sky](#) UAS and aviation business park and **\$3 million** to support operations at the Northern Plains UAS Test Site.

"These investments will ensure that North Dakota remains **America's proving ground for UAS** while also enabling commercial operations, which is good for our economy and taxpayers," Burgum says. https://unmanned-aerial.com/north-dakota-governor-proposes-30-million-for-uas-infrastructure?utm_medium=email&utm_source=LNH+12-06-2018&utm_campaign=UAO+Latest+News+Headlines

Ameren Completes 60-Mile Drone Flight Beyond Line of Sight Betsy Lillian December 3, 2018



With thousands of miles of high-voltage lines, Ameren Corp. is deploying drones beyond visual line-of-sight as a safer way to monitor its assets over rural territories. Last month, the St. Louis-based energy company worked with Black & Veatch and Collins Aerospace to conduct a **nonstop**, 60-mile BVLOS flight to inspect its transmission lines using LiDAR-based data collection.

In 2017, a BVLOS drone was used to inspect nearly 10 miles of Ameren's power lines near Newton, Ill. The 2018 flight, featuring a vertical takeoff and landing drone, went **six times** the distance of last year's flight, according to the partners. Other project partners included the Northern Plains UAS Test Range, the University of Iowa's Operator Performance Laboratory, Near Earth Autonomy, Latitude Engineering and pdvWireless. https://unmanned-aerial.com/ameren-completes-60-mile-drone-flight-beyond-line-of-sight?utm_medium=email&utm_source=LNH+12-06-2018&utm_campaign=UAO+Latest+News+Headlines

AirMap Rolls out Real-Time Geofencing Alerts Betsy Lillian December 5, 2018



AirMap, an airspace management platform for drones, has added real-time geofencing alerts to its mobile app on iOS and Android.

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com



UAS and SmallSat Weekly News

Available for free, the feature alerts pilots of their DJI drone's in-flight positioning and offers a visual and verbal alert when their aircraft approaches airspace that is unsafe for drone operations. Additionally, the alerts are available to developer partners and OEMs via a mobile SDK for iOS and Android, notes AirMap.

The app alerts pilots when they are approaching geo-fenced airspace in which drone flight is regulated (orange), restricted or prohibited (red). If the pilot's drone's positioning is less than 30 seconds from entering a new airspace boundary, AirMap displays a warning message onscreen and verbally announces the warning with the appropriate message, such as "Approaching Class B airspace." It is available only for operators of DJI drones with the AirMap for Drones fly mode. https://unmanned-aerial.com/airmap-rolls-out-real-time-geofencing-alerts?utm_medium=email&utm_source=LNH+12-06-2018&utm_campaign=UAO+Latest+News+Headlines

AeroVironment UAS Aids National Park Recovery Efforts from Woolsey Fire Betsy Lillian December 4, 2018



Unmanned aircraft systems company AeroVironment Inc. is supporting the National Park Service's Inventory and Monitoring Program to assess the environmental impacts of the recent Woolsey Fire in the Santa Monica Mountains National Recreation Area of Southern California.

Burning over 96,949 acres, the wildfire destroyed more than 616 park structures and consumed approximately 88% of NPS land within the recreation area. Working with NPS park rangers and scientists, AeroVironment initiated a drone-based imaging and environmental impact study to assess fire damage in key areas of the park. Aerial imagery collected will be used to quantify oak tree mortality and vegetation stress, as well as document the dramatic changes in park visitor experience.

The team analyzed aerial imagery to map the affected burn area to assess the scope and scale of the damage. The data will facilitate the development of a long-term environmental recovery and park rebuilding strategy.

The Quantix vertical takeoff and landing (VTOL) drone can survey up to 400 acres in 45 minutes and capture high-resolution RGB color and multispectral imagery. On-board processing delivers true color and normalized difference vegetation index maps as soon as the drone lands, allowing teams to ground-truth potential issues immediately. <https://unmanned->



UAS and SmallSat Weekly News

aerial.com/aerovironment-uas-aids-national-park-recovery-efforts-from-woolsey-fire?utm_medium=email&utm_source=LNH+12-06-2018&utm_campaign=UAO+Latest+News+Headlines

Are You Ready for Integrated Skies? Alan H. Collier, Esq. December 5, 2018



In December 2017, a McKinsey & Company study [revealed that the value of drone activity](#) in the United States had risen from \$40 million in 2012 to \$1 billion in 2017. The study further projects that commercial UAS will have an annual impact of \$31 billion to \$46 billion on the U.S. GDP by 2026.

Investment into the commercial UAS industry **has intensified** with more and bigger players (like Lockheed-Martin, Northrup-Grumman and Boeing) joining the movement toward the full integration of commercial UAVs into the National Airspace. The **U.S. Government is doing its part** as well with the *FAA Reauthorization Act* signed into law by President Trump on October 8th of this year, the recent launch of the FAA *UAS Integration Pilot Program* (“IPP”) in 10 government sites across the U.S., and the FAA’s recent public statements that they are “Open for Business” backed up with real movement in the direction of integration.

With the reality of integration comes the **reality of risk**. While rare to this point, we have seen real-life examples (as well as simulated ones) over the last year of what can happen in integrated skies. Like any advance in technology, while initially compelling to the public at large, once the risks become real in the form of accidents and especially loss of life, acceptance becomes a huge challenge. These issues will develop in city council meetings, state legislatures and courtrooms across the country as the risk issues play out over time. Everyone is playing their part in moving toward safe integrated skies and the benefits this world will bring, yet the players in this newly expanded world of aviation cannot afford to turn a blind eye toward the **necessity of preparing for the inherent risk** that is coming as well.

https://www.expouav.com/news/latest/are-you-ready-for-integrated-skies/?utm_source=marketo&utm_medium=email&utm_campaign=newsletter&utm_content=newsletter&mkt_to_k=eyJpIjoiWTJFMlpXSXhaVEU0TUdVeClInQiOiJTOzYwXC8zYU55TVwvT3A5RkpdIhNRTmVkiLVHhtcCt2ZjY2QjFhVGM1RVdyc09GQjRVZk50MDU0QTBPOTBLVEpYMWIxd1wvdFcxakNoNF15Qk9NS1FrbEdEMWFvMXZmK3dUK2FsNDFGMTNUQ0tcl2ZhaUp6QIQ1cGxNZmllaFFYMTEifQ%3D%3D

What Does it Mean to Build and Enable MaaS (Mobility as a Service)? Jeremiah

Karpowicz December 2, 2018



Pop.Up Next, on display at Amsterdam Drone Week

[Amsterdam Drone Week](#) provided attendees with an incredible look at how drone technology is going to be integrated into the everyday lives of

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com



UAS and SmallSat Weekly News

people from across the globe. [Pop.Up Next](#), which combines the flexibility of a small two-seater ground vehicle with the freedom and speed of a VTOL air vehicle, was on display at the event to provide literal proof of what this integration could look like.

MaaS (Mobility as a Service) has emerged as a **key concept** of this interconnected urban environment, since it is designed to bring together all current and future means of travel. Exactly what that will mean to potential passengers and cities as a whole was discussed during the “Building a MaaS” session at Amsterdam Drone Week.

Moderated by Patrick van der Pij from Business Model Inc., the session featured experts from Bell and Airbus who detailed what it will mean to embed this new concept of mobility into society at large. Since MaaS needs to be built around travel like personal drones or air-taxis feeling as natural as taking a bus or getting onto an airplane, what this integration will look and feel like is especially critical.

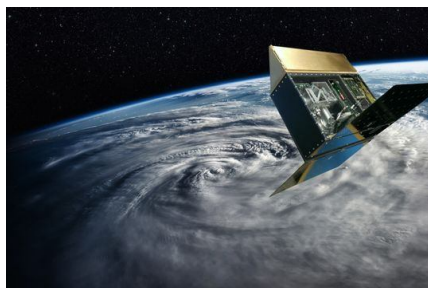
Successful Integration is also going to depend on the **public acceptance** of new ways to travel, and that [acceptance has to be built on safety](#). Public acceptance is also going to depend on transparency when it comes to what vehicles in a MaaS ecosystem are and aren't doing, making sure these new means of travel aren't too noisy, and making it affordable.

https://www.expouav.com/news/latest/maas-mobility-as-a-service/?utm_source=marketo&utm_medium=email&utm_campaign=newsletter&utm_content=newsletter&mkt_tok=eyJpIjoiTkRNMU9EVmhOMkUzTnprNSIsInQiOiJuVUg1Y3BMVWVITHdJNjkwWFVzeVB2OTRpUEJyNWFDY0hIWVozM2FRS3JOUe9URU1JMIFiYm5HZ2p6WnUyaWpNVIBBUkdqRjRTTHBuQmxKRUIld2YzK2hJaGZNT3VpN3dKNVIMNStWbWZKbmtSOEFVNTJnbnA1NVIFYVU5UHM4QSJ9

7Dec18

Successful test for Harris Corp.'s 'small' satellite technology Wayne T. Price, Florida

Today Dec. 6, 2018



The Melbourne-headquartered Harris has announced it successfully launched and communicated with its first small satellite, or "smallsat" called HSAT.

HSAT was on India's Polar Satellite Launch Vehicle, which was launched from Satish Dhawan Space Centre on Nov. 28.

It was part of a payload that included an earth observation satellite and **30 small satellites from eight countries**, according to the Indian Space Research Organization.



UAS and SmallSat Weekly News

Harris is operating the smallsat from its satellite operations center and ground station in Palm Bay. All indications so far is that the briefcase-sized satellite is "performing as expected. It **can be reconfigured in space** — enabling customers to upgrade or reprogram the application on orbit."

Smallsats are looked upon as a growing niche market of about \$3 billion a year and that's expected to more than triple in size by 2028.

Earlier this year, SpaceWorks Engineering, based in Atlanta, said more than **300 satellites weighing between 1 and 50 kilograms launched in 2017**. And on Monday, SpaceX's launch from California included more than 60 small satellites. The mission was named the "**Smallsat Express.**" <https://www.floridatoday.com/story/news/2018/12/06/successful-test-harris-corp-s-small-satellite-technology/2224883002/>