UAS and SmallSat Weekly News

Contents

2 Virginia Flight Information Exchange Key to Future of Advanced Air Mobility
2 Ukraine Needs a Whole Lot of Deadly Drones
3 First FPV BVLOS Waiver Awarded
4 Drone inspects subway tunnels after nearby building collapse
4 Drones Discover Hidden Weaknesses of Collapsing Volcanoes
5 EuroLink Beluga Mini Drone to Launch at AUVSI: Dual Use Technology, Ready to Deploy
6 US Military Sends Another 600 Switchblade Drones to Ukraine
6 Scientists say this new satellite is a game changer for tracking environment changes
7 Honeywell Aerospace Engineers Develop Version 2 of the IntuVue Radar System
8 Gambling on advanced air mobility
9 Mixed reactions as drones follow players at USFL opening weekend
9 EU renews drone use to detect violations of ship emissions
10 UPTICKS IN BVLOS APPROVALS SIGNALS BIG PROGRESS FOR DRONE INDUSTRY
11 A glimpse into Wisk's 6th-generation eVTOL aircraft
11 TruWeather and Iris Automation: Weather Data for Drone Operations
12 FAA grants $4.4 million to seven universities for drone safety research
13 Fire Technology: Champlain Towers South Collapse: Drones' Value Soars
13 Dutch Reapers poised for operational evaluation in Caribbean
14 AeroVironment Donates Over 100 Quantix Recon Unmanned Aircraft Systems to Ukraine
15 Zipline Drones to Deliver Medicine to Remote Japanese Islands
16 Amazon, SpaceX snag NASA space communications contracts
16 Swoop Aero in Christchurch NZ: Partnership for Urban Network Drone Deliveries
17 How Will the Future of the Airspace be Defined by AAM/UAM Ecosystems?
17 With BVLOS Waiver, Iris Automation Advances UAS Public Safety Operations in Reno, NV
18 This drone is made to catch other drones with a built-in net gun
19 Drone performance in Ukraine may force military strategy rethink
19 Drones to monitor sulfur emissions from ships over the Baltic Sea
20 Iris Automation Casia G: Ground-Based Detect and Avoid Technology

Robert Rea | Axcel Innovation | Suffolk, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

16Apr22

Virginia Flight Information Exchange Key to Future of Advanced Air Mobility April 1, 2022

The Unmanned Aerial Systems industry has been clear that the #1 factor holding back growth is a lack of clarity. Through FAA programs like Data Exchange and UAS Service Suppliers, the federal government is meeting its commitments to support the industry with regulations addressing operations in controlled airspace. Now, Virginia is helping to provide clarity at the state and local levels.

The Virginia Department of Aviation, together with its partners at the Unmanned Systems Center at the Virginia Innovation Partnership Corporation, the Virginia Department of Transportation, the Virginia Department of Emergency Management, and Virginia based small business ATA LLC, is reporting the continued success of the Virginia Flight Information Exchange (VA-FIX).

In Virginia, state and local agencies are laying out advisories around incident responses, HAZMAT, search & rescue, critical and sensitive infrastructure, public safety facilities, obstructions, and ground hazards to help pilots avoid risky areas and breaking the law. The VA-FIX shared governance model, including the FIX User Group, brings together diverse stakeholders from across the Commonwealth to work out issues of information sharing and ground space configurations. https://theroanokestar.com/2022/04/01/virginia-flight-information-exchange-key-to-future-of-advanced-air-mobility/

Ukraine Needs a Whole Lot of Deadly Drones By **Christopher Bronk**, an associate professor of information science and technology at the University of Houston, and **Gabriel B. Collins**, the Baker Botts fellow in energy and environmental regulatory affairs at Rice University's James A. Baker III Institute for Public Policy. APRIL 13, 2022

Kyiv needs long-range offensive strike options that can be deployed en masse and regenerate after attrition by Russian air defenses—something that the Ukrainian Air Force, despite its heroic efforts to date, cannot do.

Long-range, low-cost, self-manufactured kamikaze drones—produced and launched from a variety of locations throughout Ukraine's nearly Texas-sized

Robert Rea | Axcel Innovation | Suffolk, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

territory—would be a game-changer. Kyiv could begin to break Russian sieges through high-volume strikes against command-and-control nodes, artillery units, rotary and fixed-wing airfields, and logistics chains—including in Belarus and Russia itself.

As Russian forces immobilize themselves voluntarily by digging in to consolidate gains and involuntarily through what appear to be compounding logistics supply chain breakdowns, higher-intensity kamikaze drone operations can amplify Ukraine's demonstrated capabilities in cyberintelligence, signals intelligence, and special operation forces for compounding lethality as Russian capacity for mobile warfare erodes. For now, NATO should focus on helping Ukraine scale up its capacity to inflict drone hell on its invaders and facilitate their military defeat.
https://foreignpolicy.com/2022/04/13/ukraine-drone-warfare-armaments-russia/

First FPV BVLOS Waiver Awarded

On April 11, 2022, our own Kenji Sugahara was awarded the first Beyond Visual Line of Sight (BVLOS) FPV (First Person View) 107 waiver in the United States (to our knowledge) that does not require a visual observer.

While the process was not complicated, Kenji benefited from understanding the risk assessment processes within the FAA as well as their affinity for an incremental approach to approvals. To be awarded a waiver, both ground and air risk needed to be mitigated. The FAA not only required a Concept of Operations but also an Operational Risk Assessment. The FAA also required FCC documentation of the emitters that were used.

Kenji based the waiver application upon the idea of sheltered operations or operations below the level of obstructions. Sheltered operations was one of the recommendations in the FAA BVLOS Aviation Rulemaking Committee (of which Kenji headed the safety subgroup). FPV fans will find it interesting that he wrote crashes were expected and normal! He also found it fascinating that adherence to weather minimums is still required (and that section of the waiver application was denied.

While the requirements seem to limit the usefulness of the waiver, it opens the door to further push the envelope as long as the safety cases can support expansion. In the interest of accelerating innovation and enabling the industry, Kenji has decided to release all the information in the waiver application as well as all the documentation that was required.
https://dspalliance.org/fpv-bvlos-waiver/

Robert Rea | Axcel Innovation | Suffolk, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

17Apr22

Drone inspects subway tunnels after nearby building collapse

Shourjya Mookerjee, Associate Editor, GCN APRIL 5, 2022

After the collapse of a parking garage over subway tunnels, officials in Boston used a drone to assess conditions before sending in a team of structural engineers for in-depth inspections.

Following the partial collapse of a Boston-area parking garage onto subway tunnels, Massachusetts Bay Transportation Authority officials used a drone to conduct preliminary inspections on two subway lines before sending in a team of structural engineers. The construction accident prompted delays and closures to subway services in downtown Boston, and the drone helped official assess the conditions of the tunnels, MBTA General Manager Steve Poftak told WCVB5 news.

MBTA enlisted the drone from the Massachusetts' Department of Transportation's Aeronautics Division Drone Program, which regularly provides unmanned aerial system services to all divisions of MassDOT and the MBTA for inspecting critical infrastructure like roads, bridges, airports and rail and transit facilities. https://gcn.com/public-safety/2022/04/drone-inspects-subway-tunnels-after-nearby-building-collapse/364049/

Drones Discover Hidden Weaknesses of Collapsing Volcanoes

Clarissa Wright 7 April 2022

The unstable southern flank of Indonesia's Merapi volcano during a partial collapse in 2019.

In a new study published in *Scientific Reports*, a team of international researchers set their sights on the summit dome atop Indonesia's most active volcano—Mount Merapi—where hazardous pyroclastic flows have occurred. By using drones, the researchers not only accessed Merapi's summit but also monitored its new lava dome, which had been forming since 2018 and was collapsing along a hidden zone of fractures.

The team flew a drone about 500 meters above the lava domes, capturing more than 1,000 high-resolution images over a span of 10 years. According to Valentin Troll, a petrologist from Uppsala University in Sweden and a coauthor of the study, getting usable images was

Robert Rea | Axcel Innovation | Suffolk, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

challenging. “Gas emissions or clouds can obscure the view into the crater and onto the dome at times,” he said.

A drone captured an oblique view of Mount Merapi in 2019 from an altitude of 3,087 meters that shows the new dome growing.

Once enough images were collected, 3D information was extracted from them using software. The collection of aerial drone surveys was also combined with mineralogical, geochemical, and mechanical rock strength measurements that reflected areas of weakness resulting from hydrothermal alteration. https://eos.org/articles/drones-discover-hidden-weaknesses-of-collapsing-volcanoes

18Apr2022

EuroLink Beluga Mini Drone to Launch at AUVSI: Dual Use Technology, Ready to Deploy Miriam McNabb April 16, 2022

Italy’s EuroLink Systems has decades of industry experience and strong customer following. At next week’s Xponential 2022 in Orlando, the company will launch the Beluga mini drone, a dual-use aircraft ready to deploy anywhere from the desert to the arctic.

Loaded with options, the Beluga mini drone is adaptable to a wide variety of missions: from military or public safety applications like short-range reconnaissance, search & rescue or security applications to commercial use in 3-D terrain mapping, critical delivery, or urban logistics support.

EuroLink says the drone combines art with science – and offers unparalleled ease of use. “Beluga users indicate that it ramps-up 100% faster with less complexity and delivers an ROI that can be realized within the first 3-to-6 months of operational use,” says Pietro Lapiana, EuroLink CEO. https://dronelife.com/2022/04/16/eurolink-beluga-mini-drone-to-launch-at-auvsi-dual-use-technology-ready-to-deploy/

Robert Rea | Axcel Innovation | Suffolk, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

US Military Sends Another 600 Switchblade Drones to Ukraine Stephen Shankland April 15, 2022

The United States has sent 600 more AeroVironment Switchblade drones to help the Ukrainian military counter Russia's invasion. That's a major increase from the 100 drones the US sent in March.

The drones are "loitering munitions" that can circle above a battlefield before becoming missiles that attack specific targets. They're included in the Pentagon's new $800 million in military aid to Ukraine, a package that brings the country's total contributions to $2.6 billion in security assistance. The US also has sent an undisclosed number of AeroVironment Puma drones, which can circle for hours above a battlefield and help soldiers direct Switchblades toward their targets.

Drones in Ukraine are changing the nature of war, providing a relatively cheap way for soldiers to see what's going on and launch attacks against expensive armored vehicles. Ukrainian troops are using everything from small commercial drones to the large military Turkish-built Bayraktar TB2. https://www.cnet.com/news/us-military-sends-another-600-switchblade-drones-to-ukraine/

Scientists say this new satellite is a game changer for tracking environment changes Danya Gainor April 15, 2022

(CNN) Space technology has long been used to help forecast weather, spot wildfires and aide scientists' understanding of the climate crisis. But this next-generation German satellite is being called a game changer for its ability to use more than 250 colors to produce the most precise data on water, soil and vegetation in satellite history.

The Environmental Mapping and Analysis Program, or EnMAP, is capable of measuring things that would otherwise be invisible, from the degree of pollution in a river flowing through a forest to the nutrient supply within a plant.

The images EnMAP will take are so high in resolution that scientists will be able to study the environment at a previously unachievable level of detail for space-based observing systems, scientists told CNN. The highly sophisticated satellite was designed to study the environmental

Robert Rea | Axcel Innovation | Suffolk, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

impact of the climate crisis, observe how environments respond to human activities and to monitor the management of the world's natural resources.
https://us.cnn.com/2022/04/15/world/enmap-satellite-climate/index.html

Honeywell Aerospace Engineers Develop Version 2 of the IntuVue Radar System

Jessica Reed | April 15, 2022

Honeywell Aerospace is currently working on version 2 of its IntuVue RDR-84K radar system, which can be seen mounted on the drone

Honeywell Aerospace has unveiled a new lab at its facilities in Phoenix, Arizona, featuring the company's latest advanced air mobility (AAM) solutions. The lab has not formally opened yet, but the Honeywell team hosted a preview event on April 12.

The AAM lab features a space dedicated to its RDR-84K radar system. The first version recently demonstrated autonomous detect-and-avoid (DAA) capabilities during a series of tests completed with a second non-cooperative drone in Arizona. The DAA algorithm calculates the speed of moving targets to determine when it needs to change direction to avoid collision. "There was no intervention from the pilot, who relinquished control of the drone to the radar," stated Surace during the preview of the AAM lab. "We flew it on multiple missions, at various altitudes, and at different angles."

Next, they plan to perform tests against multiple drones in multiple scenarios. The radar can detect up to 30 moving targets at the same time. The radar is compact and capable of detecting objects at 3 kilometers. https://www.aviationtoday.com/2022/04/15/honeywell-aerospace-engineers-radar/?oly_enc_id=7021F0632090D7B

Robert Rea | Axcel Innovation | Suffolk, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

Gambling on advanced air mobility AARON KARP|APRIL 2022

Most plans call for electric vertical takeoff and landing, or eVTOL, designs, and in fact the figurative order book for eVTOLs stretches to at least 3,600 units, according to AirInsight Group, a consultancy with offices in Detroit and Washington, D.C., that tracks eVTOL commitments. For now, these are all provisional orders from a who's who of corporations around the globe and acting on those orders depends on manufacturers earning certifications from FAA, the European Union Aviation Safety Agency, and Japan's Civil Aviation Bureau.

This graphic of electric vertical takeoff and landing aircraft from the article is in the April 2022 edition of Aerospace America published by the American Institute of Aeronautics and Astronautics Although difficult to read here, it lists pledged investments ranging from $170m in Volocopter to $1.6B in Joby and $25B in Vertical Aerospace of the UK.

	COMPANY	AIRCRAFT	PASSENGERS	FUNDING
	**Archer Aviation of Silicon Valley**	Maker, a two-seat demonstrator, is conducting test flights	4	• Raised a combined $857.6 million from private investors and a September merger with Atlas Crest Investment Corp., a special purpose acquisition company or SPAC* • United Airlines in early 2021 announced a provisional $1 billion order for 200 Archer eVTOLs, with the option to purchase an additional 100
	**Eve Urban Air Mobility Solutions of Brazil**	Eve	4	• The Former Embraer subsidiary in December raised a combined $542 million from private investment from companies including Embraer and a planned merger with Zanite Acquisition Corp., a special purpose acquisition company or SPAC* • Announced that 17 customers as of late 2021 had signed non-binding letters of intent to purchase eVTOLs, including Republic Airways for 200 eVTOLs and SkyWest Airlines for 100 eVTOLs
	**Joby Aviation of California**	S4-2, a four-seat prototype, is conducting test flights	4	• Raised $1.6 billion in August from private investment and a merger with Reinvent Technology Partners, a special purpose acquisition company or SPAC* • Uber has invested $125 million in Joby as of late 2020, when the California company acquired Uber's air taxi division • Toyota Motor Corp. in early 2020 said it had invested $394 million and will advise Joby in setting up its eVTOL manufacturing facility
	**Lilium of Germany**	Lilium Jet	6	• Raised $584 million after a September merger with Qell Acquisition Corp., a special purpose acquisition company or SPAC* • Azul Brazilian Airways in 2021 announced an agreement to buy 220 Lilium Jets, a $1 billion transaction • Honeywell in June 2021 announced an unspecified investment in Lilium and that it would provide the fly-by-wire, flight controls and custom avionics for Lilium Jets
	**Vertical Aerospace of the U.K.**	VX4	4	• Raised $300 million after a December merger with Broadstone Acquisition Corp., a special purpose acquisition company or SPAC* • American Airlines in June 2021 said it planned to invest $25 billion and pre-order 250 VX4s, worth about $1 billion • Irish aircraft leaser Avolon Aerospace in 2021 said it will invest $15 billion and preorder 500 VX4s, valued at about $2 billion
	**Volocopter of Germany**	VoloCity	2	• Volocopter in March announced a $170million Series E funding round led by Korean firm WP Investment • Geely Technology Group of China in September 2021 signed an agreement to purchase 150 eVTOLs • Japan Airlines invested an undisclosed amount in Volocopter in 2020
	**Wisk Aero of Silicon Valley**	Cora, a two-seat demonstrator, is conducting test flights	TBD	• Boeing in February pledged $450 million, to be paid in installments • Wisk in May 2021 announced it would fly 30 of its eVTOLs for Blade, a Delaware company creating an advanced air mobility network with flights operated by third parties

Robert Rea | Axcel Innovation | Suffolk, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

How has all this investment changed the sector? In the view of Vertical's Puerta, the investments contributed to whittling down a field of dozens of prospective players to half a dozen or so with the financial backing to have credible hopes of succeeding. "Investors have made their bets," he says. https://aerospaceamerica.aiaa.org/features/gambling-on-advanced-air-mobility/

Mixed reactions as drones follow players at USFL opening weekend Ishveena Singh - Apr. 18th 2022

As the new and improved United States Football League (USFL) began its inaugural season on Saturday night, every attempt was made to give fans as much access to the teams and players as possible. One technology that had many viewers talking about it was the use of drones during gameplay.

Fox Sports, which owns the USFL, plans to make a $150 million investment in the spring football league over three years. A chunk of that money is going into trying out broadcast innovations that may draw fans in.

So, in addition to drones, you have two players from each team wearing helmets with cameras on them. The coaches and players are all donning mics, the audio feed from which is being made available for telecasts; even the interactions inside the locker room are not off-limits.

Only time will tell whether this version of the league has some staying power, but the unique perspective provided by drones inside the stadium soon became a talking point on social media. https://dronedj.com/2022/04/18/drones-usfl-football/#more-79427

EU renews drone use to detect violations of ship emissions Bruce Crumley - Apr. 18th 2022

The European Union's main agency for maritime activity is once again deploying drones in partnership with member nations in a common effort to detect and pursue large shipping companies violating tightened limits on sulfur emissions, which are major contributors to global warming.

The European Maritime Safety Agency (EMSA) announced it will be teaming up with Germany's Federal Maritime and Hydrographic Agency in the upcoming large-scale deployment of drones

Robert Rea | Axcel Innovation | Suffolk, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

in the Baltic Sea. The UAVs will collect and analyze the emissions content of passing ships, and relay measurements that exceed sulfur thresholds in real time to port authorities.

The craft are equipped with specialized sensors to capture and measure exhaust plumes as they fly over or behind travelling vessels. Communications tech aboard then relays analyses indicating sulfur violations via the EMSA's Port State Control information system, allowing authorities to investigate and potentially fine offending ships when they come to shore. Penalties already meted out have surpassed $10,000.

Restrictions are part of a range of global reductions introduced in 2020 by the International Maritime Organization to cut the considerable contribution that global cargo shipping makes to climate change. https://dronedj.com/2022/04/18/eu-renews-drone-use-to-detect-violations-of-ship-emissions/#more-79442

19Apr22

UPTICKS IN BVLOS APPROVALS SIGNALS BIG PROGRESS FOR DRONE INDUSTRY

April 19, 2022 Sally French

Beyond Visual Line of Sight (BVLOS) approvals are flying high, and it signals that governments are getting more comfortable with drones.

This spring, drone inspection company Percepto received approval from the Civil Aviation Authority of Israel to fly drones Beyond Visual Line of Sight across three different industrial locations in Israel.

The Dutch civil aviation authority ILT has approved Percepto drones for BVLOS flights.

Altitude Angel announced in March plans to build the world's largest and longest network of 'drone superhighways' that would link towns and cities across the United Kingdom. Dubbed Project Skyway, it would integrate advanced drone technologies beyond just UTM, but also things like detect and avoid technology.

The City of Reno, Nevada granted drone company Iris Automation a waiver to use the company's Casia G ground-based solution for BVLOS operations in April 2022. https://www.thedronegirl.com/2022/04/19/bvlos-approvals-drone-industry/

Robert Rea | Axcel Innovation | Suffolk, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

A glimpse into Wisk's 6th-generation eVTOL aircraft April 18, 2022

Wisk has built and flown several prototypes of the two-seat Cora autonomous air vehicle.

California-based Wisk Aero has revealed that its sixth-generation eVTOL aircraft — the model that the company plans to get type certified with U.S. aviation authorities — will have four seats.

During a recent segment of 60 Minutes with Anderson Cooper, Gary Gysin, Wisk's CEO, talked about the company's autonomous eVTOL aircraft. The two are sitting in Wisk's fifth-generation aircraft.

In a TV segment with American broadcast journalist Anderson Cooper, the company talked about developing and certifying an autonomous eVTOL, sharing small details about its upcoming aircraft.

Gary Gysin, Wisk's CEO, said in the segment that when its four-seat autonomous aircraft does take off with passengers on board, the company doesn't plan to completely remove the pilot out of the picture. Gysin said each passenger "can be in verbal communication with the ground. They can be talking to a pilot whenever they want to."

Wisk still hasn't set a target certification date for its autonomous vehicle, but Cooper reported that Wisk wants to have its aircraft ready for passenger services in the world's 20 busiest cities within the next decade. JoeBen Bevirt, founder and CEO of Joby, told Cooper that the eVTOL developer planned to launch piloted passenger services in 2024. https://evtol.com/news/glimpse-into-wisks-6th-generation-evtol-aircraft/

TruWeather and Iris Automation: Weather Data for Drone Operations Miriam McNabb April 19, 2022 DRONELIFE Staff Writer Ian M. Crosby

Weather data analytics provider TruWeather Solutions today announced a partnership with safety avionics leader Iris Automation for the integration of TruWeather's micro weather services and weather sensors into Iris Automation's Casia G ground-based surveillance system. This collaboration will provide operators with access to real-time integrated communications, collision avoidance and micro-weather data.

Robert Rea | Axcel Innovation | Suffolk, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

Micro weather or low-altitude local atmospheric conditions are often drastically different from those in higher altitudes, resulting in a degree of uncertainty for uncrewed aircraft systems (UAS) and advanced air mobility operations. An FAA-funded study at MIT Lincoln Lab found that only 3% of the U.S. has access to reliable surface weather and cloud ceiling measurements.

"This is what we refer to as a 'data desert'. Up to 40% of crewed aviation flights that are either canceled or delayed due to weather could have flown. Even higher scrub rates will occur for UAS' flying beyond-visual-line-of-sight, with no pilot on board to spot problems, unless the surface and low altitude weather measurement gap can be closed," said TruWeather CEO Don Berchoff, retired U.S. Air Force Colonel and former Technology Director of the National Weather Service Science. "The industry requires even more low altitude weather measurements to increase data fidelity and flights per airframe. Failure to resolve this problem will result in fewer flights, disgruntled customers and significant revenue losses." https://dronelife.com/2022/04/19/truweather-and-iris-automation-weather-data-for-drone-operations/

FAA grants $4.4 million to seven universities for drone safety research Ishveena Singh - Apr. 19th 2022

The Federal Aviation Administration has invested $4.4 million in drone research through its Alliance for System Safety of UAS through Research Excellence (ASSURE) program. The grants – focusing on the areas of electromagnetic compatibility, UAS detect and avoid classifications, and cybersecurity oversight – have been awarded to seven US universities.

These universities are the University of North Dakota, University of Kansas, Drexel University, The Ohio State University, Embry-Riddle Aeronautical University, Mississippi State University, and Oregon State University.

The research on drone electromagnetic compatibility will assess the risks and identify drone design vulnerabilities as well as material and procedural mitigations. It would also propose guidance for safer electromagnetic compatibility with emitted and static fields.

At the same time, research investigating detect-and-avoid track classification and filtering will provide proposed metrics, guidance, and test methods to assess the effects of false or misleading information. The findings are expected to support FAA's Beyond Visual Line of Sight operations.

Robert Rea | Axcel Innovation | Suffolk, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

Finally, an investigation into drone cybersecurity oversight and risk management will seek to address issues pertaining to the National Airspace System and other FAA systems. https://dronedj.com/2022/04/19/faa-drone-safety-research-grant/

Fire Technology: Champlain Towers South Collapse: Drones' Value Soars April 18, 2022 Charles Werner

Charles Werner spoke to numerous people who responded to the condominium collapse to learn that unmanned aerial systems were crucial to the effort in many ways.

On June 24, 2021, the Champlain Towers South condominium in Surfside, FL, collapsed without warning and became the third-deadliest engineering failure in U.S. history. The incident resulted in 98 deaths and 11 injuries. The collapse was over in 11 seconds. More than 80 fire rescue units responded along with an equal amount of law enforcement units.

Throughout the incident, drones were flown by each of USAR teams and a team from Florida State University. Drones provided: overwatch of the debris pile and surrounding area; interior flights to access difficult areas and/or areas that were dangerous from a potential collapse standpoint; and mapping of the incident scene and surrounding area, for engineering evaluation of structural integrity, for forensic investigation and for volumetric assessment of the debris pile. https://www.firehouse.com/tech-comm/drones/article/21260858/fire-technology-champlain-towers-south-collapse-drones-value-soars

20Apr22

Dutch Reapers poised for operational evaluation in Caribbean Craig Hoyle13 April 2022

The Royal Netherlands Air Force (RNLAF) is to begin operating a trio of newly delivered General Atomics Aeronautical Systems MQ-9A Block 5 Reapers during missions flown from Curacao in the Caribbean.

"We will test and evaluate the system during our deployment… and expect it to be a valuable asset for the commander of Netherlands forces in the

Robert Rea | Axcel Innovation | Suffolk, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

Caribbean," says Lieutenant Colonel Boudewijn Roddenhof, commander of the RNLAF's 306 Sqn.

Offering a new intelligence, surveillance and reconnaissance capability for the NATO nation, the Block 5 Reaper – which has been acquired in an unarmed configuration – can perform missions lasting more than 27h, General Atomics says. It cites a maximum speed of 240kt and an operating ceiling of 50,000ft.

General Atomics was in March 2019 awarded a $123 million Foreign Military Sales contract via the US government to produce a total of four MQ-9As for the Netherlands. Dutch Reapers poised for operational evaluation in Caribbean | News | Flight Global

AeroVironment Donates Over 100 Quantix Recon Unmanned Aircraft Systems to Ukraine April 20, 2022 Military | News

AeroVironment, Inc. a global leader in intelligent, multi-domain robotic systems, today announced it will donate more than 100 Quantix™ Recon unmanned aircraft systems and operational training services to the Ministry of Defense of Ukraine and territorial forces amid the ongoing war against Russia. The donation was presented to the Ambassador and the Defense Attaché at the Embassy of Ukraine by AeroVironment chairman, president and chief executive officer Wahid Nawabi last week.

"This donation will provide operators with a tool that can fly undetected by enemy forces and unaffected by radio frequency jammers to deliver accurate and rapid reconnaissance of remote, inaccessible areas of the dynamically changing battlefield. Operators can conduct quick mission planning and verification to help keep Ukrainian ground forces out of harm's way. AeroVironment is honored to support the people of Ukraine," Nawabi added.

AeroVironment's Quantix Recon UAS is a lightweight, easily deployable, fully automated reconnaissance solution that provides on-demand intelligence using high-resolution georeferenced terrain, vegetation, and infrastructure imagery. With its hybrid vertical takeoff and landing design, Quantix Recon combines the VTOL advantages of a multirotor drone with the range, speed and efficiency of a fixed-wing unmanned aircraft. Featuring fully automated flight operation, the UAS can survey up to 1.6 square kilometers (0.6 square miles), or 20 linear kilometers (12.4 miles), per 45-minute single battery flight.
https://uasweekly.com/2022/04/20/aerovironment-donates-over-100-quantix-recon-unmanned-

Robert Rea | Axcel Innovation | Suffolk, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

aircraft-systems-to-the-ministry-of-defence-of-ukraine-and-territorial-forces/?utm_source=rss&utm_medium=rss&utm_campaign=aerovironment-donates-over-100-quantix-recon-unmanned-aircraft-systems-to-the-ministry-of-defence-of-ukraine-and-territorial-forces&utm_term=2022-04-20

21Apr22

Zipline Drones to Deliver Medicine to Remote Japanese Islands

Stephen Shankland April 21, 2022

A startup drone company will begin delivering prescription drugs and other medical supplies in May to hospitals in Japan's hard-to-reach Goto Islands.

Zipline, a drone maker based in South San Francisco, and Toyota Tsusho Corp, a logistics subsidiary of the car manufacturer, said the service will cut delivery times to 30 minutes from several hours. Test flights are already underway, the companies said.

Zipline and other drone delivery companies could dramatically speed up shipping for lightweight, premium products if they can clear regulatory concerns and improve the technology to make it economical. Amazon, Google parent Alphabet and several startups have drone delivery investments, though the industry remains small amid concerns about noise, privacy and safety.

Still, drones promise to be especially useful in remote locations, like the Goto Islands, where conventional delivery by truck isn't an option. A chain of dozens of islands dotted across about 50 miles of sea west of Japan, the Goto Islands have a population of 50,000 people.

The service will eventually expand to several islands and be able to handle 250 deliveries a day "to thousands of facilities and homes within the service area," Zipline said in a statement.
https://www.cnet.com/tech/computing/zipline-drones-to-deliver-medicine-to-remote-japanese-islands/

Robert Rea | Axcel Innovation | Suffolk, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

Amazon, SpaceX snag NASA space communications contracts Joey Roulette April 20, 2022 J

WASHINGTON, April 20 (Reuters) - Amazon's satellite venture, SpaceX's Starlink network, and other satellite firms on Wednesday won a combined $278.5 million in contracts from NASA to demonstrate communications in space as the U.S. space agency moves to replace its current satellite network in orbit with privately-built systems.

Amazon's (AMZN.O) Project Kuiper, a planned network of over 3,000 satellites built to beam broadband internet to remote regions, won $67 million, while SpaceX's Starlink venture, a larger satellite-internet network with some 2,000 satellites in space already, received $70 million. Each company is expected to complete development and demonstrations of their satellites under the contract by 2025, NASA said in a statement. The other awardees include Inmarsat , SES, Telesat and ViaSat (VSAT.O). https://www.reuters.com/business/aerospace-defense/amazon-spacex-snag-nasa-space-communications-contracts-2022-04-20/

Swoop Aero in Christchurch NZ: Partnership for Urban Network Drone Deliveries Miriam McNabb April 20, 2022 by DRONELIFE Staff Writer Ian M. Crosby

Today, air logistics leader Swoop Aero announced the formation of a partnership with Christchurch NZ's Urban Development team to create a network that will include Swoop Aero's Aviary, an autonomous docking station for a fleet of drones that blends landing infrastructure, charging technology, payload exchange, and a user interface to allow scaling of integrated drone logistics.

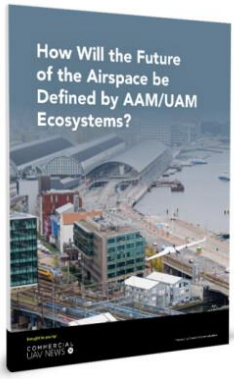
Swoop Aero has carried out upwards of 13,000 Beyond Visual Line of Sight operations since 2017, completing more than 750,000 deliveries across the globe. It was the first company in the world to deliver a vaccine via a commercial drone operation in 2018. Deployed across 3 continents, Swoop Aero's technology platform has seen use in the UK, Australia, the Democratic Republic of the Congo, Mozambique, and Malawi.

"We have proven our capabilities in remote and rural areas," said Eric Peck, CEO of Swoop Aero. "This partnership will implement the concept of an urban drone logistics network in a modern city bringing us closer to our goal to providing a service accessible by 100 million

Robert Rea | Axcel Innovation | Suffolk, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

people in 2025." https://dronelife.com/2022/04/20/swoop-aero-in-christchurch-nz-partnership-for-urban-network-drone-deliveries/

How Will the Future of the Airspace be Defined by AAM/UAM Ecosystems?



Although some continue to view Advanced Air Mobility (AAM) as something in the far-off future, the AAM industry is here, it is growing, and it will play an important role in our everyday lives.

The AAM ecosystem includes Urban Air Mobility solutions, which previously described the entire sector. The update in terminology reflects the fact that drones that are large enough to transport a person will not only be operating in urban environments—they will become a mainstay in the airspace across the entire world.

Industry leaders are excited about the future AAM, and they are eager to push the technology forward to address issues such as traffic congestion, package delivery, healthcare access, air pollution, and more. https://www.commercialuavnews.com/reports/how-will-the-future-of-the-airspace-be-defined-by-aam-uam-ecosystems?utm_source=marketo&utm_medium=email&utm_campaign=AAMReport&utm_content=attendee&mkt_tok=NzU2LUZXSi0wNjEAAAGD661KYbiYAZv83EKkvJrLRD1YcDoVmff_5-_BvOPsTu-OX7FMrsuC4z1vQgy6rANQdYuZmRfo0I-5SYduBMuBp_Yf3uc2S6-G9HSZ-djD_bpINQ

With BVLOS Waiver, Iris Automation Advances UAS Public Safety Operations in Reno, NV Scott Howe APRIL 20, 2022

The waiver will enable the City to increase the testing of UAS for its public safety operations, to reduce the resources required for these missions, and decrease risks to personnel.

This waiver is an important step in achieving autonomous flight, first testing over unpopulated areas before it can move to urban areas. The first waiver covers a rural, unpopulated area south of Reno and was submitted by Iris Automation for the use of its advanced, onboard detect and avoid solution, Casia X. It provides situational awareness exceeding that of a human pilot.

The waiver is for the deployment of Iris Automation's patented Casia G detect-and-avoid solutions. Casia G, a ground-based version of its detect and avoid (DAA) surveillance solution,

Robert Rea | Axcel Innovation | Suffolk, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

does not require integration onto the aircraft, preserving payload for sensors or packages while providing a greater choice of aircraft. The system creates a stationary perimeter of sanitized, monitored airspace, enabling UAVs to perform work safely. Casia G provides awareness of intruder-piloted aircraft to maneuver UAVs to safe zones.
https://www.commercialuavnews.com/public-safety/with-bvlos-waiver-iris-automation-advances-uas-public-safety-operations-in-reno-nv?mkt_tok=NzU2LUZXSi0wNjEAAAGD7KHjNHClVQ71HrPmGkm5kzkSXiJF-tYd_vTUyTTJF4MQKQrhHW5kfrm9_TswH9EHiEhMJZVDtOK989DKdyjQvXKYPkp1e_syrUYoZNHVGgW6

This drone is made to catch other drones with a built-in net gun Seth Kurkowski - Apr. 21st 2022

A drone created by Aleksey Zaitsevsky shows what you get when you combine a racing drone and a net gun – a super-fast drone with the sole purpose of catching other drones in its net. It's insane to watch it fly.

The idea is to be a fast response drone that can be deployed at a moment's notice to find and neutralize poorly behaving drones. It features a high power to weight ratio, making for a pretty high top speed.

The genius is how it deploys the net. The Drone Interceptor has a built-in net gun. The mechanism to deploy the net is linked to the drone's rotor. Once activated, the rotor detaches from the drone to spread out and propel the net towards the target.

Deploying the net, of course, no longer makes a functioning drone; a parachute is deployed to allow the main assembly to be recovered and reused, allowing for the drone to somewhat land gently on the ground. This little drone could be deployed on vehicles for quick deployment.
https://dronedj.com/2022/04/21/this-drone-is-made-to-catch-other-drones-with-a-built-in-net-gun/#more-79479

Robert Rea | Axcel Innovation | Suffolk, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

22Apr22

Drone performance in Ukraine may force military strategy rethink Bruce Crumley - Apr. 21st 2022

Despite the long and often controversial use of military UAVs in wars in Afghanistan, Iraq, and Syria, the prevalence and performance in Ukraine of drones – this time, the consumer variety – have been both a surprise and often determining factor in local forces repelling invading Russian forces. Indeed, some experts now believe the results of store-bought drones as well as military-grade craft are forcing reconsideration of decades old military strategies about waging war.

Drones flowing in from abroad have been matched by Ukrainians donating or piloting their own drones, following the Defense Ministry's appeal after the invasion began for citizens to fly their UAVs in the country's defense. Together, both old and newly arriving drones have been used for critical delivery, search and rescue, surveillance, intelligence-gathering, and even Molotov cocktail-dropping by Ukraine forces.

Those small drones have significantly complemented military-grade UAVs provided by foreign governments, or contributed by defense companies themselves. Even more critical have been the often devastating strikes carried out by Turkish-built Bayraktar TB2 – one of which may well have delivered the Ukraine anti-ship missiles that last week destroyed the Russian flagship *Moskva*. https://dronedj.com/2022/04/21/drone-performance-in-ukraine-may-force-military-strategy-rethink/#more-79661

Drones to monitor sulfur emissions from ships over the Baltic Sea Ishveena Singh - Apr. 21st 2022

The European Maritime Safety Agency has kicked off a large-scale emissions monitoring campaign in the Baltic Sea this week. As part of the project, drones are being deployed through Germany to remotely measure the sulfur content in ships' exhaust plumes and detect violations of the applicable limits.

Robert Rea | Axcel Innovation | Suffolk, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

Over the next three months, Norway-based drone manufacturer Nordic Unmanned's CAMCOPTER S-100 aircraft will fly over selected ships operating in the German Fehmarn Belt to determine whether they are complying with the sulfur and nitrogen oxide regulations. Should vessels be found utilizing fuel with a sulfur concentration greater than 0.10%, they will likely undergo further investigation, such as an inspection at the next port of call.

In the meantime, the emission-monitoring drone will also acquire visible and infrared aerial imagery for hydrographic surveying purposes. For shallow waters, bathymetric values can be extracted from images. Moreover, imagery allows for three-dimensional mapping of the shore zone. The drone survey campaign will investigate whether aerial imagery can provide complementary information for the German hydrographic surveying service.
https://dronedj.com/2022/04/21/drones-emissions-monitor/

Iris Automation Casia G: Ground-Based Detect and Avoid Technology Miriam McNabb April 21, 2022 by DRONELIFE Staff Writer Ian M. Crosby

Today, Iris Automation announced that its ground-based detect and avoid surveillance solution, Casia G, will be made commercially available. Utilizing the same AI and computer vision technology as Iris Automation's onboard solutions, Casia G offers a full optical, 360° field of view to detect, alert and enable operators to avoid both co-operative and non-cooperative aircraft for safe beyond visual line of sight flight.

Casia G establishes a zone of sanitized, monitored airspace for the safe operation of UAVs. Perfect for operations in both fixed or temporary locations, Casia G supports drone-in-a-box solutions and can be used to either supplement or replace human visual observers.

With Casia G, operators have access to an affordable airspace awareness solution that allows for the operation of various aircraft within the coverage area, due to the lack of requirement for direct aircraft integration. This all comes without requiring difficult or expensive integrations with aircraft systems, consuming valuable size, weight and power from the aircraft, or requiring approvals from agencies other than the FAA.

Casia G was previously granted a BVLOS waiver on behalf of the City of Reno, with Iris Automation in the process of proving additional deployment patterns and concepts of

operation with the FAA. https://dronelife.com/2022/04/21/iris-automation-casia-g-ground-based-detect-and-avoid-technology/

Robert Rea | Axcel Innovation | Suffolk, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net