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# DRONES

## WORLD

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DRONE DIRECTORY



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# DRONES WORLD

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**DRONES WORLD is published by - B. Kartikeya**



**B. KARTIKEYA**

**H**ello folks! Welcome to the newest Drones World editorial. The most recent advancements in the drone business are examined in our April edition, focusing on important news. For the time being, lean back, relax, and glimpse the growth and progression of the drone industry as we transport you throughout the world's skies.

Also, 100 autonomous drones are now soaring in IKEA stores, the most recent in IKEA Zaventem, Belgium. When you turn the leaves, you'll find a technology-related article about Qii. AI, a software company awarded a contract to provide AI Corrosion Detection to inspect Royal Canadian Navy vessels. In the drone business, you can also learn about recent hires. After reading the BVLOS portion of the article, you will learn about ADS-B spoofing detection for SkyLine UAS BVLOS activities.

Give the interview section's discussion with Karna Raj, Prudhvi Raj, and Chaitanya Reddy of Vector Technics your undivided focus. You will be aware of how Vector Technics, an organization that is "Made in India," supports the Atmanirbhar Bharat program. Talking with Mr. Shripathi V, Senior Technical Manager, Aerospace, Indo-Pacific, Hexagon, you can also learn more about the company's essential technologies and solutions exclusively for the drone business.

We regret to inform that only paid customers will be promoted in the Drones Directory. But, don't worry we are launching annual directory which will be publishing on May 2023. As it is an annual directory companies has to hurry up to send us the details ASAP.

Future Aviation media is proud to announce as we have launched India's first Bi Monthly E Magazine on Space. Indian Space is rapidly growing and directly & indirectly helps the Drones Eco System. do you have questions more? Feel free to contact us.

Finally, don't fail to look at Red Cat Holdings' investment in Firestorm Modular Unmanned Aerial Systems Company partly devoted to fundraising.



## One hundred drones now used across IKEA retail for stock inventory

One hundred autonomous drones are now flying in IKEA stores – the latest in IKEA Zaventem, Belgium – with Ingka Group being the first retailer to use such solution successfully at scale for stock inventory.

IKEA is constantly looking for new opportunities to innovate and create an even better experience for customers across channels. Two years ago, Ingka Group and the Supply Chain Development Team at Inter



“We are investing in technology across the board so that our stores can better support customer fulfillment and become true centers for omnichannel retailing. Introducing drones and other advanced tools – such as, for example, robots for picking up goods – is a genuine win-win for everybody. It improves our co-workers’ wellbeing, lowers operational costs, and allows us to become more affordable and convenient for our customers,” says Tolga Öncü, Head of Retail at Ingka Group (IKEA).



IKEA Group, together with Verity, a provider of indoor drone systems, started developing a fully autonomous drone solution to track inventory and improve the wellbeing of its co-workers on the floor. As a result, one hundred busy drones are now at work during non-operational hours to improve stock accuracy and secure availability of products for online or physical retailing. This solution supports a more ergonomic workplace for IKEA co-workers as they no longer need to manually confirm each pallet.

The first drone took off in IKEA Switzerland in 2021 and the 100 that are operational now are stocking inventory in 16 different locations in Belgium, Croatia, Slovenia, Germany, Italy, the Netherlands, and Switzerland.

“Being at the forefront when it comes to innovative and value adding solutions is part of the IKEA heritage. We are always curious of learning from others and this project is a great example of how we have collaborated across IKEA and together with an external partner come up with a solution that we all benefit from,” says Peter Ac, Head of Innovations in Logistics & Fulfilment, Supply Chain Development, Inter IKEA Group.

Ingka Group continues to revamp stores across the world, improving their handling capacities and enabling them to ship online orders in a fast, more sustainable and affordable way.

## Spright Earns ISO 27001:2013 Certification



Spright, a global drone solutions provider addressing the growing demand for autonomous flight operations in healthcare and utility inspection, has announced that it has achieved ISO 27001:2013 certification for its Information Security Management System (ISMS). This international certification recognizes Spright’s steadfast commitment to information security and data privacy across internal and external systems.

ISO 27001:2013 is an internationally recognized standard that outlines best practices for implementing an effective ISMS to protect the confidentiality, integrity, and availability of information. The certification demonstrates that Spright has implemented a comprehensive information security management system that meets the highest standards of security and risk management.

“We are thrilled to have achieved ISO 27001:2013 certification,” said Justin Steinke, Senior Vice President of Commercial Business at Spright. “This certification is a testament to our commitment to protecting our customers’ data and ensuring the security of our systems and processes. It is also a reflection of our ongoing efforts to continually improve our information security practices.”

To achieve ISO 27001:2013 certification, Spright underwent a rigorous assessment process, which included an independent audit of its ISMS by a third-party certification body. The assessment evaluated Spright’s information security policies, procedures, and controls, as well as its risk management and incident management practices.

“We are proud of our team for their hard work and dedication in achieving ISO 27001:2013 certification,” added Steinke. “Our customers are rightfully protective of their information, and it’s our responsibility to demonstrate our commitment to the privacy and security of the information in our custody. We believe customers will find tremendous value in our ISO certification and overall commitment to service quality.”



## Drone Delivery Player Manna Enters US Market with Coca-Cola HBC Investment

**M**anna, the Irish drone delivery start-up, is expanding into the US after securing an investment from Coca-Cola HBC. The Dublin-based company has been operating in parts of its home city in recent years, carrying out delivery by unmanned drones of food and consumer products like electronics. It is now launching a trial of its service in the Dallas/Fort Worth area through a partnership with real estate development firm Hillwood.

The pair will test drone delivery within a 27,000-acre mixed-use development in the area. Approvals from the FAA for the trial are pending. Ahead of the deal, Coca-Cola HBC, a partner of the soft drink giant, has invested in Manna. Figures for the deal have not been disclosed.

Manna chief executive Bobby Healy said the latest moves are the first steps for the company to scaling internationally.

“Working with Hillwood who develop technology-forward, innovative lifestyle communities and with Coca-Cola HBC who are committed to more sustainable and advanced delivery solutions is testament to the realization that last mile delivery can be done in a more efficient, safer and greener way,” Healy said.

Christopher Ash, senior vice president of aviation business development for Hillwood, said the mixed-use development provides a unique environment to test new technologies.

“At Hillwood, we are a team collaborating to bring innovative supply chain technologies to North Texas and provide next-level amenities to the communities we reach,” he said.

The Coca-Cola HBC investment will also see Manna collaborate with the bottling partner on other new ventures. Last year Healy said in an interview that Manna would first expand in Europe before looking to the US. It is understood the company is still planning mainland European operations this year.

The trial in Dallas/Fort Worth puts Manna right in the crosshairs of one of its competitors. Israeli drone delivery company Flytrex has been operating in the area in recent years as well as another location in North Carolina, as it focused on the US market first.

## Inmarsat and Heron to enable uncrewed aircraft in Singaporean airspace

**I**nmarsat has welcomed Singapore-based Heron AirBridge, a specialist in Uncrewed Aircraft System Traffic Management (UTM) in the Asia Pacific region, as the latest company to join its Velaris Partner Network, following a Memorandum of Understanding (MoU) signed today at Drones Asia.

Working alongside regional regulators, the two companies will enable the safe integration of uncrewed aircraft into Singapore’s commercial airspace by integrating Inmarsat Velaris, a highly reliable command and control (C2) datalink built for UAVs, with Heron’s AirBridge, a complete and flexible UTM system.

Inmarsat will also supply Heron with its low size, weight, power, and cost (SWaP-C) Velaris satellite terminals for UAVs, delivering the secure datalink needed for Beyond Visible Line of Sight (BVLOS) operations. The collaboration will mark the first deployment of Velaris technology in Asia Pacific and trials will commence later this year.

In tandem, Inmarsat and Heron will leverage the Velaris Partner Network, working with stakeholders across the aviation community to develop regulatory frameworks and technologies that will boost Uncrewed Aerial Vehicle (UAV) numbers in Singapore’s airspace and provide a blueprint for successful integration that can be rolled out worldwide.

Joel Klooster, Senior Vice President, Aircraft Operations & Safety, Inmarsat Aviation, said “Uncrewed aviation is a sector poised for growth. The air vehicles and communications technology are ready, but unlocking their full potential hinges on consistent, global regulatory progress.

“Together with Heron, we are creating a blueprint for the integrated airspace of the future. Inmarsat’s Velaris technology, coupled with Heron’s regional domain expertise, will ensure operators of airspace and UAVs have the tools they need to drive regulatory acceptance in the region and beyond.”

Ryan Lee, CEO and Co-Founder, Heron AirBridge, added “Our partnership with Inmarsat is a major step towards increasing UAV integration into Singapore’s crowded airspace and updating regulation so that our efforts can be replicated worldwide. Working together, we look to establish Singapore as a world leader in this burgeoning sector, sharing our vision of creating value through the utilisation of low-level airspace globally. Inmarsat was the sure partner in powering the movement, with Velaris ensuring that we’re equipped with the core network and datalink capabilities we need to drive UAV integration.”



# World's first: Belgian Citymesh helps save lives with drone shield

**W**orld's First! Keep an eye on the sky because with SENSE, Belgian Citymesh is introducing a network of 70 Safety Drones built to support our emergency services. In a world's first, police stations and fire stations across Belgium will have a Drones-in-a-Box (DiaB) solution at their disposal.

## From smart city to smart country

World's First! Keep an eye on the sky because with SENSE, Belgian Citymesh is introducing a network of 70 Safety Drones built to support our emergency services. In a world's first, police stations and fire stations across Belgium will have a Drones-in-a-Box (DiaB) solution at their disposal. When emergency services receive a call, depending on the type of call, the Safety Drone will take off to gather critical information in the first 15 minutes. Thanks to 4K high definition & thermal images enriched with AI, the emergency services get a lot more info on the situation and can thus make better and faster decisions... Crucial minutes for a human life.

Every year, more than two million urgent calls reach our emergency centres. Based on that information, they have to decide what actions the police or fire brigade can take. A crucial decision that determines the success and speed of the intervention. Unfortunately, they often have to make that decision based on incomplete information. After pilot projects from 2018 in Kortrijk (Fluvia), Brussels Airport Company (BAC) and Port of Antwerp Bruges, we completed the first full integration in Genk in the summer of 2022.

"Now, four years later, Citymesh is introducing SENSE. By scaling up the number of Safety Drones to 70, we want to create a drone grid across Belgium as a tool for emergency services. Something that does not yet exist anywhere else in the world, crazy right? We are the first Belgium to go from a smart city to a smart country. In each of the 35 emergency zones, two Drones-in-a-Box (DiaB) will be available. We believe very hard in this story at Citymesh, this can really save lives," said Hans



Similon, General Manager - Citymesh Safety Drones.

## Saving lives by saving time

Citymesh's Safety Drones should help emergency services work even more efficiently. Today, they often do not know what awaits them the moment they turn out. In that initial chaos, they lose precious time. Once emergency services receive a call, a Safety Drone can autonomously take off and fly to the scene of the disaster to take accurate images. Those images are sent over Citymesh's 5G network to the emergency centre and emergency workers. On top of that, they are enriched using AI. This allows the drones to automatically detect smoke plumes, but also, for example, fire areas and people.

As a result, emergency workers get a better view of what is happening where and are thus faster and more prepared at the scene. This information not only saves lives and environments (such as forests and residential areas). SENSE also increases efficiency, as police and fire brigades can send out their units in a more targeted way.

## Who is piloting these Drones?

From various Remote Operations Centres, pilots are available 24/7 to conduct the flights and intervene so that emergency services get the right images at the right time. The safety of the flights is ensured by a UTM platform

where everything is logged and coordinated. If you want to know more about how everything works, feel free to give us a call.

## Why Citymesh?

Citymesh is the expert on 5G networks. 5G is essential for this project. Thanks to 5G, the drones can be remotely controlled and there is a reliable high broadband connection for the drone and the video images. This allows the emergency services to view the footage in real time, even before someone is at the scene. Citymesh is also no stranger to the world of drones. In 2018, it launched Safety Drones as a pioneer in Belgium through a pilot project in Genk, Port of Antwerp-Bruges and Kortrijk, among others.

On top of that, CEO Mitch De Geest has been a firefighter himself for more than 20 years. So he knows the workings of our emergency services well and knows where their resources often fall short. "SENSE sits at the intersection of those three fields of knowledge (5G, drones and emergency services). It is therefore only a logical step for Citymesh to immediately launch the world's first drone grid to support emergency services after the pilot project. This is how my greatest passions come together nicely," says Mitch De Geest, CEO of Citymesh.

For the implementation of this project, Citymesh is assisted by SkeyDrone, Cegeka and IDLabTE.

# AFSOC Selects MQ-9B SkyGuardian for UAS Family of Systems Concept



**G**eneral Atomics Aeronautical Systems, Inc. is proud to announce a new contract with U.S. Air Force Special Operations Command (AFSOC) to provide three MQ-9B SkyGuardian® remotely piloted aircraft systems to its first U.S. customer.

AFSOC's acquisition of MQ-9B builds on more than 20 years as a GA-ASI partner and more than 14 years flying the MQ-9A Reaper, operating more than 40 aircraft in harsh environments around the world.

MQ-9B will feature a key role in developing AFSOC's new Adaptive Airborne Enterprise (A2E) concept, which envisions AFSOC projecting air power for special operations forces from beyond the horizon, using a family of large UAS and expendable, small UAS

from permissive to denied environments.

"We're very excited to continue our great partnership with AFSOC well into the future," said David R. Alexander, president of GA-ASI. "MQ-9B is the ideal platform for inserting air-launched effects into potentially hostile environments. The MQ-9B's combination of range, endurance, reduced manpower footprint, and overall flexibility will make it a true centerpiece of AFSOC's future family of advanced UAS systems."

MQ-9B represents the next generation of UAS, having demonstrated airborne endurance of more than 40 hours in certain configurations, automatic takeoffs and landings under SATCOM-only control, as well as a GA-ASI-developed Detect and Avoid System,

among other upgrades. Its development is the result of a company-funded effort to deliver a UAS that can meet the stringent airworthiness certification requirements of various global military and civil authorities.

MQ-9B has garnered significant interest from customers throughout the world. After the UK Ministry of Defence selected MQ-9B SkyGuardian for its upcoming Protector program, the Belgian Ministry of Defense signed a contract for SkyGuardian. The Japan Coast Guard is currently operating MQ-9B in the SeaGuardian® configuration, which the Japan Maritime Self-Defense Force (JMSDF) also recently selected for its Medium-Altitude, Long-Endurance (MALE) RPAS Trial Operation Project beginning in April.



# Flying Lion and Iris Automation Add Airspace Awareness Capabilities for Drone as First Responder (DFR) Programs

Drone service provider, Flying Lion, Inc., and safety avionics technology innovator, Iris Automation have entered into a new partnership to provide Drone as First Responder (DFR) programs with enhanced airspace awareness. This partnership will see the addition of Iris Automation's Casia G ground-based detect and alert system to the Flying Lion suite of services.

With over 22,000 DFR flights logged to date, Flying Lion has vast experience working closely with leading law enforcement agencies to provide rapid emergency response and aerial assessment through DFR program including for Chula Vista PD, Redondo Beach PD, Santa Monica PD, and Beverly Hills PD.

In order to comply with current FAA requirements, Flying Lion and these DFR programs have been utilizing human remote pilots in command (RPICs) and visual observers (VOs) to allow for BVLOS operations in their cities. While this has been necessary to comply with FAA certificate of authorizations (COAs) for these agencies, it is not optimal for ongoing or large-scale DFR operations. DFR programs enable the immediate dispatch of a drone in response to a 911 call for the purpose of real-time aerial situational awareness, in advance of, and to support ground units to enhance community and first responder safety.

With the implementation of Casia G, the next generation of DFR programs will have the capability to create a volume of surveilled airspace to conduct drone operations without the need for human visual observers. Casia G is a small, passive, low-power, weather-hardened device that can be installed anywhere there is a clear view of the sky. This can be a rooftop, street light pole, cellular tower, or other vertical structure. Casia G detects cooperative aircraft using ADS-B and non-cooperative aircraft using Iris' patented computer vision and artificial intelligence software. Once an aircraft is detected, two concepts of operation are possible:

Casia G alerts the Remote Pilot in Command (RPIC), providing the classification



and location of the detected aircraft. The RPIC then initiates an avoidance maneuver and resumes the mission once the detected aircraft is clear of the operational area.

Casia G sends an automated collision alert to the uncrewed aerial system's command software, resulting in the system automatically executing a pre-programmed avoidance maneuver.

Multiple Casia G nodes can be deployed to cover any operational area, enabling drones to cover an entire municipality. DFR program managers can then enjoy BVLOS operations of multiple UAS from multiple launch points, enabling minimum response time. In addition, the ability to fly routine BVLOS missions enables the centralized management and operations of the UAS, and integration into 911

dispatch and real-time crime center operations. There are more than 18,000 municipal police departments in the USA, and only 200 of them have access to an aerial asset. BVLOS operation of drones enables the remaining 17,800 departments to not only have access to an aerial asset, but within existing budget constraints - relieving pressure on the human capital in police operations.

"Casia G provides an inexpensive and effective way for customers to take advantage of BVLOS flight through increased airspace awareness without the use of visual observers. The new types of DFR programs are a perfect example, and working with Flying Lion and its incredible work across law enforcement to offer these solutions is an important step." Iris Automation CEO, Jon Damush

“

"Flying Lion is proud to partner with such a forward-thinking organization as Iris Automation, to provide a safer environment to conduct DFR operations. The Casia G technology for BVLOS drone flights breaks new ground for public safety – it not only saves time and resources but also allows first responders to better protect the communities they serve."

Flying Lion President & Founder, Barry Brennan

”



## Sheboygan County, Wisconsin, Announces the Launch of the FlySafe Program, powered by AirHub®, in Partnership with Airspace Link

The Sheboygan County Planning & Conservation Office is proud to announce the launch of the FlySafe Program, powered by AirHub®, aimed at safely integrating drones into the community. With the increasing popularity and accessibility of drones, the County recognizes the need to ensure they are used responsibly and in accordance with regulations.

The FlySafe Program enables Sheboygan County residents and visitors to quickly understand FAA drone rules, local advisories, ground risk hazards, and additional information to help them plan safer and compliant flights when operating in the region. Pilots can access FlySafe via the Drone Operations page on the County Planning and Conservation Department page under Programs/Associations (<https://www.sheboygancounty.com/departments/departments-f-q/planning-and-conservation/programs-associations/drone-operations>).

The FlySafe Program is critical in establishing two-way communication between drone pilots and their communities to ensure operations are in harmony with the community providing near-instant authorizations when operating in controlled airspace.

Sheboygan County is committed to promoting innovation and technology while maintaining public safety. Launching the FlySafe Program is a step in the right direction toward achieving that goal.

“We are excited to launch the FlySafe Program and see the positive impact that drones can have on our community,” said Keith Abler, Chairman of the Planning, Resources, Agriculture & Extension Committee. “By working together, we can ensure the safe and responsible integration of drones into our daily lives” he also went on to add.

Sheboygan County is a great place to live, work, and play. From breathtaking views of Lake Michigan with two miles of sandy beaches to world-class sailing and golfing, and premier charter fishing, this coastal community has much to offer including consistently being ranked as one of the safest metro areas in the country. The County is also consistently ranked as one of the top five counties in the U.S. where the manufacturing industry is thriving, Sheboygan County’s diverse economy provides a unique opportunity for drones to add value in a variety of use cases.

“Drones increasingly provide value across use cases like infrastructure inspection and just-in-time parts delivery, making jobs safer and more efficient. At the same time, the use of drones is becoming increasingly popular amongst hobbyists and tourists. Implementing the FlySafe Program in Sheboygan County is a great first step toward implementing the necessary infrastructure and platforms to ensure drone operations are safe and in harmony with the community,” says Michael Healander, Co-Founder and CEO of Airspace Link.

## Russian Fighter Strikes US Unmanned Aircraft



A Russian Su-27 aircraft struck a U.S. Air Force intelligence, surveillance and reconnaissance MQ-9 unmanned aerial vehicles propeller, causing U.S. forces to bring it down into international waters of the Black Sea early this morning, according to U.S. Air Force Gen. James B. Hecker, commander, U.S. Air Forces Europe and Air Forces Africa in a statement.

“Several times before the collision, the Su-27s dumped fuel on, and flew in front of the MQ-9 in a reckless, environmentally unsound and unprofessional manner. This incident demonstrates a lack of competence in addition to being unsafe and unprofessional,” Hecker stated.

The MQ-9 aircraft was conducting routine operations in international airspace when it was intercepted and hit by a Russian aircraft, he added.

“This incident follows a pattern of dangerous actions by Russian pilots while interacting with U.S. and allied aircraft over international airspace, including over the Black Sea. These aggressive actions by Russian aircrew are dangerous and could lead to miscalculation and unintended escalation,” Hecker stated.

Pentagon Press Secretary Air Force Brig. Gen. Pat Ryder briefed the media regarding the incident. The incident most likely caused damage to the Russian aircraft, although it was able to land, he said. The U.S. Air Force routinely flies aircraft throughout international airspace in coordination with applicable host nation and international laws and will continue to do so, he said.





## ArroTech Corporation Named as Finalist in AUVSI XCELLENCE Awards

**A**rroTech Corporation has been named a finalist in the XCELLENCE Awards by the Association for Uncrewed Vehicles Systems International (AUVSI). The company was selected from a pool of accomplished applicants as one of five finalists for the Humanitarian category. Winners will be announced at XPONENTIAL 2023 on May 8-11 at the Colorado Convention Center in Denver, CO. Learn more about the AUVSI XCELLENCE awards here.

“This year, XPONENTIAL is all about designing a shared plan for the future of autonomy,” said Brian Wynne, President and CEO of AUVSI. “There’s no better place to announce the 2023 XCELLENCE award finalists. Together, they are redefining what’s possible with uncrewed and robotic technology.”

“ArroTech’s mission is to develop innovative technologies to help rid the world of dangerous explosive remnants of war (ERW), which include unexploded ordnance (UXO) and abandoned explosive ordnance (AXO). We are very honored that our new GEON E61 autonomous drone has been selected as a finalist in the XCELLENCE Awards,” said Steve Millaway, CEO of ArroTech.

AUVSI’s XCELLENCE Awards honor innovators with a demonstrated commitment to advancing autonomy, leading and promoting safe adoption of uncrewed systems and developing programs that use these technologies to save lives and improve the human condition. Featuring a proven onboard military-grade metal detector, the GEON E61 is the world’s first fully autonomous drone optimized for military, humanitarian, and commercial demining organizations. Currently, these organizations detect ERW and metallic landmines using metal detectors that are handheld and rolling cart-based. Although effective, this method is dangerous, time-consuming, and extremely expensive.

Using the GEON E61, the GPS coordinates of metallic objects can be more safely provided to explosive ordnance disposal (EOD) personnel in a fraction of the time and cost. Flight plans are easily configured in seconds with user-friendly smartphone and tablet apps.

Ukraine is one of the world’s largest providers of wheat, corn, barley, and sunflower oil, and these exports have been severely impacted by the war in Ukraine. Starting this spring, ArroTech’s drone operators will use GEON E61s to help Ukraine farmers locate and remove hundreds of thousands of ERW and metallic landmines from their fields. The company hopes to use donations to help cover its costs so that it can provide these services to Ukraine’s farmers for free.

## Skyrise celebrates the sixth anniversary of its first unmanned VTOL flight



**S**kyrise, bringing trust, safety, and accessibility of flight for all through its flagship technology, commemorates the sixth anniversary of the first lightweight unmanned vertical take-off and landing (VTOL) flight achieved on March 29, 2017. This aviation milestone has become a driving force in Skyrise’s innovative approach to bringing the joy and freedom of aviation to all as it heads toward FAA (Federal Aviation Administration) certification.

Six years ago, Skyrise set out to develop a technology stack, making flying a general aviation aircraft simpler and safer. Founder and CEO Dr. Mark Groden and a team of four spent nearly a year working to earn FAA (Federal Aviation Administration) approval to fly an unmanned aircraft above 55 pounds (above typical drone weight). The team achieved the first lightweight unmanned flight within three months of their initial seed funding.

Building on the first unmanned flight, the company operated the highest volume, full-service, multimodal door-to-door air-taxi service in the world, leading to the development of the first cost-effective instrument flight rules (IFR) VTOL. Skyrise has grown from a team of four to nearly 100 with a similar objective of making flying simpler and more accessible, democratizing the skies.

Skyrise’s intuitive, highly-automated, airframe-agnostic, and universal flight control system accelerates accessibility, safety, and overall ease of flight by decades. Anyone can complete an entire flight from skids up to set down with the same familiar tap-and-swipe gestures used on a mobile device.

“Celebrating this anniversary is a reminder of our humble beginnings and an extraordinary triumph in our company history,” said Groden of Skyrise. “We continue to celebrate our early achievements to bring increased ease and safety to every flight across general aviation.”

On average, there are more than 300 general aviation deaths each year in the United States, according to the National Transportation Safety Board (NTSB). Most of these incidents occur due to loss of control or pilot error, an issue Skyrise and FlightOS address head-on. Skyrise FlightOS can reduce general aviation fatalities and allow anyone to enjoy the freedom of piloting an aircraft. Skyrise’s FlightOS offers 10-9 safety standards (one-in-a-billion chance of catastrophic system failure) through a full fly-by-wire system with triply redundant, dissimilar architecture, increasing general aviation safety to commercial air transport levels. FlightOS has already achieved 100% means of compliance for its full-stack technology solution after completing a major System Review with the FAA, including hardware, software, and human-factor components. This achievement accelerates the company’s path toward certification, focusing on simplified vehicle enhancements of already certified airframes.



# Teledyne FLIR Adds New Boson+ Thermal Resolution Options, Radiometry, and MIPI Interface Simplifying Embedded System Integration

Industry-leading 20-mK-sensitivity Boson+ with 640x512 and 320x256 resolutions is ideal for unmanned platforms, security applications, handhelds, wearables, and thermal sights

GOLETA, Calif., April 3, 2023 - Teledyne FLIR, part of Teledyne Technologies Incorporated, today announced the expansion of the Boson+ thermal camera module product line with twenty-four compact models featuring 320 x 256 resolution. Radiometry, the ability to take the temperature of every pixel, as well as both MIPI and CMOS interfaces are now also available on all resolutions. With these updates and a thermal sensitivity of 20 millikelvin (mK) or less, Boson+ is the most sensitive longwave infrared (LWIR) camera line in the market and is ideal for integration in unmanned ground vehicles (UGV), unmanned aircraft systems (UAS), automotive, wearables, security applications, handhelds, and thermal sights.

“Boson+ is in volume manufacturing and is a drop-in upgrade for systems designed with Boson, making upgrades low risk and plug-and-play simple,” said Dan Walker, vice president, product management, OEM cores, Teledyne FLIR. “With customer-selectable USB, CMOS, or MIPI video interfaces, it is now easier than ever to integrate Boson+ with a wide range of embedded processors from Qualcomm, Ambarella, and more.”

Made in the USA, the Boson+



features 640 x 512 and now 320 x 256 resolutions utilizing the latest 12-micron pixel pitch thermal detector within a size, weight, and power (SWaP) optimized package.

The noise equivalent differential temperature (NEDT) of 20 mK or less offers enhanced detection, recognition, and identification (DRI) performance, especially in low-contrast and low-visibility environments. With improved automatic gain control (AGC) and video latency compared to previous iterations of Boson, the Boson+ delivers dramatically enhanced scene contrast and sharpness while improving tracking, seeker performance, and decision support.

Boson+ customers gain access to the US-based Teledyne FLIR Technical Services team for integration support, which

reduces development risk and shortens time to market.

Designed for integrators, the Boson+ is available with a variety of lens options, comprehensive product documentation, an easy-to-use SDK, and a user-friendly GUI. Boson+ is dual use and classified under the US Department of Commerce jurisdiction as EAR 6A003.b.4.a.

The Teledyne FLIR Boson+ is available for purchase globally from Teledyne FLIR and its authorized dealers. To learn more or to purchase, visit <https://www.flir.com/bosonplus>.

To view the Boson+ thermal camera modules in person, please visit booth #1003 at the SPIE Defense and Commercial Sensing Exhibition, May 2-4, 2023, in Orlando, Florida, or booth #1811 at AUUSI Xponential, May 9-11, 2023, in Denver, Colorado.

# Abu Dhabi Announces World's Largest Autonomous Racing League



In line with its vision of building a world-class research and development (R&D) hub in Abu Dhabi, ASPIRE, has today announced the launch of the world's largest autonomous racing league. The league will kick off with the autonomous car race set to happen in Q2 of 2024. Set to take place at the iconic Yas Marina Circuit in Abu Dhabi, United Arab Emirates, the autonomous car race will be the first in a series of autonomous vehicle races. With a prize pool of up to USD 2.25 million, the Abu Dhabi Autonomous Car Race will feature the Dallara-built Super Formula cars, the usage of which has been enabled by Japan Race Promotion, Inc. (JRP). The Super Formula cars are the fastest in the world, outside of Formula One, and they will be adequately equipped for autonomous racing.

A core goal of the Abu Dhabi Autonomous Racing League is to push the boundaries of autonomous mobility by hosting challenges to advance R&D in autonomous racing and artificial intelligence (AI). Additionally, the applied research executed in preparation for the League will develop cutting-edge and low-risk solutions to significantly reduce fuel consumption and carbon emissions through the increased efficiency, while at the same time increasing safety and performance standards of motorsports and commercial transportation.

JRP will enable ASPIRE to leverage one of the world's most advanced racing cars in order to push the limits and high speeds of autonomous driving by providing the Abu Dhabi Autonomous Racing League with exclusive access to the Dallara Super Formula car. Key members of JRP will also share their significant

expertise in race management accumulated for over 50 years since 1973.

Race viewers will be invited to dive into a new world of entertainment, experiencing the thrill of head-to-head autonomous car racing, with live updates from Augmented Reality (AR) and Virtual Reality (VR) infographics and real-time displays shown on screen.

His Excellency, Faisal Al Bannai, Secretary General, Advanced Technology Research Council, said: "Abu Dhabi is a rising hub for STEM empowerment and envisioning a decarbonized economy, which is why we are proud to launch the Abu Dhabi Autonomous Racing League. Autonomous racing is continuing to gather steam, given its significant potential to disrupt the future of transportation and mobility. We are proud to announce the Abu Dhabi Autonomous Racing League, where we will set new benchmarks for autonomous vehicles and help them pre-empt and prepare for unknown challenges as they become more mainstream. In addition to creating a community platform for motorsports fans, the Abu Dhabi Autonomous Racing League will feature an open development model, supporting faster progress, faster testing, and greater innovation. Machine learning and reinforcement learning will be key to collecting data and developing the technology of these vehicles."

Yoshihisa Ueno, President, Japan Race Promotion, Inc. commented: "In Japan, we are proud of our pioneering heritage in both motor racing and advanced technology. As Japan's premier racing series, SUPER FORMULA, we are delighted to partner with ASPIRE for the Abu Dhabi Autonomous Racing

League to see racing and technology come further together. Since 1973, we've accumulated over 50 years of expertise, and always operated at the forefront of racing. Our SF23 race car, which will be used in the Abu Dhabi Autonomous Racing League, is a huge leap forward in technical performance and, importantly, carbon neutrality, so it's very exciting to see it being driven by an autonomous technology stack. This partnership with ASPIRE is yet another example of our ambition and we cannot wait for the first race."

Andrea Pontremoli, CEO of Dallara, said: "For over 50 years, the Dallara name and motor racing have been in lockstep. We have designed and manufactured some of the most important racing cars in the sport, forever pushing the boundaries of what has been possible. To continue that journey, and in line with our vision to design and build the fastest and safest cars in the world, we are so excited to partner with ASPIRE to shape the future of mobility. The Abu Dhabi Autonomous Racing League will set the pace and drive new levels of performance, safety, efficiency, and importantly, sustainability, in autonomous technologies. Watch this space."

The Autonomous Car Race will be the first among a series of autonomous vehicle races in the Abu Dhabi Autonomous Racing League launching in 2024, which will include autonomous offroad racing, autonomous drone racing, and more. This will make Abu Dhabi and the United Arab Emirates the world capital for extreme autonomous racing. Open to all teams from previous autonomous racing challenges, teams from universities around the world, public and private research institutes, will be welcome to participate.





## Qii.AI Wins Software Contract to Provide AI Corrosion Detection for Inspection of Royal Canadian Navy Vessels

Qii.AI, the provider of AI-assisted digital inspection software, announced today that it has entered into a license and AI customization agreement with Canada's Naval Engineering Test Establishment («NETE») to provide the Qii platform for use in the Royal Canadian Navy's ship inspection program.

Using the Qii.AI system, ship inspections from drone imagery can be completed in a fraction of the time taken for traditional methods. Artificial Intelligence then accelerates the process even more by automating the detection and measurement of issues in need of remediation, like corrosion or other problems.

According to Qii.AI CEO, Michael H. Cohen, there is potential for the technology that Qii.AI is providing to the Canadian Navy to be applied broadly across military and non-military shipping assets, and that he hopes this is the first of many such engagements with the Canadian Armed Forces as well as NATO partner forces, saying:

“We are extremely proud of the success we have had so far in working with the Canadian Navy through its Sandbox program, to bring this project to this point, and we are extremely excited to commence work customizing the full spectrum of our technological capabilities, from thermal, to visual, to sonar, to fit the Navy's unique needs. We're very confident that once we have shown the efficiency and accuracy that we can add for Canada's naval inspection program, other branches of the military and partner militaries will take notice.»

While the Qii.AI platform provides the data analytics, the visual data gathering part of the Navy's new ship-inspection program will be carried out using small inspection drones from Skydio.

Skydio cofounder and CEO Adam Bry said, «Autonomous drones will revolutionize naval inspections by creating comprehensive digital copies of vessels. Skydio 3D Scan automates the capture process, and partnering with Qii.AI enables an end-to-end AI-driven workflow to help operators make better decisions faster. We are excited to help build this program for the Royal Canadian Navy, and are looking forward to more success in this sector.»

## Leopard Imaging Announces Intelligent Embedded Solutions Collaborating with Intel



Leopard Imaging Inc. (Leopard Imaging), a global leader in intelligent embedded camera design and manufacturing launched its new state-of-the-art camera LI-ADL-ADP-IMX415-MIPI-081H based on Intel Atom processors x7000E Series, Intel Core i3 processors and Intel Processors N-Series.

Founded in 2008, Leopard Imaging has supported thousands of well-known companies in advanced imaging solutions with its experienced engineering teams, high-quality manufacturing capabilities in both “Made in U.S.A” and offshore, and quality management certifications such as IATF16949 for the automotive industry and AS9100D for the aerospace industry.

Powered by Intel processors, Leopard Imaging has designed, manufactured cameras, developed camera driver software, and provided image tuning for global customers in robotics, edge AI, industrial machine vision, and autonomous machines applications.

Intel Atom processors x7000E Series and Intel Core i3 processors [CD17] break new ground for x86 processors in the 6W to 15W base processor power range. Built with the same Efficient-cores and Intel UHD Graphics as 12th Gen Intel Core processors, the series supports Intel Advanced Vector Extensions 2 (Intel AVX2) and Intel Deep Learning Boost (Intel DL Boost) for accelerated deep learning inference and media processing.

“We are very excited collaborating with Intel,” said Bill Pu, president and co-founder of Leopard Imaging. “We are looking forward to meeting our partners and more high technology companies who are seeking advanced image solutions at Embedded World 2023.”



# Kneron KL720 supports Qualcomm for virtually seamless AI for robotics, drones and industry 4.0



Leading edge AI solutions provider Kneron announces that its KL720 AI SoC now supports the Qualcomm® Robotics RB1 and Qualcomm® Robotics RB2 Platforms from Qualcomm Technologies, Inc. for robotics, drones, and industry 4.0. Based in San Diego, Kneron is backed by the likes of Sequoia, Horizons Ventures, Qualcomm Ventures, and Foxconn.

For robotics use cases, the KL720 supports these Qualcomm Robotics RB1 and RB2 Platforms in deploying object detection for smart vacuum cleaners, customer service robots, as well as drones. For industrial use cases, applications include automatic optical inspection, safety monitoring, as well as predictive maintenance.

The combined solution of two Kneron KL720 chips paired with the Qualcomm® QRB2210 or Qualcomm® QRB4210 System-on-Chips (SoCs) that power the Qualcomm Robotics RB1 and RB2 Platforms respectively, can achieve up to four-fold increase in AI compute

power compared to the Qualcomm Robotics RB2 Platform alone. Moreover, Kneron's core reconfigurable hardware architecture supports the cascading of multiple KL720 chips without incurring any losses in performance or efficiency.

The KL720 is a power-efficient AI chip with an effective compute power of 4 TOPS, and it stands above the competition in its high frames per second (FPS) as well as frames per second per watt (FPS/W) performance. The solution's efficiency is enabled by Kneron's highly streamlined hardware architecture design as well as superior data pipeline organization.

The KL720 supports various sensor and information inputs ranging from color image, near-infrared data, millimeter waves, to voice and language data. To date, beyond robotics and industry 4.0 use cases, the chip has been commercialized in IP cams, edge servers, as well as vehicle use cases.

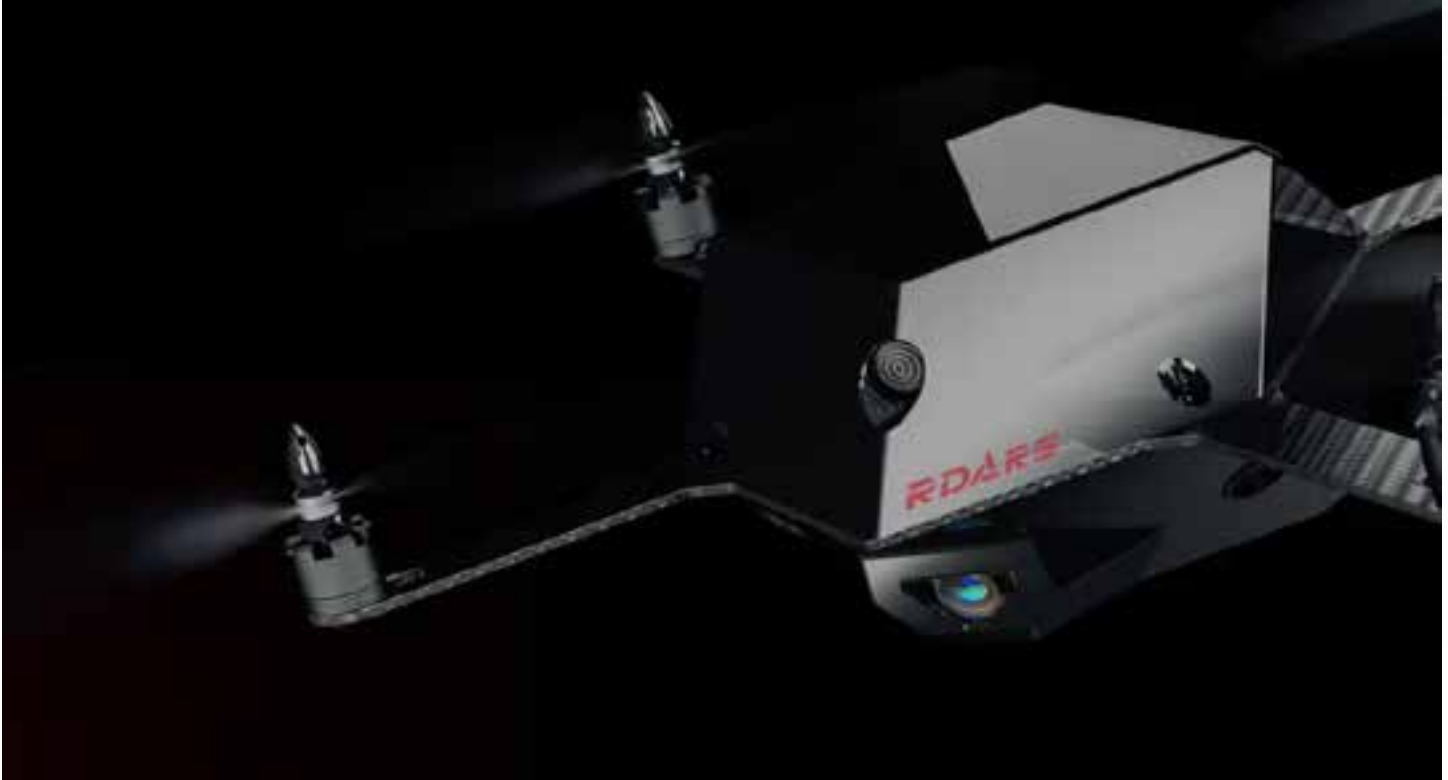
In conjunction, the KL720 alongside Qualcomm® IoT solutions offer a seamless experience for customers and developers

offloading heavy AI tasks from main board to companion chip, bringing on real-time, high-accuracy AI inferencing at a competitive cost.

"As a leading provider of edge AI accelerator solutions, Kneron is excited to support Qualcomm Technologies' new hardware platform for IoT and robotics," said Albert Liu, founder and CEO of Kneron. "In collaboration, we offer compatible solutions that are both high-accuracy and cost-effective, seamlessly enabling everyday robotics and IoT projects for customers as well as developers."

"The Qualcomm Robotics RB1 and RB2 Platforms each provide a comprehensive, cost-effective solution to quickly deploy everyday robotics and IoT projects," said Dev Singh, vice president, business development, and head of building, enterprise and industrial automation, Qualcomm Technologies, Inc. "We are pleased to work with Kneron. With the KL720 supporting our robotics and IoT platforms, we amplify the value of the combined solutions and better serve customer applications."

## RDARS to Integrate Aloft's Advanced Unmanned Aircraft System Traffic Management Products into the Eagle Watch V1.5 RC1 Release



**R**DARS Inc., an autonomous robotics and drone technology company developing advanced systems for alarm system augmentation and surveillance, is pleased to announce that after conducting significant research and testing of various UTM products, the Company has now formed a working relationship with Aloft Technologies, Inc. ("Aloft") ([www.aloft.ai](http://www.aloft.ai)) to integrate its advanced Unmanned Aircraft System Traffic Management (UTM) applications and features into the forthcoming Eagle Watch V1.5 RC1 release.

This update will provide the Company's Eagle Watch software platform ("Eagle Watch") with advanced airspace management and near instant response from the Federal Aviation Administration (FAA) for flight clearance. Autonomy is a major feature of the Eagle Watch, and having a tight integration with instant and responsive regulatory adherence is critical to remote operations. By having access to Aloft's UTM system, remote Eagle Watch operators can get instant airspace awareness,

file and receive electronics permissions, and transmit Remote ID information as required by the FAA during the automated pre-flight and pre-landing procedures. Aloft's UTM platform and its seamless integration with Eagle Watch provides the remote operator with critical immediate situational awareness and enables compliance with the FAA's Remote ID requirements for Beyond Visual Line-of-Sight (BVLOS) operations, and Low Altitude Authorization and Notification Capability (LAANC), a collaboration between the FAA and private industry partners which supports unmanned Aerial Services (UAS) integration into the U.S. national airspace.

The Eagle Watch technology allows for operations to be conducted in a very confined airspace, on private property, at low altitude, and with strict limitations regarding the Company's Eagle Eye drone's flight patterns so that operators can conduct their operations in a manner that minimizes disruptions to the surveillance area. Integrating the Aloft UTM management platform provides operators with

further instant situational awareness of any potential conflict as airspace changes in real-time.

"The Aloft integration further improves our goal of providing the highest quality of service with real time security drone response in compliance with regulatory concerns in a matter of seconds versus minutes and is critical for our real time security autonomous response system. We believe that this integration is a game changer for the RDARS drone system," said Jason Braverman, Chief Technology Officer.

"We are excited to have RDARS integrate our new developer tools with map tiles for visualization and APIs to provide programmatic access to Aloft's exclusive dataset and capabilities for maximum compliance and situational awareness," said Josh Ziering, Aloft's CTO and Co-Founder. "Enabling companies like RDARS to build Aloft UTM capabilities into their own products is how we envision the future of drone flight as operations scale and become more complex."

## Drone Delivery Canada and Pegasus Imagery Ltd. Sign MOU to Develop Onboard Detect and Avoid Technology for Condor



**D**rone Delivery Canada Corp. is pleased to announce that it has signed a memorandum of understanding with Pegasus Imagery Ltd. (“Pegasus”) to work together to develop and implement on board detect and avoid technology (“DAA”) for DDC’s heavy lift Condor remote piloted aircraft (“RPA”).

The basis of the development effort will be to integrate Pegasus’ proprietary A3S™ DAA system onto the Condor. A3S™ is an Autonomous Airspace Awareness System using sensor fusion to merge onboard sensor data with artificial intelligence to detect, track and autonomously avoid other aircraft and obstacles.

This project builds on DDC’s efforts to implement DAA technology into all its RPAs to move towards fully automated

flights for all operations to be conducted in accordance with the Canadian Aviation Regulations and Transport Canada flight authorizations, while being remotely monitored by DDC through its proprietary FLYTE software from its Operations Control Centre located in Vaughan, Ontario.

With the Pegasus A3S™ onboard DAA system integrated into the Condor, DDC would have a full suite of DAA systems integrated into its patented drone delivery technology enabling automated flights and enable DDC to increase its offerings into potentially more complex air spaces, while significantly increasing operational efficiency.

“We are thrilled to work with the Pegasus team on this exciting project which represents a final piece towards achieving

fully automated flights for the Condor RPA. Cole and his team have made tremendous progress on their proprietary A3S™ system and we are excited to integrate this technology onto our Condor» said Steve Magirias, CEO of DDC.

“A3S™ unlocks the full potential of the Condor RPA and will enable Drone Delivery Canada to commercialize heavy lift cargo delivery for industry and government customers at scale, «said Pegasus CEO Cole Rosentreter. This will shape the next century of middle-mile logistics, through a flexible, scalable and certifiable safety system” said Pegasus CEO Cole Rosentreter. “We’re excited to be working with Steve and the DDC team to launch this game-changing capability together in Canada and future global markets.





## Airbus and Norwegian Air Ambulance Foundation to Develop City Airbus NextGen's Future Medical Missions in Norway

**A**irbus Helicopters has partnered with the Norwegian Air Ambulance Foundation to develop CityAirbus NextGen's future missions for medical services in Norway. To this end, the parties will jointly measure the added value of electric vertical take-off and landing (eVTOL) aircraft for a selection of medical services use cases across the country to integrate the operational requirements right into the configuration of Airbus' eVTOL.

Focusing on how eVTOL aircraft can be used for different types of air medical missions, Airbus Helicopters and the Norwegian Air Ambulance Foundation will elaborate a comprehensive roadmap toward reducing emergency response time through the researched scenarios in Norway. In order to improve patient outcome and the overall performance of the Norwegian Emergency Medical Services system, the signatories will follow a long-term strategic approach to research the complementarity of existing assets, such as conventional helicopters, and eVTOLs when the technology enters into service. This approach could be further expanded in the region through collaboration with other countries to optimise operations beyond the national healthcare system.

Prof. Hans-Morten Lossius, Secretary General of the Norwegian Air Ambulance Foundation, said: "Airbus' aviation expertise across the board is a major asset to help us combine different aircraft for medical services. Complementarity is a key driver in this endeavour: helicopters remain essential to perform EMS missions, whilst eVTOLs can bring additional capabilities to support first responders, for instance by transporting medical specialists to accident scenes or organs from one medical site to another."

Balkiz Sarihan, Head of Urban Air Mobility at Airbus, said: "The Norwegian Air Ambulance Foundation has always been at the forefront of medical innovation, most recently with dedicated research to integrate a CT scanner into a five-bladed H145 helicopter. We're looking forward to working with the Norwegian Air Ambulance Foundation as a strategic partner to further develop the exact missions where our eVTOLs capabilities would contribute to protecting citizens and making sure they can access effective healthcare in Norway."

As a result, the first step toward the creation of a medical eVTOL ecosystem will be the evaluation of the efficiency of the current emergency medical system in Norway, to then simulate different air medical services scenarios, integrating advanced air mobility assets. To develop the right concepts of operations for these complementary air medical missions, Airbus Helicopters and the Norwegian Air Ambulance Foundation will drive the definition of the foundational elements of the eVTOL ecosystem in the country, including for infrastructure, traffic management and energy sourcing and distribution.

Operating a mixed fleet of H135 and H145, the Norwegian Air Ambulance is Norway's national Helicopter Emergency Medical Service (HEMS) operator. With more than 40 years of experience in emergency medical response, the Norwegian Air Ambulance supports pre-hospital care across the country by delivering air ambulance services to provide patients with advanced medical solutions through state-of-the-art aircraft configurations and equipment.

## After Unveiling Its Production Aircraft, Midnight, Last November Archer Nears Completion of Its 1st Build



**A**rcher Aviation Inc. announced that it is nearing completion of the final assembly of its first Midnight, the production aircraft it unveiled last November. All major aerostructures (i.e., wing, tail, and fuselage) have been built and mated together and the company reported it has also installed a significant portion of the wiring, electronics, actuators and other systems. Archer is currently targeting to begin flight testing of this aircraft in mid-2023. This aircraft will be used to enable company testing in advance of "for credit" certification testing.

The company has also now begun component manufacturing for its conforming Midnight aircraft, which will be flown with a pilot. Archer intends to build at least six of these conforming Midnight aircraft to be used as part of its "for credit" testing with the FAA in support of Type Certification. The company is targeting completion of its initial conforming Midnight aircraft in Q4 2023. In turn, that conforming aircraft would then begin piloted flight test operations in early 2024. These conforming aircraft are set to be built at Archer's San Jose, California manufacturing facility and integrated test lab, located strategically just around the corner from its headquarters.

"A lot goes on behind the scenes to advance the development of our aircraft as efficiently as we have. I couldn't be more excited to share the news of Archer's progress on Midnight," said Tom Muniz, Archer's COO. "This latest milestone is further validation of our strategic approach of using known building blocks to enable realistic innovation significantly de-risking our path to certification and mass manufacturing. The team and I are looking forward to moving this aircraft into flight testing soon and continuing on our path to flying our conforming aircraft in early 2024."



## Lilium Teams With Collins Aerospace to Build New Innovative Inceptor System



**L**ilium N.V. developer of the first all-electric vertical take-off and landing (eVTOL) jet, has teamed with Collins Aerospace, to design, develop, and build the Lilium Jet's inceptors – the innovative sidestick system used by the pilot to control the aircraft. Collins is a leader in technologically advanced and intelligent solutions for the global aerospace and defense industry and a Raytheon Technologies business.

The Lilium Jet inceptors will provide safe and intuitive handling qualities, easy access to functionalities, and an aesthetic, ergonomic design. While integrating all conventional mechanical and electrical flight controls into two sidesticks, the Collins system brings a new piloting philosophy for single pilot operations in the eVTOL realm. The system will also be designed to bring significant space and weight savings compared to conventional sidesticks.

Lilium's collaboration with Collins continues the company's strategy of teaming up with established tier one aerospace suppliers to support certification and prepare the industrial ramp-up. As part of the supplier agreement, Collins, with its extensive experience in developing and certifying inceptors for commercial jets, will certify the Lilium Jet's inceptors to commercial aviation standards.

Yves Yemsi, Chief Operating Officer at Lilium, said: "Our partnership with Collins Aerospace allows us to reap the benefit of five decades of experience in flight deck controls. Our two companies' collaborative development approach allows us to re-imagine the cockpit and pilot experience, and further strengthens our path towards certification and commercialization."

"Our extensive experience innovating sidestick design is key when tackling the challenges of redefining the entire flight control philosophy for single-pilot aircraft in this new market of advanced regional air mobility," said Jean-François Chanut, vice president and general manager of Collins Aerospace Propeller Systems. "This innovating and exciting partnership with Lilium is a first step in defining the right solutions toward more automated, sustainable and safe operations for the future of flight"

## SITA & Volocopter Collaborate on Digital Infrastructure for Vertiports

**V**olocopter, the pioneer of urban air mobility (UAM), and SITA, the world's leading IT provider to the air transport industry, have entered a partnership, with SITA selected as Volocopter's preferred digital and IT systems partner for vertiports. Under the agreement, SITA has become the latest investor to join Volocopter's Series E funding round, cementing the strategic vision espoused by this partnership.

UAM will offer a new form of sustainable aviation, replete with multiple mobility options to cities worldwide. The company's launch product, the VoloCity electric air taxi, will operate routes in congested megacities to offer future passengers stable, quiet, and safe flights. Flights can be hailed via designated boarding points (or "vertiports"). The partnership therefore has the potential to shape aviation industry standards.

SITA will deploy its expertise in air transport for the emerging UAM industry, developing new operating standards and a digital-first passenger experience. SITA's portfolio includes a wide range of IT solutions, including airport management and operations, passenger operations, flight and aircraft operations, baggage processing, and border management.

Volocopter is known for its integrated UAM ecosystem approach. Its digital operating system, the VoloIQ, connects all partners, thus enabling a holistic service. The VoloIQ therefore enables a digital-first approach that will translate to end-to-end passenger air transportation experiences. This cloud-based system is in the process of being certified by the relevant aviation authorities.

Christian Bauer — Volocopter's Chief Commercial Officer: "Volocopter consistently takes a holistic ecosystem approach. Working in concert with our partners, we are setting up for commercial operations. This involves establishing the requisite infrastructure, maintenance, flight operations, IT, and customer services. SITA is a leading IT provider for airports and airlines, and we believe there is no better partner to make our seamless travel experience possible."

Sergio Colella — SITA President for Europe: "Volocopter is in pole position to make electric air taxis a reality, benefiting from its first-mover advantage. At SITA, we will play a key role in delivering this new digital UAM world and defining a seamless, smarter approach to air travel in a city environment. Together we will turn the theory into practice as early as 2024 when we expect the first commercial eVTOLs to take flight."



# United Airlines and Archer Announce 1st Commercial Electric Air Taxi Route in Chicago



**A**rcher Aviation Inc. and United Airlines announced plans to launch the first air taxi route in Chicago, between O'Hare International Airport (ORD) and Vertiport Chicago. Vertiport Chicago, North America's largest vertical aircraft take-off and landing facility, is located in the Illinois Medical District near the Chicago Loop. This site was selected as the takeoff and landing site for this airport to city center route because of its unparalleled convenience, access and service. From there, passengers will be able to travel to and from ORD via Archer's Midnight aircraft in approximately 10 minutes. A similar trip by car can take upwards of an hour or more during rush hour traffic.

United and Archer's goal for its UAM network is to provide residents and visitors in the Chicago Metropolitan Area with a safe, sustainable, low noise, and cost-competitive alternative to ground transportation beginning in 2025. Chicago is the third most populous city in the United States, a center for business, innovation and investment, and home to United's headquarters. This makes it a unique city for Archer and United to build out. The early launch routes will focus in on airport to city center transportation service, which are referred to as "trunk" routes. Once the trunk routes have been established, the next step will be to build out "branch" routes to connect to surrounding communities.

"Both Archer and United are committed to decarbonizing air travel and leveraging innovative technologies to deliver on the promise of the electrification of the aviation industry," said Michael Leskinen, President of United Airlines Ventures. "Once operational, we're excited to offer our customers a more sustainable, convenient and cost-effective mode of transportation during their commutes to the airport."

"Technological innovation thrives here in Chicago, and this venture between Archer and United is yet another example of this strength," said Chicago Mayor Lori E. Lightfoot. "This exciting new technology will further decarbonize our means of transportation, taking us another step forward in our fight against climate change. I'm pleased that Chicago residents will be among the first in the nation to experience this innovative, convenient form of travel."

"We're thrilled to add Chicago to our growing list of initial launch cities as we continue to solidify our UAM network plans," said Adam Goldstein, Archer's Founder and CEO. "We're looking forward to working with state and city leaders to bring an innovative transportation solution to the City of Chicago and its surrounding communities."

"Vertiport Chicago is delighted to participate alongside United Airlines and Archer in revolutionizing intra-city travel in Chicago," said Daniel Mojica, the Executive Director of Vertiport Chicago. "This partnership will inspire other cities to plan for cutting-edge transportation solutions."

ComEd, the Midwest's largest utility company, will work with United and Archer to establish the power infrastructure necessary to support eVTOL aircraft operations in and around the Chicago Metropolitan Area.

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"Here in Illinois, we are taking bold steps to lead the clean revolution—paving the way for a more sustainable future for our state, our nation, and our world," said Governor JB Pritzker. "I can't think of a better team than Archer and United to partner with as we work to ensure our existing aviation infrastructure can support this new and exciting form of transportation. This partnership is just another way that we will achieve our goal of transitioning to 100% clean energy by 2050—all while saving Illinoisans money and creating thousands of good paying jobs in the process."

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# Eve Announces Collaboration with Ferrovial Vertiports to Explore the Use of Eve's Urban ATM Solutions



**E**ve Air Mobility has signed a Letter of Intent (LOI) with Ferrovial Vertiports, a subsidiary of leading global infrastructure operator Ferrovial, to explore the use of Eve's Urban Air Traffic Management (Urban ATM) software solution to support the safe and reliable operation of vertiports and electric vertical take-off and landing (eVTOL) aircraft. Ferrovial Vertiports focuses on the development of vertiport networks for the take-off, landing, operation, and maintenance of passenger services of eVTOL.

"This agreement represents a significant step forward and is a strong validation of Eve's Urban ATM service offering," said Andre Stein, co-CEO of Eve. "Eve is more than an eVTOL manufacturer and we are working with companies like Ferrovial Vertiports to provide them with solutions that will allow these aircraft to operate safely and efficiently."

Eve's Urban ATM software is an agnostic solution that will enable the integration of all airspace users in the urban environment. This

is critical to support the safety, efficiency, and improvement of the entire Urban Air Mobility (UAM) ecosystem, including fleet and vertiport operators. This new collaboration reinforces a shared commitment to safely integrating and scaling global UAM operations.

Ferrovial's Vertiport division will provide an essential piece of the ecosystem to enable landing, recharging, and taking off with passengers of eVTOL aircraft. These intermodal centers will be integrated into cities

and adapted to the surrounding environment. Their innovative design will reduce noise impact, allow zero operating emissions and improve energy efficiency. Ferrovial Vertiports has already announced that it will develop a network of more than 10 vertiports across state of Florida, USA and a network of 25 vertiports across the United Kingdom. It is currently studying other markets in the United States and around the globe which will benefit from a more sustainable and efficient mode of urban transportation.

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“As a leading global infrastructure provider and operator for over 70 years, Ferrovial is committed to building and operating safe, efficient and sustainable transportation infrastructure, which is why we are truly excited to announce our collaboration with Eve. Our goal is to build a series of agnostic vertiport networks across the United States and Europe and ensuring that we are utilizing an agnostic state-of-the-art Urban Air Traffic Management system will be key to achieving our ambitions,” said Kevin Cox, Chief Executive Officer, Ferrovial Vertiports.

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# Electric Air Mobility Division of AIRO Group Holdings Announces MoU with BLADE India



**F**ly Blade (India) Private Limited (“BLADE India”), a joint venture between Hunch Ventures and Blade Air Mobility, Inc., and Jaunt Air Mobility LLC (“Jaunt”), a subsidiary of AIRO Group Holdings, Inc. (“AIRO”), announced they have signed a memorandum of understanding (“MOU”) aimed at launching electric vertical take-off and landing (eVTOL) aircraft operations in India and the subcontinent region by 2027. The MOU includes BLADE India’s intended acquisition of 150 Jaunt Journey aircraft, with an option to order another 100 aircraft to meet the projected demand over the next decade.

As the 3rd largest aviation market in the world, India is undergoing a major transformation with a growing need for seamless and faster connectivity to connect passengers in urban areas. BLADE India is a leader in this effort, having established short haul mobility services in cities nationwide. Jaunt, a global aerospace company, has pioneered the all-electric Jaunt Journey, an aircraft that combines helicopter and fixed-

wing flight capabilities, highlighting safety, low noise, and operational efficiencies. Jaunt is pursuing a Transport Category certification for its aircraft, equivalent to that of commercial airliners.

The companies expect to collaborate in specific areas that are critical to support future short-haul mobility operations. Their plans include, in particular, BLADE India working with Jaunt and its partners to explore development of key infrastructure capabilities in aircraft charging and energy distribution technologies. In turn, Jaunt intends to use BLADE India’s existing short haul operational and customer experience to support the development of the Jaunt Journey aircraft and its integration into the Indian airspace.

Speaking on the strategic partnership, Amit Dutta, Managing Director, BLADE India said, “With its vast expanse and increasing congestion, India is one of the biggest markets in the world for AAM solutions. With BLADE’s first mover advantage in nurturing the Urban Air Mobility ecosystem in India and

Jaunt’s technical expertise, this partnership is well poised to pioneer the transition to electric and revolutionize the transportation system.”

“We are thrilled to partner with an exceptional BLADE India team to pursue the launch of a new form of urban air travel in India and the subcontinent region,” said Simon Briceno, Chief Commercial Officer for Jaunt. “Our collaboration with BLADE India and our clear path towards aircraft certification means that the Indian public will soon be able to benefit from the development of a new safe, affordable, and accessible mode of transportation.”

“Jaunt’s MOU with BLADE India demonstrates AIRO’s commitment to bringing innovative air mobility solutions to the people of India,” stated Dr. Chirinjeev Kathuria, Chairman and co-founder of AIRO.

Suren Ajarapu, Chairman and CEO of Kernel Group Holdings, Inc., states, “The news of the MOU between BLADE India and AIRO’s Electric Air Mobility division provides a roadmap for integrating eVTOLs into the global transportation market.”



# uAvionix announces truSky™ ADS-B spoofing detection for SkyLine UAS BVLOS operations



U Avionix announced that it is introducing truSky™ ADS-B “spoofing” detection for its SkyLine Uncrewed Aircraft System (UAS) Beyond Visual Line of Sight (BVLOS) services. The innovation provides pilots and controllers confidence by validating that an individual aircraft ADS-B signal is indeed coming from an aircraft and not being broadcast as a means to fake or spoof the signal.

## ADS-B Spoofing & Validation

ADS-B spoofing refers to the malicious manipulation of ADS-B signals to transmit false information about an aircraft’s position, velocity, and identification. This interferes with Detect and Avoid (DAA) and Air Traffic Control (ATC) systems, compromises airspace awareness and leads to safety and security risks. ADS-B can be a fantastic DAA technology, but without validation, there is a risk that the incoming ADS-B information is misleading. The hazards arising from ADS-B spoofing have been discussed in numerous articles and reports, which caution pilots to be wary of relying on unvalidated ADS-B in critical applications.

Enter ADS-B validation. Validation refers to the process of checking and verifying the accuracy and integrity of the data transmitted by an aircraft. This can include cross-checking the information with other sources of air traffic data and monitoring for any anomalies or inconsistencies in the signals. The goal of ADS-B validation is to ensure the information being transmitted can be trusted so that UAS operators and ATC can make informed decisions and maintain safe separation between

aircraft.

## Introducing truSky

The innovative uAvionix truSky validation process uses a network of multiple low-cost and low-profile deployed dual-frequency (1090MHz and 978MHz) ADS-B ground receivers to evaluate each signal transmitted from the aircraft. The system then instantly compares the received signals to confirm that the signal originated from the aircraft’s position. When enough sensors are available, truSky uses a number of methods to backwards calculate the aircraft’s position and compares it to the position contained within the ADS-B transmission. Using Doppler information, multilateral timing, and aircraft kinetics, the calculation produces a validation score on each aircraft to provide the confidence and safety margin required for BVLOS operations. This process requires a tightly integrated and secure network of receivers with precision timing capabilities such as those provided by the uAvionix SkyLine platform.

## Visual Confidence

When used within the uAvionix SkyLine platform, each aircraft track point is color-coded based on its confidence score. In the example below, an aircraft departs Denver airport with only visibility to a single receiver (red), but quickly gets picked up by a second (yellow), then a third (green) receiver. When used with the SkyLine API, the validation score is transmitted along with the position updates of the aircraft.

An FAA whitepaper published in 2017 titled: “White Paper: FAA position on use of ADS-B for Alerting and Guidance” concludes with the following:

Until truSky, validated ADS-B signals came at immense cost, requiring high-cost MLAT sensors, primary radar, or onboard Traffic Collision Avoidance Systems (TCAS) to correlate aircraft positions.

truSky is being piloted in numerous locations in the United States, and is available as a component of uAvionix’s SkyLine UAS BVLOS service or as an API for integration into UAS GCS, UTM, or ATM platforms

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For DAA systems, the implications of this policy are as follows: DAA Warning guidance may only be generated on ADS-B tracks that have been validated [...]. DAA guidance to regain well-clear may only be generated on tracks that have been validated. DAA Caution suggestive guidance may be generated by unvalidated ADS-B tracks. If the DAA system is being integrated with the UAS flight control system to automate maneuvers, the guidance system may only maneuver automatically against ADS-B tracks that have been validated.

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# First in the Nation - Pearland PD expands DFR operations to include BVLOS without Visual Observers



Pearland Police Department has been awarded a certificate of authorization (COA) to operate its drone as first responder (DFR) program beyond visual line of sight (BVLOS) operation, eliminating the need for human visual observers (VOs). This was achieved using Iris Automation's Casia G ground-based air surveillance system.

The City of Pearland is a rapidly growing city south of Houston with a population of 129,600 and 179 sworn police officers. It covers a mostly residential area of 49 square miles, and includes major urban facilities such as hospitals, schools, colleges, and shopping centers.

Pearland PD is now able to radically improve its DFR program and how it responds to emergency calls. Drones can be dispatched immediately, circumventing traffic, and offering an advanced assessment of the incident scene and reducing risks to officers. This allows first responders to be 'on scene' virtually, in minimum response time, allowing them to observe the scene and relay critical information to other responding officers, fire or paramedics. These 'early eyes on scene' can be the difference between life and death, allowing for the appropriate level of response, including reducing the over deployment of resources.

This is possible through the use of highly automated drones, centrally managed by a small number of personnel. Operating BVLOS removes the requirement for the operator to be co-located with the drone, potentially increasing the ratio of drones to operators and exponentially improving scale

and efficiency.

Quote from Chad Randall, Assistant Chief of Police, Pearland Police Department

"In a climate where manpower is impacting first responders across the nation, having a fully BVLOS drone as first responder program greatly enhances resource allocation while maintaining a high level of situational awareness for first responder safety."

The approval for its Drones as First Responder (DFR) program required the use of Iris Automation's Casia G system as an alternative means of compliance to the 91.113 "see and avoid" requirement. This is a significant achievement in scaling drones for public safety operations and is the first Part 91 approval secured using Casia G.

**Quote from Jon Damush, CEO, Iris Automation :** "Pearland PD has been operating Casia G systems since last summer, collecting and analyzing performance data and submitting to the FAA, which resulted in this approval. It's a testament to the department's commitment to fully utilizing drones to provide more efficient services across its region and an important example of how a thoughtful CONOP combined our ground-based system mitigates air-collision

risk enabling BVLOS operations. We're proud to be a component of Pearland's safety case, and look forward to working with them and other DFR programs to provide these breakthrough capabilities.»

Complying with 14 CFR 91.113 (i.e. 'see and avoid') has long been the bane of the UAS industry. The removal of a pilot from the cockpit removes a layer of risk mitigation from an aviation safety case - the avoidance of mid-air collisions. Operators have been forced to explore a variety of solutions including both on-board and off-board technologies and to date, the FAA has required the use of human visual observers in any UAS operation to mitigate this risk despite humans not being the best solution to this problem.

Part 91 is the 'general operating rules' part of 14 CFR that governs a wide range of aviation operations, from private recreational flying to corporate charter and other commercial operations. Public Aircraft Operators, like Pearland PD, operate under 14 CFR 91, as opposed to 14 CFR 107, widely referred to as the 'drone rule'. The approval was secured by Pearland by carefully and rigorously developing a concept of operation (CONOP) that leverages technologies to mitigate risks. This includes Iris Automation's Casia G ground-based detect and alert system and DroneSense's situational awareness software.

Casia G is a passive, ground-based air surveillance system, which creates a volume of monitored airspace without the need to integrate any hardware onto the drone itself. Using patented computer vision technology, Casia G alerts the Remote Pilot in Command (RPIC) to an intruder which presents a collision risk who then commands the drone to maneuver to safe zones.



This landmark approval for Pearland PD is a game-changer. It enables drones as first responders to grow exponentially, helping emergency responders to maximize resources, while making communities across the nation safer.

Charles Werner, director, Drone Responders Public Safety Alliance



# RigiTech Leads the Way with Daily BVLOS Drone Delivery Service in France

**D**rone delivery competition is heating up in Europe as the promise of BVLOS flights across the EU draws ever closer and one manufacturer who has placed a marker down is Swiss-based RigiTech.

The company has achieved the accolade of becoming the first operator to be given Beyond Visual Line of Sight (BVLOS) in France. Starting with its first approved route linking Bourgoin-Jallieu to Tignieu-Jamezieu, RigiTech has begun daily flights between two laboratories, using its long-range drone, the Eiger. The labs are part of France's largest laboratory group, Biogroup.

The release states, "Specifically designed to ensure cold-chain transportation of blood and biological samples, RigiTech's Eiger drone has a large payload bay that allows for efficient, long-distance flights, making the most of this sustainable delivery solution." It continues, "This newly implemented technology can carry a payload of up to 3 kg, and medical boxes with up to 150 pre-conditioned blood vials."

David Rovira, Chief Business Officer and co-Founder of RigiTech, commented, "We are extremely proud to announce we've achieved a major milestone in France, as the first drone delivery company able to start a daily BVLOS delivery service. The future of medical logistics is here and we're leading the way."

The two French laboratories are located 26 km apart and the Eiger drone takes just 15 minutes flight time, reducing delivery by 50 percent, as this route usually takes 30 minutes or more by car. This innovation enables faster diagnosis, resulting in rapid access of treatment to patients.

RigiTech is pioneering other aerial logistics networks across Europe. Last October, the company performed drone deliveries across Lake Geneva between two other laboratories. The journey took just 10 minutes. Road transportation requires driving around the lake and can take up to 90 minutes.





# PrecisionHawk and European geo-tech company Field combine forces

**P**recisionHawk and European technology company Field have merged, bringing world-leading geospatial data analysis solutions to the US infrastructure and energy sectors and beyond.

Field is a European leader in digital reality services working with premium clients across the infrastructure, construction, environment, and public sectors. The partnership complements the two companies' international growth strategy and aspiration to shape the future of infrastructure management.

"We're on a mission to build and maintain a better tomorrow with smarter and more sustainable insights from geospatial data. We're excited to be merging our companies, products and technology to deliver world-class infrastructure management solutions to customers across the US, Europe and beyond," said Field CEO Cato Vevatne.

The two companies' proprietary software and revolutionizing inspection technology using artificial intelligence and machine learning offer an exciting new inspection and analytics solution to the United States infrastructure and energy sectors.

"This partnership will shake up the US infrastructure and energy market and help drive the shift to more sustainable and effective solutions. Our combined resources help our customers boost efficiency and reliability, build resilience, manage risk and safety, and move towards a cleaner and greener future," said Mr. Vevatne.

With similar values and a shared commitment to improving infrastructure management, combining team expertise and leading technology across countries is a smart strategic decision that will benefit the industry and customers in the United States, explained David Culler Jr., Managing Director, PrecisionHawk.

"Merging with Field makes complete



sense. We're sharing knowledge and expertise with our European team and they're introducing state-of-the-art European technology to the US that will bring substantial benefits to the energy and communication sector. It's a very collaborative process," he said.

Importantly, the merged companies offer a trusted solution combining inspection, processing, and visualizing technology solutions to help customers

make critical and timely business decisions. Data security will continue to be a top priority with all the data remaining in the US. Field is an established technology supplier in the US following an exclusivity agreement with drone solution company Spright in 2021. PrecisionHawk will operate under the Field brand by the end of the year. The company's US headquarters will remain in Raleigh, North Carolina.

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"I'm confident that our US customers and partners will greatly benefit from our collective insights and innovations. Our absolute commitment to our customers remains unchanged, we will continue to work to advance our offerings and deliver the best quality service they have come to expect, with the mindset of continuously improving" he said.

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## AutoFlight names former Mini designer as design chief for new Prosperity 1 eVTOL

**F**uture mobility design house Frank Stephenson Design is today named the Director of Design of AutoFlight's latest eVTOL (electric vertical take-off and landing) Prosperity I. It is the third eVTOL project overseen by Frank Stephenson Design, putting it at the forefront of the future mobility design industry.

With over thirty years of expertise from world-leading companies including Ferrari, Maserati and McLaren, BMW and MINI, Frank is known for a design philosophy that blends art with science, whilst using the latest eco-friendly technology to shape the future of design mobility. Stephenson's role with AutoFlight involves the design of the interior and exterior of the whole vehicle, with light weighting and luxury the foremost consideration for future mobility users.

The team at Frank Stephenson Design includes world-renowned designers and pioneering innovators which are instrumental in the recent upgrades for Prosperity I. The vehicle has successfully completed multiple full-scale test flights last year and has already claimed a world record for the longest flight by an eVTOL aircraft on a single electric charge in February 2023.

"The aviation landscape is shifting, and we are on the cusp of entering a new era where electric air transportation is affordable and available to everybody. The AutoFlight name is synonymous with simplicity, safety, and efficiency. I'm delighted to be part of its fantastic team and join them on their inspiring journey."

Mark Robert Henning, Managing Director of AutoFlight Europe said: "Frank is one of the world's most renowned and influential designers of our time. His unique style is already evident on Prosperity I with its sleek, sculpted, uncluttered and dynamic feel that has been inspired by a natural sense of flow and dynamics. It's uplifting to work with him as we bring our vision of unlocking the skies for mass individual transportation to life."

The last 12 months have seen a series of milestones and significant developments for AutoFlight including the establishment of a European base in Augsburg, the appointment of Mark Robert Henning (formerly of Airbus) as its European Managing Director, as well as a \$100 million investment from next-generation mobility investor Team Global. More recently, Prosperity I has had 105 sales to date and is on the fourth prototype, with the final design of Prosperity I being unveiled in Q3 of this year.

Prosperity I has been built for transfers between parts of a city, airport commutes, connecting two nearby cities or enabling trips to the countryside while avoiding traffic on the ground. When ready for commercial flight in 2026, it is expected that a trip that takes an hour by car will be reduced to about 10 minutes with Prosperity I, whilst being safer and not much more expensive.

## Dronamics appoints Chief Revenue Officer



**D**ronamics, the world's first cargo drone airline, announced the appointment of Tim Martin as Chief Revenue Officer and member of the Executive team, effective April 1st, as the company prepares to commercialize its operations across Europe and expand to other geographies following the completion of its test flight program.

Tim brings nearly three decades of senior management experience across global supply chain and logistics sectors, most recently as Chief Operating Officer for Kuoni Tumlare and, formerly, as SVP Global Sales and Marketing, Asia Pacific for DHL Global Forwarding.

His experience in commercial development and strategic sales spans logistics companies including DHL Express, where he held the role of Vice President, Global Sales Strategy & Development, DHL Global Forwarding, UPS and TNT. Tim has a long track record of accelerating commercial success for global organizations across Europe, the Middle East and Asia.

"As the world's first cargo drone airline, our business model is a real differentiator on the market – we sell capacity, not aircraft. Tim's expertise and insights, as well as his extensive international and cultural background, will be invaluable in helping us execute our commercial strategy as we gear up to roll-out our operations later this year," said Svilen Rangelov, Co-Founder and CEO of Dronamics.



## Former Virgin Senior Partner joins Altitude Angel's board

**A**ltitude Angel, the world's most trusted UTM (Unified Traffic Management) technology provider, has announced Patrick McCall is to join the company's board as a non-executive director.

Patrick is a former chairman of Virgin Galactic and Virgin Orbit, prior to which he held the role of partner at Virgin Group where he was pivotal in developing several brands in the Virgin stable including Virgin Active and Virgin Trains. Patrick also held the position of non-executive director at OneWeb.

On Patrick joining Altitude Angel, Richard Parker, CEO and founder, said: "Patrick brings with him a wealth of experience in growing and developing businesses whose focus is emerging technologies. I'm excited to welcome him to the board at this exciting time as we further scale our operations across Europe and beyond."

On joining the board of Altitude Angel, Patrick said: "I've been very impressed with the team at Altitude Angel, from both management and technology perspectives. They are very clearly the ones driving the UTM industry, and in turn the use of drones and UAM (urban air mobility), forward. I'm very much looking forward to helping the business continue its growth and to realise its world-changing potential."

The news of Patrick joining the board follows the announcement earlier this year that BT Group incubation hub Etc. invested £5m in Altitude Angel.

Parker added: "Our recent investment from BT Group and now Patrick joining our board is a clear demonstration to the market, industry, and regulators of our intent to enable automated drone flights, at scale, to all. Through 2023 we will roll out our ARROW technology, the foundation behind the world's longest drone superhighway and in doing so unlock the potential of these new and innovative technologies, revolutionising business operations in countless industries."

As well as Seraphim Investment Trust and BT Group, Altitude Angel is also backed by one of Europe's leading VC groups, Octopus.

## Jill Viccars appointed Chief Growth Officer at Aerium Analytics



**W**e are excited to announce that Jill Viccars has joined Aerium Analytics as our Chief Growth Officer. With over 12 years of entrepreneur and growth experience, Jill brings a wealth of knowledge and expertise to our organization.

As CGO, Jill will be responsible for developing and implementing Aerium Analytics' to-market strategy, working closely with our sales and business development teams to help drive growth and awareness of our innovative solutions, and working with our development teams to ensure proper product/Market fit.

Jill is highly skilled in strategically applying technology to solve industry problems and inclusively leading teams toward successful program rollout. She is also effective at gathering executive input and gaining buy-in on new projects that truly make a difference. Her leadership and ability to galvanize teams around ambitious goals, including envisioning training effective with field teams, make her a trusted team leader. She has also started and sold a fluid transport logistics technology business, demonstrating her entrepreneurial spirit and business acumen.

At Aerium Analytics, we are committed to empowering our clients with innovative solutions that transform the way they operate. With Jill's experience and expertise, we are confident that we can reach even more clients and drive our growth to new heights.

# LightWare LiDAR Appoints Nadia Nilsen as Group CEO

MicroLiDAR sensor technology developer LightWare LiDAR has appointed Nadia Nilsen, current interim CEO since August 2022, into the position. Nilsen has been with LightWare as a co-founder since 2015, joining James Portman, whom she had worked with before at his company Laser Measurement, which was acquired by ABB in 2010.

This new appointment marks the successful conclusion of a long-term succession plan from Portman that ensures that all shareholders and customers continue to experience the best results from their affiliation with LightWare.

“Nadia has been part of LightWare since the company’s earliest days. In her former roles as Chief Financial Officer and as Chief Operations Officer she demonstrated exceptional skills that helped lay a stable foundation for our rapidly growing company,” said Portman, now Chief Technical Officer for the group, based in the UK subsidiary. “For me personally, having such an experienced and execution-focused leader in charge of the business that I spent so many years building, finally gives me the freedom to concentrate my efforts on the design and development of the groundbreaking products that have become the LightWare brand. I wish Nadia the best of success in her new role as CEO of LightWare and am sure that her drive and passion will continue to underpin the growth of the company.”

“There are very exciting global opportunities that the LightWare team is capitalizing on. As pioneers in LiDAR technology, we will continue to set the pace in terms of microLiDAR sensors,” said Nilsen.

Group CRO, Philip Constantine, said: “Nadia is a dedicated team player that has led the charge from the trenches. Her tenacity and dedication is



Our new Group Chief Executive Officer  
**Nadia Nilsen**



what earns the entire team’s respect. I wish her every success in this new role.”

Developing LiDAR technology that fits its customers’ needs and specific application requirements, has always been a strong focus for LightWare. The company believes that LiDAR has many valuable uses that will provide benefits that have not yet been realized.

“Our technology finds use cases in various sectors. We have customers who are counting wildlife for conservation purposes, others who monitor the calving of icebergs, and another who creates interactive art incorporated into architecture and parks. The possibilities are endless,” said Nilsen. “We are currently working on longer-range technology at affordable price points to enable applications like Beyond Visual Line of Sight (BVLOS) flight for unmanned aerial vehicles. The next frontier is to build further

intelligence into the technology to augment the edge computing already offered.”

In 2020, LightWare raised capital from Sanari Capital, a private equity firm investing in growth companies emanating from Africa, mainly South Africa, with regional and global scalability and exposure. Sanari has invested \$3.4 million in support of LightWare’s expansion and growth strategy.

“We are delighted to announce Nadia’s formal appointment to the CEO role, which she has been successfully fulfilling since her promotion to interim CEO in August 2022,” says Samantha Pokroy, CEO of Sanari Capital and Chairperson of LightWare. “Already, Nadia has made a mark with her leadership and we know our investment and the prospects of all of LightWare’s stakeholders are in good hands.”



“As a majority women-led firm, we recognize the significance of visible female leadership in traditionally male-dominated industries. We are therefore inspired by Nadia’s achievements and the example she sets for other technology and industrial sectors, encouraging girls and women to pursue and excel in STEM-related fields.”







Drone manufacturers must invest time and money, early in the design cycle for simulation.

Drones World Special Editor Dr. Pranay Kumar in conversation with

**Mr. Shripathi V, Lead, Aerospace, Indo Pacific, Hexagon**

**Q** What is your opinion on the recent National Geospatial Policy 2022? What are the new opportunities that will be open for drone & GIS industry?

**A** Geospatial Technology is an emerging technique to study real earth geographic information using Geographical Information Systems (GIS), and Remote Sensing (RS). Geospatial Technology has a wide range of applications in Agriculture, Urban & Rural Development, Delivery Services, Mining etc. The recently launched Geospatial Policy 2022 is essentially a 13 Year Guideline aimed at enabling India to be a world leader in the global Geospatial Space. India's geospatial economy is expected to grow at the rate of 12.8% till 2025 and could employ approximately 10 lakh people through Geospatial start-ups. The Policy also outlines the formation of an apex body - the Geospatial Data Promotion and Development Committee (GDPDC). The GDPDC will be responsible for providing details on the use of geospatial data in governance across specific ministries and for enabling the development of private start-ups and companies to work on specific projects. While today, satellites cover most of the land mass through imaging, drones have the potential to play a key role in mapping and surveying the details with unparalleled image and data resolution. This will aid precision agriculture, city mapping, atmospheric





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sounding, real-time monitoring and homeland security.

As of today, metropolitan city authorities in India are already using drones to map and measure plot sizes for taxation and records.

**Q** What are the key technologies/solutions provided by Hexagon for Drone industry only?

**A** Hexagon offers end-to-end solutions for Drones industries. The range

of solutions spans Design to Manufacturing through our Manufacturing Intelligence Solutions and Geosystems solutions.

Manufacturing Intelligence provides solutions starting with Reverse Engineering of existing technology, design modification, multi-domain numerical simulation of new or existing designs, design optimisation, manufacturing feasibility study, simulation for subtractive and additive manufacturing processes and finally, high accuracy

precision metrology for the post-production parts, sub-systems and drone systems. Hexagon Geosystems provides digital solutions that capture, measure, and visualise the physical world, with industrial applications including but not limited to Agriculture, Energy and Power Generation, Forestry, Mining and Transportation to name just a few.

**Q** What are some of the challenges that the GIS & Drone industry faces?

**A** Some of the biggest challenges of this industry include the skewed supply-to-demand ratio, the long drone development cycle, and certification. Currently, imported drone components seem attractive to designers due to their low cost. However, in the long run, indigenisation will be key from the point of view of sustainability, scalability and national security. The 'Make In India' initiative is paving the path to achieve the same.

**Q** **What are the key challenges Hexagon faces in deploying smart technologies in the Drone sector?**

**A** Start-ups and new players in the drone industry are hesitant to invest time and money, early in the design cycle for simulation. The direct return on investment that an organisation sees through simulation is assumed to be that only pertaining to certification. However, most designers search for a simulation solution later in the design cycle, when they realize that experimental testing alone can be expensive, iterative, and time-consuming. This is especially true for material selection and testing, and multi-physics phenomena such as aeroelasticity, thermo-structural analysis, bird strike etc. This can be mitigated by integrating simulation right from the initial design cycle by engaging with Hexagon.

**Q** **What are the recent innovations of Hexagon in India and World wide?**

**A** Hexagon has developed a new platform called Nexus for collaborative innovation. Nexus empowers teams with data-driven insights by connecting data from multiple sources and creating a digital thread that offers unprecedented access to information. Users can collaborate in real time across the product lifecycle - from design and engineering to production and quality.

**Q** **What are the opportunities for new Start-ups who want to associate with you?**

**A** Hexagon has start-up offerings which enable start-ups to access multiple solutions at an affordable cost. Hexagon Manufacturing Intelligence India has also completed the first edition of the Start-Up India Challenge recently and will continue to support Indian start-ups through such events.

Please visit Startup India and Hexagon invite entrepreneurs to compete for ([mcadcafe.com](http://mcadcafe.com)) for more details.

**Q** **How is Hexagon working towards creating a sustainable future? And is Hexagon able to manage a successful outreach strategy?**

**A** Hexagon's innovative solutions are designed to contribute to environmental and social

sustainability by improving efficiency, quality, and safety in a broad array of industries and societal applications. But its sustainability journey, in specific, is not only determined by the role that its solutions play in the market, but also by its own processes and actions.

Hexagon has developed a sustainability programme called R-evolution <https://r-evolution.com/> which is designed in the manner to take an active part in the sustainability revolution — leading a charge straight through the impasse of inertia, challenging assumptions and laying the framework for a new business model that profitably solves the world's greatest environmental problems.

**Q** **Finally, what is your perception of Indian Drone Industry? What are your suggestions for upcoming start-ups?**

**A** The Indian drone industry is one of the fastest-growing industries. There is a growth of 35.5% in the number of start-ups in India.

The drone analytics market is projected to reach \$6.5 Bn by 2027, at a CAGR of 25.5%, as per a report by MarketsandMarkets.

For start-ups, it is important to reduce their lead time for product development and minimize physical tests. Therefore, they should adopt simulation driven design and manufacturing to reduce cost and develop a quality product.



# APKWS Laser-guidance Kits Successfully Tested by US Counter-drone Office



The Joint Counter-Small Unmanned Aircraft Systems Office (JCO) has successfully tested BAE Systems' APKWS® laser-guidance kits in a counter-unmanned aircraft systems (C-UAS) mission. The testing against Class-2 UAS paves the way for fielding of the precision-guided rockets to partner nations around the globe.

APKWS transforms unguided rockets into smart munitions for precision strikes on soft and lightly armored targets. A newly developed proximity fuze for the standard M151 warhead allows the laser-guidance kits to target Class 2 and Class 3 drones, which

typically weigh less than 55 pounds. The fuze retains the legacy point denotation capability for maximum flexibility of the weapon in the field. APKWS now enables rockets to engage and destroy drones at a fraction of the cost of existing C-UAS systems with unprecedented precision.

During the Department of Defense-led exercise at Yuma Proving Ground, Arizona, the 70 mm APKWS-guided rockets demonstrated 100 percent effectiveness when fired against 25 to 50 pound drones traveling at more than 100 miles an hour. The APKWS C-UAS solution is platform agnostic, permitting multiple options to accelerate fielding.

"Our engineers' passion for APKWS

technology led to the development of this new product designed to meet drones head-on," said Aimee D'Onofrio, a director of Precision Guidance and Sensing Solutions at BAE Systems. "This is a solution that comes at a remarkably affordable price point, and with APKWS already at full-rate production, we can ramp up to 25,000 units per year to make an immediate impact."

APKWS laser-guidance kits are produced at BAE Systems' state-of-the-art manufacturing facility in Hudson, New Hampshire. The kits are available to all U.S. armed forces, as well as allies via Foreign Military Sales.



## EHang and CATEC Successfully Complete ICEX's BAUD Project in Spain

**E**Hang Holdings Limited, the world's leading Autonomous Aerial Vehicle ("AAV") technology Platform Company, announced that it has collaborated with Spain's Advanced Center for Aerospace Technologies ("CATEC") to successfully complete the BAUD project in Spain. Framed under the Invest in Spain program of ICEX Trade and Investment, and sponsored by the Spanish Ministry of Industry, Trade and Tourism, the BAUD project aims at enhancing the operational safety and efficiency of Unmanned Aerial Systems ("UAS") for aerial logistic missions, as well as enabling their integration in U-Space.

After one year of intense industrial research, EHang and CATEC achieved the project objectives through the development of an autonomous airborne beacon, which provides more precise and comprehensive UAS positioning by using Global Navigation Satellite Systems, EGNOS (European Geostationary Navigation Overlay Service) and Galileo, along with providing the UAS status, remote e-ID (electronic identification) and other tactical information with U-Space systems.

The flight test campaign of the BAUD project was conducted at CATEC's Air Traffic Laboratory for Advanced Unmanned Systems ("ATLAS") test flight center, using two EHang Falcon B (Logistics) autonomous aerial vehicles. The developed autonomous airborne beacon can not only be applied by EHang AAVs, but also by any UAS, and will enable the safe operation of UAS in European airspace, through their intelligent integration with U-Space systems.

Victoria Xiang, COO of EHang Europe and Latin America, highlighted, "We are delighted to announce the successful completion of the BAUD project, achieving all of its goals and objectives. EHang welcomes public-private partnership opportunities for research, development, and investment in the UAS field in Spain. This has encouraged EHang to execute several innovation projects, share EHang's world-leading technology and extensive international experience on Urban Air Mobility, and strengthen our wide technological collaboration network in Europe".

## US Army Selects NGC, Teamed with Shield AI, for FTUAS Prototype



**N**orthrop Grumman Corporation teamed with Shield AI, has been chosen by the U.S. Army to participate in the Future Tactical Unmanned Aircraft System (FTUAS) competition, Increment 2, to replace the long-serving RQ-7B Shadow tactical unmanned aerial system (UAS).

Under a seven-week base period contract, the Northrop Grumman-led team will define the modular open-system architecture of an enhanced V-BAT aircraft, including the integration of advanced surveillance and electronic warfare (EW) payloads. The V-BAT UAS is an innovative, agile, compact and lightweight platform that a combat team of two soldiers can rapidly launch and recover in challenging and on-the-move environments.

"Our team's enhanced V-BAT embodies more than 30 years of experience designing, delivering and sustaining advanced unmanned aircraft systems, combined with a field-proven platform and production facilities," said Angela Johns, vice president, autonomous and tactical air systems, Northrop Grumman. "We bring a unique perspective and capabilities to this critical Army mission."

Northrop Grumman is teamed with Shield AI, designer and manufacturer of the V-BAT platform, to provide best-in-class solutions for an expeditionary vertical takeoff and landing (VTOL) UAS, capable of persistent aerial reconnaissance for U.S. Army Brigade Combat Teams, Special Forces and Ranger battalions. As a Future Vertical Lift program, the FTUAS is the Army's premier VTOL unmanned aircraft modernization effort.

Earlier versions of the V-BAT have supported operations for the U.S. Navy and Marine Corps since 2016. The new enhanced V-BAT is simple to operate, has increased power, a reduced logistics tail and capacity to carry a range of interchangeable payloads, including electro-optical/infra-red, synthetic aperture radar and EW systems, offering long-term adaptability and life cycle management.





## FAA Grants Textron Systems Special Airworthiness Certificate to Operate Aerosonde UAS in Civil Operations

**T**extron Systems Corporation announced it has been issued a special airworthiness certificate from the Federal Aviation Administration (FAA) to conduct civil unmanned aircraft operations at its Unmanned Systems Service and Support Center located in Blackstone, Virginia, adjacent to the Allen C. Perkinson Blackstone Army Airfield (KBKT).

The company received the special airworthiness certificate in the experimental category, abbreviated SAC-EC. The rarely granted authority allows Textron Systems to operate its Aerosonde® MK 4.7G unmanned aircraft system (UAS) within the National Airspace System (NAS) as part of initial and recurring proficiency training missions and research and development (R&D) operations. The SAC-EC represents increased flexibility and convenience for the company's customers, as well as cost savings that result from the ability to train steps away from the classroom at the Unmanned Systems Service and Support Center.

"This is a significant achievement because of what it says about the safety of operating unmanned systems in the NAS," said Wayne Prender, Senior Vice President of Air Systems. "We've shown that our Aerosonde system achieves an equivalent level of safety compared to conventional aircraft. We've backed that up with more than 600,000 hours of flight time and over 3,000 aeronautical research flights conducted at KBKT airfield to support integration in the NAS."

To grant a SAC-EC, the FAA must determine the company's proposed operations will have no adverse impact on public safety. Obtaining the approval required the company to submit an in-depth Program Letter, Safety Checklist, operating manuals, an approved Maintenance Inspection program, and to host a comprehensive on-site safety evaluation of every component of the aircraft, the ground station, and the aircraft's launch and recovery equipment.

Textron Systems' Aerosonde UAS is a small, high endurance, expeditionary unmanned aircraft. It is powered by a high performance, heavy fuel, direct injection, reciprocating engine and has a broad operational flight envelope. The certification allows the company's aircraft operators to conduct Visual Line of Sight training and R&D operations in Class D, E, and G airspace.

## GA-ASI Establishes New Collaboration Agreement with Leidos in Australia

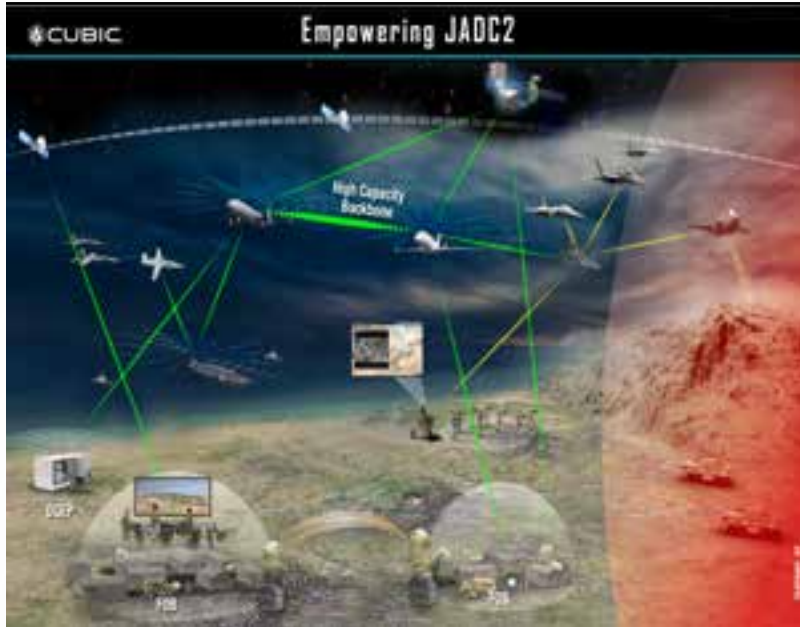


**G**eneral Atomics Aeronautical Systems, Inc. (GA-ASI) and Leidos have agreed to continue the successful business relationship previously held between GA-ASI and Cobham Australia. With Leidos' acquisition of the Cobham Special Mission business in October 2022, Leidos has now assumed the role of GA-ASI's primary Australian industry collaborator for defence and security business.

The arrangement will support discussions relating to a Defence Armed Remotely Piloted Aircraft System, and the Australian Border Force future crewed/uncrewed aircraft system under the Civil Maritime Capability Program. Discussions are also underway between Leidos and GA-ASI for cooperation on further defence projects in Australia and opportunities in the U.S.

"GA-ASI is delighted to establish a collaboration agreement with Leidos that continues the successful business relationship previously held with Cobham since 2006," said Ken Loving, GA-ASI regional vice president for Indo-Pacific. "The broader and deeper capabilities that Leidos brings to the relationship, including its impressive capability within Australia, combined with GA-ASI's substantial global experience in remotely piloted and autonomous aircraft systems, will provide an impressive capability for Australia's future defence and security needs."

Leidos Australia Chief Executive Paul Chase said, "We are delighted to continue and build upon the terrific partnership that Cobham Special Mission has developed with GA-ASI over the past 17 years. When we acquired Special Mission last year, we recognised the huge potential for both advancing current capabilities and services and pursuing new opportunities in Australia and globally. General Atomics has excellent technology and by collaborating with them, our complementary capabilities and experience will combine to provide world-class solutions for current and future customers."



## US Army Selects AeroVironment JUMP 20 Medium UAS to Enter FTUAS Program Increment 2



AeroVironment, Inc. a global leader in intelligent, multi-domain robotic systems announced it was selected by the United States Army on Feb. 28, 2023, to move forward in the Future Tactical Unmanned Aircraft System (FTUAS) program.

AeroVironment's JUMP® 20 will compete with several other vendors in the FTUAS Increment 2 multi-phased effort which will allow the Army to select the best system for its needs. Ultimately, FTUAS Increment 2 aircraft will be fielded to Brigade Combat Teams (BCTs) throughout the Army, replacing the long-serving RQ-7B Shadow UAS.

During the early stages of what would become the U.S. Army's FTUAS program, AeroVironment's JUMP 20 demonstrated superior competitive performance and was awarded the FTUAS Increment 1 contract to develop a prototype system to field to one Brigade Combat Team (BCT). Its success throughout the demonstrations led to AeroVironment's contract award for FTUAS Increment 0, in which the U.S. Army fielded the JUMP 20 into an additional Army BCT within the United States Army Europe. AeroVironment is the only company awarded the FTUAS contract for all three program increments.

"The AeroVironment JUMP 20 is the most mature and capable solution in its class," said Gorik Hossepian, AeroVironment's vice president and product line general manager for medium unmanned aircraft systems. "We will continue to work closely with the U.S. Army to ensure we meet their performance needs both today for an all-environment aircraft system and in the future as requirements evolve to meet changing battlefield demands."

## Cubic Awarded USAF Contract for Halo™-Enabled Resilient Mesh (HERMes) System

Cubic Mission and Performance Solutions (CMPS) was awarded a cost-plus-fixed-fee contract from the U.S. Air Force Research & Development (R&D) program for Halo-Enabled Resilient Mesh (HERMes) software and a hardware prototype. The project is designed to advance the technological capabilities of the U.S. Air Force (USAF) High-Capacity Backbone (HCB).

The USAF contract is to investigate, design, develop, test and demonstrate the capabilities of the HERMes system. It also directs Cubic to expand the HCB communication system's technical capabilities, such as developing the hardware used for the solution. Such expansion increases the range of operating frequencies, enables code and algorithm optimization, and will be backed by research into alternative capabilities to augment both the type and number of operational platforms.

"Cubic is committed to ensuring aerial networks produce a connectivity and user experience in the battlefield that mirrors what our warfighters experience in their everyday lives: high throughput, high availability and data when they need it," said CMPS President Paul Shew.

Under development since 2008, Halo facilitates a high bandwidth, resilient, ad hoc multi-link mesh network using novel digital beam forming techniques. Cubic's HERMes research and development effort aims to enhance and mature the Halo capability.

"We're excited to complement ongoing efforts to transition Halo to the warfighter with parallel efforts like this new Air Force Research Laboratory (AFRL) project to innovate and make Halo even better," said Scott Rosebush, vice president and general manager of Cubic's Secure Communications business.

The contract announcement follows Cubic's successful demonstration of an HCB-enabled gateway system solution in an air/ground configuration in 2022. The solution provides foundational connectivity and processing capabilities that enable Joint All Domain Command and Control (JADC2) and ensure delivery of the right data to the right place at the right time.



# Elbit Receives Order for the 120th Hermes 900 UAV



**E**lbit Systems has received and order for its 120th Hermes™ 900 Medium-Range Long-Altitude (MALE) unmanned aerial vehicle (UAV). The family of the Hermes 900 multi-role MALE UAV is Elbit Systems' largest unmanned aerial vehicle and is capable of performing a wide range of missions including persistent intelligence, surveillance, target acquisition and reconnaissance (ISTAR). The advanced UAV can also can perform ground support and maritime patrol missions, and provides the capabilities for integrated multi-platform, multi-sensor operations.

The UAV has an endurance of up to 30 hours in a single sortie and features over-the-horizon, persistent multi-mission capabilities with a class leading payload carrying capacity of 450 kgs and maximum ceiling of 30,000 feet. The Hermes 900 incorporates flexible cutting edge multi-payload configurations employing standard and long-range SPECTRO EO/IR/SWIR/LTD, SAR/GMTI & MPR, COMINT Cellular, CoMMJAM, ELINT, large area scanning systems, SkyEye wide

area persistent surveillance and other payloads.

The Starliner™ UAV, a derivative of the Hermes 900, is equipped with advanced civil aviation technology allowing it to meet both military and civilian certification standards. These technologies include a terrain avoidance warning system; automatic take-off and landing in limited visibility conditions; redundant avionics, sensors and satellite data links; as well as adverse weather capabilities, direct lightning strike sustainment, flight in denied / Jammed GPS environment, automatic air traffic sense and avoiding systems and avoiding auto-maneuvers and last resort parachute to avoid injuries to human lives.

The Starliner UAV is the only NATO Class III UAV in the world with these certifications in the world.

Since the first order of the unmanned aerial system (UAS) in 2011, the Hermes 900 has been selected by more than 20 customers around the world, making it the only NATO class III MALE operational on five continents. Its users are the Air Forces,

Navy, and Army agencies such as border protection, police and more. The UAS is flown by Israel, Switzerland, Canada, Brazil, Chile, Mexico, Switzerland, Phillipines, Thailand and others.

The significant number of Hermes 900 ordered and delivered to customers attests to its competitive edge that combines technological sophistication, reliability, open architecture, and advanced Visual, Signal and RADAR intelligence capabilities. Elbit Systems is one of the leading manufacturers of UAS in the world with over a thousand platforms delivered.

Yoram Shmuely, Executive Vice President and General Manager of Elbit Systems Aerospace: "The 120th Hermes 900 UAV order is a significant milestone that is testament to the hard work and dedication of the whole Elbit Systems' team. We are proud to have reached this remarkable milestone. Our ongoing commitment to providing top-quality products and outstanding customer service has led us to this achievement, and we appreciate all our loyal and supportive customers and end-users."



## Hydrogen Power for Delivery Drones: Wingcopter and ZAL Start Joint Development

**W**ingcopter, the German developer and operator of delivery drones, and Hamburg-based ZAL Center of Applied Aeronautical Research GmbH have announced a development partnership. Together, they intend to explore the potential of green hydrogen to power Wingcopter's drones, which are already purely electric, and develop a sustainable, hydrogen-based propulsion system. The propulsion system will later be produced by Wingcopter itself and installed in its delivery drones.

By refitting the battery-powered Wingcopter 198 to run on hydrogen, the plan is for the drone to not only continue to fly emission-free in the future, but to become even more powerful. The Wingcopter already achieves higher ranges and speeds than most competitors' models thanks to the added lift of its wings and its aerodynamic design. However, hydrogen propulsion could ensure even longer flight times and thus enable correspondingly greater distances for different delivery applications.

**“**We are very excited about the collaboration and are confident that together we can develop an even more efficient propulsion solution that benefits nature at the same time. We have always wanted the Wingcopter to be able to fly even further. However, we categorically ruled out the installation of a conventional combustion engine right from the start with a view to the environment and climate change. We are happy to now explore technical possibilities in the field of hydrogen propulsion together with the ZAL experts and then put the best concept into practice,” explains Wingcopter co-founder and CEO Tom Plümmer.

The project-related modification of the Wingcopter will take place at ZAL's Fuel Cell Lab in Hamburg. As part of the development partnership, a solution is being developed that will fit into the existing technical ecosystem of the Wingcopter delivery drone while preserving the characteristic flight capabilities of the Wingcopter. In the past, ZAL engineers have already been able to achieve a flight duration of over two hours with the company's own ZALbatros hydrogen drone. This was achieved using compressed gaseous hydrogen in combination with a fuel cell. A comparable technology will also be used in the Wingcopter.

Roland Gerhards, CEO of ZAL GmbH, adds: “Our mission is to bring hydrogen into the air and create innovative solutions for sustainable aviation. With Wingcopter as our partner, we're not only impressed by their drones' flight performance, but

also by their clear vision of how urban air mobility and especially drone delivery can help improve people's lives. This aligns perfectly with ZAL's values. With our expertise, we want to convert the Wingcopter to hydrogen and thus strengthen the Hamburg UAM network Windrove with another flagship project.”

## GA-ASI Signs New MoU with Conflux



**I**n an effort to further advance its Additive Manufacturing capability, General Atomics Aeronautical Systems, Inc. (GA-ASI) has established a new Memorandum of Understanding (MOU) with its longtime partner Conflux Technology. The new MOU, signed this week at the AVALON 2023 Australian International Airshow and Aerospace & Defence Exposition, is the culmination of several years of collaborative work between GA-ASI and Conflux to build a flight-qualified Fuel Oil Heat Exchanger (FOHE) for GA-ASI platforms.

“We continue to work closely with Conflux on the design and manufacture of FOHE for our aircraft,” said Ken Loving, GA-ASI Regional Vice President for Indo-Pacific. “Through this new MOU, we will establish a clear path to production for the heat exchanger components used by multiple GA-ASI production lines.”

GA-ASI is a leading developer of unmanned aircraft, and Conflux is a thermal management system solution company headquartered in Australia. Conflux is an industry-leading expert, mastering Additive Manufacturing (AM) for heat exchanger applications.

“Our continued partnership with General Atomics is a milestone for the commercialization of additively manufactured heat exchangers within the aerospace and defence markets, carrying the significant weight and performance benefits offered by these technologies towards production,” said Abe Masoud, Conflux Business Development Manager - North America.





## Insitu Sets Company Record for Longest Flight at 25.5 hours with its Integrator UAS

Insitu, A Boeing Company, recently set a company record for the longest duration flight with a 25.5-hour sortie with its Integrator Unmanned Aircraft System (UAS) on an operational mission. The record flight was achieved with a 150-pound Integrator equipped for a multi-payload mission. It surpassed the previous record of 24.2 hours performed in 2014, also with an Integrator.

The customer requested persistent eyes on target for an extended period. The Integrator's configuration, with its long endurance capability, allowed the customer to use one aircraft instead of two or lower endurance aircraft. UAS with lower endurance require transitioning among multiple aircraft to maintain persistent eyes on a target. The Integrator allows customers to assure sustained eyes on target with less risk to the mission.



"Our Integrator provides customers benefits they can't get with other unmanned aircraft," said Diane Rose, Insitu president and CEO. "Customers can focus on the mission and have confidence to achieve their critical goals more affordably and reliably with our field-proven unmanned aircraft."



Long endurance aircraft reduce risk with fewer launch and recovery sequences, where UAS are most vulnerable to damage. They also provide better coverage in areas with sparse basing and allow customers to operate with less equipment and manpower than aircraft with lower endurance.

Insitu's long endurance Integrator provides benefits to customers in many ways, such as an unbroken chain of imagery intelligence, surveillance and reconnaissance (ISR), to ensure customers continually track a target of interest.

It also provides pattern of life, allowing customers to review video footage to identify valued targets. Insitu's full suite of modular payloads provides persistent ISR in the world's most extreme environments. Our payloads, ranging from day and night full motion video (FMV) and signals intelligence (SIGINT) to electronic warfare (EW), extend the capabilities of UAS to meet the specific and evolving needs of our customers through flexibility and easy integration.

## USMC Use GA-ASI MQ-9A for Training Exercise



General Atomics Aeronautical Systems, Inc. (GA-ASI) is working with the U.S. Marine Corps (USMC) on a series of Service-Level Training Exercises (SLTE) using a company-owned MQ-9A Unmanned Aircraft System to support the Marine Air-Ground Task Force Training Command (MAGTFTC). The SLTE 2-23 is being conducted near Twentynine Palms, Calif. with participation from Joint Forces. The training ensures participants are prepared for the future dynamic environment.

Contracting the use of MQ-9A enabled USMC to begin integrating Group 5 unmanned aircraft into the Marine Air-Ground Task Force for the first time within the various exercises. GA-ASI began flying the MQ-9A on Feb. 3, 2023, with a combination of GA-ASI and VMU-3 pilots and sensor operators. The aircraft flew out of GA-ASI's facility at the Yuma Proving Ground, Ariz., with flights over training ranges in Southwest-Continental United States (CONUS). The MQ-9A is providing its proven Intelligence, Surveillance and Reconnaissance (ISR) data package – including GA-ASI's Lynx® Multi-mode Radar – to provide the USMC with extraordinary situational awareness and simulated close air support.

"GA-ASI is always ready and willing to support the USMC exercises," said GA-ASI Vice President of DoD Strategic Development, Patrick Shortsleeve. "We know that being able to utilize an actual MQ-9A is critical to the success of these exercises and helps the USMC ramp-up their training program."

The SLTE Program consists of a series of exercises, including the live-fire Integrated Training Exercise (ITX), Marine Littoral Regiment Training Exercise (MLR TE), and Force-on-Force (FoF) MAGTF Warfighting Exercise (MWX). MAGTFTC executes the SLTE Program, which includes simulated and live-fire armed exercises, to enhance the readiness of the Fleet Marine Forces and support the Marine Corps' responsibilities to national security.

GA-ASI was contracted by the USMC in 2022 to deliver eight MQ-9A Extended Range (ER) UAS as part of the ARES Indefinite-Delivery/Indefinite-Quantity (ID/IQ) contract.

# Airbus Achieves In-flight Autonomous Guidance and Control of a Drone from a Tanker Aircraft



**A**irbus Defence and Space and the company's wholly-owned subsidiary, Airbus UpNext, have achieved in-flight autonomous guidance and control of a drone using an A310 MRTT. In a first step towards Autonomous Formation Flight and Autonomous Air-to-Air refuelling (A4R), the technologies demonstrate a significant breakthrough for future aerial operations involving manned and unmanned assets. These cutting-edge, 'Made in Europe' solutions could reduce crew fatigue and the potential for human error, as well as minimising crew-training costs and providing more effective operations.

"The success of this first flight-test campaign paves the way for developing autonomous and unmanned air-to-air refuelling technologies," said Jean Brice Dumont, Head of Military Air Systems at Airbus Defence and Space. "Even though we are at an early stage, we have achieved this within just one year and are on the right track for manned-unmanned teaming and future air force operations where fighters and mission aircraft will fly jointly with drone

swarms."

Known as Auto'Mate, the technologies were integrated on an A310 MRTT flying testbed, which took off from Getafe, Spain, on 21 March, and on several DT-25 target drones, acting as receiver aircraft and flying from Arenosillo Test Centre (CEDEA) at Huelva, Spain. Over the waters of the Gulf of Cadiz, the control of the drone transitioned from a ground station to the A310 MRTT, autonomously guiding the DT-25 to the in-flight refuelling position.

During almost six hours of flight test, the four successively launched receivers were sequentially controlled and commanded thanks to artificial intelligence and cooperative control algorithms, without human interaction. The different receivers were controlled and guided until a minimum distance of 150 feet (around 45 metres) from the A310 MRTT.

Auto'Mate Demonstrator technology focuses on three pillars:

Accurate Relative Navigation to precisely ascertain the relative position, speed and attitudes between the tanker

and the receiver;

Intra-Flight Communication between platforms to allow information exchange among the different assets, increasing the autonomy of the system of systems;

Cooperative Control Algorithms to provide guidance, coordination, consensus and collision-avoidance functionalities to the tanker and the receiver/s.

These pioneering technologies, developed by a European team from Spain, Germany and France, will continue to increase the capability gap among competitors, as well as being re-used in key technological projects, such as the Future Combat Air System (FCAS).

A second campaign is expected towards the end of 2023, exploring the use of navigation sensors based on artificial intelligence and enhanced algorithms for autonomous formation flight. In addition, there will also be two simulated drones flying in the vicinity of the A310 MRTT to demonstrate multi-receiver autonomous operations and collision-avoidance algorithms.





Drones World Special Editor Dr. Pranay Kumar in conversation with  
**Karna Raj, Prudhvi Raj and Chaitanya Reddy,  
Vector Technics**

**P**ropelling the Future of UAVs: An In-depth Interview with Vector Technics Founders. Dr. Pranay Kumar, Special Editor - In this exclusive interview, we delve into the world of UAV propulsion systems with Vector Technics founders Karna Raj, Prudhvi Raj, and Chaitanya Reddy. We discuss their innovative products, commitment to India's Atmanirbhar Bharat initiative, and their vision for shaping the future of drone technology in the country. They also share the challenges they face in the market and their strategy to make a global impact.

**Q** Tell us about the inception of Vector

**Technics. What inspired you to start a company focused on UAV propulsion systems?**

**A** Vector Technics emerged from our passion for engineering, drones, and our commitment to India. Noticing the UAV industry's reliance on imported components, we aimed to make India self-reliant in UAV technology. Our diverse expertise equipped us to pursue this goal.

We founded Vector Technics to develop world-class, made-in-India propulsion systems for

UAVs, supporting the domestic industry and strengthening our armed forces' capabilities. We believe our dedication, innovation, and hard work will solidify India's position as a global leader in the UAV sector.

**Q** Vector Technics offers both electric and gasoline propulsion systems. Can you walk us through your product range and the applications they cater to?

**A** Certainly! Our journey into UAV propulsion began in



2019 with internal combustion engines for fixed-wing aircraft. However, we quickly recognized the industry's shift towards multirotor and electric propulsion systems and decided to innovate accordingly.

We enthusiastically explored brushless DC (BLDC) motors, developing our prototype within just three months, achieving an impressive 12 kg of thrust per axis. This milestone bolstered our commitment to electric propulsion. We meticulously refined our BLDC motors and expanded R&D to include electronic speed controllers (ESCs), Propellers, Power Distribution Boards and DC-DC Converters all while handling the complexities of concurrent development.

Now, we design, develop, and manufacture everything in-house. Our electric propulsion range caters to drones with payload capabilities from 2 kg to 50 kg. Currently, we're excitedly prototyping next-gen propulsion systems for heavier payloads in cargo.

Our journey has been fuelled by perseverance, innovation, and growth. We're determined to keep pushing boundaries in the UAV propulsion industry, making a significant impact on our

clients and the entire sector.

**Q** How do your products stand out from competitors in terms of technology and performance?

**A** Innovation is at our core, driving us to create stand-out products in terms of technology, performance, and manufacturing processes. Our BLDC motors, ESCs, and propellers boast cutting-edge features, and exceptional quality, and are developed using in-house machinery and techniques.

Our BLDC motors use high-quality materials like aerospace-grade aluminium, high efficiency electro steel, N42SH magnets, superior copper with litz winding and rubber sealed bearings, ensuring top performance and durability. We've developed specialized machines to enhance precision and streamline production. Our motors also have excellent ventilation and are repairable,

extending their service life and offering cost savings.

Our ESCs with our custom firmware generating trapezoidal waveforms and designed ground up for increased efficiency and we are working on next-gen smart ESCs with CAN protocol. To manufacture our ESCs in India, we've innovated production processes, focusing on quality assurance and component sourcing from OEMs, with a strong emphasis on securing the supply chain.

We've developed innovative carbon fibre-reinforced nylon material for our propellers, offering performance, affordability, and durability. They're foldable for convenient transportation and storage, and we've invested in research to improve aerodynamic efficiency.

Our motors and ESCs are designed for rugged environments with MIL-810 certification in mind, ensuring they withstand demanding applications and extreme conditions. We've dedicated substantial resources to R&D, fine-tuning designs, and optimizing manufacturing processes.

Innovation permeates every aspect of our company, from design and material selection to manufacturing processes. By focusing on continuous improvement, we offer UAV propulsion systems that deliver unparalleled performance, reliability, and value to our clients.

**Q** How does Vector Technics contribute to the Atmanirbhar Bharat initiative as a "Made in India" company?

**A** At Vector Technics, we actively support the Atmanirbhar Bharat initiative by embracing the broader





ecosystem to develop local vendors, source materials domestically, and nurture homegrown talent, fostering a self-sufficient UAV industry in India. We work closely with suppliers to enhance their capabilities and ensure global quality standards, resulting in reliable products that showcase India's UAV potential.

Continuously investing in R&D, we drive innovation and technological advancements in the aerospace sector. Our collaboration with research institutions and stakeholders helps propel the industry's progress.

In addition to our focus on product development, we prioritize nurturing local talent and creating opportunities for young engineers, scientists, and professionals in the aerospace industry. Through mentorship, training, and hands-on experience, we help our team members contribute to India's self-reliance journey.

**Q Scalability is essential for any startup to make a global impact. How does Vector Technics plan to scale up its operations and expand its market reach?**

**A** Our strategy involves broadening our product offerings and forging strategic alliances with local and global companies. We've refined our processes, developed custom

machinery, and incorporated advanced technology to operate efficiently at a larger scale.

We invest in state-of-the-art infrastructure and adopt Industry 4.0 principles to ensure continuous innovation. By collaborating with research institutions and industry leaders, we stay at the forefront of UAV technology.

We build our brand by showcasing our products and commitment to Made in India ethos, focusing on market penetration strategies, competitive pricing, and exceptional customer support. Optimizing our global supply chain and streamlining logistics processes further strengthen our position in the worldwide UAV propulsion systems market.

**Q What are your plans for the future? Are there any new products or technologies in the pipeline that we can expect from Vector Technics?**

**A** As an innovative company, we're constantly exploring new ways to revolutionize the UAV industry. Our R&D focuses on developing more integrated systems, like combining ESCs and power distribution boards, which will enable faster and easier manufacturing of drones while simplifying troubleshooting for end users.

We're also keenly aware of the growing adoption of agricultural drones in India and the value they bring to our farmers. We're working diligently to create propulsion components specifically designed to meet the unique needs of this sector, ensuring that our products deliver maximum value to the end customer.

In essence, our goal is to create futuristic, integrated systems that are easy to

integrate and troubleshoot. We believe that by consistently pushing the boundaries of innovation and focusing on the evolving needs of the UAV industry, we'll continue to lead the way as a trailblazing company in this exciting field.

**Q The UAV industry is rapidly evolving, with new players entering the market regularly. What are some of the challenges you face in the current market landscape, and how do you plan to overcome them?**

**A** We have a unique position in the market, as we are the only Indian organization that designs, develops, and manufactures a complete propulsion system for UAVs in-house. This gives us a significant advantage in terms of quality control, as well as the ability to offer customized solutions that meet the specific needs of our customers.

We're also proud to say that our products are highly efficient, with an average efficiency rate of 20% higher than imported systems. Our products undergo rigorous testing and certification to ensure that they meet international quality standards and perform reliably in the field.

While we face challenges in the market, such as the heavy reliance on imported components and limited facilities, we remain focused on driving innovation and delivering value to our customers. We believe that collaboration and partnerships with other players in the industry will be critical to achieving this goal, and we're always open to exploring new opportunities to work together towards a common goal of advancing the UAV industry.

Overall, our commitment

to quality, innovation, and collaboration sets us apart from the competition and positions us as a leading player in the Indian UAV industry.

**Q** **Import dependency has been a significant concern for India's UAV industry. How does Vector Technics plan to replace imported propulsion systems with its indigenous products?**

**A** At Vector Technics, we are committed to creating a sustainable and self-reliant UAV industry in India. As a homegrown company, we understand the challenges of import dependency, and we're working tirelessly to develop high-quality indigenous propulsion systems that can compete with the best in the world.

We recognize that collaboration is key to unlocking the full potential of the industry, and we're always looking for new ways to work with other companies, academic institutions, and government bodies. We believe that by sharing knowledge, resources, and expertise, we can develop even more innovative products that meet the evolving needs of the UAV industry.

Our commitment to R&D and innovation is at the heart of our strategy for replacing imported propulsion systems. We're perfecting our electrical propulsion systems and exploring new technologies like fuel cells, hybrid powertrains, and more. By keeping an open mind and a sharp focus on innovation, we believe that we can continue to drive the industry forward and create even more value for our customers.

Overall, we're excited about the future of the Indian UAV



industry, and we're proud to be playing a role in building a self-reliant and sustainable ecosystem. With our cutting-edge technology, commitment to innovation, and passion for excellence, we're confident that we can make a significant impact and establish ourselves

as a leader in the industry. Conclusion from Editorial Team Vector Technics, a leading drone propulsion technology company, has demonstrated impressive innovation in the field of unmanned aerial vehicles (UAVs). From developing its prototype in 2019 to now catering to the needs of customers manufacturing drones with payloads from 2kg to 50kg, the company has maintained its position as a market leader in India's UAV components industry. With a commitment to quality and affordability, Vector Technics offers a product range that includes BLDC Motors, ESCs, Propellers, and Power Distribution systems. The company's success is a testament to its persistence and hard work, and with a team of brilliant aerospace engineers and scientists at the helm, it is poised for even greater heights in the future.





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# Zipline Unveils New Autonomous System Capable of Quiet, Fast and Precise Home Delivery

Zipline unveiled its new platform that provides quiet, fast and precise autonomous delivery directly to homes in cities and suburbs. The company's next generation home delivery platform is practically silent (designed to sound like wind rustling leaves), and is expected to deliver up to 7 times as fast as traditional automobile delivery, completing 10-mile deliveries in about 10 minutes.

Zipline has spent the last several years building and fine tuning its next generation technology, Platform 2 (P2), to provide an optimal customer experience at scale. Unlike other drone delivery services, Zipline's drones (Zips) fly more than 300 feet above the ground and are nearly inaudible. When the Zip arrives at its destination, it hovers safely and quietly at that altitude, while it's fully autonomous delivery droid maneuvers down a tether, steers to the correct location, and gently drops off its package to areas as small as a patio table or the front steps of a home. This is all made possible through major innovations in aircraft and propeller design. Several businesses across the healthcare and restaurant sectors have already signed on to use Zipline's new home delivery service. Sweet green is partnering with Zipline to further its mission of connecting people to real food in the U.S., while moving a step closer to its pledge to be carbon-neutral by 2027. By ordering through Zipline's marketplace, Sweetgreen customers can get their orders using 97% less energy than traditional automotive methods.

"The future of delivery is faster, more sustainable and creates broader access, all of which provides improved value for our customers," said Jonathan Neman, Co-Founder and CEO of Sweetgreen. "We couldn't be more excited to work with Zipline to complement our delivery strategy. Zipline's sustainable technology and ability to reach customers quickly,

with a great delivery experience, will help us give our customers what they want, when they want it."

Michigan Medicine will use Zipline's new service to more than double the number of prescriptions it fills each year through its in-house pharmacy. Intermountain Health will use it to deliver prescriptions to patients' homes in the Salt Lake City metro area. MultiCare Health System plans to use the new platform to expedite diagnostics and deliver prescriptions and medical devices throughout MultiCare's network of facilities, including hospitals, laboratories and doctors' offices. And Zipline's first customer, the Government of Rwanda, will use the company's new home delivery service to enable urban aerial last-mile delivery to homes, hotels and health facilities in Kigali and elsewhere in the country.

Zipline's end-to-end solution seamlessly integrates with a business's current operations. That includes its dual-use docking and charging hardware, software that easily works with third-party inventory management and ordering systems, an intuitive app that allows order tracking down to the second, and an autonomy system that has already guided the flight paths of 40 million commercial miles. Zipline designed its docking and charging hardware to have a light footprint that can be attached to any building or set up as a freestanding structure. A Zip can be easily loaded by a business' employee who can send off orders in seconds, right from their location, without even having to leave the kitchen, pharmacy or doctors' office. Businesses can offer Zipline's

home delivery service in a variety of ways, including native integrations into apps and websites, white labeled opportunities, and by joining Zipline's marketplace. Customers can make on-demand

orders, or schedule the exact time they'd like their package to arrive, down to the second.

Each P2 Zip has a 10-mile service radius while carrying a 6-8 pound payload for out-and-back deliveries from a single dock. Alternatively, it can also fly up to 24 miles one way from dock to dock, charging at each dock before picking up its next delivery. Because Zips can move from dock to dock, Zipline can dynamically respond to peak order times - ensuring there's enough delivery capacity for an urgent prescription delivery or a busy Friday pizza night or weekday lunch rush.

"Over the last decade, global demand for instant delivery has skyrocketed, but the technology we're using to deliver is 100 years old. We're still using the same 3,000-pound, gas combustion vehicles, driven by humans, to make billions of deliveries that usually weigh less than 5 pounds. It's slow, it's expensive, and it's terrible for the planet," said Keller Rinaudo Clifton, co-founder and CEO of Zipline. "Our new service is changing that and will finally make deliveries work for you and around your schedule. We have built the closest thing to teleportation ever created - a smooth, ultrafast, convenient, and truly magical autonomous logistics system that serves all people equally, wherever they are."

Zipline plans to conduct high-volume flight tests this year involving more than 10,000 test flights using about 100 aircraft. The first customer deployment of P2 will follow shortly after that. Zipline's record for safety has been proven over the past seven years of operations and over more than 500,000 commercial flights. Its long-range platform, P1, has autonomously flown 40 million miles worth of commercial deliveries through all kinds of weather without a safety incident - the vast majority of which were flights flown beyond visual line of sight.

Zipline has received Part 135 certification, is authorized to complete the longest-range, on-demand commercial drone flights in America, and recently received FAA approval to enable its onboard autonomous detect and avoid system.

Zipline completed more deliveries in 2022 than in all previous years combined, and is planning to complete about 1 million deliveries by the end of 2023. By 2025, Zipline expects to operate more flights annually than most airlines.





# 1st DGCA Certified drone with Cellular Connectivity in India

Urban matrix is thrilled to share with you the news that UrbanMatrix Technologies has obtained certification from the Directorate General of Civil Aviation (DGCA) in India for our latest drone, the UMT Hawk4G. The certification process is rigorous, but it is an essential step towards ensuring the safe and regulated use of drones in Indian airspace. At UrbanMatrix Technologies, we are committed to this process.

This certification is a testament to the quality of our products and the dedication of our team to delivering safe and reliable drone solutions. We are proud to be the first certified drone with cellular connectivity. Our latest product, MatrixCC, played an instrumental role in clearing sections 7.1 and 7.2 of this process, which relate to hardware and software tamper avoidance.

MatrixCC is a small yet powerful Plug-and-play Edge device which enables a secure and reliable drone operation at scale. It runs on our proprietary MatrixOS, an operating system built for drones.

The extensive research and development and on-site experience of over seven years have helped UrbanMatrix manufacture a highly robust, reliable, and user-friendly product that addresses the top three pain points in the drone industry. Our drone, the Hawk4G, has been designed to revolutionize the world of automated operations with longer flight times and autonomous patrolling capabilities.

The same drone is capable of functioning with different payloads, making it useful for surveying, inspection, surveillance, as well as crowd control. It is India's first 4G/5G UAV that allows live video



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feed viewing and has the potential to receive remote control/command from anywhere in the world. Coupled with our proprietary cloud console, tamper alerts, real-time health monitoring, and over-the-air software

updates, it is truly a revolutionary product.

We would like to express our gratitude to the DGCA, QCI, and UL India team for their unwavering support throughout our journey.

# Plana looks to create Asia's first eVTOL corridor between South Korea and Japan



South Korean aircraft developer Plana doesn't plan to introduce its first air taxi for a few years yet, but it's already initiating work to create what it says will be Asia's first international corridor for electric vertical takeoff and landing (eVTOL) flights between its domestic market and Japan.

Plana has signed a Memorandum of Understanding (MoU) with Osaka-based vertiport development and management company SkyScape Japan to prepare eVTOL flights between the archipelago and South Korea. In addition to what would be very long trips between cities in the two countries – 718-plus miles between their capitals, for starters – the accord also foresees developing a range of shorter-distance advanced air mobility (AAM) services within both nations.

Though the partners say the resulting international corridor would be the first in Asia for eVTOL operation, the claim may be somewhat of a misnomer given the use of hydrogen power in Plana's six-passenger-and-pilot aircraft designs. Those currently involve a hybrid powertrain system to fuel the six-rotor craft to cruising speeds of 190 mph over

a range of more than 310 miles. That distance is expected to expand to 500 miles through increased reliance on the greater flight capacities afforded by hydrogen compared to lithium batteries.

Even that, however, would come up short to power Plana eVTOL (plus hydrogen) planes between South Korea and Japan – not to mention popular inland departure and arrival routes on both ends. Presumably, then, the company plans on amping craft capabilities even more than previously announced.

As Plana moves its aircraft through development and certification processes – starting with test flights expected to begin later this year – the two companies will begin work on the air corridor through a joint concept of operations project. That will detail operations between the two countries, measure potential impact routes would have on communities within principal target areas, and recruit appropriate stakeholders for the preparation phase.

Using that base to build on, the partners also hope to extend their network to other Asia-Pacific nations.

"We are glad to sign a MoU with SkyScape, which is enthusiastically

creating an AAM ecosystem in the APAC region," said Plana chief operating officer Minyoung Ahn. "Through this partnership, we believe Plana and SkyScape will be able to co-develop a highly accessible aerial transportation network in Asia and realize it together for the benefit of the region."

Its accord with SkyScape to create eVTOL services between, and in South Korea and Japan follows a deal Plana signed last week with vertiport developer Volatus Infrastructure to build networks on the US. As part of that, Plana eventually intends to establish a US office to facilitate the certification process of its craft by the Federal Aviation Administration.

If created in time to claim the title of Asia's first eVTOL corridor, however, Plana's South Korea-Japan operation isn't likely to be the first international route in the world. Work toward establishing that precedent began last year through a partnership between the Northeast UAS Airspace Integration Research Alliance (NUAIR) and the Vports vertiport in Mirabel, Quebec. Those plans call for the creation of an operational zone dedicated to drone and AAM flights between New York and the Canadian province.



# AutoFlight Achieves World's longest eVTOL Flight with New Gen4 Aircraft



**A**utoFlight achieves world's longest eVTOL flight with new Gen4 aircraft. AutoFlight, the global eVTOL (electric Vertical Take Off and Landing) pioneer, announced it had achieved the world's longest eVTOL flight in history with distance of 250KM / 155 miles on a single charge of the aircraft's lithium-ion batteries.

The flight, which took place at AutoFlight's eVTOL testing facility on February 23th, consisted of 20 circuits on a predefined flight track, with the plane remotely piloted from the ground by AutoFlight's Flight Test team. Interestingly, while AutoFlight's Gen4 aircraft is fitted with the latest in state-of-the-art avionics, the aircraft also ran third-party avionics to record and verify the distance flown on ForeFlight, an independent system widely used in the aviation sector.

The flight is recognized as the longest fully electric aircraft flight in history, where the aircraft both takes off and lands vertically. This long-range test flight is a key milestone in the development of the Prosperity I aircraft, as it undergoes continued testing towards the company's goal of airworthiness certification in 2025 with EASA.

Omer Bar-Yohay, AutoFlight's president commented: This flight is both a great celebratory milestone, and a testament to the team's incredible effort and progress in testing and incrementally pushing the aircraft's performance envelope.

"It's a remarkable achievement that shows our aircraft's capability, and we are excited to continue working towards our next goals all the way to EASA certification in 2025."

The aircraft used in this record flight is the world's first look at

AutoFlight's newest Generation 4 model, which was penned by legendary designer Frank Stephenson. Frank's vehicle design portfolio includes iconic successes from brands including Ferrari, Maserati, McLaren, MINI and now AutoFlight.

AutoFlight's Prosperity aircraft is a state-of-the-art electric aircraft that uses rotors to lift the aircraft vertically for takeoff, then transitions to horizontal flight on the wing (like a traditional airplane). The aircraft is capable of speeds in excess of 200KMH, over a range greater than 250KM.

AutoFlight is one of only a few eVTOL OEM's to have mastered the challenging 'transition phase' from vertical to horizontal flight and have done so hundreds of times, clocking thousands of flight miles on multiple iterations of their aircraft.

# DroneShield Completes \$40 million Capital Raise with Substantial Investor Support



**D**roneShield Ltd is pleased to announce the successful completion of its Share Purchase Plan (SPP), which follows the \$10.9 million Placement, completed on 6 February. The SPP generated significant support from DroneShield's existing shareholders and substantially exceeded the \$3 million the Company targeted via the SPP. DroneShield received SPP applications of \$29.4 million at an issue price of \$0.30 per Share.

Given the strong support shown by shareholders, the Board exercised its discretion under terms of the SPP and has determined not to scale back applications, in recognition of the long-term support of its investors and to maximise growth opportunities. The funds will be used to accelerate

DroneShield's growth through a faster scale-up of inventory for near-term sales, growth of key parts of the team, and general working capital.

DroneShield's total funds raised under the Placement and SPP are \$40.3 million (before costs). Following completion, the Company has a robust balance sheet to accelerate growth with cash of approximately \$50 million and no debt.

Oleg Vornik, DroneShield's CEO, commented: "We are pleased to have received outstanding shareholder support for both the Placement and SPP. The funds will allow us to take advantage of the highly favourable environment for defence and specifically customer demand for counterdrone solutions as witnessed by the Ukraine conflict, as we target

2023 to be a transformative year for DroneShield.»

"The SPP proceeds in particular have been significant, and the Board is appreciative of the support from our shareholders. The higher proceeds will enable DroneShield to turbo-charge its growth, more rapidly fulfil anticipated near-term contracts, accelerate its technology development, and enhance its customer engagement. The Company is well-funded to execute its growth objectives."

Following this raise and recent record contract wins, the Company continues to scale its teams in Sydney and Warrenton, with available engineering, operations and other vacancies at [www.droneshield.com/open-positions](http://www.droneshield.com/open-positions)



# Wingtra lands \$22M funding round as their commercial drones take off to new heights

The business use case and appetite for drone technology is growing rapidly. A marketplace that was worth \$29.8B in 2022 is growing 38.6 percent annually. Serving this demand, the world's largest producer of commercial vertical take-off and landing (VTOL) drones, Wingtra, today announced a \$22M series B funding round as they accelerate their operations globally. The funding round included DiamondStream Partners, EquityPitcher Ventures, Verve Ventures, the European Innovation Council Fund (EIC Fund), ACE & Company, John L. Steffens (founder of Spring Mountain Capital) and some of the most successful Swiss Entrepreneurs.

Wingtra manufactures professional mapping drones and develops the flight software for fully autonomous operation. The WingtraPilot app operates the combined solution for reliable, fast and accurate collection and processing of aerial survey data. The drones are making it easier for surveying professionals in industries like construction and infrastructure, mining, environmental monitoring, agriculture and urban planning and land management to digitize their surrounding world.

Their signature drone, the commercial WingtraOne VTOL, has emerged as a formidable aerial data solution on the market. The VTOL design means the WingtraOne can take-off and land almost anywhere, even in confined spaces or on rough terrain, enabling widespread data collection. It is being used by hundreds of businesses and organizations, including CEMEX, Rio Tinto, Army Corps of Engineers and Kenya Red Cross, spread across 96 countries. The drones conduct over 100,000 flights annually, having mapped 18 million acres of land and sea (the equivalent of 13.6 million football



fields).

The team successfully released their second generation drone in 2021, the WingtraOne Gen II, which offers superior survey grade 2D and 3D maps to help users of the data make better decisions. It integrates the highest quality sensors of top-end RGB cameras to create 3D models, helping make digital twins at scale so that a single flight covering over 100 hectares can be digitized at 0.5 in/px. Compared to terrestrial surveying this is up to 30 times faster and 90 percent cheaper. Wingtra is delivering on the promise of the drone industry to offer effective and reliable means to achieve their needs.

Wingtra is the brainchild of four young entrepreneurs Maximilian Boosfeld (CEO), Basil Weibel (VP Growth), Elias Kleimann (CFO) and Sebastian Verling (lead engineer). It was created in the Autonomous Systems Lab of ETH Zurich, one of the world's leading tech universities. Its notable graduate luminaries include Albert Einstein and Swiss entrepreneur and philanthropist Hansjörg Wyss, who financed the Wyss Zurich Translational Center and is also an investor in Wingtra.

Wingtra started as a thesis paper for the university and became a startup at the Wyss Zurich accelerator. It grew to an internationally expanding scale-up business

and, today, the world's largest producer of commercial VTOL drones. Wingtra employs almost 200 people, has offices in Zurich, Switzerland (headquarters), Fort Lauderdale, US, and Zagreb, Croatia.

Maximilian Boosfeld, CEO and co-founder of Wingtra commented: "Our vision at Wingtra is to create a world where drones help people make the management of large parts of our planet more sustainable and efficient. We reduced the cost of adopting drone assets and increased the data quality. This will help industries to plan better and, fundamentally, improve safety for humans and the environment.

"We have built the best tool for accurate data collection and have created solutions together with our partners for a variety of use cases our customers face:

"As an example, our solution is used in all stages of the construction life cycle: from the concept phase (feasibility and right-of-way studies), to design phase (bidding process, detailed design and site planning), to construction phase (progress tracking to build survey all the way to maintenance, repair and operations). The same holds true for use cases in agriculture, land management and environmental protection. We will continue to innovate and solve the problems of the future with easy-to-use solutions."



# BRINC Announces Release of its Next Generation LEMUR 2 Drone

**B** RINC, an American developer and manufacturer of technology in the service of public safety announced the release of its next-generation drone, LEMUR 2. LEMUR 2 is the latest product from BRINC and is specially designed to enable law enforcement and public safety professionals to survey areas too dangerous to send a person, assess a threat profile, and de-escalate conflict without putting individuals in harm's way.

BRINC was founded in 2018 with the mission of designing and delivering products that address the major challenges in American public safety, de-escalate conflict, and save lives. BRINC's first drone, the LEMUR, was a milestone event for drone technology that introduced two-way communication capabilities, a glass breaker and optimized systems for indoor flight, among other features. Today, the newest iteration LEMUR 2 drone advances drone technology further with the introduction of an intelligent software layer.

The LEMUR 2 builds on the technological breakthroughs of LEMUR and introduces new features such as their proprietary BRINC Autonomy Engine, where the drone's onboard LiDAR sensor creates a 3D map of its surroundings in real time to enable a suite of capabilities. This includes a 360-degree standby hover that doesn't rely on light or GPS systems and an obstacle awareness system that dynamically adjusts speed around objects while still providing complete control to the drone operator for tactical maneuvers. Just as the autonomy engine simplifies operation, it also keeps law enforcement and emergency services personnel informed by providing an easy to interpret, 2D floor plan to users in real



time.

Blake Resnick, CEO of BRINC, commented on the news, "Today marks the next step on BRINC's journey to advance drone technology in the service of public safety. Our mission at BRINC is to revolutionize public safety by leveraging technology to de-escalate dangerous situations. Each drone deployed to a dangerous situation is one less individual in harm's way, and a potential life saved. The LEMUR 2 is the next era of first response technology that will undoubtedly make law enforcement and emergency services in our country more efficient and safer for all involved."

Alongside this powerful autonomy system is a first-of-its-kind sensor array, combining 10 unique systems for supporting its autonomy systems, visual / night / thermal imaging and two-way comms. This includes a LiDAR sensor, tracking camera, multiple night vision illuminators, a spotlight with strobe, 4K camera, FLIR thermal imager, microphone and loudspeaker.

Video and data is transmitted locally to a custom BRINC controller, and encrypted using AES-256 protocols. The LEMUR 2 is also mesh network compatible, allowing for multiple drones to extend each other's range in large buildings or underground. With an integrated 4G

LTE-powered connection, LEMUR 2 drones can securely stream a live camera view and 2D floor plans to stakeholders off-site through the new BRINC LiveOps web platform.

BRINC manufactures all of its products in, and source the vast majority of its parts from, the United States. BRINC has co-located R&D and production at its Seattle headquarters and is vertically integrated, controlling its supply chain. The BRINC LEMUR 2 is National Defense Authorization Act (NDAA) compliant and approved by the US government for its products to be used by federal agencies and contractors. BRINC is also investing in a safer tomorrow by developing a network of docked drone systems to respond to 911 calls quickly and effectively, moving response time from minutes or hours into seconds while providing the capabilities to enable a de-escalation-first approach to public safety.

Resnick continued, "Throughout our journey, we have worked with past and present law enforcement and emergency services professionals to understand their unique challenges and enhance their ability to do difficult jobs safely with best-in-class technology. We look forward to building upon our success and continually pushing the boundaries of what BRINC can offer to benefit public safety."

# Red Cat Holdings Invests in Firestorm Modular Unmanned Aerial Systems Company

**R**ed Cat Holdings, Inc. a military technology company integrating robotic hardware and software to protect and support the warfighter, has made a materially significant financial investment in Firestorm, an American company developing the first completely Modular Unmanned Aerial System (MUAS) that is 3D printed and payload agnostic.

Firestorm is building a new category of fixed-wing UAS with 30-day product iterations, a commitment to open-system architectures, and an additive manufacturing approach that allows them to scale production in an elastic manner.



“Firestorm is changing how UAV’s can be designed, manufactured, and delivered quickly, and the Firestorm system solves a lot of problems for many critical situations. Their long-range and long-duration loitering capabilities are a cost-effective approach to winning in the air. We believe that our Teal 2 drone

and the Firestorm UAV could be a great combination for the warfighter,” said Red Cat CEO Jeff Thompson.

Firestorm’s founding team has deep industry expertise in additive manufacturing, aerospace, and defense and understands how to build and quickly scale dual-use technology companies.

“We are honored to have Red Cat join us on our journey. Red Cat’s Blue UAS products, their American manufacturing facilities, and their industry knowledge have made them a great partner as we work to scale our business,” said Firestorm CEO Daniel Magy.



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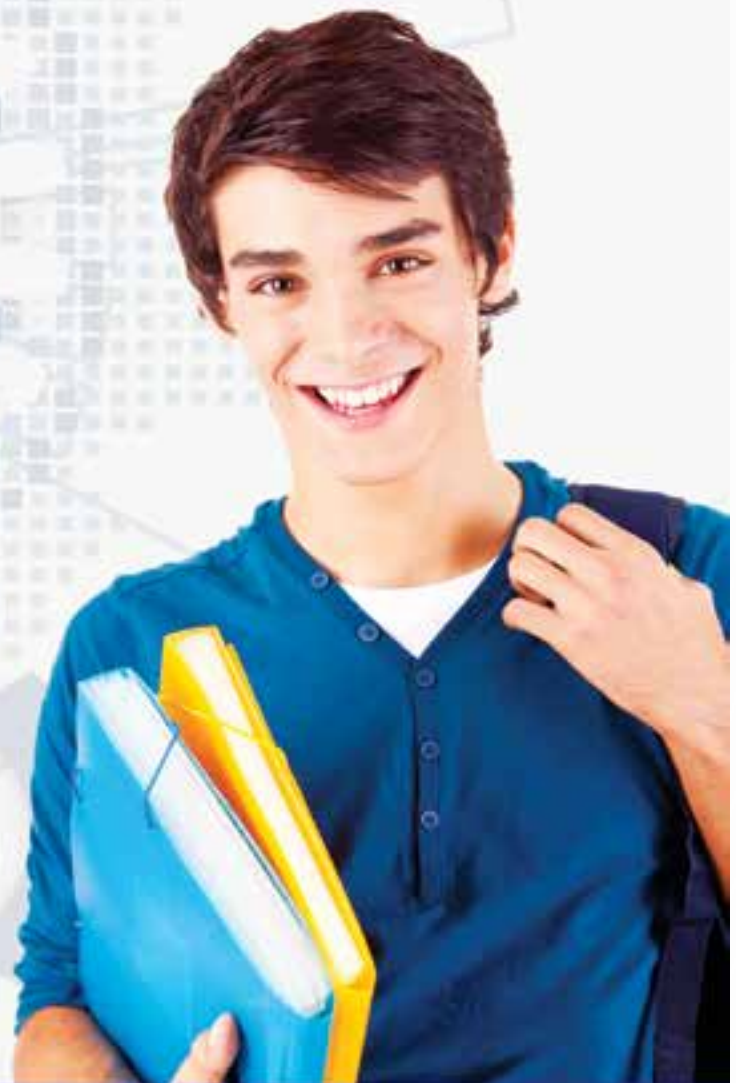
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