

# DRONES

India's first bi - monthly E magazine for Drones

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# WORLD



**Mr. Juergen Greil**  
CEO, FlyNow Aviation

A large portrait of a man with dark hair, wearing a blue button-down vest over a white shirt. He is smiling and looking slightly to the right.

**Mr. Rohan Verma,**  
CEO & Executive Director, MapmyIndia



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# DRONES WORLD

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DRONES WORLD is published by - B. Kartikeya

Welcome to yet another issue of Drones World. Let me start with a quote which is a general law of nature: "Everything that has a beginning must end". So does the year 2022. Let us show our gratitude to everything that has created new possibilities and end this year in high spirits.



The Drones World team has certainly made great efforts to bring to our readers, the most crucial updates on drone sector to keep them well informed. We are committed to shorten the information gap between the drone industry and our readers. There are lots of informative updates in our different sections such as Drone news, Drone Reviews, New rules & regulations, Questions & answers, interviews from top industry key people.

Next, in our Think Tank section, our story for the month is titled Integrated Sustainable solution to Develop Digital e-Market platform For Drone Industry., which offers an insight explosion of e-commerce and increasing use of smart assistants driven by the pandemic effect on our everyday living, the story takes a solen turn covering all integral aspects related to the world situation and beyond.

The career prospects that exist and will exist in near future in Drones/UAV's field will provide a great motivation to the patrons wishing to enter this sector. We wish them a great success in the captivating and lucrative aviation sector. The biggest achievement for us would be the contribution we have made in bridging the gap between drone enthusiast and the industry itself.

We are coming up with Drones Directory 2023 from all verticals of Drones Industry. There is cost involved in keeping them. Nothing is free. Better we thought of doing it for Drone Community. We will be always to support drone Eco System.

Overall, we have compiled a few thought-provoking and fascinating topics to make this edition fun and informative to read. We always try to provide the finest content to our readers and appreciate your feedback & suggestions regarding the same!

Till then, keep reading, stay safe and God Bless.!

*Thanks*

*Kartikeya*

**B. Kartikeya**  
Editor

**Zero Petroleum to provide fossil-free synthetic fuel to power Dronamics long-range cargo drone**

Zero Petroleum will supply its revolutionary fossil-free fuel to the world’s first licensed drone cargo airline, Dronamics, for testing with a view to commercial use in its long-range cargo drone. The partnership aims to support the creation of Dronamics’ sustainable same-day delivery service for items such as e-commerce goods, perishable food, manufacturing parts and medical supplies.

Zero Petroleum’s ZERO SynAVGAS fuel will be used in Dronamics’ ‘Black Swan’ drone to enable the company to deliver a carbon-neutral operation. The drone, which can carry a 350kg payload over distances of up to 2,500km, is powered by a ROTAX

propeller engine provided by CFS AeroProducts.

Dronamics recently became the first drone cargo company in the world to obtain a European drone airline license and is currently working with a consortium in the UK to build out a medical supply drone network for NHS Scotland.

Zero Petroleum Co-Founder and CEO Paddy Lowe said, “As a former Formula One engineer, I have spent my entire career working on cutting edge innovation so I am very excited for Zero Petroleum to partner with Dronamics and CFS AeroProducts on this potentially ground-breaking project. Operating an autonomous delivery network on this scale makes great sense but to carry these heavy payloads over such great distances would be impossible using electric power. Our fossil-free fuels, which have a carbon neutral lifecycle and can

be produced in a factory on any site close to water and renewable power, are the ideal way to deliver this as a fully sustainable alternative to the existing airfreight solution.”

Dronamics Co-Founder and CEO Svilen Rangelov said, “Sustainability is a vital part of our plans and as the first drone cargo airline in the world, we are delighted to have secured an agreement for Zero Petroleum to supply their fuel for Dronamics’ future drone network. Not only is the fuel entirely sustainable and fossil-free, the modular manufacturing process has a small footprint so it fits perfectly into our future drone port plans, potentially enabling the fuel to be produced on-site. We are very excited to work with the team at Zero Petroleum as we move towards commercial operations in the coming year.”

**RDARS opens its 1st UAS Command and Control Center in Miami, FL.**

RDARS Inc. an autonomous robotics and drone technology company developing advanced autonomous drone and robotic systems for alarm system augmentation and surveillance, is pleased to announce that it has opened its first UAS (Unmanned Aerial System) Command and Control Center in Miami, FL. This center, in addition to several more planned centers for growth and redundancy purposes, will allow its FAA (Federal Aviation Administration) licensed drone operators, using the Eagle Watch technology system, to manage its global fleet of autonomous systems, namely its Eagle Eye Drone and Eagle Rover UGV (Unmanned Ground Vehicle), improving the security situation of the property and people in the vicinity, and greatly enhancing situational awareness of the area of concern.

The remote operators will also be trained for Security Alarm Response Management and are anticipated to be integrated into the Alarm Monitoring Stations and Public Safety Agencies for data sharing, transmission, and emergency response purposes. As this technology and level of operational control falls under FAA’s beyond visual line of sight environment («BVLOS»), the Company will be seeking waivers and certification from all necessary regulatory bodies through the rigorous BVLOS testing of its products as the Company’s applications progress over the next 9 months.

Each Eagle Watch Command Center will be receiving and transmitting data over redundant high-speed networks and operating on Amazon Web Services in order to provide the highest level of availability and service. Recent natural disasters, like Hurricane Ian, has demonstrated the tremendous potential for services like Eagle Watch where first responders could

use this technology to provide live video imaging from places where damage has occurred. The Eagle Watch platform has its own reserve power and could be used as a base by first responders in emergency situations.

RDARS believes that this is the way of the future as more beyond visual line of sight UAS systems are deployed and require the necessary tools to integrate these systems safely into the National Airspace.

“We are really excited about the evolution of our systems, the industry, the technology, and the regulatory oversight that is occurring to allow for the realization of visionary systems to make the country a safer place and emergency response times faster and better,” said Charles Zwebner, Chief Executive Officer of the Company. “We are forging ahead and are proud of our vision, system designs, and state of the art technology leading the way with breakthrough autonomous systems,” added Charles.

**Autel Robotics Reaches MediaMarkt’s 75 Stores to Create Offline Shopping Experience in European Market**

Autel Robotics, a leading developer of drones and aerial photography devices, now has its products available in MediaMarkt’s 75 brick-and-mortar stores, across the Netherlands, Belgium, and Luxembourg, marking a key milestone for the company to expand its European expansion.

The company is actively developing a new portfolio of market development strategies for the European region, integrating offline experiences and online sales so that consumers can enjoy more unique opportunities to experience Autel products.

From November 7th to December 2nd, Autel’s industry-grade Dragonfish Pro will be placed in MediaMarkt Amsterdam Arena and Dragonfish Lite will be placed in MediaMarkt Braine l’Alleud. The Dragonfish series will demonstrate to customers the professionalism of Autel’s industry-grade products and

advanced drone R&D technology, allowing customers to acknowledge the unique features of these relatively tilt-rotor UAVs, including vertical take-off and landing.

The company aims to glean deep insights from the changing needs of consumers based on the performance of products on sales at these locations in Europe. Autel will gain a more robust understanding of the purchasing intention among customers and bring them a better offline experience, both during purchase and after-sales. The company’s growing offline presence in the region will also make it more convenient to collect feedback on user needs and build connections with them.

“Our expansion in product exposure to MediaMarkt’s 75 offline stores, as well as Autel Brand Day that is already in process, demonstrate Autel’s commitment to the European market. We will continue to actively expand channels in the market going forward and hope to engage more distributors and agents to

collaborate on developing our local user base,» Autel Robotics’ marketing manager stated.

Brick-and-mortar locations in the market are mainly selling the EVO Nano+ at present, with in-store demonstrations available for potential customers. After won international recognitions for the build quality and unique design, EVO Nano+ recently also completed an extreme challenge. Autel delivered the mini-drone to Iceland to take aerial photos of the Fagradalsfjall volcano, which had been previously dormant for more than 6,000 years. Weighing a mere 249 grams, the EVO Nano+ faced the gusty winds and scorching heat of the volcanic landscape along with signal interference. However, it still performed its mission outstandingly, recording scenes of the stunning volcanic eruption in the evening with support from its stable flight control technology and strong imaging performance.

**FAA releases new vertiport design guidelines to ensure safety**

The Federal Aviation Administration (FAA) has released new design guidelines for vertiports, infrastructure that will support advanced air mobility (AAM) aircraft. The design standards will serve as the initial step to provide key information for airport owners, operators and infrastructure developers to begin development of facilities that will support operations of AAM aircraft that are electrically powered and take-off and land vertically.

“Our country is stepping into a new era of aviation. These vertiport design standards provide the

foundation needed to begin safely building infrastructure in this new era.” said Associate Administrator for Airports Shannetta Griffin, P.E.

These Vertical Takeoff and Landing (VTOL) operations will transport passengers or cargo at lower altitudes in rural, urban and suburban areas. The design standards include critical information that designers and builders will need to follow to allow for safe take-offs and landings.

Some of those include: Safety-critical geometry and design elements: Dimensions for vertiport touchdown and liftoff areas, additional airspace needed for approach and departure paths and load-bearing capacity. In the future FAA anticipates a high rate of

operations at many vertiports.

Charging and electric infrastructure: Initial safety standards and guidelines for batteries and charging equipment that will be central to vertiports. On-airport vertiports: Requirements for airports looking to add vertiports to an existing commercial airport, including the distance a vertiport would have to be from a current runway. Elevated vertiports: Requirements and guidelines for vertiports that may be on top of existing structures. This vertiport guidance will be used until performance-based vertiport design guidance is developed.

**Sky Power International with new distribution partner in India**

Sky Power International has gained an exclusive distribution partner for the Indian market, Zerosum Technologies Pvt Ltd. The new distributor offers products and systems for the development and operation of UAVs and works with numerous drone manufacturers in the national market.

“India is one of the most important Asian markets for us. We are therefore pleased to have gained a partner in Zerosum Technologies, whose contacts we have already worked with successfully on previous projects,” says Karsten Schudt, Managing Director of Sky Power. Zerosum Technologies will take over the entire product portfolio of Sky Power International, which includes the two-stroke and Wankel engines, the compact single-cylinder SP-28 CR engine up to the powerful two-cylinder SP-275 TS engine. All

engines are offered in different versions, such as carburator and FI, with and without generator, etc. In addition to the engines, Zerosum Technologies will also offer all ancillary items such as propellers, filters and engine control units. The Indian distributor will also be the local service and maintenance partner for all Sky Power International engines and, in addition to test services, will also assist in integrating the engines into UAVs. To this end, the company employs industry veterans with extensive technical backgrounds.

Zerosum Technologies Pvt Ltd, a registered mid-sized company, provides subsystems for the emerging Indian UAV industry. India aims to be at the forefront of UAV technology in all sectors. A goal that can only be achieved with the best and



most technologically advanced subsystems. The partnership with Sky Power International is expected to make India the local center for testing and overhauling propulsion systems that meet the requirements of the next generation of engines. “Sky Power International represents the best-in-class technology in the UAV space. We are excited to be partnering with them. This perfectly dovetails in our Prime Minister’s vision of Atmanirbhar Bharat to make the country self-reliant in critical technologies. We plan to co-develop next generation engines for India and the World” says Vikram Bansal, CEO of Zerosum Technologies.

**Trinity F90+ UAV is C3 certified!**

The news of Trinity F90+ receiving the EASA C3 certification is finally out. This significant event occurred on October 25th, 2022, when Trinity F90+ received the EASA C3 certification for the EU drone class. The certification also allows take-off weight of over 4 kg.

The C3 certification is mandatory in the EU member states for UAVs purchased from January 1st, 2024. Trinity F90+ has prepared itself to comply with this mandatory requirement way ahead of schedule. The certificate recognizes Quantum-System’s commitment to supplying cutting-edge technology. At the same time, they are fully compliant with the



complex regulatory framework in existence for UAVs.

For C3 compliance, all Trinity F90+ users will be eligible to upgrade their systems. The UAVs sold before January 1st, 2024, will be allowed to operate legally in the A3 category in Europe. Hence, the upgrade is fully voluntary. In order to receive the class C3 label for Trinity F90+, Quantum-Systems

collaborated with Spanish Alter Technology Group (TUV Nord) to ensure compliance with the C3 class requirements.

Alter Technology Group, part of the TUV Nord Group, is an accredited and notified body of the EASA for drone classification and CE declarations.

**Sabrewing’s Rhaegal Cargo UAV Shatters World Record Payload on First Flight**

Sabrewing Aircraft Company, Inc. announced that its RH-1-A “Rhaegal” (pronounced “Rye-gull”) VTOL air cargo drone had achieved its first hover flight while lifting a record-setting payload. This pre-production air vehicle, also known as the RG-1-A “Alpha” model, was able to lift a record-breaking 829-pound (374 kg) payload, shattering the previous world record for the “dead-lift” of any commercial, vertical takeoff, uncrewed air vehicle (UAV).

The Rhaegal “Alpha” aircraft is the world’s first autonomous cargo aircraft capable of both vertical and conventional take-off and is designed to take tons of cargo to any location on Earth, in almost any weather.

“We are extremely proud to have accomplished this milestone,” stated Ed De Reyes, chairman and CEO of Sabrewing. “It’s been a long journey to get here, but we

were unwilling to compromise safety or design. Our design and tests teams—and our development partners—invested tens of thousands of hours to make this milestone such a history-making success,” De Reyes added.

Vast improvements to the blades, ducts, and shape of the shroud of the aircraft’s ducted fans allowed each duct to produce 30% more thrust than it was originally designed to provide. These improvements contributed to the aircraft’s ability to lift the record-shattering payload. The pre-production prototype aircraft weighed just over 2,700 pounds (1,225 kg) for the first flight and is capable of a maximum gross weight (with payload) of up to 3,100 pounds (1,406 kg) at altitudes up to 22,000 feet (6700 meters) and 200 knots. When taking off conventionally, this aircraft has enough thrust to carry over 2 tons of cargo with the same range, altitude, speed, and efficiency.

“This is only a fraction of what this aircraft can carry. But it proves

that we’re able to lift more cargo on our maiden flight than any previous cargo UAV that has ever flown,” said De Reyes.

The Rhaegal aircraft uses a turbo-electric drivetrain based on Safran’s Helicopter Engines turbine-based motor, the Ariel 2E. The Ariel can use 50% sustainable aviation fuel (SAF), and turns an electric generator which produces nearly 1 megawatt of electric energy which in turn then powers electric motors in each of the four ducted fans.

“We’re able to generate more propulsive energy - much more efficiently - with a turbo-electric drivetrain and ducted fans than with batteries or directly driven by the turbine,” said Oliver Garrow, Chief Technology Officer for Sabrewing. “The Safran motor is currently cleared to use 50% sustainable aviation fuel (SAF). We expect to be one of the first aircraft manufacturers to use hydrogen when Safran completes testing on their motor in the next couple of years,” Garrow stated.

**AgEagle’s eBee X Series Drones Are the First and Only UAVs to be approved by the FAA for Operations over People (OOP) in the United States**

AgEagle Aerial Systems Inc, an industry-leading provider of full-stack flight hardware, sensors, and software for commercial, government, and defense use, announced that the Company’s “eBee X” series, including the eBee X, eBee GEO, and eBee TAC of the fixed-wing unmanned aircraft system or UAS, are the first and only drones to comply with the Category 3 of the FAA’s “Operations of Small Unmanned Aircraft System Over People” rules. These rules were published in the Federal Register by the U.S Federal Aviation Administration (FAA) in March 2021.

The Chairman and CEO of AgEagle said, “Becoming the first and only UAS approved for OOP in the United States is expected to have a material impact on AgEagle’s growth and standing as a recognized leader in this industry. It is another testament to our commitment to providing our commercial partners with the best-in-class solutions. We are also confident that this will serve as a key driver in the growth of eBee utilization in the United States.” He further added, “We believe it will further improve the business applications made possible by our drone platform for a wide range of commercial enterprises which stand to benefit from the adoption of drones in their business. Especially those in industries such as insurance for storm damage

assessment, telecommunications for network coverage mapping, and energy for power line and pipeline inspections, will benefit from using drones.”

For sUAS users, securing a Part 107 certificate of waiver from the U.S Federal Aviation Administration (FAA) is the longest, most arduous, and most costly process. However, now that the eBee has been approved and is compliant with Category 3 of the rules, the drone operators no longer require an FAA waiver for OOP or Operations over Moving Vehicles.





**Robotic Skies Introduces SPAN Software Platform to Integrate Operations and Customer Data across the Company’s Global UAS Maintenance Network**

Robotic Skies made an announcement of the launch of its cloud-based SPAN software platform. This software is used for managing and tracking Unmanned Aviation Systems (UAS) and Advanced Air Mobility (AAM) service and repair projects for its commercial OEM and aircraft operator customers. CORRIDOR Aviation Service Software powers the SPAN software platform. It is managed by Robotic Skies’ strategic partner, Continuum Applied Technology, Inc.

SPAN fuses information across the company’s global

Maintenance, Repair, and Overhaul (MRO) network. This is done via a customized implementation of the world-class CORRIDOR software platform. It manages its unique MRO operations to develop new aviation market sectors rapidly. In the first quarter of 2023, access to the cloud-based CORRIDOR Go software employed by SPAN will be rolled out to beta Robotic Skies Service Centers.

Brad Hayden, CEO and Founder of Robotic Skies, said, “Reliable data collection, analysis, and prediction is essential for safe and productive remotely piloted aircraft operations. SPAN encompasses all service and maintenance activity aspects across our global network.” He added, “The Robotic Skies-CORRIDOR partnership creates a one-stop, comprehensive solution

that supports the unique UAS-AAM operations requirements while maintaining regulatory compliance for aircraft maintenance execution and maintenance tracking.

The UAS/AAM manufacturers and operators now realize that access to global airspace is contingent as it depends upon the establishment of aviation compliance practices, including formalized maintenance programs and accurate record keeping. While tracking aircraft compliance, the SPAN platform facilitates scheduled and ad hoc maintenance activity management. Robotic Skies’ customers can use SPAN service data to establish optimal maintenance intervals and improve aircraft reliability.

**Elevating high-precision aerial lidar mapping with TOPODRONE and Velodyne Lidar**

Based in Switzerland, Automated with Velodyne partner TOPODRONE designs and manufactures high-precision lidar equipment for installation on drones, vehicles and backpacks. TOPODRONE’s lidar solutions are used for mapping and 3D modeling as well as forest and agricultural monitoring. Their advanced post-processing software provides users with easy-to-use innovative data processing workflows for automatic data generation, georeferencing and alignment using GNSS and IMU data post processing, and SLAM algorithms.

TOPODRONE has announced a new solution that fills the gap between heavyweight and expensive manned aerial lidar systems and lightweight drone lidar systems. Meet LiDAR PRIME + aOrion Heli-E! LiDAR PRIME is TOPODRONE’s most advanced lidar system, with a working range up to 300 meters

covering a 500-meter corridor width and more than 20 km2 per flight with the aOrion helicopter. This new system is enabled by the Alpha Prime sensor, Velodyne’s world-class, long-range lidar sensor.

With LiDAR PRIME, mapping with lidar is better than ever. Users can dramatically expand their applications to survey large areas that were previously only possible to survey using manned airplanes or helicopters. LiDAR PRIME provides users the opportunity to captures tens of kilometers

of power lines, dozens or even hundreds of square kilometers of a surveying area, and more.

TOPODRONE’s full payload range is built on Velodyne Lidar’s sensor technology, including the HDL-32E, Puck Hi-Res, Ultra Puck and Alpha Prime. Velodyne’s lidar sensors are installed on board unmanned helicopters together with TOPODRONE’s P24/P61 for survey and mapping, providing previously unavailable efficiency to the market.



## Aramex completes testing of drone delivery in Oman.

Logistics provider Aramex has accomplished the pilot phase of its drone delivery project in Muscat, Oman. The company is eager to expand its drone delivery testing across the Middle East regions. The drone testing is part of Aramex's "Future Delivery Program." With testing, Aramex aims to leverage the next generation of last-minute delivery solutions that improve customer satisfaction and generate cost savings.

The test flights were directed in partnership with USA-based UVL Robotics, a leading technology brand that offers cutting-edge drone-based solutions with AI features. Aircraft usage aligns with Aramex's commitment to the SBTi (Science Based Targets initiative) as it yields various environmental

benefits, reducing traffic congestion and carbon emissions.

Through successful drone delivery testing with UVL Robotics, the company proved that these automated delivery modes would enhance speed, reliability, and accessibility. Aramex successfully delivered packages, especially to remote areas with hard-to-reach territories. Furthermore, the program supports sustainability ambitions to reduce greenhouse gas emissions and reach carbon neutrality in the upcoming year.

Global Director Angad Singh said, "The success of the pilot drone delivery is an exceptional



milestone of our Future Delivery Program," which is a key feature in our sustainable and innovative roadmap. The autonomous aircraft potentially cut transit times by half in difficult routes, resulting in customer satisfaction. He added we could accelerate the delivery of packages across different regions, including healthcare, eCommerce, and pharmaceuticals. Moreover, drones deliver parcels safely and efficiently across different terrains and weather conditions in Muscat.

## Drones Delivery Project with Garuda Aerospace, KL Tech City, and Jedsy

Garuda Aerospace, India's best Drone Company, has become the market leader in the Drone industry. It acts as a complete solution space to increase efficiency and reduce redundancies. Kualumpur (KL) Tech City is an integrated local-global network of tech business experts working to foster a creative, diverse, and dynamic environment. Apart from that, Jedsy entitles to the fastest and most reliable aircraft delivery service in the world that delivers vital shipments.

A drone delivery project in India required the collaboration of

these three leading companies. As a Memorandum of Understanding (MoU) was signed by Garuda Aerospace, KL Tech City, and Jedsy to advance their collaboration on Jedsy delivery drones, it calls for cooperation in technology and knowledge as joint ventures and market expansion.

The CEO of Garuda Aerospace, Mr. Agnishwar Jayaprakash, commenced that the industry is now prepared to accept drones for various purposes, including delivery. He said our team was allowed to showcase drone-based delivery, and we victoriously completed the tasks to deliver couriers and packages for the Indian government and military forces. The Prime Minister then requested to facilitate mail delivery through Jedsy services.

With Jedsy efficient system,

drone deliveries are expanding alongside Garuda Aerospace and KL Tech City. The company uses a fixed-wing aircraft design to fly fifty times more efficiently than any automobile. Apart from that, Co-Founder and Managing director at KL Tech City, Mr. Suraj Arora, said, we are very excited about this collaboration of expanding the aircraft portfolio for Garuda Aerospace with Jedsy Delivery Drones. He added that our transformative technologies help create new geographies for Jedsy.



## Wingcopter Delivery Drones for Better Local Supply in Rural Areas

In a joint project, the Frankfurt University of Applied Sciences (Frankfurt UAS) and the delivery drone manufacturer and operator Wingcopter are testing the potential of on-demand transport of consumer goods to improve local supply in rural communities. For the project called “Drohnen-Lastenrad-Express-Belieferung” (“Drone Cargo Bike Express Delivery”), which is funded with almost 500,000 euros by the German Federal Ministry of Digital and Transport, the funding certificates were officially handed over to the project partners in Berlin today.

As part of the pilot project, everyday goods will be flown by Wingcopter from a medium-sized center to surrounding smaller villages, where they will

be delivered to end customers by cargo bike. The goal is to realize the fast and reliable delivery of groceries and other consumer goods to rural areas and thus improve the local supply of citizens. The use case is to be evaluated from an economic and environmental point of view and, if successful, a sustainable and easily scalable business model will be developed. The planned start of the first flights in the south of Hesse in Germany is in spring 2023.

Professor Dr. Kai-Oliver Schocke, Director of the Frankfurt UAS Research Lab for Urban Transport (ReLUT), comments: “In many rural areas today, supply is severely limited due to the closure of smaller, local stores. We expect that the use of delivery drones will improve the local supply in rural areas again. From a socioeconomic perspective, this type of delivery is especially beneficial to citizens with limited mobility, such as the elderly or those without their own cars. In addition, the alternative transport option can result in

economic and environmental benefits for the partners involved.”

Using battery-powered Wingcopters and electric cargo bikes also enables emission-free delivery, bringing significant environmental benefits compared to road-based transport.

“Delivery drone applications will prevail where they serve a real need and improve lives. This is clearly the case with our medical delivery projects in Africa and other parts of the world. However, we are convinced that “Drone Delivery as a Service” offerings also have a real benefit for many people in rural areas of Germany. We are pleased to now be able to evaluate this use case over a longer period of time”, adds Selina Herzog, Head of Service Solution Design and Planning at Wingcopter.

The project is the first of its kind in Germany and is funded by the Federal Ministry of Digital and Transport as part of the “Innovative Air Mobility” funding program. It is scheduled to run for 12 months.

## Drone Delivery Canada provides update on Canary drone parachute testing

Drone Delivery Canada Corp is pleased to provide an update on the successful parachute testing and development of the innovative Canary drone. Further to its press release on January 25th, 2022, the testing of the Canary continues to progress on schedule with full autonomous missions and expanded flight envelope including the parachute validation testing.

DDC’s Canary drone successfully passed the parachute safety system air-deployment

test as well as the automated motor safety shut-off. Moreover, the team pushed the Canary up to 5,900ft ASL with full payload of 4.5kg to validate performance including the demonstration of its stability, fidelity and reliability. Additionally, the team tested the drone for cold and hot weathers forcing it to perform at -35 degrees Celsius and +50 degrees Celsius. Finally, the team flew the drone at a maximum range of 21km to ensure the validity of the drone’s range and payload capabilities. DDC’s engineers have a drop test program to conduct and the completion of the parachute flight test program, following which DDC will submit its declaration to Transport Canada that will enable the Canary to fly over people.

“The team has made incredible

progress with the flight test program and validation to bring to market a drone to enable flights over people. A drone like the Canary, with a weight-class of under 55lbs (25kg), will bring new opportunities and use cases for the healthcare sector as well as the retail environment (i.e., residential deliveries at scale). Being able to address these vertical markets with our award-winning solution is part of our strategic roadmap and is expected to open underserved markets,” said Steve Magirias, CEO of DDC.



## Matternet M2 Drone Delivery System First to Achieve FAA Type Certification

Matternet announced that the Matternet M2 drone has achieved Type Certification by the Federal Aviation Administration (FAA). As the first non-military unmanned aircraft to achieve Type Certification in the US, this gives Matternet a strong competitive advantage in the drone delivery market. The completion of the four-year rigorous evaluation by the FAA proves the safety and reliability of the M2 aircraft, a key step in scaling US commercial drone operations.

“We are incredibly proud that Matternet M2 has met the very rigorous safety standards of the

FAA and is the first drone delivery system to be Type Certified in the United States,” said Andreas Raptopoulos, founder and CEO of Matternet. “Drone delivery will revolutionize healthcare and e-commerce in the US. We’ve been at the forefront of this revolution since launching US operations in 2019 — we are now ready for scale.”

For the last four years, a select number of UAS, including the Matternet M2, have been operating under Part 135, the FAA framework for revenue on-demand air carrier operations, using an exemption while the systems are evaluated. With a Type Certification, implementing new networks and getting approvals will be a more streamlined and predictable regulatory process. Additionally, air carrier operating licenses such as

Part 135 on-demand transportation can only use Type Certified aircraft.

“This is a victory for not only Matternet, but for the whole UAS industry as it indicates a maturing of the industry and a shift away from exemptions and waivers towards more standard regulation,” said Jim O’Sullivan, vice president of regulatory strategy for Matternet. “Matternet would like to thank the FAA, as well as our advisors at End State Solutions.”



## Zipline and Intermountain Healthcare begin drone deliveries in the Salt Lake Valley

Zipline’s on-demand delivery system features a fleet of fixed-wing, small, and autonomous aircraft that operates silently and rescues packages with parachutes to a patient’s yard. It is the global leader in instant logistics and delivery that begin deliveries of medical products and prescriptions directly to Intermountain Healthcare patients’ yards in the Salt Lake Valley area. The aircraft company will begin to offer its services in the Salt Lake and Utah counties.

Intermountain Healthcare is the primary health system of

the Mississippi River to utilize a Zipline to bring prescriptions. The company provides proper medications to patients’ homes via Zipline’s on-demand logistics partner, which includes fully electric and autonomous aircraft. This empowers Intermountain to provide patients with full support and necessities. Patients can receive support in an accessible and convenient way which is particularly impactful to their health.

Test flights in Utah began a couple of weeks ago. The partnership between Zipline And Intermountain Healthcare will expand gradually over five years. Now, it can deliver the best medical help to patients in the Salt Lake Valley area. Gradually, the companies will develop beyond Salt Lake to several other regions in Utah so that patients can get the

best care they need, regardless of where they live.

Moreover, the drone can fly up to a 50-mile radius, regardless of weather conditions and extreme temperatures. Each flight covers the distance for about 30 times less CO2 emissions per mile than an average electric vehicle. It is beneficial in Utah’s Wasatch Front, where air quality has been a major issue.



## Boeing and Wisk Unveil Concept of Operations for Urban Air Mobility

Boeing and its joint venture partner Wisk released a roadmap for transitioning to a future where automated and uncrewed aircraft can safely carry passengers and cargo in urban and suburban areas. The concept of operations lays out the technology, regulatory and social recommendations needed to deploy Urban Air Mobility (UAM) in the United States and integrate it into the national airspace system.

“We’re working to enable a future of aerospace that is safe, sustainable and at scale. Uncrewed operations will be fundamental to realizing that vision, and we have to exceed the current safety standards for the air transportation system,” said Brian Yutko, Boeing Vice President and Chief Engineer of Sustainability & Future Mobility.

The concept of operations begins by proposing bedrock principles for urban air mobility, including that flights should be safe and affordable for everyone. Additionally, the aircraft would be automated to reduce the load on air traffic controllers and pilots, and they would fly day or night under visual or instrument flight rules, and be supported by automated onboard and ground-based systems.

“The important work we’re sharing today provides a stepping stone in the advancement of UAM in the U.S. and the world,” said Gary Gysin, CEO of Wisk, which has been working to bring to market the first all-electric, self-flying air taxi in the U.S.

“The vision we have outlined is the result of many years of collaboration with Boeing, the FAA, NASA and key industry stakeholders. As a result, this document offers the most comprehensive framework proposed to date with a vision for enabling UAM in the national airspace. Wisk is committed to deliver, with its partners, on this vision,” said Gysin.

Boeing and Wisk say that evolutionary and pragmatic methods will be needed to make the vision of UAM a reality. This includes the creation of new infrastructure such as ‘vertiports,’ locations where UAM aircraft can take off and land, load and unload passengers, and receive services. Additionally, while the aircraft will be automated, Boeing and Wisk recommend the creation of ‘fleet operations centres’ where ‘multi-vehicle supervisors’ will monitor flights, implement air traffic control instructions to maintain aircraft separation, and ensure safe operation of the flight.

“The work we’ve done with our partners at Wisk demonstrates how this shared vision can become reality, and we’re excited to share these ConOps with public, government, policy and regulatory stakeholders to engage across industry to shape that future,” said Yutko.

## VPorts Creates the First-of-Their-Kind International Electric Advanced Air Mobility Corridors between Quebec and the United States

VPorts, a Quebec-based world leader in the design, construction and operation of Advanced Air Mobility (AAM) infrastructure announced the signing of a Memorandum of Understanding (MOU) to establish the first-of-their-kind international electric AAM corridors between Quebec (Canada) and the United States. The electric vertical take-off and landing (eVTOL) aircraft test flights are planned for 2023.

The MOU was signed by a consortium of international organizations, including VPorts, Aéro Montréal, Northeast UAS Airspace Integration Research Alliance (NUAIR), Innovitech, the Unmanned Aerial System Centre of Excellence (Alma) and Helijet International.

“Advanced Air Mobility is moving very fast. These Quebec-U.S. international corridors will contribute to the development, integration, and social acceptability of Advanced Air Mobility. This initiative is in keeping with our ambition and vision to build and operate 1,500 vertiports around the world by 2045,” said Dr. Fethi Chebil, President and Founder of VPorts.

The aim of the corridors is to build an AAM ecosystem that will provide a platform for full commercial cargo transport operations using eVTOLs. They will allow the consortium’s members to explore all aspects of AAM, including goods transportation, charging readiness, stakeholder management, business cases, security and safety protocols, social acceptability and urban integration of infrastructure and operations. The initiative could also be replicated in other countries.

“This project is aligned with Aéro Montréal’s mission of enhancing the Quebec aerospace cluster and positioning it as an international leader. We are delighted that VPorts is leading the way in establishing electric Advanced Air Mobility corridors between Quebec and the United States,” said Suzanne M. Benoît, President of Aéro Montréal, Quebec’s aerospace cluster.

## **XAG Goes Global with its P100 Agricultural Drone, Helping Farmers to Reap More**



With 8 years' effort of XAG to promote smart agriculture, drones flying above the field to perform farm works have been gradually adopted in many regions. To meet farmer's need for a large-capacity drone, XAG officially makes its P100 Agricultural Drone available for sales globally. This fully autonomous drone has multiple uses around the farm, such as spraying pesticides, spreading fertilizers and broadcasting seeds, to boost yield and lower costs.

As one of the fast-growing markets for agricultural drone, Vietnam becomes the first to witness the rising force of XAG P100. With the payload upgraded to 40 kg, the drone can serve larger fields more effectively to address labour shortage. In the meantime, drone pilot is seen as the new favored career for rural youth, who can harness technology to make a good fortune.

The new rising force to grow rice yields

Nhan, a farmer who owns a 70-hectare rice field in the Bac Ninh Province of Vietnam, used to suffer from unstable yield and profit decline. He was not content with the performance of manual spraying that was costly and inefficient. As the cost of hiring workers had posed great pressure on his livelihood, he ordered services from KPT Fly Team to help him cultivate rice with XAG's drone.

"Before approaching us, Nhan hired 20 to 25 workers to spray pesticides manually, but this often led to uneven spraying and waste of chemicals. Now because we have the tool of preventing pests more effectively, our team becomes his first option to reap harvest," said by 30-year-old Khuong, KPT's co-founder.

"With two XAG P100 agricultural drones, two small teams consisting of only 4 to 6 people can finish the fieldwork much faster and easier. While the drone sprays evenly and penetrate the rice crops more quickly, it can also spread seeds and fertilizers. Our service has helped him reduce labor cost and improve the yields."

## ANSL and Skyports partner on CAA innovation sandbox project

Air Navigation Solutions (ANSL) announced on 26th October 2022 that it had joined hands with Skyports Drone Services in the Civil Aviation Authority's (CAA) Sandbox, which provides many companies with a space in which they can test innovative airspace solutions.

The partnership between air traffic management provider ANSL and drone operations company Skyports Drone Services aims to develop plans to create the UK's first low-level Transponder Mandatory Zone (TMZ) west of Scotland. The project's main aim is to provide safe, efficient and equitable access for all airspace users. This includes both crewed and uncrewed aircraft.

Both these services are working with the CAA Innovation team to create an operational safety case of Beyond Visual Line of Sight (BVLOS) operations. By doing so, before they formally submit for approval, they can develop their plans for the TMZ operation and explore regulatory views and the feasibility of the proposal.

The ATM Operations Specialist at ANSL, Vicki Hughes, said, "We are excited to continue our work with the CAA's innovation team. This will allow us the space to build on our innovative paths with Skyports and to have expert reviews while evolving our safety work. This initiative delivers on a key part of the Government's aviation strategy to ensure new technology is integrated safely, securely, and sustainably."

ANSL has proven itself, and its track record of delivering air traffic management in Scotland is anything short of remarkable. ANSL has been the air traffic control provider for Edinburgh airport since 2018.

Skyports Drone Services is quite experienced in operating BVLOS drone flights in Scotland. Previously, the company has also performed multiple test flights and projects in the Bute and Argyll regions. Currently, they are also working on a project in the east with Angus Council and the NHS.



## Drone Racing League and PointsKash Cash in on Inaugural, Five-Year Loyalty-Rewards Partnership

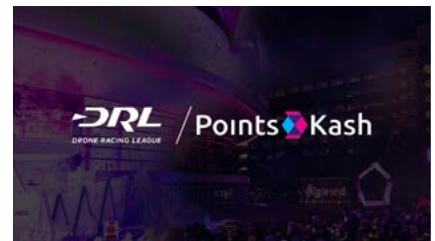
The Drone Racing League (DRL), the world's professional drone racing property, and PointsKash have entered into a partnership. As per the terms of the partnership, PointsKash, the first blockchain-enabled conversion platform which enables users to collect, convert and spend loyalty points, will provide inaugural loyalty rewards to elevate DRL fandom globally.

The deal is signed for a five duration and includes the unveiling of the DRL Flight Club, which will be starting this 2022-2023 DRL Algorand World Championship Season. It is the first program for DRL fans to collect rewards on PointKash and also allows branded integrations in DRL events, gaming products, and other content.

DRL and PointsKash will make it easy for DRL Flight Club Members to cash in on spectacular drone racing experiences by leveraging Algorand's high-performance blockchain platform. Algorand's fast, safe and decentralized will allow fans to redeem PointsKash points for DRL live event access, limited apparel, and extra plus-ups within the DRL SIM video game and the Drone Racing Arcade mobile game.

PointsKash CEO Steve Janjic said, "PointsKash is made for Gen Z, so we knew we had to partner with Gen Z's favorite sport, the Drone Racing League. DRL fans are young and tech-savvy and tend to have a higher income than traditional sports fans, which suggests that they are more likely to stack up points across different loyalty rewards programs. We will help these DRL fans to consolidate these benefits into one centralized PointsKash account and use them towards DRL's incredible drone racing events and gaming products."

The PointsKash mobile app will be available for fans from December 2022 during the 2022-2023 DRL Algorand World Championship Season.



## Eve Announces Collaboration with Skyway Technologies for its Urban Air Traffic Management Solution

Eve Air Mobility signed a letter of intent with Skyway Technologies Corp. The intention behind it is to provide Eve's Urban Air Traffic Management (UATM) software solution to ensure that the management of future Urban Air Mobility (UAM) solutions can support the needs and growth of the industry.



The CEO of Skyway, Clifford Cruz, said, "Integrating Eve's UATM solution into Skyway's air traffic vertiport operation service further increases industry support for eVTOL sales and pushes Skyway's service to new heights. It enables airline investments into this sector the ability to close the loop when it comes to operating these aircraft digitally driven vertiports being developed. It's an important step forward in bringing UAM to life, and we look forward to all the great innovations to come."

Andre Stein, co-CEO of Eve, spoke on this occasion, "The partnership with Skyway will help drive market awareness for Eve as a software supplier for UAM and help understand how to improve and advance UAM operations. We are studying the use of Eve's UATM software solutions for Skyway's operations and, with it, develop an operational model for use in certain missions and regions."

The ATM software created by Eve is an agnostic solution. It will enable the integration of all airspace users in the urban environment. This integration process is critical to support the safety and efficiency of the entire UAM ecosystem, including fleet and vertiport operators. The collaboration between Eve and Skyway marks their commitment to creating a safe integration and scaling global UAM operations.

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## MissionGO signs 3-year, \$50 million UAS infrastructure partnership

MissionGo Unmanned Systems, the leader in uncrewed aircraft systems production and operations, announced a 3-year partnership with Southern California Edison, the largest subsidiary of Edison International and the primary electricity supplier for much of Southern California. Under this partnership, MissionGo will provide UAS inspection services to Southern California Edison.

For energy and utility companies, staying ahead of mechanical issues, malfunctioning equipment, and dangerous facilities is a priority due to high temperatures and extreme droughts throughout the region.

The minimization of time and hazards while increasing the quality and quantity of collected data is possible with the use of UAVs. UAVs can be used to inspect and view transmission and distribution electricity poles along with other components of critical infrastructure.

The President of MissionGo, Chris Corgnati, said, "MissionGo is proud of its long-standing history with Southern California Edison, and we look forward to continuing working together. SCE's commitment to safety makes us their perfect partner to keep the people of California connected and secure."

Throughout their existing partnership with Southern California Edison, MissionGo's UAS inspection team performed over 6500 sorties and also cataloged more than 1200 hours of flight time. They recorded and reviewed zero incidents from the captured data of 20,000 distribution poles and 4,000 transmission poles. This has given Southern California Edison the time it needed to prioritize and repair damaged infrastructure to make the community safe and has also prevented wildfires.

MissionGo was selected as one of the two companies that would secure this new contract with Southern California Edison after a vigorous vetting demonstration process. Under the contract, nearly 1,60,000 poles will be inspected, and it is estimated at over \$50 million for the span of the next 3 years. MissionGo is looking forward to one of the world's largest UAS services contracts in the world by bringing on talented pilots and crews to continue this critical task in California.



## New AI-Powered VTOL UAS with 5G & BVLOS Capabilities

As 5G is sprawling everywhere, BVLOS (Beyond Visual Line of Sight) technology provides numerous advantages over constant line-of-sight flying. BVLOS is a pivotal aspect in the drone industry that allows drones to fly beyond visual range. A drone equipped with BVLOS technologies needs no human interference as it includes new AI-powered VTOL UAS software.

The VTOL UAS suite provides a range of facilities, from detection and tracking to image enhancement. It consists of various payloads and advanced sensors for long-range missions such as mapping, surveillance, and inspection. The UAS comes with exclusive cloud-based software, allowing operators to plan missions in 3D and add and adjust waypoints according to their choice. All flight logs are stored in the cloud software for easy access and detailed analytics that ensures early detection of any potential issue.

Many Industries are adopting AI-powered BVLOS techniques for better drone functioning. Sky-Drone consisted of BVLOS capabilities to inform operators about its position, direction, speed, and altitude. It facilitates smooth functioning in Complex operations. Moreover, the electrically powered Sky-Drone with 5g connectivity enables real-time telemetry and streaming of video feeds.

The world of aircraft systems is evolving fast. The VTOL UAS brings a new concept of acronyms for drone operators and aviation regulators. Flying BVLOS constitutes a huge opportunity to expand UAS operations and use the technology to its full potential. It can carry more weight, fly farther, and avoid hazards. Therefore, the powerful combination of 5G and BVLOS can unlock new probabilities for flight technology, from autonomous package delivery to critical mission applications.



## UK: SKYFARER, Medical Logistics Commence BVLOS Hospital Drone Deliveries

Due to the increasing demand for healthcare facilities, patients require vital and time-sensitive medical supplies. Skyfarer, a specialist healthcare organization, a UK aerial coordinator company & Medical Logistics feel that these demands should be fulfilled effectively because of substantial road congestion and heavy-infrastructure enterprises.

To handle these demands, the company has announced a joint Beyond Visual Line of Sight (BVLOS) Medical Drone Delivery in an area called “The Medical Logistics UK Corridor.” Skyfarer and the partner Medical Logistics UK trial exacting real-world scenarios of BVLOS flights to deliver the best medical care in the hospitals. The organization’s main aim is to provide “essential time-sensitive medical supplies” to hospitals via BVLOS drones.

The campaign’s primary objective is identical to the previous testing of drone medical deliveries, most of which use BVLOS technology due to geographical boundaries. In order to cut the time and cost involved in ground transportation, a UK trial connects two hospitals by a drone flight corridor that will fasten up the medical deliveries. The 20 miles long flight corridor connects the Warwickshire Trust’s Hospital and the University Hospitals in Coventry and Rugby in Center England.

The trial is sponsored by London-based Medical couriers, a leading provider of vital time-sensitive medical deliveries. After getting approval from the UK Civil Aviation Authority, Skyfarer empowers emergency flights operated on the same 24/4 basis as health centres and hospitals. All flights will be directed in all weather conditions throughout the year and the varying times of the day. Undoubtedly, Skyfarer is the leading BVLOS drone driver, creating a massive step in completing the two-year project to speed up medical deliveries in health centres.



## Longest Commercial BVLOS Drone Flight in the US Achieved

For rural areas like Lyons, economic forces often limit the medical services available through community health centres. Supplying inventories like blood or other critical medications are often centralized in larger healthcare spaces to control costs. Therefore, assessing those items in an emergency medical situation is time-consuming and quite challenging. To overcome these situations, “Spright” created the longest BVLOS Drone to solve many of the biggest challenges facing communities across the Northern States of America.



The company has set the record for completing the longest BVLOS drone. It has successfully completed the longest UAS Beyond Visual Light of Sight (BVLOS) drone flight in the US by a commercial entity. The 29-mile flight was accomplished with the help of Wingcopter 198 eVtol Aircraft. The fixed-wing Drone departed from Hutchinson Medical Center in Hutchinson, KS, and arrived at the affiliated Rice County District Hospital in Lyons, KS. In comparison, the same passage would have taken 45 minutes to complete by road.

Spright can now enable faster and more efficient on-demand transport of basic medical supplies. The drone company is proud to lead the UAS industry in opening doors of opportunity for commercial drone delivery. It looks forward to the next step to establish a US medical drone network that secures communities with the much need resources to expand healthcare facilities and improve patients’ health. By creating internal efficiencies through enhanced resource allotment, the company delivers the best care possible to the patients.

## Paladin launches EXT- an LTE module that integrates with DJI M300/M30 for effective BVLOS & DFR applications.

The well-known software and drone manufacturer Paladin Drones recently launched EXT, an LTE module for DJI drones. The Paladin EXT integrates directly with DJI Matrice 30 and Matrice 300 drones, allowing them to strengthen the range of an LTE connection. The DJI M30 or DJI M300 is a roughly \$11,000 rugged one that offers Advanced AI capabilities, 6 Directional Sensing & Positioning, over 55 minutes of flight time, and more.



With the Paladin EXT module, industries don’t need to purchase new equipment as its DJI drone brings complete comfort. It enhances the ease of use and introduces an unlimited range of C2 links, making DFR more accessible. The product is designed to help Public Safety Agencies and Organizations. Every department that needs DFR can use DJI drones that provide effective and efficient service to the communities.

A new module is a game changer capable of multi-device live video feed, data management, and drone flight within one platform. The main aim is to increase situational awareness, lessens response times, and build technology that saves lives.

Paladin EXT connects to specific compatible DJI drones over a cellular network. Its all-in-one package for the drone as a First Responder (DFR) powered by the LTE platform allows first responders to fly beyond a visual line of sight. It gives a live overhead view of an emergency before it arrives.

Furthermore, LTE is a major factor in how Paladin acquires BVLOS waivers without needing a Visual observer on the rooftop. By leveraging the power of LTE, drones can safely travel beyond a 3-mile radius from their home location. It allows for a 3:1 coverage compared to traditional radio drones. With LTE connection, departments and agencies can eliminate the need for RPICs and larger rooftop fleets and cut down unnecessary costs to cover the same area.

## RigiTech performs BVLOS flights over Lake Geneva, Switzerland.

Swiss drone designer RigiTech just reached an important milestone, performing a long-range BVLOS flight over Lake Geneva in Switzerland. Getting the approval for the Flying BVLOS was an enormous project that took RigiTech several months to complete. The company required several organizations to collaborate, including the Cognoy Municipality, the Office Cantonal De l'agriculture et de la nature (OCAN), the Geneva Police, and the FOCA (Federal Office of Civil Aviation).

By connecting with laboratories in Coppet and Cognoy, the RigiTech Eiger craft became the first flying BVLOS to make an excursion between two different Swiss cantons over water. With the innovation of the BVLOS drone, RigiTech can now offer immediate transportation of medical goods and services. The Eiger Aircraft lands on the lab's rooftop to allow easy access for the medical staff members to deliver pre-requisite materials and then return to Geneva in less than 10 minutes. It saves upto 90 minutes in delivery time compared to ground transportation during rush hours. The craft can fly over 62 miles on a single battery charge and offers a maximum payload capacity of 3 kg (6.6 lb).

The delivery route over Lake Geneva was a challenging task that required consideration of necessary protection for local fauna. Moreover, RigiTech had to pay vigilant attention to the ongoing boat traffic on the water. But the work was worth it as RigiTech's team successfully coordinated the planned flights with information from the CGN (Compagnie de Navigation) before executing the route to connect Geneva.



## Soaring Eagle Technologies Scores New BVLOS Waiver for Commercial Inspections without Geographical Restraint

Soaring Eagle Technologies is a drone data processing company that offers services for critical infrastructure across the US. The company has achieved one of the first BVLOS Waivers with the help of the Federal Aviation Administration (FAA). The BVLOS Waivers are meant to fly small Unmanned Aerial Systems (UAS or drones) for Commercial Inspection Operations under specific guidelines as opposed to particular operations in restrained Geographical areas.

The latest BVLOS approval is nationwide and based on specific operational parameters, which are

not confined to specific areas within a particular time frame. The Waiver permits Soaring Eagle Technologies clients to collect data such as LiDar or high-resolution images more quickly and efficiently than traditional manned aviation. Before this latest BVLOS Waiver, Soaring Eagle Technologies had received acceptance to inspect a maximum range of 61 linear miles, one of the wider distances approved by the FAA for distribution and transmission operations.

The recent FAA approval for BVLOS drones for commercial missions allows asset managers to inspect critical infrastructure and other electric utility corridors. This helps them to collect more data on the condition of assets and



vegetation and better Return on Investment. The long-range Waiver lets commercial and industrial clients inspect vegetation audits and detailed mapping in large geographical areas ranging from 800-3000 acres.

The Remote Pilot-in-Command (RPIC) mission was to use Casia to enable BVLOS flights with the safety components of Iris Automation's Advanced DDA (Detection-And-Avoid) technology system. In addition, the FAA distributes BVLOS drones based on the pilots' and management's proven safety norms.



**Drones World Editor Kartikeya in Conversation with  
Mr. Rohan Verma,  
CEO & Executive Director, Mapmyindia**

**How best can you describe the journey of Mapmyindia since its humble beginnings to where it is now?**

MapmyIndia was founded by two Indian visionary entrepreneurs, my parents - Rakesh Verma (Alumnus of BITS, Pilani) and Rashmi Verma (Alumnus of IIT Roorkee) who left their settled careers in the USA working with General Motors and IBM respectively, to return to India. This was the early 90s and India was facing one of her worst economic crisis. Undaunted, they believed in the resilience of India and determined to do something for their motherland. Digital maps fascinated them, like the ones they had seen in the US. It would be a great idea to build them for India, and in the year 1995, when maps to a common Indian were some exotic commodity bound within the school atlas, they said that 'Someday 80% all that we do would have a location component to it!'

And thus began the journey of MapmyIndia, a journey of herculean challenges surmounted and the realisation of a near impossible dream. From 1995 to this day, in a new millennium, adoption of maps and mapping technology has witnessed an exponential rise. MapmyIndia through constant innovation, understanding the user needs, and proactively adapting to change, continued to carve a niche and established itself as a pioneer and a dominant player in the Indian Digital mapping, Deep Tech, Location tech, IoT and GIS space. Today, MapmyIndia is one of the very few, if not the only Indian digital map product company. Industry, media and governments among others have bestowed recognitions after recognitions upon the founders and the company for their unique contributions towards the creation of the Geospatial sector in India.

Over the years Mapmyindia has grown in both business and stature, to become one of the most successful technology companies in India that has created value for all its stakeholders - the culmination of which was the company being recognized as a 'Unicorn' in 2021, post the company's blockbuster IPO that was oversubscribed by more than 154 times and the stock listed with an opening day premium of 65% despite uncertain market conditions.

**What types of industries/people have you noticed are most keen on drone technology?**

Just like Location technology, Digital mapping and GIS, engagement of drones with various sectors is horizontal. They are finding uses in defence, mapping, infrastructure, logistics delivery, retail, entertainment, surveillance and security, weather and meteorology, agriculture, mining etc. But these are just the tip of the iceberg, just like our founders at MapmyIndia predicted the proliferation of location tech some 27 years back and today we see that as a reality. I see a similar thing happening with Drones and Drone tech, in a much shorter time span, as we move up the learning curve and with advances in technology, so would the utility of drones increase, new uses and users of drones will come up.

As drones become more and more accessible to people at large, amateurs, innovators, entrepreneurs will join the fray, these avant-garde will disrupt and diffuse the ecosystem with their revolutionary ideas and challenge the obvious, thus pushing the envelope further and further. I see this trend has already started, every now and then I hear of a new drone based start-up coming up and even investors are looking into this arena with keen interest. So now you have

the people, the regulation and the money - the nebula is there - it is only a matter of time that stars begin appearing!

**How do you think that regulation changes will affect the growth of the drone industry?**

The Government of India introduced pathbreaking regulatory reforms in the geospatial industry in February 2021, which liberalised, unshackled and unleashed the potential of the indigenous geospatial industry, for which we at MapmyIndia are extremely grateful. Similarly, the announcement of the Drone Rules 2021 which are aimed at liberalising the drone sector and also launch of the Digital Sky platform and portal, are very welcome and progressive steps. It is a matter of great pride for us that MapmyIndia's digital maps, APIs and technologies are being extensively used in the Digital Sky Platform.

**What are a few of the most creative ways you have seen drones getting used?**

MapmyIndia has been building 3D Metaverse Maps using drones, amongst other technologies, and putting on our indigenous, swadeshi, consumer mapping & navigation app - Mappls. Users can see and immerse themselves in these 3D Metaverse Maps by visiting Mappls.com or downloading the Mappls App. On a lighter note, the light shows using coordinated drones are so exciting to watch!

**How Mapmyindia is revolutionizing Using Drone technology? What are the sectors getting benefitted? What are the challenges you are faced & how you have overcome them?**

At MapmyIndia, we are completely aligned with the Honourable Prime Minister's vision of an Aatmanirbhar Bharat, and since our inception in 1995, have

been focused on accelerating the advent of a Sarvottam Bharat, bringing the benefits of best-in-class, indigenously and in-house developed, digital maps and location technologies to all Indians and at the same time enabling India to become a global powerhouse in these strategically important sectors and advanced technologies. MapmyIndia is actively contributing with our drone solutions for the Swamitva project to map property ownership for rural 'abadi' areas using drones. We are also mapping lots of infrastructure across the public and private sector, and enabling smart cities, state urban development authorities, real estate companies, infrastructure companies and even helping consumers to navigate safely on roads, using our drone solutions!

We are excited about the prospect of more and more drone manufacturers, service providers and solutions developers coming in the fray. In the past few years we have funded and partnered with various drone startups and ecosystem players. MapmyIndia is already working with Drone Federation of India (DFI), a premiere industry body that promotes drone-

tech and strives towards building a safer and scalable unmanned aviation industry to help promising Drone related start-ups with joint go-to-market business and funding opportunities, further scaling up the indigenous ecosystem. One such initiative was 'The Drone Innovation Challenge 1.0' with up to Rs 1 crore for winners and up to Rs 4 lakh each for qualifying participants designed to encourage indigenous innovation in Drone-tech. You will see more such activations and initiatives by MapmyIndia that encourage innovation at the grass root level.

#### **MapmyIndia Drone solutions suite:**

MapmyIndia Map and Location APIs which leverage MapmyIndia's comprehensive, accurate, detailed and continuously updated digital map data that covers the length, breadth and depth across rural and urban India and provides advanced, interactive map rendering, geocoding, routing, geo-fencing and reverse geocoding capabilities.

MapmyIndia mGIS geospatial platform allow for geospatial data ingestion, integration, management, visualisation, analytics, arithmetic

measurements, and publishing visualisation and data management platform across 2D (including both vector maps, geo-referenced data, raster drone and satellite imagery etc), as well as full 3D (allowing for 3-Dimensional data, models and point clouds ingestion, visualisation, and analytics covering heights, terrains, textures, volumes etc. of land surface, buildings as well as full-scale city and country-side models), and even 4D (time being the fourth-dimension, showing time-changing live and recorded geospatially referenced 2D and 3D data, including interactive flight animations and time-based shadows) and HD (high-definition, centimetre accurate and photo-realistic data)

MapmyIndia GPS-based drone tracker IoT devices can be attached or embedded into drones and send in real-time the id, latitude, longitude, altitude, speed, heading and other data about the drone, enabling real-time drone identification, tracking and monitoring, as well as MapmyIndia's InTouch IoT platform, which can communicate

# M A P P L S

# MapmyIndia



technology, should not be used to harm the country's security and people's safety. This is the most important point if we want the drone sector to proliferate.

**Where do you see the drone industry in 2030?**

India's drone market will grow rapidly to a size of worth INR 1.8 lac crores by 2030, as per a report by FICCI. And we are focused on enabling, the best, most cutting edge drone solutions that positively benefit the Indian industry, economy and society and ensure our country's and citizens' safety, security and privacy.

Globally this industry is poised to be a \$ 30 billion industry by 2030, with strong action, careful planning and investments will create a fertile environment for development of cutting edge indigenous tech and innovative manufacturing capabilities - Made in India for the world products and solutions that are competitively priced. Then nothing can stop India from becoming a global hub for Drone manufacturing and Drone Tech.

with, and ingest real-time telemetry data at scale, from large fleets of drones continuously and provide live visualisation and advanced analytics and geo-fencing alerts to users.

MapmyIndia Workmate which allows for workforce monitoring, management and automation enabling location tracking of drone pilots, task assignment, field survey data collection and overall management and automation of workflows regarding drone operations.

**Drones are beginning to explode in the civilian market. What are a few reasons why UAV's have grown so much in the last few years?**

Drones are increasingly finding utility in our daily lives. From ecommerce companies getting into drone deliveries to completely redefining how aerial photography done, rather almost anyone can indulge in such hobbies. The recent regulations liberalizing the usage of drones, will further proliferate their use. I see more and more start-ups getting into this arena. With the encouragement and support of

the Government, soon we will see India as the hotbed of innovation in drone tech. And as has been the case with 'Made in India' products or solutions which are usually 'Made for the World' because they are economical, low maintenance, inherently simple and high on utility. Similar would be the case with Drones. I see a million dreams take to sky, quite literally!

**What are the dangers of not understanding the regulations when somebody is looking to fly a drone commercially?**

It is very important that any responsible organisation understand that drones, like any



## Inuitive launches NU4100, expanding its Edge AI Vision-on-Chip IC portfolio

Inuitive Ltd., a Vision-on-Chip processors company, announced the launch of its new NU4100, an expansion of its Vision and AI IC portfolio. Based on Inuitive's unique architecture and advanced 12nm process technology, the new NU4100 IC supports integrated dual-channel 4K ISP, enhanced AI processing, and depth sensing in a single-chip, low-power design, setting the new industry standard for Edge-AI performance.

The NU4100 is the second generation of the NU4x00 series of products. The NU4x00 series is ideal for Robotics, Drones, VR, and Edge-AI applications that demand multiple sensor aggregation, processing, packing, and streaming. It is specifically designed for robots and other applications that must sense and analyze the environment using 3, 6, or more cameras, as they make real-time actionable decisions based on that input.

"Robots designers demand higher resolutions, an ever-

increasing number of channels, and high-performing, enhanced AI and VSLAM capabilities," said Shlomo Gadot, Inuitive's CEO. "The NU4100 addition to the Vision-on-Chip series of processors is a true revolution, based on all integrated vision capabilities, combined in a single, complete-mission computer chip. The integrated dual-camera ISP provides much-needed flexibility without having to add more components, which, in turn, require additional processing power at a higher price point."

Mr. Gadot also said, "Inuitive is committed to bringing the most advanced technology to the market. NU4500, the next processor in our roadmap, is planned for tape-out on Q1 2023 with additional 8 cores of ARM A55, more than double the AI compute power and H.265 & H.264 video encoder & decoder and is to be the ultimate single-chip solution for robotic and applications."

The new NU4100 supports multi-camera designs and can

simultaneously process and stream two imager channels of up to 12MP, or 4K resolution, each at 60 frames per second (fps), while running advanced AI networks. This IC enhances the level of integration for products using Inuitive technology and speeds the AI processing power by 2X-4X while consuming 20% less power than Inuitive's first generation.

"Robots are increasingly reliant on vision processors. Their ability to perceive and understand the environment is fundamental to achieving a higher level of robot autonomy," said Dor Zepeniuk, CTO and VP of Product, Inuitive. "Processing streams of input from multiple cameras expand the robot's independence and flexibility, while the integrated dual-channel 4K ISP improves the system's capabilities. Both, in turn, serve the end goal of designing powerful products that are lower on cost.»

## Release of advanced ESC introduces Currawong Engineering to new UAS markets

Currawong is excited to announce the release of its smallest Electronic Speed Controller (ESC) to expand upon its world-leading range of aerospace-grade motor controllers. The Velocity XS ESC is the smaller sibling to the HS, HT and HC, with a weight approximately one-quarter of the HS, but packing an extremely high power-density - Currawong's highest.

Weighing just 75g, the Velocity XS provides the same field-proven

reliability and comprehensive feature set of the highly successful H-Series in a much smaller package. Operating at voltages up to 14S (58V) and delivering over 4kW continuous power, the Velocity XS is engineered specifically to meet and exceed the particular requirements of airborne operation.

The XS brings all of the features of its larger siblings, including an isolated CAN interface, with advanced telemetry and protection features. To assure serviceability

for a wide range of customers, the autopilot integration capabilities include DroneCAN, PiccoloCAN and PWM.

As a leader in UAV power electronics, the XS will enable Currawong to service the smaller UAS market by providing a significantly smaller and lighter alternative to the existing ESC range. This addition to the product line-up ensures that Currawong continues to provide best-in-class solutions for the UAS markets.



## AeroVironment Introduces Puma VNS, a Visual-Based Navigation System That Enables GPS-Denied Navigation across GPS-Contested Environments

AeroVironment, Inc a global leader in intelligent, multi-domain robotic systems introduced Puma™ VNS, a visual-based navigation system for Puma 2 AE and Puma 3 AE small unmanned aircraft systems (SUAS) that will enable GPS-denied navigation across increasingly GPS-contested environments.

The system will provide operators with continually advanced navigation capabilities, features and functionality through anticipated software and hardware updates. The system will also enable the integration of future

autonomy capabilities.

“Puma VNS gives operators an unprecedented advantage in the battlefield,” said Trace Stevenson, AeroVironment vice president and product line general manager for SUAS. “Operators now can execute missions with more confidence in GPS-contested environment with the system’s new navigational capabilities.”

The next-generation navigation system features a suite of down-looking sensors that gather imagery data and track features on the ground, as well as an embedded compute module to process and

determine the precise location of an aircraft while it is in flight. Designed with the operator in mind, the system automatically transitions to and from GPS-denied navigation mode without any input from the operator.



## SpearUAV Unveils Viper- World-First Encapsulated and Launchable Hovering Precision Attack Drone

Israeli company SpearUAV has unveiled the Viper. It claims to be the world-first Viper encapsulated and launchable hovering precision attack drone. The company says that this systems is giving tactical forces the capability for an immediate, precise and autonomous aerial loitering munition (ALM) capability against BLOS targets. Enhancing force protection, the hovering capability of the Viper enables aerial observation of targets - including the ability to review buildings floor by floor - in complex urban environments, while also offering mission abort and wave-off capabilities.

The rugged, compact, portable and wearable system can be launched on demand, with mission

readiness achieved in less than a second, from both static and on-the-move positions. Intuitive and designed for single-user operation, Viper requires minimum training. Fused day and night payload and Artificial intelligence-based computer vision for real-time target recognition and tracking enable intuitive user interface and ensure minimal collateral damage.

Adapted to all types of ammunition available today, the Viper is equipped with the Ninox GCS (Ground Control System), which is compatible with Android, Microsoft Windows and Linux. Open system architecture integrates seamlessly with existing C2 systems.

“The Viper system is the latest

and most advanced development from SpearUAV,” says Colonel (Ret.) Gadi Kuperman, Founder & CEO of SpearUAV. “It combines all the features required for a precise attack - launch within a few seconds, the ability to hover slowly to detect and identify targets, and precise attack with minimal collateral damage. We are proud that this system has already been proven in the field.”



## SkyDrive Unveils SD-05 Flying Car Design, Aiming to Begin Air Taxi Service in 2025

SkyDrive Inc. has unveiled the design of its commercial model flying car — the SkyDrive SD-05. SkyDrive is planning to use the SD-05, currently in development, to launch air taxi service in the Osaka Bay area during the world exposition scheduled for 2025 in Osaka, Japan.

“This is another big step towards the realization of flying cars and sky roads,” said Takumi Yamamoto, SkyDrive design director. “Two years have passed since the announcement of the SD-03, which successfully completed its public manned flight test in August 2020, and we are very happy to be able to announce its successor, the SD-05.”

Headquartered in Toyota City, Aichi Prefecture, SkyDrive is a leading developer and manufacturer of flying cars (\*1) and cargo drones in Japan.

### SD-05 Overview

The SD-05 is a two-seat,

electric-powered compact aircraft with vertical takeoff and landing capabilities. Operated by a driver pilot, its flight stability is secured with the assistance of a computer-controlled flight system. SkyDrive is developing flying cars with an eye toward realizing a world where they are used in daily life for air mobility much as automobiles are used for daily ground transportation.

“This vehicle is not just a simple means of travelling from point A to B,” Yamamoto said. “Based on the design concept of ‘giving wings to daily travel,’ it’s also a safer and more enjoyable travel partner.”

SkyDrive is in the process of acquiring a type certificate (\*2) for the SD-05 from the Ministry of Land, Infrastructure, Transport and Tourism (MLIT), as the first of its kind in Japan. The company continues to work toward initiating practical use of flying cars during the World Exposition Osaka, Kansai,

scheduled for 2025 in Japan. The SD-05 is designed to travel up to approx. 10 km and the maximum cruise speed is 100 km/h. However, design and specifications are subject to change and the progress of design development.

Potential applications for SD-05 are currently under consideration, including short-cut transportation through the sky, a unique access to resort facilities, and emergency medical services.

“SkyDrive will continue to design the dreams of the future with the aim of realizing sky roads,” said Yamamoto. SkyDrive is also moving to promote its business operations not only in Japan but also outside the country. In the U.S., for example, the company set up an office in September 2022, for the purpose of providing a means of “last mile” air transportation. The company has been developing the market jointly with local authorities and partner companies.

## AeroVironment Introduces Next-Generation All-Electric VAPOR 55 MX Helicopter Unmanned Aircraft System

AeroVironment, Inc. a global leader in intelligent, multi-domain robotic systems announced the launch of the next-generation VAPOR® Helicopter unmanned aircraft system (UAS), VAPOR 55 MX. Delivering new levels of operational performance with a completely redesigned modular autonomy framework, VAPOR 55 MX enables increased endurance and expanded payload capacity to meet current and emerging needs of defense, commercial and industrial customers.

“The new VAPOR 55 MX is an easy-to-maintain system that incorporates a highly versatile modular architecture and tool-free rail system for simple, efficient

integration of third-party or custom payloads, allowing users to adapt to multi-sensor, multi-mission requirements including utility inspection, aerial surveying, public safety and defense applications,” said Trace Stevenson, AeroVironment vice president and product line general manager for small UAS.

Built on the class-leading endurance and payload weight performance of its predecessor, VAPOR 55 MX features a new sleek and efficient low-profile design that enables the helicopter UAS to stay in the air 25 percent longer and operate in all weather. VAPOR 55 MX is heavy-lift capable and its increased usable payload capacity

allows users to choose from single or multiple payload configurations.

This expansive modular payload bay can carry up to 12 pounds of payload with more than 70 minutes of flight endurance while still maintaining the 55-pound gross take-off weight (GTOW) restricted by the Federal Aviation Administration (FAA) for commercial customers. For military customers that require more take-off weight, VAPOR 55 MX is capable of a 65-pound GTOW and can carry up to 22 pounds of usable payloads with a reduced endurance trade-off, nearing the edge of Group 3 weight class.

## infiniDome Released Its GPSdome 2 Dual-Band Anti-Jamming Technology



InfiniDome, a leading provider of GPS protection technology, has released the newest product of their anti-jamming solutions featured at the AUSA expo on October 10-12. The GPSdome 2, a cost-effective and lightweight device, provides simultaneous dual frequency protection from 3 directions of attack for both smaller and larger applications.

InfiniDome has unveiled the latest offering in their range of anti-jamming technologies, the GPSdome 2, a high-end solution tailored for defending small to medium tactical UAVs as well as manned and unmanned ground vehicles.

With the notorious vulnerability of GNSS due to its weak signal from orbiting satellites, together with the wide availability of cheap jamming devices and the rise of hostile jamming attacks worldwide from Ukraine-Russia, through South and North Korea to the Middle East, the need for effective anti-jamming solutions has never been clearer. Disruptions in critical PNT (Positioning Navigation Timing) data mean loitering munitions that never find their targets, UAVs that fall to the ground, and ground vehicles that cannot

be managed (with dangerously impaired IFF - Identification, Friend or Foe). But with many GPS protection devices being oversized and expensive, finding the right solution that makes both budgetary and operational sense is nearly impossible.

InfiniDome's new GPSdome 2 comes to disrupt exactly that - protection of mission-critical assets in GPS-challenged environments in a more efficient and cost-effective manner than ever before. With a small form factor (500g, 87 x 91 x 61.55mm) and minimal power consumption, it is very well-suited for loitering munitions as well as drones and small-med UAVs, increasing resiliency while prolonging mission time and providing a superior ROI. Fully retrofit and completely standalone, the system is compatible with almost any off-the-shelf GNSS receiver on the market as well as standard active GNSS antennas, meaning that it can be integrated into existing GPS systems or into new product lines, manned or unmanned, including LAVs and ATVs.

With sophisticated algorithms and a proprietary RFIC (chip), InfiniDome's GPSdome 2 analyzes the RF interferences in the

environment, combines multiple antenna patterns to create and dynamically steer three nulls in the direction of any hostile signal.

One of the unique features of the GPSdome 2 is how it provides simultaneous dual frequency protection (GPS L1 + L2 or GPS L1 + GLONASS G1), creating up to 3 nulls, protecting from 3 jamming directions within each band in real time (making it ideal for PNT applications). Furthermore, the GPSdome 2 also provides the platform and its command and control, actionable, real time intelligence and analysis on GPS attacks it detects in the field.

Omer Sharar, InfiniDome's CEO: "We are incredibly proud to present our latest solution for protecting small-medium UAVs and ground vehicles from GPS jamming. With disruptive C-SWaP benefits as well as dual frequency and multi-directional nulling capabilities, we're sure our latest offering will hit the mark."

The GPSdome 2 is a dual-use, non-ITAR device and comes with optional mil-spec compliance. Only recently launched, it has already been chosen by a leading Israeli defense contractor for integration with their platforms.

# Integrated Sustainable solution to Develop Digital e-Market platform For Drone Industry.

## Overview and Background

We are living in a 21st century and Drones have their plethora of advantages and that is the reason why Drones are getting more popularity among the people. Drones can be used for various purposes. Drones are the device full of features and functions that efficiently manage the time to complete hours of work in few minutes and with the same or even more effectiveness. Drones represent a significant development in Robotic technology and recently private use of drones are started in media and now a day for delivery purposes too. Till 31st Oct 2022, 538 drone start-ups registered in India.

## Market Challenges

1: Policy Challenges:- There are policy challenges which are hindering organizations from maximizing their utilization of UASs in India currently. Once the draft policies get finalized, a lot more organizations will explore the usage of UASs in their operations. However, the market needs to be ready to satisfy the demand which will be created.

2. Building an eco-system:- UAS companies are still focusing on primary applications for UASs such as real-time monitoring which involves communicating information in Realtime. UAS companies should extend their capabilities and build that ecosystem of UASs and emerging technologies to fully utilize the potential of UAS.

3. Training:- Apart from building an ecosystem of equipment and technology providers, it is also important to set up training

institutes and certification courses which impart the necessary skills to operate the UAS technology.

4. Understanding regulations:- It is important organizations adopting UAS technologies to understand the regulations which are currently being proposed. These regulations would impact the implementation of applications in different industries.

5. Requirement gathering:- Organizations should look at the potential of UAS technology in conjunction to other emerging technology areas, like 3D modelling, AR, etc. The right combination of UAS specifications along with the emerging technologies provides the optimized benefit for each use case.

## Key factors responsible for technology development efforts

Ban on imports:- According to a notification issued by the Directorate General of Foreign

Trade (DGFT) in Feb 2022, the import of drones in completely built-up (CBU), semi-knocked-down (SKD) or completely knocked-down (CKD) form is prohibited. Imports of drone components shall be, however, free. Stakeholders generally believe that the ban is a step in the right direction as it brings clarity after the blanket ban on drones imposed in 2018.

Need for Technology Know-how:- Local players are mostly into 3D modelling, design and testing the airflow, analysis by software of the frame, etc. They would require time and technology to successfully manufacture complete drones, including individual motors and the GPS which will drive the technology development efforts.

Current, Emerging / Potential areas in Drone Sector:

Urban/ Rural / Infrastructure Development, Mining, Environmental Monitoring & Wildlife Conservation/ Agriculture,



Healthcare, Disaster Management, Oil, Gas and Power Utilities, Good and service delivery, Telecom, Defence and Surveillance.

**Problem Statement**

1. Since now no aviation map is available for drones there can be a chance of collision of drone with Each other or with any other obstacle.

2. Inadequate funding and insurance for startups.

3. Currently a huge deficit of drone pilots as well as drone training institute.

4. Infrastructure, public acceptance, safety, and regulatory barriers are likely the biggest hurdles to overcome in establishing the scaled deployment of drones.

5. No such Decision-Support Tool for adaptation planning at state and national levels that integrates district, block, GP and village level data to provide decision makers with dynamic information that is regularly updated using data from ongoing project, exchange of drone imageries to other line department.

6. Lacking of market research capabilities. People who are running drone and GIS Company have different mindset. Drone company owner think that his technology is latest and GIS Company is dependent on Drone Company for data acquisition and mapping. Similarly GIS company owner think that drone is only survey instrument and replacement of satellite imagery. Drone industry is dependent on GIS industry.

7. Drone manufacture startups in India have different drone products. It's difficult for



buyer or any end user to analyse where to buy best drones as per their specifications (as per DGCA policy) from their associate partners, distributors or from other traders. Who is providing or giving better AMC support, Demonstration support, Timely response, Timely delivery of drones from manufacturing plant to client side. Currently there is no centralize tracking system to track and monitor starting from post the requirement of purchasing of drones, demonstration before booking, booking confirmation, clearance of payment, delivery tracking and etc.

8. Travel, Logistic and Accommodation problem in remote project site location. End client and vendor have to pay higher price on urgent basis situation.

**Solutions**

Overcome batter related problems and provide customize battery solutions, Use of block chain and aviation map for drones to mitigate chance of collision with any obstacles, Work on drone insurance part, Motivate and promote small and medium size start-up companies rather than big companies so that we grow together and we win together,



Dr Pranay Kumar,



Mahima Singh

**Techno India Network LLP.**

## Spyglass short-range surveillance radar, a product of Numerica Corporation

Numerica Corporation, a provider of advanced air and missile defense solutions, announced that its Spyglass™ short-range surveillance radar was demonstrated as part of SAIC's Counter small-UAS as a Service (CaaS) offering that was recently recommended by the Department of Defense's (DoD's) Joint Counter-small Unmanned Aircraft System Office (C-sUAS).

The SAIC CaaS offering was one of only three recommended by the JCO after demonstrations were held at Yuma Proving Ground in Arizona last month. Spyglass radar was included in SAIC's demonstrated solution as part of two Liteye Systems' SHIELD™ C-sUAS platforms. During the demonstration, Spyglass radar performed long-range small unmanned aircraft systems (sUAS) detection and precision tracking to support threat mitigation by SHIELD's directional RF defeat and the Aeroguard drone capture system.

"We are happy to see this recommendation made by the JCO and this recognition of the value delivered by the SAIC-led team," said Nate Knight, Numerica vice president for air and missile defense. "Spyglass did what it was built to do, providing precision tracking for precision sUAS mitigation throughout the event. We learned an enormous amount from the multi-week test and the Government's feedback. That critical input, combined with the Numerica team's energy and expertise, has resulted in an even more capable product today. One that's ready to support C-sUAS missions across the DoD."

Spyglass radar provides long-range detection and tracking of Group 1 and 2 UAS, delivering high-precision tracks through its Ku-Band phased array technology and advanced signal processing. Earlier this year Spyglass radar was tested as part of the U.S. Army Rapid Capabilities and Critical Technologies Office's (RCCTO) C-sUAS High Energy Laser (HEL) prototyping program and was also demonstrated to support engagements of sUAS by a precision high-power microwave weapon.



## D-Fend Solutions and Liteye Systems Integrate Counter-UAS Systems

D-Fend Solutions, the leader in radio frequency (RF), cyber-based, counter-drone takeover technology, and Liteye Systems, a technology provider and integrator of C-UAS systems announced a system integration between EnforceAir and SHIELD for a Multi-Domain Defense System called SHIELD-Cyber. This collaboration will enable the Liteye SHIELD system to use the radio frequency cyber detection and defeat capabilities of EnforceAir, D-Fend Solutions' flagship product, to improve detection and broaden the operator response to all C-UAS threats.

With the integration of SHIELD and EnforceAir, Liteye Systems and D-Fend Solutions will offer an enhanced multi-layered systems solution to address today's complex drone threats from both RF control and RF silent waypoint navigation. The combined capability of SHIELD-Cyber will provide an in-depth defense mechanism with a coordinated response according to scenario and security considerations specific to each protected asset or area of concern.

"This partnership provides a multi-layered cyber, radar, visual and jammer combined system of systems solution to serve the complex counter-UAS environment, with heightened benefits to operators across sectors and use cases," said Zohar Halachmi, Chairman & CEO of D-Fend Solutions.

The SHIELD-Cyber system uses EnforceAir's radio frequency detection in conjunction with radar detection, track, and ID to positively identify the targeted drones. EnforceAir provides information about the drone type, protocol, and frequency to classify the threat. This information will then assist SHIELD operators to determine which frequencies to jam, for mitigation purposes. The integrated solution provides a stronger countermeasure against the drone threat while allowing for a safer outcome for troops, personnel, and infrastructure.

"We're excited to have two combat-proven capabilities in the hands of operators protecting themselves and others on a daily basis. I'm pleased to join forces with D-Fend and focus on continuous improvement in a C-UAS layered defense by seamlessly integrating our respective technologies," said Kenneth Geyer, CEO of Liteye.



## Airobotics Ltd. to Acquire Iron-Drone Assets to Offer Counter-Drone Capabilities via Its Optimus System

AIROBOTICS Ltd. a leading provider of autonomous unmanned aircraft systems (“UAS”) and automated data analysis and visualization platforms, announced that it will acquire the intellectual property, technical systems, and operations of Iron-Drone Ltd., an Israeli-based company specializing in the development of autonomous counter-drone systems. Subject to completion of all legal terms and conditions, Airobotics intends acquire Iron Drone, to integrate



Iron-Drone counter-drone technology with the Company’s networked Optimus Urban Drone Infrastructure. The system will provide additional capabilities, specifically when deployed for homeland security applications in «smart cities,» and for the monitoring and protection of critical infrastructure and complex commercial environments.

“We’re thrilled to bring Iron-Drone and its sophisticated counter-drone technology and products to Airobotics,” said Meir Kleiner, CEO of Airobotics. “Incorporating the technology of Iron-Drone with our Optimus Urban Drone Infrastructure System will allow us to offer our customers an advanced and unique integrated solution, enabling an even more robust automated homeland security platform. The Iron-Drone counter-drone system enables the interception of hostile drones, in areas where it is not possible to use jamming means, such as airports, populated areas, and critical infrastructures. Through the Airobotics’ drone network, security and surveillance officers will be able to neutralize these threats while utilizing Optimus drones for monitoring, observation, and video surveillance.”

In recent years, there has been a noticeable increase in the use of drones and other small, unmanned vehicles by terrorist and criminal elements for the purpose of attacking and disrupting the functioning of strategic facilities, such as airports and oil and gas facilities, as well as mass events and city centers. The small size of these aircraft, and the nature of their slow and low-altitude flight, makes it difficult to locate them, and this is usually done only when they are very close to the target. These aircraft may also be used for intelligence gathering, smuggling and as weapons.

The counter-drone capability, whereby counter-drones are launched from a counter-drone docking station to be integrated into Airobotics Optimus UAS platform, is a complementary feature to the Airobotics UAS platform, which is capable of operating day and night. Once integrated, the small, unmanned counter-drone aerial vehicles can launch at a fast pace, equipped with interception means, thus enabling the simultaneous handling of several hostile drone targets.

As soon as detection is established, an interceptor drone will be launched, and will fly towards the target under the guidance of the radar and the detection systems currently installed around the world. At this stage, the intercepting drone will identify and “lock on” to the target, using computer vision capabilities together with artificial intelligence, and will follow the target as well as perform the interception, by physically damaging the attacker’s tool and neutralizing it. The interception process will be carried out autonomously and without any need for human intervention.

## SkySafe Partners with Robotics Centre to bring Cloud-Based Counter-Drone Technology to Canada

An airspace security and technology management company SkySafe announced that its cloud-based counter-drone technology can detect drone flights in Canada, all thanks to its partnership with Robotics Centre. SkySafe Cloud offers its customers a way to detect, track, and analyze the drones in the airspace without buying or maintaining expensive hardware. This adds to its uniqueness as the only company in the world to build, own and operate city-wide sensor networks. SkySafe also offers airspace awareness via a subscription to its cloud-based application.



The CEO of SkySafe, Grant Jordan, said, "As more and more drones enter the airspace, more incidents are occurring from the work of careless or criminal drone operators." He added, "Drones and dropping contraband into prisons; at the same time, drones smuggle drugs across the borders and disrupt open-air events. Hence, we are excited to bring airspace awareness to Canada so unauthorized and dangerous drones can be identified and mitigate threats."

Since 2015, SkySafe has tested and deployed counter-drone capabilities counter-drone capabilities to military and public safety customers, domestically and abroad. The company also offers a comprehensive defence against the threat of drones. This is possible by applying advanced radio frequency (RF) technology, reverse engineering, and deep threat analysis.

SkySafe's partner company Robotics Centre's CEO and Co-founder, Charles Barlow, said, "SkySafe is a great partner for Robotics Centre. It has been exciting to see the technology live in Ottawa, and we will also focus on expanding its reach throughout Canada."

Established in 2009, Robotics Centre is an Ottawa-based company with offices in Sapporo, Japan, and Saudi Arabia. To address a wide range of challenges, the company works with the government and industrial clients to create integrated unmanned systems solutions.

## Indian Army installs quadcopter jammers to protect military bases from Pakistani drones

The Indian Army has installed two systems, including quadcopter jammers and multi-shot guns, on the line of control (LoC) due to the recent incidents of drone surveillance from Pakistan. In this year alone, from January to September, 191 Pakistani drones have entered Indian Territory. Out of these, 171 had entered the Punjab sector, while 20 were spotted in the Jammu sector.

Defence sources said, "The Army has installed quadcopter jammers called aqua jammers on the LoC, and they are supported by multi-shot guns. They have an efficacy up to a height of 4,99 meters. The aqua jammers snap the connectivity of enemy drone with its operators across the border before freezing it." It was further added, "The subsequent action is followed by other multi-shot guns mounted on a multi-weapon platform to bring it down. The two machines are operated by many soldiers."

The aqua jammer is able to detect drone signals up to a range of 5 km. Regarding the multi-weapon platform, another platform said, "Three guns mounted on it fires nine shots at a time in a triangular format leaving no scope for the enemy drone to escape the fire."

Both systems are already deployed around 400 meters behind the LoC. Sources said that the surveillance centres work 24x7 to detect any mischief by the adversary and are also equipped with cameras and thermal imagers. Around 2.5 km behind the LoC, the two systems are backed up by surveillance centres.







## Drones World Editor Kartikeya In conversation with **Mr. Juergen Greil** CEO, FlyNow Aviation

**Tell us about your experience in the field of UAVs and what were your fields of expertise before venturing into UAVs?**

I am a mechanical engineer with focus on mobility and have been working in the aerospace as well as the automotive industry all my professional life. Since my childhood I have been building and flying model airplanes and helicopters and with 19 I started to fly hang gliders. Some years later I made my PPL & CPL with instrument and multiengine ratings and finally my CHPL. During all these years I observed the growing possibilities

of UAV applications and started to see the commercial advantages. The founding of FlyNow Aviation and developing a modular eVTOL family for cargo and passenger transport was a logical next step and closes a cycle in my aviation career.

**Speaking of your product Flynow PAV, could you elaborate its specifications, capabilities and the possible modifications?**

Our eVTOL family consists of a cargo, and a single & twin seater passenger version. The range for all these variants is 50km, maximum cruising speed is 130km/h and the maximum payload is 200kg.

**Is the single-occupancy version the only aircraft you are planning now?**

For being commercially successful it is key to meet different customer requirements with the same technical solutions. So we are developing a modular eVTOL family for cargo as well as passenger transportation. First applications will be cargo end of 2024.

**What according to you are some necessary reforms to be introduced in our Global Drone space?**

I believe that for a successful and timely application of unmanned aerial vehicles, integration into the existing aviation structures is inevitable. However, in order to be able to handle the volume of new traffic efficiently and safely, a higher degree of automation of air traffic control is required than currently existing. In addition, special air routes for UAVS should be created in the lower airspace in order to equalize the traffic density and spatially separate the traffic flows.

**What are the biggest challenges you have faced & how do you overcome?**

Implementing a new means of transport which is safe, comfortable, efficient and cost effective in production and operation is a big challenge in itself and can only be achieved when there is a benefit for all stakeholders involved. If the broad public realizes the potentials these eVTOL offer them in form of availability and affordability in comparison to existing mobility solutions than 3D mobility can acquire the same impact as the car did in the 20th century without the negative side effects associated with it.

**How long do you consider to get final certification & to start production? Any Orders or LOI's?**

Concerning certification we are following a three step approach consolidated with AustroControl following EASA regulations. We are currently close to the first step to acquire a specific category certification with a SAIL 2 for our 1:1 scale proof of concept. In the second step we stay in the specific category and increase the SAIL for first commercial applications of our Cargo

Variant transporting goods over non populated areas starting end of 2024. In the third step we aim for a certified category certification to transport passengers over populated areas. FlyNow Aviation has LOI`s and MoU`s with a large importer from south-east Asia, with a German logistic company and hotel operator and is in negotiation with potential customers in Austria, India and Africa.

**Where do you see Flynow in the next five or ten years in the Global market? Do you have specific markets in target?**

Due to our unique concept approach FlyNow Aviation`s eVTOL family differentiates itself from its competitors mainly through its affordability and availability for everyone. We want to help ease existing traffic problems, reduce resource and energy requirements per tonne- and passenger kilometers and contribute to economic growth. For many reasons

we therefore consider besides specific European countries many Asian, Arabic and African countries as interesting markets since they proofed to be leapfrogging also in other areas of technology.

**Can you give us some valuable suggestions for the Drone-prenuers and the Drone pilots?**

Thorough education and training is key to understand and tackle the challenges and problems associated with in all areas of aviation. Done right, 3D-mobilty can help to reduce the negative side effects of transporting goods and people in comparison to all existing means of transport and therefore will contribute to a better world with many opportunities to all kinds of jobs in this emerging industry.



## Indian Army installs quadcopter jammers to protect military bases from Pakistani drones

The Indian Army has installed two systems, including quadcopter jammers and multi-shot guns, on the line of control (LoC) due to the recent incidents of drone surveillance from Pakistan. In this year alone, from January to September, 191 Pakistani drones have entered Indian Territory. Out of these, 171 had entered the Punjab sector, while 20 were spotted in the Jammu sector.

Defence sources said, "The Army has installed quadcopter jammers called aqua jammers on the LoC, and they are supported by multi-shot guns. They have an efficacy up to a height of 4,99 meters. The aqua jammers snap the connectivity of enemy drone with its operators across the border before freezing it." It was further added, "The subsequent action is followed by other multi-shot guns mounted on a multi-weapon platform to bring it down. The two machines are operated by many soldiers."

The aqua jammer is able to detect drone signals up to a range of 5 km. Regarding the multi-weapon platform, another platform said, "Three guns mounted on it fires nine shots at a time in a triangular format leaving no scope for the enemy drone to escape the fire."

Both systems are already deployed around 400 meters behind the LoC. Sources said that the surveillance centres work 24x7 to detect any mischief by the adversary and are also equipped with cameras and thermal imagers. Around 2.5 km behind the LoC, the two systems are backed up by surveillance centres.



## Indian Navy & Drone Federation tie-up to promote indigenous drone technology

The Drone Federation of India and the Indian Navy's Technological Department and Acceleration Cell of the Naval Innovation Indigenisation Organisation (NIIO) have entered into an agreement to collaborate and work towards the promotion of indigenous development, manufacture of drones, testing of drones, counter-drone and other technologies for the Navy. This collaboration will increase the Navy-industry academia synergy.

In a statement by an official, it was said, "A special maritime drone testing site shall also be embarked for the Indian drone industry to facilitate faster development and testing of drones, especially in maritime environments to enable the development for a host of applications."

Furthermore, as a part of this understanding, programs on sensitisation and skill development shall be undertaken as well.

The Code A P Golaya, VSM, Oic TDAC, Indian Navy said, "TDAC has been working towards the accelerating development of indigenous technologies to be utilised by the Indian Navy. Our collaboration with the Drone Federation of India will help us develop a deeper industry connection and help us create a stronger roadmap for induction of drone platforms in the Indian Navy in a time-bound manner."

The Drone Federation of India is a non-government, not-for-profit, industry-led body. It promotes the drone industry by creating business operations as well as developing a robust and skilled infrastructure and promoting research and development.

The president of the Drone Federation of India, Smit Shah, said, "It is a proud moment for the Indian drone industry to have established a partnership with the Indian Navy to build and test superior drone platforms."

It was further mentioned by Shah that the maritime testing site is being developed under this initiative. It will accelerate the development of highly versatile and reliable drone platforms. The Navy shall use these drones for the purpose of maritime patrolling, drone landing on moving ships, ship-to-ship deliveries and ship-to-shore deliveries.



## GA-ASI SeaGuardian® Begins Operations for Japan Coast Guard

The Japan Coast Guard (JCG) commenced flight operations using an MQ-9B SeaGuardian® Remotely Piloted Aircraft (RPA) from General Atomics Aeronautical Systems, Inc. (GA-ASI). JCG is operating the SeaGuardian from the Japan Maritime Self Defense Force (JMSDF) Air Station Hachinohe. The RPA will primarily perform Maritime Wide Area Search (MWAS) over the Sea of Japan and the Pacific Ocean. Other missions will include search and rescue, disaster response, and maritime law enforcement.

“SeaGuardian is the world’s premier asset for performing MWAS,” said Robert Schoeffling, vice president of International Strategic Development at GA-ASI. “We’re proud to support the Government of Japan’s policy to strengthen its maritime security.”

SeaGuardian features a multi-mode maritime surface-search radar with an Inverse Synthetic Aperture Radar (ISAR) imaging mode, an Automatic Identification System (AIS) receiver, and High-Definition - Full-Motion Video sensor equipped with optical and infrared cameras. This sensor suite enables real-time detection and identification of surface vessels over thousands of square nautical miles and provides automatic tracking of maritime targets and correlation of AIS transmitters with radar tracks.

GA-ASI’s MQ-9B SkyGuardian® and SeaGuardian are revolutionizing the long-endurance RPAS market by providing all-weather capability and full compliance with STANAG-4671 (NATO UAS airworthiness standard). This feature, along with our operationally proven, collision-avoidance radar, enables flexible operations in civil airspace.



## PABLO AIR contributes to NASA demonstration project

PABLO AIR a member of the Born2Global Centre, announced that it will participate in a project to improve urban airspace safety hosted by the National Aeronautics and Space Administration (NASA)’s Aeronautics Research Mission Directorate. This project feeds into NASA’s larger vision for Advanced Air Mobility.

The testing will happen in the Hampton Roads, Virginia area where NASA’s Langley Research Center is located from this October to July next year. The project will include collaboration from five companies: PABLO AIR, ResilienX, TruWeather, Spright and Longbow. PABLO AIR will install wind speed sensors on its multicopter delivery drone and collect and utilize data through the smart traffic management system (PAMNet, PABLO AIR Mobility Network).

Through this effort, PABLO AIR will help collect and analyze real-time wind speed data that significantly affects flight stability. The prediction of the wind speed model helps ensure the stability of the flight path and identifies the effect on the battery, thereby improving flight efficiency.

Regarding the project with NASA, Lee Chan-Joo, C.O.O of the U.S. branch of PABLO AIR, said, “This is a great project to bolster the UAS industry with a proven set of market leaders. We are excited to work with NASA and the ResilienX team to help enhance the safety features of our UAS operations. This effort represents an excellent opportunity for PABLO AIR to serve as a bridge and enhance cooperation between the U.S and the Republic of Korea, and to set the bar for safe UAS environments globally.”



## Israel and Ukraine discuss air defence systems after drone strikes

Days after Russia purportedly deployed Iranian “Kamikaze Drones” as part of a new wave of air raids on Ukraine, the Ukrainian and Israeli officials held talks about Kyiv’s request for Israel to provide air defence assistance. Dmytro Kuleba, the Ukrainian foreign minister, said that he spoke with Israeli Prime Minister Yair Lapid on a phone call, and they “discussed in detail” the provision of air and missile defence systems and technology.

The Prime Minister’s office said in a statement on Thursday that their prime minister had expressed “deep concern” over the military ties between Russia and their arch enemy Iran. Ukraine also accused Russia of its use of four Iranian-made drones to bomb Kyiv. It also said that its air defenses have shot down 223 Iranian drones since mid-September.

The Kremlin responded to the accusation made by Ukraine. Russia denied the accusations saying that it had no knowledge of its army ever using the Iranian drones in Ukraine. On the other hand, Tehran claims that it is the rumors that it is providing Russia with weapons are “baseless”.

However, the European Union Countries have said that they had found evidence supporting Kyiv’s claim. Considering all sides of the situation, they adopted sanctions on Iran over its provision of drones to Russia.



## Elbit Systems Awarded a \$120 Million Contract to Supply Hermes 900 UAS to the Royal Thai Navy

Elbit Systems Ltd. announced that it was awarded a contract valued at \$120 million to supply Hermes™ 900 Maritime Unmanned Aircraft Systems (UAS) and training capabilities to the Royal Thai Navy. The contract will be performed over a three-year period.

Under the contract, Elbit Systems will provide the Royal Thai Navy with Hermes 900 Maritime UAS featuring maritime radar, Electro Optic payload, Satellite Communication, droppable inflated life rafts and other capabilities. The Hermes 900 Maritime UAS is intended to enable the Royal Thai Navy to perform both blue water and littoral missions, dominate vast swathes of sea and long coastlines, communicate with operational vessels and carry out civilian mission such as maritime Search and Rescue and identification of suspicious activities and potential hazards.

UAS of the Hermes family have been selected to date by more than 20 customers including Israel, the UK, Switzerland, Canada, the United Nations, the European Union, Brazil, Chile, Mexico and others; attesting to their competitive edge combining technological sophistication, reliability, open architecture and a solid growth path.

Yoram Shmueli, General Manager of Elbit Systems Aerospace, commented: “This is yet another vote of confidence in the Hermes family of UAS. We are experiencing a growing demand around the globe for our unmanned solutions that are capable of effective integration with operational activities of manned forces across domains of operation, addressing a wide range of evolving threats.”



## Turkey Delivers First 'GPS-Independent' Drones

The Turkish military has received the KERKES GPS-independent autonomous navigation system from the STM Defence, enabling control over drone swarms in the contested electromagnetic environment. In 2019, KERKES was launched by STM with support from the Turkish defense procurement agency called SSB. The purpose of the project was to enable accurate location data and mission execution by applying object recognition technology and AI with deep-learning capabilities. A UAV begins its mission with a pre-loaded map with KERKES. After this, the map is compared with the data collected during the flight.

In early October, the final acceptance testing of the system was completed. On 9th October, the SSB chief, Ismail Demir, announced the arrival of KERKES with the Turkish Armed Forces on social media. He claimed that Turkey is one of the few countries in the world capable of operating UAVs independently. He further mentioned that the SSB is still working on a technology that can allow mini drones to perform missions without the threat of being blinded by electronic warfare.

KERKES is able to gather targeting data in a GPS-denied scenario. It does so by processing information and images received by various sensors. The GM of STM, Ozgur Guleryuz, said, "This enables attacks on targets detected by artificial intelligence and deep learning techniques." He further added, "These capabilities are developed as part of the KERKES project and can also be applied to other micro/mini, tactical or operational UAV systems."

According to a claim made by Guleryuz, KERKES can be adapted to land and naval platforms. Since rotary-wing and fixed-wing UAVs can enable rapid and reliable attacks with the support of satellite navigation systems, especially GPS, they are becoming increasingly common on the battlefield.



## GA-ASI to Deliver MQ-9A Reapers to Poland

As part of a new contract, Poland will take delivery of MQ-9A Reaper Unmanned Aerial Vehicles (UAVs) from General Atomics Aeronautical Systems, Inc. (GA-ASI). The agreement between the Polish Ministry of Defence and the GA-ASI is valued at USD 70.6 million. MQ-9A Reapers are operated by different countries, including the UK, Italy, France, the United States, Spain, and the Netherlands. Belgium and the UK have acquired GA-ASI's newer MQ-9B variant that recently began operations supporting the Japanese Coast Guard.

MQ-9A Reaper has a perseverance of over 27 hours, attaining speeds of 123.5 m/s (240 KTAS) and operating at altitudes up to 15,240 m (50,000 ft). It has a 1,746 kg payload capacity, including 1,361 kg of external stores. The Reaper provides a persistent surveillance capability with Full-Motion Video (FMV) and Synthetic Aperture Radar (SAR)/Moving Target Indicator (MTI)/Maritime Radar. Moreover, a fault-tolerant flight controller is equipped with a triple-redundant avionics system architecture.

GA-ASI support for NATO and Poland alliance is abiding as they confront the ongoing war in the region. The CEO of GA-ASI said, "We look forward to delivering our demonstrate MQ-9A platform system to Poland to enhance the nation's ability to conduct perpetual airborne ISR and support its Defense Forces." In addition, as the company provides mission-capable aircraft with integrated sensor and data link systems, it enhances situational awareness and rapid strikes. With a variety of ground control stations and control software, GA-ASI develops meta-material antennas.



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