

India's first monthly e-magazine for Drones

DRONES WORLD

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Authority of India



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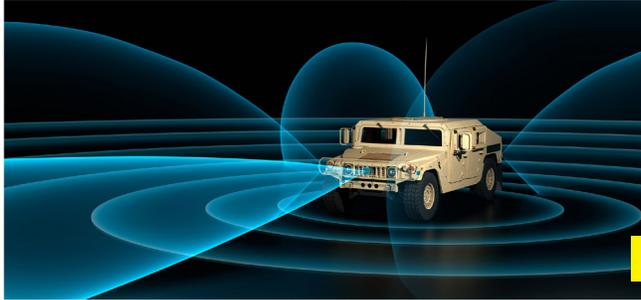
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DRONES WORLD

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DRONES WORLD is published by - B. Kartikeya



B. KARTIKEYA

Hello my dear readers,

With a focus on important news from Indian Drone circles, our February edition examines the most recent advancements in the Drone sector. As we begin a new month, we provide you with a beautiful, fresh design makeover of your favorite Drones World Magazine. We have decided to switch from a bimonthly to a monthly E-Magazine so that you stay updated often. We appreciate your tremendous reaction. This month, we have a few more surprises for our readers (Job Openings). The key pieces of international news, technological advancements, anti-drones, trails, sensors, and new items have all been discussed in this edition.

Founder of Marvel Geospatial Solutions, which offers a comprehensive ecosystem of drone solutions for multi-sensor drone surveys and data processing, Mr. Raghu Boyapally was the subject of an individual interview we conducted for you. A few extracts from our interview with Mr. Pawan Kakkar and Maj Gen MPS Baweja (Retired), in which we discussed mitigating this developing threat, may be found by turning the pages. Watch out for the debut of Ring by Regulus Cyber, a cutting-edge counter-drone/UAS system that uses innovative GNSS manipulation.

I am happy to see that Dr. Pranay Kumar is working hard to provide you the best industry interactions with Mr. Rajesh Kumar who is Joint Advisor (GIS) to National Highway authority of India (Ministry of Road Transport and Highways, Govt. of India). Interesting read for Drone Industry lovers.

Please do not hesitate to contact us if you need help with the Aero India promotion. It's advantageous for drone startups to demonstrate their skills and capabilities to draw in investors and governments worldwide. We want to see the artificial industry emerge as the decade's victor. We value your appreciation and support for Drones World in 2023. In 2023, we're hoping to set a higher standard and accomplish more. I'll leave you now for the remainder of this month. We will provide more information in our upcoming issue. Stay safe till then, and may God continue to bless you.

Squadrone Flies India's First Autonomous Drone in Underground Mines

Squadrone, one of the most progressive companies in Aerial Intelligence in Mining & Infrastructure, became the first company to fly autonomous drones in Underground mines in India, after successfully completing a Proof of Concept (POC) at Hindustan Zinc Limited's (Vedanta) underground mines in Udaipur, Rajasthan. The success of this project has proved that the application of drone-based Hovermap LiDAR technology would bring about a huge transformation in the way underground mines are worked in India and would make a huge difference in the life of every miner in India with enhanced safety, productivity, and higher efficiency.



Commenting on the development, Cyriac Joseph, Founder and CEO, Squadrone Infra and Mining Pvt Ltd said, "This is a historic moment for us, as we become the first company in India to fly autonomous drones in underground mines in the country. We sincerely thank the entire team at Vedanta for facilitating this Proof of Concept and congratulate them for taking this exciting step to bring this latest and smart LiDAR-based technology into the Underground mines in India. We also have plans

to work with various other mining and tunnelling companies to design and implement innovative applications of this state-of-the-art technology. This technology can be used to improve safety and reduce risks, resulting in more efficient, cost-effective, and smart mining operations."

Squadrone has partnered with Emesent Australia to drive SLAM based technology in the underground mines in India and Middle East to implement Hovermap LiDAR technology. Hovermap is a drone-based LiDAR sensor that works on the latest SLAM (Simultaneous Localization and Mapping) technology, comprising revolutionary equipment for mapping of underground workings by autonomously flying in underground mines, tunnels, and remote locations without GPS.

"Squadrone assess the potential of the LiDAR technology in terms of providing 3D mapping of the underground environment and investigate the different applications of the LiDAR data in terms of understanding the geological structure and composition, locating faults and fractures, and inspecting surface features, as well as monitoring and controlling surface subsidence. We also assess the economic benefits of deploying this technology, and the potential of achieving cost savings and increased efficiency. The application of autonomous drones with LiDAR mapping can benefit the mines, by providing high-quality data for safety, mine planning and design, subsidence mapping, and providing advanced analytics for better planning and management of underground operations" Cyriac Joseph added.

Percepto approved to deploy highly automated Beyond Visual Line of Sight drones for remote operations at record-breaking altitude

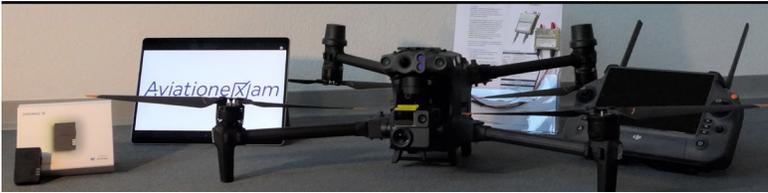


Percepto, the leading autonomous inspection and monitoring solution provider announced that the Federal Aviation Administration (FAA) has allowed operators to use Percepto's drone-in-a-box solution to perform highly automated Beyond Visual Line of Sight (HA BVLOS) inspection and monitoring operations at a large Texas solar power plant. The drone operations are approved for up to 200 feet above ground level, double the altitude of any previously approved HA BVLOS drone operation in the U.S. This uniquely high altitude will enable greater operational flexibility to monitor larger areas and taller structures, including mapping and modeling use cases.

Without a pilot or visual observer on site, Percepto's advanced technology enables an automated detect and avoid (DAA) cycle. This eliminates the need for remote pilot in command intervention if other aircraft are detected within the airspace. This automatic airspace deconfliction capability paves the way for centrally controlled drone-in-a-box fleets of multiple sites in the future.

The solar power plant deployment for which this approval was provided serves as a model for many other industries, including oil & gas, mining and utilities, to increase site efficiency through automated remote inspection operations. Percepto's automated drone-in-a-box technology has been deployed by many of these industries to streamline preventive maintenance, drive efficiency, increase safety and reduce operational costs.

Gaining this approval marks a significant milestone to provide remote and autonomous inspections at industrial sites, fulfilling Percepto's mission to provide safe and reliable critical infrastructure," said Percepto Policy & Government Affairs VP Neta Gliksman. "We are grateful to the FAA for their diligence in reviewing Percepto's safety case, and we look forward to continue to support the critical infrastructure community across the U.S."



Droniq enters into new sales partnerships and expands its product portfolio

Droniq has entered into sales partnerships with Globe Flight, Dronetag, uAvionix and Aviation exam. This will expand Droniq's range for commercial and government customers.

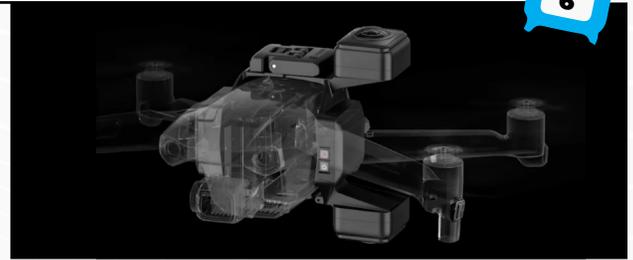
"As Droniq, we want to support commercial and governmental drone users in all phases of drone flight," explained Droniq CEO Jan-Eric Putze. "Through the interplay of our collaborations, we can now offer everything from a single source: be it the right drone, solutions for safe drone flight, operating licences or training and testing for remote pilots. This 360-degree approach makes us unique in Germany. At the same time, we are positioned to further support the growth of the drone market."

Sale of drones for commercial and governmental applications : One of the new collaborations is with Globe Flight. The company, based in Barbing, Bavaria, is one of the largest resellers of the drone manufacturer DJI for Germany, Austria and Switzerland (DACH region). As part of the cooperation with Globe Flight, Droniq will offer DJI drones of the Enterprise Series (M30, M300, M3E) including accessories in future. The drones are suitable for commercial and governmental applications, such as site security, infrastructure inspection or the search for missing persons, among other uses.

Be U-Space ready with Dronetag : Droniq is embarking on another partnership with the Czech company Dronetag. The small tracker of the same name, distributed by Droniq, is integrated into Droniq's drone traffic management system (UTM) via mobile communications. It also broadcasts the drone's position via Remote ID. An app released earlier this year allows users to manage their account. This means that Droniq also has a product in its portfolio for drone operators who would like to fly in a U-Space at low cost and without cumbersome bureaucratic barriers. Sending a remote ID is mandatory for the airspace element, which can be established in EU Member States for the first time from January 2023.

Solution for drone operations in controlled airspace : Through the collaboration with the American company uAvionix, Droniq is also expanding its portfolio to include an approved Mode-S transponder. The Ping20Si Mode-S ADS-B transponder makes drones visible to secondary radar, TCAS and ADS-B receivers. This means it is especially suitable for drone operators who also perform flights in controlled airspace or a transponder mandatory zone (TMZ) and require a Mode-S /ADS-B out solution for drones. **Expansion of the Droniq Academy :** For a few weeks now, Droniq has been a testing centre approved by German Federal Aviation Office (LBA) for the acquisition of the EU remote pilot certificate for the open category. For this purpose, a cooperation agreement was concluded with Aviationexam. The Czech company is one of Europe's leading providers of learning software for manned aviation. As part of the agreement, Droniq will use the examination system developed by Aviationexam for aviation authorities for the examinations to obtain the A2 remote pilot certificate.

“Drone sales add another element to our expertise,” explained Thilo Vogt, Director Sales and Business Development at Droniq. “We plan to continuously expand this segment with strong partners to provide our customers with the best possible solutions.”



OpenSpace expands support for drone-based reality capture with the Insta360 Sphere

OpenSpace®, the global leader in reality capture and AI-powered analytics, formally announced platform support for the Insta360 Sphere, an easy-to-install, dual 360° camera that can be attached to DJI Mavic Air 2 and Air 2S drones. Paired with OpenSpace's technology, drone capture with Sphere is easy and scalable—opening up 360° capture for a wider business audience. Sphere joins a growing list of capture technologies supported by OpenSpace's platform, including 360° cameras, drone cameras, mobile cameras, LiDAR scanners, and more, empowering users to capture however they choose.

"Ease of use is at the core of OpenSpace's platform," says Neel Sheth, VP of Product at OpenSpace. "Our customers have been attaching cameras to drones for years, and our dedicated support for Sphere will simplify and improve their experience. We want OpenSpace customers to be able to capture in a way that aligns with their workflows and goals, and extending our drone support through this partnership will further enable exterior captures to be seamlessly integrated into our platform."

With two cameras, one upward facing and one downward facing, the Insta360 Sphere integration achieves a 360° view where the camera is rendered invisible in the capture, enabling drone pilots of various levels of experience to capture all angles of a jobsite without any reflights needed. Sphere makes installation and flight simple with an easy locking mechanism and FlowState stabilization to ensure footage is smooth. OpenSpace is currently beta testing captures with the Insta360 Sphere to further improve capture processing, calibrations, battery life, image quality, ease of installation, elevated captures, and the multitude of angle selections. Support for Sphere will be generally available to customers later this quarter. With OpenSpace Capture, users attach cameras to their hard hat, drone, robot, or other apparatus, and walk the site as they normally would. Regardless of where the camera is mounted, once the video is uploaded to the cloud, OpenSpace's computer vision technology stitches images together and pins them to the floor plan, creating a trusted visual record of site status. Powered by the company's Vision Engine, the site image map is typically ready to view about 15 minutes after upload.

With Sphere, builders are able to seamlessly capture high-resolution footage of the job site, without having to worry about factors like stabilization or editing out the drone body," says Max Richter, VP of Insta360. "We're excited to partner with OpenSpace to bring an affordable, easy-to-use drone camera to builders to capture the full job site.

Strategic partnership between ACC Innovation and Modini Ltd



“The growing relationship between ACC innovations group and Modini has started to yield fantastic results, as identified by the Royal Navy for the award of this Heavy Lift Challenge. This has been successful by our engineering, integration and operations teams working in harmony with world leading #OEMs to deliver best in class #drone solutions.”
 Nick Sharpe, CEO, Modini.

ACC Innovation AB and Modini Ltd. seal their strategic partnership to engineer the heaviest lift drone platform capable of lifting up to 700kg in a Beyond Visual Line of Sight (BVLOS) environment. This pioneering platform will enable shore-to-ship and ship-to-ship delivery of heavy payloads for the Royal Navy. This collaboration of innovative solution design, #RPAS engineering, trials and evaluation and airmanship bring to fruition a solution that can operate in the challenging and unpredictable environment of a moving ship at sea.

ACC Innovation CEO, Claes Drougge commented “ACC Innovation is proud to have been selected by Modini for a strategic partnership to bring a new paradigm to RPAS capabilities for the UK Royal Navy and Future Capability Group. Modini’s professional and experienced organisation helps us to bring the most powerful heavy lift #VTOL to the market and we are fully committed to further innovation of the drone industry.”



Perceptual Robotics announces first close round of funding with investment from Brookstreet

Perceptual Robotics has announced the closing of the newest funding round led by investment from Brookstreet Equity Partners LLP (“Brookstreet”). An investment group focused on supporting companies, which experience transformational growth, London-based Brookstreet will support Perceptual Robotics in the first quarter of 2023 to expand its products and explore new markets, including America. Perceptual Robotics, which has bases in the UK and Europe, is already backed by international investors such as TSP Ventures, Future Fund, Humble Holdings and Metavallon VC.

Kostas Karachalios, CEO and Founder of Perceptual Robotics, said: “We are delighted to have raised our first close of the round and to bring along Brookstreet. Their invaluable experience with companies in the robotics space, as well as international transactions, will enhance our transatlantic exposure whilst we push to expand in new geographies and expand our product offerings.

“We are looking forward to getting Brook Street’s support in this new phase of growth for Perceptual Robotics, fuelled by being the number one self service provider for the technology of the inspection of wind turbines.”

By utilising drones and AI, Perceptual Robotics offers a vital solution designed to undertake autonomous in-depth turbine inspections four times faster than traditional solutions, collecting high-quality data, and quickly analysing it with state-of-the-art AI data processing. Perceptual Robotics’ Dhalion solution increases safety during inspections, as well as increasing cost-effectiveness and dramatically reducing turbine downtime for wind farm operators. While the company’s headquarters is in Bristol, UK, Perceptual Robotics’ European base is in Athens, Greece, and last year it opened operations in both Spain and France.

Founded by M&A, McKinsey and CEO veterans, Brookstreet brings established scale-up practices in asymmetric markets, offering differentiated strategies focused on providing commercial capital and hands-on support in driving strategy and its execution. With a global network and platform, which outreaches USA, UK, Continental Europe, Middle East and Asia, Brookstreet is recognised as a ‘DraxFuture40 Investor’. The company is a thematic investor in innovations across the 4th Industrial Revolution (4IR), Green and ESG technologies with wider impact such as Nanotech, Internet of Things, Artificial Intelligence, Robotics and Cybersecurity. To date, Brookstreet has completed 23 transactions across its portfolio of assets.

“We welcome Perceptual Robotics to the Brookstreet family and look forward to working with Founders, Management and Co-Investors to fast track their Scale Up journey. In the era of Digital Transformation and Green Transition, Perceptual Robotics blends Artificial Intelligence and Autonomous Technologies for the benefit of Renewable Energy Sources, which fuel our Circular Economy.”

Omiros D. Sarikas, (Managing Partner) CEO of Brookstreet

H3 Dynamics and Hylium Industries Join Forces to Progress Liquid Hydrogen-Electric Flight Capabilities



H3 Dynamics and Hylium Industries have joined forces to boost the performance of zero emission hydrogen-electric flight, by combining the strengths of Hylium's liquid hydrogen storage and liquification solutions, and H3 Dynamics' distributed hydrogen-electric propulsion nacelles, ultra-light fuel cells, and new hydrogen drone refueling stations.

Moving to liquid hydrogen represents a significant capability leap for small electric-powered unmanned systems. Cryogenic (liquid) hydrogen stores 3 times more energy as compressed gas in the same given volume. This means delivery drones will be able to fly further, mapping and ISR missions could be done on a much bigger scale.

To illustrate the jump in performance, the same 25kg hydrogen-electric propulsion UAV demonstrated by H3 Dynamics last July in France, will be able to fly over 900km with a single fill. With pressurized hydrogen, that range reduces to 400km, which is still 3 times more than a battery-powered equivalent.

"When combined, our global best-in-class solutions achieve the global performance limit for low-altitude electric powered flight" says Taras Wankewycz, CEO H3 Dynamics. "We are proud to be working with Hylium to move hydrogen-electric flight propulsion to the next level"

Now all the various forms of hydrogen drones and UAVs powered by H3 Dynamics including hydrogen airships, multi-rotors, vertical take-off and landing (VTOL), have a way to further boost flight durations by another factor of 3 over pressurized hydrogen systems, or a factor of 10 compared to batteries.

H3 Dynamics also recently announced a first hydrogen production, and automated hydrogen refueling mobile station for hydrogen UAV operations. Named H2FIELD the mobile station produces hydrogen from water and delivers compressed hydrogen gas tanks to the operator with little human intervention and no required hydrogen expertise. H3 Dynamics and Hylium's partnership will upgrade the station so that it can fill liquid hydrogen tanks.

Developed in South Korea, Hylium's breakthrough technology provides one of the most advanced solutions and has already been proven in a number of applications. South Korea is also leading the development for LH2 standardisation. One local proposal was accepted as a draft standard by a global ISO committee.

Hylium and H3 Dynamics technologies are currently being integrated to attempt a 3,300km crossing of the South Atlantic, in a program led by ISAE SUPAERO Toulouse, one of the world's leading aerospace engineering schools. H3 Dynamics' team developed a special fuselage design that can store a small LH2 tank and manage the thermal behavior of all the propulsion sub-systems.



DARPA Selects Aurora Flight Sciences for Phase 2 of Active Flow Control X-Plane

DARPA has selected Aurora Flight Sciences to move into the detailed design phase of the Control of Revolutionary Aircraft with Novel Effectors (CRANE) program. This follows successful completion of the project's Phase 1 preliminary design, which resulted in an innovative testbed aircraft that used active flow control (AFC) to generate control forces in a wind tunnel test. Phase 2 will focus on detailed design and development of flight software and controls, culminating in a critical design review of an X-plane demonstrator that can fly without traditional moving flight controls on the exterior of the wings and tail.

The contract includes a Phase 3 option in which DARPA intends to fly a 7,000-pound X-plane that addresses the two primary technical hurdles of incorporation of AFC into a full-scale aircraft and reliance on it for controlled flight. Unique features of the demonstrator aircraft will include modular wing configurations that enable future integration of advanced technologies for flight testing either by DARPA or potential transition partners.

"Over the past several decades, the active flow control community has made significant advancements that enable the integration of active flow control technologies into advanced aircraft. We are confident about completing the design and flight test of a demonstration aircraft with AFC as the primary design consideration," said the CRANE Program Manager Richard Wlezien. "With a modular wing section and modular AFC effectors, the CRANE X-plane has the potential to live on as a national test asset long after the CRANE program has concluded"

The AFC suite of technologies enables multiple opportunities for aircraft performance improvements, such as elimination of moving control surfaces, drag reduction and high angle of attack flight, thicker wings for structural efficiency and increased fuel capacity, and simplified high-lift systems.

"Thanks to a variety of innovative participants, the CRANE program has significantly advanced the state of the art of multiple active flow control technologies," said Wlezien. "We are uniquely positioned to build on those achievements by evaluating a wide range of relevant technologies during our planned X-plane flight tests."

SKY-HERO and AARDVARK Announce Release of New Payloads and Accessories



SKY-HERO and AARDVARK have expanded their Tactical Robotics Suite by adding three new accessories and payloads to the current system. A new Tactical Wrist Monitor system, Typhon distraction device payload, and LED/LASER payload have joined the versatile list of equipment in the SKY-HERO Tactical Robotics Suite.

SKY-HERO's newest accessory, the Tactical Wrist Monitor, allows for the sharing of situational awareness by providing each team member with the ability to view the real-time video streams of up to four different LOKI and SIGYN systems. The monitor features a 2.7-inch, high-res display with individual channel buttons. Team members can switch between the live video feeds of deployed vehicles, even on scrambled channels, without regard for what the pilot is seeing or operating. With a 150-minute run time, wireless scrambled video, and NLOS 150m reception range, the Tactical Wrist Monitor broadens the use of the

Built in conjunction with Typhon in the UK, the Noise Flash Diversionary Device (NFDD) payload acts as a non-lethal, multi-shot distraction system, capable of producing a 165dB report as either single shots or as a burst. The pilot and other operators can initiate this payload through the SKY-HERO GCS or with SKY-HERO's new Remote Trigger system.

system's multiple devices and provides situational awareness for the entire team. The new Typhon Noise Flash Diversionary Device (NFDD) payload and SKY-HERO LED payloads — designed to provide deceptive diversions to enhance operator safety — have also been added to the Tactical Robotics Suite. These payloads are indispensable tools that facilitate safe entry into hostile environments and distract suspects. Each of these payloads features a plug-and-go design and can operate on both LOKI and SIGYN.

Built-in conjunction with top SKY-HERO users, the LED payload is a multi-function, selectable payload providing bright white light, colored LEDs, and a designating green laser in a single device. Designed to distract, temporarily disorient, and confuse suspects, the payload's high-intensity front LEDs can be used as a solid source of bright white or as a disorienting high-intensity strobe. The programmable colored LEDs can be used as a distraction or to indicate the drone is law enforcement.

The powerful green laser pointer can designate targets or get suspects' attention. The SKY-HERO Tactical Robotics Suite is the world's most widely used tactical robotics system. It combines the power of the LOKI Mk2 tactical drone, the SIGYN Mk1 ground robot, and integrated payloads to operate from a single GCS. The Tactical Robotics Suite allows teams to scout unknown areas, reduce risk to operators and share situational awareness.

The Tactical Robotics Suite is built by SKY-HERO and sold exclusively in North America by AARDVARK. Visit aardvarktactical.com/tactical-robotics-suite or contact AARDVARK to learn more about how the complete Tactical Robotics Suite can change the way your team operates.

Epazz Holdings' ZenaDrone Will Use Open AI Predictive Artificial Intelligence Technology in ZenaDrone 1000 Units



Epazz Inc a leading provider of drone technology, blockchain mobile apps, and cloud-based business software solutions, has announced that it is upgrading its Artificial Intelligence predictive automation software in current and subsequent productions of the ZenaDrone 1000 aerial technology. ZenaDrone, Inc. is a provider of a multi-functional unmanned aerial vehicles equipped with machine learning systems, multi-spectral sensors, and AI technology.

The ZenaDrone 1000 has successfully garnered positive assessments and influence in several industries, especially in the Agribusiness and Industrial Sectors. This year, Epazz ZenaDrone aims to enhance the artificial intelligence capabilities of ZenaDrone 1000 to include autonomous navigation of unmapped terrains, deep learning algorithms for various actions, and dual-use features to accommodate commercial and military drone utilization.

The ZenaDrone team will use Predictive AI Analytics, or predictive modeling, a type of analysis that employs methods and resources to create predictive models and make predictions of future outcomes based on acquired data. Machine learning algorithms, sophisticated mathematics, statistical modeling, descriptive analytics, and data mining are techniques utilized in predictive analytics. Predictive analytics refers to a method rather than a specific technology.

Integrating predictive AI technology in the ZenaDrone 1000 will enhance its autonomous capabilities, allowing the drone to complete aerial missions using real-time acquisition and processing of data to make predictive decisions with less help from human drone operators.

CEO Shaun Passley, Ph.D., commented: "We will upgrade all our current and future drones with predictive AI to enhance the ZenaDrone 1000's navigation, sensors, and autonomous flights."

Epazz Holdings will prioritize developing the ZenaDrone 1000 by upgrading its AI technology to boost its global reach across industries.

Draganfly Selected by Lufthansa Industry Solutions to Strengthen Marine Search and Rescue Infrastructure



Draganfly Inc. an award-winning, industry-leading drone solutions and systems developer, is pleased to announce that Lufthansa Industry Solutions, an IT service provider and a subsidiary of Lufthansa Group has entered into a letter of intent with Draganfly to explore providing its drone solutions and Vital Intelligence (VI) technology for use into its existing infrastructure and customer solutions.

Draganfly's technology will assist in Lufthansa Industry Solutions' objective of providing the maritime industry with the highest information technology and performance monitoring standard. Draganfly's drone solutions will be integrated for deployment during marine search and rescue operations and for reconnaissance purposes, adding another layer of safety and security for crew members and passengers.

Built in conjunction with Typhon in the UK, the Noise Flash Diversionary Device (NFDD) payload acts as a non-lethal, multi-shot distraction system, capable of producing a 165dB report as either single shots or as a burst. The pilot and other operators can initiate this payload through the SKY-HERO GCS or with SKY-HERO's new Remote Trigger system.

Draganfly's search and rescue drone can be utilized when a passenger aboard a vessel falls into the ocean. These specialized drones are high-endurance, multirotor UAVs capable of utilizing Draganfly's optical and infrared imaging solutions during an active emergency. The company's drone can be used to thoroughly map certain areas, locate survivors, and begin measuring core vitals.

The reconnaissance drones provided by Draganfly can carry out inspections of cargo and potential hazards on the water. This UAV is a high-endurance, drone that utilizes optical and imaging solutions.

These drones can even function in hazardous areas.

Lufthansa Industry Solutions plans to integrate Draganfly's Vital Intelligence technology into its Artificial Intelligence as a Service (AIaaS) platform, a package that offers a quick and easy solution for businesses trying to achieve digital transformation. Draganfly's Vital Intelligence (VI) is software that uses video feed from simple RGB cameras to measure biometric data and share

human experience and health insights.

"We are thrilled to partner with Lufthansa Industry Solutions and provide our versatile AI technology for use in their current infrastructure," said Cameron Chell, President and CEO of Draganfly. "This partnership reflects the growing demand for our drone, AI and data solutions with Tier 1 customers."

"Draganfly's support has enabled us to increase our portfolio for the cruise industry," said Klaus Vollmer, Managing Director of Lufthansa Industrial Solutions Hamburg & VP of Lufthansa Industrial Solutions Miami. "We are looking forward to a long and successful partnership."

UAV CORP'S SKYBORNE TECHNOLOGY RECEIVES PERMIT APPROVAL FROM GULF COUNTY, FLORIDA FOR THE BUILD OF A NEW DRONE HANGAR



UAV Corp's Skyborne Technology receives building permit from Gulf County, Florida for the build of the largest drone hangar in the State of Florida. Further, from the awarded \$1,104,868 million in Grant funding for the infrastructure for water, sewer, power, and road to the hangar site (one mile) will start construction early 2023.

The 100-foot high and 300-foot-long hangar is currently scheduled for completion at the end of 2023 to run in parallel with the build of the SMA 600 Series drone tether-airship. Winfield Construction has been awarded to be the General Contractor for the build of the hangar and the manufacturer of the hangar is Legacy Building Solutions. "The new drone hangar will be a one-of-a-kind technology center for our customer base for integration, flight tests and training," stated Michael Lawson CEO.



"Great news! It was a long journey, and we are thrilled by the issuance of the building permit to Skyborne Technology. Permit in hand, Skyborne can begin construction of the drone hangar necessary for production of the DATT SMA 600's, a project we anticipate will bring good paying jobs to our community in late 2023," stated Jim McKnight, Director of the Gulf County Economic Development Council.

"Expanding the infrastructure of the Costin Airport to provide new services, jobs and investment opportunities has been our goal since we chose this slice of paradise to make our home. The county as well as the US government has been focused on providing the tools for our company to make this a reality. The issuance of the permit is one more step towards completing our vision for today and the future yet to come," stated Billy Robinson, Chairman.

Mitsubishi Electric Announces AnyMile Drone-Based Logistics Operations Management Platform



Mitsubishi Electric US, Inc. announced its drone-based logistics operations management platform, called AnyMile, a holistic solution that is designed to enable businesses and fleet operators to schedule and manage cargo deliveries via drones over long distances of up to several hundred miles.

The platform is intended to support operation across all known categories of drones – multi-rotor, fixed-wing, single-rotor or fixed-wing hybrid VTOL – to provide an end-to-end resource planning and management system. Use of drones is expected to dramatically reduce asset transfer time for corporate shippers and logistics companies, enabling just-in-time inventory.

AnyMile will interface with last-mile delivery service providers to create a door-to-door infrastructure solution for industries such as healthcare, manufacturing, oil and gas. An interactive demo will be on display at the Consumer Electronics Show (CES) in Las Vegas from January 5 – 9, 2023.

Recent research from GlobalMarkets.com indicates that drone use in the transportation, logistics and supply chain industries is expected to grow by a CAGR of 55% by 2030. The U.S. already has invested \$9 billion in the drone industry since 2020 to support increasing demand for efficient product delivery and promote carbon neutrality.

The AnyMile platform is expected to enable businesses to seamlessly manage their shipments, drone fleets and infrastructure services, including scheduling cargo pick up at a specific location, tracking delivery to multiple destinations; managing drone maintenance tasks; live situational awareness; and performing routine operational tasks, such as generating customer invoices, booking services for drones including refueling and much more. The AnyMile drone logistics management

platform is anticipated to be available for beta use with its core features in summer 2023. For additional information, visit ces.mitsubishielectric.com.

The addition of AnyMile to Mitsubishi Electric’s suite of products supports the organization’s long-range vision to digitally transform our society,” said Zafer Sahinoglu, vice president and general manager of Mitsubishi Electric Innovation Center (MELIC). “Drone operators, corporate shippers, and transportation and logistics companies will benefit from access to shipment, fleet and service management applications, allowing for faster and more convenient deliveries.”

Hoverfly Technologies Secures Landing Ring Design Patent



Hoverfly Technologies Inc. announced that it has been issued U.S. Patent No. 11,518,542 from the U.S. Patent Office for the “Landing Structure for an Unmanned Aerial Vehicle.” Hoverfly has been the leader in the tethered drone industry since its inception, and its unmanned aerial vehicles (UAVs) have evolved year after year.

One of the largest concerns with UAVs has been determining where the system will land when it is commanded to land or power is interrupted. Free-flying drones have the concern of battery running out, but tethered systems operate differently. Because power and data are transmitted through the tether to the aircraft, tethered UAVs can fly persistently for hours, days, or weeks at a time. All the while, there remain questions on where the tethered system will land when commanded. Hoverfly tethered aircraft possess proprietary landing technology that allows the aircraft to land in its landing ring without fail. The patent protects our landing ring technology for the tethered UAV, allowing for takeoff and landing in the defined precision landing nest.

Hoverfly tethered systems first began with a landing platform, but quickly realized that a redesign was necessary. Requirements from end users and discussions with key decision makers challenged Hoverfly to create a much more compact system. The priority was to integrate on to manned and unmanned vehicles or vessels, and the form factor of the tethered platform had to be much smaller. The compact tethered system with the patented landing ring is second to none in terms of size and capability.

Hoverfly tethered UAVs, often referred to as the Variable Height Antenna (VHA), are multi-purpose UAVs with versatile capabilities. They can be found integrated on both manned and unmanned vehicles or vessels in defense, security, and public safety industries across the globe.

Al Ducharme, co-founder and Chief Technology Officer, explains, “The driving force of this evolution came from the end users. We wanted to make a more compact system that was easily transportable and able to integrate on a variety of platforms. I’m proud of our engineering team for providing a novel solution to our customer’s needs.”

From Humble Beginnings: The Rise of Drone Pilot Network

When the world was grappling with the effects of the COVID-19 pandemic. Businesses and Industries were shutting down, people were losing their jobs and it was becoming difficult for everyone to make ends meet. Hence, Despite all the adversities and economic shutdown, many entrepreneurs found the light bulb moment to start a business of their own right in the middle of the pandemic in the year 2020.

While the skies were getting clear, coronavirus-led gloom was setting in everywhere. It was when Yash Tanwar, Vishal Modi and Gajendra Singh, came forward with a vision to make a difference. Hence, they realised the potential of their skills, work experience and technology to help the government in providing essential services to the communities in the time of crisis using drone technology “Identifying this gap, I and my Co-founders, Vishal Modi and Gajendra Singh came together and we started to leverage the power of social media and formed small groups of drone pilots and looked for ways to reach out to the government. Our motive was to join hands as frontline workers to provide services to the people on the ground by flying drones “says Yash Tanwar, founder of Drone Pilots Network. The community of drone pilots helped the government in sanitising public places, surveillance, monitoring crowds and delivering medicines to people across cities.

With time, they saw exponential growth of communities and saw many new drone pilots willing to connect for the humble cause. However, the enthusiasm and the will of drone pilots to help the people selflessly motivated them to do something big for the unsung heroes (Drone Pilots) as well. “This is what led us to start Drone Pilots Network officially by creating a Portal (www.dronespilots.co.in) within two months from our humble beginning,” says, Vishal



Modi, the co-founder of Drone Pilots Network. Drone Pilots Network is India's first largest platform that aims to connect pilots to drone companies on one platform. However, the driving force to create such a platform was to help drone pilots make a living in such challenging times while staying in their hometowns.

This online platform breaks geographical boundaries and makes employment opportunities accessible even for drone pilots living in remote

areas of India. Drone Pilots Network is one of a kind because it lists down full-time freelancing gigs on one platform. Hence, it enables the pilots to register their profiles for free highlighting their work experience to close relevant gigs in nearby locations. “Our mission is to connect drone pilots and employers offering suitable work opportunities and make it easy for both the parties to get the work done in a time-bound manner.” Says Gajendra Singh.

The platform began to bask in the warm glow of recognition from all corners of the drone industry. Inspired by the recognition the founders of the Drone Pilots Network embarked upon the journey of experimentation and expansion. Hence, they brought together a diverse group of certified pilots from across the nation and offered them a platform to showcase their skills and fulfil the needs of the drone companies. Through this endeavour, they not only aimed to support the industry but also to help drone pilots to augment their income during challenging times.

Thus, Drone Pilots Network provides companies with a seamless solution for hiring certified drone pilots without wasting their time and money of on the endless hiring process. It also acts as a bridge to overcome language barriers between the pilots and the employers to ensure a smooth and hassle-free experience for both of them.

The platform's rapid rise can be attributed to its ability to provide a reliable source of income to drone pilots while living in close proximity to their loved ones. As a result, pilots were able to connect with employers from nearby locations which helped the pilots save unnecessary travel expenses. In addition to this, the platform is a go-to solution for aspiring drone pilots because the platform enables training institutes to create their profiles highlighting the facilities they have for aspiring pilots and the pilots willing to enhance their skill- set to provide better services in the future.

Recognising the scope and potential the drone industry can offer in the times to come, Drone Pilots Network is continuously collaborating with training institutes and international drone companies to create better employment opportunities for the drone pilots connected on the platform. Therefore, qualified drone pilots can easily grab relevant opportunities and share the quote (charges) with drone companies based in different cities while sitting in the comfort of their homes.

The platform today empowers



thousands of drone pilots to unleash their full potential and work on a variety of projects using drone technology. Thus, the selfless acts of drone pilots in times of need and the will to show up and help the people with unwavering dedication at the cost of their own safety, make them the heroes of 2020. This serves as a shining example for everyone to know what it truly means to make a positive impact.

The journey of the Drone Pilots network is a testament to the power of passion, perseverance and purpose. As the founders themselves have said “ We saw the need in the market to overcome the problem of unemployment and something that could support and

empower drone pilots. And we knew we can create a solution for them.” Therefore, from the humble beginnings of Drone Pilots Network to the heights of success, the founders have proved that with hard work and determination to bring change anything is possible. Moreover, as they continue to grow and expand, we know that there is much more to come from Drone Pilots Network.

Let's take a moment to applaud their efforts and achievements and look forward to all the amazing things that are yet to unfold on the platform for drone pilots.

HERE works with AWS to provide indoor/outdoor device positioning services to AWS third-party developers



HERE Technologies, the world's leading location data and technology platforms, announced its work with Amazon Web Services (AWS) to deliver developers with improved performance for indoor/outdoor positioning capabilities to track and manage any number of internet-of-things (IoT) devices. Across industries and sectors, devices and applications demand reliable and accurate positioning information, regardless of environment or signal availability from Global Navigation Satellite Systems (GNSS).



We're proud to expand our work with AWS to bring these increasingly relied upon capabilities and location-based services to the AWS developer community. Support for HERE Positioning makes devices and applications location-aware at a global scale in various environments with high-levels of positioning accuracy and data security," Giovanni Lanfranchi, Chief Product and Technology Officer at HERE Technologies.



Recently at re:Invent 2022, AWS introduced the new AWS IoT Core Device Location feature to make it possible to track and manage IoT devices without relying on GNSS/Global Positioning System (GPS) hardware. Historically, not all IoT devices can be equipped with GPS due to its high-power requirements, larger device footprint and higher integration costs.

HERE Positioning is being supported by AWS IoT Core Device Location for more accurate, indoor/outdoor position estimates globally. HERE Positioning allows for seamless switching between different localizing technologies and does not rely on GNSS for the location of a device or application. The HERE Positioning API supports a large variety of device types, regardless of operating system if some network or cellular connectivity is available.

With AWS IoT Core Device Location, for example, field service teams can stay informed and quickly identify the location of devices that require maintenance action. It can also support location-based security enhancements, such as restricting access

to a specific geographic region and improve the security of any IoT solution.

HERE Positioning maintains a worldwide database of more than 200 million Cell-ID (GSM, WCDMA, LTE, 5G) and 5.6 billion Wi-Fi Access Point locations, which is dynamically updated and populated through sophisticated machine learning (ML) algorithms.

Leica Geosystems simplifies utility detection and increases site safety with new intuitive locator technology



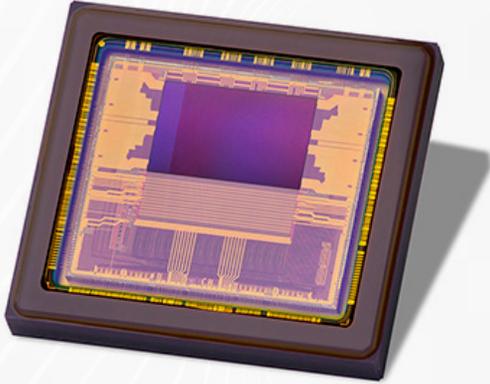
Leica Geosystems, part of Hexagon announced its latest solution for utility and excavation professionals. The new Leica DD175 utility locator and Leica DA175 signal transmitter complement the existing Leica DD100 series and help operators easily detect underground utilities to ensure site workers' safety.

Locating the position of underground cables and pipes before excavation is paramount for site workers' safety. The Leica DD175 and Leica DA175 feature an intuitive design that enhance the user experience and advance automatic controls for simplified utility detection.

The DD175 is a smart utility locator that connects to the Leica DX Field Shield/DX Manager Shield software to enable users to connect the site to the office in real time with fast and stable data transfer. The DD175's automated pinpointing technology and clear display helps users discover buried utilities with confidence. The built-in self-check verifies that the tool is functioning properly, ensuring the dependability of the information and thus enhancing operator safety. The tool's data-logging and GPS features allow managers to see how and where the locator is used.

The new DD175 cable locator and DA175 signal transmitter are designed for construction, civil engineering, utility and general site workers who need to clearly and intuitively understand what assets are located beneath their sites. "Our portfolio ranges from basic entry-level utility locators to sophisticated, high-end, fully featured locators," says Federico Bertolucci, GPR Product Manager at Hexagon. "The new Leica DD175's advanced automatic controls decrease the likelihood of human error even for less skilled professionals, enabling easier and more efficient cable and pipe locating for improved workplace safety."

Teledyne e2v releases Hydra3D+, the first high resolution ToF sensor to work in all light conditions without motion artefacts



Teledyne e2v, a part of Teledyne Technologies announces the release of its Hydra3D+, a new Time-of-Flight (ToF) CMOS image sensor which incorporates 832 x 600 pixel resolution and is tailored for versatile 3D detection and measurement.



Today, many Time-of-Flight sensors suffer from motion artefacts and can't instantly perform in changing operating conditions. With Hydra3D+, our customers can easily achieve reliable 3D measurement with the highest levels of 3D performance, uncompromised image quality in both 2D and 3D modes, and in all distance ranges and conditions even where multiple systems operate or in outdoor environments.

Ha Lan Do Thu, Marketing Manager for 3D imaging at Teledyne e2v



The sensor has been thoughtfully designed for customers seeking real-time and flexible 3D detection with uncompromised 3D performance. It offers large field-of-view scenes captured in both 2D and 3D by a compact sensor which makes the system very cost effective.

Documentation, samples, and development tools are now available upon request. In addition, there are several proprietary modelling tools to support customers in their assessment of the operation of Hydra3D+.

Designed with Teledyne e2v's proprietary CMOS technology, Hydra3D+ features a brand-new 10 µm three-tap pixel which provides very fast transfer times (starting from 10ns), and displays high sensitivity in the NIR wavelength, alongside excellent demodulation contrast. This precise combination enables the sensor to operate in real-time without motion artefacts (even if there are fast moving objects in the scene) and with excellent temporal noise at short ranges, essential in applications such as pick and place, logistics, factory automation and factory safety. An innovative on-chip multi-system management feature enables the sensor to work alongside multiple active systems without interference which can lead to false measurements.

The excellent sensitivity of Hydra3D+ enables it to effectively manage lighting power and handle a wide range of reflectivity. Its high resolution, with powerful on-chip HDR, featuring an on-the-fly flexible configuration, enables the best trade-off between application-level parameters, such as distance range, object reflectivity, frame rate etc. This makes it ideal for mid, long-range distances and/or outdoor applications such as automated guided vehicles, surveillance, ITS and building construction.

The sensor has been thoughtfully designed for customers seeking real-time and flexible 3D detection

Clouidian Raises \$60 Million in Funding to Accelerate Hybrid Cloud Data Management



Clouidian announced that it closed \$60 million in new funding, bringing the company's total funding to \$233 million. The round includes participation from Digital Alpha, Eight Roads Ventures Japan, INCJ, Intel Capital, Japan Post Investment Corporation, Silicon Valley Bank, Tinshed Asia, Wilson Sonsini Investments, and strategic investors. This latest investment reinforces Clouidian's leadership position, accelerates its hybrid cloud platform capabilities and prepares the company for its next phase of growth. The company also announced Bob Griswold as chairman of the board of directors.

"As organizations move to the next level of digital transformation, they increasingly seek technologies that deliver hybrid cloud data management at limitless scale across all platforms," said Clouidian CEO Michael Tso. "Clouidian's cloud-native data management software lets our customers simplify operations and creates new opportunities to derive value from data."

Bob Griswold, Clouidian's new board chairman, brings to the role a wealth of experience as an investor and strategic advisor. Griswold's prior roles include VP of strategy and planning at HPE, senior vice president product line management at Seagate, and VP, chief strategist for Enterprise, Commercial and Small Business at Cisco.

"I am thrilled to join Clouidian at this pivotal moment in the storage industry," said Bob Griswold. "Clouidian is exceptionally well positioned to capitalize on today's transition to cloud-native technologies, and I believe strongly in the company's strategy and its enterprise-proven platform; so much so, that I personally invested in the current funding round."

Clouidian's hybrid cloud data management software transforms any compute platform – including standard servers, virtual machines, containers or public cloud – into a pool of S3 API-compatible object storage resources that can be co-located with data sources and data consumers. Scalable to hundreds of petabytes and beyond, the Clouidian architecture creates a global federation of local storage assets that can be easily integrated with public cloud platforms for consolidated data management.

Red Cat Subsidiary Teal Drones Enhances Low-Light Navigation through New Partnership with Immervision



Red Cat Holdings, Inc. a military technology company that integrates robotic hardware and software to provide critical situational awareness and actionable intelligence to on-the-ground warfighters and battlefield commanders announced an important new partnership.

Opening day of the Consumer Electronics Show (CES) in Las Vegas, Nevada, brought the announcement that Teal Drones, a Red Cat subsidiary, has partnered with leading Canadian optical products manufacturer Immervision, whose latest navigation camera module is used for surveillance and unmanned systems. Immervision will provide Teal's flagship drone with exceptional low-light capabilities – capabilities that Immervision demonstrated at CES.

Teal said that the new model of its Golden Eagle drone, now under development, will be equipped with two Immervision low-light camera modules. In addition to enhancing autonomous navigation at night and in other light-denied situations, such as in fog, beneath bridges and inside buildings, having two cameras provides stereoscopic vision to Teal's autonomous pilot system. This enables the drone to create a 3D map it can use to navigate and locate itself geographically in low-light situations and in areas where a GPS signal is not available.

Ryan Kier, a senior electrical engineer at Teal who conducted independent tests

RED  CAT

to determine the best-performing low-light camera for Teal's new drone, said the Immervision camera was “easily two times better than the nearest competitor.”

Teal is integrating the new Immervision camera with its software system to enhance the Golden Eagle's autonomous flying capabilities. These include avoiding obstacles and taking off and landing without pilot assistance, as well as automatically generating a 3D map and locating itself on it without the benefit of a GPS signal.

“Our objective with Teal is to create the ultimate small unmanned vehicle for military and security use,” said Red Cat CEO Jeff Thompson. “We're doing that by designing and manufacturing a highly reliable, easy-to-use drone platform to which can be added capabilities that warfighters and others on the frontlines

need.”

“Because most military operations happen at night, having a low-light solution is a key capability for Teal, and we are very pleased to partner with Immervision to make this possible. Between this new development and other night-time-focused capabilities on the horizon, Teal's new model will be the go-to small drone that defense and security forces will turn to when they need to ‘Dominate the Night,’” Thompson added.

Both Teal and Immervision are certified as “Blue UAS,” a designation awarded to manufacturers authorized to provide equipment to the U.S. military. Teal is also one of only three drone manufacturers invited to participate in the U.S. Army's Short Range Reconnaissance Tranche 2 (SRR T2). The ultimate goal of the SRR T2 program is to provide a rucksack-portable, small unmanned aircraft system (sUAS) that gives fighters situational awareness beyond the next terrain feature.

“The lens is designed to maximize the concentration of light per pixel on the image sensor to provide the best image quality in low-light conditions, across the complete field of view,” said Jean-Sébastien Landry, Immervision director of product management. “Our camera module has been designed from the ground up to address the challenging requirements of operating safely in low-light conditions where other sensors are inefficient. It is capable of seeing objects in a dark environment at 1 lux, which is equivalent to deep twilight.”

HERE introduces UniMap to revolutionize how maps are created, updated and used

Digital maps just took a huge leap forward. At CES 2023, HERE Technologies, the world's leading location platform, unveiled UniMap, a revolutionary, highly automated mapping technology that enables rapid creation of digital maps and location products.

HERE has been developing the technology over the last three years in close collaboration with automotive groups including BMW Group. Primed for a rollout to selected customers in 2023 ahead of coming fully online for all HERE customers by 2024, UniMap is designed to deliver unmatched levels of map freshness, quality and coverage. At the heart of the HERE platform, the technology will produce the entire HERE map as well as enable customers to rapidly create their own private maps and customized location services.

Giovanni Lanfranchi, Senior Vice President and Chief Product & Technology Officer, HERE Technologies, said: "Ever since we started out mapping California in the mid-1980s, we've been seeking to shrink the time it takes to detect a real-world change, reflect it in the map and get it into the hands of our customers. The turnaround time in our industry has typically been measured in months. With UniMap, we provide anytime access to a unified map that's refreshed in hours, minutes or seconds. This is a big leap forward for anyone building applications that use location data."

Mapmaking at the speed of business

UniMap is under-the-hood technology built on a new computing architecture that: Automates map data processing and map creation wherever possible and logical: For example, UniMap uses AI models to automate the processing of 500 million kilometers of vehicle probe and sensor data every hour, to extract map



features such as 2D and 3D positioning of road signs, to validate speed limits and to build missing road geometry.

Conflates multiple types of data: UniMap transforms data from a wide variety of sources into map content. Sources range from vehicle cameras and LiDAR to overhead imagery and IoT data.

Produces a unified map: UniMap aligns all standard definition (SD), high definition (HD) and Advanced Driver-Assistance System (ADAS) data into one single semantically consistent digital representation of reality; in a first for the industry, HERE is offering seamless access to a unified catalogue of the data needed for navigation, automated driving

and intelligent speed assistance (ISA). Different data types are aligned thanks to Map Object Model, an extendible unified map content data model.

Enables changes detected in the physical reality to become visible in the map within 24 hours

Stores all data in a single environment, readily accessible for customers 24/7

Enables customers to combine and connect data sets: With UniMap, businesses can bring in their own location data and information from other sources such as crowdsourced content to create new products in just hours.

“With UniMap, the world is moving into a new era of mapmaking,” said HERE Technologies CEO Edzard Overbeek. “We look forward to extending the benefits of UniMap to all our customers in automated transportation, smart logistics, urban mobility and beyond.”

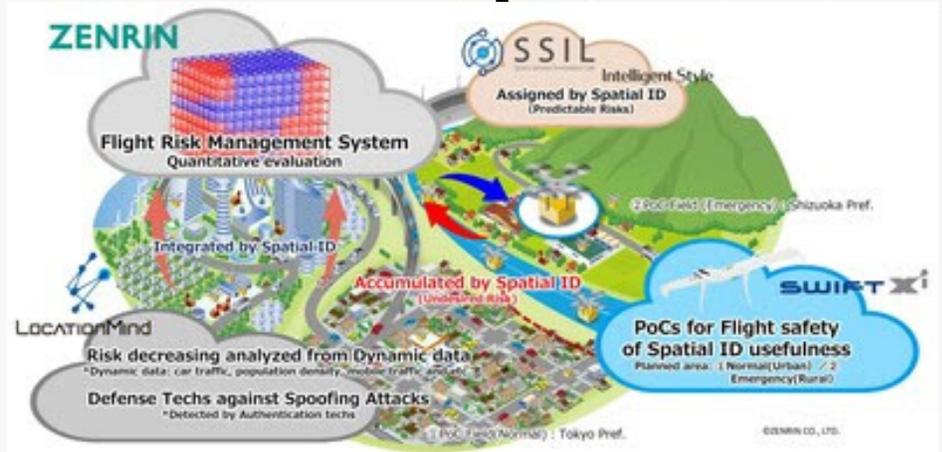
Swift Tactical Systems and the Swift Group to Help Build a Platform for UAVs and UAMs Flight Planning for Urban Environments in Japan

Swift Engineering announced its Japanese Subsidiary, Swift Xi, signed an agreement with Japan's New Energy and Industrial Technology Development Organization (NEDO) in a project called "Digital Infrastructure Development Project for Digital Transformation of Industries: Research and development on 3D spatial information infrastructures." Both Swift Tactical Systems and Swift Engineering will support the project.

"As the Swift family, we are excited to be a part of this predominant and innovative project conducted by NEDO. And we would like to be the very first team in the world to establish a safe 3d Spatial Information Infrastructure System," says Hiro Matsushita, Group Chairman/CEO at Swift Group.

Swift Tactical Systems and the Swift group are collaborating with Zenrin Co. Ltd., LocationMind Inc., Intelligent Style, and Space Service Innovation Lab (SSIL) to develop a 3D spatial information infrastructure using the spatial ID. There needs to be a platform for understanding and identifying flight safety information.

NEDO's Basic plan for this project is to use the spatial ID as a standard index, making it easier and more efficient to search, integrate, and utilize a wide variety of spatial information and provide spatial information in a machine-readable format. By providing this service, we aim to realize the safe and efficient operation of autonomous mobile robots such as drones, automatic delivery robots, and self-driving cars and create new value using spatial ID. Furthermore, by 2030, the Japanese government wants unmanned aerial vehicles (UAVs) and urban air mobility (UAMs) to fly in urban areas within Japan.



Each company collaborating on this endeavor brings a unique skill set to develop 3D spatial information infrastructure:

SSIL will design specifications and build the 3d spatial information infrastructure. Intelligent Style will create the database architecture and prototype the system infrastructure.

LocationMind will provide the dynamic data (people-flow analyses) to decrease flight risks in Zenrin's system and test the usefulness of its spoofing protection system.

Zenrin will develop a "flight risk management system" prototype, which will automatically make flight plans using its algorithms to maintain flight safety.

Swift Tactical Systems, alongside the rest of the Swift Group, will advise, fly and make flight routes of UAVs under the

guidelines of the "flight risk management system" developed by Zenrin to improve safe operations of UAVs under the 3D spatial information infrastructure. Swift will use its transitional Vertical Take Off and Landing UAV and other platforms to support flight operations.

"This project, with its goal of creating a 3D spatial information infrastructure, will establish safe flight paths for UAVs and UAM corridors in urban areas. We are proud to be a part of this project, driving the development of new infrastructure that will enable the safe and efficient operation of autonomous unmanned aerial vehicles and create new value using spatial ID. By leveraging the capabilities of our partners, we are confident in our ability to create a platform that will revolutionize how we fly in urban environments," says Alex Echeverria, President of Swift Tactical Systems.

"Data integration of autonomous mobility, including drones, which will connect the digital and virtual worlds, is essential in creating the next generation of services. We have high expectations for this project, as it will be a milestone in this direction," says Hiroshi Senzoku, Managing director at SSIL.



Q Can you brief us about your professional journey and how you founded Marvel Geospatial?

A I began my professional journey at Cyient (previously known as Infotech Enterprises) where I gained extensive experience in various aspects of geospatial technology over five years. My time at Cyient provided me with a deep understanding of both the industry and technology. After leaving Cyient, I worked for a smaller company where I learned valuable business skills. My passion for both creating employment opportunities and my interest in geospatial technology led me to start my own company, Marvel Geospatial Solutions, in February 2008. With my business background and passion for geospatial technology, I saw the potential to make a meaningful impact in the industry.

Q What are the difficulties that you have faced while managing at Marvel geospatial? How did you overcome them?

A One of the major difficulties I faced while establishing Marvel Geospatial was building the right team. Putting together a group of individuals who shared my vision, had complementary skills, and could work cohesively was a significant challenge. To overcome this, I

Drones World Special Editor Dr. Pranay Kumar in Conversation with **Raghu Boyapally, Founder & CEO** Marvel Geospatial Solutions

took my time to carefully recruit and hire the right people who shared my passion and could bring their own unique skills and experiences to the table. I also worked on developing a strong company culture that emphasized collaboration, open communication, and a shared commitment to our goals. Through these efforts, I was able to build a strong and successful team that has helped drive the growth and success of Marvel Geospatial.

After successfully assembling a dedicated and capable team, we set our sights on expanding our operations overseas. This presented a new set of challenges as we navigated unfamiliar business and cultural environments. However, we were able to overcome these obstacles by staying focused on our goals and mission, and by constantly seeking out new industry perspectives and insights. This allowed us to stay ahead of the curve and maintain our position as a leader in the geospatial technology industry. Through a combination of careful planning, diligent execution, and a commitment to continuous learning, we were able to successfully expand our operations and solidify our position as a key player in the industry.

Q What are the various products and services that Marvel Geospatial is currently offering? What are the sectors that you are serving?

A At Marvel Geospatial, we are dedicated to delivering cutting-edge geospatial solutions that support the development of projects and businesses.



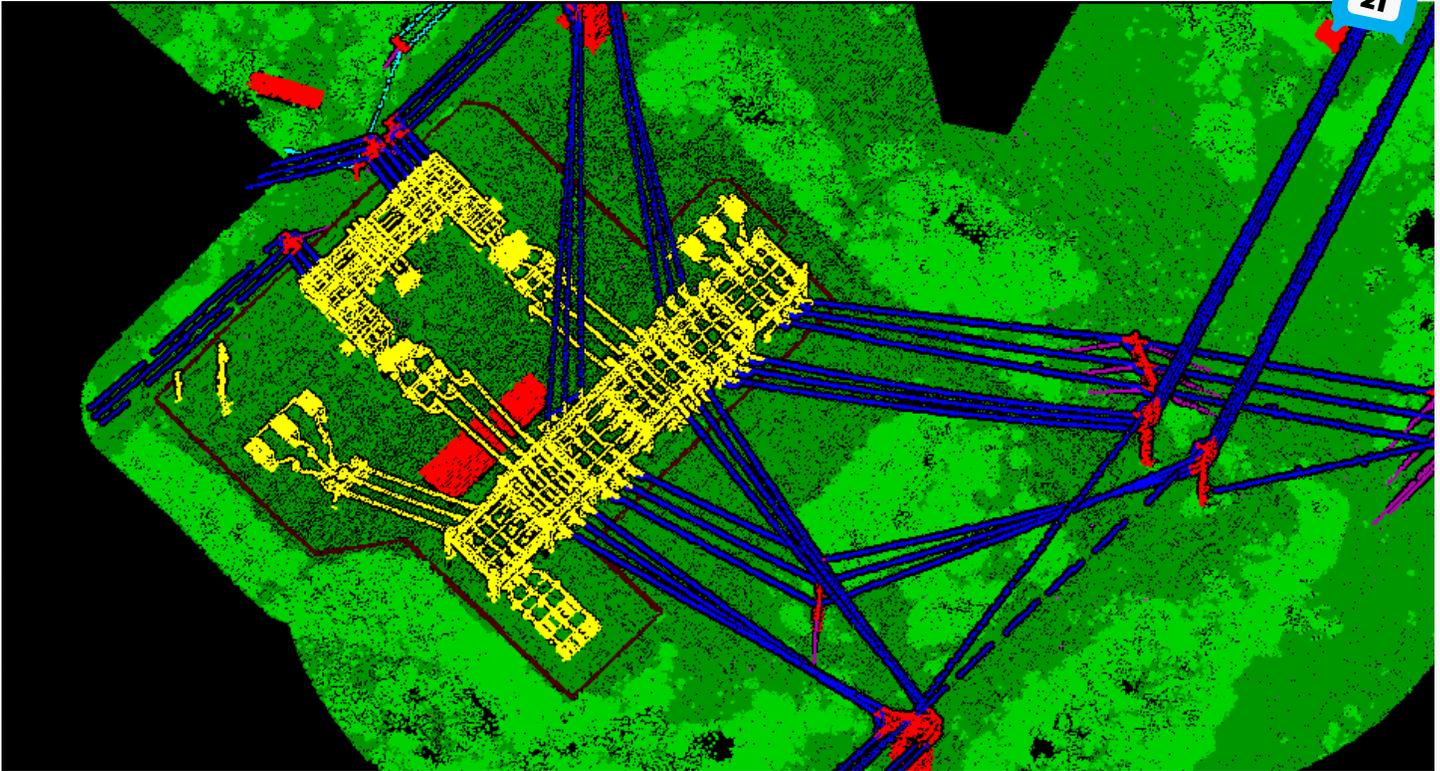
Our comprehensive suite of services includes expert surveying, GIS/CAD, photogrammetry, BIM, digital twins, LiDAR services as well as the latest in aerial and terrestrial LiDAR scanning technology and SAR satellite imagery solutions using Artificial Intelligence & Machine Learning.

As a registered drone manufacturer with the Indian government, we are at the forefront of innovation in the field, offering fully-developed, deployment-ready anti-drone systems that meet the needs of even the most sensitive installations and organizations. Our focus is on key sectors that are critical to national development, including smart cities, transportation infrastructure, mining, water resources, land information, utilities, renewable energy, forestry, and the environment. With a strong global presence, we serve clients in India, the Middle East, Europe, and North America through our offices in these regions. At Marvel Geospatial, we are committed to providing the best possible geospatial solutions to support

the growth and success of our clients.

Q How are the happening and emerging technologies like Drones and advancements in remote sensing helping scale up businesses?

A Geospatial data is proving to be an increasingly valuable tool for businesses looking to streamline their operations and improve their bottom line. Drones and advancements in remote sensing are helping to drive this growth, offering unparalleled access to fast, accurate, and reliable data that was once out of reach for many organizations. The rise of drones has disrupted the geospatial industry, breaking down barriers to entry and empowering businesses of all sizes to leverage the power of geospatial data. This is helping to scale up operations, improve planning and decision-making, and support the growth and development of businesses across the board. In addition, the government is playing a key role in supporting



the growth of the drone industry, offering a dedicated push that is helping to build and sustain the drone ecosystem. This presents a significant opportunity for drone manufacturers and service providers to grow their businesses and capitalize on the rising demand for high-quality geospatial data.

Q There has been a lot of competition lately in terms of surveying/mapping with the emergence of a lot of drone companies. Quoting for Tenders at lower prices – is it a boon or bane for the industry?

A The increasing competition in the drone industry and the resulting lower quotes for tenders is a double-edged sword. While it provides equal opportunities for companies, it can also lead to a focus on low pricing at the expense of quality. This can impact the overall perception of the technology and its capabilities.

To ensure the growth and sustainability of the industry, it is important that both pricing and quality are considered in the tendering process (QCBS Method). Companies with high-quality output and a focus on meeting the requirements of the project should be favoured over those who only offer lower quotes. The industry will naturally self-correct as demand for quality grows, and only companies with a commitment to producing high-quality work will survive.

Q How good and accurate are the drones when compared to traditional methods of surveying/mapping?

A Drones have revolutionized the way geospatial data is captured and managed. Compared to traditional methods like DGPS, drones provide more accurate and high-quality visual data in a much shorter period of time. The visual interface of data

and terrain that drones provide greatly enhances the accuracy and efficiency of the acquisition process, making it easier for businesses to implement the data.

Q What advice would you like to give the new generation entrepreneurs tied to the budding GIS companies?

A My advice is to always prioritize quality over quantity. Building a reputation for delivering exceptional work will be the key to your success in the long run. Never compromise on the quality of your products or services, and always strive for excellence. Your hard work, dedication, and commitment to delivering top-notch solutions will not go unnoticed, and you will see that opportunities for growth and success will come your way. So stay focused, stay driven, and always put quality first. That, I guarantee, will be the key to your success in this exciting and rapidly evolving industry.



SAIC Receives BIG Innovation Award for Counter Unmanned Aerial Systems



U.S. Army Taps Leonardo DRS to Provide Additional M-LIDS L Counter-UAS Platforms

Leonardo DRS, Inc. announced it was awarded a contract to provide additional counter unmanned aircraft system (C-UAS) platforms in support of U.S. Army's Integrated Fires/Rapid Capabilities Office's ongoing Mobile-Low, Slow, Small Unmanned Aircraft System Integrated Defeat System (M-LIDS) program.

On October 7, 2022, DRS received approximately \$40 million and on November 11, 2022, the company was awarded approximately \$20 million through a modification contract.

Under the existing indefinite delivery/indefinite quantity contract, this new task order requires DRS to deliver additional kinetic defeat vehicles and spares. M-LIDS allows soldiers to detect, identify, track, and defeat small UAS with electronic warfare and kinetic defeat systems. The M-LIDS system includes a mix of kinetic defeat effectors including the XM914 (30mm) cannon hosted by the Moog Inc's Reconfigurable Integrated-weapons Platform (RIwP[®]) turret.

In March 2022, M-LIDS Increment 2 was identified as a U.S. Army ACAT III program of record, and the U.S. Army leadership directed accelerated deliveries of multiple C-UAS capabilities, including M-LIDS. The two-vehicle capability provides a balance of kinetic and non-kinetic defeat capabilities which have already completed extensive government testing. Several sets of M-LIDS Increment 2 are currently deployed overseas protecting U.S. and allied forces.

The DRS Land Systems business unit serves as the lead systems integrator for this mobile C-UAS capability.

The DRS Land Systems business is part of the company's Integrated Mission Systems segment which provides force protection products and services including counter-unmanned aerial systems, short-range air defense systems, and active protection systems, across multiple platforms for the men and women of the U.S. armed forces.



"Leonardo DRS is proud to be a member of the M-LIDS team, and we appreciate the opportunity to deliver additional vehicles. Drones have become a dangerous threat to our warfighters," said Aaron Hankins, Senior Vice President and General Manager, DRS Land Systems. "Delivering M-LIDS vehicles remains one of our highest priorities, and we are excited about this new task order."



Science Applications International Corp has been named a 2023 Business Intelligence Group's (BIG) Innovation Award Winner for its Counter Unmanned Aerial Systems (CUAS) solution. The annual BIG Innovation Award recognizes organizations, products and people that bring new ideas to life in innovative ways. Organizations around the world submit their recent innovations, which are judged by a select group of business leaders and executives.

"SAIC developed a Counter UAS solution that is platform-agnostic to easily interface with our customer's systems and enable mission success around the world," said Bob Genter, president, Defense and Civilian Sector at SAIC. "The BIG Innovation award further solidifies our commitment to finding innovative solutions to solve our customers' critical needs especially when it comes to mitigating drone threats. SAIC integrates best-in-class CUAS capabilities and works with partners to globally deploy drone defense systems that protect warfighters, law enforcement personnel and civilians."

SAIC's CUAS was developed to safeguard against the threats drones pose to defense and civilian infrastructures using CUAS architectures comprised of sensors and effectors within scalable, platform-agnostic command and control capabilities. The system is capable of monitoring and protecting military bases, commercial flights, borders and more by performing drone detection, identification and mitigation. Using embedded artificial intelligence and machine learning, SAIC's CUAS supports a single operator in mission-execution decisions.

In April 2022, following a field test demonstration, the U.S. Army's Joint Counter-small Unmanned Aircraft Systems Office (JCO) named SAIC as the most robust and qualified of three companies recommended for Counter-UAS as a Service (CaaS).



Environment, Food and Rural Affairs shows that the UK's utilized agricultural area accounts for 71% of UK's land total, which puts larger pressure on the environment. To help farmers produce in a greener, energy-smart way, the government released the Sustainable Farming Incentives. Farmers will be paid up to £40/hectare for the effective improvement of soil health and for mitigating climate change during production.

Drones deliver clear environmental benefits in agriculture. Running on batteries, the electric XAG Agricultural Drone reduces diesel use and lowers greenhouse gas emissions. It is designed for precision, with RTK centimeter-level navigation, to decrease the amount of chemicals used. Also, aerial operations protect the soil from compaction. Typical applications for drones include plant protection spraying, fertilizer spreading, broadcast sowing, and greenhouse shading.

Traditionally, UK farmers use large tractors or self-propelled sprayers. In addition to high costs, the use of heavy ground machinery is limited by the rainy climate and mountainous terrain. The alternative solution is to apply the fully autonomous drone to reach and treat previously inaccessible land with no damage.

Since cooperating with Harper Adams University in research on precision agriculture in 2018, XAG has never stopped exploring the UK drone market. The grantee of Operational Authorization marks a significant change that agricultural drone officially set foot in the country.

XAG Agricultural Drone is granted the CAA Operational Authorization to Spray in the UK

XAG Agricultural Drones, P40 and V40, have been granted the UK's first-ever Operational Authorization from the Civil Aviation Authority (CAA) for agricultural spraying operations. With the efforts of XAG's partner, AutoSpray Systems, drone spraying and spreading on farms become legal in the UK, which means that agriculture is about to embrace automation and AI for the net-zero goal.

Drone technology has been developed and widely used in various industries, where agriculture is one of the most promising. In the UK, the applications of drone are strictly regulated by the CAA. Drone's takeoff weight was limited to under 25kg, and dropping materials from drones is also prohibited. Although farmers have a growing demand for intelligent production tools, agricultural drones did not

ground on UK farmland.

Change comes with the release of the UK Government's ambition statement and vision for commercial drones, after which CAA started to consider granting Operational Authorization to heavier spray drones. XAG's autonomous drones for agriculture can spray and spread precisely straight to the target. They not only conform to the operational safety standards, but also help farmers boost yields with less input.

According to PwC's forecast for the future of commercial drones in the UK, by 2030, the country will have 900,000 drones in operation, which would create 650,000 new jobs, contribute £45 billion to the UK economy, save £22 billion in business and reduce carbon emissions by 2.4 million tons. The widespread use of commercial drones will benefit the UK rural economy and reduce environmental footprints.

Vertical Aerospace Progresses Launch Plans in Japan with Asia's First eVTOL Delivery Slot Reservation Fee From Marubeni Corporation



Vertical Aerospace (Vertical) a global aerospace and technology company that is pioneering zero-emissions aviation announces that it has secured a pre-delivery payment for the reservation of aircraft delivery slots from its existing customer, the leading Japanese trading and investment conglomerate, Marubeni Corporation [Marubeni].

Following the joint working group partnership with Vertical, Marubeni has reserved aircraft delivery slots for 25 out of its up to 200 VX4 conditional pre-orders and becomes Vertical's first customer in Asia to make a pre-delivery payment.

Marubeni's commitment further reinforces Japan's potential as a key launch market for Advanced Air Mobility [AAM] and over recent months, Marubeni has also conducted proof-of-concept (POC) demonstration trials in preparation for the Osaka World Expo 2025. Marubeni conducted flights from Osaka heliport to Wakayama using existing helicopters at future expected AAM service prices. Throughout the trials, Marubeni began addressing public awareness, acceptance, and requirements for future eVTOL services in the prefecture.

Vertical and Marubeni previously announced a partnership in September 2021 for conditional pre-order options of up to 200 aircraft, and joint evaluation of the requirements for eVTOL aircraft operations in Japan, as well as commercial considerations such as route and network planning and infrastructure requirements.

Stephen Fitzpatrick, Vertical Founder and CEO, said "We are delighted to have reached the next milestone in our partnership with Marubeni. Japan is a wonderful country which is embracing the promise of eVTOL, as it will connect cities and regions like never before. We look forward to our joint efforts to build the ecosystem for zero-emissions travel in Japan."

Satoshi Takechi, General Manager, Aviation, Space & Defense Dept. said "We are proud to have taken another major step with Vertical Aerospace to introduce VX4 in Japan. I am confident that our continued joint efforts with Vertical Aerospace, such as evaluating the requirements for eVTOL operations and engaging the potential partners under the Joint Working Group, together with this new agreement, will accelerate the development of the AAM market in Japan. Marubeni will further enhance activities to materialize our business, which aims to make air travel more accessible and convenient, while simultaneously contributing to climate change mitigation measures, including low-carbon and decarbonization initiatives."

Lobo Leasing and Air Taurus enter into LOI to lease five Pipistrel NUUVA V300 Unmanned aircraft



Lobo Leasing and Air Taurus Limited, the Irish Group affiliate of humanitarian logistics specialist AYR Logistics Limited (AYR), have entered into a letter of intent to lease five Pipistrel Nuuva V300 hVTOL unmanned cargo aircraft. The companies will cooperate in developing a leasing model for the new asset class.

Lobo Leasing entered an LOI with Pipistrel for 15 Nuuva V300 aircraft earlier this year. These are the first five of these 15 aircraft to be committed to a lease customer. The LOI is aligned with the Nuuva V300 development program and targets delivery of the first units to Air Taurus between 2025 and 2026. The transaction, therefore, brings together a lessor order position for a new technology hVTOL aircraft with a lease to a customer. It is a clear demonstration of the anticipated market demand for operating lease solutions for advanced new-technology aircraft and the enthusiasm from investors for participating in the market through an experienced lease manager.

Air Taurus will deploy the Nuuva V300 aircraft in AYR's global humanitarian operations. The aircraft will represent a revolution in the ability to move critically needed cargo (including food and medical supplies) across areas with limited or degraded ground infrastructure. The Nuuva V300 is being designed as a sustainably powered cargo solution using a hybrid propulsion system including electric motors for vertical lift and a fuel efficient FADEC IC power plant for cruise flight. The NUUVA V300, currently under development, is planned to have a cruise speed of approximately 120 knots with a cargo capacity of up to 300kg and maximum range of 300km with reserves.

Gustavo Semeraro, Senior Vice President, Business Development at Lobo Leasing, said: "We are proud to continue at the forefront of this fast-developing market by bringing a pioneering partnership to develop a financial solution to support AYR's crucial humanitarian work. AYR is a respected and experienced operator, and we greatly appreciate the opportunity to work with them on finalising this letter of intent. The V300 has the potential to transform the humanitarian aviation sector by bringing an entirely new approach to the delivery of long-standing operational requirements".

Stephen Lyons, Chief Development Officer at AYR, said: "This marks an important step forward in our plans to introduce unmanned aircraft to the humanitarian sector. We are grateful to Lobo Leasing for their support and the shared vision we have for the humanitarian application of unmanned aircraft."

LCI Signs Agreement with Elroy Air for a Committed Order of Up to 40 Chaparral VTOL Aircraft

LCI a leading aviation company and a subsidiary of Libra Group, has signed an agreement with Elroy Air, developer of advanced autonomous cargo aircraft systems, to acquire up to 40 of the company's Chaparral vertical take-off and landing (VTOL) aircraft. LCI's investment in Elroy Air's system underpins the Company's long-term commitment to sustainable growth and innovation. Under the terms of the deposit-backed agreement, LCI will initially acquire 20 aircraft with an option for a total of up to 40 units. The VTOL aircraft are currently under development at Elroy Air's facility in South San Francisco, California.

The Chaparral is the first end-to-end autonomous VTOL cargo delivery system. It is designed for aerial transport of up to 500 lbs (225 kgs) of goods over a 300 nautical mile range. This is enabled initially by a turbine-based hybrid-electric powertrain with distributed electrical propulsion, and specially designed aerodynamic modular cargo pods.

Its applications include safe, efficient and cost-effective aerial cargo transport for commercial logistics, disaster relief, firefighting and humanitarian operations without risk to pilots or the need for airport infrastructure.

Jaspal Jandu, CEO of LCI, says: "This commitment for the pioneering Chaparral system will enable us to efficiently support mission critical, remote logistical work and socially responsible humanitarian efforts around the world. It will do so in complement with the wide-ranging capabilities of our existing aviation fleet."

"We have been impressed with Elroy Air's vision and approach and look forward to working closely with the team on a wide range of opportunities. This forms part of our wider advanced air mobility strategy and will strengthen LCI's position as a leading provider of



leasing, financing and investing solutions for this new and exciting market."

David Merrill, CEO and Co-Founder of Elroy Air, says: "We're experiencing an enthusiastic response to the Chaparral and its capabilities to serve as a key part of a safe, efficient, and capable fleet of aircraft to respond in emergency situations, protect pilots, and enable rapid logistics in a new and sustainable way.

The new VTOL aircraft will complement LCI's existing fleet of modern helicopters and fixed wing aircraft. In addition, LCI and its parent company, Libra Group, whose subsidiaries own and operate assets in approximately 60 countries, plan to share commercial, financial and end-user expertise with

Elroy Air through well-established industry networks.

George Logothetis, Executive Chairman of Libra Group, stated, "We are proud of LCI's partnership with Elroy Air, which further accelerates the Chaparral's entry into the global market. Bridging the present with the future requires novel partnerships such as these where established industry leaders join with innovators to make paradigm-shifting technologies a reality.

"Our Group is committed to leveraging our global platform to catalyse the uptake of sustainable innovations across our six sectors, and we look forward to sharing many future-focused partnerships to come."

“Through our agreement with LCI, the Chaparral will be available for financing – enabling much broader access to the aircraft. We are proud that the Chaparral will now be part of LCI's aviation fleet and look forward to providing aerial cargo transport globally.”



Drones World Special Editor
Dr. Pranay Kumar
in conversation with

MR. RAJESH KUMAR
JOINT ADVISOR (GIS)

National Highways Authority of India
(Ministry of Road Transport and
Highways, Govt. of India)





Q Before we start our conversation what, is your opinion on the recent National Geospatial Policy 2022? What are the new opportunities will be open for drone and GIS industry? How this policy will help NHAi to implement GIS and Drone project in better way.

A It is a citizen-centric policy based on Geo-Spatial technology, which seeks to strengthen the Geospatial sector to support national development, economic prosperity and a thriving information economy.

This will provide a roadmap for sustainable development. NHAi has already started the transformation of non-spatial road data into digital GIS data. In future, you will be observed lots of work progress in GIS domain.

Q Can you brief your experience on NHAi datalake portal?

A NHAi Datalake portal has vision to transform conventional work into digital transaction based system. It has user-based logins for internal and external both stakeholders. Datalake has three stages i.e.

Pre-Construction, Construction and O&M. The portal is in its initial stage of development. Pre construction stage is almost completed. It's a robust system to control and monitor the NHAi work.

Q What are the challenges you have faced while implementing GIS & drone technology at national level? Can you brief us on the advantages of using GIS, IoT, AI & ML and drone technology compared to old methods?

A GIS implementation at National level

has lots of issues like Data Availability, Authenticity of Data. Data sharing issues are more common in G2G. Different agencies/authorities have their data in silos. A unified GIS dashboard are required for each agency. PM Gati Shakti initiative are one of the milestones in way of GIS data implementation at National level. We can use AI and ML emerging technologies in GIS data analysis. We can identified road defects through drone Video analysis and so on.

Q What are the other use cases of GIS & Drones can be implemented by NHAI in near future?

A NHAI has obtained drone data every month for construction projects and in every six months in O&M Projects. In near future, NHAI going to do lots of analysis with these drone videos using AI/ML/ GIS technology. For example, we can monitor construction progress, identified road defects, pay attention on road safety measures. Track plantation requirement along NH. Monitoring of encroachment activities and etc.

Q What kind of support do start-up and newly established drone companies will get exemptions from NHAI?

A NHAI has given many chances to new Startups to work with them. IT Division of NHAI offers some small and mid-size POCs to new startups. Recently, NHAI has given a chance to do a POC on drone videos analysis to some startup agency.

Q At present or in near future do you have any specific requirement of GIS, IT, AI-ML & drones for NHAI?

A Yes, we are looking some startup agency to do some work progress analysis using satellite image or ortho photos.

Q What are the other Technologies used in meeting safety, health and environment requirements for projects specific to India?

A We are focusing on BIM implementation in NH projects in order to reduce re work in construction activity. We are also planning to implement some project monitoring system.

Q Finally, what is your perception about Indian GIS & Drone industry & what are the pain points to be answered by 2030 to make India as real drone hub?

A There are lots of opportunities IN Indian GIS and Drone Industry. This is the time when Govt. Actually, think about these emerging technologies. PM Gati Shakti is entirely GIS based initiative by Govt. Of India.

Q Any advice or suggestion that you want to highlights on current DGCA drone policy with respect to NHAI ongoing drone projects?

A Most of the Drone agency or owners have less knowledge of this technology. They are just running

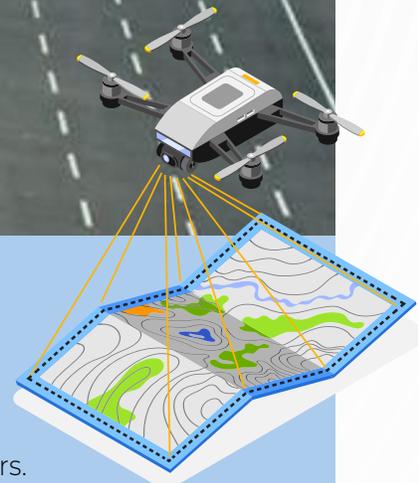


the business with low quality cameras. It would be great if good if drones have quality spatial resolution data. If some advance drone technology owned by drone agencies, it will certainly add more values.



Q Anything else you would like to comment on the GIS & drone sector potential and growth in the country?

A India has lots of potential for the GIS and Drone industry. In comparison with developed countries, we are just beginners in GIS. Govt. Agencies are far behind as far as GIS technology implementation is concerned. Every aspect that exist on earth surface can be mapped with GIS technology. All the best for GIS lovers.

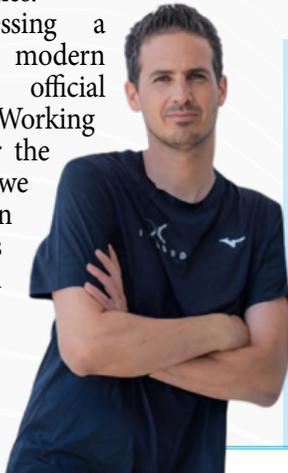


XTEND awarded an exclusive multi-year, \$20M contract to develop and supply multi-drone operating system

XTEND – the developer of XOS, a human-guided autonomous operating system that is revolutionizing (human to machine) interaction, has been awarded a \$20M contract by Israel Ministry of Defense, for the development and supply of a first-of-its-kind multi-drone operating system.

The new joint project with MAFAT and the Israeli Ministry of Directorate of Defense Research & Development, will see XOS enable the remote, safe, and intuitive operation of dozens of human-guided semi-autonomous drones simultaneously, utilizing the latest virtual reality, edge processing and AI technology. XOS will allow XTEND's drones to be deployed remotely by military units in various scenarios precisely, intuitively, and immersively. The unique and groundbreaking joint initiative, which embodies the IDF and XTEND's shared vision of enabling drones to become more than just another "eye in the sky", enable operators to control, interact, and run 3rd party applications on the drones remotely, keeping forces out of danger, while fusing an operator's expertise with machine autonomy, VR and AI. The deal is based on performance and deliverable milestones.

"We're witnessing a revolution on the modern battlefield," says official source, at the IDF. "Working with XTEND over the last three years, we have already been able to field systems that are now in daily use, and we are confident that this new program will provide a



tremendous leap in our operational capabilities. Putting the best of civilian technology into the hands of our soldiers. One of the greatest challenges for a program office working with cutting-edge technologies is to find the right industry partners. Along with very few other vendors, we see XTEND as such partner."

XTEND's new contract with Israel's Ministry of Defense is the latest in over 20 major contracts secured by the company in the last three years, including a multi-million-dollar contract with the U.S. Department of Defense, which will see XTEND's technology enabling US military drone operators to interactively operate multiple smart machines from a remote, safe distance,

with minimal training.

XOS is easily programmable and configurable to suit different needs outside defense, as Aviv Shapira, co-founder, and CEO at XTEND, explains: "Scalable, affordable, and infinitely flexible, XOS's unique operating system allows humans to connect and interact with drones, robots, vehicles, smart devices, and smart machines remotely, safely, and intuitively. Letting almost anyone to control multiple remote machines simultaneously - using advanced VR technology, on top of an AI layer. Alongside defense, XOS is providing a new way for public safety, inspection and homeland security professionals to interact with machines virtually in various civilian scenarios."

“We are very honored and excited to have been chosen once again by MAFAT, and to collaborate with them on this game-changing project,” says Ido Bar-On, VP BD & Sales, XTEND. “Our continued partnership reflects the trust of the Israeli Ministry of Defense has in our company’s team and technology. XTEND’s deep collaboration with MAFAT in recent years has already been operationally proven time and again, reducing the risk to operators and providing them with best of breed technology to give them an operational edge. XTEND and the Ministry of Defense are working to secure the cooperation of other ally countries in this development program.”



DriX Unmanned Surface Vehicle Takes Part in Digital Horizon 22 Military Exercise

Exail, formerly iXblue, recently took part in the Digital Horizon Unmanned & Artificial Intelligence Exercise in Bahrain, organized by the US Navy. The U.S. Navy's 5th Fleet held the three-week exercise in December to test new unmanned technologies, as part of its plans to establish the world's first Unmanned Surface Vehicle (USV) fleet of one hundred drones in the Gulf by the end of the summer.

The current geopolitical situation means that manned assets are in increasing demand elsewhere, leading the Navy to look to the latest unmanned technologies to expand its capabilities. Vice Adm. Brad Cooper, commander of U.S. Naval Forces Central Command, U.S. 5th Fleet and Combined Maritime Forces, set up Task Force 59 last year to speed new tech integration across the 5th Fleet, and seek alternative, cost-effective solutions for conducting Maritime Domain Awareness (MDA) missions. Maritime Domain Awareness can be defined as the effective understanding of military and non-military events in the maritime environment that could impact the security, safety, economy, or environment of a nation or a region.

Exail's DriX USV was among the fifteen USVs and Unmanned Aerial Vehicles (UAVs) selected to participate in the exercise, which staged a Maritime Domain Awareness (MDA) mission. The USVs and UAVs were tasked with gathering data on the surface in order to detect and identify potential threats. One of the main requirements was for the drones to communicate with each other using a common OPS system. The complementarity aspect of the different drones was also important, as the 5th Fleet aims to leverage the different capacities of each drone to cover a wide array of competencies in order to produce a Common Operating Picture of what is occurring in a specific zone of water.

With its highly hydrodynamic monohull and drop keel, DriX showed high reliability with excellent seakeeping and speed results, accomplishing its mission of gathering data on the surface and proving its capacity to successfully integrate third party radar and cameras. The ability of DriX to integrate within a military communications network was successfully proven, thanks to its wide range of communication means (including Certus, 4G, Wifi and Silvus). The USV further meets requirements in terms of communications redundancy, crucial for minimizing risk during military operations, and is fitted with an advanced collision avoidance system that ensures robust and safe autonomous navigation at sea.

“We’re very happy about the feedback from the TF59 on DriX’s performance. We’d like to thank the US Navy 5th Fleet for their support throughout the exercise and in particular Capt. Michael Brasseur and his staff. For the first time DriX integrated a multiple-unmanned collaborative military organization, alongside some of the industry’s best. It was a real success and we are proud to have collaborated in this group effort, which showed what unmanned technologies can bring to MDA.”

Guillaume Eudeline, Exail’s Naval Autonomy Market Director



NGC Partners with NASA to Shape Future Integration of Uncrewed Autonomous Systems in National Airspace



Northrop Grumman Corporation is collaborating with NASA to develop and test solutions for integrating large, uncrewed aircraft systems into the National Airspace System (NAS). The effort will focus on air cargo operations and is part of NASA’s Air Traffic Management-eXploration (ATM-X) Pathfinding for Airspace with Autonomous Vehicles (PAAV) subproject.

“Partnering with NASA, we will detail requirements and solutions to make it possible for autonomous aircraft, in this case being air cargo, to be integrated seamlessly and safely into national airspace,” said Tom Jones, corporate vice president and president, Northrop Grumman Aeronautics Systems. “Our work together will improve airspace access and transform how uncrewed systems are used to transport goods across U.S. airspace and help establish airspace integration critical to future manned unmanned teaming efforts.”

Under this partnership, Northrop Grumman and NASA will develop and test solutions for integrating large Unmanned Aircraft Systems into the national airspace system, with an emphasis on air cargo operations. To support this long-term goal, they will exchange data and information to define technologies and procedures for remotely piloted systems. This work will include coordination with the FAA, flight readiness reviews and development of a test plan for simulations and flight demonstrations.

Northrop Grumman is a long-standing leader in the development and operations of advanced autonomous systems and future autonomous air capabilities. From rudimentary radio-controlled aircraft to today’s software intensive systems, the company’s aircraft, such as the Global Hawk, are already operating in collaborative environments with crewed aircraft. With technical expertise in military aviation and autonomy, Northrop Grumman developed the first distributed autonomous framework that allows military commanders to control numerous uncrewed aircraft simultaneously.



GA-ASI Flies Multiple Missions Using Artificially Intelligent Pilots

General Atomics Aeronautical Systems, Inc. (GA-ASI) further advanced its Collaborative Combat Aircraft (CCA) ecosystem by flying three unique missions with artificially intelligent (AI) pilots on an operationally relevant Open Mission System (OMS) software stack. A company-owned Avenger® Unmanned Aircraft System (UAS) was paired with “digital twin” aircraft to autonomously conduct Live, Virtual, and Constructive (LVC) multi-objective collaborative combat missions. The flights, which took place on Dec. 14, 2022, from GA-ASI’s Desert Horizons flight operations facility in El Mirage, Calif., demonstrate the company’s commitment to maturing its CCA ecosystem for Autonomous Collaborative Platform (ACP) UAS using Artificial Intelligence (AI) and Machine Learning (ML). This provides a new and innovative tool for next-generation military platforms to make decisions under dynamic and uncertain real-world conditions.

The flight used GA-ASI’s novel Reinforcement Learning (RL) architecture built using agile software development methodology and industry-standard tools such as Docker and Kubernetes to develop and validate three deep learning RL algorithms in an operationally relevant environment. RL agents demonstrated single, multi, and hierarchical agent behaviors. The single agent RL model successfully navigated the live plane while

dynamically avoiding threats to accomplish its mission. Multi-agent RL models flew a live and virtual Avenger to collaboratively chase a target while avoiding threats. The hierarchical RL agent used sensor information to select courses of action based on its understanding of the world state. This demonstrated the AI pilot’s ability to successfully process and act on live real-time information independently of a human operator to make mission-critical decisions at the speed of relevance.

For the missions, real-time updates were made to flight paths based on fused sensor tracks provided by virtual Advanced Framework for Simulation, Integration, and Modeling (AFSIM) models, and RL agent missions were dynamically selected by operators while the plane was airborne, demonstrating live, effective human-machine teaming for autonomy. This live operational data describing AI pilot performance will be fed into GA-ASI’s rapid retraining process for analysis and used to refine future agent

performance. The team used a government-furnished Collaborative Operations in Denied Environment (CODE) autonomy engine and the government-standard OMS messaging protocol to enable communication between the RL agents and the LVC system. Utilizing government standards such as OMS will make rapid integration of autonomy for CCAs possible.

In addition, GA-ASI used a General Dynamics Mission Systems’ EMC2 to run the autonomy architecture. EMC2 is an open architecture Multi-Function Processor with multi-level security infrastructure that is used to host the autonomy architecture, demonstrating the ability to bring high-performance computing resources to CCAs to perform quickly tailorable mission sets depending on the operational environment.

This is another in an ongoing series of autonomous flights performed using internal research and development funding to prove out important AI/ML concepts for UAS.

“The concepts demonstrated by these flights set the standard for operationally relevant mission systems capabilities on CCA platforms,” said GA-ASI Senior Director of Advanced Programs Michael Atwood. “The combination of airborne high-performance computing, sensor fusion, human-machine teaming, and AI pilots making decisions at the speed of relevance shows how quickly GA-ASI’s capabilities are maturing as we move to operationalize autonomy for CCAs.”

Elbit Systems UK to Deliver Magni-X UAS for British Army

Elbit Systems UK has been awarded a contract to provide Magni-X micro-Uncrewed Aerial Systems (micro-UAS) to the UK Ministry of Defence (MOD). The contract has been awarded by Defence Equipment & Support’s Future Capability Group as part of the British Army’s Human Machine Teaming framework, and the proven micro-UAS will be delivered to specialist army units for service by mid-2023.

Magni-X is a proven military-grade Vertical Take-Off and Landing (VTOL) micro-UAS from a family of quadcopter platforms already in service with armed forces across the globe. As part of the contract, Elbit Systems

UK will deliver the service-ready Magni-X systems to the British Army with a contracted option to deliver many further systems. The Magni-X that will be delivered will carry a variety of payloads, including Electro-Optical and Infrared gimbaled cameras, giving the users extensive long-range reconnaissance capabilities.

The Magni-X is a 2kg, packable and easily portable mUAS system, which is capable of autonomous flight and can be integrated with Elbit’s Legion-X System to give it swarming capabilities, acting as a force multiplier for soldiers on the ground.

Featuring a low radar and acoustic

signature, Magni-X is a proven and in-service backpack-portable micro-UAS designed to enhance Short Range Reconnaissance and support combat and intelligence operations for up to 60 minutes at a time.

“This contract represents another milestone in Elbit Systems UK’s delivery of advanced UAS systems to the UK Armed Forces. The unique capabilities of these systems demonstrates our commitment to being at the forefront of technological advances to support the integration of Robotics and Autonomous Systems to enhance the British Army’s capabilities.” Martin Fausset, CEO of Elbit Systems UK.



U.S. Army Funds Advancement in Perception Sensing for Autonomous Ground Systems

Metawave Corporation, a leading provider of advanced radar sensing and perception technologies, today announced that it has been awarded a \$1.7M Small Business Innovation Research (SBIR) contract by the U.S. Army. Pursuant to the contract, Metawave will enhance its defense application-proven Carson™ radar technology platform to support off-road perception sensing and other advancements for autonomous ground vehicles and systems. The resulting Hudson™ technology platform utilizes Metawave’s unique long-range and all-weather detection, tracking, and perception capabilities enabled by its patented phased array beam forming and steering front-end Marconi™ chips, highly integrated Antenna-in-Package (AiP) modules, and proven high-resolution and accurate radar algorithms. The new Hudson radar platform will also incorporate enhanced processing units (GPUs) from NVIDIA, the world leader in artificial intelligence (AI) computing. The contract also includes an option for a Phase III follow-on contract, which would allow for the further development and deployment of the solution.

Software – A Critical Component : In addition to the Hudson radar platform, Metawave will also develop Anthem™ — a proprietary Recursive Neural Network Machine Learning (ML) software platform comprising lidar, camera, and fusion stacks to support advanced sensing and perception radar platforms. Integral to the Hudson platform, Anthem will expand the capabilities of Aware (the industry standard collaboration intelligence platform that identifies and reduces risk, strengthens security and compliance) to include wider sets of classification libraries and Regions of Interest (RoI) identification. Anthem is trainable over time to support various off-road terrain operations and new scenarios such as the need to differentiate between real and negative obstacles, dense and thin shrubs, trees, rocks etc., allowing vehicles to operate more safely in unknown environments.

“Autonomous defense applications require the highest level of precision enabled by Metawave’s unique chips, modules, and radar algorithms which have proven to be a valuable asset in the automotive industry,” said Dr. Stephen Aubin, defense industry expert and member of Metawave’s board of directors. “This is a great opportunity for Metawave to take radar technologies to the next level with the Hudson and Anthem solution which could easily support other Department of Defense requirements such as aerial and marine autonomous operations.”

“

We are thrilled to have been selected by the U.S. Army for this important contract,” said Dr. Maha Achour, founder and CEO at Metawave. “The power of phased array radar is well-known to the defense sector, but rapid innovation and advancements in millimeter, semiconductor-enabled radar solutions for safe, driverless automotive technologies have become increasingly attractive for mission-critical military operations.

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L3Harris Receives VAMPIRE Contract for Ukrainian Security Defense Efforts



L3Harris Technologies announced receiving a \$40 million Department of Defense contract to deliver 14 Vehicle Agnostic Modular Palletized ISR Rocket Equipment - or VAMPIRE™ multi-purpose weapons system - to strengthen Ukrainian security defense efforts.

The portable VAMPIRE kit will allow Ukraine ground forces to target and shoot down enemy drones and defend against adversary ground threats. The systems ordered by DoD are tailored to provide critical defense assets to help Ukraine protect against attacks on civilian infrastructure.

“We’ve invested in procurement, testing and certification since August so VAMPIRE production can begin without delay,” said Luke Savoie, President, Intelligence, Surveillance and Reconnaissance, L3Harris. “We’re committed to supporting a U.S. strategic partner with a robust capability, as the people of Ukraine continue to defend their country and protect their independence.”

Under the DoD contract, L3Harris will install VAMPIRE kits on U.S. government-provided vehicles for agile combat support to the Ukrainian battlefield. The contract calls for L3Harris to deliver 14 VAMPIRE systems to DoD, with four delivered by mid-2023 and ten more delivered by the end of 2023.

The VAMPIRE prototype, submitted to DoD in April, was selected in August as part of DoD’s \$3 billion security assistance package under the Ukraine Security Assistance Initiative. The company began field testing in 2021 and continued range and durability tests in summer 2022.

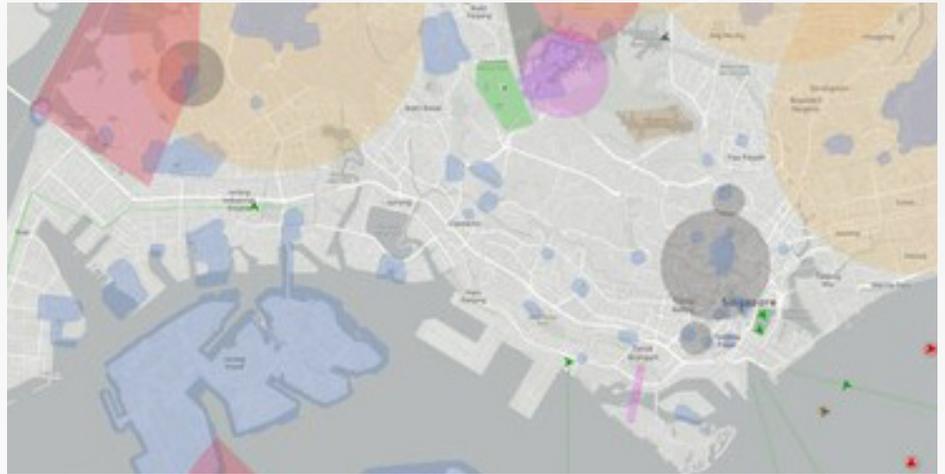
The VAMPIRE’s mission management system integrates an advanced WESCAM MX-10 RSTA targeting sensor with its weapons station, allowing an operator to quickly and accurately engage targets. The low-cost, highly accurate Advanced Precision Kill Weapons System rocket, selected specifically for use in Ukraine, provides increased lethality for engaging small or soft targets when combined with L3Harris’ proximity fuze.

Singapore's Heron Technology targets extension of Unmanned Traffic Management services in the region with incorporation of Heron AirBridge

Singapore-based digital aviation and cybersecurity solutions provider, Heron Technology announces the incorporation of Heron AirBridge - the company's standalone Advanced Air Mobility (AAM) and drones technology business.

The formation of Heron AirBridge reflects the company's steady progress in the development and testing of its proprietary Unmanned Traffic Management (UTM) solution, AirBridge, in real-world conditions. The newly formed entity will serve an essential role in enabling the fast-moving AAM industry by developing and providing customised digital platforms on which the industry's hardware will operate. Through the multi-year course of the AirBridge platform's development, the company has worked closely with AAM industry partners, regulatory bodies, and Air Navigation Service Providers (ANSP) across the region to design a secure, reliable and tailored solution that will form the bedrock of the AAM industry.

Mr Ryan LEE, Co-Founder & Chief Executive Officer of Heron AirBridge said, "The aviation industry experienced a slowdown amidst Covid-19 pressures, but talks surrounding the AAM industry remained - owing to the promised potential of AAM to positively impact our current mobility processes and standards. As we approach a revival of the aviation industry in 2023 with impending introduction of unmanned aircraft regulations in the near future, AAM stakeholders need reliable, secure and rigorously tested technology solutions that will enable their aircraft, vertiport infrastructure, and fleet and customer



management systems to be realized.

We are proud to have indigenously developed Singapore's first UTM system to cater to the region's unique requirements. Given the enormous potential of AAM to address the growing challenges of population growth, urbanisation and sustainable development in the region,

there is a critical need for a digital platform that can support the introduction of more unmanned aerial operations here. We must move ahead in tandem with continued collaboration between stakeholders to develop the systems required. My partners

and I firmly believe this is the

perfect time to

establish Heron

AirBridge to

provide dedicated

focus to ensuring the

necessary software

solutions are in place to

enable this next exciting

phase of the industry."



Dedrone Acquires Aerial Armor to Accelerate Airspace Security Leadership



Dedrone, the market leader in smart airspace security announced its acquisition of Aerial Armor, a leader in counterdrone systems and integrator of drone detection hardware. The acquisition will enable Dedrone to deliver the best-in-class technology platform to meet airspace security needs of the future as demand for counterdrone protections continues to increase in the US and around the world. As part of the acquisition, Dedrone will honor all Aerial Armor customer contracts and retain all employees, including CEO Russ Haugan and CTO Matt Altman. Customers of each company will continue with no changes to their solutions in the near term. Over time, Dedrone will leverage the best elements of both companies' solutions, paving the way for customers to easily implement a multi-sensor fusion, cUAS (counter Uncrewed Aerial Systems) command and control (C2) platform into their security infrastructure.

Devarakonda continued, "I am

thrilled to have Russ, Matt and the entire Aerial Armor team join Dedrone. We are constantly looking for the finest talent in the market and Aerial Armor provides one of the best groups of individuals with a deep understanding of the cUAS space. I have a lot of respect for the business they have built and am looking forward to building the best-of-breed solution for our customers."

The move is the latest in a series of developments following Dedrone's growth in recent months, including a rapid increase in global demand for detection, tracking, identification, and mitigation technology to protect airspace. Its platform and products, including DedronePortable, are in use by governments around the world.

The ever-increasing threats to airspace make it clear that the world needs a strong counterdrone C2 platform — point solutions will no longer be enough. Dedrone offers a like-minded team in its approach to the future of airspace security, which is why this acquisition is an important one for our 100+ customers and team to continue to deliver the best possible solution for airspace security against the persistent and escalating threat of drones," added Russ Haugan, CEO of Aerial Armor. "Together, our strengths will continue to provide best-in-class service to the venues, airports, federal entities and law enforcement agencies that rely on us for truly secure airspace no matter the perimeter size."

“We have created a fantastic rapport with the team at Aerial Armor and are greatly impressed with their technology, expertise and the strong customer relationships they've built. As we come together under the Dedrone umbrella, we're confident we will continue to find great synergies in our respective platforms and bring new innovations to market for our customers,” said Aaditya Devarakonda, CEO of Dedrone. “All of our customers around the world will reap the benefits of our more powerful C2 cUAS system, powered by inputs from a multitude of sensors including radio frequency (RF), radars and cameras in a single UI.”



Hostile Drones – The perspective of the emerging threat

Special editor Dr Pranay in conversation with Mr Pawan Kakkar and Maj Gen MPS Baweja (Retired), to discuss the mitigation aspect of this emerging threat, here are a few excerpts.



Q Now that we see several incidents across the world, what are the security measures to counter the attacks using drones?

A There are not many options to the common people when it comes to counter the threats from an intruding drone, your first instinct might be to hurl stones on it, we did see videos of frying pans being hurled over by disenchanting women, if there is a security agency around a several instances of neutralisation have been reported using the barrage of gunfire, sometimes foreign agencies have resorted using projectiles and even missiles, if the urge to shoo these mechanical birds is quite urgent. We have also heard some agencies training Birds of prey to attack the drones and sometimes, it works.

Q On a serious note, it is becoming imperative that the counter drone solutions are necessary, please explain what are the options for the security

agencies?

A On the serious note, the Jammer have, so far been doing a good job, if you can snap the communication link between the pilot and the drone or deny the GPS or GNSS for the navigation, the battle is nearly half won.

Q Why do you say, the battle is half Won?

A Since the time the breed of Self Navigating drones has entered the scene, the whole paradigm of the Anti Drone solutions has shifted, we need additional measures to counter the threats when the adversary can fly the drones using optical guidance, or with the those which can navigate hugging the terrain with help Lidar the job of the CUAS operator becomes yet tougher, the jammers might not work, but the GPS Jamming will still be effective.

Q So if jamming works, why bother with anything else?

A In theory, when you can use a jammer and or resort to GNSS denial attacks, the drone traffic can be prevented from entering the protected zone, right? But no, the usage of Jammers to block the ISM

band frequencies and or the GNSS bands is not a preferred strategy in the civilian Airspaces. The jammers cannot be used as often, unless there is a real crisis. There are several radars, RF Equipment in use by civilians and aviation authorities that can get affected by indiscriminate jamming. The collateral damage risks of peripheral equipment going haywire does exist. The use of jammers in the theatre of war is a different ball game, but imagine the impact on the communication links when several RF hotspots start radiating humongous amount of RF energy into the airspace with a single sighting of a drone. The commercially available drones operate on the same frequency bands on which you have WiFi and other devices.

Q You said that GPS Jamming is illegal, why so?

A There are thousands of devices in the civilian and military use that GNSS constellations like GPS (US), GLONASS (Russia), Galileo (EU), BeiDou (China). Additionally, there are two regional systems, like QZSS (Japan) and IRNSS or NavIC. Any EW attack blocking these constellations can successfully

mitigate the drone threats to a great extent, as most of the COTS are programmed to RTK/hover or land when the navigation is lost, that well serves the purpose of the security agencies, who are facing a life and death situation in an active theatre of war, however GPS jamming or GNSS denial in the civilian spaces can be catastrophic in some cases and the legal and moral responsibilities cannot be ignored.

For your information Jamming and interference with GNSS is a criminal act in almost all parts of the world including India. The civilians, including our homeland security agencies shall need a specific permission to obtain and use Jamming devices of any kind and that permission is hard to get and rightly so.

If you are any private or even a semi government agencies planning to deploy any kind of counter drone solution, it is imperative that you obtain expert opinion and requisite permissions before going ahead with any procurement plans.

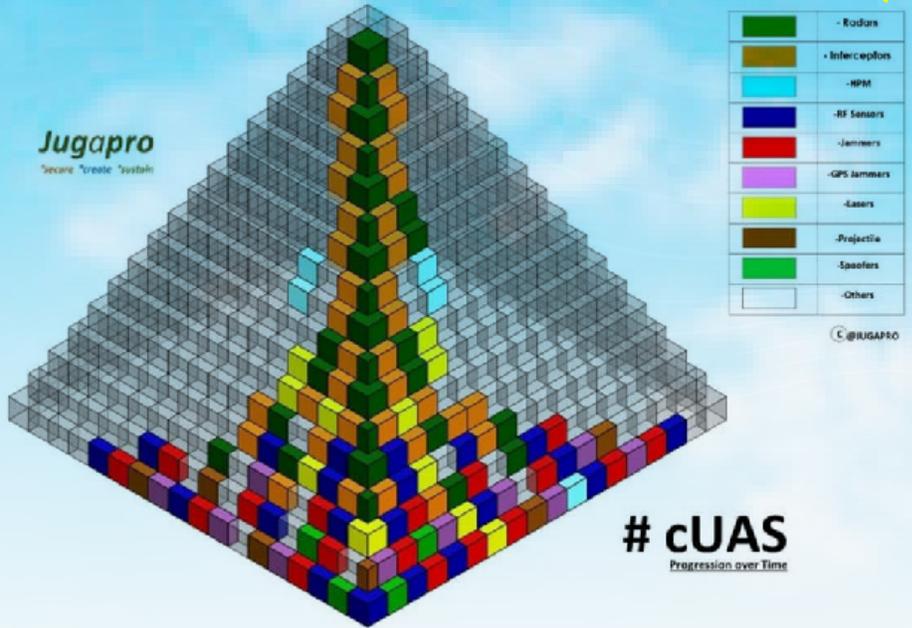
Q Is it only the legality of their use or is there any other issue with Jammer?

A The investment in jammers as an effective tool for Counter Drone Operations requires a very careful study and where the deployments are being allowed, the deployment of these devices has to be carefully calibrated. In an urban environment, where



we might have civilian airports adjoining other sensitive sites, some of which might be quite sensitive, the indiscriminate deployment of jammers by one could render the detection equipment by another absolutely useless.

The considerations on the flight safety of small aircrafts is also a big concern, some of the legacy aviation equipment including S Band radars can get affected by Jamming.



Q Can you elaborate more on this aspect?

A Sorry, no more, one this subject is too sensitive to be discussed in greater detail on a public forum and two, each installation has to be designed after a careful study of the threat, terrain and situation, any generic comment can be misleading.

Q Agreed, if Jamming is not the comprehensive solution, then what are the other options?

A The art of countering the drone threats or the #cUAS is emerging as a whole new discipline and largely a work in progress, as you shall see the graphic below.

Q Quite intriguing, much of this pyramid is still blank, can you explain?

A You might have noticed that the use of the drones in hostile attacks is almost new, the world had been blissfully protected from such threats until recently. Prior to their use in the recent conflicts in Syria, Libya, Nagorno-Karabakh, Persian Gulf and now in the Ukraine, the incidents involving drones to inflict serious harm were not too many. The Counter Drone industry is quite young and most of us carry very little experience in this specialised

domain. It must not otherwise mean that there are no real solutions against the drone attacks, the ones other than the jammers are not that simple nor so cheap and thus less common.

Besides the Jammers shown in Red and the GPS/GNSS denial shown in pink, the advanced counter drone systems use Directed Energy weapons (DEW) like lasers shown in Yellow and HPM devices shown in Skyblue. Till the time these DEW tools like lasers and High Power Microwaves become affordable and easily available, their dominance in the counter UAS strategy is still quite a distant option.

These Hard Kill options are currently both experimental and bulky, their use in the real theatres of war is quite promising, however, these weapons cannot be deployed in the urban spaces and during the peace time.

Q If Jamming is not an option, Hard Kill measures still experimental, do you see anything else?

A When this deadly trouble is falling freely from the skies, and this asymmetric warfare needs to be contained somehow, the

soldier on the ground can always deploy the weapons they have in hand, we have seen successful attempts to bring down the Pakistani drones by our own BSF, those sharp shooters are doing a good job. Giving them long range guns along with digital targeting aids shall be a good option. Use of missiles is another commonly counter attack practice, being reported in several battle zones. The missiles and rockets are both expensive and a very scarce resource, though these do become a primary tool, when the adversary has launched a frontal attack using bigger military drones, in the civilian space, the ballistics are not a preferred option, you need to match the response according to the size and the enmity of the threats.

Q cUAS is a challenge indeed, what other strategies do you suggest?

A One of the winning strategies is the Radar based Interceptor Drone technology, where the fabled DroneHunter, from Fortem Technologies, USA tops the charts. While there are a couple of other options where the drones throw a

net to entangle the intruder drone midair and bring it down, this one is indeed the leader in its field because of its fully autonomous operations. The “DroneCatchers” as these specialised drones are now being popularly called fill up the gap between the “Soft Kill” space, occupied by the Jammers and Spoofers and the “Hard Kill” options like Rockets, Missiles, Ballistics, Lasers and soon to come High Power Microwave devices.

Q Interesting, can you elaborate more on the “DroneCatchers”?

A To some extent, yes. There are two types of Net Catcher attacks, one which are launched from an airborne platform and the other from the ground. The ground systems have been there for quite while and seem like a small cannon, which fires a shot containing a light weight net targeting the incoming drone, largely inexpensive, these solutions work very well against the aerial threats at a short distance. Given the sensitive nature of the protected sites, it is always advisable that the protected zones must have an impregnable dome over their skies, thus the need for kinetic devices, which can approach the incoming threat, while it is still quite far away, thus the concept of drones catching the drones emerged.

Q Drone capturing another drone, interesting, but, is it practical?

A Seeing is believing, the DroneHunter is dispatched towards the incoming drone as soon as the outer perimeter is breached, detection is done by both passive “RF sensors”, which continuously scan the lower airspace for all kinds of moving RF energy sources in 3D as well as active AESA panel

“Radars”. At the slightest detect a custom built AI/ML engine analyses the threat and based on the “Rules Engine” the threat is classified as a Friend or a Foe, if latter the nearest DroneHunter is dispatched autonomously from its secure charging pod to make a capture all on its own! Once on the prowl, the DroneHunter, depending on the size and speed of the incoming meets the incoming threat somewhere midway, throws a net, entangles it and hauls it back to a predesignated location for safe disposal and lands, simple!

Q Simple! It sounds quite a complex operation, how can one remain prepared to do all that much within a short span?

A While it seems quite a complex operation, the devil is in the detail. The whole Detect and Defeat process is Fully Autonomous, repeat fully automatic, there is No Man in the loop. The DroneHunter, its controlling software suite- SkyDome and its purpose built radars- TrueView is a complete system that operates on AI/ML, a differentiator from Fortem, that has been perfected over the last 6 years! The DroneHunter has over 5000 successful capture missions to its

credit, nearly two dozen of which have been recorded in the Indian skies. The whole suite commands over 85% success rate over small fixed wing and multicopters, some of which could be much larger and much faster than itself! The biggest advantage of this system is its capability to mitigate the hostile drone threats with great precision, that is possible because this UAV is capable of fully autonomous BVLOS missions all on its own, to take off, it just needs the cue from the C2 software and the general direction of the incoming, thereafter, its own onboard Radar and the AI/ML processor takes charge.

Q Radar onboard a Drone, is it for real?

A Yes indeed, the DroneHunter is the only available Drone Catcher in the world that has its own “Radar” to lock on to the target and thereafter hound till the intruder gets hunted, plus its own “Brain” to analyse the tracks to position itself for getting the best shot at the incoming drone. The DroneHunter can thus also differentiate between a bird and a drone and thus has never brought a live prey as a trophy! Since seeing is believing, you may try evaluating this option on your own. Recording of extensive trials done by NATO, interesting slow

motion view from captured drone and commentary from the Military commanders.



*dronehunter.
in/dronehunter/
nato856794_10.mp4
Capture of bigger drones
and parachute assisted
release
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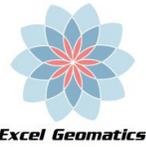
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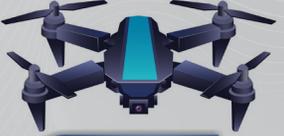


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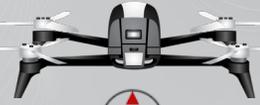


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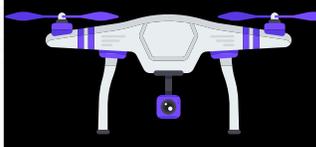
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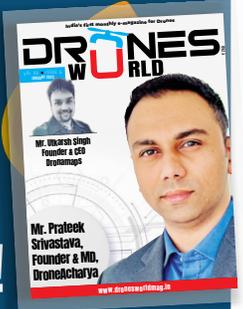
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