India's first monthly e-magazine for Drones

DRONES WORLD

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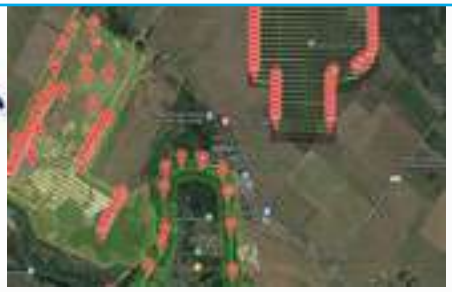

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DRONES WORLD

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B. KARTIKEYA

Hello my dear readers,

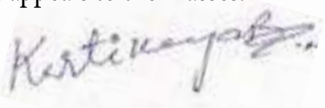
Any people find drone technology intriguing, and some amazing product promises are made by it. In the end, the most effective and economically viable technology matters, not the most attractive. The industry must create viable business models, and artificial systems must find their market. We have a tonne of educational content for you this month.

In DRONE NEWS, you may find out that Garuda Aerospace has secured the largest Series A Round in the history of drones, totaling $22 million, in time for the 2023 Aero Show. To better synchronize and empower stakeholders working to integrate and operate drones, Airspace Link has announced the launch of the new AirHub® web application. Percepto, an industry-leading autonomous inspection and monitoring systems provider (FAA), revealed a first-of-its-kind exemption refusal from the Federal Aviation Administration.

Many intriguing stories await you in the area of BVLOS and GIS. In the PRODUCT area, keep an eye out for the newest developments.

The significant interaction between Drones World Special Editor Dr. Pranay Kumar and Mr. Anil Kumar Ojha, PSCC, Automation &GIS - Tata Power, is presented in the INTERVIEW section. Concentrate on your discussion on GIS and drone technology with Mr. Agendra Kumar, Managing Director, Esri India. Given the concentration on agriculture, you should also look at Mr. Pradeep Palelli's (CEO) and Prathyush Akepati's (CTO) perspectives on UAVs. Remember to look at the EVTOL and DEFENSE sections last. Dr Anjana Vyas is a founder of GIS Applications in urban planning and development in india. Her Contribution to the urban planning and development in india needs appropriate recognition by the urban sector and the developing world.

DRONES WORLD has traveled a long way to become the publication we know today. Beginning in the year, Drones World will be the magazine for the drone economy that appeals to the masses.



MapmyIndia announces strategic investment in Indrones, a leading Drone solutions startup

MapmyIndia India's pioneering and leading deep-tech, digital mapping, geospatial software & IoT Company, announced that it has made a strategic investment in Indrones Solutions Private Limited (Indrones), a leading end-to-end drone solutions startup. Indrones has been a leading drone company and drone service provider in the country and with the new funding, the company will scale up operations, expand its thousands of hours of flying experience, be able to deliver more and larger projects for customers, and build next-gen autonomous and reliable drones that push the boundaries of what is possible with drone technologies. MapmyIndia, India's pioneer and leading deep-tech digital maps-based products, platforms, and solutions company since 1995, which services 2000+ leading enterprise customers across all industry verticals in the private and public sector, will now be able to offer customers industry-leading drones and drone-based solutions. MapmyIndia's consumer-facing Mappls app will offer more high-definition and 3D maps, based on drone-collected data, offering unparalleled immersive and metaverse experiences to users of the Mappls app.

Indrones specialises in manufacturing drones for a variety of use cases and providing drone-based end-to-end solutions for verticals like smart cities, government, construction, oil & gas, agriculture, etc., and has developed technologies that allow for highly efficient and cost-effective data collection, data processing and analytics. Indrones has already been working with a reputed list of clientele across India in the 'Drone as a Service' (DaaS) model. The strategic investment from MapmyIndia will be used to improve its products and offerings further and help the company develop digital solutions in the drone sector at par with global standards.

> "We are thrilled to have MapmyIndia onboard who shares our vision of contributing to the growth of India's digital economy," said Mr. Pravin Prajapati, Founder & CEO of Indrones. "Drones today are solving some of the most complex problems across industries like mining, construction, oil & gas, infrastructure, agriculture, etc., and Indrones is here to be a part of the digital transformation journey of its customers while leveraging indigenous software maps, geospatial software and IoT technologies developed by MapmyIndia" he added.

Mr Rakesh Verma, CMD of MapmyIndia said "Drones are a sunrise industry, with incredible potential and market opportunity. Our strategic investment in Indrones is in-line with the vision of our Prime Minister's vision of Aatmanirbhar Bharat and making India a drone hub by 2030. The Indrones team is highly experienced, and we are certain that together we would be able to be a leading player in the Indian and global drone industry. We are excited to work with Indrones strategically to further augment our solutions and offerings based on drones, through which we can deliver on more use cases and needs of both our large base of enterprise customers across industry verticals and to consumers through cutting-edge capabilities of drones", he added.

Training Centre for drone pilots started by Drogo Drones in Andhra Pradesh

A new era is coming in the field of drones in Andhra Pradesh. There is an increase in use of drones in agricultural, non-agricultural and industrial sectors. To cater this demand a start-up company has come forward to give training and produce expert drone operators.

Drogo Drones, a startup company, has started a training center for pilots operating drones at Tadepalli in Guntur district of Andhra Pradesh. Mr. Yashwant Bontu, Managing Director of Drogo Drones, said that representatives of the office of the Director General of Civil Aviation (DGCA) visited the company's office and conducted inspections and issued a no-objection letter.

This is the only private organization that has obtained the necessary permissions to train pilots to operate drones in the state. Drogo Drones provides week-long training for drone operators as per the syllabus designed by DGCA. Apart from teaching lessons in the classroom, training in operating drones in the field is also given here. Drogo Drones has been designed syllabus by experts with extensive experience in handling drones. The 50-acre campus of this company provides training to those who want to operate drones. Mr. Yashwant, said that it is one of the leading institutes in the country for training drone operators. He added that the DGCA has given permission to the organization to train 30 students in each batch. DGC has set a rule that those who want to be trained to operate drones must be 18-year-old and have passed at least tenth standard. The training programs will start from the 20th of February in the premises of Drogo Drones Company situated in Tadepalli.

SOON DRONES MANUFACTURING UNIT WILL BE STARTED

Drogo Drones will soon start a drone manufacturing unit in Tadepalli. The company has created a system for manufacturing spare parts of drones and it is ushering in a new era in this field.

DROGO DRONES USED IN SURVEYING

These Drogo Drones will be operational in conducting necessary surveys for various organizations in the public & private sectors. It has already conducted necessary land surveys for NMDC, GMDC, MEIL, GAIL, APSSLR and other prominent organizations. Till now, nearly 7,000 hectares of land has been surveyed. It uses advanced technologies such as AI & ML in this field to complete the survey tasks within the scheduled time.

Collaboration between UAV Navigation–Grupo Oesía and Zerosum Technologies to Boost the Indian UAS Aerospace Industry

UAV Navigation-Grupo Oesía has signed a collaboration agreement with Zerosum Technologies in order to increase its presence in the Asian market. With this accord, UAV Navigation-Grupo Oesía expects to go beyond a commercial agreement with the Indian company and rely on Zerosum Technologies' experience in India to boost their sales in the fast-growing Indian market.

"India is a growing market with great future prospects, so having a local partner would help us to understand the requirements and demands of the clients in India, to then introduce our products and solutions." states Carlos Lázaro, UAS Key Account Manager at UAV Navigation-Grupo Oesía.

> This partnership would allow us to position ourselves as a crucial element in Indian unmanned aviation." says Vikram Bansal at Zerosum Technologies

For its part, Zerosum Technologies expects to use UAV Navigation-Grupo Oesía's experience to become a key factor in the Indian market and boost their growing relevance on the Asian aerospace industry.

The Spanish and Indian companies' aligned mission of designing and developing world class systems for UAS platforms, geared towards civil and defense applications, has made it easier to reach this strategic agreement. The combination of UAV Navigation-Grupo Oesía's proven experience in the design of aerospace-grade flight control solutions for unmanned systems and Zerosum Technologies' ambition to be at the forefront of UAS technology by means of an experienced team of electronics and aerospace engineer's promises a great future for both companies in India.

Airspace Link Announces New AirHub® Portal Application to Further Align and Enable Stakeholders Working to Integrate and Operate Drones

Airspace Link, Inc. is announcing the next generation of the AirHub® Platform: AirHub® Portal. Following the introduction of their UAS Integration Framework last fall, Airspace Link has continued to innovate in their mission to help align stakeholders in advancing safe drone integration into the national airspace and communities at scale. Today's announcement brings together Airspace Link›s AirHub technology with their UAS Integration framework approach – providing a common platform for both the UAS industry and government stakeholders through AirHub® Portal.

AirHub Portal streamlines workflows for users involved in drone integration, including national, state, and local government managers, planners, and drone operators, as well as recreational and certified pilots looking to utilize airspace for private and commercial use cases. AirHub Portal is a progressive web application allowing users to install it directly on their desktop or mobile device or utilize a web-based experience, depending on their preference. The application enables users to prepare and plan for, manage, and execute drone operations within a unified system.

"As the number of drone operations increases, so does the need for enhanced planning and management tools. As we work on what our customers need today and what they'll be relying on in the future, our new Portal platform will help unify all stakeholders on one platform and empower them with the individual features they want and need." says Daniel Bradshaw, CTO & VP of Engineering.

As the drone industry has scaled, fragmentation has increased with specific applications designed for specific use cases, often leaving users dependent on a broad range of applications to execute their needs. AirHub® Portal brings users together to enable all types of use cases and functions in the future.

Private drone operators are also planning for a changing set of needs as their operations scale in complexity and geography, while regulations advance in parallel. Today, operators are concerned heavily with core functions such as mission planning, fleet management, regulatory compliance, and safety. When they look to the future of what the industry will need in terms of advanced mission planning, insights, and other analysis, they'll also need the ability to disseminate that information across fleets. Airspace Link is announcing a multitude of new features coming into the AirHub® Portal App, including Airspace Awareness, Authoritative & Enterprise Advisories (Constraints), Mission Planning including Routing, Risk Analysis and Situational Awareness, Fleet Management Integration, UAS Traffic, and more on the horizon. Demos and access to the AirHub® Portal application can be requested through the Airspace Link business development and technical teams which can be reached at sales@airspacelink.com.

In the past, our government customers were focused on enabling and supporting operators – but now, government customers are also operators themselves, buying and operating their own drones for public safety, infrastructure inspection, surveying, and other use cases designed to make work safer and more efficient. Having tools to help them understand their airspace, communicate with pilots, and provide the functions necessary to help them operate and manage their own drone fleets has become increasingly important to them. The AirHub® Portal application will begin to serve all of those needs in one place, says Michael Healander, President & CEO at Airspace Link.

TechEagle launches Asia's first drone delivery hub in Meghalaya

TechEagle, one of the fastest-growing drone delivery startup, unveiled Asia's first drone delivery hub and network in Meghalaya. "The groundbreaking effort intends to improve the universal access to healthcare in the state by delivering vital supplies like drugs, diagnostic samples, vaccines, blood and blood components quickly and safely to different regions of the state using a dedicated drone delivery network," says an official release.

The project began with the inauguration of the hub built at the Jengjal Sub-Divisional Hospital by James P.K.Sangma, Minister, Health and Family Welfare, Meghalaya. "On the same day, the first official drone flight took off from Jengjal Sub-Divisional Hospital and delivered medicines to Padeldoba PHC in less than 30 minutes which would have otherwise taken 2.5 hours by road."

TechEagle's Vertiplane X3 drone delivered different healthcare products including snake venom-2 pax, Labetalol- 4 pax, Human Albumin-1 pax, Cefotaxime (typhoid dose)- 50 pax in its first flight, which was 5X faster in comparison to ground transportation, the release added.

"We are seeing something that is unparalleled in any place of the world," says Sangma. "It is a matter of pride for Meghalaya that we would be the first state to institutionalise this initiative and have a system that can be expanded to other areas of the state as well."

> MDDN & Hub in Phase 1 is a combination of one central Hub and 25 spokes (supply chain nodes) in a radius of 50 km where the drone hub at Jengal Hospital shall act as the centre point. TechEagle's drones are capable of vertical take off and landing from small areas, which enables both forward and reverse logistics of healthcare products in the network. MDDN would bring universal access to healthcare for 2.7 million people of Meghalaya.

Vikram Singh Meena, CEO & Founder, TechEagle adds: "Transforming the logistics and healthcare supply chain is at the heart of TechEagle's vision and this launch of Meghalaya Drone Delivery Network (MDDN) is a first big step forward in the direction of achieving the goal of universal access to healthcare and logistics across the world. We are thankful to the Govt of Meghalaya & MHSSP to provide us this opportunity to create a larger impact on grass root level.

UAVOS & GradeOne Group Launch Strategic Partnership

UAVOS Inc., a developer and manufacturer of advanced unmanned systems, and GradeOne Group, a part of the EDGE the UAE's world's leading advanced technology groups, started a major new chapter in their partnerships when Vadim Tarasov, Board Chair of UAVOS, and Khalifa AI Ali, Managing Director at GradeOne Group, agreed to create a unique, strategic relationship between the two companies. The new agreement provides a tactical framework for current and future cooperation that leverages the resources, talent, and ideas of both companies to produce innovative solutions for the industry of autonomous systems as part of the joint R&D Laboratory.

A Memorandum of Understanding was signed at IDEX 2023, one of the largest tri-service defense exhibitions in the world, which is being held in Abu Dhabi, UAE, until 24 February.

The agreement ensures work in three key areas related to development and adoption of security technology for uncrewed land and air platforms. Developing, testing and manufacturing an anti-drone laser system, Refinement of a family of uncrewed jet powered Arrow aerial targets, and Program of piloted aircraft into drones conversion. The cooperation will be geared towards developing the products for the UAE market as well as other countries.

> UAVOS is thrilled to be formalizing our long-term partnership with the GradeOne Group. Our combined strength will provide capacity for innovation needed to respond to complex global issues and autonomous systems industry challenges," said Vadim Tarasov. "Our strategic relationship will leverage the best talent and ideas from both companies to produce innovative solutions for our future.

Spright Earns First of its Kind FAA Waiver for Drone Operations

Spright announced that it earned a nationwide, non-geospecific Certificate of Waiver (CoW) for Beyond Visual Line of Sight (BVLOS) drone operations from the FAA. The CoW allows small Unmanned Aircraft Systems (sUAS) to travel up to four nautical miles for critical utility infrastructure surveys. This waiver puts Spright in a unique position to maximize service efficiency for utility customers across the United States.

"Spright is proud to have earned the FAA's first non-geospecific BVLOS waiver for utility inspection, and we believe it is testament to our aviation-minded culture that puts safety at the center of everything we do," said Joe Resnik, president of Spright. "Moving forward, Spright customers will have access to the most advanced and versatile inspection solutions in the industry, resulting in a more effective maintenance model that leads to measurable time and cost efficiencies."

BVLOS refers to a critical capability to fly drones further than what is visible to the human operator, depending on the landscape and terrain. As part of a broader drone program, BVLOS operations enable electric utility companies to increase the efficiency and effectiveness of long-linear inspection and vegetation management activities. BVLOS operations also allow companies to perform more frequent and demand-responsive inspections, leading to a maintenance model that better predicts and helps to decrease the risk of outages and interruptions.

Obtaining a BVLOS waiver is a lengthy process that requires a complex analysis of internal operations and procedures to ensure total compliance with regulatory standards and requirements. Established as the UAS division of Air Methods, Spright leverages its aviation foundation to operate at the highest level of safety and professionalism. By issuing this waiver, the FAA recognizes that Spright has achieved all necessary benchmarks to perform BVLOS flights in a safe and compliant manner.

Spright's BVLOS services are available as part of a comprehensive UAS inspection solution or as a standalone service for utility companies looking to increase the long-range capabilities of their existing drone program.

> I am proud of our commitment and leadership in seeing this process through to a successful end," said Resnik. "Being the first UAS operator in the utility space to receive this type of waiver really speaks to the collective operational experience of the team and overall maturity of Spright operations.

Primoco UAV announces sales contract worth EUR 2.35 Million

Primoco UAV SE has announced a new contract for the supply of unmanned aerial vehicles. The Czech manufacturer will deliver machines with an aggregate value of EUR 2.35 million to a European customer.

Primoco UAV SE's new order follows a successful 2022, in which the company sold a total of 22 UAVs One 150. Twelve of them were delivered to customers last year, and the remaining ten will be completed and handed over in the first half of 2023. "Our goal for 2023 is to deliver a total of one billion crowns worth of unmanned aircraft and services to our customers. Due to the ongoing negotiations, I expect that the first contract concluded this year will be followed by the sale of 9 more machines in Asia and Africa in the first half of the year," said Ladislav Semetkovský, founder and CEO of Primoco UAV SE.

The shares of Primoco UAV SE are traded on the PX START market of the Prague Stock Exchange. The company's securities were among the best-performing shares on the Prague stock market last year with an appreciation of 52%.

In addition, from 30 January 2023, the purchase and sale of Primoco UAV SE shares is even more accessible to retail investors. The Prague Stock Exchange reduced the basic investment volume (lot) for this title on the Start market to 10 units, which at the current rate corresponds to CZK 4,000. Originally, the minimum threshold was ten times higher.

Fortem Technologies Closes $17.8M in Funding Round to Scale Airspace Safety and Security Capabilities

Fortem Technologies, a leader in airspace awareness, security, and defense announced that they have closed a funding round of $17.8 million led by new key industry investors including Lockheed Martin Ventures, Hanwha Aerospace, and AIM13|Crumpton Venture Partners. Existing investors DCVC and Signia Venture Partners have also contributed additional funds. The capital will help Fortem scale to meet growing demands across multiple regions and market sectors in airspace safety and security.

The Counter-UAS market continues to expand rapidly from a value of 685 million USD in 2019 to an estimated 4.7 billion USD by 2027. In addition, the Advanced Air Mobility market size was estimated at 8.93 billion USD in 2022 and is expected to hit around 45.12 billion USD by 2030. With Fortem›s support in Ukraine fighting suicide drones like the Shahed-136 and protecting world venues such as the World Cup Games in Qatar, the company is seeing this market growth and demand for their unique airspace awareness, security, and defense technology. This investment round will benefit the company's strategy to be at the leading edge of this growing market.

"We are very pleased to invest in Fortem, a leading dual-use counter-UAS provider. The unique low collateral solution developed by Fortem will contribute to the growth of the c-UAS market globally and help to address the evolving UAS threats," said a representative from Hanwha Aerospace. "Hanwha Aerospace is excited to support Fortem's growth through the investment and continue to bring tremendous value across the sector."

"Rapid development and legitimate applications of UAS create an increasingly capable threat when in the hands of bad actors," said Chris Moran, vice president and general manager of Lockheed Martin Ventures. "Lockheed Martin Ventures' investment in Fortem Technologies signals our commitment to keeping pace with our customer's requirements, ensuring the U.S. and its allies stay ahead of ready."

The investments from these industry-leading companies represents a significant endorsement for the growth and opportunity the company is seeing in the Counter-UAS and Advanced Air Mobility marketplace. Joining existing investors such as Boeing, Toshiba, Mubadala Investment Company, Signia Venture Partners, and DCVC, the new investors can also bring key industry insights and product development support as Fortem continues its aggressive growth strategy.

"We are extremely excited to be working with such respected companies in this funding raise," said Jon Gruen, CEO of Fortem Technologies. "Not only does this investment help us address our rapidly growing market demand, but the level of support and industry experience these companies bring allows us to tap into unparalleled business, technical, and industry knowledge."

HevenDrones Launches Hydrogen-Powered Drone for Commercial and Defense Use

HevenDrones, a leader in the development and commercialization of actionable drones, launched its first hydrogen-powered drone for commercial use, the H2D55. With 5-times greater energy efficiency than traditional lithium battery-powered drones, the H2D55 is capable of flying for 100 minutes with a payload capacity of 7kg.

The launch of HevenDrones' hydrogen product line addresses the challenge of flight endurance and payload capacity associated with lithium battery-powered drones as well as the long term environmental impact linked to lithium mining. Without the need to frequently replace batteries, hydrogen fuel cells will also lower long term ownership costs for organizations implementing drone technology at scale. The H2D55 is the first in a planned lineup of 3 Hydrogen fueled drones that will be released over the next 9 months. The additional models will have increased payload capacity while preserving the longer flight endurance.

HevenDrones has designed its carbon neutral H2D product-line to be fully customizable to the unique goals of its commercial and defense clients. Commercial use case examples range from last-mile and just-in-time (JIT) delivery, measuring the nutrient levels of soil and precision crop spraying to collecting risk-assessment data for construction companies, surveying real estate for reforestation projects and aiding emergency responders in risk assessment and delivery of life saving equipment. Defense use cases include more extensive surveillance missions and supplying larger quantities of medical aid, food and ammunition to soldiers.

In addition to being lightweight, the H2D55 is programmed with a control system that contains multiple gyroscopes and supporting algorithms to significantly extend the operating limits of stable flight.

We are delighted to bring hydrogen-powered drones to the global market and we are excited to see the expanding range of use-cases across numerous industries," said Bentzion Levinson, Founder & CEO of HevenDrones. "Not only do actionable drones add immense value to key areas of our economy and society, but we are working to ensure that this value is compounded by reduced carbon emissions and general energy efficiency by using hydrogen. The H2D55 is our first step towards achieving this vision.

AVAIR Awards Kratos Sole Source $49.6M Initial Contract for FRP of the BQM-177A Subsonic Aerial Target System

Kratos Defense & Security Solutions, Inc a leading National Security Solutions provider and industry-leading provider of high-performance, jet-powered unmanned aerial systems, announced that Kratos has received a $49,568,200 Full Rate Production (FRP) contract for Lot 4 of the BQM-177A Subsonic Aerial Target (SSAT) from the U.S. Navy for the procurement of an additional 55 aircraft, mission kits, certain flight consumables, and technical data.

Steve Fendley, President of Kratos Unmanned Systems Division, said, "Since becoming an aerial target system provider in the early 2000s, Kratos has produced and delivered well over 1,000 high performance jet target aircraft across our family of systems and customers. For the U.S. Navy, following the first full-rate production award in October 2020, the combined Navy-Kratos team has completed activation of all four operational sites around the globe; delivered an additional 77 BQM-177A SSAT Air Vehicles; and declared full operational capability. To have achieved all of this during the pandemic – with unprecedented labor and supply chain disruptions and a very unusual economic environment – is nothing short of remarkable. Today's announcement marks the next step in our continuing efforts to provide world class training capabilities to the U.S. Navy and its allied and coalition partners for the next several decades and beyond. I couldn't be more proud of this team and its exceptional achievements. We are laser-focused on the customer mission capability and these incredibly high-performance-to-cost-ratio systems that deliver key, threat representative capabilities to support the Navy's ever increasing (quantity, technical, performance) training and test needs."

> Don Blottenberger, Program Manager for the Navy's Aerial Targets program office (PMA-208), said, "The BQM-177 is quickly becoming a workhorse of the Navy targets inventory. Target presentations have never been more important than they are right now based on real world events and new capabilities under development. It provides reliable presentations of evolving missile and aircraft threats to test our developmental weapon systems and provide training to our deploying sailors preparing to go into harm's way. The hard work of the team – one team across Kratos and the Navy Aerial Targets office – will provide cost effective, quality target presentations through the next decade.

The work under this contract will be primarily conducted in Kratos' facilities in Sacramento, CA, and Ft. Walton Beach, FL. Total contract value if the options for Lots 5, 6, and 7 are all exercised at the maximum production quantities is $227,647,890

Skyports Drone Services strengthens presence in Korea through Joint Venture with Korean drone company, Marine Drone Tech Inc.

Skyports, the leading Advanced Air Mobility (AAM) infrastructure developer and drone services provider announced the formation of a joint venture (JV) entity between its drone services business and Korean drone technology company, Marine Drone Tech (MDT). Named Skyports Drone Services Korea, the JV Co will be dedicated to delivering tailored drone solutions that address connectivity, productivity, and safety. With a growing demand for innovative technologies in the country, Skyports Drone Services Korea is poised to meet the needs of the market and bring its expertise to the forefront of the drone industry.

In line with Skyports' calibrated expansion plans, local branch offices have also been set up in Busan and Yeosu to better serve its on-ground partners and customers in both AAM infrastructure and drone services segments.

Director for Skyports Drone Services, Mr Alex Brown said, «Korea is a market that is well-known for its forward-thinking and innovative technology ecosystem. Our partnership with MDT brings together two market leaders and will see us rapidly scale up drone operations across Korea. Expanding on our work in Singapore, our focus will be ship-to-shore operations in the maritime sector. We will be bringing the best of our global offering across delivery and monitoring drone services to Korea, improving transport service levels, reducing costs and ultimately improving lives for communities all around Korea.»

Mr Hwang Eui-Cheol, Chief Executive Officer of Marine Drone Tech, said, "MDT is proud to join forces with Skyports and bring our expertise in drone technology to the table. Together, we will be able to offer customers a complete solution that will address a broad range of challenges in multiple industries. Our complementary expertise makes Skyports Drone Services Korea a formidable force, and we are excited to work together to bring cutting-edge drone solutions to our home market."

On the JV Co's immediate agenda is the setup of operations in Yeosu and Busan, with a primary focus on maritime ship-to-shore deliveries. In 2022, Skyports Drone Services made its first foray into the market, having executed a successful Proof of Concept (PoC) for cross-island drone deliveries conducted Beyond Visual Line of Sight (BVLOS).

The opening of Skyports' Korea office follows the establishment of its Japan office in October 2022, as the company expands its presence across the Asia-Pacific region. The move comes after the steady progress of the past year in extending the company's AAM infrastructure projects and drone delivery operations with local partners, businesses, and regulators.

Percepto Achieves Regulatory Breakthrough to Scale Commercial Drone Operations

Percepto, an industry-leading autonomous inspection and monitoring solutions provider announced a first-of-its-kind exemption denial from the Federal Aviation Administration (FAA). The FAA's denial provides cause for the whole industry to celebrate, as for the first time it allows Percepto to operate Uncrewed Aircraft Systems (UAS) beyond visual line of sight (BVLOS) without human's onsite, eliminating a burdensome exemption process that has been required to enable remote pre-flight check under Part 107.

To operate UAS BVLOS without human's onsite, the FAA has previously required both a Part 107 waiver approval and an exemption to 14 CFR Sections 107.15 (condition for safe operation) and 107.49 (preflight familiarization, inspection, and actions for aircraft operation). An onerous rulemaking process, an FAA exemption typically takes years to approve and is disproportionate to the risk involved. There is also nothing in the text of Part 107 that requires pre-flight inspections to take place in person.

Percepto demonstrated to the FAA that the company's pre-flight inspection went above and beyond the FAA's Part 107 requirements and therefore did not require an exemption. Percepto's procedures include UAS inspection with cameras on and around the base and images to confirm safe deployment. Percepto proactively engaged with the FAA to address its questions, exceeding the FAA's expectations of pre-flight inspection processes. This advancement for Percepto will benefit the entire industry as it seeks to streamline applications and approvals for BVLOS UAS operations.

"Percepto is very grateful to the FAA staff for their engagement and consideration of our CONOPS and technical information to reach this groundbreaking result for Percepto and the broader UAS industry," said Neta Gliksman, Percepto VP of Policy and Government Affairs. "In these circumstances, we are thrilled with an exemption denial. We look forward to continuing to work with the FAA as we bring the significant benefits of scalable BVLOS UAS operations to the US critical infrastructure industry."

> "This decision's implications for BVLOS UAS operations in the United States in the near-term cannot be overstated," said Lisa Ellman, Chair of the Global UAS Practice at Hogan Lovells and Outside Counsel to Percepto. "The FAA is opening the door to the industry for more streamlined and timely approvals for BVLOS UAS operations and the realization of their benefits for many societally beneficial use cases.

Helisul partners with FIXAR to meet Brazil's booming BVLOS drone demand

Starting in March, Helisul will oversee the import, sale, and advanced operation of cutting-edge FIXAR enterprise drones. In a swiftly expanding Brazilian UAV market. Deployment of drones in Brazil for both business and pleasure is on the rise. But demand is especially strong from Brazilian enterprise users operating long-range, beyond visual line of sight (BVLOS) surveying, remote sensing, and surveillance missions. To meet those pressing needs, local aviation group Helisul Aviação is partnering with innovative European drone and software developer FIXAR to provide customers valuable long-distance aerial services.

Beginning in March, Helisul will manage the sale, support, and operation of FIXAR 007 drones. The technologically advanced, compact fixed-wing craft boasts over 60-kilometers of flight capacity. That will enable extended BVLOS services for enterprise users in Brazil, particularly those in agriculture, mining, infrastructure inspection activities, and owners of offshore platforms whose missions cover vast areas.

The FIXAR 007 has already demonstrated its endurance and mettle in exacting conditions like high-altitude mountain flights. Yet its Latvia-based developer will soon top that with the FIXAR 025 – a drone with a 10-kilogram payload and astonishing 300-kilometer flight capacity that's expected to come online later this year. Awaiting that, Helisul will provide aerial services with the innovative FIXAR 007. The hybrid fixed-wing vertical takeoff and landing (VTOL) craft can carry a two-kilogram payload for up to an hour at speeds of 20 m/s – around 30% faster than competing craft.

Its configuration provides the convenience of a quadcopter with the range and efficiency of a fixed-wing drone. That winning combination permits fast and easy takeoffs and landings on any terrain without needing parachutes, catapults, or other accessories, and prolonged mission distances with greater speed and efficiency. Drawing on its deep experience and qualifications in Brazilian aviation, Helisul will put FIXAR drones' outstanding performance capabilities to maximum use for enterprise clients.

"As it considered Brazilian partners, FIXAR recognized Helisul's reputation for safety, quality, and technology in the aviation market," says head of Helisul's drone division, Lucas Fontoura, adding his company will also facilitate securing authorization from regulators to operate the craft in exceptional circumstances. "FIXAR also appreciated our experience and unparalleled ability in obtaining certification of drones used, and authorization to fly missions above 400 feet from the National Civil Aviation Agency."

As the Helisul-FIXAR tandem solidifies its activities in Brazil, the partners will also examine ways expand their drone services work to other nations in region.

"Helisul, with its 50-year experience in aviation, offers everything FIXAR needs for expansion in the Latin American region," says Yulia Druzhnikova, FIXAR's co-founder and Director of Global Expansion, who points to Helisul's excellence in drone training and maintenance as another driver of the partnership. "We are happy to contribute FIXAR's VTOL drones, designed for advanced missions in challenging environments, to unleash the full potential of the Latin American drone market, and increase safety and efficiency."

Its entry into Brazil reflects continued efforts by FIXAR to raise the profile of its ground-breaking drone technology in an increasing number of nations around the world – an objective Helisul will help it attain in the country and wider region.

> "With this partnership, Brazil joins the USA, Australia, Japan, Korea, and European and African countries playing home to FIXAR distribution centers," says Helisul's executive superintendent Humberto Biesuz. "We are investing heavily in this FIXAR-Helisul partnership in order to deliver the best technology, most advanced drones, and safety to Brazilians in collaboration with the National Civil Aviation Agency".

DELAIR UX11 becomes the 1st professional drone with class C6 marking available in Europe for Beyond Visual Line Of Sight (BVLOS) Flights

The French drone manufacturer DELAIR releases the UX11 with C6 class marking, allowing BVLOS missions throughout Europe without specific authorization within the framework of the EASA European standard scenario STS-02. DELAIR a pioneering manufacturer in terms of certification and BVLOS flight 10 years ago, the DT18 designed and manufactured by DELAIR, was the first drone in the world to obtain airworthiness certification for BVLOS flights in civil airspace (DGAC S4 Scenarios in France). With the C6marking of the UX11 drone, DELAIR is once again a pioneer in BVLOS flights, at the forefront of technology and European regulation, for the benefit of its customers.

A new UX11 version with extended endurance and retrofit options for older versions Carried in a backpack, with a deployment time under 5 minutes, hand launched, the UX11 weighs 1.4 kg with its payload and lands almost vertically anywhere thanks to its patented BTOL (Bird like Take-Off and Landing) technology. UX11 is extremely reliable, simple, and has already flown several hundred thousand of kilometers BVLOS all over the world. In addition with the C6 marking, the new UX11 offers improved autonomy (1h20 of endurance) to carry out even - longer range missions. DELAIR also provides to its current customers an upgrading option of their actual UX11 via a retrofit to adapt the new requirements and affix the C6 marking.

Simplified regulatory flight conditions opening up new uses for UX11 operators Since January 1st 2021, professional drones are subject to harmonized European regulations developed by the EASA (European Aviation Safety Agency) which defines the authorized uses according to the class of the device (class C0 to C6). The UX11 is the first C6 class drone available in Europe. UX11 operator's will now be able to fly in a standard European scenario (called STS-02) without the need to first obtain an operating permit. They will be able to operate in a simpler and more efficient way. The UX11 is particularly suitable for linear inspection, safety and topography operations.

> With this C6 marking, DELAIR becomes the benchmark BVLOS drone manufacturer in Europe. This marking will allow us to address the entire European market. In the power line inspection market for example, our solution benefits from the experience of 10 years of successful operations in France, both on the acquisition and the processing of the data. Drones are much more frugal in terms of energy consumption and carbon emissions than traditional means such as helicopters. We are proud to provide our customers and their operators a reliable, rugged drone and, from now on, adapted to the latest European regulations » concludes Bastien MANCINI, DELAIR CEO

VOTIX Partners with Iris Automation to Bring Comprehensive Drone Management for Safe BVLOS Operations

Drone automation technology leader, VOTIX, is excited to join forces with safety avionics technology innovator, Iris Automation. The partnership enables safe BVLOS flights through the seamless integration of Iris Automation's Casia G ground-based detect and alert system into the VOTIX cloud-based drone operating system.

This integration makes remote operations a reality for enterprises that need effective and flexible drone BVLOS deployments, from routine automated inspections of critical infrastructure to rapid mobilization seen in Drone as First Responder (DFR) programs.

This hardware-software solution will feed data from the Casia G system into the VOTIX platform to provide a complete picture of the operational airspace in real-time. A key requirement to obtaining BVLOS regulatory approvals is the ability to detect non-cooperative aircraft at distance. The Casia G system fulfills this by monitoring the airspace and providing precise location and classification data of intruder aircraft, enabling automated conflict resolution via the VOTIX platform. This brings a new level of safety and mission capability to customers looking to expand their operations at scale.

VOTIX, with its pioneering "Drone Orchestration" approach, integrates all processes and systems required for a BVLOS operation. Its drone-agnostic solution enables and tracks effective C2 and live video stream, including use of cellular connectivity, integrates Casia G for Detect-and-Avoid technology, automates conflict resolution, integrates weather tracking and traffic management, controls operational limitations, automates fail-safe measures to increase safety, performs autonomous flights, enables precision landing and drone-in-a-box integration.

Casia G creates a stationary perimeter of sanitized, monitored airspace without

the need to add additional sensors or payload to the drone. Using patented computer vision technology, Casia G alerts the Remote Pilot in Command (RPIC) if a risk of collision is present and allows the drone to maneuver to safe zones. This eliminates the need for the pilot to maintain visual contact with the drone or to have Visual Observers (VOs) in place to monitor the skies.

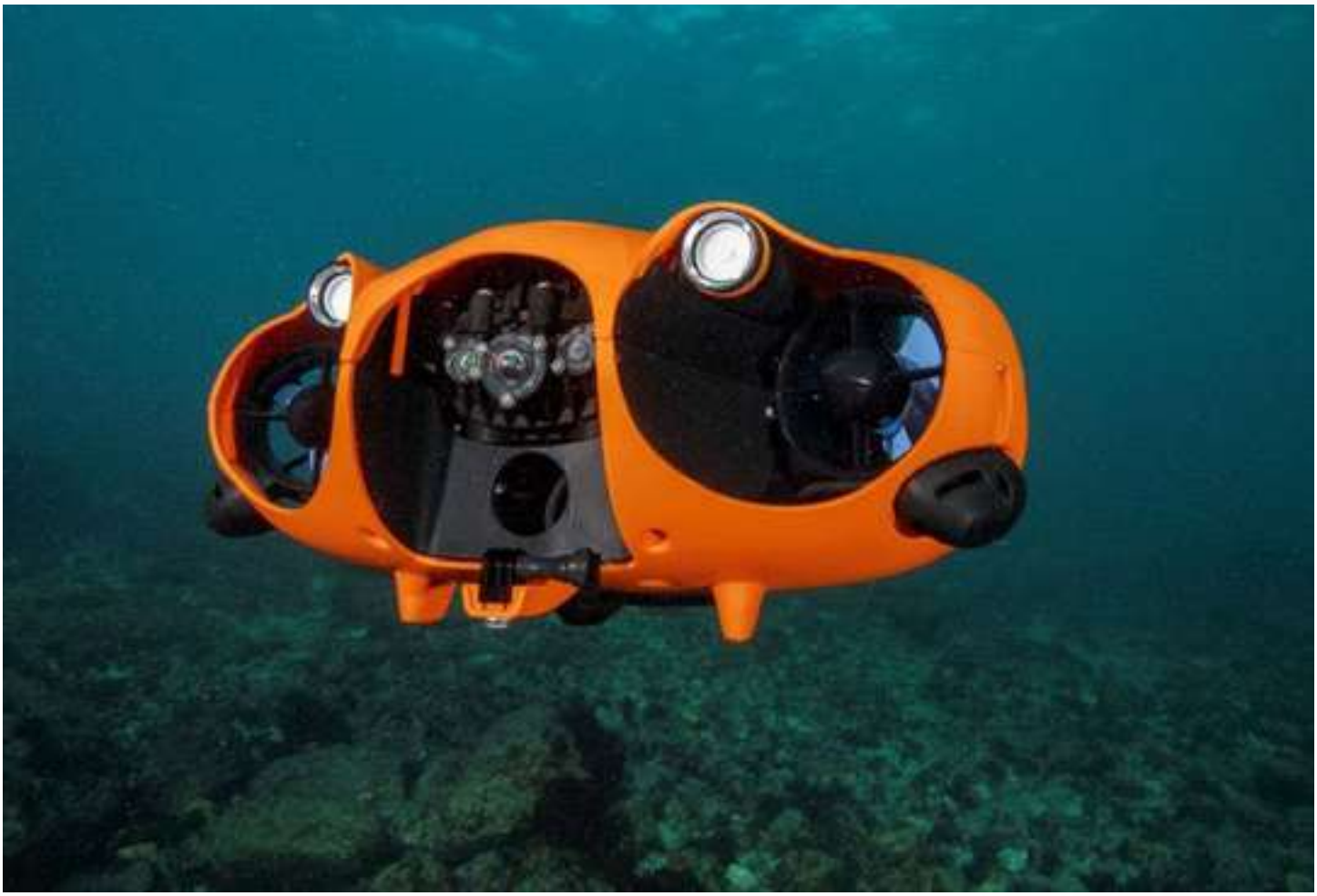
Quote from VOTIX CEO, Ed Boucas "Our mission is to make BVLOS easy. We have integrated every aspect of drone operation in a single pane of glass so pilots can easily perform safe and secure BVLOS flights."

A good example is the drone inspection provider AviSight which, using VOTIX platform, obtained two ground-breaking waivers for recurrent BVLOS inspections over several miles of Shell pipelines in the U.S. The FAA approved the first waiver in just nine days of receiving the application with VOTIX reports.

Quote from Iris Automation VP of Product, Jason Hardy-Smith

> To safely advance unpiloted operations, technology companies across our industry need to collaboratively deliver their innovative technologies in seamless solutions that are easy for customers to consume. Our partnership with VOTIX is a terrific example of that, delivering a complete platform for RPICs to safely and efficiently execute their missions.

DELAIR acquires NOTILO PLUS



NOTILO PLUS, founded in 2016, develops and markets end-to-end service solutions for the inspection of underwater infrastructures: boat hulls, dams, offshore wind networks, etc… The NOTILO PLUS solution includes an autonomous underwater drone, an IA-based platform for processing collected images, and an integrated service offer. The solution is intended for the industry and Defense sectors.

"The business unit renamed DELAIR MARINE, is at the forefront of the latest technological developments and completes our offer of products in the 2 markets in which we are already positioned, Industrial Inspection and Defense » said Bastien MANCINI, DELAIR Ceo.

"The underwater drone developed by NOTILO PLUS is reliable, efficient and able to carry any type of sensor. It appeared to us as the aquatic alter ego of our aerial drones. The NOTILO CLOUD software platform, which becomes DELAR CLOUD, makes it possible to offer a service integrating the latest artificial intelligence technologies applied to the underwater world in a sovereign cloud environment. "

The NOTILO PLUS acquisition, part of DELAIR's external growth strategy, consists in strengthening its offer in its two major markets, Industry and Defense, by extending its range of solutions. It is based on the technological and commercial synergies between the two companies and will make it possible to perpetuate and develop the activity of NOTILO PLUS which will retain its current locations (head office in Marseille). The drones design and production, both aerial and underwater, will be entirely carried out in France.

A global inspection solution « made in France » with a very high added value DELAIR and NOTILO PLUS have already successfully collaborated in 2022 as part of missions commissioned by NAVAL Group on behalf of the SSF (Fleet Support Service) to carry out the inspection of the Charles de Gaulle Aircraft Carrier.

With this acquisition, DELAIR now develops a complete solution for the maritime environment with both aerial and underwater drones, sovereign data processing software, and an associated service offer. "DELAIR is positioned as a major player in France in the inspection of naval, civil and military infrastructures and buildings : ships, offshore wind infrastructures, port infrastructures, etc… with an entirely sovereign solution, designed and manufactured in France, and very high added value" said Bastien MANCINI.

Element 84 Acquires Azavea to Provide Comprehensive, Impact-Focused Geospatial Solutions

Alexandria, VA-based Element 84 has acquired Philadelphia Technology Company Azavea, joining forces as a singular professional services firm focused on the open source geospatial technology ecosystem. As of Feb. 16, 2023, Azavea has joined Element 84 led by Tracey Pilone and Dan Pilone under the Element 84 name as a woman-owned small business.

The work conducted at Element 84 and Azavea addresses every step in the processing, visualization, and analysis of geospatial and Earth observation data. Through this work, the organizations share a commitment to civic, social, and environmental impact. In addition, Element 84 and Azavea both prioritize open technology ecosystems and contribute significantly to both open standards and open source software.

With a shared focus on open technology that supports positive change, the two companies are logical partners. "After over 20 years in the industry, this transition will enable Azavea to extend its innovation and impact-focused mission to serve a broader range of customers as well as leverage our geospatial software innovations, such as GroundWork and Raster Vision, in new directions," said Robert Cheetham, founder and CEO of Azavea.

Post-acquisition, Element 84 will consist of over 100 employees, representing the best in cloud-native geospatial software engineering, machine learning, data analysis, project management, and UX design. The combined organizations will retain Azavea's Philadelphia office as the new Element 84 headquarters.

"The combined team is brimming with talent and enthusiasm to solve geospatial problems that address climate change and sustainability challenges globally," said Tracey Pilone, Co-Founder and President of Element 84.

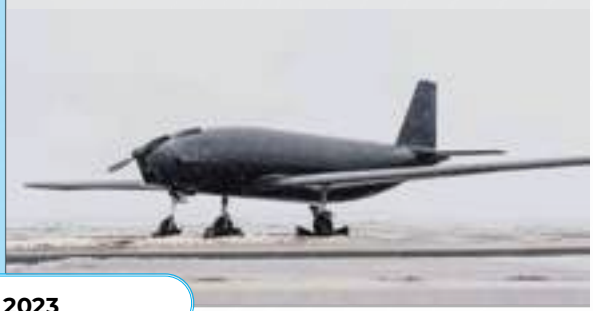
> Being able to combine Azavea's machine learning expertise and application of remote sensing data with Element 84's ability to operate on petabytes of complex geospatial data means we can collectively go from orbiting satellite constellations to understanding water security, disaster response, and climate resilience. Our shared investment in the open source and open data communities means that not only can we do this, but we can also help others build solutions to better understand our changing planet," said Dan Pilone, Co-Founder and CEO of Element 84.

Dronamics raises $40 million to launch Europe's first middle-mile deliveries

The world's first cargo drone airline with license to operate in Europe, Dronamics has today announced that it has raised a total of US$40 million in pre-Series A funding from venture capital funds and angel investors from 12 countries as the company approaches its upcoming Series A round. The funding includes money received from Founders Factory, Speedinvest, Eleven Capital, and most recently the Strategic Development Fund (SDF), the investment arm of the Tawazun Council, Abu Dhabi, United Arab Emirates.

The $40 million is funding in addition to a €2.5 million ($2.7 million) grant which the company was given by the European Commission under the European Innovation Council Accelerator programme. This is part of the EIC's commitment to support Dronamics' A round funding with a further €12.5 million ($13.45 million) in equity investment.

"The investment from SDF, Founders Factory, Speedinvest, and Eleven Capital is a strong validation of our goal to bring our cargo drone solution to more people and businesses around the world. Their confidence in Dronamics confirms the strength of our business model and we are excited to continue growing and achieving success with the support of our investment partners," said Abdulla Naser Al Jaabari, Managing Director and CEO of SDF.



Drones World Editor Kartikeya in conversation with

Professor Dr. Anjana Vyas (PhD)

Fellow, Indian Society of Remote Sensing | Fellow, Indian Society of Geomatics

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

A When I started my career, the geospatial sector was in a very nascent stage, geospatial community was small and limited to manual mapping, cartography, and surveying. The available means of technology were also limited which changed with gradual introduction of digital mapping and surveying. Awareness spread as governments realized the importance of geospatial sector. It was just time when the geospatial sector was to just about to grow exponentially. It was in the year 1987, I was a faculty member at School of Planning, CEPT, Ahmedabad when one day the then Dean, CEPT, Dr. R. N. Vakil directed me to study Remote Sensing (RS) at IIRS, Dehradun. As an academician, Urban Planner, I found this course interesting and very useful. I was encouraged to start offering RS in Planning Syllabus in 1988 and later the Master's program in Geomatics at CEPT in 2008, pioneered to start first in entire state of Gujarat. I became involved in various activities of national and international professional societies representing academics in Geographical Information Systems (GIS) and RS. Additionally, organizing events on RS, GIS, Cartography with multiple activities; conducting field trips, popular lecture series, seminars on Industry-Academia Collaboration, and relevant other themes. I successfully encouraged, motivated, and mentored many students, researchers, and, colleagues in the geospatial technology knowledge domain. Today, I feel proud to have a large pool of my students advancing in this field as professionals engaged in governments, corporates, Non-profits, start-ups, and academics. GIS and RS are interdisciplinary domains assimilating various domains of science and finding applications in various fields. Through the years as I see, together with the efforts of many best minds in the country, the geospatial sector is transforming while growing leaps and bounds to

cater to the needs of the economy together with other allied, applied fields. It continues to attract many young minds which gives me a great sense of hope and confidence for a better future.

Q Emerging technologies like block chain, IoT, Artificial Intelligence have found many usages in different fields. What can you comment on them?

A The technologies like AI, IoT, and Blockchain are changing the way we function including the management and utilization of geospatial data. Indeed, with the emergence of such technologies, many fields are getting immensely benefitted. Blockchain technology addresses crucial data security and integrity issues by enabling create a secure and tamper-proof record of geospatial data such as land records, thereby increasing transparency and trustworthiness. The IoT offers the possibility to collect and analyze geospatial data on a real-time basis by integration of different devices, and sensors with the geospatial system. AI is instrumental in the automation of various tasks including the analysis and interpretation of geospatial data, thereby improving the efficiency in risk management and decision-making in various sectors. Such technologies have the potential to serve as tools for citizen empowerment, efficient governance, accountability, and environmental monitoring, as well as innovative solutions that ensure transparency, security, and accuracy.

Q What do you see as the biggest challenges & opportunities in the Indian GIS / Drone Industry?

A Geospatial sector is evolving rapidly, of which the use of drones is particularly very significant. Drones have emerged as time and space-efficient solutions across many sectors and may become widely adopted in near future. The growth possibilities are immense, especially in the fields of agriculture, defence, and infrastructure. Drones have the potential to be used to collect large amounts of data in their lifetime (despite in some cases needing initial high investment) thereby making it a cost-effective solution for high-quality geospatial data. There are many such advantages it offers, for example, the ability to operate in remote, inaccessible areas. The drone industry is at an inflection point offering innovative solutions in confluence with advanced technologies like AI and Machine Learning to deliver highly accurate and insightful observations. Though there are many opportunities it finds, the drone industry also has its own set of challenges to face. The skill gap and lack of availability of reliable professionals for drone operation and processing of data are foremost among many. Though there were many regulatory concerns, the industry is now able to overcome many regulatory challenges with the government easing the control regulations like in the recent drone policy. It is now much easier to get approvals and to use drones for commercial purposes now than ever before. Despite this, there are still some limitations in data handling, processing, and support which often may be a result of not-so-widely available, very expensive, and delicate-to-handle equipment like sensors, and imaging systems aboard drones.

Q What is your Opinion on recent National Geo Policy?

A National Geospatial Policy is a true game changer coming at the right time when the geospatial sector needed it the most. It is a futuristic bold step that has the potential to place India as a global leader in the Geospatial sector as it leverages all the potential thrust areas needed for the growth of geospatial data useful for national development. It attaches importance to various aspects of geospatial data like the need for open standards, data security, and data compliance to promote its more efficient use. It envisions creating a vibrant ecosystem that creates opportunities for all stakeholders and actively caters to national development in many allied sectors where geospatial data is crucial. The policy provides a comprehensive framework for the development and management of geospatial data including creation, sharing, and dissemination while recognizing the importance of innovation, and emerging technologies. The policy emphasized enabling data accessibility to users including government agencies, the private sector and citizens. This gives a boost to the digital economy where vibrant start-up ecosystem is possible. Governments also will be able to make better decisions in crucial sectors for economic growth including infrastructure creation, urban and regional planning, agriculture, and disaster response using geospatial data.

Q India is the second largest urban system in the world. How important is urban planning required in preparing smart cities and what type of challenges are there in implementation?

A India stands at an important juncture in the growth of urbanization. The urban areas are not only continuously expanding but also modernizing themselves. Fortunately, the key emphasis of governments and local bodies is on infrastructure. Improved amenities,

key facilities, efficient land use, and transport mobility will usher in growth in quality of life, and drive the local economies. This is important because many urban tier I, II, and III cities in India still suffer from inadequate infrastructure, unaffordable housing, traffic congestion, and environmental challenges as major issues. On the bright side, with more investment from governments, these are steadily improving. The success of urban planning lies in being citizen-centric and Geospatial technologies play a key role in offering solutions to the problems in urban areas. Urban planning is crucial, especially in the context of limited resources, shortage of space, and informal settlements which is the case with many cities in India. The recent trends in urban planning show the successful cases where the digitalization of urban areas like the use of the Building Information Models (BIM), City Information Models (CIM), energy-efficient buildings, immersive and realistic visualization, virtualization of the construction process, Digital Twins, sustainable infrastructure and monitoring systems-all of which use geospatial data.

Q What is your message to youngsters who wish to enter in the GIS/Drone industry?

A As a new entrant into the GIS/Drone industry, it is crucial for youngsters to develop the necessary key skills and fundamentals to stay relevant in the industry. In fact, it is more beneficial to develop a learning mind-set as a student itself. It is good to develop a sound knowledge of both theoretical subjects like, geography as well other practical, computational skills like, design, modelling, programming, and statistical data analysis. Emphasis should be laid on learning useful tools and technologies hands-on that find direct application in GIS / Drone industry. Youngsters need to update their skills and stay up-to-date with prevailing trends in the industry and prepare themselves to be adaptable to changing market needs. They need to build strong interpersonal communication skills and communicate with professionals, mentors, and peers so that collaboration is possible.

"Together, we all can work to achieve a sustainable geospatial ecosystem that has a 'place for everyone, connects everyone, and serves everyone' in making the world a better living place."

Prof Dr. Anjana Vyas can be reachable at - profanjanavyas@gmail.com

Q And to conclude on high spirits, could you list out your New Year resolutions for the development of our GIS / Drone Industry, society & Economy?

A As an academician with more than 40 years of experience, I still feel fresh, excited, curious, and enthusiastic at the prospect of not only exploring and learning new frontiers in the field but also exchanging more with students, industry, and governments. I believe there is so much more that is yet to be brought to the table and fostering collaboration across verticals is on my cards. One of my top priority resolutions is to encourage a sense of innovation and creative thinking in young minds. I have resolved to bridge the gaps between professionals, academia, and government agencies which is so important to me. I will continue advocating for an open, collaborative environment where sharing of knowledge and data between these groups is possible and benefits everyone. I will contribute to doing my part in the development of skilled individuals and hope that will somehow contribute to the betterment of society and the environment. I propose:

Esri Signs Space Act Agreement with NASA

The science community at large is undertaking critical work, researching solutions to the world's most pressing challenges, many of which require a geographic approach. The ability of scientists and researchers to make informed decisions related to these challenges—from natural disasters to climate change mitigation—relies heavily on accessible, authoritative geospatial data. To support these efforts, Esri, the global leader in location intelligence, has signed a Space Act Agreement with the National Aeronautics and Space Administration (NASA).

> We are at a critical crossroads for climate action, and it is imperative that the global community has access to authoritative data to do this vital work," said Jack Dangermond, Esri founder and president. "We are honored that this partnership with NASA will make its data accessible to the geospatial community so we can all do our part in working toward the health of the planet.

The agreement focuses on extending access to the broader global community of NASA's geospatial content for continued research and exploration—including new datasets from nearly 100 spaceborne sensors, measuring atmospheric health, land-based phenomena, and characteristics of the oceans. Partner efforts under this agreement will add to the existing NASA data in ArcGIS Living Atlas of the World, the foremost collection of geographic information and services, including maps and apps. NASA data will be increasingly available to more than 10 million users of geographic information system (GIS) software in ArcGIS and Open Geospatial Consortium, Inc. (OGC)-based formats.

Historically, geospatial data has played a key role in NASA's earth science research initiatives, which involve scientific efforts to monitor and study climate change. Additionally, GIS has been an essential tool for NASA in creating public resources such as NASA's Disasters Mapping Portal and the NASA Earthdata GIS, a centralized, cloud-native resource for distributing earth observation data, services, and resources.

"We want NASA data to be used by the broadest possible audience for good," said Gerald Guala, program scientist in NASA's Earth Science Division. "We appreciate Esri's vast community and are proud to take another step forward in making earth science data more accessible."

Hexagon announces new platform for defense mobile apps

Hexagon's Safety, Infrastructure & Geospatial division has introduced LuciadCPillar for Android, a platform for developing mobile applications for dismounted soldiers in the field. The new Android platform enables developers to build applications with 2D/3D views, featuring military symbology and supporting many geospatial data types, including vector data, raster data, elevation data, point clouds and 3D meshes – the same capabilities found in desktop, in-vehicle and browser applications built with LuciadLightspeed, LuciadCPillar and LuciadRIA.

IMPACT, a French system integrator, helped Hexagon test LuciadCPillar for Android and will integrate it into its DELTA SUITE product used by the French Special Operations Command. The DELTA SUITE allows the combination of geo-localized information with data from different sensors, which can be shared with all members of an operation.

"Our new version of DELTA SUITE integrating LuciadCPillar for Android is very stable, and its performance meets the requirements of the French Special Forces," said Stéphane Juigné, IMPACT founder and CEO. "We were impressed by its performance and how easily we could integrate its capabilities into our application. With the addition of LuciadCPillar for Android, DELTA SUITE will undoubtedly become a game changer for the Special Forces."

LuciadCPillar for Android offers capabilities to match the high-resolution screens, GPUs and multi-core processors offered in today's Google-powered smartphones and tablets, including the ability to display rich, high-performance 3D data in mobile applications. LuciadCPillar for Android supports ARM processors and an API that aligns with the Android developer experience.

"Luciad is the technology of choice for high-performance defense applications," said Mladen Stojic, president of Government, Transportation and Defense within Hexagon's Safety, Infrastructure & Geospatial division. "With the introduction of LuciadCPillar for Android, we have extended those capabilities to mobile applications used by soldiers in the field, where situational awareness is critical."

LuciadCPillar for Android was released as part of Luciad 2022.1, which is available worldwide now. For more information about Hexagon's geospatial platforms, visit their website.

VisionTrack sees Growing Demand for Video Telematics

VisionTrack, the leading AI video telematics specialist, achieved rapid growth during 2022, experiencing strong demand from commercial fleet operators both in the UK and internationally. The number of cameras connected to its award-winning IoT platform, Autonomise.ai, increased by 43 per cent, with the rapidly expanding US market now making up more than 10 per cent of the overall devices.

> Vehicle operators are increasingly targeting road safety, fleet risk and insurance improvements, so there are huge opportunities for us with our proven and industry-leading video telematics software," explains Simon Marsh, CEO of VisionTrack. "The functionality, scalability and capacity of Autonomise.ai is making it possible for us to develop sophisticated AI technologies. This is keeping us at the forefront of the marketplace.

VisionTrack also increased its global workforce by over 40 percent and doubled its operation in the US. Senior appointments were made to the company's management, professional services, and development teams, with particular focus on strengthening its computer vision and machine learning capabilities. As a result, VisionTrack was able to accelerate the development of innovative AI video telematics that automate management processes, data analysis and incident detection.

During 2022, VisionTrack continued to champion fleet safety, working with key partners – including Brake, Together for Safer Roads, and Driving for Better Business – to help reduce unnecessary road deaths and injuries. In particular, the company was a co-headline sponsor of Road Safety Week 2022, supporting the efforts of road safety charity, Brake, and launched its own Fleet Risk Reduction campaign that is engaging with vehicle operators to improve work-related road safety.

"Our video-enabled devices are now recording on average 4.0 million driver miles every day, equating to travelling the entire UK road network 16 times over. Furthermore, 35 billion data points a month are collected, as well as 63 million hours of video that would take over 12.5 lifetimes for the average individual to watch. By leveraging this information, we are gaining a unique understanding of vehicle journeys, traffic levels and driver behaviour, which is enabling us to continually push the boundaries of what is possible and support data-driven problem solving," concludes Marsh.

Introducing a new road lidar at GeoWeek 2023

XenomatiX, a true solid-state lidar company specialized in road asset management and digital twins of the roads, took a step-in easing 3D pavement measurement by introducing the Dual Lane lidar system, a solution built to guide road authorities in the decision-making for road works and road maintenance.

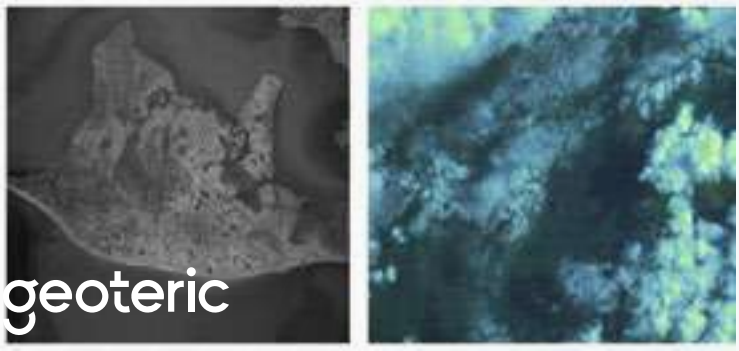
The Dual Lane lidar is designed to survey two neighbouring lanes in a single pass. While the vehicle drives in one lane, the system simultaneously measures the road surface condition of that lane and the neighbouring lane. All XenoTrack products including the Dual Lane system use an innovative, highly accurate lidar as main component, offering 3D and intensity maps of the road. Additionally, 2D RGB camera images can complement the 6D Road Survey concept.

Traditional road assessment systems are limited to measuring the width of one or part of a road lane on each pass while the Dual Lane lidar system allows a surveyor or road inspector to save time, resources, and budget by measuring two lanes in one go.

In 2022, XenomatiX launched the XenoTrack Single Lane system. Both the Single Lane and the Dual Lane systems fit on any standard vehicle, saving the customer the hurdle to invest in expensive and dedicated survey vehicles. The XenoTrack system is set up in no time and the measurement vehicle can drive faster than 70km/h, further increasing the efficiency, especially for highway measurements.

XenomatiX will be exhibiting the Dual Lane for the first time at Geo Week in booth #826. Additionally, XenomatiX is hosting a launch webinar on March 2.

First Earth Observation images from 'Menut' satellite received!



A little more than a month after its launch, the 'Menut', the second nano satellite placed in orbit by the Government in the framework of the NewSpace Strategy of Catalonia, has provided the first observation images of the Earth obtained from space: an infrared image (grayscale) of some marshes located near New Orleans, USA, and a colour image (RGB) of the clouds in Europe. On January 3rd 2023, Open Cosmos launched the Earth Observation satellite aboard SpaceX's Transporter-6 rideshare mission. The successful launch saw the satellite deployed and first signal received just a few hours later.

> Although it is still early days for the Menut satellite, the fact that we have received the first clear image from the onboard camera is fantastic validation, not only of this mission but also the ability of Open Cosmos to provide Earth Observation imagery. The whole team has worked incredibly hard over the past months to ensure this project is successful and having imagery a few weeks after launch is a great result. We will now continue to work closely with the customer on the rest of the tasks required in the mission.

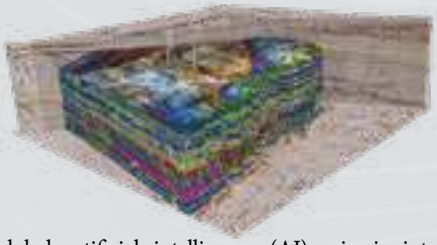
In the weeks after the launch, the Open Cosmos team continued this critical phase called LEOP - which stands for Launch and Early Orbit Phase. During this time, the team worked to ensure we could demonstrate good communication with the satellite on each pass, that the satellite was stable in orbit and that the satellite was in a power safe mode. This phase was successful and closed two weeks after launch.

Following LEOP, the team has now moved onto the commissioning phase, something that Mission Manager Jordi Castellvi calls 'waking up the children'. During this phase, each subsystem is tested individually to ensure its standard functionality is operational. Following this, the end to end functionalities (at satellite and mission level) are then tested. For the Menut satellite, the subsystems need to integrate in order to perform complex actions such as image acquisition, satellite pointing and data download. This will continue to be tested over the coming weeks with the view to signing off the commissioning stage mid-March.

Encouragingly, just one month post launch, Open Cosmos was able to share the first images from Menut with the customer: an infrared (greyscale) image of the swamps near New Orleans, USA, and a colour image (RGB) of clouds over Europe.

Mission Manager Jordi explains the significance of this event:

Geoteric launch the world's first customer-hosted AI seismic interpretation software



Global artificial intelligence (AI) seismic interpretation experts Geoteric are continuing to disrupt the market with another world-first software release. The new technology is game-changing for energy companies and will prove critical to operators; enabling them to de-risk well placement, reduce their environmental impact and increase profitability by better predicting future production.

Building on Geoteric's cutting-edge AI Fault Interpretation that accurately detects faults invisible to the human eye, the new release – Geoteric 2023.1 – now includes structurally-aware AI Horizons. The technology identifies every event from surface to region of interest in hours and comes at a crucial time for operators facing demands to fast-track production.

The software will be revolutionary for geoscience teams, enabling 100% interpretation of the data in a seismic volume, even in complex geology, in a very short time frame. This unique product – delivering results that have never been possible before - will be essential for the energy sector where shorter seismic interpretation time ultimately equates to assets being brought online safer and faster.

Geoteric 2023.1 continues to leverage the combination of geoscientist expertise with the guidance of AI. The new user-friendly workflows bring together AI Faults and AI Horizons, reducing the time it takes to make accurate volumetric calculations or create structural models with the automatic fault surface extraction tool and one-click transfer to 3rd party modelling software.

Nicola Blanshard, CEO at Geoteric said: "We're proud to be the first AI seismic interpretation provider to deliver these innovative capabilities to our customers around the world. Users will now be able to complete projects faster than ever before with no compromise on accuracy or quality, whether they need to understand compartmentalisation of their reservoir for better production prediction, de-risk future well placement or be able to quickly identify suitable and safe locations for carbon capture and storage (CCS) sites.

"Our customers asked for more transparent data consumption models and we listened. With 2023.1 we're offering unlimited access to the technology, and, as it can be installed on the desktop, users can be confident that no data need leave their IT security system.

"We believe that seismic interpretation is at its most powerful when human and artificial intelligence are combined, and this is true now more than ever. By reducing the time to complete tasks with no reduction in accuracy, our software enables companies to make better business decisions. We're literally, expanding their horizons."

Availability: Geoteric 2023.1 is available now, for more information get in touch - info@geoteric.com

Esri Releases New ArcGIS Reality Software to Capture the World in 3D

Business, government, and science organizations increasingly rely on drones, crewed aircraft, and satellites to capture imagery. Detailed imagery data provides visibility into operations and opportunities, unpacking information from every pixel and transforming static pictures into dynamic digital representations of the world. 3D models and high-resolution maps of construction sites, complex cityscapes, or entire countries allow these organizations to analyze and interact with a digital world that accurately shows places and situations as they are. Layered with geospatial information such as cadastral surveys, utility networks, building information models (BIM), and real-time sensor data, they become digital twins of reality. These enable better understanding of the world through analysis, asset monitoring, or even predictive simulation.

This need to capture reality as the foundation for digital twins is expanding the aerial imaging market, which is expected to grow from $1.4 billion in 2017 to over $4 billion by 2025. To further support this cross-industry trend, Esri, the global leader in location intelligence technology, is introducing ArcGIS Reality.

ArcGIS Reality is a family of products for site, city, and countrywide reality mapping—all using the new ArcGIS Reality Engine:

ArcGIS Reality for ArcGIS Pro—a new extension of Esri's flagship desktop GIS software, allowing users to input images from drones or crewed aircraft to generate 3D outputs for reality mapping.

ArcGIS Reality Studio—a new focused application for reality mapping from aerial images for entire cities and countries. A map-centric intuitive interface enables high production efficiency to deliver survey-grade representations of reality.

Site Scan for ArcGIS—Esri's cloud-based end-to-end reality mapping software for drone imagery, designed to simplify drone program management, imagery data collection, processing, and analysis.

ArcGIS Drone2Map—an intuitive desktop application focused on reality mapping from drone imagery, enabling offline processing and in-the-field rapid mapping.

> Digital twins have become a critical tool for many industries, and to be effective they rely on highly accurate and up-to-date maps and 3D models derived from imagery," said Jack Dangermond, Esri founder and president. "We are happy to offer this new family of products to the professionals who are digitizing our world to help us all better understand it—whether their operations are large or small, local or global."

Leica Geosystems announces performance upgrades for airborne deep bathymetric surveys

Leica Geosystems, part of Hexagon, announced the release of the Leica HawkEye-5, the new highly efficient airborne bathymetric LiDAR solution for deep water surveying. The upgraded technology increases survey efficiency by up to 25% compared to previous generations. The Leica HawkEye-5 expands the capabilities of the Leica Chiroptera-5 bathymetric LiDAR system, enhancing the productivity of applications such as nautical charting, environmental monitoring, and maritime surveillance in deep waters.

The HawkEye-5 is designed to fit the Leica PAV100 gyro-stabilised mount, which isolates the sensor from unwanted aircraft movements, resulting in consistent data density and more efficient area coverage. Greater flight efficiency leads to faster data collection and minimises the operational costs and environmental impact of each mapping project. Users can complete more projects in a shorter time frame, maximising their revenues and return on investment. The combination of the Chiroptera-5 with the HawkEye-5 features three LiDAR sensors, one 4-band camera and a QC camera. Each module is optimised for a specific task, allowing seamless acquisition of the highest quality geospatial data from land to deep ocean seafloors.

The HawkEye-5 fully integrates with Leica Geosystems' bathymetric data processing and analysis workflow, providing users with powerful tools from mission planning and execution to product generation. The LiDAR Survey Studio (LSS) software suite enables full waveform analysis, automatic data classification and advanced turbid water enhancement to support multiple applications. The new technology is available as an upgrade package to the owners of previous HawkEye systems, who can easily enhance their sensor capabilities for deep water bathymetric surveying while leveraging their initial investment.

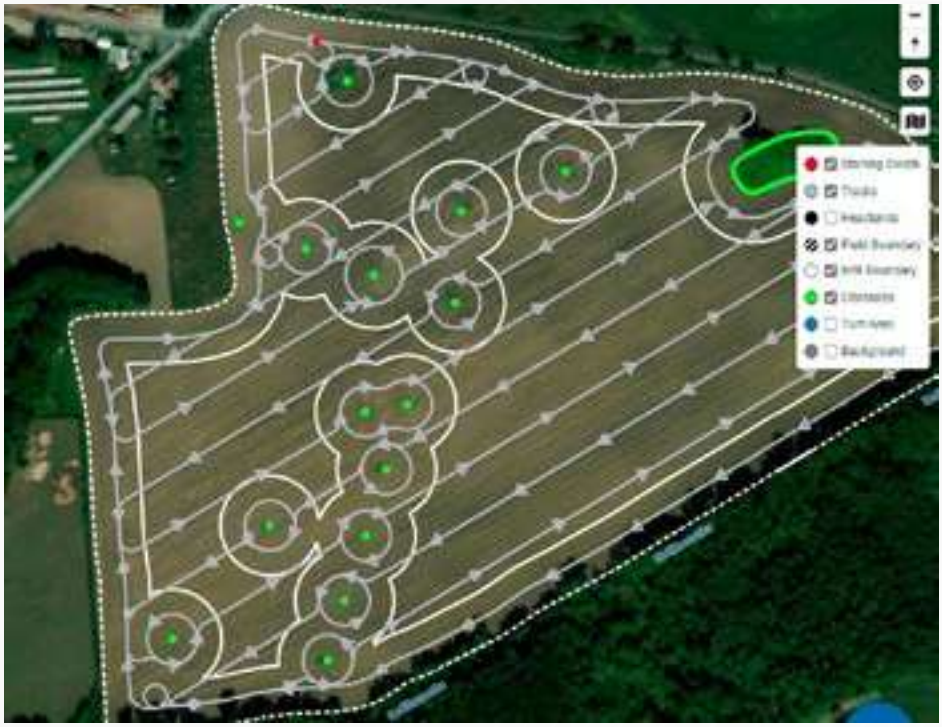
> "The HawkEye-5 is the world's only stabilised sensor performing advanced bathymetric surveys in deep waters", said Anders Ekelund, Vice President of Airborne Bathymetry at Hexagon. "Paired with the Chiroptera-5, the new system provides a comprehensive solution to efficiently address the most diverse application requirements, equipping customers to take on the challenges of the growing bathymetric market, and to optimise their financial outcome".

Trimble Announces Advanced Path Planning Technology, Taking the Next Step toward Fully Autonomous Equipment for a Variety of Industries

Trimble announced its new advanced path planning technology. This software-based technology gives Trimble end users and equipment manufacturers the ability to optimize and automate the trajectory, speed and overall path design of industrial equipment to increase efficiency of work. Manufacturers worldwide can now provide their customers with an easy-to-integrate, automated solution that works not only with Trimble systems, but also with an equipment manufacturer's existing system. The technology will also be available within Trimble Connected Farm and Trimble Construction Cloud, offering a seamless, end-to-end experience to Trimble end users.

Traditional path planning options require manual set-up, which impacts productivity, consistency and execution. By contrast, Trimble's advanced path planning technology offers automated, full path, complete project trajectory from entry to exit, including logistics points. The technology allows plans to be created in the office and adjustments made in the field or worksite. In addition, it is optimized for complex fields, unique site shapes, obstacles and avoidance zones.

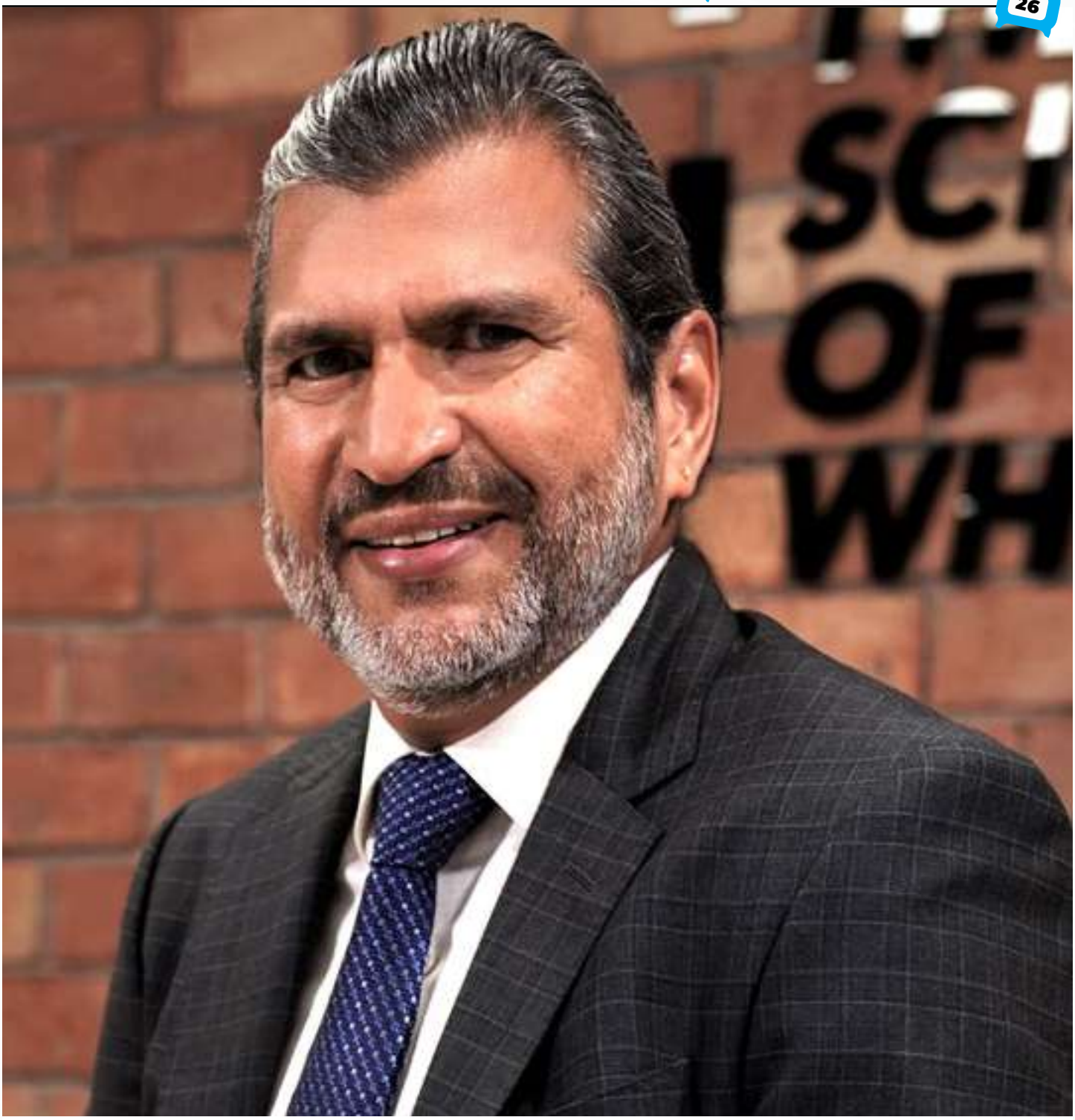
"Our new path planning technology is the next step in Trimble's vision of making fully autonomous solutions available across industries, regardless of brand, type of equipment or use case," said Finlay Wood, general manager, Off-Road Autonomy, Trimble. "With this easy-to-integrate solution, we've taken another significant step towards full autonomy. It enables our customers to reduce waste and simplify complex tasks, whether they are in the cab or not—part of our vision to meet operators where they are on their path toward fully autonomous solutions."



This new software capability will enable a broad range of autonomous applications across a variety of industries, including construction and agriculture. Once implemented, it can allow customers to meet their emerging product and operational goals no matter where each one is on the autonomy journey.

Trimble field tested the technology with HORSCH, one of the world's leading manufacturers of modern agricultural technology, integrating path planning technology into HORSCH's self-propelled PT and VL sprayer series to provide an autonomous, four-wheel-drive solution. Trimble is also currently field testing this technology with Dynapac, a leading supplier of high-tech soil and asphalt rollers, light equipment and pavers, as part of its autonomous compactor. This new technology was demonstrated at the Dimensions+ 2022 user conference in Las Vegas and BAUMA 2022 in Munich, Germany.

> Through our work with Trimble, we were able to test the latest path planning technologies in real-time on farms to understand how the technology performed in real-world environments," said Theo Leeb, managing director, HORSCH. "We had the opportunity to experience fully automated spraying for the first time ever. This is yet another example of how HORSCH is at the forefront of thought leadership for ag working practices. We're two high-tech companies changing the future.



Drones World Special Editor Dr. Pranay Kumar in coversation with

Mr. Agendra Kumar, Managing Director, Esri India

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

A National Geospatial Policy 2022 is a very enabling policy for the geospatial industry, user segments, and the country as a whole. The Policy is a concrete step taken by the government to make India a leader in the geospatial domain at the global level. The Geospatial policy has covered efficiently the overall geospatial spectrum, be it the creation of Geospatial Knowledge Infrastructure, geospatial education and skill development, formation of the Geospatial Industrial Development Board, incubation centers, or surveyors' registration and certification. It offers a complete bouquet that establishes geospatial as the key enabler of India's vision of a $5 trillion economy.

It is encouraging to observe that the Government is considering collaboration with private agencies at a larger scale for improvising the Geospatial information delivery. This will ensure continuous updating of existing datasets, meeting the requirement of manpower and technology, and avoiding duplication in data acquisition/ processing. The Policy sets the ground for further simplification of the rules and regulations for operating aircrafts and drones for the purposes of surveying. Easier regulations would eventually open up new opportunities for the drone industry as well as for enabling technologies such as GIS.

The Indian drone industry is exhibiting phenomenal growth, and this is a very positive indication for India's economic growth. India's UAV market is estimated to be worth $1.81 billion by FY26.

It is also encouraging to witness the Government's inclination toward utilizing this technology for achieving efficiency in various government projects, a major one being the Svamitva project, where drones are getting used for land mapping in villages and digitization of land ownership records. By manufacturing specialized drones for crop management to surveillance, emergency response and defense, India is creating exciting stories in drones. Add to that the potential of indigenous drone data processing platforms like Site Scan for ArcGIS, and India can surely become a global drone hub by 2030, as envisioned by the leaders of the country.

Q What are the key technologies/solutions provided by Esri India for the drone industry?

A Esri India offers 'Indo ArcGIS' which helps the integration of data from a variety of sources, these are satellite imagery, imagery captured by drones, information coming from IoTs, video feeds, textual information, etc. Data from different sources can be processed, shared and integrated into various applications seamlessly. Esri India offers the following solutions for drone users:

Site Scan for ArcGIS

- It is an **end-to-end** cloud-based drone mapping system.
- Helps users to maintain a **complete picture** of their drone inventory and flight history with automatic fleet management.
- Allows secure processing of imagery in a **scalable Cloud environment fully hosted in India.**
- Users can generate 2D and 3D mapping and analytics products from drone imagery.
- Provides access to Site Scan Flight app for autonomous drone flying.
- Provides a solution for Fleet Management.
- Users can publish data layers directly on ArcGIS Online and Enterprise.
- It can be seamlessly integrated with ArcGIS Pro, Online and Enterprise for advanced GIS workflows.
- Allows quick sharing of mapping and analytics products throughout the organization, on any device.

ArcGIS Drone2Map

- Allows immediate processing of drone images on a laptop or desktop computer.
- Analytics can be performed on natural colour, thermal infrared, or multispectral datasets.
- Provides ready to use templates for various kinds of processing for easy output generation.
- Users can:
- Generate vegetation indices and spectral profiles for multispectral imagery on the fly.
- Open project files directly on ArcGIS Pro.
- Publish data layers directly on ArcGIS Online and Enterprise.
- Create the outputs they need—including orthomosaics, 3D point clouds, and textured meshes.
- Outputs can be easily shared for greater collaboration and awareness.

Motion Imagery and Full Motion Video (FMV) for ArcGIS

- Provides capabilities for playing and geospatial analysis of video data that is FMV-compliant.
- Allows integration and analysis of video and metadata with traditional GIS datasets.
- Allows digitization of assets and points of interest on GIS maps directly from videos.
- Users can also work with streaming or recorded videos to make informed, timely decisions.

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

A Today, drone surveys are getting used in a large number of industries - land management, mining, power, roads and rails, water resources, forest, agriculture, and more. These drones collect volumes of data that need to be processed and analyzed effectively to get the desired insights. Another challenge with drone data is to manage, store and share it due to its high volume. Esri India's Site Scan for ArcGIS, hosted on a government-approved Cloud in India provides the much-needed manageability, reliability, scalability, and cost efficiency for drone data processing and analysis.
With our partnership with RailTel, we are better equipped to enable the government as well as the private sector to overcome the challenges of data management. With our end-to-end drone solutions and Indo ArcGIS Solutions and Data Products, we are looking at facilitating large-scale surveying and mapping projects by the Indian government, thereby enabling it to considerably save time and cost in executing various developmental projects.
Challenges arising out of unsafe IT infrastructure in organizations can also be overcome by moving to safe Cloud environments.
There also exists the challenge of skill shortage. Different kinds of technical resources and skills are required for drone surveys and processing the data captured. This becomes a challenge, especially in the wake of a shortage of skilled workforce in the domain. Site Scan helps in automated workflows for processing raw data and provides useful outputs like high-quality 2D and 3D imagery products that can be quickly shared throughout the organization. Site Scan integrated with Indo ArcGIS Enterprise also offers the capability of GeoAI, Deep Learning and advanced analytics to create valuable information on the drone-captured datasets.

Q Can you brief us on the advantages of using GIS, IoT, AI & ML and drone technology compared to old methods?

A The rapid technological developments in GIS have kept pace with the emergence of new and emerging technologies in the IT space, like Internet of Things (IoT), artificial intelligence (AI), machine learning (ML), deep learning (DL), augmented reality (AR), virtual reality (VR), Big Data, Digital Twin, and Web/Cloud.
In this way, GIS deployment on Web/Cloud is now enabling organizations to build enterprise geo-platforms hosting data, applications, solution templates and open APIs (application programming interface) serving a variety of users/purposes.
Esri has a lot of focus on using AI and machine learning, some of the capabilities are built within ArcGIS. We call it GeoAI. GeoAI helps in discovering patterns and relationships between different kinds of datasets. Through ArcGIS, we are offering a number of ready-to-use models that work with both vector and tabular data, imagery and text. We also integrate many open science libraries like Python and TensorFlow in applications like auto-detection and tracking of vehicles, point cloud classification, object detection, land cover classification, feature extraction, etc. This combination of AI and spatial analysis is helping

industries to simulate outcomes in diverse scenarios, and it's evolving in fascinating ways.

Q What are the key USPs of Esri Software?

A The key USPs of Esri software for drone data processing are the following:

- Seamless integration with ArcGIS Pro, Online and Enterprise for advanced GIS workflows.
- Powered with the best-in-class SURE engine for 2D and 3D modelling.
- Site Scan for ArcGIS is on a MeitY empaneled cloud and adheres to all government regulations for cloud data storage and processing.
- Lidar data captured from aerial, terrestrial and drone based sensors can be processed on ArcGIS Pro.

Q How Esri India supports start-up companies?

A Esri India runs a unique Start-Up Program that is designed to empower emerging businesses by providing them with technology support at an early stage. Under this program, selected software start-ups receive three years of access to Esri's ArcGIS Online services, software development tools, ready-to-use content, training & technical support, global partnership opportunities, and co-marketing to help them build mapping and location analytics capabilities into their products and businesses. The Esri Non-profit Organization Program (NPOP) is designed to provide qualified non-profit organizations with an affordable way to acquire Esri solutions.

Q Are there enough skilled individuals like Drone Pilots, Technicians as far as Drone Industry is concerned?

A The lack of a skilled workforce is definitely a cause of concern for the growing drone industry. Technological advancements in this realm are happening at a fast pace while training is limited. Lack of qualified personnel is stifling growth opportunities for the industry. There is a skills gap. This gap can be largely filled through partnerships between the industry and academia. Esri India offers numerous training programs to its users to facilitate easy and optimal use of the software and solutions. **We are also working with 800+ colleges and universities to skill students in the latest geospatial technologies. We are collaborating with academic institutes at all levels by way of learning resources, events, and training programs so that students can embark on successful geospatial careers.**

Q Finally, what is your perception about Indian Drone Industry & what are the pain points to be answered by 2030 to make India a real Drone Hub?

A Embedded with an array of sophisticated observation, mapping and sensing equipment, drones are increasingly getting used for diverse commercial and government projects across sectors. The Indian drone sector is expected to achieve a turnover of Rs 12,000-15,000 crore by 2026. The Government also emphasizes the importance of using drones as a means for effective governance and growth and advocates public-private partnerships to promote its use. Supporting this step are a number of policy and regulatory decisions under the Drone Rules 2021 and Guidelines for Acquiring and Producing Geospatial Data and Geospatial Data Services, which are aimed at fostering a vibrant drone manufacturing and services sector. One of the critical areas in which the liberalized geospatial guidelines will help immensely is developing 2D and 3D elevation maps of our towns and villages, which are essential for drones to operate BVLOS over long distances and secondly, these guidelines will permit the development of dedicated drone flight corridors thus making way for unhindered data collection. This is where the integration of GIS and drone data will play a critical role. Several sectors such as agriculture, insurance, logistics, entertainment and media, railways, and surveying and mapping, among others, are already taking advantage of the liberalized regulations and are leading the adoption of drones. There are several pilot projects underway in the agriculture and healthcare sectors to test the resilience of drones beyond visual line of sight (BVLOS) solutions. India has already undertaken the world's largest rural land mapping initiative under the SVAMITVA project, which is using drones for capturing data about land parcels. With the rollout of 5G, the Indian drone sector is expected to get another dose of booster shot. As the use of drones increases, there arises a need for solutions that provide a complete, end-to-end workflow for acquiring and processing drone imagery, processing the data and gathering useful insights from the same for informed decision-making. This is where market leaders like Esri India will continue to play a phenomenal role.

Telecom Shows Interest in Visual Intelligence's Revamped Engineering Class Drone Sensors Leveraging Sony Electronics' Alpha 7R IV Camera

Visual Intelligence, the first unified drone sensor and software platform capable of digitizing physical infrastructure at millimeter accuracy, is ramping up production on a new lightweight version of its patented Engineering Class drone sensor. The manufacturing increase is in response to renewed interest from the Telecom sector in an emerging category of drone data offerings that serve engineering workflows and benefit digital twin analysis across an asset's complete lifecycle.

Visual Intelligence was founded by Ted Miller, who is well known in the Telecom industry. Previously, Mr. Miller founded Crown Castle International Corp. (NYSE:CCI), a global wireless communications infrastructure company currently valued in excess of $80 billion, where he served as Chairman and CEO. Mr. Miller is currently also involved in various other Telecom-adjacent technology ventures.

"While drone technology isn't new to the Telecom industry, drone data that has engineering applications is unprecedented," said Ted Miller, Founder and Chairman of Visual Intelligence. "The industry is finally ready to switch out of analog-mode and embrace digital reinvention. As more companies discover the potential of Engineering Class 3D data, we're aligning ourselves with market leaders like Sony Electronics, who are equipped to grow and serve an international audience."

The latest version of Visual Intelligence's MACS-3D™ sensor features a compact and lightweight design that provides increased compatibility with smaller commercial class drones, including the popular DJI Matrice 300. The patented dual-sensor drone payload is equipped with two Sony Alpha 7R IV cameras that have been specialized for tower data collection. Visual Intelligence worked closely with Sony to integrate Sony Alpha-series technology into the sensor's unique dual-camera configuration, optimizing the setup for 3D reality model coverage and accuracy.

Visual Intelligence is currently engaging in Telecom projects with multiple tower companies across the Americas, Asia Pacific, Europe, and Africa.

> Sony Alpha camera technology combined with Visual Intelligence's automation platform and design for UAS payloads creates transformative, engineering-grade data for design, 3D modeling, inspection, and analysis of critical infrastructure," said John Monti, Director Industrial Camera Solutions, Sony Electronics Inc. "We value our relationship with Visual Intelligence as we explore the boundaries of image sensing combined with drone-based methodologies for photogrammetry.

Presagis Introduces VELOCITY 5D Plugin for Unreal Engine

Presagis, developer of the VELOCITY 5D (V5D) digital twin production platform, today announced availability of the V5D Plugin for Unreal Engine, the most powerful 3D computer graphics engine on the market. The plugin enables users to load a GIS-generated V5D digital twin into Unreal Engine to create highly realistic visualizations and simulations of entire cities and even countries.

"The primary application of the Unreal Engine Plugin will be in 3D visualization applications covering large geographic areas because of V5D's unmatched ability to produce 3D digital twins from massive geospatial data sets," said Jean-Michel Briere, Presagis President.

The most beneficial applications of the plugin will be in aviation, aerospace, urban planning, disaster preparation, and defense simulations that need to include expansive geographies. Visualizations that span long linear distances, such as the design of transportation routes and utility corridors, will also benefit. V5D for Unreal is the perfect extension of the scalable and highly automated, cloud based CDB production pipeline VELOCITY 5D. V5D for Unreal allow users to create custom visualization and simulation experiences in Unreal Engine while natively loading OGC CDB content produced by Velocity 5D platform or other OGC CDB compliant toolsets.

Release of the plugin is a win-win for existing users of both V5D and Unreal Engine, Briere explained. V5D users will be able to make powerful 3D fly-throughs and immersive simulations of their GIS-based digital twins. Unreal Engine users can now incorporate geospatially accurate cityscapes and terrains into their 3D experiences. Launched in November 2022 by Presagis, V5D is a cloud-based platform that quickly and automatically converts massive volumes of geospatial data into high-fidelity 3D digital twins. With no geospatial processing expertise, V5D users can easily produce accurate digital twins from multiple 2D data sets, including GIS vector layers, remote sensing imagery, and other structured and unstructured data of any size, format, or type.

Developed by Epic Games, Unreal Engine is the 3D computer graphics generator that powers many of the world's most popular and successful video games. Due to its vivid graphics and extremely accurate spatial presentation capabilities, Unreal Engine is increasingly being employed in other industries using 3D visualization and simulation technologies for improved understanding of current or future situations, risks and conditions.

FET Unveils All New VisualDVR System

Forum Energy Technologies (FET) has announced the release of its latest generation of video recording solutions for the survey and inspection of subsea assets. Version 11 (V11) of VisualDVR, a digital video recorder produced by FET's VisualSoft product line, marks a major step forward for the technology's capability and user experience. VisualSoft was originally launched in the early 2000s and has continued to be at the cutting-edge of developments in the technology.

In common with its predecessors, VisualDVR (V11) is a multi-channel, rack mountable digital video system designed for use on remote operating vehicles (ROVs), supporting activities in the energy, defence and ocean science sectors. The system can record up to four channels of HD video and is equipped with a host of tools and complementary applications to support real time documentation of the video images with data from subsea sensors and inspection personnel.

As part of the update, V11's user interface which has been completely modernised. Configuration of recording quality, data paths, input and output profiles can be accessed easily, and channels can be developed in a simple step-by-step process. There are also new tools to flag potential setting conflicts while improvements have been made to allow video overlay set up to be simpler. Andy McAra, FET's product director, said: "We are very excited about demonstrating the capabilities of our new VisualDVR system to our existing and future customers. Our team has worked tirelessly to select the most robust and capable hardware and to ensure our new software solution meets the complex and changing demands of the subsea industry.

"Our technology takes into consideration the challenges we may face in supply chain, and we believe any necessary changes to our hardware architecture will be more easily implemented than with our legacy system.

The new system is also supported by new hardware architecture. A proficient motherboard and high-end graphics card have been chosen alongside a leading-edge multi-channel video encoder card that has been selected for optimum performance and reliability.

FET's technology now has the capability to record four channels of HD Video at 1080p / 60fps from HD-SDI sources. As with the legacy VisualDVR system, files are encoded using H.264 format. A new higher compression option, H.265, is now included. Each channel can output HD-SDI video complete with video overlay. In addition to this, VisualDVR can now stream each channel of overlayed video over a network using UDP. A free network player will be available to allow these video streams to be easily viewed.

According to VisualSoft, it is expected that subsequent releases in the coming months will include a capability to stream video using an alternative protocol and also to output an HD-SDI signal using H.265. Testing of these options is currently ongoing while the ability to accept video from IP camera sources is in the test pipeline.

> The flexibility offered in terms of input and output options and encoding formats provided will undoubtably make VisualDVR more compatible with our customers' camera and client configurations. The system is also well equipped to be integrated into remote operational scenarios and we shall be working on additional tools in the coming months to provide further options to our clients.

Teledyne's New Ladybug6 Camera for High Accuracy 360° Spherical Image Capture is Shipping Now

Teledyne FLIR is pleased to announce its all new Ladybug6 360-degree camera is now in full production.

"We are excited to announce that our newest Ladybug camera is in production now and units are shipping immediately. The interest expressed by so many of our long-term customers has been astounding with order commitments made months in advance," said Mike Lee, Senior Product Manager at Teledyne FLIR. "For applications that require high accuracy imaging like high-definition mapping, road surveying, and asset inspection, the Ladybug6 gives users precision trigger control and resolution in a field-proven format unmatched by other manufacturers."

Ladybug6 is the industry's leading high-resolution camera designed to capture 360-degree spherical images from moving platforms in all-weather conditions. Its industrial grade design and out-of-the-box factory calibration produces 72 Megapixel (MP) images with pixel values that are spatially accurate within +/- 2 mm at 10-meter distance.

See our Ladybug6 on show at the following events:

Geo Connect Asia 2023: Mar 15-16, 2023 | Sands Expo & Convention Centre | Marina Bay Sands, Singapore

TEKEVER Expands AR5 UAS Capabilities with SAR Integration

TEKEVER, the European market leader in unmanned aerial systems and intelligence-as-a-service solutions, announces it has successfully added GAMASAR to its AR5 UAS. GAMASAR is a Synthetic Aperture Radar (SAR) designed and built by TEKEVER to support Aerial and Space-based Earth Observation, which is now available on both AR5 and AR3 systems to support the most demanding maritime and land missions.

Developed by TEKEVER's Space division, GAMASAR has the ability to detect multiple types of objects in all-weather conditions, making it the perfect tool to support maritime and land-based wide-area surveillance missions.

The integration of SAR payloads typically imposes a significant trade off in operational capabilities, especially in smaller UAS platforms. By having an integrated design approach between GAMASAR and its UAS product-lines, and having an extremely deep level of integration between the sensor, the platform and the rest of its sensors, TEKEVER is now able to offer unprecedented capabilities for both AR3 and AR5 in their respective UAS classes.

By adding GAMASAR to its payload package, the TEKEVER AR5 can now offer users a vastly increased operational performance, and the ability to effectively detect targets under any weather condition, day and night, over extremely wide areas. The combined usage of Ka/Ku Band SATCOM, capable of delivering more than 4Mbits in BRLOS, and GAMASAR, with up to 40km dual-side looking detection range, makes the AR5 an extremely effective tool for any type of wide-area surveillance mission. With an MTOW below 200Kg, and more than 12h of operational endurance, the TEKEVER AR5 is, by far, the most advanced system in its class, and can provide customers around the world with a highly mobile, simple to use and very cost effective tool to help deliver their mission.

Besides being already fully integrated on both the AR3 and AR5 platforms, TEKEVER's Space division is also developing GAMASAR versions to support micro-satellite constellations. By applying advanced AI capabilities to fused Space and UAS-based SAR data, TEKEVER believes it can provide customers with a deeper and more comprehensive understanding of all activities being performed in their regions of interest.

> TEKEVER's CEO, Ricardo Mendes commented: "Our SAR, which we decided to name "GAMASAR" in honour of the Portuguese navigator Vasco da Gama, was designed and built to enable our customers with the capabilities that are typically only available through much larger systems. With an extremely reduced logistics footprint and the unique capabilities provided by GAMASAR, the AR5 is a game-changer that provides our customers with tremendous value and cost effectiveness".

New Quanta Plus

SBG Systems has introduced the Quanta Plus, a next-generation GNSS-aided inertial navigation system (INS) in an OEM form factor. The compact and lightweight system combines a tactical-grade MEMS IMU with a high-performance GNSS receiver to deliver reliable position and attitude data even in GNSS-denied environments. Quanta Plus can be easily integrated with LiDAR or other third-party sensors in UAV (unmanned aerial vehicle)-based survey systems.

The system includes a wide range of features that make it easy to use and to customize for a variety of applications. Motion profiles allow users to optimize the sensor parameters to suit different use cases, while the built-in PTP server (Precise Time Protocol) ensures sub-microsecond synchronization with external devices such as LiDAR (legacy PPS synchro is still available). Additionally, Quanta Plus features a built-in datalogger, ethernet interface for seamless integration, and a user-friendly web configuration UI for simple setup and control.

Quanta Plus also benefits from easy integration within Qinertia, SBG Systems' state-of-the-art post-processing software. Qinertia improves the performance of data acquired during a mission using reliable RTK corrections from a wide range of CORS networks, or by importing base station data during the process. It also improves accuracy of the position and attitude using forward and backward processing and by integrating a tight coupling between GNSS and IMU data.

Qinertia also supports virtual base stations to support large-scale corridor mapping and mobile mapping applications. Specific solutions are available for integrators and OEMs who want to use Qinertia as a component in their data-processing products and workflows.

Hitec RDX2 1000 AC/DC Dual Port Charger & AD350 Discharger

RDX2 1000 AC/DC Dual Port Charger / Discharger / Power Supply With a sleek modern design and easy-to-transport handle, the RDX2 1000 is the AC/DC powerhouse you need to charge your high-capacity battery packs at rapid rates. The dual output ports each offer 20 amps of power to simultaneously charge two batteries of any chemistry; or, you can pair the outputs to charge at rates up to 35 amps.

The RDX2 1000 features an easy-to-use LCD interface display and handy push button controls, while the front-panel XT60 connectors and XH balance ports help keep wiring uncluttered. Its high charge and discharge rates for lowering resistance and improving power make it perfect for Stock Class racers. Accepting both 12V DC, and 100 – 240 volts AC, the RDX2 1000 is ideal for charging at home or in the field, and perfect for all hobbyists needing ultra-fast charging of their larger battery packs. Internal circuitry allows discharge rates up to 2 amps, and 40 amps when paired with the companion AD350 discharge module (sold separately).

Features:

- User-Friendly Interface
- Balance, Standard, Storage and Cycle Modes for All Lithium Battery Chemistries
- Battery Meter
- Internal Resistance
- Terminal Voltage Control
- Re-Peak Charge Mode and Delta-Peak Sensitivity for NiMH/NiCd Batteries
- Capacity Cut-Off Limit
- Smart Ventilation Fan
- Intelligent Power Distribution Between Ports
- USB-C Socket for PC Interface and Firmware Upgrades
- Programmable Power Supply Function 5-27V / 1-15A
- Tire Warmer Power Supply Output (16V/8A
- Technical Specifications:
- 100V – 240V AC Operating Voltage Range
- LiPo, LiFe & LiIon Cell Count: 1-6 Cells
- NiCd/NiMH Cell Count: 1-15 Cells
- Pb Lead-Acid Based Cell Count: 2-20 Volts
- Charge Circuit Power: 450W AC / 1000W DC
- Discharge Circuit Power: 10W (350W w/ AD350 Discharge Module)
- Charger Current Range: 0.1A – 20A x 2 / 0.1A – 35A Parallel
- PC Interface with Downloadable Software
- 12V Power Supply Mode Runs other Devices
- Dimensions: 7.5 x 6.0 x 3.9 in. / 190 x 152 x 99mm
- Weight: 3.0 lbs. / 1.36kg

AD350 Analyzer & Discharger

- The high-power AD350 is ideal for discharging and analyzing both Nickel and LiPo batteries. Its PC interface and higher capacity offer extended capability and convenience to help you maintain ultimate battery performance.
- Paired with the companion RDX2 1000 Charger discharge module (sold separately).
- Features:
- High-Power Analyzer Discharger for Cycling NiCd/NiMH & LiPo Batteries
- PC Interface with Downloadable Analyzing Software
- All Aluminum Case with Built-in Fan
- Technical Specifications:
- Discharge Power: 350W
- Discharge Current: 0.1-40.0A
- Over Temp. Protection: > 203°F
- Working Temp.: 32° ~ 104°F
- Dimensions: 6.2 x 4.1 x 3.7 in. / 158 x 104 x 94mm
- Weight: 2.7 lbs. / 1.22kg

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ComNav's latest 610T5 brings the enhanced reliability in ionospheric environment and greater functionality

ComNav Technology, a global leading provider of GNSS products and solutions announces the release of the 610T5 firmware for the K803 GNSS module. The newly introduced firmware version brings higher performance, PDP accuracy, support raw observation output from SBAS.

New features in version 610T5:

- The receiver update the RTK algorithm to optimize the ionospheric delay processing, and to improve the reliability in the complex ionospheric;
- The PDP single-point smooth accuracy is improved.
- Fast fix function (fixed coordinates) has been added to accelerate the RTK initialization speed;
- K803 can automatically filter and select IDs with multiple base station and various kinds of types of differential data to improve compatibility;
- RTCM data output signal-to-noise ratio is optimized. The data lower than 32dB will output to ensure the data quality of the base station. User can configure va command refsnrthresh XX, and the range is 15~44;
- The calculation of clock difference for base station is optimized to be compatible with base stations with clock difference;
- It is now possible to output raw observations of SBAS as L1C is turned on by default
- PVT library is updated

TDK expands the Tronics AXO®300 series with two types of high-performance digital MEMS accelerometer sensors

TDK Corporation announces the extension of Tronics AXO®300 accelerometers platform with two new products. After the successful production launch in 2020 of the ±14 g AXO315 accelerometer for high-performance navigation and positioning of dynamic systems, Tronics extends the AXO300 accelerometer series with AXO301, a low-noise and high-resolution ±1 g accelerometer for high precision acceleration/deceleration measurements in railway applications and inclination control in industrial applications, and AXO305, a ±5 g accelerometer tailored for navigation, positioning, and motion control of land and marine manned and unmanned systems. Built with an innovative closed-loop architecture that delivers high linearity and stability even under strong vibrations, the accelerometers from the AXO300 platform feature an excellent one-year composite bias repeatability of 1 mg and composite scale factor repeatability of 600 ppm.

AXO301 High-Resolution Accelerometer and Inclinometer for Railway and Industrial Systems

AXO301 is a low-noise, high-resolution, closed-loop digital MEMS accelerometer with ±1 g input range that offers a performance-equivalent, low-SWaP (Size, Weight and Power) and cost-effective alternative to force balance inclinometers and servo-accelerometers. It demonstrates an ultra-low noise density of 8 µg/√Hz with an excellent 50 µg resolution to offer high-accuracy inclination angle measurements. AXO301 is tailored to odometry assistance for train positioning and localization systems, high-end industrial tilt and inclination measurements systems as well as motion control of construction machinery. The AXO301 is compliant with EN61373 railway standard for vibrations and shocks.

AXO305 High-Performance Accelerometer for Land, Marine and Robotics applications

With an input measurement range of ±5 g and vibration rectification error of 20 µg/g², AXO305 is tailored to navigation, positioning and motion control functions of land, rail and marine transportation systems and vehicles.

It demonstrates a Bias Instability of 4 µg with a ±0.5 mg bias over its temperature range, thus enabling precise GNSS-aided navigation of manned and unmanned ground vehicles and trains when integrated into Inertial Navigation System (INS). AXO305 is a perfect candidate for Motion Reference Units (MRU) used for ship motion control and dynamic positioning, Inertial Measurement Units (IMU) for land navigation, subsea navigation of AUV (Autonomous Underwater Vehicles) and ROV (Remotely Operated Vehicles), platform and crane stabilization as well as precision robotics.

Miniature and robust accelerometers for systems operating under vibration conditions

The closed-loop architecture of Tronics AXO300 platform offers high resolution and strong vibration rejection. Accelerometers and inclinometers from the Tronics AXO300 series are housed in a miniature, hermetic, ceramic J-lead package that ensures long operational and storage life and guarantees a high compliancy with the stringent thermal cycling requirements of critical applications. They embed a fully hard-coded electronics with a 24-bit digital SPI interface for a swift integration into stand-alone sensor modules, INS, IMU as well as Attitude and Heading Reference Systems (AHRS). The built-in self-test ensures initial verification of the sensor's integrity and continuous in-operation functionality test.

Low-SWaP and cost-effective high performance accelerometers

Thanks to their common sensor's architecture, miniature package and low-power consumption, Tronics AXO315, AXO305 and AXO301 accelerometers offer a digital, cost-effective and low-SwaP alternative to bulky, expensive, and power-consuming analog solutions like tactical-grade quartz accelerometers. AXO300 accelerometers are ideally complemented by high performance Tronics GYPRO® digital rate gyros that share the same SMD J-lead ceramic package (12 x 12 x 5 mm) and same digital interface to enable low-cost integration, assembly, and reliability on PCB, even in fast-changing temperature conditions.

AXO315 volume production started in 2020. AXO301 and AXO305 are now available for sampling and customer evaluations, directly at Tronics or through specialized distribution channels like Texim. Swift evaluation of the sensors can also be made with an Arduino-based evaluation kit that provides built-in testing functionalities such as output reading and recording, recalibration, and digital self-tests.

Drones World Special Editor Dr. Pranay Kumar in coversation with

Mr. Anil Kumar Ojha, Head - Technical Services, TPWODL

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 TPWODL to implement GIS and Drone project in better way?

A National Geospatial Policy (NGP) 2022, is making India a world leader in the Global Geospatial Sector. India's geospatial economy is expected to cross Rs 63,000 crores by 2025 at a growth rate of 12.8% and to provide employment to more than 10 lakhs people.
With the National Geospatial Policy, the government aims to employ geospatial technology and data towards achieving Sustainable Development Goals (SDGs). The policy emphasizes the importance of locally available and locally relevant maps and geospatial data. 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 policy will create a strong geospatial infrastructure underpinned by integrated data and information framework. This will help TDWOPL to work better and with more accuracy.

Q Can you brief us on TATA POWER WESTERN ODISHA DISTRIBUTION LIMITED upcoming projects in WESTERN ODISHA? What are the challenges you have faced while implementing GIS & drone technology in GIS Mapping of distribution and transmission lines? Can you brief us on the advantages of using GIS, IoT, AI & ML and drone technology compared to old methods? At present or in near future do you have any specific requirement of GIS, IT, AI-ML & drones for POWER SECTOR?

A As you all know TPWODL has a vast area to serve

approx. 48 373 square km area. There are many challenges with distribution when we take over the WESCO, distribution network is in Jan 2021. There was no concept of asset mapping and consumer indexing w.r.t network connectivity hence there was strong need for deployment of GIS in short span of 2-3 years therefore conventional approach of GIS mapping need latest 7-8 years therefore TPWODL since inspection was looking for use of advance technology to collect accurate, authenticated, digitally to ensure smooth deployment of GIS in western part of Odisha. The drone technology has helped us to eliminate lat/long in accuracy, data attribute collection and quality check accuracy. Another site, O&M preventive activity requires collection of defects and as per traditional approach 7-8 peoples are going on field for defect identification. They need to take power outages to climb on poles and check all the assets and then note down the defect list. With the help of drones, we are able to do feeder audits and collect minute information required for maintenance activity.
In near future all the preventive active maintenance will be performed under drone survey reports with thermal monitoring of each network in TPWODL. Additionally, Disaster management and surveillance will be planned in selected areas of operation with drone technology. TPWODL is aggressively working for technology deployment to cater major operation challenges and Drone is one of them. This is helping us for quick GIS deployment, quality inspection of project work and O&M activity. The AI and ML is helping to a great extent for data processing, bringing higher accuracy and eliminating human error hence digitalisation in quick time.

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

A As TPWODL geography covers paddy fields, forest, hill and many river crossing hence the traditional methods will be a less acute and assumption based mapping as we know access to that location of asset will always be a challenging task and bring accurate data will be difficult assignment however drone can fly anywhere irrespective of demography or geography and help to bring actual information for business use.

Q What are the other use cases of Drones can be implemented by TPWODL in near future? Can you brief your past experience on GIS & Drone?

A Drone has multiple use case in Distribution such as O&M inspection, quality of project work execution, open area theft detection, paddy filed meter reading, announcement system in rural area for any scheme and assessment of damage during disaster. As we started drone for GIS, we struggle for conceptualizing, understanding limitations, incorporating learning and finally getting the data which requires for successful deployment with AI/ML approach.

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 boon or bane for the industry?

A As emergence of a lot of drone companies in India, it is good to

SUSPICIOUS PUMP CONNECTIONS WITHOUT METERING POINT CAPTURED @ SOHELA, BARGARH CIRCLE

SUSPICIUOS POINT FOUND DURING LI POINT FIND @ SOHELA

SUPICIOUS LINE CONNECTION FROM POLE

TWO LT LINES CROSSING NEAR POINT, ONE WITH MORE THAN 50 METER SPAN

have entrepreneurs in our developing country of India. Lot of companies are providing mapping and surveying services but also there are many start-ups who are manufacturing Drones under MAKE-IN-INDIA project which is a very good approach there. On Quoting for Tenders at lower prices, low price does not means to compromise with their quality and features. When you are setting a new business at start you should focus on quality, services, and innovations. "Great things take Time" but it also take money as well, so quoting for tender at lower price is not a problem however this should not be on cost of quality.

Q Finally, what is your perception about Indian GIS & Drone industry & what are the pain points to be answered to make india as real drone hub? Anything else you would like to comment on the GIS & drone sector potential and growth in the country?

A As GIS is concern, this is a mandatory enabler for any moder Distribution company to optimes assets, resource and substance however up keeping and regular upgradation of GIS need robust process and discipline within Distribution company or organization and another side, Drone can be a game changers for vast geographic distribution company for utilizing use case as mention earlier. Now a days, drone can be utilize any sector such as agriculture, Distribution, law and order etc. on growth prospective, there are huge potential and we are witnessing high traction in this industry.

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

A As far as Drone is concerned, this is" pawan putra" in our era. now our new generation has to craft this as robust, accurate and easily available to masses for bring new use cases in our daily life. this can be game changer in logistic delivery, surveillance, agriculture etc. As a entrepreneurs prospective, I see huge potential to tap in Indian market however need focused approach and develop expertise on few segment rather covering all in same time span.

Migrated data with Section Boundary

Land base data with drone image

Babcock and IAI Announce Collaboration to Develop RPA Applications for Police, Emergency Services, Maritime Surveillance

Babcock Australasia (Babcock) and Israel Aerospace Industries Ltd (IAI) have signed a Memorandum of Understanding (MoU) to pursue remotely piloted aircraft (RPA) solutions for law enforcement, maritime surveillance, and disaster management applications in Australia. With the signing of the MOU, Babcock and IAI are planning to undertake a series of in-country demonstrations of two of IAI's unmanned aerial systems, the WanderB-VTOL and ThunderB-VTOL this year. As part of this demonstration they are engaging with State and Federal government law enforcement, emergency services and national security agencies to refine a range of practical operational concepts to prove the capabilities.

IAI's VTOL unmanned aerial vehicles (UAV), provide important benefits for land and maritime applications as they combine the advantages of a fixed wing UAV (long range, long endurance, high speed, wind independency, large area coverage, etc.) with the advantages of a multi-copter. The company has over 250 WanderB-VTOL and ThunderB-VTOL systems in use by customers around the world. Babcock's Director of Aviation and Critical Services Peter Newington, said the new partnership with IAI will allow Babcock to offer 'blended operations' combining crewed rotary wing and fixed wing aircraft with uncrewed RPAs.

"This partnership with IAI is about bringing together solutions that are the best fit for our customers, integrating our rotary capabilities with RPAs to deliver the most effective and cost-efficient solutions.

"The addition of autonomous systems reduces operator workloads and augments existing capabilities with flexible, rapidly deployable, long endurance assets for law enforcement, maritime surveillance, disaster management or environmental situational awareness.

"The platforms are readily configurable to provide appropriate sensors for the task at hand coupled with the ability to distribute video and other user critical data in near real time across end-user networks.

IAI Australia Managing Director, Mr Yonatan Segev said the partnership between IAI and Babcock would provide vital intelligence and situational awareness in real-time to the end-user, allowing them to effectively execute various missions while keeping the operators out of harm's way.

"IAI's systems have been tested in extreme environmental conditions and comply with the end user's operational needs, providing them with significate operational advantages.

"From the Tactical WanderB-VTOL and ThunderB-VTOL systems to the medium-altitude long-endurance (MALE) Maritime Heron, IAI looks forward to bringing the most advanced technology together with our partners in Babcock to offer unique operational solutions to customers."

VP&GM Malat Division IAI, Meir Shabtai, said "For four decades IAI has occupied a position as the pioneer and leader in the field of unmanned aerial systems, offering a broad range of strategic and tactical UAVs. Technological developments in the UAV field include Artificial Intelligence capabilities, integration of a wide range of sensors, and a precise real-time intelligence picture.

"I welcome our collaboration with Babcock, which is hugely important from both the viewpoint of Australia's security and from the technological side, in terms of sharing both knowledge and technology." The two companies will be attending Avalon 2023 – the Australian International Airshow Aerospace and Defence Exposition – where they intend to engage with industry on this concept and upcoming demonstration.

> "Importantly, a key element of our offer to state and federal government agencies is that Babcock already holds a Remotely Piloted Aircraft Operator's Certificate (ReOC) which will allow us to operate RPAs like the WanderB-VTOL and ThunderB-VTOL in Australia," Mr Newington said.

Teledyne FLIR Defense Wins $13M Pentagon Contract for Remote CBRN Detection Using Autonomous Drones

Teledyne FLIR Defense, part of Teledyne Technologies Incorporated announced that it has been awarded a $13.3 million contract by the U.S. Department of Defense to further expand the capabilities of its R80D SkyRaider™ unmanned aerial system to autonomously perform chemical, biological, radiological and nuclear (CBRN) reconnaissance missions.

Teledyne FLIR Defense will integrate flight control software that enables the SkyRaider Unmanned Aerial System (UAS) to autonomously fly CBRN missions currently performed by soldier's hand-carrying detection sensors into hazardous areas. Blending the new technology with Sky Raider's existing capabilities will allow soldiers to complete these missions without directly controlling the drone – and without exposing themselves to toxic substances. Teledyne FLIR also will design and build prototype chemical and radiological sensor payloads for the R80D SkyRaider, as well as integrate existing detectors in the U.S. Army's inventory. This effort builds on three years of investment by several joint program offices to develop new and improved UAS capabilities for CBRN missions.

"For many good reasons, militaries are shifting their CBRN defense strategy from manned to unmanned platforms," said Dr. David Cullin, vice president of technology and product management at Teledyne FLIR Defense. "Employing unmanned air and ground assets to assess risks from weapons of mass destruction is an increasingly sought-after capability. We'll continue our customers' important work to enhance situational awareness for mounted and dismounted operations, enabling greater maneuverability on future CBRN-contested battlefields.

> This project also complements our existing portfolio of CBRN sensing drone payloads – the MUVE™ C360, MUVE B330, and MUVE R430 – all of which allow users to remotely detect and identify a broad spectrum of potentially lethal threats," Cullin added.

Both the autonomous SkyRaider and the new sensor payloads will be designed to operate with the command and control user interface for the U.S. Army's Nuclear, Biological and Chemical Reconnaissance Vehicle (NBCRV) Stryker platform, for which Teledyne FLIR Defense is the prime systems integrator.

For the base contract, Teledyne FLIR will deliver four SkyRaiders and six of each sensor payload, with options to support training, documentation, plus the delivery of additional UAS and payloads. The award was made through the Joint Program Executive Office for Chemical, Biological, Radiological, and Nuclear Defense; Joint Product Manager for Reconnaissance and Platform Integration (JPdM RPI); and the Chemical, Biological, Radiological, and Nuclear Sensor Integration on Robotics Platforms Program Office (CSIRP). Initial deliveries are scheduled for fall 2023. The contract period of performance is 33 months, if all options are exercised.

GA-ASI Flight Tests LEO SATCOM on MQ-9A

On Dec. 22, 2022, General Atomics Aeronautical Systems, Inc. (GA-ASI) and the Air National Guard (ANG), with joint support from the U.S. Marine Corps (USMC) and U.S. Air Force (USAF), flight tested an MQ-9A remotely piloted aircraft (RPA) equipped with a Low Earth Orbit (LEO) satellite communications (SATCOM) Command and Control system. This groundbreaking capability provides global coverage and connectivity that will enable pole-to-pole operations for GA-ASI's family of RPA – including models such as the MQ-9B SkyGuardian®/SeaGuardian®, MQ-9A Reaper, and Gray Eagle 25M.

"This is truly game-changing for our platforms," said GA-ASI President David R. Alexander. "Using LEO SATCOM not only keeps GA-ASI aircraft connected from the North Pole to the South Pole to allow operations in the most austere environments, but it will also provide resilient connectivity that allows operators to pass much more data to and from the aircraft."

Early testing indicates LEO SATCOM significantly reduces latency and can be used in all phases of flight. For customers across the MQ-9 family of systems, LEO SATCOM should decrease operational costs, and the smaller hardware footprint will ultimately increase flexibility and reduce future payload integration costs.

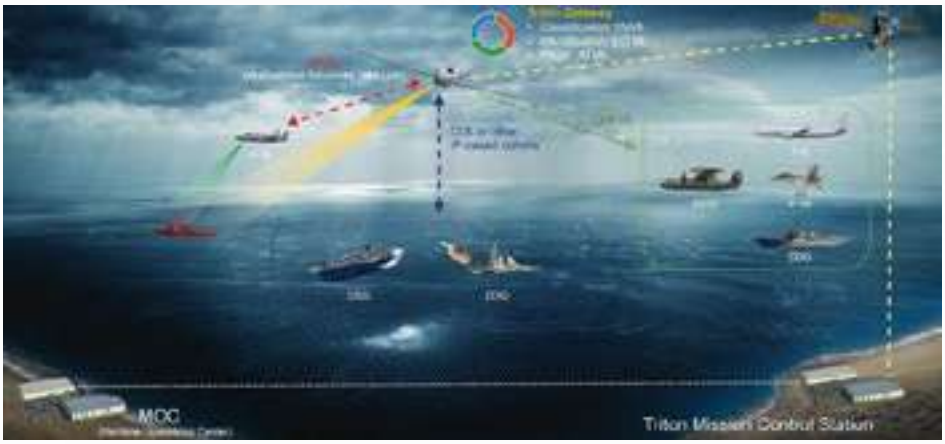
The MQ-9A flight test was based out of GA-ASI's Gray Butte Flight Operations Facility near Palmdale, Calif., and followed several weeks of ground testing.

NGC Connects Distributed Platforms across Domains

Northrop Grumman Corporation successfully demonstrated its gateway technology in a flight test that proved the ability to connect airborne platforms with naval assets. The first-of-its-kind demonstration was conducted with Naval Air Systems Command, Office of Naval Research, Naval Information Warfare Center Pacific and BAE Systems.

"Our gateways provide an open, secure and resilient solution needed to enable information advantage for our customers," said Ben Davies, vice president and general manager, network information solutions, Northrop Grumman. "This powerful combination expands the mission sets of maritime platforms to deliver a seamlessly connected fleet – a critical step as the U.S. Navy achieves its naval operational architecture to enable distributed maritime operations."

Equipped on Northrop Grumman's MQ-4C Triton Flying Test Bed, the airborne gateway shared fifth-generation sensor data to ground-based simulators that represented an F-35, an E-2D Advanced Hawkeye, U.S. Navy Aegis class destroyers and carrier strike groups. The gateway integrated with Triton's



radar and artificial intelligence and machine learning capabilities to significantly enhance situational awareness across previously disconnected platforms. The addition of the gateway on Triton expands data sharing and will improve the warfighter's ability to stay ahead of the adversary and make decisions faster across a vast and diverse environment. Northrop Grumman recently demonstrated another gateway solution and also unveiled Australia's first Triton. Northrop Grumman's family of systems brings enhanced interoperability between joint and coalition forces across air and sea.

> Triton's altitude, persistence, and robust communication links make it an ideal candidate to host the Gateway system," said Jane Bishop, vice president and general manager, global surveillance, Northrop Grumman. "This demonstration highlighted gateway technology enhancements to Triton that would enable information dominance across distributed maritime assets; including access to the F-35's robust sensor suite and the E-2D's battle management capabilities.

HAL Will Provide MRO Support for GA-ASI MQ-9B Turbo-Prop Engines

General Atomics Aeronautical Systems, Inc. (GA-ASI) and Hindustan Aeronautics Limited (HAL) have jointly announced that turbo-propeller engines, which power GA-ASI's state-of-art MQ-9B Remotely Piloted Aircraft System (RPAS), will be supported by the HAL Engine Division at Bengaluru for the Indian market.

"GA-ASI is proud to collaborate with HAL on this prestigious project," said Dr. Vivek Lall, Chief Executive, General Atomics Global Corporation. "HAL is the foremost Indian public sector Aerospace and Defence agency, and its vast experience in the domain of aero-engine technology makes it our natural partner in India."

Though the turboprop engine fitted onboard the MQ-9B RPAS looks similar to other commercial engines in its category, it

is unique in its configuration and operation, requiring special training and equipment to maintain, repair and overhaul.

The Expression of Interest was exchanged in presence of Mr. C B Ananthakrishnan, Chairman and Managing Director, HAL and Mr. Mihir Kanti Mishra, CEO (Bangalore Complex), between Dr. Vivek Lall, Chief Executive, General Atomics Global Corporation and Mr. B. Krishna Kumar, Executive Director (Engines & IMGT).

"HAL has been manufacturing and providing MRO support for TPE 331-5 engines for the last 40 years. We are also establishing facilities for manufacturing TPE 331-12B engines for HTT-40 project. The engine used on the MQ-9B RPAS belongs to the same family of engines with upgraded configuration to adapt to the RPAS technology. I am glad that HAL Engine Division, Bangalore would be providing MRO support to the engine for MQ-9B RPAS, one of the most sophisticated equipment in the world," said Mr. C B Ananthakrishnan, Chairman and Managing Director, HAL.

GA-ASI and HAL eagerly look forward to formulating a comprehensive engine MRO program for upcoming RPAS projects. This joint collaboration echoes India's clarion call for 'Atmanirbhar' or 'Self-Reliance', while underscoring the deep industrial connection between U.S. and Indian Aerospace Companies.

GA-ASI Partners with Divergent Technologies, Inc

General Atomics Aeronautical Systems the world's leading manufacturer of Unmanned Aircraft Systems (UAS), radars, electro-optic and related mission systems, is partnering with Divergent Technologies, Inc. (Divergent) to support its Additive Manufacturing applications development efforts and implement a full digital manufacturing process for GA-ASI's products. Divergent has developed a data-driven approach to design, fabricate and assemble vehicle structures called the Divergent Adaptive Production System (DAPS). GA-ASI is working with Divergent to apply this capability to manufacturing its line of UAS.

"Throughout our 30 years of designing and developing advanced UAS, GA-ASI has been focused on implementing new capabilities into our manufacturing process," said GA-ASI President David R. Alexander. "We're working with Divergent to integrate their technology as part of our Additive Design and Manufacturing Center of Excellence strategy, with the goal of optimizing our design and manufacturing processes and providing next generation UAS at the lowest cost."

In 2022, GA-ASI began a joint development program with Divergent, which led to a stronger strategic partnership on multiple platforms. GA-ASI's Additive Manufacturing (AM), aircraft integrity, material and design engineering teams are working with Divergent to adapt, apply and qualify its automobile industry-qualified technology to GA-ASI's aircraft production. Divergent has grown within the automobile sector as a Digital Manufacturing process innovator, producing some of the fastest cars on the market with several recent car OEM adoption announcements.

GA-ASI and Divergent have already completed two projects leading to a fully integrated small (< 500 lbs.) UAS aerostructure, leveraging model-based, Artificial Intelligence (AI)-driven, and topology optimized designs. The integrated metal structure was 3D printed, which led to the reduction of the part count integration by over 95% while meeting weight targets. The DAPS process inspected each printed components by creating a full digital twin of the small UAS (SUAS) that was then applied to a fully automated, tool-less robotic assembly process that took less than 20 minutes to complete. This process enabled the team to go from a print-ready SUAS design to a fully assembled deliverable airframe in less than two days. GA-ASI anticipates this capability will enable near-theater ramp capacity in the future to support the warfighter.

This innovative approach to design and manufacturing leads to highly integrated weight and performance-optimized designs that are naturally, but not exclusively, leveraging AM technologies at a substantially lower airframe recurring cost, while providing a rapid tool-less iterative design approach for multiple platform variants

> "Divergent has invented the first industrial digital manufacturing system. Leveraging innovations in artificial intelligence, 3D printing, and automation, DAPS can be used to build the underlying structure for virtually any vehicle – whether land, sea, air, or space – better, faster and more cost efficiently than traditional manufacturing," said Kevin Czinger, Founder, Lead Inventor & CEO of Divergent.

BAE Systems successfully tests Lockheed Martin Skunk Works®' small unmanned aerial systems on ACV C4/UAS

BAE Systems and Lockheed Martin Skunk Works® conducted a successful test of the Stalker and Indago small uncrewed aerial systems (UAS) on an Amphibious Combat Vehicle Command, Control, Communication and Computers/Uncrewed Aerial Systems (ACV C4/UAS) variant. Both UAS will provide unprecedented, long-endurance reconnaissance capabilities to support the U.S. Marine Corps' expeditionary warfare and battle management capabilities aboard the ACV C4/UAS.

"We're focused on giving Marines an advanced technology solution to meet their reconnaissance requirements," said Mark Brinkman, program manager for ACV design and development. "That's why we're teamed with companies like Lockheed Martin—to provide Marines with the best possible capabilities for their expeditionary needs."

BAE Systems tested Skunk Works' Stalker and Indago UAS along with a number of other technology suppliers as part of contractor verification testing, a key event in the ACV C4/UAS program's lifecycle. Now that contractor verification testing is complete, the Marine Corps will conduct its own series of tests to evaluate if the ACV C4/UAS is a capable and cost-effective Government off the Shelf (GOTS) solution for the Advanced Reconnaissance Vehicle (ARV) program.

Skunk Works' Stalker and Indago UAS provide industry-leading endurance, a broad operating envelope, and an open systems architecture to allow them to execute diverse and demanding missions while maintaining a small operational footprint and crew requirement.

"Collaboration with our SOCOM and Marine Corps customers and industry partners has enabled the rapid development of needed capabilities for the warfighter – as exemplified through this partnership with BAE Systems," said Jacob Johnson, Skunk Works UAS and Attritable Systems director. "By integrating Stalker and Indago on BAE Systems' ACV platform, we are delivering greater mission flexibility in a small form factor that supports Marine Corps operations."

BAE Systems' ACV C4/UAS vehicle is a Mobile Systems Integration Lab (SIL) built to demonstrate the transformational technology Marines need to conduct reconnaissance, surveillance & acquisition capabilities, including the ability to sense and communicate targets over the horizon using cutting edge C4 systems. Skunk Works' Stalker and Indago UAS are some of the technology components that the ACV C4/UAS employs to achieve this goal.

DARPA, Services Demo Battlefield Airspace Deconfliction Software

DARPA's Air Space Total Awareness for Rapid Tactical Execution (ASTARTE) program recently demonstrated new automated flightpath-planning software that successfully deconflicted friendly missiles, artillery fire, and manned and unmanned aircraft while avoiding enemy fires in a simulated battle in contested airspace. In a demonstration held at the U.S. Army's Mission Command Battle Lab, Ft. Leavenworth, Kansas, in late 2022, the ASTARTE software seamlessly integrated with the Army's Integrated Mission Planning and Airspace Control Tools (IMPACT) software suite. IMPACT is managed by the Aviation Mission Systems and Architecture Project Office in the Program Executive Office for Aviation.

The ASTARTE Program, which began in 2021, is a joint collaboration between DARPA, the Army, and the U.S. Air Force to enable efficient and effective airspace operations and de-confliction in a highly congested anti-access/area denial, known as A2/AD, environment. The program's goal is to provide an accurate, real-time common operational picture of the airspace over an Army division, enabling long-range fire missions, as well as manned and unmanned aircraft operations, to occur safely in the same airspace.

ASTARTE performer Raytheon Technologies developed an automated flightpath-planning capability for fixed and rotary wing aircraft, which includes the capability to deconflict airspace use by routing through or around defined airspace coordinating measures, commonly called ACMs, in both space and time. General Dynamics Mission Systems (GMDS) developed the Army's IMPACT suite, which adds a Joint All-Domain Command and Control (JADC2) class of data-enabled, over-the-horizon tools to existing airspace management systems to form a multidomain capability supporting the Army's 2030 Multi-Domain Operations vision.

During the demonstration, GDMS and Raytheon identified the interfaces allowing the ASTARTE flightpath planner to receive flight path requests with associated constraints from IMPACT (e.g., timing, altitude range, start and end points), and returned complete deconflicted flight paths back to IMPACT on demand. The ASTARTE-IMPACT demonstration also illustrated a novel approach for transitioning cutting-edge micro services and software components developed by the science and technology community very quickly into military service programs of records. ASTARTE is currently wrapping up Phase 2 integration efforts and is scheduled to begin Phase 3 live testing this summer.

> "The demonstration showed that complex route alternatives could be created in seconds, leveraging available permissive airspace to avoid airspace where conflicts would potentially occur," said Paul Zablocky, ASTARTE program manager in DARPA's Strategic Technology Office. "There are many reasons this integration helps the warfighter. Coordinating and consolidating services at the user level greatly reduces procedural burden, which speeds the enterprise. ASTARTE also increases accuracy by automating tasks and reducing inherent human error. Most importantly, the ASTARTE and IMPACT integration forms a foundation of artificial intelligence-enabled services that will interact with other service component AI tools such as the Air Force's Kessel Run All Domain Operations Suite (KRADOS) for planning and the All Domain Common Platform (ADCP) for operations."

D-Fend Solutions and Resource Industries Announce Partnership to Deliver C-UAS Security Solutions in the UAE

D-Fend Solutions, the leader in radio frequency (RF), cyber-based, counter-drone takeover technology and Resource Industries, a company engaged in production, development, research and logistics of military vehicles and equipment, have announced that they will cooperate to provide United Arab Emirates' security agencies with advanced C-UAS technology.

This partnership will fulfill the urgent need for tiered methods of safe drone mitigation in the UAE, as well as give more versatile options to security services aimed at protecting the area's sensitive environments from rogue drones, while avoiding operational disruption and collateral damage. Both organizations will work in tandem to analyze end-user needs and deliver C-UAS solutions for all possible scenarios and sectors.

"We are honored to partner with Resource Industries in this mission-critical task," said Zohar Halachmi, Chairman and CEO of D-Fend Solutions. "Expanding the scope and capabilities of C-UAS solutions in the UAE is a significant step toward realizing the urgent need for safer airspace and safer outcomes in the face of the threat from hostile UAVs".

"D-Fend Solutions Counter-UAS technology is a best in class, proven, tested and trusted product. Partnering with tier-1 manufacturers to introduce unique, easy to use and rapidly deployable solutions to further enhance the UAE's defense landscape is part of our mandate and we look forward to long term cooperation with D-Fend." said Resource Industries' CEO, Mansour Alblooshi.

NAVAIR Awards Kratos Sole Source $49.6M Initial Contract for FRP of the BQM-177A Subsonic Aerial Target System

Kratos Defense & Security Solutions, Inc a leading National Security Solutions provider and industry-leading provider of high-performance, jet-powered unmanned aerial systems, announced today that Kratos has received a $49,568,200 Full Rate Production (FRP) contract for Lot 4 of the BQM-177A Subsonic Aerial Target (SSAT) from the U.S. Navy for the procurement of an additional 55 aircraft, mission kits, certain flight consumables, and technical data.

Steve Fendley, President of Kratos Unmanned Systems Division, said, "Since becoming an aerial target system provider in the early 2000s, Kratos has produced and delivered well over 1,000 high performance jet target aircraft across our family of systems and customers. For the U.S. Navy, following the first full-rate production award in October 2020, the combined Navy-Kratos team has completed activation of all four operational sites around the globe; delivered an additional 77 BQM-177A SSAT Air Vehicles; and declared full operational capability. To have achieved all of this during the pandemic – with unprecedented labor and supply chain disruptions and a very unusual economic environment – is nothing short of remarkable. Today's announcement marks the next step in our continuing efforts to provide world class training capabilities to the U.S. Navy and its allied and coalition partners for the next several decades and beyond. I couldn't be more proud of this team and its exceptional achievements. We are laser-focused on the customer mission capability and these incredibly high-performance-to-cost-ratio systems that deliver key, threat representative capabilities to support the Navy's ever increasing (quantity, technical, performance) training and test needs."

Don Blottenberger, Program Manager for the Navy's Aerial Targets program office (PMA-208), said, "The BQM-177 is quickly becoming a workhorse of the Navy targets inventory. Target presentations have never been more important than they are right now based on real world events and new capabilities under development. It provides reliable presentations of evolving missile and aircraft threats to test our developmental weapon systems and provide training to our deploying sailors preparing to go into harm's way. The hard work of the team — one team across Kratos and the Navy Aerial Targets office — will provide cost effective, quality target presentations through the next decade."

The work under this contract will be primarily conducted in Kratos' facilities in Sacramento, CA, and Ft. Walton Beach, FL. Total contract value if the options for Lots 5, 6, and 7 are all exercised at the maximum production quantities is $227,647,890.

U.S., UAE Naval Forces Complete First-Ever Bilateral Unmanned Exercise

U.S. Naval Forces Central Command (NAVCENT) concluded a weeklong unmanned systems and artificial intelligence integration exercise with the United Arab Emirates Navy in the Arabian Gulf.

Five unmanned surface vessels (USVs) from the Emirati navy and NAVCENT's Task Force 59 operated off the coast of the United Arab Emirates. Cameras and sensors aboard the USVs captured imagery and video of vessels sailing nearby. The visuals were then transmitted to operational centers ashore where artificial intelligence platforms helped detect, identify and classify the data.

"This exercise allowed us to further train our artificial intelligence platforms to sort through new data sets, which will ultimately enhance our detection capabilities," said Lt. Jay Faylo, Task Force 59's lead exercise planner. "It has been a tremendous opportunity doing this with our Emirati partners who are at the leading edge of technology in the region."

NAVCENT established Task Force 59 in September 2021 to integrate new unmanned systems and artificial intelligence into U.S. naval operations across the Middle East. This was the unit's first bilateral exercise with the United Arab Emirates. Participating USVs from Task Force 59 included an L3 Harris Arabian Fox MAST-13, Ocean Aero Triton, and two Saildrone Explorers.

Since its launch, Task Force 59 has operated a suite of new unmanned systems based at operational hubs in Bahrain and Aqaba, Jordan. The Middle East region's unique geography, climate and strategic importance offer an ideal environment for unmanned innovation. The U.S. 5th Fleet operating area includes 21 countries, the Arabian Gulf, Gulf of Oman, Red Sea, parts of the Indian Ocean and three critical choke points at the Strait of Hormuz, Bab al-Mandeb and Suez Canal.

Steadicopter and BIRD AeroSystems to reveal new capability for the Black Eagle 50H

Steadicopter – a leader in the Rotary Unmanned Aerial Systems (RUAS) industry, and BIRD AeroSystems – a global provider of innovative defense technology and solutions that protect the air, sea, and land fleets of governments and related agencies, are unveiling the BlackEagle 50H (BE50H) – an advanced hybrid unmanned helicopter, featuring a miniature airborne radar with advanced proprietary technology, for use in maritime intelligence missions.

Advanced capabilities for long endurance of up to five hours, together with BIRD AeroSystems µMPR capabilities for the detection and tracking of maritime vessels, enable the BE50H to carry out accurate mapping of all vessels within a radius of 200 km within a few hours, in harsh environmental conditions, day or night.

A true game-changer for uncrewed operations, the BE50H provides its users with the most cost-effective solution for both ISR and pinpoint CAS operations, in both the land and maritime domains, by enabling a unique combination of impressive flight endurance and an extremely versatile sensor suite. With its open architecture modular design, the BE50H accommodates the latest mission payloads, such as BIRD AeroSystems' µMPR. Coupled with the µMPR, the BE50H provides a first-ever combination of a small tactical RUAS (with a near-to-zero operational, maintenance & logistic footprint), capable of wide-area persistent surveillance and coverage for long durations on the one hand, with all the advantages of the rotary-UAS, such as persistent hovering, which enable additional concepts of operations for many mission applications, on the other.

Implementing sophisticated patented design features, together with powerful signal processing algorithms, BIRD AeroSystems' µMPR uniquely detects and tracks maritime vessels with 100% identification accuracy. Implemented in a single small Line Replaceable Unit (LRU), the µMPR is extremely lightweight, with very low power consumption. It can be installed in conjunction with AIS and an electro-optical (EO/IR) payload, perform automatic cross-cues between the radar and the EO/IR sensor to confirm target identification, and automatically inform ground control using a precise geo-reference.

Ronen Factor, Co-CEO and Founder of BIRD AeroSystems, added: "Ideal for the protection of maritime borders and strategic assets, BIRD's innovative µMPR cuts through sea clutter and significantly increases mission effectiveness and cost efficiency. Small and lightweight, it can easily be installed on unmanned aerial systems, such as Steadicopter's BlackEagle 50H, to create a cost-effective surveillance platform with excellent performance."

> "Maritime border protection is one of the most prominent needs in the world today," says Noam Lidor, VP Sales, Marketing & Business Development at Steadicopter. "The combination of the proven advantages of a hybrid unmanned helicopter system with long flight endurance that enables coverage of large maritime surfaces, with radar capabilities for identifying and locating hostile ships at ranges of several tens of kilometers, provides the vessel's crew with an accurate intelligence picture within a wide radius of hundreds of kilometers, thereby giving them a significant advantage for mission success.

US Army Continues to Modernize SHADOW TUAS Fleet

Textron Systems Corporation announced the U.S. Army exercised an option valued at up to $76.1 million to provide continued contractor logistics support; field service; maintenance including hardware, spares and repairs; and engineering support for existing Shadow® Tactical Unmanned Aircraft Systems (TUAS). Also scheduled are upgrades of Shadow systems to the significantly improved Block III configuration. The work, to be completed at Textron Systems' Hunt Valley facility, is scheduled to begin immediately and cover continued support through 2023.

The award is for option year two in a five-year contract awarded December 31, 2020, to modernize the current Shadow RQ-7B Block I and II and lead product support and sustainment activities for the fleet. The Shadow Block III system gives soldiers and commander's increased situational awareness, improved wide-area target acquisition and high-value target tracking, and enhances manned-unmanned teaming capabilities.

The Shadow Block III system builds on the proven success of previous configurations incorporating design improvements to allow for increased operations in adverse weather conditions, the latest high-definition day-and-night video payload, increased engine power and reliability, reduced acoustic signature and advanced communications relay capabilities. Together, these improvements were significant enough to require their own Follow-on Operational Test & Evaluation determination.

"The Block III Shadow system is built on soldier feedback. Improvements like quieter engines, improved weatherization and increased standoff range allow operators to employ the system in new and innovative ways," said Wayne Prender, Senior Vice President of Air Systems. "Because Combat Aviation Brigades and Special Forces units will use Shadow systems through 2036, modernization of the fleet supports readiness of already-fielded systems for up to 15 more years."

To date, Textron Systems has worked with the Army to support 17 new equipment training events across the United States. Textron Systems is the original equipment manufacturer for the Shadow TUAS. The system, which provides reconnaissance, network/communications relay support, and surveillance and target acquisition, has attained more than 1.3 million flight hours, 85 percent of which were flown in combat, and a mission readiness rate exceeding 90 percent.

Drones World Editor Kartikeya in conversation with

Mr. Pradeep Palelli (CEO) & Prathyush Akepati (CTO) of Thanos

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

A Working since 2016 on this, we can proudly claim to be one of the oldest Agri Drone Companies in India. This has given us the advantage to work with some of the largest Agrochemical companies in the world such as Bayer, Syngenta among others in the very early stages of R&D on Agri Drones and Spraying Application in India. Through our close to 7 years of experience, we have also built our own expertise in designing the right Drone for the application. Having carried out Spraying Demos and Pilots over more than 3500 Acres in several South Indian states, we also built expertise with regards to the nitty-gritties of field operations. Our team's core expertise to start with has been in designing & building Custom Drones for various applications. Through the Custom Drones we have built for various Customer Requirements and also for various Applications, we have come out with certain Standard Designs that we expect to launch over the coming years. Before Drones, both of us Co-Founders (Pradeep Palelli & Prathyush Akepati) were in varied fields ranging from Renewable Energy to Software to Health. Each of us have more than 14 years of professional

experience in various roles in large organizations as well as running Small Startups.

Q Talking about the agriculture technologies, drones are stealing the show lately with their applications limited to our imagination. What is your opinion on their utilization?

A It's difficult to grade some application as good/bad or useful/not-useful. It is mostly a matter of perspective. Crop Protection & Liquid Fertilizer or Micro-nutrient spraying being one of the most immediate application that is picking up across the country, there are the lesser popular applications such as Seed Dispensing or Granule (DAP/Urea) Spreading. While these are not necessarily as cost-effective currently given their limited application to a few crops and their relatively less usefulness compare to Crop Protection or Liquid Nutrient Spraying, these are some applications which will make Agricultural Drones truly multi-functional in future. Fruit-plucking, Individual Plant/ Fruit Evaluation, Genotyping, Phenotyping etc. are some of the applications that seem to be already active in other countries (and partly in India too on an R&D front) and these could be implemented in India in the near future so as to extract maximum value from these Aerial Robots or Aerial Cameras/ Sensors.

Q How good are the Agricultural Drones in terms of cost effectiveness, crop yield and conservation of resources?

A Everyone compares Agricultural Drones that

Made-In-India or Assembled-In-India or completely Imported-Into-India on a Capex or Capital Cost Investment point of view. We believe that's not the right approach. Capex and Opex aspects needs to be looked at jointly over the life of the Drone so as to make the right comparison and to ultimately take the right decision. For Example, Drone A may cost 20% more than Drone B but Drone A's Battery Lifetime (Cycles) and Battery Runtime may make the Opex 30-40% cheaper compared to that of Drone B. Drone A may have better Spare Part Availability and After-Sales Support compared to Drone B thus keeping the Uptime of Drone A's customer high ultimately leading better economics for the customer. With regards to other Spraying Technologies or Manual Labour, Drones have already proven their Efficiency and Effectiveness in various countries as well as in India. Cost Effectiveness is often compared with Manual Labour Spraying method wherein sometimes it is shown to be expensive and hence not viable based on this comparison. Cost per Acre needs to be calculated not just based on the Cost of Labour per Day and the Acreage per Day but also other Tangible & Intangible factors such as More Effective Spray (addressing the pest problem), possibly reduced Input Costs owing to the Effective Spray, better Yield compared to Quicker (timely) & Effective spray, Eliminated Health Hazards among others. Drone Spraying is already Cost Effective in areas where there is very limited or no labour availability.
Along with the above stated

benefits, Drone Spraying cuts down Water Usage by 90-95% (depending on the Crop and Spray Volume chosen). This is a major benefits environmental speaking and a major one at that given that Water a very precious resource.

Q You visualize the advancements in the Agritech sector in the next decade? What would be the participation of Drones?

A Any application in Agriculture that has to do with Drones can be broadly put into 2 categories – Agri-Automation & Agri-Intelligence. Our current Products and efforts are in the Agri-Automation space where we are trying to automate the previously extremely arduous manual tasks. Going forward, we expect to bring in more Intelligence into our Spraying Drones as well as use Intelligent Insights from information gathered via Visual & Spectral Sensors mounted on Drones. Put together, Agri-Automation & Agri-Intelligence close the Precision Agriculture loop.

Q What are the various products and services that Thanos has in offer currently? Could you elaborate its specifications, capabilities and the possible modifications?

A THANOS currently has only 1 TYPE CERTIFIED Drone i.e. SYENA-H10. SYENA-H10 is a Designed & Built in India 10 Litres capacity Agricultural Spraying Drone that currently has the Best-in-Class Flight Time of upto 20 minutes and a work rate of 3 Acres per battery at a Spray Volume of 10 Litres per Acre.

SYENA-H10 is a MEDIUM Category Drone and has all the required features such a MANUAL/AUTONOMOUS Spraying Mode, Terrain Radar for Height Maintenance among others. SYENA-H10 is also an extremely sturdy and extensively field-tested Drone. The Ground Control Station app that is provided along with the Drone can be installed in any Android Mobile and is easy to use.
In future, we expect to add capabilities of Granule/Seed Dispensing mechanism so as to make it multi-functional.
We are already working with RPTOs in helping create MEDIUM Category Drone Pilots. Given that majority of the Agriculture Drones belong to MEDIUM Category, it is imperative that there be more avenues for MEDIUM Category Drone Pilot licensing and we are open to partnering with interested organizations/RPTOs.

Q What are your suggestions to youngster who wish to choose Agriculture Drone Industry?

A Agricultural Drone Industry is very huge and probably the biggest among all commercial applications given its pure scale in an Agricultural Country such as India. There's large number of opportunities for youngsters in various roles. On the Manufacturing front, you need Assembly Technicians, Machine Operators, Quality Check Technicians, Test Pilots. On the Spraying Service front, you need Drone Pilots, Drone Co-Pilots. Post Sale of Drones, you need Drone Service/Repair Technicians. This is just a brief list and as the role of Drones expands, you could expect there to Farmer Advisors, Crop Health Experts, Demand Generation Executives, Customer Relation Executives just to name a few. To put a bit of numbers and scale to the opportunity, we expect there to be more than 1 Lakh Agricultural Spraying Drones operational in India in the coming 5-7 years. Each Drone requires a Pilot & a Co-Pilot. Each Mandal will have OEM Sales, Spares and Service centres. At THANOS, as we grow, we expect to have dozens

of skilled youth in most of the above mentioned Roles join our team in the coming 12-18 months.
Drone Industry is still afresh and the opportunities are limitless. Agricultural Drone Industry specifically offers a wonderful opportunity to the rural youth to work in a hi-tech industry and be close to their homes. Manufacturers/OEMs such as us, Agri Service Providers, Training Organizations are all looking for interested youth with whom we can jointly build this industry and a bright future.

Q How will you visualize the future of Drones in the coming 5-10 years?

A The applications in the entire Drone Industry across the world are practically limitless. Every other day, someone thinks of a new application. We are already seeing Drone Delivery, Emergency Healthcare Delivery take-off and Human carrying/ transportation Drones could be a reality very soon. Mapping, Surveillance, Asset Inspections are already a standard.
On the Agriculture front, we expect there to be a Drone in every Village or atleast multiple Drones in every Mandal.
While most of these Drones will be carrying out Spraying operations, the others will be periodically collecting data, analyzing crops, generating insights & recommendations for Farmers & Service Providers.

Q What is the process to buy drones from you? Are you inviting any franchises applications? Why should anyone take franchise from you? Currently are you providing any drones as services?

A Anybody who wishes to buy Type-Certified Agricultural Spraying Drones from us can reach out to us on 040-48213212 or sales@thanos.in
While we are currently mostly doing Direct Sales, we expect to start authorizing Dealers/ Distributors starting April 2023 and would be happy to talk to any interested Organizations with extensive experience in the Agriculture domain dealing or distributing Agri-machinery and related equipments across multiple geographies and have the appetite for newer technologies that make farming more easier and profitable for farmers.

Volocopter in Japan: Series E Investment and Regulatory Pathway Set

Volocopter, the pioneer of urban air mobility (UAM), announced that Sumitomo Corporation, a Fortune 500 company and one of the largest trading companies in the world, invested in the company's Series E Funding round. They will also become a key strategic partner for entry into service in the Japanese market starting in 2025. Additionally, Japan Civil Aviation Bureau (JCAB) has accepted Volocopter's application for concurrent type certification (TC) of the VoloCity aircraft in Japan. To celebrate these milestones, Volocopter will showcase a full-scale VoloCity static model for the first time at the Grand Front Osaka from 8 to 12 March, to raise regional public awareness and acceptance of electric air taxis.

Volocopter is committed to flying its VoloCity air taxi at the 2025 EXPO Osaka Kansai. Today, a major regulatory milestone was achieved to make this ambitious goal a reality: the European Union Aviation Safety Authority (EASA) and JCAB announced that they have accepted Volocopter's application process for concurrent TC of the fully electric VoloCity aircraft to fly commercially in Japan. Volocopter is currently pushing the envelope on flight testing and is on target to achieve certification for the VoloCity from EASA in 2024. As of now, the company is pursuing concurrent validation with three non-European civil aviation authorities: JCAB in Japan, Federal Aviation Administration (FAA) in the United States, and the Civil Aviation Authority of Singapore (CAAS) in Singapore.

The company's dedication to Japan dates back to 2018, when the country became one of the first to announce its commitment to bringing UAM to life. This includes a clear roadmap outlining the steps it needs to take to educate the public, introduce regulations, and launch commercial services. As the frontrunner for a Japan-based UAM launch, Volocopter has both the experience and expertise to work with local authorities to create a UAM ecosystem that establishes a safe and sustainable environment for UAM.

To further strengthen Volocopter's local ties from a business perspective, Sumitomo Corporation became the latest Japanese investor and strategic partner in the company to join its list of partners, via the Series E funding round. Sumitomo Corporation possesses a keen understanding of the global business market, the energy and resource sectors, as well as Japanese market operations. This move diversifies Volocopter's global partnerships to establish a UAM ecosystem.

Christian Bauer — Volocopter's Chief Commercial Officer, "Committing to fly and enter a market is no small feat, but for Volocopter and Japan, who are both pioneers in the UAM space, it just makes sense. Over the past few years, Volocopter has made significant progress toward becoming an integral part of the team that will bring UAM to life in Japan in 2025, thanks to partners like Sumitomo, EASA, and JCAB who share our vision. I cannot wait to see the public reaction to the VoloCity air taxi being unveiled in Osaka for the first time."

Patrick Ky — Executive Director of EASA, "This is an important milestone in the development of relations between Japan and Europe in the field of new aviation technologies. EASA is proud partnering with Japan's Ministry of Land, Infrastructure, Transport and Tourism (MLIT) and support the development of the UAM industry in Japan and share with JCAB its experience with its SC-VTOL regulations in the certification process of VoloCity."

To increase public awareness and acceptance of electric takeoff and landing aircraft (eVTOL) in Japan, Volocopter is showcasing its VoloCity full-scale static model for the first time from 8 to 12 March. The showcase event will take place at the Grand Front Osaka, a shopping mall with high footfall and ideally located adjacent to the Osaka Umeda station, which sees 2.3 million passengers passing through every day. Since late 2022, Volocopter is hosting UAM knowledge sessions for elementary school children in selected Osaka city wards, as part of its obligation to the Prefectural Government grant and will continue to involve the future generation of UAM passengers by offering VoloCity tours at the showcase event.

Ameriflight Signs Intent to Purchase Agreement with Sabrewing Aircraft for 35 VTOL Air Cargo Drones

Ameriflight, the nation's largest Part 135 Cargo airline, announces signed letter of intent to purchase 35 VTOL air cargo drones from Sabrewing Aircraft Company, Inc., a U.S. corporation designing and producing a new generation of regional cargo UAV that offers high-efficiency, all-weather operation with vertical landing and takeoff (VTOL) capabilities. The agreement is for the Rhaegal-A aircraft, also known as "Alpha", the world's best-in-class, highest fuel and maintenance efficiency cargo UAV on the market. Ameriflight expects to take delivery following type certification of the aircraft.

The Sabrewing partnership and Rhaegal-A purchase will enable Ameriflight to enter into new business opportunities in distribution center logistics. Using the VTOL capabilities to carry over a ton of cargo to off-airport alternative landing zones, the new cargo aircraft will allow Ameriflight to aid customers in developing a faster and more efficient warehouse distribution network. For Ameriflight, this will be a complementary service, not replacing their current flying operation, aircraft, or pilots. The company's goal is to build diversified aviation services, and this fits well with that vision.

"In looking to the future, adding this advanced aircraft to our portfolio will complement our fleet and increase our assortment of assets, allowing us to expand our service areas through the development of warehouse distribution operations," said Ameriflight President and COO Alan Rusinowitz. "With a payload capability of 2,000+ pounds, the Rhaegal-A is perfectly suited for the medium lift category operation. Sabrewing's record-setting technology guiding Rhaegal-A as the world's first autonomous cargo aircraft capable of both vertical and conventional take-off is an incredible milestone, and we are excited to partner with them on this new fleet."

"We're committed to developing advanced, versatile, and efficient air cargo solutions with our best-in-class Rhaegal aircraft that maximize on long range, payload capacity, and sustainable fuel efficiency to successfully deliver on a range of cargo missions," explained Ed De Reyes, CEO of Sabrewing. "We're excited to be at the forefront of autonomous innovation and to have Ameriflight at our side, with this new agreement marking the Alpha's first American launch customer."

Sabrewing's Rhaegal-A aircraft achieved its first hover flight in September 2022 while lifting a record-setting payload of 829 pounds. The company is in the process of initiating the aircraft's production line, with first deliveries expected to take place in the first quarter of 2024. Innovation in design allows the Rhaegal-A aircraft the ability to use sustainable aviation fuel (SAF) reducing carbon emissions by up to 80%, while maintaining the efficiency to fly cargo between facilities four times faster than can be driven and land in locations other aircraft cannot, eliminating the added cost of airport transfer of cargo. The new fleet will be used to support Ameriflight's new business opportunities, primarily for its expedited supply chain services.

This marks Ameriflight's second agreement to purchase autonomous aircraft after having signed with Natilus just last month on the purchase of its Kona aircraft, a 3.8-ton payload, short-haul feeder uncrewed aerial vehicle. Ameriflight intends to use both fleet types in tandem with their current operation.

Collaboration between Skyfly and Embention

Embention, has more than 15 years of experience developing high performance avionics systems and motor controllers for electric aircraft and eVTOL in compliance with DO178C and DO254 aeronautical certification standards, works closely with leading eVTOL manufacturing companies, such as the English company Skyfly.

Skyfly is based in the United Kingdom. Its electric/hybrid eVTOL, called the Axe, is a manned fixed-wing vehicle capable of vertical and conventional take-off and landing. In addition, its innovative design allows it to glide and take off vertically without the need to rotate wings or engines, all thanks to the integration of Veronte Autopilot 4x which integrates advanced flight controls for automatic stabilisation.

The main features of the eVTOL Axe are as follows:

- Canard fixed wing design
- 9:1 glide ratio
- Non-rotating wings and engines to reduce complexity, failure and weight
- Veronte Autopilot 4x redundant flight control system
- 4 redundant flight systems
- 8 electric motors (2 per wing for hover redundancy)
- 16 redundant lithium-ion batteries

Veronte Autopilot 4x in eVTOL AXE

Axe, scheduled to complete its first manned flights later this year and start production in 2024, will operate like a private helicopter, avoiding traffic jams, reducing travel time and minimising pollution. It will be manufactured according to aeronautical certification standards, hence the key role of the flight control system supplied by Embention. Veronte Autopilot 4x will play a critical role, as its compliance with DO178C and DO254 enables eVTOL certification for integration into UAM environments. In addition, the system has successfully passed environmental tests according to DO160 / MIL-STD-810 and has MTBF data, ATR (Acceptance Test Report) and other documentation for certification.

The Veronte Autopilot 4x flight control system is designed for integration into critical systems, it is especially suitable for eVTOL, incorporating advanced functions for both fully autonomous flight and fly-by-wire flight controlled by an on-board pilot. The redundancy of the Veronte 4x Autopilot is managed by a different arbitration system, and thanks to it, there is no single point of failure and it is reliable even in the event of an arbitrator's failure. The design of the Axe therefore focuses on pilot safety, and to this end, in addition to using an advanced flight controller such as the Veronte Autopilot 4x, the aircraft is integrated with components that have been extensively tested in traditional aeronautical design.

Mr. Sunil Shelke is the Founder& CEO at AbhitaUAV Infratech & Abhita land Solution. In addition being Ex Deputy Collector, he specialised in land records.

We are very much in touch with our technology and leading our map integration system with land records and services, we are focusing on various GIS based, Drone & Surveying projects, Implementation & developments. Under the umbrella of Abhita Land Solution, we have opened and successfully run 27 branches for land records and for consultation.

Our company has delivered some projects in Maharashtra, Andhra Pradesh, and Assam.

Recently, we started manufacturing agricultural spraying drones in Maharashtra. A drone is designed to support pesticide spraying in order to increase crop production and farmers' well-being.

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Textron Systems' Aerosonde UAS Takes 1st Maritime Flight aboard USS Miguel Keith

Textron Systems Corporation, a Textron Inc company, announced that the Aerosonde® Unmanned Aircraft System aboard the USS Miguel Keith, designated ESB 5, took its first operational flight. The inaugural mission follows an October 2022 contract award by the U.S. Navy's Naval Air Systems Command (NAVAIR) to provide unmanned aviation support aboard the ship for up to five years.

The ESB 5 supports a broad range of military and aviation operations as part of the Forward Deployed Naval Force. Textron Systems is tasked to deploy its Aerosonde UAS to provide extended range intelligence, surveillance and reconnaissance (ISR) services with enhanced mission payloads aboard the ESB 5. The company's Field Service Representatives (FSR) will work alongside the sailors onboard to provide support for a variety of

maritime missions.

"Having an unmanned aircraft system operational aboard the ship acting as a remote sensor contributes to overall maritime domain awareness and mission success," said Wayne Prender, Senior Vice President, Air Systems. "The Aerosonde system is providing added reach beyond the horizon and an ability to operate multi-INT ISR consistently, both great examples of the benefits of teaming unmanned aircraft with manned ships."

In addition to the USS Miguel Keith, the Aerosonde unmanned system supports maritime operations aboard the USS Hershel "Woody" Williams (ESB 4) and two DDG-class ships, bringing the total number of U.S. Navy ships supported by the system to four.

The Aerosonde system has amassed more than 600,000 flight hours while serving multiple U.S. customers and international allies. It is designed for expeditionary land- and sea-based operations in austere environments and is equipped for multiple payload configurations.

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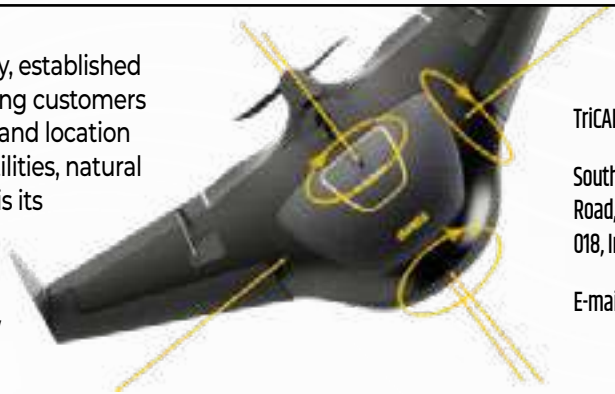

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Product Demonstration or business highlight or case studies Section:
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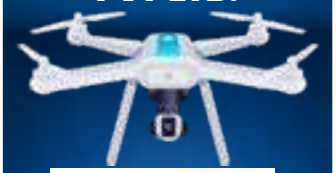

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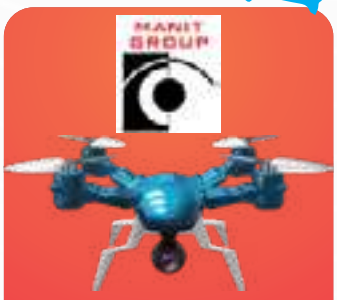

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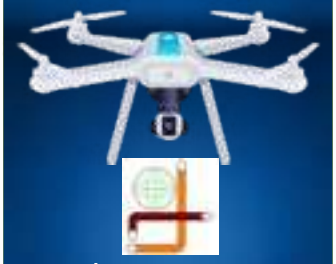

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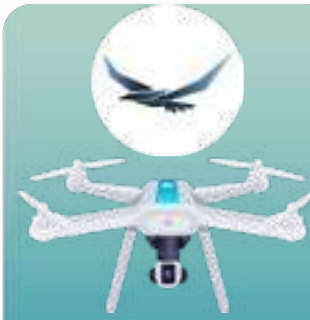

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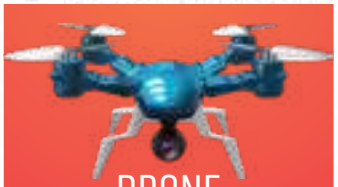

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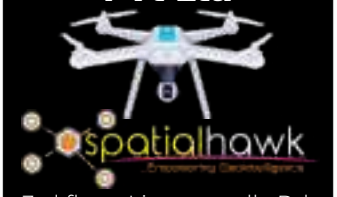

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