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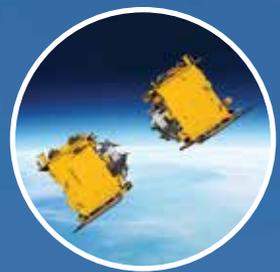
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EXCLUSIVES

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Adapting to new market realities, the irrepresible spirit of MEBAA was on display at the 2024 event as the show was quick to bounce back after some difficult years due to pandemic related restrictions

(Cover Photo: Sarthak Baranwal / SP Guide Pubns)

COVER DESIGN BY: SP's Team



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NEXT ISSUE: *Aero India 2025*



As we usher in 2025, the world stands witness to a series of transformative advancements in aviation and space, fields that continue to redefine our technological horizons. This issue captures some of these compelling developments and perspectives, showcasing the dynamism and ambition of industries that are reshaping the future.

INDIA'S STRIDES IN SPACE EXPLORATION TOOK A HISTORIC leap with the successful demonstration of space docking—a sophisticated orbital maneuver mastered by only a handful of nations. This accomplishment, as detailed in an insightful article by Air Vice Marshal Sanjay Bhatnagar (Retd), marks a critical step toward India's long-term goals, including manned space flights, in-orbit maintenance, and the ambitious Bharat Antariksha Station. Complementing this, the magazine highlights the recent appointment of Dr V. Narayanan as Secretary, Department of Space, and Chairman, ISRO, symbolising a new chapter in India's space journey.

On the defence front, the Ministry of Defence is addressing delays in its Airborne Early Warning and Control (AEW&C) systems, with plans to procure six Mk1A aircraft worth ₹9,000 crore and advancing the development of six Mk-2 systems at the cost of another ₹10,990 crore. Manish Kumar Jha's report sheds light on these pivotal initiatives, underscoring India's commitment to enhancing its airborne capabilities, especially bearing in mind that China has significantly advanced its AEW&C technology in recent years.

In the realm of business aviation, the Middle East has emerged as a global leader, leveraging strategic investments, economic diversification, and a growing demand for private travel. At the heart of this transformation was the tenth edition of MEBAA 2024, held in December, which featured groundbreaking deals and innovative platforms. MEBAA 2024 was the perfect platform for global business aviation, emphasising sustainability, leading platforms for advanced air mobility, enhanced connectivity, and luxury services to cater to corporate and individual clients. Ayushee Chaudhary reports a detailed coverage of MEBAA 2024 and a range of expert insights, underscoring the innovation and resilience that continue to drive the aviation and space sectors in the Middle East.

Extending our coverage of MEBAA, there are three exclusive interviews, with torch bearers of Business Aviation around the

globe. In the first interview, Ali Ahmed Alnaqbi, Chairman of IBAC Governing Board and Founding Chairman of MEBAA, reminisces on the region's exponential growth from a handful of companies in 2006 to now over 370 companies engaged in all aspects of business aviation in the region. He also shared his insights and vision on business aviation's role, challenges and a sustainable future.

Then we have an exclusive conversation with Michael Swift, Group Vice President – Sales, EMEA & APAC at Gulfstream Aerospace. He stressed that Middle-East market is a launch pad and that there is a Gulfstream aircraft for every mission. He then delves into the company's groundbreaking achievements in sustainability, including its pioneering transatlantic flight powered entirely by sustainable aviation fuel.

Similarly, in another upfront tête-à-tête, Carlos Brana, Executive Vice President Civil Aircraft at Dassault Aviation, discusses how Dassault Falcon Business Jets are blending luxury, safety, and utility to redefine business aviation. Quite the story teller, Carlos Brana proudly shares that till date, no Falcon aircraft has been lost in incidents or accidents. According to him, Falcon aircraft are very stable airplanes, very easy to fly, very easy to pilot and deemed extremely efficient. He also believes that the new Falcon 10X will be a 'game changer' in business aviation.

All this and more in this issue of *SP's Aviation*. Welcome aboard and we wish you many happy landings!



JAYANT BARANWAL
PUBLISHER & EDITOR-IN-CHIEF

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THROUGH THE SPADEX MISSION, INDIA IS MARCHING TOWARDS BECOMING THE FOURTH COUNTRY IN THE WORLD TO HAVE SPACE DOCKING TECHNOLOGY

SPADEX: ANOTHER FEATHER IN ISRO'S CAP

SpaDEx is key to achieving India's long-term space exploration goals, including manned spaceflight, spacecraft maintenance, and the construction of the Bharat Antariksha Station (BAS)

By AIR VICE MARSHAL SANJAY BHATNAGAR (RETD)

PHOTOGRAPHS: ISRO

NEVER EVER IN THE RECENT HISTORY OF SPACE EXPLORATION

have the space agencies across the globe, the media and a nation of 1.43 billion people watched the events unfold in space with so much of excitement and awe as the Space Docking Experiment (SpaDEX) by Indian Space Research Organisation (ISRO). This is one event that has gathered as much attention of the nation as the Moon landing by Chandrayaan-3 on August 23, 2023.

ISRO announced on January 16, 2025 that they have successfully completed docking with smooth precision, making India the fourth space faring nation to achieve this significant milestone.

Space Docking is a controlled mechanical process for spacecraft orbital mating. It begins with the initial approach of the spacecraft and its first contact. It is performed with a docking system that includes control avionics and mechanical docking assemblies. Methods for the design, simulation and testing different docking systems have been researched and reviewed since 1984. The initial conditions for docking are provided by a rendezvous system and the docking assemblies themselves actually perform the mechanical process of spacecraft mating.

This process is a long drawn one and comprises of various stages, takes tens of hours depending upon various factors. Docking involves aligning the spacecraft docking adaptor with the target docking point and then controlling the spacecraft so that it docks with zero relative velocity (both angular and linear), zero angular error and zero position error. It is a six-degrees-of-freedom (6DOF) problem.

DOCKING IN SPACE A NICHE TECHNOLOGY

Only the US, Russia, and China have mastered such advancements so far. The US has been a pioneer in space docking, undertaking manual docking on March 16, 1966 in which Gemini VIII (astronauts Neil Armstrong & David Scott) accomplished the first docking of two spacecraft with an unmanned Agena target vehicle launched earlier the same day. However, world's first truly automatic docking of two spacecraft took place nearly 50 years back in the Low earth Orbit (LEO) with Kosmos-186 and Kosmos-188 of erstwhile USSR docking on October, 30, 1967. They remained mechanically docked for 3.5 hours. The US fully automatic docking took place with the docking of US's Apollo with Russian Soyuz capsule in 1975. In 2011, China accomplished its first space docking mission when Chinese Shenzhou-8 spacecraft docked with space lab module Tiangong-1 in LEO. Elon Musk owned SpaceX is among the first private company to have developed automatic docking technology and now the International Space Station (ISS) relies on SpaceX for docking. Space docking operations are being undertaken by these countries as a matter of routine. Through the SpaDEX mission, India is marching towards becoming the fourth country in the world to have space docking technology.

Docking spacecrafts is a complex space operation that involves heavy space crafts and many systems. The spacecrafts travelling at approximately 7 km a second have to be brought to 1 mm per second relative speed in a phased manner to achieve a soft docking.

The Indian SpaDEX mission is ISRO's space docking experiment, by far the most historic step in India's journey of space exploration. It's a built up to nation's human spaceflight capability. The SpaDEX mission will experiment autonomous space docking technology, considered crucial step for both India's ambitious Lunar programme and its efforts to built an indigenous space station (Bharat Antriksh Station, BAS).

On December 30, 2024 the PSLV C60 rocket carrying two small spacecrafts, SDX01 (as Chaser) and SDX02 (as Target), along with 24 payloads, lifted off from the Satish Dhawan Space Centre at Sriharikota. These two small spacecraft weighing about 220 kg each were launched into a 470 km circular orbit at 55° inclination.

At launch from PSLV-C60, these Target and Chaser spacecrafts were imparted a small relative velocity. This incremental velocity allowed the inter spacecraft distance (ISD) to build to 20 km within a day. At this point, a drift maneuver was executed by which the relative velocity between the Target was arrested by using onboard thrusters when the Target and Chaser were in the same orbit with identical velocity but separated by about 20 km, known as 'Far Rendezvous'. With a similar strategy of introducing a small relative velocity between the two spacecraft, the Chaser now was made to approach the Target with progressively reduced ISD of 5 km, 1.5 km, 500 m, 225 m, 15 m, and 3 m.

ISRO has informed that the Indian docking system is similar to the International Docking System Standard (IDSS), a petal-based design, used by other agencies but uses two motors instead of 24 used in IDSS. The SpaDEX mission also uses several new sensors such as Laser Range Finder, Rendezvous Sensor, Proximity and Docking sensor to take precise measurements while bringing the two spacecrafts closer and joining them. It will also use

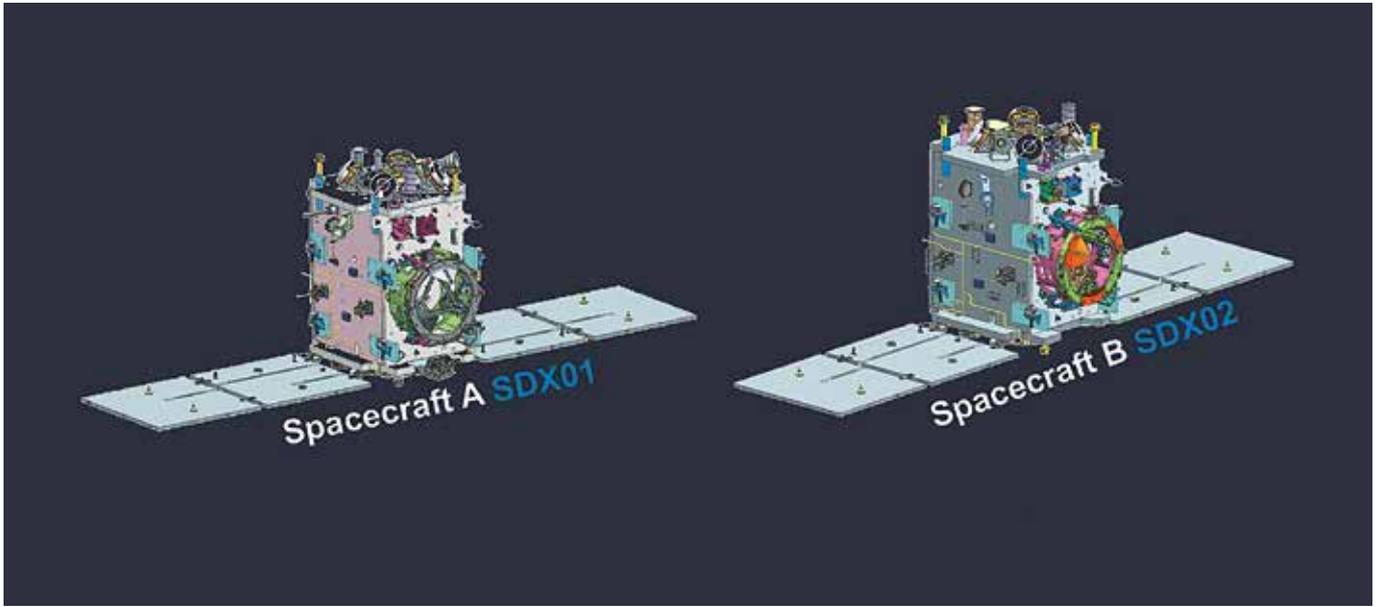
a new processor based on spacecraft navigation systems to determine the relative position and velocity of the other spacecraft. This is a precursor to completely autonomous systems for future missions that would be able to achieve docking without spacecraft-based navigation data.

It is further planned that after successful docking of the two spacecraft and rigidisation, electrical power transfer between the two spacecrafts will be demonstrated before undocking and separation of the two spacecrafts. Thereafter, once the SpaDEX mission is over, these two spacecrafts will start their independent operation of their respective payloads for the expected mission life of two years.

All this is part of the ambitious space roadmap revealed by Union Minister of State for Science & Technology and Space,



PAYLOAD ACCOMMODATION
IN PSLV-C60



THE SPACE DOCKING EXPERIMENT (SPADEX) IS A PIVOTAL PROJECT BY ISRO DESIGNED TO DEVELOP AND DEMONSTRATE THE TECHNOLOGY NEEDED FOR SPACECRAFT RENDEZVOUS, DOCKING, AND UNDOCKING USING TWO SMALL SATELLITES.

Jitendra Singh in December 2024. India has plans for a lunar sample return mission by 2028, establish its own space station—the Bharat Antariksha Station (BAS), by 2035 and to land an Indian astronaut on the Moon by 2040.

SpaDEX is key to achieving India's long term space exploration goals, including manned spaceflight, spacecraft maintenance and BAS construction. The mission's success could open up a range of opportunities for India in space exploration, including long duration human spaceflight, the construction of large space structures and commercial possibilities in spacecraft servicing and space debris management.

ISRO has been rather transparent in publishing the event by sharing some interesting radar and optical photographs and videos of the experiment taken by each spacecraft. On two earlier occasions on January 7 the spacecrafts closed in to an ISD of 200 m and later on January 9 the ISD was arrested at 230 m for half a day. Later the trials were postponed by ISRO saying that some more simulations and trials had to be conducted for reasons of excessive drift during the crucial maneuver. On January 12, 2025, the ISRO informed that a third trial attempt was made starting from 20 kms of ISD to reach up to 15 meters and later successfully progressed to 3 meters. Following this, the spacecrafts were moved back to a safe distance and the docking process was pended for further analysis. It was on January 16, 2025 morning that ISRO informed through their official Twitter handle that this milestone has been achieved smoothly and rigidisation of two satellites could be achieved successfully.

ISRO in this experiment has followed a very pragmatic and cautious approach of closely monitoring, validating alignment and other parameters with ground simulations, essentially the 'Proximity and Docking Sensor (PDS)' data that provides relative position and velocity over a range of 30 m to 40 cm. SpaDEX after all is an experimental mission and by maneuvering the spacecrafts closer to each other some valuable crucial data is being generated and ISRO is making best of the rare opportunity to experiment with ISD, maneuvering, firing of thrusters- its effects and various command and control protocols over

various segments of LEO, during visibility period and non-visibility periods. Trials so far have provided reasonable confidence that safe soft docking by SpaDEX is only a matter of time.

ISRO's POEM effort also needs to be appreciated. Along with the SpaDEX mission the PSLV-C60 was also tasked with the POEM mission. Simply put, POEM is an acronym coined by ISRO for 'PSLV Orbital Experiment Module', it relates to the employment of the spent fourth stage of the PSLV. While the first three spent stages off PSLV fall back into the ocean, the final stage (PS4) after launching the spacecraft into orbit is discarded and ends up as a space junk. Two years back, ISRO hit upon the idea of innovatively utilising the spent stage as an orbital stabilised platform for undertaking experiments as a floating lab in space. These experiments help in validating various proof-of-concept and other enabling technologies for future missions. The first POEM was launched in June 2022. The POEM has its dedicated solar panels, a Li-Ion battery, a Navigation Guidance and Control (NGC) system for attitude stabilisation- essentially controlling its orientation with four sun sensors and a magnetometer, a dedicated Helium gas control thrusters, it also has a telecommand enabled feature. POEM missions have a life of approximately three months.

PSLV-C60 SpaDEX mission launched on December 30, 2024, is the fourth POEM Mission (POEM-4). It has a total of 24 payloads, 14 from ISRO and DOS centres and 10 are from various Space Start-Up companies and Academia.

Success of SpaDEX mission not only strengthens India's position in space technology but also opens new vistas of opportunities in spacecraft servicing, lunar and deep space exploration and global collaborations. The SpaDEX mission success could open up a range of opportunities for India in long duration human spaceflight, the construction of large space structures and commercial possibilities in spacecraft servicing and space debris management.

Mastering rendezvous and docking operations is indeed a historic feat in space arena that will catapult India into an elite league of nations capable of executing complex space operations. Nation salutes ISRO for successful outcome of this SpaDEX mission. SP

DR V. NARAYANAN TAKES OVER AS CHARGE OF SECRETARY, DEPARTMENT OF SPACE; CHAIRMAN, SPACE COMMISSION AND CHAIRMAN ISRO

DR V. NARAYANAN ASSUMED THE CHARGE OF SECRETARY, Department of Space, Chairman, Space Commission and Chairman, ISRO on the afternoon of January 13, 2025. Prior to this, he served as Director, Liquid Propulsion Systems Centre (LPSC), one of the major centres of the Indian Space Research Organisation (ISRO), with its headquarters at Valiamala in Thiruvananthapuram and a unit at Bangalore. As Director, he provided techno-managerial leadership to LPSC, which is engaged in the development of Liquid, Semi-Cryogenic and Cryogenic Propulsion Stages for Launch Vehicles, Chemical and Electric Propulsion Systems for Satellites, Control Systems for Launch Vehicles and Transducer development for propulsion system health monitoring. ISRO Propulsion Complex (IPRC) located at Mahendragiri (Tamil Nadu) is a unit of ISRO responsible for Assembly, Integration and testing of Liquid Propulsion systems. As Chairman of LPSC-IPRC Coordination Committee, he was responsible for reviewing and executing the activities.

Dr V. Narayanan as the Chairman of Project Management Council-Space Transportation System (PMC-STSS), the decision making body in all Launch Vehicle projects & programmes, guided the operational and development activities of launch vehicle of ISRO. He was also the Chairman of the National Level Human Rated Certification Board (HRCB) of Gaganyaan programme.

Dr V. Narayanan, who is a Rocket and Spacecraft Propulsion Expert, joined ISRO in 1984 and functioned in various capacities before becoming Director of the Liquid Propulsion Systems Centre in January, 2018. Dr V. Narayanan completed his M. Tech in Cryogenic Engineering and Ph.D. in Aerospace Engineering from IIT, Kharagpur where he was awarded a Silver Medal for achieving the first rank in M. Tech programme.

He started his career, initially with TI Diamond Chain Ltd, Madras Rubber Factory, BHEL, Trichy and BHEL, Ranipet for one and half years before joining ISRO in 1984. In ISRO, he has completed 40 years of Meritorious service including 7 years as Director of Liquid Propulsion Systems Centre. Under his leadership, LPSC delivered 226 Liquid Propulsion Systems and Control Power plants for Launch Vehicles and Satellites of ISRO.

When India was denied the Cryogenic Technology for GSLV Mk-II vehicle, he designed the engine systems, developed necessary software tools, contributed for establishing the necessary infrastructure/test facilities, testing and qualification and completing the development of Cryogenic Upper Stage (CUS) and making it operational.

As Project Director for C25 Cryogenic Project of LVM3 vehicle, he led the team in successfully developing C25 Cryogenic Stage

powered by a 20-tonne thrust Engine and played vital role in the successful launch of LVM3 vehicle in its maiden attempt and made the stage operational. The development of Cryogenic Propulsion Systems made India one among six countries to have this capability and ensured self-reliance in Launch Vehicle.

Towards the LVM3-M1/Chandrayaan-2 and LVM3/Chandrayaan-3 missions, he led the teams and developed & delivered the L110 Liquid Stage and C25 Cryogenic Stage for the LVM3 vehicle and the propulsion systems which took the spacecraft from Earth to the Moon's orbit and Throttleable propulsion system of the Vikram lander used for soft landing near the south pole of the moon. He was the Chairman of the National Level Expert Committee which pin-

pointed the reasons for Chandrayaan-2 hard landing and recommended necessary improvements which eventually contributed to the success of Chandrayaan-3 and made India as the first country to soft-land near south-pole of Moon.

For PSLV C57/Aditya L1 mission, he led the teams in realisation of 2nd and 4th Stages and Control Power Plants of the launch vehicle and the propulsion system used for traversing the spacecraft from Earth's orbit to L1 point of the Sun and retaining it in the Halo orbit. As the Chair-

man of the Mission Readiness Review, he reviewed the mission and ensured India becoming the fourth country to have a successful satellite to study Sun.

Towards Human Space Flight Gaganyaan Programme, he contributed to Human Rating of LVM3 vehicle, development of Human rated L110 and C32 Cryogenic Stages, Environmental Control & Life Support System, Service and Crew module propulsion systems and Test vehicle for Crew escape system demonstration. As Chairman of Gaganyaan Certification Board, he contributed to certification process of various systems for Human Space Flight.

Under his leadership, the development of a new cryogenic stage (C32) was completed successfully and the stage was delivered for the first Gaganyaan mission. He was also leading the development activities like, 200-tonne thrust LOX-Kerosene Semi Cryogenic Rocket System for improving LVM3 payload, a 110T thrust LOX-Methane engine for future launch vehicles, Electric and green propulsion systems for spacecrafts.

As Chairman of Project Management Council of Space Transportation System, he guided the teams for the operational & new launch vehicles. He was also responsible for the Propulsion Systems for Venus Orbiter, Chandrayaan-4, Gaganyaan, Bharatiya Antariksha Station (BAS) and Next Generational Launch Vehicle programme cleared by Cabinet recently. SP



DR V. NARAYANAN, THE NEW SECRETARY, DEPARTMENT OF SPACE; CHAIRMAN, SPACE COMMISSION AND CHAIRMAN ISRO



INDIA'S AEW&C MODERNISATION IS NOT JUST ABOUT ENHANCING RADAR RANGE BUT ALSO ABOUT INTEGRATING DATA AND COMMUNICATIONS SYSTEMS THAT CAN PROVIDE REAL-TIME INFORMATION TO ALL LAYERS OF THE MILITARY'S DEFENCE INFRASTRUCTURE

EYES IN THE SKY: INDIA'S PUSH FOR ADVANCED AEW&C CAPABILITIES

India's AEW&C modernising efforts are now geared up for critical decisions amid delays

By MANISH KUMAR JHA

IN A CRUCIAL DEVELOPMENT, THE MINISTRY OF DEFENCE (MoD) is geared up to address the delays over the Airborne Early Warning and Control (AEW&C) systems and aircraft. It is reported that MoD will add six Mk1A aircraft worth ₹9,000 crore while the developmental work on the six Mk-2 aircraft, with bigger second-hand Airbus-321 planes bought from Air India, is already in an advanced stage which costs ₹10,990 crore.

In its capability outlook, IAF is planning to acquire 12 Mk1A and Mk-2 AEW&C which will add to the existing fleet

of three Netra Mk1 and three Phalcon Airborne Warning and Control Systems (AWACS). Airborne Early Warning and Control (AEW&C) systems are among the most critical components of modern military arsenals for enhanced situational awareness, command, control, and intelligence capabilities.

These systems use radar and other sensors mounted on aircraft to detect and track airborne targets, directing military operations effectively. In the context of India, Airborne AEW&C and AWACS modernisation programmes are critical

PHOTOGRAPH: IAF_MCC/X



WITH THE CHINESE KJ-500, INDIA FACES A STRATEGIC CHALLENGE IN MAINTAINING AN AIR DEFENCE CAPABILITY THAT CAN MATCH OR COUNTER CHINESE TECHNOLOGICAL SUPERIORITY

components of the Indian Air Force's (IAF) strategy to enhance its air defence capabilities. AEW&C modernisation is not just about enhancing radar range but also about integrating data and communications systems that can provide real-time information to all layers of the military's defence infrastructure.

As regional security dynamics in South Asia evolve, India has placed a strong emphasis on modernising its aerial surveillance systems, incorporating cutting-edge technologies, and ensuring that its radar and communication systems can counter emerging threats effectively.

On the other hand, China and Pakistan are actively advancing their AEW&C programmes to maintain or enhance their air superiority.

India's AEW&C Development. India's focus on developing its AEW&C capabilities has been marked by significant strides, particularly through indigenous efforts and international collaborations. The primary AEW&C platform developed by India is the Netra, an airborne radar system mounted on the Embraer 145 aircraft. This project is part of IAF's larger strategy to build a robust multi-layered air defence network.

Netra AEW&C. Developed by the DRDO (Defence Research and

Development Organisation) and manufactured by Embraer, the Netra is equipped with a variety of radar and communication systems. This system provides the IAF with real-time surveillance, intelligence, and early warning capabilities. With its advanced phased array radar and the ability to detect targets at long ranges, Netra strengthens India's defence perimeter, particularly along its borders with China and Pakistan.

While the Netra system reflects India's growing capabilities in indigenously designed defence technologies, India's AEW&C development continues to be a work in progress. The country aims to enhance its AEW&C systems further with the development of larger platforms and more advanced radar systems. The future goal is to develop a more advanced version of Netra with longer ranges and improved tracking capabilities, ensuring better detection of stealth aircraft and missile threats.

Here, India's collaboration with Embraer for the Netra platform has been instrumental in bridging the gap in airborne surveillance. Embraer's expertise in producing aircraft with exceptional airframes and reliable systems has allowed India to accelerate its AEW&C ambitions while also developing a robust domestic defence manufacturing base.

Airborne Early Warning and Control (AEW&C) systems are among the most critical components of modern military arsenals for enhanced situational awareness, command, control, and intelligence capabilities

PHOTOGRAPH: ENG.CHINA.MIL.COM.CN / GAO HONGWEI AND ZHANG BIN

The future of India's AEW&C programmes is expected to see the development of more advanced versions of Netra, possibly with larger platforms like the Airbus A330 or Boeing 737 to provide greater radar coverage and accommodate more sophisticated radar arrays. Such systems will be able to counter stealth aircraft and high-speed missiles.

China's AEW&C Capabilities. China has significantly advanced its AEW&C technology in recent years. Its growing technological prowess has allowed China to rapidly deploy a range of airborne surveillance systems, which play a crucial role in both defensive and offensive operations in the region.

KJ-2000 and KJ-500. China's main AEW&C platforms are the KJ-2000 and KJ-500, both of which are based on indigenous designs. The KJ-2000 is based on the Russian Il-76 transport aircraft and is equipped with an active phased-array radar that offers extensive coverage and tracking capabilities. The KJ-500, a more modern platform, is based on the Chinese Y-9 aircraft and features similar radar technology but is smaller and more versatile.

Advanced Radar and Surveillance. The Chinese AEW&C systems boast some of the most advanced radar technology in the region, offering long-range detection and improved target identification, including the ability to detect stealth aircraft. This gives China a considerable advantage in the region, particularly in countering both the Indian and US air forces' capabilities.

The integration of KJ-2000 and KJ-500 systems into China's air force allows for a broad surveillance range, covering not just Chinese airspace but also regional waters and areas of strategic interest. This capability significantly enhances China's situational awareness, especially in the South China Sea, the Taiwan Strait, and along its borders with India.

Pakistan's AEW&C Development. Pakistan's AEW&C capabilities are less advanced than those of India or China but have been gradually improving in recent years. Pakistan has focused on leveraging foreign technology while also developing its indigenous capabilities.

Pakistan's primary AEW&C platform is the Saab 2000 system, which is based on the Swedish-designed Saab 2000 aircraft, integrated with the Erieye radar system. This system offers Pakistan the ability to detect and track airborne targets at long ranges, providing a crucial layer of defence against aerial threats.

Strategic Limitations. Although Pakistan's AEW&C systems are capable, they are relatively limited in range and sophistication compared to China's or India's offerings. The Saab 2000 radar, while effective in regional airspace, falls much short of the capabilities of the Chinese KJ-500 or India's Netra in terms of detection range, data processing, or multi-role operational capabilities.

Pakistan's reliance on foreign systems like the Saab 2000 reflects its strategic need to build defence partnerships with countries like Sweden and others in NATO. In the future, Pakistan may

seek to develop more advanced AEW&C platforms or deepen collaboration with allies to close the technological gap.

With the Chinese KJ-500, India faces a strategic challenge in terms of maintaining an air defence capability that can match or counter Chinese technological superiority. India's ongoing development of the Netra series and the potential induction of larger platforms will be critical in maintaining a balance of power in the region.

AWACS Modernisation Plans. The Phalcon AWACS, although effective, is nearing the end of its lifecycle, and India has begun efforts to modernise and expand its AWACS fleet. There are plans to procure additional AWACS systems to ensure that India maintains a comprehensive air defence network. IAF in its futuristic



IAF HAS BEGUN TO MODERNISE AND EXPAND ITS AWACS FLEET

capability roadmap plans to acquire at least 18 AWACS aircraft to keep them available in the skies around the clock.

The Future AWACS systems will feature even more advanced radar and sensor technologies, such as Active Electronically Scanned Array (AESA) radars, which offer higher resolution, greater target detection capability, and the ability to track more targets simultaneously. This would allow India to improve its early warning and surveillance capability in increasingly complex and congested airspaces.

The key factor here is building airborne surveillance integration which is linked to improving integration with India's other air defence systems. The goal is to create a seamless network of surveillance, tracking, and combat control platforms that can respond to a variety of aerial threats. The integration of AWACS with ground-based radar systems, air defence systems like the S-400, and other intelligence-gathering systems will create a more effective air defence ecosystem. **SP**

Manish Kumar Jha is a Consulting & Contributing Editor for SP's Aviation, SP's Land Forces and SP's Naval Forces and a security expert. He writes on national security, military technology, strategic affairs & policies.

EXCLUSIVE

ALI AHMED ALNAQBI -
FOUNDING CHAIRMAN, MEBA -
A FIRM AND DYNAMIC
CRUSADER COMMITTED TO
THE CONSISTENT GROWTH OF
BUSINESS AVIATION INDUSTRY
ACROSS THE MIDDLE EAST.
HAS BEEN SELECTED AS CHAIR
OF IBAC BOARD FOR SECOND
CONSECUTIVE TENURE.



PHOTOGRAPHS: SARTHAK BARANWAL / SP GUIDE PUBNS

“THE PERCEPTION IS WHAT WE HAVE TO CHANGE”

In an exclusive chat with **Jayant Baranwal**, Chairman and Managing Director, SP Guide Publications at the recently concluded MEBAA 2024, **Ali Ahmed Alnaqbi**, Chairman of the IBAC Governing Board, and Founding Chairman, Middle East and North Africa Business Aviation Association (MEBAA) shared his insights and vision on Business Aviation’s Role, Challenges and a Sustainable Future

Jayant Baranwal (Baranwal): What are the key roles business aviation play in the interest of world countries and society?

Ali Ahmed Alnaqbi (Alnaqbi): Well, business aviation, you know, plays so many roles and the most important is, contribute in the growth of economies. The people who actually make the investment are our clients, so we carry them safely from one place to another place. Our role as business aviation is very important, taking the investors safely from one place to another place. Sometimes, we also take them to a new area where airline cannot reach and that’s the leverage of having a business aircraft. The business aircraft can land not only in a big airport, it can land anywhere, with special permission. Airlines cannot go except to a hub, which we have seen. And then we are, as you know, part of economy development. We are part of the process of creation of jobs. We create jobs for thousands and millions of people around the world.

Business aviation is vital, when it comes to support, you know, like charities, and supporting those companies who needed help. We transfer sick people, who cannot be mingled with others on an airline, from one area to another area. We, in certain area, transfer organs of human to another hospital. It doesn’t go by the airline for various reasons. So, we play so many roles, in addition to our existing set of roles. And one of the main things is, we help in making company profitable. So basically, we work with the companies. And most of the bigger companies in the world, are actually using private and business aircraft. The reason - they save time, and they don’t have to wait so long with the airlines. They also are able to avoid long queues in the airport. And, you



ALI AHMED ALNAQBI BELIEVES THAT BUSINESS AVIATION PLAYS MANY ROLES IN ADDITION TO THE EXISTING SET OF ROLES

know, they want to do business and come back. So, it is a factor of business tool for profitability and creativity and making the company a success.

Baranwal: Can you list down some of the major challenges the industry is still facing?

Alnaqbi: Again, a lot of issues that the business aviation facing mainly come from the understanding and the perception of business aviation. Now, people know what is the airline, but they think we are an airline, too. And when they realise that we are not like an airline, you know, we become an enemy again for them. But actually, the way we work, we contribute and we complement each other. Airline does a certain job, the cargo does certain work and we do certain work for certain people as well. So, the challenge is to change the perception. We are also under, I would say, attack, by protesters in Europe, different regions, because they think that we contribute in the CO₂, the carbon emission. And that is absolutely fake, not true. Because if you look at all aviation, they contribute two per cent on CO₂. Business aviation is 0.002 per cent of that percentage. So, we are less than two per cent of that two per cent. We are basically contributing nothing in the CO₂ emission, but we are still under attack, because we don't talk loudly and we don't speak too much. That's why we change the perception by doing shows. And we ask everybody to come and see this is what we are actually doing. Other things like the grey market and everywhere, it's always a problem. And we really work very hard to eliminate that. Have we succeeded? No. But we are working on it. So many people have to work together in order to get results.

Baranwal: How do you find the journey of MEBAA and the industry in the Middle East?

Alnaqbi: Well, we started MEBAA in 2006. There were a few companies in the whole region doing business aviation. There was one company in Jordan, three companies in UAE, four companies in Saudi, and so on and so forth. It was a very shy business. MEBAA came and started promoting the business, started talking to everybody. It is not luxury services only, but it's a business tool. So, business aviation is there for profitability for the reasonably bigger companies which need to save time, to fly to places where an airline cannot go. So, we started talking about all this, and then things have changed. A lot of companies started joining this region. Now in the region we have more than 370 companies doing charter, doing MROs, doing FBOs, doing refueling. All this has been done by the companies who serve airlines, but now have a dedicated company for us. So, in UAE, for example, if you look at the 2000s, there were about three companies. Now we have more than 35 companies. More than 10 times in Dubai, in Saudi and in Egypt. So, the market is growing, and MEBAA has paved the road for companies from abroad to come and check the opportunity here. And when they come and see the opportunity, within a few years you see they are opening their branches. Or, they move their headquarters to UAE, or the Middle East in general, for example. So that's a big growth driver.

“When we started MEBAA in 2006, there were a few companies in the whole region doing business aviation. Now in the region we have more than 370 companies.”

Baranwal: You will agree that the US still remains the biggest business aviation market. Why is it then visible that NBAA (their in-country body for business aviation industry) continues to fight for their rights?

Alnaqbi: Well, as I mentioned, the perception is what we have to change. The perception of business aviation is a lot of VIPs own aircraft, a lot of decision-makers own aircraft. A lot of people who are very rich, high net worth, own aircraft. The people don't see beyond. As that represents maybe 30 per cent of our business. The other 70 per cent is corporate, which is for business. You have other 70 per cent of the market size doing chartering and doing corporate. So, in a market like the US, which has been there for quite a long time, it's saturated. And now it's come to the point that we have to fight with somebody. So, this is existing. When you become a success, like the NBAA, like the US market which is huge and very successful, there is a price you have to pay. And that's what we are seeing now. You see my point? Again, it's one country, it's controllable. The problem is here, in our region, when you have 24 countries. And you have to have an agreement from all the countries when you want to

implement rules that help the business aviation or regulations. So, this is where the challenge is. But I think we were all going, at one stage, to convince everybody of our existence. Because our success, business aviation success, we become a threat to others. So, you then expect to be attacked. That's what happened in the United States. But again, more visibility for us, more help from the media, more help of showing our case and showing our stories and telling the world what we are actually doing. I think, all this will change the perception.

Baranwal: And how do you see the upcoming role of business aviation industry towards a greener future?

Alnaqbi: Of course, this is very important. Sustainability for us is essential. And SAF has been endorsed to be used fully by

2050. And of course, from IBAC perspective, which has an office at ICAO, we are fully committed to this. So, if you look at all aircraft now, all the new aircraft, their efficiency. They always come with a new product, new technology, efficiency therefore less carbon, less fuel. They're all green. They're all using SAF fuel. It's all contributing to this. So yes, we are understanding it. And we are working towards making, contributing to have the world reduce CO₂.

Baranwal: The cost of SAF is an issue?

Alnaqbi: It's always an issue. What comes first, chicken or egg? Because when you produce something new, it's very expensive. And you only can reduce the cost if there's so much demand or good demand. If you manufacture 10 aircraft versus manufacturing 1,000 aircraft, the cost would be different. And that's what actually happens. So now the debate is about availability. What we are telling the companies is that you need to ask for it so that we can provide it to you. I think eventually this will be our direction, where we're going.

Baranwal: And is the goal for 2050 achievable?

Alnaqbi: Well, it's a goal. I hope it's not movable and it's a fixed goal. But everybody is working towards 2050. SP

GULFSTREAM AIRCRAFT ENABLE EASY CONNECTIONS TO REMOTE LOCATIONS ACROSS CONTINENTS, TO HELP FUEL ECONOMIC DEVELOPMENT



“MIDDLE-EAST REGION IS A LAUNCH PAD, AND OUR AIRCRAFT ARE WELL-SUITED FOR MISSIONS OUT OF HERE”

PHOTOGRAPH: GULFSTREAM

EXCLUSIVE

MICHAEL SWIFT,
GROUP VICE PRESIDENT –
SALES, EMEA & APAC,
GULFSTREAM AEROSPACE



The MEBAA show, held in Dubai every second year, witnesses a very regular participation of Gulfstream Aerospace. The 2024 edition held in December last year also witnessed a great and active participation of Gulfstream. **Jayant Baranwal**, Editor-in-Chief, *SP's Aviation*, had an exclusive conversation at this occasion, with **Michael Swift**, Group Vice President – Sales, EMEA & APAC, Gulfstream Aerospace.

Jayant Baranwal (Baranwal): How was Gulfstream's current fleet conceptualised? Can you elaborate a little bit on the journey till now?

Michael Swift (Swift): Gulfstream conceptualized our next generation aircraft family with a holistic strategy for a fleet for every mission which includes the G400, G500, G600, G700 and G800. This began with the launch of the G500 in 2013, and you can see that fleet strategy come into play even more now with the recent certification of the G700, the G800 around the corner and the G400 to follow.

Baranwal: And what is the standing of, if you can just give me a little brief overview of Gulfstream family, in the world market today. How do you perceive that?

Swift: It's a good question. The Gulfstream fleet is well accepted around the world. For my part, I cover all the sales teams outside of the Americas. So, I have Europe, the Middle East, Africa and Asia, and we see robust demand for all our aircraft in each market. It really comes down to the end client, where they're flying, where they need to go, and we believe we have a Gulfstream for every mission.

Baranwal: What sets Gulfstream apart?

Swift: We're a leader in innovation; we're a leader in sustainability; and we deliver the finest aviation

experience to our clients. I'm proud to stand behind that with all our customers.

Baranwal: When you say sustainability, can you elaborate that a little bit for us?

Swift: Absolutely. We have a great sustainability story to tell. We were the first OEM to fly transatlantic on 100 per cent neat SAF, and each year we continue to make further advancements towards our sustainability goals. We have a very robust customer advisory board, and we know that a lot of our customers are trying to tackle their own sustainability efforts in their business. And we want to help them with that from a Gulfstream perspective.

Baranwal: Even today, at times, business jets are perceived as the toys of rich. Is that a correct perspective? And if not, what all could the counterpoints be?

Swift: No, I don't think so. I just wrapped up a meeting here at MEBAA Show where we were looking at the facts and the figures of the flights and who's using business aviation, and it's clear our customers use business aviation in a variety of different ways. We fly special missions. We make medevac flights. Some of our customers are large companies that have facilities in hard-to-reach destinations that aren't well-served by the airlines. So, I know

“The Gulfstream fleet is well accepted around the world. We believe we have a Gulfstream for every mission.”

PHOTOGRAPH: GULFSTREAM



INDIA IS EMERGING AS A MAJOR MARKET AND WILL BE A GROWTH ENGINE FOR GULFSTREAM FOR YEARS TO COME

there’s a misperception of the industry that differs from the reality of the day-to-day operations for business aviation. There’s a reason why it’s called business aviation. It is for business.

Baranwal: Absolutely, so it is like an office in the sky?

Swift: A hundred per cent. I’ve personally flown with our customers all over the world. They’re not sitting back. They’re advancing their business. Connectivity is a huge concern for them because they need to be connected and moving around. And you see that here at MEBAA Show, too. I just met with a customer this morning that flew in on his aircraft, and he can avail his schedule versus having to wait. That owner can arrive, meet with the people he needs to see, and then depart and get to where he needs to be next.

Baranwal: So can we say that business jets considerably contribute towards the economies of the countries?

Swift: Yes, without a doubt.

Baranwal: How? A few quick pointers?

Swift: Business aviation stimulates the economies where it’s active and where it’s growing – business aircraft enable easy connections across continents, including both international business hubs and more remote locations to help fuel economic development.

Baranwal: Your window size is very attractive, and I think it’s a very unique

feature of Gulfstream jets. Anything you would like to speak about that which gives a very wide and panoramic sort of view for the traveler sitting next to the windows?

Swift: We get compliments from owners all the time about the windows and how they enhance the way passengers feel when they’re traveling. Along with the natural light they allow, customers benefit from our industry-leading cabin altitude, and a hundred per cent fresh air every two to three minutes. When you get off the aircraft, you don’t feel like you’ve just flown for 10 or 12 or 13 hours. You arrive completely refreshed. The natural light has a big part to play in that.

Baranwal: So you invite nature to be part of your interior circulation, right?

Swift: Absolutely.

“We were the first OEM to fly transatlantic on 100 per cent neat SAF, and each year we continue to make further advancements towards our sustainability goals”

Baranwal: What is special about the Middle East market? Then I’ll come to the India market.

Swift: Gulfstream’s been very active in the Middle East for over 65 years – we’ve been selling airplanes here for a very long time and have a strong installed base in the region. We have loyal customers here that use the aircraft to go to the destinations they need to get to, whether that’s London, the US, Singapore, anywhere, really. This region is a launch pad, and our aircraft are well-suited for missions out of here. We fly long range, high speed, very efficient



GULFSTREAM IS THE LEADER IN SUSTAINABILITY. IT IS THE FIRST OEM TO FLY TRANSATLANTIC ON 100 PER CENT NEAT SAF.

flights. So, to get from the Middle East to wherever they need to get to, Gulfstream aircraft can do that.

Baranwal: And how do you perceive the India market?

Swift: The market in India is great and has an incredible story to tell in terms of GDP growth to fleet size. I am there quite a lot and love seeing next generation Gulfstream aircraft coming into the market in India, and customers are excited about that. I personally enjoy working with customers in India and see it as a growth engine for years to come.

Baranwal: It's going to be a very, very major economy in coming times in the world. And we at SP Guide Publications and the associations like Business Aircraft Operator Association and others, we all are pushing to better the environment for business aviation, smoother regulatory process and so on. And it appears that we have very dynamic government and the policy-makers in place, these days. So, therefore, I think, like you said, you rightly love India.

Swift: India is growing into a major market, and we have been bringing our new aircraft into the region regularly over the last few years. We've been working with the DGCA so they can better understand the products we are bringing to the market and all the new safety enhancements they offer.

Baranwal: Anything specific you would like to say which is unique to Gulfstream?

Swift: We have a great story to tell and value our customers in India. We're known for world-class customer support and market-leading products – we look forward to even more customers in India sitting next to our panoramic oval windows

GULFSTREAM: CITY-PAIRS		
	Ground Distance (nm)	Cruise Mach
Gulfstream G400		
Delhi to Tokyo	3,597	0.88
Delhi to Milan	3,498	0.88
Gulfstream G500		
Delhi to Johannesburg	4,431	0.87
Delhi to Perth	4,439	0.90
Gulfstream G600		
Delhi to London	4,741	0.90
Delhi to Melbourne	5,635	0.87
Gulfstream G700		
Delhi to Honolulu	7,029	0.87
Delhi to New York	6,624	0.87
Gulfstream G800		
Delhi to Auckland	7,126	0.87
Delhi to Seattle	6,811	0.90

and reaping the benefits of Gulfstream whether they are flying in the region or around the world. [SP](#)

PHOTOGRAPH: GULFSTREAM/MAERO / X

EXCLUSIVE

CARLOS BRANA,
EXECUTIVE VICE PRESIDENT
CIVIL AIRCRAFT, DASSAULT AVIATION



PHOTOGRAPHS: DASSAULT AVIATION

A LEGACY OF SAFETY, EFFICIENCY, AND INNOVATION

Dassault Falcon Business Jets are redefining luxury and safety in Business Aviation. **Carlos Brana**, Executive Vice President Civil Aircraft, Dassault Aviation shares insights into the company's vision and cutting-edge technology in an exclusive conversation with **Jayant Baranwal**, Editor-in-Chief of *SP's Aviation*, during 2024 edition of MEBA held in Dubai.

Jayant Baranwal (Baranwal): First of all, what are the very key features of Falcon family jets which make them different from any other jets in the world?

Carlos Brana (Brana): Well, let's say that when the Falcon started, of course, one of the key features was safety. At the time, in the 1960s, 1963 actually, when we launched the first Falcon, a lot of people didn't know very much what aviation was really, although they had the opportunity to fly, but, you know, there were a lot of accidents and so on. And so, our tradition was to make sure that the airplane was safe. With time, we have made progress to be more and more safe, and so on. And right now, we have the flight control system, which is the core of the safety of the airplanes. So, now we have the digital flight control system. This is one of the big features of the Falcon. And thanks to that, they are deemed extremely safe. Actually, to be clear with you, we never lost the Falcon 2000, never lost the Falcon 900 and have never lost the 7X. So, all these airplanes, maybe we were lucky, but at least no incidents or no accidents, which led to the destruction of the airplane. So, it is to say, this is the thing we have been doing for years. The second point is about efficiency. What we have been doing for many, many years is develop efficient airplanes. Efficient airplanes is that you adapt, let's say, the size of the engines to the size of the airplane. So, you design a very aerodynamic airplane with nice wings and so on, but also you adapt the thrust of the engine to the size of the airplane. If you have too much thrust, it's nice, but on the other hand, your efficiency is not that good. For example, if you take a three-engine airplane, you have three small engines, and this is a very efficient airplane when it's cruising. If you take two engines, a two-engine airplane will have bigger engines, because once you start to take off, if there is a fail of one engine, you still need to be able to take off with one engine. So, of course, you need to have the thrust for that. With a three-engine, if one engine fails, you still have two engines. So, you see the big difference. So, efficiency.

“Business aviation is not only for the super-rich. It's a tool—a flying office that saves time and creates opportunities.”

Baranwal: But then why some of your jets are two engines, some of your jets are three engines?

Brana: Let's say the point is also that the engines are more and more reliable. So, little by little, we looked at the global equation between the cost of the engines to the cost of the airplane, the maintenance cost of the engines and, of course, the maintenance cost of the airplane, and also the additional drag created by the third engine compared to the drag created by only two engines. We made a computation, optimisation and so on, and now we have to admit that two engines is okay. Although, it's less frugal than the three engines. So, safety issue is always something you need to focus on and to take care of. But, we also understand that the people who are behind, they would like to fly comfortably. So, we have put more emphasis now on the comfort of the airplane. So, the level of noise, the amortisation of the plane or the dampening of the plane when you are in turbulences, the cabin pressure, the altitude, the cabin altitude, the ergonomics of the cockpit, how to fly better, the information you have in the easy flight deck, etc, everything is paramount to have a very, very nice airplane to fly. And so, the latest we are doing now, with the people getting bigger and taller, for the 6X and the 10X, we have now a bigger tube. The fuselage is a bigger diameter than it used to have. If you look at the Falcon 20, it's very tight. And now, expanding with the Falcon, starting at 900, in the 2000, 7X, 8X, it is the same tube. 6X is a bigger tube and the 10X is even a bigger tube.

Baranwal: So, which one is the biggest?

Brana: The 10X will be the biggest. Today, the 6X is the biggest. And the 6X, I don't know if you had the opportunity to visit it. But it's the biggest cross-section of any purpose-built business jet. I mean, of course, it's not bigger than the 777 or BBJ. But the BBJ is not a purpose-built business jet. And there is a big difference between a purpose-built and a non-purpose-built. Because when you are in a purpose-built, landings, in high altitudes, the performances are different. The cabin pressure is different. A lot of things are



CARLOS BRANA IS VERY UPBEAT ABOUT FALCON AIRCRAFT AS THEY ARE VERY STABLE, VERY EASY TO FLY, VERY EASY TO PILOT AND EXTREMELY EFFICIENT

different compared to a non-purpose-built business jet. Even the ceiling to fly is different. So, we can go up to 51,000 feet. The ceiling for a non-purpose-built business jet would be maybe 41,000. That's all.

Baranwal: Tell me something about what enables you to take off a land on a short runway. And how short is the runway? What is the minimum size of runway you can work with?

Brana: We can certainly show you numbers. Typically, for example, a big 8X could land in 2,000 feet or even less. Of course, it depends on the weight and so on. The D.I.D., to have short landings, you have to have a decrease in speed at the time of landing. The way you can land with a slow speed, is based on the way we design the wings. So, we have in the wings the flaps and also the slats. So, actually, the wing is very straight when it's cruising, and then when it lands, it's distorted in order to increase the drag, but also the lift. And so, the speed is slower, and of course, the slower you land, the quicker is the slowdown. The brake acts much efficiently. And so, that's the reason why we can have high performance in terms of landing on any kind of airport. By the way, other planes, some of them do not have the slats. And so their landing is much further. And in order to adapt to have a slower speed, they will have bigger wings. The whole stuff is a sort of compromise. Of course, when you have this kind of device, so flaps and slats, there is an additional cost to the airplane because you have to design and build mechanisms, sophisticated mechanisms, which allow the deformation of the wing at the time of the landing.

Baranwal: Well, business jets or private jets are perceived as only meant for rich and super-rich. Is this a correct expression?

Brana: So, there is sometimes a perception of business aviation which is different to what business aviation is really. We are in a segment where, yes, the market, let's say the models, are certainly more expensive than others. But business aviation is not only for super-rich people. It's also for people like you and me who are supposed to link from one town to another faster because there is no airline, there is no nothing. And so, the idea is sometimes to use small airplanes, sometimes with propellers, but they are not business jets, but they are business aircraft. And the majority of business aviation is linked to those kind of users. Actually, we represent in our segment a minority of airplanes. But it happens that some people, for example, they cannot be satisfied only with 500 kilometre range. They need a longer range airplane. Of course, they can afford that kind of range, that kind of airplane. But that also saves them a lot of time. If you think about the United States, for example, and it could be in China tomorrow. You know, a lot of big companies are located in remote areas because of large facilities. You have a lot of advantages being in remote areas, but the problem is how do you link between the remote areas to other parts of the United States or of the world. So, this is the reason why business aviation is a great link between towns which are not necessarily connected together. For their own safety, sometimes it's better that they go in a private jet rather than in the middle of the crowd. You never know what can happen. So, for those reasons, there is a need for business aviation.

“India is a country with immense potential and a growing business aviation culture. People are gradually recognising business aviation as a business tool.”

Baranwal: How do you find India as one of the upcoming markets?

Brana: So, India is, of course, a market with a huge potential. You know, 1.5 billion people almost. It's a super big country compared to China or compared to the United States. It's not that different in



BUSINESS AVIATION IS FOR PEOPLE WHO NEED TO LINK FASTER FROM ONE TOWN TO ANOTHER AS A LOT OF DEALS ARE MADE BECAUSE OF FACE-TO-FACE MEETINGS

terms of size. No, India is, of course, a country with an immense potential. Now, you know, the potential is one thing and then the culture is another one. Everyone is not necessarily in tune with the use of business aviation because culturally they are not there. Now, what we see is that there is a growing market in India right now. And hopefully, you know, we will sell more and more and more. Let's say, 20 years ago there was a market but not that big. So, people are coming little by little to business aviation as it is a business tool.

Baranwal: So, it's a tool for you to do business. It's a more efficient way. In other words, we can also say flying office or office in the sky.

Brana: To the point that, you know, when we are dealing with customers, one of their main problems is when the internet connection between the airplane and the rest of the world is different. This is something that they cannot stand. And it's for good reason. You know, more and more people now are wanting the ability to perform their business while they are in flight. When we were flying an airline 20 years ago, you were watching movies or you were, you know, finishing your work and so on. But it was a more relaxing because there was no connection with the ground. But now everyone wants to be connected to the ground because they have a lot of interactions with their peers, with their families or whatever. And they need that connection. To the point today that when the internet connection does not work, some people, they refuse to fly. So, what we call AOGs, aircraft on the ground, are done, not because the airplane has failed, but because the internet connection has failed. But now, we

have a revolution in the internet connection with the systems now, Star-link and so on, where the speed of connection of the internet is about the same as your own. So, you can be, in that particular sense, talk about a flying office. Because it is exactly like if you were in your office.

Baranwal: When are the 10Xs going to fly, going to be delivered?

Brana: We are working for a 2027 delivery. So, the entry into services will be 2027. And we start from there.

Baranwal: And have you started receiving the orders?

Brana: Yes. The 10X is going to be the best jet from the Falcon family in coming years? The big difference with 10X is the range and the cabin volume. We compare this not with our own airplanes, but to the competition. We think it will be a game changer! A game changer because the volume of the cabin is impressive. You will have a little apartment, let's say, a flying apartment. It will be a like your old room with the same kind of surface of the small apartment. The people who are visiting the mock-up in Paris, you know, we brought the mock-up last year during the Dubai Airshow, they are very impressed by the cabin volume. Of course, we will make the airplane as comfortable in terms of noise, in terms of cabin pressure, brightness, etc. For example, right now, what we do is we have a cabin pressure which is about 1,200 meters. So, it's about 3,900 feet. And for the 10X, it will be 3,000 feet. So, it's about 900 meters. And the idea is that you feel the same, you have the same kind of air that you would have if you go to a mountain at 900 meters high. ^{SP}

“The 10X is going to be a game changer. The range, the cabin volume, and the comfort—it's like having a flying apartment with the brightness, noise control, and cabin pressure of a luxury experience.”



BUSINESS AVIATION IN THE MIDDLE EAST IS EXPERIENCING REMARKABLE GROWTH, DRIVEN BY STRATEGIC INVESTMENTS, ECONOMIC DIVERSIFICATION, AND INCREASING DEMAND FOR PRIVATE TRAVEL

MEBAA SHOW 2024 – MIRRORING **BIZAV** GROWTH IN MIDDLE EAST

The Middle East is emerging as a key player in global business aviation, emphasising sustainability, leading platforms for advanced air mobility, enhanced connectivity, and luxury services to cater to corporate and individual clients

By AYUSHEE CHAUDHARY

BUSINESS AVIATION IN THE MIDDLE EAST IS EXPERIENCING remarkable growth, driven by the region's strategic investments, economic diversification, and increasing demand for private travel. With hubs like Dubai and Riyadh leading the charge, the sector benefits from state-of-the-art infrastructure, innovative technologies, and a growing base of high-net-worth individuals. The Middle East is emerging as a key player in global business aviation, emphasising sustainability, leading

platforms for advanced air mobility, enhanced connectivity, and luxury services to cater to corporate and individual clients.

With this backdrop, the tenth edition of the Middle East Business Aviation Association (MEBAA) 2024 was organised in December 2024. Held at Dubai World Central - Al Maktoum International (DWC), MEBAA 2024 solidified its position as the premier business aviation platform in the Middle East and North Africa. Over three days, the event attracted attendees

PHOTOGRAPH: MEBAA

from more than 95 countries, uniting global leaders, innovators, and industry visionaries to drive growth, innovation, and collaboration in business aviation.

The MEBAA Show 2024 drew to a close with a series of key deals and announcements, all set to drive the business aviation industry forward. The event attracted attendees from 100 countries, showcasing a notable rise in international participation compared to previous editions—underscoring its importance to the global business and private aviation sectors. Throughout the show, more than 145 local, regional and international exhibitors displayed the latest business aviation aircraft, technology and solutions which are supporting the industry's strong growth trajectory. With more than 30 aircraft on display, this was one of the most remarkable static displays in the MEBAA Show's history, with representation from leading names such as Airbus Corporate Jets, Boeing Business Jets, Bombardier, Dassault Aviation, Embraer, Gulfstream, Textron, and more.

His Highness Dr Sheikh Sultan bin Khalifa Al Nahyan, Adviser to the UAE President also visited the show on its opening day, which gathered members of the business aviation community from more than 95 countries. Reaffirming its position as the foremost business aviation platform in the Middle East and North Africa, exhibitors and visitors convened to explore key themes of sustainability, business aviation technologies and future trends that will shape the industry.

Ali Ahmed Alnaqbi, Founding and Executive Chairman of MEBAA - the Middle East & North Africa Business Aviation Association, commented, "This year's MEBAA Show sets another milestone in the remarkable evolution of business aviation across the region. On day one, we've seen the unveiling of innovative technologies, new solutions, and exciting announcements that are driving the industry forward. The energy and collaboration among exhibitors, visitors, and global leaders have set the tone for what promises to be an impactful show. We are proud to be at the heart of these transformative conversations and look forward to building on today's momentum in the days ahead."

The MEBAA Show 2024 underscored its role as a key platform for collaboration, fostering partnerships essential to the growth of the business aviation sector. Khaled Hashem, President of Honeywell Middle East and Africa, emphasised the UAE's leadership in aviation innovation, citing its position as a global hub driving growth and prosperity. Honeywell showcased its cutting-edge solutions at MEBAA 2024, reflecting over 70 years of serving regional customers and aligning with aviation megatrends.

Holger Ostheimer, Managing Director of DC Aviation Al-Futtaim, praised the region's visionary leadership, highlighting Dubai's two decades of aviation growth and Saudi Arabia's

rising prominence. He noted the influx of wealthy individuals relocating to the region, creating an exceptional environment for business aviation. Similarly, Ramandeep Oberoi, CEO of Falcon Aviation Services, reinforced Dubai's status as a private aviation hub, pointing to Al Maktoum Airport's five-runway infrastructure and a 230 per cent surge in UAE flights since 2019, prompting significant MRO investments.

Networking opportunities were further enhanced by the Operators Programme, sponsored by Saudia Private Aviation, and the Platinum Guest Programme, sponsored by Falcon. Discussions extended to Saudi Arabia's Vision 2030 during the panel "The Rise of Saudi Arabia – Exploring the Boom and Opportunities," which detailed plans to expand to 250 destinations and serve 330 million passengers with \$100 billion in investments. Eng. Imtiyaz Manzary of Saudi Arabia's General Authority of Civil Aviation (GACA) outlined efforts to streamline regulations, create 30,000 jobs, and drive growth in emerging sectors like eVTOL and air mobility.

The BizAv Talks conference featured over 55 top executives, including 70 per cent c-suite speakers, addressing themes such as the future of business aviation, sustainability, and the evolving market landscape. Youssef Mouallem, Executive Vice President of Vista, emphasised the strategic importance of the Middle East for private aviation, describing it as not just a status symbol but a vital business tool. New platforms such as the Startup Hub and the Advanced Air Mobility Pavilion spotlighted innovations like eVTOL technologies, while the NextGen Leaders platform engaged students with industry experts to inspire future talent in business aviation. Collaboration remained central to the event's success, supported by initiatives like the Operators Programme, sponsored by Saudia Private Aviation, and the Platinum Guest Programme, sponsored by Falcon. The AI-powered MEBAA Connect matchmaking app facilitated lead

generation, pre-scheduled meetings, and enhanced networking opportunities.

MEBAA PROVIDES PLATFORMS FOR KEY DISCUSSIONS

The BizAv Talks conference commenced with a compelling exploration of "The Next Frontier of Business Aviation," attracting prominent executives and innovators from across the globe. The opening panel, titled 'Middle East BizAv and the Global Equation,' delved into how the Middle East's strategic investments, forward-thinking policies, and economic diversification have revolutionised business aviation. The discussions emphasised the region's strengths, challenges, and its transformative role in the global business aviation market, with a focus on innovation and sustainability.

The day's sessions included insights from key industry figures such as Andrea Zanetto, CEO of Comlux Aviation; Joanne



"The MEBAA Show has always been more than just an event – it is a platform for innovation, collaboration, and inspiration, setting benchmarks for the future of business aviation"
— Ali Ahmed Alnaqbi, Founding and Executive Chairman of MEBAA



GULFSTREAM G700, FEATURING MAJESTIC INTERIORS AND LARGE OVAL WINDOWS THAT OFFER PANORAMIC VIEWS AND AMPLE NATURAL LIGHT, HAD A COMMANDING PRESENCE AT MEBA 2024



Goodall, CEO – Europe of TAG Aviation Europe; Jorge Colindres, Founder & Executive Chairman of San Marino Aircraft Registry; and Bernard Van Milders, President & CEO of Flying Group. These experts contributed to shaping a robust narrative about the region’s pivotal role in shaping the future of global business aviation.

Another panel then unpacked the key trends with global industry representatives, including Kurt H. Edwards, Director General of IBAC; Douglas Carr, Senior Vice President, Safety, Security, Sustainability & International Operations of NBAA; Robert Baltus, Chief Operations Officer of EBAA; and Jenny Lau, Vice Chair, Asian Business Aviation Association (AsBAA) & Founder and Vice Chair of Sino Jet.

With sustainability and innovation as key themes, the session titled “What has changed in the evolving BizAv landscape?” saw David Van Den Langenbergh, Chief Industry Affairs Officer of Luxaviation Group, and Youssef Mouallem, Executive Vice President-International of Vista, discussed how market demands, alternative fuels, and emerging business models are shaping the future of fleet strategies and operations in business aviation.

A panel moderated by Vincent featured global leaders such as Kurt H. Edwards (IBAC), Douglas Carr (NBAA), Robert Baltus (EBAA), and Jenny Lau (AsBAA), who explored industry trends. Discussions emphasised sustainability and innovation, with David Van Den Langenbergh of Luxaviation Group underscoring

the need for investments in SAF despite high costs, while Vista’s Youssef Mouallem highlighted private aviation’s critical role in global connectivity.

The session “Trade Secrets and Insights for Aircraft Owners” provided strategies for navigating the aviation market, featuring Chad Anderson (Jetcraft), Nadav Kessler (Asian Sky Group), and Paul P. Jebely (The Hague Court of Arbitration for Aviation). Panelists delved into market complexities, emphasising resilience and strategic approaches to fleet management.

Mouallem further emphasised MEBA’s importance as a platform for building connections and showcasing Vista’s solutions tailored to evolving corporate and individual needs. He noted the Middle East’s growing reliance on private aviation as a critical business tool, driving efficiency, sustainability, and connectivity.

The MEBA Show concluded, with more BizAv Talks sessions set to offer strategic insights focused on the daily theme of “The Business of Business Aviation”.

Ali Ahmed Alnaqbi also said, “The MEBA Show has always been more than just an event – it is a platform for innovation, collaboration, and inspiration. This year’s edition has surpassed all expectations, with record attendance, impactful discussions, and transformative announcements that will shape the future of business aviation. As we continue to witness rapid growth in the region, we remain committed to fostering partnerships,



DASSAULT FALCON MADE ITS PRESENCE FELT AT MEBAA 2024. FEATURING UNMATCHED SAFETY, COMFORT, AND EFFICIENCY, THE FALCON 6X DREW THE APPRECIATION OF DELEGATES AND VISITORS TO THE SHOW.

advancing sustainable solutions, and paving the way for the next generation of business aviation professionals.”

Shining a spotlight on the future of business aviation, the final day featured the ‘NextGen Leaders’ programme, an interactive initiative where students engaged with industry leaders to explore career pathways. Ali Alnaqbi opened the session with insights on unlocking opportunities in business aviation, followed by a panel of top HR leaders from Lufthansa Technik Middle East, Aviation Services Management, LunaJets, UAS, and IAE, who shared practical advice, essential skills, and personal experiences to prepare students for success in this dynamic field.

FURTHER HIGHLIGHTS FROM MEBAA 2024

Other key highlights include the Startup Hub, a brand-new platform for global startups to showcase innovations and connect with the business aviation sector, as well as the newly launched Advanced Air Mobility pavilion showcasing eVTOL technologies, and the returning Next Gen Leaders platform. Meanwhile, the new Luxury Boulevard, sponsored by Falcon, brought a dedicated showcase of the world’s most esteemed luxury brands alongside the iconic business jets at the static display. The static display was a major attraction, featuring aircraft from renowned names like RoyalJet, Qatar Executive, and Vista, with 12 exhibitors debuting their aircraft. With more than 145 exhibitors and over 30 aircraft on display, this year’s MEBAA

Show set new benchmarks for innovation and collaboration. Industry giants such as Airbus Corporate Jets, Boeing Business Jets, Bombardier, Dassault Aviation, Embraer, and Gulfstream showcased cutting-edge technologies and aircraft, emphasising the sector’s strong growth trajectory.

Attendees saw the launch of new initiatives and deals, as well as heard from top executives and innovators at the BizAv Talks conference. As a key highlight at the show, content focused on daily themes: The Next Frontier of Business Aviation; Driving a Sustainable Future for BizAv; and The Business of Business Aviation and NextGen Leaders. Top industry names on the agenda included: David Van Den Langenbergh, Chief Industry Affairs Officer of Luxaviation Group; Walid Alrahmani, Assistant Director General Strategy & International Affairs of General Civil Aviation Authority, UAE; Youssef Mouallem, Executive Vice President-International of Vista; Joanne Goodall, Chief Executive Officer – Europe of TAG Aviation Europe; and Kurt Edwards, Director General of IBAC; among others.

Reflecting the diversity of its agenda, the MEBAA Show 2024 has not only reinforced the region’s reputation as a hub for business aviation, but also demonstrated the sector’s commitment to innovation, sustainability, and talent development. From transformative partnerships to inspiring initiatives, the show has set the benchmark for what the future holds for the industry. SP



A SERIES OF GROUNDBREAKING PARTNERSHIPS AND ANNOUNCEMENTS WERE MADE AT THE MEBA 2024 THAT UNDERScoreD ITS ROLE AS THE MIDDLE EAST'S PREMIER PLATFORM FOR BUSINESS AVIATION.

A SPECTACULAR SHOWCASE OF AIRCRAFT & COLLABORATIONS

MEBA 2024 was marked by a series of groundbreaking announcements and collaborations, reflecting the sector's innovation, growth, and adaptability to emerging trends

By AYUSHEE CHAUDHARY

THE MEBA SHOW 2024 CONCLUDED ON A HIGH NOTE, cementing its status as a transformative platform for the business aviation industry. Over its duration, the event was marked by a series of groundbreaking announcements and collaborations, reflecting the sector's innovation, growth, and adaptability to emerging trends.

The MEBA show also highlighted the growing role of sustainability and technology in aviation. The show also spotlighted regional and global business expansions. Gama Aviation secured its first post-Brexit EASA air operator certificate (AOC) in Malta, allowing its managed fleet, including Gulfstream G650 and Bombardier Global aircraft, full access to the EU charter market.



(CLOCKWISE FROM TOP LEFT) QATAR EXECUTIVE ANNOUNCES ADDITION OF STARLINK INTERNET SERVICES TO ITS GULFSTREAM G650ER FLEET; IC LEASING SIGNED AN ORDER FOR A DASSAULT FALCON 2000LXS; JETEX AND JOBY PARTNER TO ADVANCE SUSTAINABLE AIR MOBILITY; HONEYWELL AND SINO JET SIGN MOU.

Similarly, Aero-Dienst received certification from the UAE General Civil Aviation Authority (GCAA) as an approved maintenance organisation, enhancing its MRO capabilities in the Gulf region.

The MEBAA Show 2024's dynamic array of announcements and partnerships reaffirmed its reputation as a cornerstone event for the global business aviation community. From technological advancements to sustainability initiatives, the event provided a glimpse into the future of the industry, highlighting its resilience and capacity for innovation amidst evolving challenges. Some of the key announcements and deals from the show are highlighted here.

- Honeywell signed a pivotal Memorandum of Understanding (MoU) with Sino Jet, focusing on advancing aviation services and developing cutting-edge technologies.
- Ayla Aviation LLC revealed a strategic partnership with Satpelda Satellite Imagery to integrate satellite technology into aerial operations, enhancing both safety and efficiency.
- MD ONBOARD, in collaboration with Laerdal, introduced advanced inflight medical advisory solutions, redefining passenger safety and operational standards in the skies.
- Qatar Executive announced significant enhancements to its fleet. Its Gulfstream G650ER jets are set to feature Starlink connectivity, ensuring superior onboard internet access, while its Gulfstream G700 aircraft integrated the MedAire360 system. This advanced solution provides real-time medical diagnostics and security intelligence, prioritising passenger and crew safety during flights.
- Victor, a private charter platform, launched the first

Arabic-language jet charter app, catering to the rapidly growing MENA market. The app reflects the region's increasing demand for private aviation, with Victor reporting a 166 per cent surge in UAE-based bookings over the past seven months. This innovative platform also allows users to select sustainable aviation fuel (SAF) for flights, underscoring a commitment to eco-conscious travel.

- Saudi Arabia's General Authority for Civil Aviation (GACA) introduced annual permits for private aircraft owners, streamlining processes and reducing bureaucratic hurdles for non-commercial flights. The initiative complements Saudi Arabia's Vision 2030 by facilitating private air travel and supporting the country's growing aviation ambitions.
- Airbus Corporate Jets celebrated a standout year, with eight orders and three commitments for its aircraft, marking one of its strongest performances in 17 years. In a fireside chat, Chadi Saade, President of Airbus Corporate Jets, celebrated a record year with eight orders and three commitments, crediting post-COVID momentum for boosting business aviation as a vital tool for diplomacy, business, and cooperation. He highlighted the ACJTwoTwenty's unique positioning in terms of space, pricing, and operational efficiency.
- Pilatus appointed Jet Aviation at Dubai International Airport as an authorised service center for its PC-24 jets, expanding support for operators in the region.
- AMAC Aerospace diversified its offerings by introducing Starlink satellite communication systems and advanced missile defence technology for aircraft upgrades.

PHOTOGRAPHS: QATAR AIRWAYS, SARTHAK BARANWAL / SP GUIDE PUBNS, JETEX, HONEYWELL

- UAS International Trip Support ventured into business aircraft sales and management, launching a managed fleet anchored by a Bombardier Global Express based in Sharjah. This move reflects the booming demand for private aviation in the Middle East.
- Essential Jet Solutions (EJS) partnered with MySky to leverage AI-powered spend management in procurement, streamlining processes for business aviation operators. MedAire expanded its offerings with AI-driven security updates and enhanced crew training programs tailored for operators in the Middle East.

AN ARRAY OF DISPLAY AND UNVEILING MOMENTS

The MEBAA Show 2024 brought together an extraordinary array of aircraft, state-of-the-art technologies, and pioneering solutions, solidifying its status as the premier platform for business aviation in the Middle East and North Africa. The static display, one of the most highly anticipated highlights of the event, featured 30 aircraft from industry leaders, including Airbus Corporate Jets, Boeing Business Jets, Bombardier, Dassault Aviation, Embraer, Gulfstream, Textron, RoyalJet, Qatar Executive, VISTA, Falcon, Comlux, and Aloula Aviation. Notably, 12 exhibitors showcased their aircraft for the first time at the event, adding a fresh dimension to the static display.

Among the star attractions, Boeing Business Jets returned to the MEBAA Show with three VIP Bizliners on display: two BBJ1s and the larger BBJ2, based on the Boeing 737-700 and -800 platforms, respectively. Dubai-based Action Aviation partnered with Boeing to showcase its BBJ1 (tail number P4-999), while Abu Dhabi-based Royal Jet displayed another BBJ1. As the world's largest BBJ operator, Royal Jet emphasised its leadership in executive aviation. Meanwhile, Monaco-based Opus Aero exhibited the BBJ2, which boasts 25 per cent more cabin space, double the cargo volume of the BBJ1, and luxurious features like a private stateroom with an ensuite shower, a dining area, and a lounge.

Greenpoint Technologies, a leader in VVIP interior design, highlighted its innovative concepts for large aircraft such as the BBJ 777-9 and 787-9. The company presented its "Oasis" interior for the BBJ 777-9 and announced that its "AeroSuite" design for the BBJ 787-9 is slated for certification next year.

First-time exhibitor Green Power Turbine Systems unveiled its compact TPE200 turboprop engine, which delivers 260 shp and features a fully digital electronic control. Expected to receive EASA certification within a year, the TPE200 drew significant interest for its advanced capabilities and compact design.

Austria-based VOO Flights demonstrated its software solution, which integrates seamlessly with charter operators' workflows, enabling "tech brokers" to access a wide range of aircraft options with ease.

This year's MEBAA Show was not just about showcasing aircraft—it was a celebration of innovation and progress in business aviation. From advanced aircraft interiors to groundbreaking propulsion systems and digital solutions, the event

highlighted the industry's dynamic future while reinforcing the Middle East's role as a global hub for business aviation.

LANDMARK DEALS LAID

The MEBAA Show 2024 in Dubai concluded with a series of groundbreaking partnerships and announcements that underscored its role as the Middle East's premier platform for business aviation. Collaboration took center stage, with industry leaders forging alliances and unveiling initiatives to drive the sector forward.

RoyalJet made headlines by signing a MoU with Airbus Corporate Jets, committing to purchase three ACJ320neo VVIP jets with options for six additional aircraft. The deal, valued between \$330 million and \$1 billion, represents a decade of negotiations between the two companies. Delivery of the jets is scheduled for 2026, with outfitting expected to take 10 to 14 months. RoyalJet's CEO, Shafiul Syed, emphasised the significance of the agreement, calling it a milestone in the company's charter fleet diversification.

Honeywell also announced an MoU with Sino Jet, focusing on advanced aviation services and next-generation connectivity technologies. Central to this collaboration is the JetWave X Satcom system, which promises enhanced data speeds exceeding 30 Mbps, with the potential for 100 Mbps in high-traffic corridors. This partnership aligns with Honeywell's strategic focus on aviation megatrends and future technology development.

Further expanding its fleet, Dubai-based IC Leasing inked a deal for its second Dassault Falcon 2000LXS. The aircraft, set for delivery in the second quarter of 2025, will be operated by DC Aviation from Stuttgart, Germany. The lease-to-purchase program offered by IC Leasing highlights its innovative approach to making jet acquisition more accessible.

UAS International Trip Support and Leon Software announced a partnership to integrate their trip management and flight planning platforms. This collaboration aims to streamline operations for business aircraft operators,

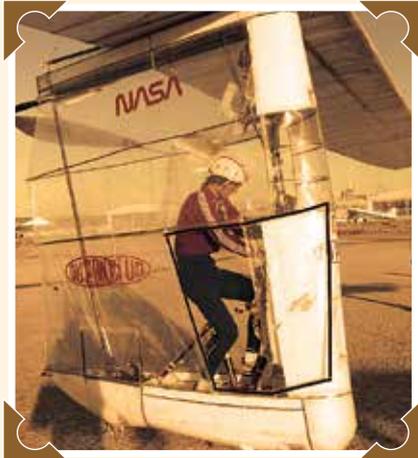
enabling seamless data management and operational efficiency. Customers will benefit from a unified system that simplifies tasks ranging from trip creation to flight scheduling.

Jetex and Joby Aviation revealed plans to install electric aircraft charging infrastructure at Jetex's FBOs in Dubai and Abu Dhabi. This initiative supports Joby's vision of launching eVTOL air taxi services in the UAE by 2025, with the chargers being compatible with other electric aircraft, promoting sustainable aviation solutions.

European FBO operator AviaVIP unveiled the AviaVIP Club in collaboration with Egypt's Aviary and the UAE's Falcon Elite, enhancing VIP services across 13 Egyptian airports and beyond. Meanwhile, AMAC Aerospace announced its diversification into advanced technologies, offering installations for Starlink satellite communications and Elbit's missile defense systems.

As the MEBAA Show continues to foster innovation and collaboration, these deals and initiatives underline the region's growing influence in the global business aviation landscape. SP

The MEBAA Show 2024 showcased the Middle East's growing influence in business aviation, with groundbreaking advancements in technology, sustainability initiatives, and a dynamic array of aircraft, solidifying the region's role as a global hub



MACCREADY GOSSAMER ALBATROSS: PEDAL-POWERED FLIGHT

The surface headwind calmed slightly and the coast of Cap Gris-Nez, France, finally came in sight. Allen made a successful landing, completing the 35.7 km flight in 2 hours and 49 minutes. And the MacCready team took home the prize.

THE GOSSAMER ALBATROSS WAS A HUMAN-POWERED aircraft (HPA) built by American aeronautical engineer Paul MacCready's company AeroVironment. It was not intended as a practical plane for production. Nonetheless, it harnessed the ultimate in human ingenuity and engineering excellence available at the time. An HPA is usually propelled forward by a lone pilot vigorously pumping a pair of pedals connected to a propeller through a simple gears-and-chain arrangement. The pilot both steers and powers the aircraft. Given the sheer amount of power required to keep even a very light plane aloft for any length of time, even a strong cyclist would find it challenging and exhausting to fly in this manner. Yet, in June 1979, the Gossamer Albatross successfully crossed the English Channel, establishing a world record that still stands today.

Dr Paul MacCready (1925-2007) was a noted aeronautical designer and a world soaring champion. His first HPA was the Gossamer Condor which won the first Kremer prize on August 23, 1977, by completing a 1.6 km 'figure of eight' course. Incidentally this prize had been announced in 1959 but had gone unclaimed for nearly two decades. Thereafter the second Kremer challenge was announced as a flight across the English Channel to commemorate Louis Blériot's epic aerial crossing of 1909. MacCready immediately set up an expert team that designed and built the Gossamer Albatross in record time. The main differences between the Condor and the Albatross were a reduced wing area and shorter wing chord on the Albatross, along with a change from an aluminium main structure to carbon fibre-reinforced plastics. The Albatross was of canard configuration, with a large horizontal stabilizer forward of the wing, somewhat similar to the Wright brothers' successful Wright Flyer aircraft. The wing ribs were made of expanded polystyrene. The entire structure was then covered with thin transparent plastic sheeting developed by DuPont. It had very long and thin tapered wings (high aspect ratio) like those of a glider. With a length of 10.36 m, wingspan of 29.77 m, and height of 4.88 m, the aircraft's wing area was 45.3 square metres. And yet the empty mass of this huge structure, comparable with a super mid-sized business jet, was just 32 kg – in itself an amazing feat of engineering. Indeed, construction of the innovative plane, and organising the Channel crossing attempt, cost far more than the prize money on offer. But seeing as it would help promote their own products, DuPont agreed to partly fund the expedition.

Test flights began in the summer of 1978, first at Shafter airport in California, then near the ocean at Long Beach. The Albatross was flown and powered by amateur cyclist Bryan Allen, seated in a clear plastic enclosure. The team knew that a Channel crossing would be an extreme athletic feat requiring the pilot to pedal hard for a lengthy period without rest. As an experienced long-distance cyclist, Allen was an excellent choice. He trained both on the road and with an ergometer (a stationary training bicycle). He finally pedalled the Albatross through a 21-km, 69-min flight over Harper Lake in April 1979. The aircraft's maximum speed was 29 km/h and design range was 56 km – more than enough for the Channel crossing.

Just before 6 am on June 12, 1979, the Channel conditions and lack of wind seemed favourable for the exhausting flight ahead. Allen pedalled the Albatross to the required speed of 75 rpm and took off from a makeshift runway near Folkestone, England. His troubles began soon afterwards. The radio failed for a while and he was only able to communicate with the accompanying boats by hand and head movements. Later he experienced strong headwinds, extending the planned flight. His water supply, just enough for a two-hour flight, ran out. Consequently, he suffered from dehydration and leg cramps. Again due to the extended flight, the airspeed instruments and acoustic altimeter failed when their batteries expired. So Allen had to visually assess his speed, and height above the water. Hence, preparations began to abort the flight, and the rescue boat began manoeuvring to hook the aircraft to safety.

However, when Allen climbed slightly to allow the boat to approach underneath, he found the air less turbulent. He requested another five minutes, then another five minutes, and then another five. The surface headwind calmed slightly and the coast of Cap Gris-Nez, France, finally came in sight. Bryan Allen made a successful landing, completing the 35.7 km flight in 2 hours and 49 minutes, with a max speed of 29 km/h and an average altitude of 1.5 m. And the MacCready team took home the prize of £1,00,000.

Paul MacCready was later awarded the Collier Trophy for the foremost achievement in aeronautics for 1977. He went on to help design and build several more record-breaking human- and solar-powered aircraft. [SP](#)

— JOSEPH NORONHA

MILITARY

DEFENCE MINISTER RAJNATH SINGH CALLS FOR ENHANCED COHESIVENESS



Defence Minister Rajnath Singh has called for enhanced cohesiveness of the global community in view of the current security environment which, he said, is in a state of flux with multiple conflicts and challenges. Addressing Ambassadors' Round-Table, organised in New Delhi on January 10, 2025, Defence Minister stressed on the need to overcome the present geopolitical tensions for ensuring mutual prosperity and global peace.

Defence Minister pointed out that India is emerging as a leading voice for the Global South, and it advocates for a multi-aligned policy approach, which ensures that diverse views are considered in the collective pursuit of prosperity. Defence Minister emphasised that air and space power have become pivotal elements in shaping strategies as such assets, incorporated with Artificial Intelligence and Machine Learning systems, provide an unprecedented advantage in battle-field scenarios. He described Aero Space Power as the new frontier of military dominance which acts as strategic deterrence.

BRAZILIAN AIR FORCE ACQUIRES SECOND FIREFIGHTING EQUIPMENT UNIT TO EQUIP KC-390 FLEET

Embraer has signed a contract with the Brazilian Air Force (FAB) to provide a new Modular Airborne Fire Fighting System (MAFFS II) unit. This will be FAB's second device, which can be quickly installed on any KC-390 multi-mission aircraft in FAB's fleet. With MAFFS II, the KC-390 offers a deployment capacity of approximately 12,000 litres of water in 7 seconds, per flight.

"The KC-390 has proven its versatility in critical missions for the country, such as fighting fires in the Pantanal, the Amazon, and São Paulo during 2024. With the acquisition of this new MAFFS II unit, FAB will double its operational performance in these operations. We are

APPOINTMENTS



O.J. Sanchez



Mike Shoemaker

LOCKHEED MARTIN ANNOUNCES LEADERS

Lockheed Martin has named O.J. Sanchez as Vice President and General Manager, Skunk Works®, and Mike Shoemaker as Vice President and General Manager, Integrated Fighter Group.

In his role leading Skunk Works, Sanchez will drive advanced technology development and integration across a diverse set of primarily classified military programmes and pursuits tied to Skunk Works. Sanchez joined Lockheed Martin in 2014 following a distinguished US Air Force career, where he served as an F-22 pilot among other roles.

As leader of the Integrated Fighter Group, Shoemaker will oversee the development, manufacture and sustainment of the F-16 and F-22 programmes as well as the T-50, KF-21, F-21 and F-2. Most recently, he served as the Vice President for F-35 Customer Programmes.

very pleased with the progress of the multi-mission platform manufactured by Embraer in meeting the country's needs," said Bosco da Costa Junior, President and CEO of Embraer Defense & Security.

BIRD AEROSYSTEMS SECURES SIGNIFICANT ORDER



BIRD Aerosystems, a global provider of innovative defence technology, proudly announces the receipt of a significant order from an African Ministry of Defense (MOD) to supply its Airborne Missile Protection System (AMPS). This cutting-edge solution will be deployed to protect the fleet of Mi-17 and Mi-24 helicopters from advanced missile threats, including MANPADS. Delivery is expected during 2025.

The AMPS family of solutions is engineered to detect, verify, and neutralise threats with unmatched precision. This latest order reinforces BIRD's leadership in advanced DIRCM and airborne self-protection systems.

GLOBAL COMBAT AIR PROGRAMME

BAE Systems (UK), Leonardo (Italy), and Japan Aircraft Industrial Enhancement Co Ltd (JAIEC), have reached an agreement to form a new company under a

business joint venture for the Global Combat Air Programme (GCAP), subject to regulatory approvals. The agreement builds on the strong trilateral government, defence, and industrial cooperation between the UK, Japan, and Italy on GCAP since it was established in December 2022.

The new joint venture will be accountable for the design, development and delivery of the next generation combat aircraft and will remain the design authority for GCAP for the life of the product, which is expected to go out beyond 2070.

BAE Systems, Leonardo, and JAIEC will each hold a 33.3 per cent shareholding in the new joint venture, bringing together the combined strengths and expertise of three leading companies and marking a pivotal moment for the international aerospace and defence industry. All shareholders will work together to support cost-effective and timely programme delivery, including a 2035 aircraft in-service date.

BLACK HAWK® HELICOPTERS TO THE PHILIPPINES



Lockheed Martin delivered 10 S-70i™ Black Hawk® helicopters in 2024 to

the Philippine Department of National Defense (DND), as part of a contract for 32 Sikorsky Black Hawk helicopters under the DND's Additional Utility Helicopters Acquisition Project. The S-70 Black Hawk and the UH-60M Black Hawk share the same rugged, reliable, multi-mission capabilities.

Signed in 2022, the current contract states that the Philippine Air Force will take delivery of 32 aircraft from Lockheed Martin subsidiary PZL Mielec. This will expand the PAF's current fleet of 15 S-70i Black Hawk helicopters to 47, enhancing their operational capacity. The first five aircraft under this contract were delivered in June 2024; and another five were delivered in December 2024. The remaining aircraft will be delivered over the next two years.

CIVIL

STARLINK CERTIFICATION GRANTED BY EASA TO ATR 72 AIRCRAFT



ATR, the world's leading regional aircraft manufacturer, continues to elevate the standards of regional air travel by introducing Starlink high-speed internet connectivity onboard its aircraft. After successful test flights carried out on ATR's 72-600 test aircraft in the past months, the solution has been certified by EASA. Long-standing partner Air New Zealand is poised to be the launch customer, bringing internet to its domestic flights from 2025.

Engineered by SpaceX, Starlink is the world's first and largest satellite constellation using a low-Earth orbit to deliver broadband internet capable of supporting streaming, online gaming, video calls and more. By adopting this game-changing technology, ATR operators worldwide will be able to provide their passengers with internet services that reflect their home experience. In addition to passenger benefits, this system will also allow pilots to connect to aviation weather services, with the aim to enhance flight safety through more informed decision-making. The compact

GULFSTREAM DELIVERS TWO ADDITIONAL G700 AIRCRAFT TO QATAR EXECUTIVE



GULFSTREAM AEROSPACE ANNOUNCED the delivery of two additional Gulfstream G700 aircraft to the growing Qatar Executive fleet. The two new aircraft, both delivered using a blend of Sustainable Aviation Fuel (SAF), increase the total number of G700 aircraft in the Qatar Executive fleet to six with an additional four scheduled. The newest Gulfstream G700 aircraft, delivered in December 2024, will join Qatar Executive's existing fleet of four Gulfstream G700 and 15 Gulfstream G650ER aircraft.

"The unprecedented speed with which the team has been able to deliver this remarkable aircraft is a true testament

to the quality and maturity of the G700 program," said Mark Burns, president, Gulfstream. "Qatar Executive has been a long-standing, valued partner of Gulfstream for many years and we are pleased to continue that partnership by adding more of these exceptional aircraft to their growing fleet."

In addition to Federal Aviation Administration (FAA) and European Union Aviation Safety Agency (EASA) type certifications, the G700 has earned type certificate validations in 10 nations, most recently from the Civil Aviation Safety Authority in Australia. **SP**

size of the antenna makes it perfectly suited to the ATR platform in terms of aerodynamics.

GTF ENGINE RECEIVES FAA CERTIFICATION TO POWER THE A321XLR

Pratt & Whitney, an RTX business, announced that it has received US Federal Aviation Administration certification for the GTF engine that will power the Airbus A321XLR aircraft. The engine type certificate, granted on December 12 and applicable to the PW1100G-JM engine, was updated to include the A321XLR.

Globally, 13 customers have selected GTF engines to power 217 A321XLR aircraft. To date, more than 2,100 GTF-powered aircraft have been delivered to over 80 customers worldwide. GTF engines enable up to 20 per cent better fuel efficiency compared to aircraft powered by the prior generation of engines. As a result, the GTF engine has saved operators 2 billion gallons of fuel and 20 million metric tons of CO₂, since entry into service in 2016.

The GTF Advantage engine, which is on track for certification and first engine deliveries next year, will provide even more value to customers operating the A321XLR. The GTF Advantage is ideally suited for the A321XLR, further expanding new route options and enabling even better operating economics and will be fully intermixable and interchangeable with today's model of the GTF.

MTU MAINTENANCE INTRODUCES SAF TESTING AT ITS FACILITY IN ZHUHAI



MTU Maintenance Zhuhai introduced Sustainable Aviation Fuel (SAF) testing

to its portfolio and carries out first test with launch customer China Southern Airlines Limited (CSN). A V2500 engine from IAE International Aero Engines AG (IAE) was successfully tested with a 10 per cent SAF blend following a full overhaul shop visit. The facility has procured an initial 30 tons of SAF from China National Aviation Fuel and will be offering testing as an additional service to all customers. Conducted in a controlled ground environment, test runs will initially be performed with a 10 per cent SAF blend and can be expanded to up to 50 per cent, the current regulatory limit, if required.

CAMBODIA ANGKOR AIR EXPANDS FLEET WITH THREE ATR 72-600



ATR, the world’s leading manufacturer of regional aircraft, announced the addition of three ATR 72-600 aircraft to the fleet of Cambodia Angkor Air (which will change its name to Air Cambodia as of January 1, 2025), the country’s national carrier. These aircraft, purchased by HNCAL (HNCA Aviation Financial Leasing Co., Ltd.) are leased to Cambodia Angkor Air, supporting the airline’s strategy to bolster both domestic and regional routes in Cambodia. Deliveries are scheduled in 2025.

This agreement reinforces Cambodia Angkor Air’s commitment to expanding its fleet and highlights the ATR 72-600’s role in connecting key tourism destinations and improving transport infrastructure within Cambodia. The ATR fleet expansion aligns with the Cambodian government’s plans to develop additional airports and promote regional air connectivity, particularly through high-demand routes that ensure efficient and reliable travel.

CMG HEALTHY MOTION SEATING

Healthy Motion Seating is patented breakthrough technology that offers a major leap forward in comfort and wellness for first- and business-class passengers on long-haul airline flights.

Dr Phipps presented the results of a 2023 study by researchers from Cardiff Metropolitan University and Macquarie University, which proved that there are noteworthy psychological and physiological benefits to passengers in seats equipped with Healthy Motion Seating. Passengers experienced improvements in mood, less discomfort and pain from prolonged sitting, and significantly better blood flow to the legs, in seats equipped with Healthy Motion Seating.

CMG’s technology makes occasional small, slow adjustments to the passenger’s seating position, gently moving them from one comfortable position to another, without disruption. The small motions redistribute body weight, reducing the tissue fatigue and blood vessel compression that leads to discomfort, pain, and reduced blood flow to the legs. Importantly, Healthy Motion Seating is a software-only solution that requires no additional hardware and no weight—a major benefit in the airline industry striving to achieve zero net CO₂ emissions by 2050.

CAE INAUGURATES ITS FIRST AIR TRAFFIC SERVICES TRAINING CENTRE



Global aviation training leader CAE has inaugurated its first Air Traffic Services (ATS) Training Centre, on its campus in Montreal, Canada. As the largest provider of civil aviation training worldwide, CAE trains pilots, aircraft maintenance technicians, and cabin crew. Last October, CAE started partnering in the training of air traffic controllers (ATC) and flight service specialists (FSS) with NAV CANADA. CAE’s first partnership in the air traffic services sector is with the world’s first fully private ANSP, and second largest in terms of the size of its airspace, NAV CANADA. The first students began their training at the new facility in October 2024, with CAE aiming to train approximately 500 air traffic professionals by 2028.

STRATEGIC PARTNERSHIP TO ESTABLISH AN AVIATION ACADEMY IN THE UAE

Intercontinental Aviation Enterprise (IAE), a holding company specialising in aviation investment, management and training, and HADID International Services (HADID), a global provider of international flight support and aviation services, have signed a Memorandum of Understanding (MoU) to jointly develop a state-of-the-art aviation academy in the UAE.

The Intercontinental Aviation Academy (IAA) will leverage IAE’s expertise and HADID’s global network and resources to meet the growing demand for world-class aviation training in the region. The IAA will not only support the Gulf’s thriving aviation sector but also establish new benchmarks in training excellence for pilots, technicians, and aviation professionals.

FEASIBILITY OF LIQUID HYDROGEN-FUELLED TURBINE FOR LIGHT AVIATION



In September 2024, Turbotech, Safran and Air Liquide completed ground demonstration testing of a hydrogen-fueled gas turbine aeroengine based on an ultra-efficient regenerative cycle and fed from a liquid hydrogen tank. This demonstration follows a first test phase in January 2024 using hydrogen fuel stored in gaseous form in order to perform an initial characterization of the engine. In this second test phase, the engine was coupled to a cryogenic (-250°C) liquid storage system developed by Air Liquide to demonstrate the end-to-end integration of a propulsion system replicating all functions on a complete aircraft.

Turbotech, Elixir Aircraft, Safran, Air Liquide and Daher formed the BeautHyFuel joint research project in June 2022. The aim of this project is to design and ground test a hydrogen propulsion system rated for light aviation and develop a methodology so it can be certified for retrofit. ●

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