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COVER IMAGE: EMBRAER KC-390 IMAGE © EMBRAER

A FIRST FOR FARNBOROUGH

Among the many aircraft attracting attention at the 2026 Farnborough International Airshow was the Hongdu L-15E advanced jet trainer, making its first appearance in the United Kingdom. Built by China's Hongdu Aviation Industry Corporation and presented in the striking colours of the United Arab Emi-rates' Al Fursan display team, the aircraft offered visitors a rare opportunity to see one of China's most advanced export trainers at one of the world's premier aerospace events. Captured by aviation photo-grapher Stuart Haigh, the image reflects both the growing international diversity of Farnborough and the continuing evolution of the global military aviation landscape.

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WORLD AIRNEWS

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THE LAST CONSTANT

By WAN Editorial Team

Military aviation has never stood still. Every generation has witnessed technologies that promised to redefine the balance of power, from the arrival of the jet engine and radar to precision-guided weapons, satellite navigation and stealth. Today, we find ourselves at another pivotal moment. Artificial intelligence, autonomous systems, advanced manufacturing, resilient logistics and software-defined operations are no longer emerging concepts—they are becoming integral to the way modern air power is developed, sustained and employed.

The articles in this edition explore these changes from a variety of perspectives. Some examine the rapid evolution of technology, while others focus on the industrial capability, manufacturing expertise and logistical resilience required to support it. Together, they reveal that military aviation can no longer be viewed simply through the performance of an aircraft. Every capability depends upon a much broader network of people, infrastructure, engineering, information and decision-making.

That is particularly relevant for Africa. While the continent may not always lead the development of next-generation military technologies, it will undoubtedly feel the effects of their introduction. Nations will increasingly be required to modernise ageing fleets, strengthen industrial partnerships, improve maintenance capability and develop the skills needed to operate in an environment where information moves as quickly as aircraft themselves. The challenge is no longer confined to acquiring new equipment; it lies in understanding how emerging technologies influence every aspect of military aviation.

This month's features reflect that broader perspective. We examine how commercial aerospace continues to influence military design, the growing importance of software-defined defence, advances in intelligent cockpit systems, the expanding role of uncrewed aircraft, the realities of contested logistics and the manufacturing innovations that are reshaping the defence industry. Alongside these subjects, we also recognise that aviation is about more than technology alone. Behind every aircraft are the engineers who build it, the technicians who maintain it, the crews who operate it and the organisations that ensure it remains ready for the missions demanded of it.

As I reviewed the articles for this edition, one thought returned repeatedly. Technology will continue to evolve, often at a pace that challenges even the most experienced professionals. Yet throughout the history of military aviation, lasting advantage has never been created by technology in isolation. It has always depended upon the knowledge, judgement and professionalism of the people entrusted to use it wisely. Perhaps that is the last constant. As always, I hope you enjoy the edition.


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AVIAMECH

FARNBOROUGH 2026 – READING THE DIRECTION OF TRAVEL

Images by Stuart Haigh – Farnborough 2026

Every major airshow reflects the state of the aerospace industry at that moment in history. Aircraft may fill the skies and billion-pound order books may dominate the headlines, but beneath the flying displays and exhibition halls lie the trends that will shape aviation for years to come.

The 2026 Farnborough International Airshow was no exception.

Commercial aviation remained a powerful force, with announced business totalling £62.9 billion and 353 firm aircraft orders reinforcing the industry's continued recovery and long-term confidence.

Yet beyond the commercial announcements, a different story was unfolding. The exhibition revealed an industry increasingly influenced by defence, software, autonomy and the realities of a rapidly changing geopolitical landscape. Approximately half of all exhibitors represented the defence and security sector, while a significant proportion of first-time participants came from artificial intelligence, software and deep technology companies rather than traditional aerospace manufacturers.

Walking through the exhibition halls, it became clear that military aviation is no longer defined solely by aircraft. Conversations centred on collaborative combat aircraft, autonomous systems, counter-drone technologies, advanced sensors, resilient logistics and software-defined capabilities. Companies that once measured success by airframe performance were now discussing data, connectivity, digital engineering and the integration of increasingly intelligent systems.

That shift was reflected throughout the static park and flying display. Alongside established military platforms were aircraft demonstrating hybrid-electric propulsion, autonomous technologies and new approaches to regional air mobility. The debut of aircraft such as the Chinese-built Hongdu L-15E advanced jet trainer in the colours of the UAE's Al Fursan display team illustrated the increasingly international character of the exhibition, while demonstrations by manufacturers including Embraer, GE Aerospace and Beta Technologies highlighted the pace at which innovation continues to influence both civil and military aviation.

Military programmes attracted particular attention. Loyal wingman concepts, collaborative combat aircraft, counter-drone systems and next-generation weapons featured prominently, reflecting the operational lessons emerging from contemporary conflicts. Rather than focusing solely on individual platforms, many exhibitors demonstrated how aircraft, sensors, software and autonomous systems are expected to operate together as part of an integrated capability.

This broader perspective is perhaps Farnborough's greatest value. It is one of the few places where commer-

Loganair ALIA CX300 – Loganair is preparing for the future of regional aviation with an order for five all-electric ALIA CX300 aircraft and options for a further five, following successful demonstration flights in the Scottish Highlands.

Vertical Aerospace eVTOL – showcasing its tilt-propeller design as it transitioned between hover and wing-borne flight.

cial aerospace, defence, advanced air mobility, space, manufacturing and digital technologies converge in a single environment. Viewed collectively, they reveal not simply the products entering service, but the direction in which the aerospace industry is moving.

That direction provides the foundation for this edition of World Airnews.

The articles that follow explore many of the themes that emerged throughout the week: software-defined defence, intelligent cockpit systems, autonomous aircraft, resilient logistics, advanced manufacturing and the changing relationship between commercial and military aerospace. Individually, they examine specific technologies and programmes. Together, they describe an industry undergoing one of the most significant transitions since the arrival of the jet age.

If Farnborough 2026 demonstrated anything, it is that the future of military aviation will not be shaped by a single breakthrough or one revolutionary aircraft.

It will be defined by the ability to integrate technology, industry and human expertise into capabilities that are more connected, more adaptable and more responsive than ever before.

de Havilland Canada C-23C Sherpa – a modernised development of the original Shorts-built STOL transport designed for demanding utility and tactical missions.

General Atomics AeroTec Do228 NXT – The Do228 NXT represents the latest evolution of the renowned German-designed Dornier Do228, modernised by General Atomics AeroTec for special mission and regional operations.

GE Aerospace SAAB 340B Hybrid Testbed – GE Aerospace SAAB 340B hybrid-electric demonstrator demonstrating megawatt-class hybrid-electric propulsion in flight.


F-35A of the USAF based at RAF Lakenheath performed a display. Shot here with it's bomb bay doors open.

Bell Tiltrotor MV-75. Image Courtesy of Bell

CONVERGING SKIES

HOW COMMERCIAL AEROSPACE IS RESHAPING MILITARY AVIATION

For generations, the world's most advanced military aircraft emerged from highly specialised defence programmes, with many of their technological advances eventually finding their way into commercial aviation. That model has not disappeared—but it is no longer the whole story. Across the aerospace industry, a quieter evolution is unfolding. An increasing number of manufacturers are integrating mature technologies, digital architectures and engineering practices that have already been proven in commercial service, while reserving bespoke development for capabilities that remain uniquely military. The result is not a dilution of military capability, but an evolution in engineering philosophy that is influencing how many of the next generation of combat aircraft are conceived, engineered and sustained.

By WAN Editorial Team

Modern military aircraft are often associated with entirely new technology—purpose-built machines designed from the ground up for combat. Increasingly, however, that assumption no longer reflects how many new aerospace programmes are being developed.

Across the industry, manufacturers are adopting a different philosophy. Rather than designing every component specifically for military use, they are identifying which technologies genuinely require bespoke development and which can be drawn from commercially mature aerospace platforms. The result is an increasingly integrated engineering ecosystem in which civil and military aviation share far more than production facilities or supply chains—they increasingly share the technologies that enable flight itself.

This does not suggest that military aviation has become less specialised. Mission systems, survivability, electronic warfare, weapons integration and operational capability remain uniquely military disciplines. What is changing is the growing use of commercially proven technologies for many of the systems that underpin an aircraft's performance, reliability and maintainability.

The distinction is subtle but significant. For much of the twentieth century, innovation was commonly viewed as flowing from military programmes into commercial aviation. Today, the relationship is increasingly reciprocal.

Commercial aerospace continues to benefit from defence research in areas such as advanced materials, propulsion and mission technologies, while military programmes are increasingly drawing upon commercially mature engineering, digital architectures and established manufacturing practices to reduce development risk, accelerate delivery and improve long-term sustainment.

Bespoke Design To Selective Integration

The U.S. Army's Future Long Range Assault Aircraft (FLRAA), the MV-75 Cheyenne, illustrates this changing philosophy.

Rather than developing every subsystem specifically for the programme, Bell Textron selected Collins Aerospace to supply five critical systems based on existing or adapted technologies with extensive commercial aviation heritage. These include the aircraft's main electrical power generation, interconnect drive systems, SmartProbe® air data systems, cockpit seating and ice protection systems. According to Collins Aerospace, these systems draw upon commercially proven technologies that have accumulated millions of operational flight hours before being adapted for military application.

The significance extends beyond the individual components themselves. By integrating mature technologies where appropriate, the programme allows engineering effort to remain focused on those capabilities that are genuinely unique to military operations.

Civil Platform As A Military Foundation

Airbus Helicopters has adopted a similar philosophy through the H145M.

Rather than developing an entirely new military helicopter, Airbus adapted its established civil H145 platform for defence applications. The military variant retains the Helionix digital cockpit architecture, Safran Arriel 2E engines, Fenestron enclosed tail rotor and core airframe design developed for the civil aircraft.

Military capability is introduced through mission-specific additions such as the HForce modular weapon system, defensive aids, ballistic protection and other survivability enhancements.

The approach demonstrates an important distinction. The aircraft's operational capability is transformed through specialised military systems, while much of the underlying engineering benefits from an aircraft platform that had already reached maturity in civil service.

Leonardo has taken a comparable approach with the AW149 military helicopter and the AW189 civil super-medium helicopter.

The two programmes were developed within a common engineering environment, underpinned by a company-developed open avionics architecture rather than entirely separate software programmes. While this demonstrates a shared architectural foundation and the reuse of core avionics capabilities, the available evidence does not verify the allocation of specific software functions—such as individual autopilot modes—between the two platforms.

The distinction is important. Common architecture does not imply identical mission software. Rather, it enables manufacturers to build specialised military and civil capabilities upon a common digital foundation while maintaining separate operational requirements.

An Interconnected Engineering Ecosystem

The Sikorsky Black Hawk family illustrates how this relationship can extend throughout an aircraft's operational life.

Military and commercial variants have continued to evolve alongside one another, with experience gained in different operating environments informing subsequent product development across the wider family. Although the military and civil aircraft serve very different missions, they continue to benefit from common engineering knowledge, manufacturing capability and systems development.

This reflects a broader trend across aerospace. Increasingly, innovation does not travel in a single direction between military and commercial aviation. Instead, technologies, manufacturing practices and engineering expertise circulate throughout a connected industrial ecosystem.

Why The Shift?

Commercial aviation now provides manufacturers with large production volumes, mature certification processes and extensive operational data. Technologies proven across thousands of aircraft and millions of flight hours offer a level of reliability that would be costly and time-consuming to replicate within individual military programmes.

At the same time, digital engineering, open systems architectures and software-defined aircraft have changed how new platforms are developed. Rather than treating each aircraft as an isolated programme, manufacturers increasingly build flexible digital foundations capable of supporting multiple applications across civil and military markets.

This approach reduces technical risk while allowing defence programmes to concentrate investment on the capabilities that remain uniquely military.

The relationship between civil and military aerospace has become more interconnected than at any previous point in modern aviation.

Military programmes continue to drive innovation in areas such as survivability, weapons integration, electronic warfare and mission systems. Equally, commercially mature technologies increasingly provide the engineering foundation upon which many of those capabilities are built.

The result is not a reversal of aerospace innovation, but an evolution in how innovation moves through the industry. Rather than flowing in a single direction, technology now circulates between commercial and military aviation, shaped by operational need, economic reality and an increasingly shared engineering ecosystem.

AI COMMAND STAFF

HOW AGENTIC AI IS RESHAPING MILITARY DECISION-MAKING

By WAN Editorial Team

For generations, military superiority has been measured by the quality of weapons, the sophistication of platforms and the effectiveness of logistics. From radio and radar to satellite surveillance and precision-guided munitions, technological advances have consistently provided commanders with greater awareness of the battlefield. Yet these innovations ultimately served a single purpose: enabling better decisions to be made faster than an adversary.

Today, the nature of that advantage is changing. Modern military headquarters no longer struggle to obtain information—they struggle to manage it.

Intelligence now arrives continuously from satellites, unmanned aircraft, maritime surveillance systems, cyber networks, electronic warfare sensors, ground forces and open-source intelligence. Every movement, transmission and environmental change generates new data requiring immediate interpretation.

This "data deluge" has become one of the defining challenges of contemporary military operations.

Valuable opportunities are increasingly lost not because information is unavailable, but because identifying what matters most can take longer than the operational situation allows.

It is within this environment that Agentic Artificial Intelligence (Agentic AI) is emerging as a new generation of decision-support technology.

Unlike conventional AI applications that respond to individual prompts, Agentic AI consists of networks of specialised software agents, each designed to perform a specific task while collaborating with others to achieve broader operational objectives. Some analyse sensor feeds, others prioritise intelligence, task surveillance assets, assess logistics or evaluate operational options. Working together, they aim to transform vast quantities of data into coordinated recommendations in near real time.

The objective is not to replace military leadership. Rather, it is to reduce the analytical burden placed upon headquarters, allowing commanders to concentrate on judgement, intent and decision-making.

The significance extends beyond software. Agentic AI represents a shift in how military command itself may be organised in the future, with digital agents increasingly acting as specialised staff officers within an integrated command network.

The Airbus Framework

One of the clearest examples of this emerging approach comes from Airbus Defence and Space.

Under the technical leadership of Jonathan Debure, Head of Strategy and Technical Intelligence, Airbus is developing a framework that coordinates multiple specialised AI agents rather than relying on a single large language model. According to Airbus, the framework currently incorporates approximately ninety specialised agents, each responsible for a distinct analytical or operational function.

Some agents identify and filter relevant imagery, sensor data and intelligence reports. Others determine when additional information is required and recommend tasking assets such as drones or satellites to fill intelligence gaps. Additional agents assist with operational planning, simulations and information prioritisation before presenting recommendations to commanders.

Airbus describes this collaborative architecture as an AI Agent Mesh—an interconnected network of specialised agents intended to operate across multiple levels of military command, from forward-deployed personnel to higher headquarters. Rather than requiring operators to move between multiple software applications, the framework enables agents to exchange information continuously behind the scenes, responding to natural-language requests by coordinating numerous analytical processes simultaneously.

Another distinguishing feature is its emphasis on visual decision support. Instead of relying primarily on conversational interfaces, Airbus envisages commanders working with dynamic operational maps that combine aircraft positions, maritime activity, surveillance imagery and intelligence reporting into a single operational picture.

Airbus has also stated that explainability and traceability are fundamental design principles. Rather than presenting conclusions without context, the system is intended to provide an auditable chain of reasoning, allowing commanders to understand which sources contributed to each recommendation.

Although Airbus represents only one approach to Agentic AI, it reflects a broader movement across the global defence sector to develop intelligent command-support systems capable of accelerating military decision-making.

The Global Race

Airbus is one participant in a much wider international effort to integrate artificial intelligence into military command and control.

In the United States, companies including Palantir, Anduril and Shield AI have developed AI-enabled command architectures addressing different operational requirements. Palantir's Artificial Intelligence Platform (AIP) focuses on operational and theatre-level decision support by integrating multiple information sources into planning workflows. Anduril's Lattice operating system combines sensor networks and autonomous systems into a common operational picture, while Shield AI's Hivemind software is designed to support autonomous operations in contested environments where communications or GPS may be degraded.

Across Europe, organisations including Airbus Defence and Space and Helsing have generally placed greater emphasis on sovereign AI capabilities, secure national infrastructure and explainable decision-support systems that allow governments to retain control over sensitive operational data.

These differing approaches reflect broader strategic priorities. American programmes have tended to focus on rapid operational integration, while many European initiatives have emphasised resilience, transparency and digital sovereignty.

NATO, meanwhile, is working to ensure interoperability between allied AI-enabled command systems through initiatives such as its Artificial Intelligence Strategy and the Defence Innovation Accelerator for the North Atlantic (DIANA). Rather than developing operational AI platforms itself, NATO's role is to encourage common standards that allow allied nations employing different technologies to exchange information securely during coalition operations.

Collectively, these developments indicate that intelligent command systems are increasingly being viewed not simply as supporting technologies, but as strategic military capabilities.

Military Doctrine Meets Artificial Intelligence

Although Agentic AI represents a technological innovation, the military concepts it supports are well established.

For decades, defence doctrine has emphasised that victory depends not simply on superior firepower, but on making better-informed decisions faster than an opponent. One of the best-known frameworks is Colonel John Boyd's OODA Loop—Observe, Orient, Decide and Act—which describes the continuous cycle through which commanders assess changing conditions and respond to them.

Modern militaries have become highly effective at the Observe phase through satellites, drones, radar and digital communications. The greatest challenge increasingly lies in Orient—transforming enormous volumes of information into a coherent understanding of the operational environment.

This is where Agentic AI has the potential to make its greatest contribution.

Rather than gathering more information, specialised AI agents rapidly correlate sensor data, identify patterns,

© WAN AI

eliminate irrelevant information and generate potential courses of action for human review. In effect, they aim to compress the Orient phase of the decision cycle, enabling commanders to move more quickly from observation to informed action.

The same principle underpins broader concepts such as Multi-Domain Operations (MDO) and the United States' Joint All-Domain Command and Control (JADC2) initiative, both of which seek to connect information across land, sea, air, cyber and space. Agentic AI does not replace these doctrines; it provides a means of managing the complexity they create. Rather than changing military strategy, artificial intelligence is increasingly being developed to accelerate its execution.

Human–Machine Teaming

Perhaps the greatest misconception surrounding military AI is that it seeks to replace human commanders.

Current defence programmes suggest otherwise.
Military organisations generally describe Agentic AI as a decision-support capability that augments rather than replaces human judgement. Artificial intelligence can process vast quantities of information, identify relationships and evaluate multiple variables simultaneously. Human commanders remain responsible for defining objectives, interpreting political context and accepting responsibility for operational decisions.
This relationship is commonly described through three levels of human oversight.

Human-in-the-Loop (HITL) systems require explicit human approval before action is taken and remain the preferred model for decisions involving the application of lethal force.

Human-on-the-Loop (HOTL) systems may execute predefined tasks autonomously while remaining under continuous human supervision, allowing operators to intervene if necessary.

Human-out-of-the-Loop (HOOTL) systems operate without immediate human intervention in narrowly defined circumstances where reaction times exceed human capability, such as certain automated missile defence systems.

As AI assumes more of the analytical workload, commanders face a different challenge: determining when to trust machine-generated recommendations and when to question them. Excessive confidence in AI can lead to automation bias, while unwarranted scepticism may cause valuable insights to be ignored.

The future of military command is therefore unlikely to be defined by artificial intelligence alone, but by effective collaboration between human judgement and computational speed. Agentic AI may process the complexity of modern warfare, but responsibility for operational intent, ethics and accountability remains firmly with human leadership.

Trust And Traceability

If speed defines the promise of Agentic AI, trust will determine its operational value.

Unlike commercial AI applications, where an inaccurate response may simply inconvenience a user, errors within military decision-support systems can carry far greater consequences. Misidentifying a target, misinterpreting intelligence or misunderstanding operational intent could influence the outcome of an operation or contribute to unintended escalation.

For this reason, military AI cannot simply produce plausible recommendations—it must demonstrate how those recommendations were reached.

Modern defence programmes increasingly emphasise explainability, traceability and verification. Rather than relying on a single source, AI agents compare multiple intelligence streams, correlating satellite imagery with signals intelligence, drone reconnaissance, electronic emissions and human reporting before presenting an assessment. Confidence is established through corroboration rather than probability alone.

Many emerging systems are also expected to provide confidence scoring, enabling commanders to judge not only the recommended course of action but also the certainty of the supporting intelligence. Low-confidence assessments may indicate the need for additional reconnaissance, while stronger evidence allows decisions to be made more rapidly.

Equally important is explainability. Instead of presenting conclusions without context, future military AI systems are expected to show the chain of reasoning behind a recommendation—identifying which sensors contributed to the assessment, how conflicting information was resolved and where uncertainty remains.

This transparency serves both operational and legal purposes. Commanders retain responsibility for the decisions they authorise, making it essential that AI-generated recommendations can be examined, challenged and independently verified.

Trust also depends upon protecting the integrity of the underlying data. As military AI becomes more sophisticated, adversaries are increasingly likely to target the information entering the system rather than the algorithms themselves. Protecting data provenance, validating sensor inputs and maintaining secure audit trails will therefore become as important as developing more capable AI models.

Ultimately, military confidence in AI will depend not upon how convincingly a system communicates, but upon how reliably it can justify its conclusions.

The Algorithmic Battlefield

As AI becomes embedded within military command networks, it also creates a new battlespace.

Electronic warfare has traditionally focused on disrupting communications, degrading radar systems or denying access to the electromagnetic spectrum. Cyber warfare extended that contest into computer networks, logistics and digital infrastructure. Agentic AI introduces another dimension—one in which adversaries seek to influence the reasoning of intelligent command systems themselves.

Artist Impression F–35 with C CAs. Image Courtesy of Lockheed Martin

Rather than destroying networks, future attacks may attempt to corrupt the information flowing through them.

One potential threat is data poisoning, where false or manipulated information is introduced into intelligence streams, causing AI systems to generate flawed recommendations. Closely related is sensor spoofing, in which deceptive electronic signals distort GPS, radar or other sensor inputs, leading autonomous systems to misinterpret the operational environment.

Generative AI introduces additional challenges. High-quality synthetic imagery, fabricated video and realistic audio have lowered the barriers to producing convincing deception. Future command networks may need to distinguish between genuine intelligence and highly sophisticated AI-generated misinformation designed specifically to mislead military decision-support systems.

Researchers have also highlighted risks such as prompt injection and attempts to manipulate AI reasoning through carefully crafted inputs. While many of these techniques remain the subject of active research, they illustrate how protecting AI-enabled command systems increasingly extends beyond traditional cybersecurity.

This evolution changes the nature of cyber operations. Historically, the objective was often to disable an opponent's command network.

Increasingly, the greater advantage may lie in influencing how that network interprets information and allocates resources.

The effectiveness of Agentic AI will therefore depend not only on the sophistication of its analytical capabilities, but on its resilience in contested electronic and cyber environments.

Decision superiority is meaningful only if the decision-making process itself remains trustworthy.

An Illustrative Operational Scenario

The potential value of Agentic AI becomes clearer when viewed through a representative operational scenario.

A reconnaissance patrol reports suspicious vehicle movement near a contested border. Under conventional procedures, the report passes through multiple headquarters while intelligence staff request satellite imagery, coordinate drone reconnaissance, review signals intelligence and assess available response options.

Within an AI-enabled command network, many of these analytical tasks could occur simultaneously.

A natural-language processing agent identifies the key operational details within the patrol's report. An imagery agent searches available satellite coverage while a tasking agent recommends deploying a nearby unmanned aircraft to obtain additional intelligence.

Signals intelligence is automatically correlated with drone imagery, while weather and logistics agents assess environmental conditions and the readiness of nearby forces.

Within a short period—potentially measured in less than a minute rather than hours—the commander receives several clearly defined courses of action, each supported by the available intelligence, estimated probabilities of success and associated operational risks.

Importantly, the AI has not made the decision.

It has reduced the time required to assemble and analyse information, allowing the commander to concentrate on the strategic question that remains fundamentally human: selecting the most appropriate course of action.

Although illustrative rather than representative of any specific operational system, the scenario demonstrates why military organisations are investing heavily in Agentic AI. Its principal contribution lies not in replacing command, but in reducing the analytical friction that has historically slowed military headquarters.

Military headquarters have traditionally grown by adding people. As operations became more complex, organisations expanded their intelligence, logistics, communications, planning and operational staffs to manage increasing volumes of information. Agentic AI suggests a different evolution.

Rather than continually expanding headquarters, future command organisations may increasingly employ networks of specialised digital agents that assist human staff by analysing information, coordinating data across multiple domains and presenting commanders with timely, evidence-based recommendations. Human expertise does not disappear; instead, it shifts towards judgement, intent, leadership and accountability, while AI assumes much of the computational burden created by modern warfare.

This represents a broader evolution in military command. The first digital revolution connected forces through computers, data networks and satellite communications. Today's AI revolution seeks to make those connected systems more intelligent by helping commanders understand increasingly complex operational environments.

The opportunities are significant. Faster analysis, improved situational awareness and more responsive decision-making could strengthen operational effectiveness across every domain of warfare.

The challenges are equally substantial. Explainability, accountability, cyber resilience, data integrity and meaningful human oversight will remain fundamental requirements if these technologies are to earn the confidence of military commanders and policymakers alike.

Frameworks such as Airbus Defence and Space's Agent Mesh, together with parallel developments from organisations including Palantir, Anduril, Shield AI and Helsing, demonstrate that intelligent command systems are becoming an increasingly important area of defence innovation. While their approaches differ, they share a common objective: helping commanders transform overwhelming quantities of information into timely, informed decisions.

Throughout history, military advantage has often been measured by superior platforms, sensors and weapons. In the decades ahead, an equally important measure may be the speed, quality and resilience of the decisions that connect them.

The race is no longer simply to develop smarter military systems.

It is increasingly about enabling smarter military decision-making.

Project Intuity ™ Image Courtesy of BAE Systems

THE HUMAN ADVANTAGE INSIDE PROJECT INTUITY™

BAE SYSTEMS ON WHY TOMORROW'S FIGHTER PILOT BECOMES A MISSION COMMANDER

By Alexey Rodokanakis – Exclusive interview with Nigel Kidd, Director of Business Development (Product & Capability), BAE Systems, conducted at the Farnborough International Airshow.

As allied air forces push toward sixth-generation aircraft acting as airborne command nodes, BAE Systems is deve-loping the interface that will let the pilot inside them survive the information age. Nigel Kidd tells World Airnews why Project Intuity™ is a bet on the human, not a replacement for one, and why the pilot's job is about to get harder - not easier.

What Is A Collaborative Combat Aircraft?

Before turning to BAE Systems' helmet demonstrator, it is worth pausing on a term that will recur throughout this piece. A Collaborative Combat Aircraft, or CCA, sometimes described more informally as a loyal wingman, is an unmanned, jet-powered combat aircraft designed to fly in formation with a crewed fighter and take direction from the human pilot inside it. It is not a remote-controlled drone in the sense most readers will picture, flown joystick-in-hand from a ground station thousands of kilometres away. A CCA flies and fights with a meaningful degree of autonomy, executing the moment-to-moment flying while the pilot directs its role within the mission.

In practice, picture a single fighter pilot at the centre of a small formation, with two, three or four uncrewed aircraft fanned out around them. Some may fly ahead as scouts, using onboard sensors to build a picture of the airspace before the crewed jet arrives.

Others may carry additional weapons, extending what the formation can strike without adding another cockpit at risk. Others still may be tasked to draw enemy radar and fire away from the manned aircraft, or to jam an adversary's sensors electronically. All of it is coordinated by one person, from one cockpit - which is precisely the scenario Project Intuity is designed to support.

Programmes already in development or flight testing around the world, including the United States Air Force's General Atomics YFQ-42A, Anduril YFQ-44A, Australia's Boeing MQ-28 Ghost Bat and BAE Systems' Brontanax CCA, are early, tangible examples of the concept moving from the drawing board into the air.

From Pilot To Mission Commander

BAE Systems used the Farnborough International Airshow to give the public its first look at Project Intuity, a helmet-mounted technology demonstrator built around a question the company believes will define the next decade of combat aviation: what happens to the fighter pilot when the aircraft they fly is no longer the only thing they are responsible for?

"We're definitely seeing a move from traditional aircraft pilotage to the pilot of the future being more of a mission commander," Nigel Kidd, Director of Business Development (Product & Capability) at BAE Systems, told World Airnews. "What I mean by that is controlling autonomous vehicles, or CCAs, around the aircraft they are piloting themselves, and being at the centre of the man-in-the-loop flow of how that system of systems operates - as opposed to simply being a pilot in an aircraft making decisions for that aircraft alone."

It is a distinction with real weight. Rather than flying one aircraft, tomorrow's aircrew will direct fleets of Collaborative Combat Aircraft (CCAs), interpret AI-generated recommendations and hold the final say across a networked battlespace - all from the same cockpit.

The Problem Intuity Is Built To Solve

Kidd is careful to frame Intuity as a response to workload, not a showcase for its own sake. "In that future world, where the pilot is doing much more than flying their own aircraft, workload and stress levels are going to be higher," he said. "Project Intuity is about reducing that workload by providing inputs to the pilot and taking inputs back from the pilot into the system. It provides feedback for advanced AI tools to enable the pilot to make not just faster decisions, but more intuitive decisions."

The system's headline specification is scale: a field of view Kidd says is "twice as large as anything available today," paired with peripheral colour cues and directional 3D audio designed to pull the pilot's attention to the right piece of information without forcing them to hunt for it. "They should not have to refer to other displays or screen additional sensors," he said. "It is about making it clear, quick and easy." Pilot health and cognitive-load monitoring, including brain-monitoring technology, are being built into the same architecture. Asked how that compares with anything else on the market, Kidd did not hedge. "It is completely different," he said. "The technology that we are developing with Intuity is not available anywhere else. We are not aware of anyone else developing some of the technologies that we have built into our demonstrators today." He described the programme as drawing together low technology-readiness-level components, the unglamorous/unproven groundwork, for aircraft architectures still more than a decade from service. "We are looking over the horizon and across decades," he said.

Collaborative Combat Aircraft: From Concept To Routine

Manned-unmanned teaming is often discussed as a future capability. Kidd places it closer than that. "I think we are very close," he said of routine operational CCA use. "We are definitely seeing movement from a number of forces around the world towards collaborative combat aircraft. There is clearly a lot of investment going into CCA platforms." Intuity's job, as he frames it, is to make sure the pilot-facing technology is ready the moment those aircraft are deployable - not after.

That urgency, he suggested, is being sharpened by events on the ground. "I think the recent lessons from what has been happening in the world are that the future is now," Kidd said, pointing to the rapid evolution of drone warfare, electronic warfare and distributed sensing in recent conflicts. "We need to be ready with the next technology. We need to drive and understand how technology supports that new battle space." BAE Systems itself is active in drone manufacturing and development, he confirmed, though Intuity's focus sits specifically with the crewed pilot operating alongside those uncrewed systems - BAE Systems' own or otherwise.

Ai As Teammate, Not Replacement

Artificial intelligence runs through every part of the Intuity conversation, but Kidd is precise about where he thinks it belongs. "There will always be, certainly for the foreseeable future, a human in the loop for key decisions," he said. "But a symbiotic relationship with AI on the platform is absolutely the kind of operation Intuity is designed for."

Pressed on whether the system would go as far as recommending a course of action, Kidd was measured: the concept of operations, he said, "is still very much being developed," with open questions about exactly how much weight should sit with AI versus the human operator. Asked directly whether AI's role with Intuity was closer to extrasensory support than decision-making, his answer was unambiguous: "Yes."

Dual-Use Skies: From Fighter Cockpit To Airline Flight Deck

History gives Kidd a template for where this goes next. "The commercial sector tends to lag behind the military in these technologies, and that has played out in the past with things like head-up displays, which were originally on military aircraft and then eventually moved into commercial airliners for safer operation," he said.

He expects a similar migration for Intuity's underlying ideas. "Things like pilot workload and health monitoring are relevant whether you are a fast-jet military pilot or a commercial airline pilot," Kidd said. "You want to understand that the pilot is making the right decisions, the best decisions, not being overloaded with information, and not being overly stressed. As AI moves further into commercial aviation, that symbiotic relationship between pilot control and AI support is equally valid." It is, in effect, a direct line from a Farnborough helmet demonstrator to the flight deck of a future airliner, and one reason military-to-civil technology transfer remains one of the more consequential stories in aerospace.

Why This Region, Why Now?

None of this is abstract for the readers of this edition. Africa and the Middle East have, for some time now, sat among the most active and consequential theatres of conflict anywhere in the world. Not peripheral to the great-power contest over autonomy and AI in the air, but central to it.

Sudan's civil war, now well into its third year, has drawn in aerial and drone capability from multiple sides and is increasingly spilling outward, tying the Red Sea corridor, the Horn of Africa and the Sahel into a single, interconnected zone of instability. Across the Sahel, Mali, Burkina Faso and Niger remain the focus of a widening insurgency that is pushing toward coastal West Africa, straining air forces already operating legacy fleets well past the point their designers imagined. The Red Sea and the wider Horn of Africa, meanwhile, sit astride some of the busiest and most strategically sensitive shipping lanes on Earth, and have seen recurring military flashpoints linked to the broader regional confrontation involving Iran, Israel and the Houthi movement in Yemen.

For the region's air forces, that is the operating environment in which any modernisation decision must be made: real, live, and often resource constrained. It is also precisely the environment in which the case for upgrading existing platforms, rather than waiting years or decades for new ones, becomes hardest to ignore.

Modernisation Without Replacement

Few air forces in Africa or the Middle East are in a position to replace entire fleets to access next-generation cockpit technology. Kidd argues that's not actually a barrier. "Our current mature technology programme, the Striker® II helmet-mounted display, is absolutely a system that is available in the near and medium term for existing platform upgrades and could act as a capability multiplier for those platforms," he said.

Striker II is already selected for the Eurofighter Typhoon in a number of nations, and Kidd sees a clear upgrade path elsewhere. "In places like South Africa, where the Gripen aircraft is operated, there is an older

BAE Systems Nigel Kidd at Farnborough. Image © Stuart Haigh WAN

standard of helmet used on those aircraft. Striker II could be an upgrade to that and would enable more capability," he said - with Intuity's own technologies positioned to follow as CCA operations mature into the medium and long term.

The misconception Kidd wants to correct.

While Intuity incorporates significant automation, Kidd is adamant that it is intended to enhance, rather than diminish, the pilot's role. "One misconception about next-generation pilot technologies is that the pilot's job will be easier because they will have autonomous combat aircraft around them going and doing things automatically. I do not believe that is the case," he said. "I think they will have a much harder and higher workload, controlling the aircraft around them as well as their own aircraft. Keeping stress low and keeping the character and clarity of information clear will be extremely important."

That, ultimately, is the case Project Intuity is making: as the aircraft gets smarter, the premium on the person inside it (their judgement, their workload capacity, their ability to act on the right information at the right moment) only rises.

NIGEL KIDD

Nigel Kidd is Director of Products and Capabilities within the Business Development function of BAE Systems' Electronic Systems sector, based in Rochester, UK. He is responsible for shaping product strategy and capability development across the Rochester portfolio to meet the evolving needs of defence customers.

With more than 25 years' experience in engineering, project management and advanced mission systems, Kidd previously served as Product Director for Helmet Mounted Displays, leading the development of pioneering digital HMD concepts and the Striker® II helmet-mounted display. His career has spanned senior engineering, technical leadership, and programme management roles, giving him extensive experience in the development of next-generation combat aviation technologies.

Images Courtesy of ©Rosoboronexport

RUSSIA LAUNCHES INTERNATIONAL SECURITY FORUM TO SHOWCASE INTEGRATED DEFENCE AND SECURITY TECHNOLOGIES

By Yury Laskin

The inaugural International Security Forum (ISF26), held from 26–29 May at the Live Arena near Moscow under the auspices of the Security Council of the Russian Federation, marked a significant evolution in how Russia presents its defence and security capabilities to the international community.

According to the organisers, official representatives from 125 countries attended the event, transforming what had previously been an annual meeting of security agency heads into a comprehensive international exhibition and conference dedicated to contemporary security challenges. The expanded format combined high-level discussions with indoor and outdoor exhibitions featuring technologies spanning air defence, counter-unmanned aerial systems (C-UAS), cybersecurity, critical infrastructure protection and civil security.

For World Airnews readers, the forum reflects a broader trend within the global defence sector: the convergence of aviation, electronic warfare, artificial intelligence, cybersecurity and infrastructure protection into increasingly integrated security ecosystems.

Rosoboronexport Takes Centre Stage

A central participant at ISF26 was Rosoboronexport, Russia's state intermediary for defence exports, which used the forum to present a range of technologies

intended for both military and dual-use security applications.

According to Rosoboronexport Director General Alexander Mikheev, the forum provides an opportunity to demonstrate technologies developed to address modern security challenges, including counter-terrorism, organised crime, critical infrastructure protection and national security.

Rather than focusing solely on conventional military hardware, the exhibition highlighted systems designed to operate across multiple domains, reflecting the growing importance of integrated defence networks.

Counter-Uav And Air Defence Systems

One of the exhibition's strongest themes was the protection of airspace against the rapidly expanding threat posed by unmanned aerial systems.

Among the systems displayed was the Citadel anti-aircraft artillery system, designed to counter both fixed-wing and rotary-wing unmanned aircraft. According to Rostec, the system combines radar surveillance, automated target tracking and programmable ammunition intended to improve effectiveness against small aerial targets while reducing ammunition expenditure.

Complementing the Citadel system was the Garmon-ME multifunction radar developed by Almaz-Antey. The compact radar is intended to provide air surveillance, target detection and tracking for both air defence and counter-battery operations, illustrating the increasing demand for sensors capable of supporting multiple operational roles.

Also attracting considerable interest was the RB-504P-E Silok electronic warfare system, designed to detect and disrupt radio-controlled unmanned aircraft through electronic jamming. Available in portable, fixed and vehicle-mounted configurations, the system reflects the continuing evolution of electronic counter-UAS capabilities now being adopted by armed forces worldwide.

Together, these systems demonstrate how modern layered air defence increasingly depends upon the integration of sensors, electronic warfare and kinetic interceptors rather than individual standalone platforms.

Integrated Security Beyond The Battlefield

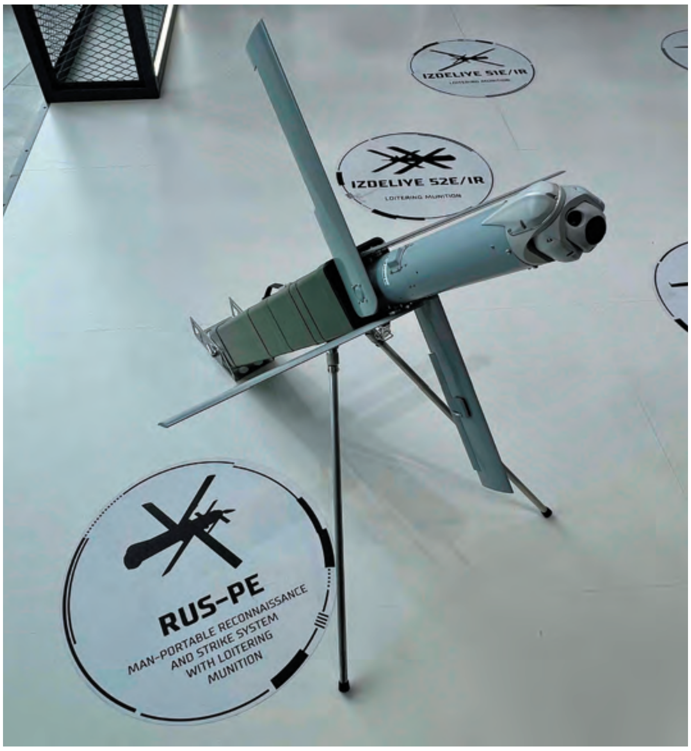
While aviation and air defence formed an important part of the exhibition, ISF26 also showcased technologies intended for wider national security applications.

Rosoboronexport presented a number of protected mobility platforms, including light armoured vehicles and tactical transport trucks designed for operations in demanding environments. Although these vehicles attracted attention, the broader message of the exhibition centred on integrated security rather than individual vehicle specifications.

The forum also introduced the Portal-3 inspection system for critical infrastructure protection. According to the company, the system is capable of detecting

weapons, explosives, radioactive materials and hazardous substances, highlighting the increasing overlap between defence technology and homeland security.

Equally notable was a neural network-based cybersecurity platform designed to monitor digital information environments continuously and assist operators by identifying potential threats through automated analysis. Such technologies illustrate the



growing role artificial intelligence is beginning to play in national security decision-support systems.

A Shift Towards Integrated Security

The exhibition demonstrated how modern def
ence exhibitions are evolving beyond the traditional display of individual weapons systems.

Increasingly, governments and defence manufacturers are presenting integrated solutions that combine surveillance, electronic warfare, cyber resilience, artificial intelligence and critical infrastructure protection into unified operational capabilities.

This mirrors developments seen across the international defence industry, where success increasingly depends not only on the performance of individual platforms but on how effectively they are connected into larger command, control and information networks.

Africa Remains An Important Market

Rosoboronexport also reaffirmed the importance of Africa within its international partnerships, noting that the continent continues to represent a significant portion of its defence cooperation activities.

According to the company, it maintains military-technical cooperation agreements with numerous African nations and continues to pursue collaborative projects across the continent. While geopolitical relationships continue to evolve, Africa remains an important market for a wide range of defence and security technologies from multiple international suppliers.

Looking Ahead

The inaugural International Security Forum signals Russia's intention to establish a broader international platform dedicated not only to defence products but also to integrated security technologies.

For aviation professionals, the most significant take-away is the growing emphasis on counter-UAS systems, advanced radar, electronic warfare, cybersecurity and critical infrastructure protection—all disciplines that are becoming increasingly interconnected as modern air power evolves.

As defence increasingly becomes a system-of-systems enterprise, forums such as ISF26 provide insight into how nations are seeking to integrate aviation, digital technologies and security capabilities to address the complex operational challenges of the future.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BEYOND THE PLATFORM HENSOLDT AND PROJECT Q ARE SHAPING THE SOFTWARE-DEFINED BATTLEFIELD

Modern military capability is no longer defined solely by the performance of an aircraft, radar or unmanned system. Increa-singly, operational advantage depends on something less visible but arguably more important: the ability to connect disparate systems into a single, coherent operational network.

As armed forces embrace multi-domain operations, the challenge has shifted from acquiring individual platforms to integrating thousands of sensors, effectors and command systems into an environment where information can be shared, analysed and acted upon in real time.

This evolving reality is reflected in HENSOLDT's recent strategic investment in European defence technology company Project Q, announced on 15 July 2026. More than a financial investment, the partnership represents a shared vision for software-defined defence built on open architectures, interoperability and resilient command-and-control.

A Shift From Platforms To Integration

For decades, military procurement focused primarily on acquiring capable individual systems. Aircraft, radars, electronic warfare equipment and command systems were often developed independently, each using proprietary software and communications protocols.

The result has been increasingly capable equipment that can nevertheless be difficult to integrate across services, domains and manufacturers.

Modern operations demand a different approach. Today's commanders require a common operational picture that combines information from airborne sensors, ground-based surveillance, unmanned systems, maritime assets, cyber capabilities and space-based platforms. Achieving this level of integration has become one of the defining technical challenges facing defence organisations worldwide.

Project Q and HYDRIS

Project Q has developed HYDRIS, an open-source integration and orchestration platform designed specifically for defence and security applications. Rather than replacing existing equipment, HYDRIS is intended to connect legacy systems, commercial off-the-shelf technologies, autonomous platforms and command-and-control applications within a common operational environment.

It bridges the gap between newer and older systems Using open standards, edge computing and AI-assisted data processing, the platform enables information from multiple sources to be exchanged securely while remaining vendor-neutral. This approach allows military organisations to extend the operational life of existing capabilities while reducing dependence on proprietary interfaces.

Complementing Hensoldt's MDOcore Vision

The collaboration brings together complementary capabilities. HENSOLDT contributes decades of expertise in mission-critical sensors, radar, optronics, electronic warfare, artificial intelligence and its software-centred MDOcore integration platform.

Project Q adds HYDRIS together with distributed edge applications, mesh networking technologies and specialised acoustic and seismic sensor capabilities.

Together, the two organisations aim to create an architecture capable of integrating sensors, unmanned systems and mission applications from multiple manufacturers into a unified operational framework.

Intelligence At The Tactical Edge

One of the most significant aspects of the partnership is its emphasis on edge computing. Instead of transmitting every sensor feed to distant data centres, processing occurs closer to the point of collection. Artificial intelligence can filter, prioritise and distribute critical information locally, reducing bandwidth requirements and significantly shortening the time between detection and operational decision-making.

Enabling Multi-Domain Operations

Multi-domain operations depend upon the ability of diverse systems to function as a coordinated whole.

Aircraft, unmanned aerial systems, ground sensors, radar installations, acoustic arrays and command centres all contribute pieces of the operational picture. The challenge lies in ensuring these components communicate effectively despite originating from different manufacturers and technology generations.

By combining HENSOLDT's MDOcore platform with Project Q's HYDRIS integration layer, the partnership seeks to simplify this complexity while supporting scalable, software-defined capability development. This enables commanders to achieve a unified, tactical advantage.

Strengthening European Technological Sovereignty

The announcement also reflects a broader strategic objective within Europe. Open architectures, software sovereignty and reduced dependence on proprietary foreign technologies have become increasingly important considerations for governments and defence organisations.

By investing in European-developed software infrastructure and promoting interoperable, vendor-neutral solutions, HENSOLDT is reinforcing its strategy of building resilient defence ecosystems capable of evolving alongside rapidly changing operational requirements.

As Christian Schmidt, Chief Strategy Officer at HENSOLDT, noted when announcing the investment, the partnership combines *"the innovative strength of young companies such as Project Q with our systems expertise and global market access,"* reflecting a collaborative approach to strengthening Europe's defence technology ecosystem.

The significance of this partnership extends well beyond a single investment announcement. It illustrates how the future of defence is increasingly being shaped by software architectures that connect existing capabilities, enable rapid integration of emerging technologies and support informed decision-making across every operational domain.

Tomorrow's military advantage may depend not simply on possessing the most advanced platforms, but on integrating thousands of sensors, autonomous systems and command networks into a resilient, intelligent operational environment.

THE COGNITIVE COCKPIT WHY THE NEXT REVOLUTION IN MILITARY AVIATION IS CENTRED ON THE PILOT

For more than a century, military aviation has been defined by faster aircraft, more capable sensors and increasingly sophisticated weapons. Today, however, the greatest challenge is ensuring that pilots can absorb, interpret and act on an unprecedented volume of information. The cognitive cockpit represents a new generation of human-centred design, engineered not to replace the pilot, but to help them make better decisions when it matters most.

From Protection To Mission System

A pilot in a modern combat aircraft has access to more information than at any other time in the history of military aviation. Active electronically scanned array (AESA) radars, infrared search and track (IRST) systems, electronic warfare suites, electro-optical sensors and secure datalinks continuously generate information about the aircraft, the battlespace and potential threats. Mission computers fuse this information into a single tactical picture, allowing pilots to understand an increasingly complex battlespace in real time.

Early military flying helmets evolved rapidly during the Second World War, incorporating communications equipment, oxygen delivery systems and protective eyewear. These developments marked the beginning of the cockpit's transformation from a collection of separate systems into an integrated pilot interface.

Yet despite extraordinary advances in sensors and computing power, one fact remains unchanged: every critical decision still depends on the person in the cockpit.

This changing relationship between technology and the pilot lies at the heart of the cognitive cockpit. Rather than focusing solely on aircraft performance, modern cockpit design seeks to ensure that pilots can absorb, interpret and act on increasingly complex information while operating in demanding combat environments. The emphasis has shifted from simply providing more information to presenting the right information at the right time.

Although the term is relatively new, the principles behind the cognitive cockpit have evolved over many decades.

Early military flying helmets served a simple purpose. Constructed from leather and later reinforced materials, they protected pilots from the elements while supporting communications equipment and oxygen systems. As aircraft became faster and operated at higher altitudes, helmets improved safety and endurance, but they remained fundamentally passive pieces of equipment.

The emergence of guided weapons, advanced radar and airborne sensors during the Cold War transformed that role. Engineers recognised that every glance inside the cockpit reduced a pilot's awareness of the outside world. Bringing essential flight and targeting information into the pilot's natural field of view offered a significant operational advantage.

One of the earliest examples was the Soviet MiG-29 and Su-27 helmet-mounted sighting system, which enabled pilots to designate targets simply by looking at them. Coupled with high off-boresight infrared missiles, it fundamentally changed close-range air combat by linking the pilot's line of sight directly to the weapon system.

Western manufacturers soon adopted similar concepts. The US Army's Integrated Helmet and Display Sighting System (IHADSS) for the AH-64 Apache projected flight and targeting information directly into the pilot's field of view while linking head movement to the helicopter's sensors. The Joint Helmet Mounted Cueing System (JHMCS) later extended these capabilities across numerous Western fighter fleets, allowing pilots to cue weapons rapidly without manoeuvring the entire aircraft.

Fifth-generation aircraft have taken this philosophy further. The F-35 Lightning II dispenses with the traditional head-up display altogether, relying instead on its Helmet Mounted Display System (HMDS) to present flight data, navigation, sensor imagery and targeting cues directly on the pilot's visor. Other systems, including BAE Systems' Striker II and Saab's Targo, demonstrate the same industry-wide objective: integrating technology around the pilot rather than expecting the pilot to adapt to the technology.

The evolution of the military flying helmet mirrors a much broader transformation in cockpit design. What began as protective equipment has become an intelligent interface connecting pilots directly with the aircraft's sensors, mission systems and weapons.

The AH-64 Apache's Integrated Helmet and Display Sighting System (IHADSS) represented a major step in cockpit evolution, projecting flight and targeting information directly into the pilot's field of view while linking head movement to the helicopter's sensor and weapon systems.

More importantly, it illustrates a fundamental shift in aerospace engineering—from improving the aircraft alone to improving the interaction between the aircraft and the person flying it.

The Information Challenge

The transformation of the military cockpit has been driven by a simple reality: modern combat aircraft generate far more information than any pilot can reasonably process unaided.

A fourth-generation fighter already carries an array of sophisticated sensors capable of detecting, identifying and tracking threats over vast distances. Fifth-generation aircraft extend this capability further by integrating active electronically scanned array (AESA) radars, infrared search and track (IRST) systems, electronic support measures, electro-optical targeting systems and secure datalinks into a single networked battlespace. Information no longer originates from the aircraft alone; it is shared continuously between airborne early

The Joint Helmet Mounted Cueing System (JHMCS) enabled pilots to designate targets simply by looking at them, dramatically improving close-range combat effectiveness. The F-35's Helmet Mounted Display System (HMDS) takes this concept much further, replacing the traditional head-up display and presenting flight, navigation and sensor information directly on the pilot's visor.

warning platforms, naval forces, ground-based air defence systems and other combat aircraft, creating a constantly evolving operational picture.

The result is unprecedented situational awareness—but also unprecedented complexity.

In earlier generations of combat aircraft, pilots interpreted information from largely independent systems. Radar, navigation, communications and weapons each had dedicated displays, requiring crews to mentally combine multiple streams of information while simultaneously flying the aircraft. As sensors became more capable, the workload increased accordingly.

Today, the challenge is no longer collecting information, but determining what matters most in the moment.

This has placed human factors engineering at the centre of cockpit design. Rather than presenting every available data point, modern mission systems prioritise information according to the operational situation. Through sensor fusion, radar tracks, infrared detections, electronic warfare data, navigation information and intelligence from external platforms are combined into a single, coherent tactical picture before being presented to the pilot.

The objective is not to make decisions for the pilot, but to reduce the time and mental effort required to understand the battlespace. By organising information intelligently, the aircraft allows the pilot to focus on assessing threats, making decisions and executing the mission instead of managing individual systems.

This approach has become even more important as combat aircraft operate within highly connected, network-centric forces. Information is now exchanged continuously between aircraft and other military assets, greatly expanding situational awareness but also increasing the volume of data entering the cockpit.

Simply displaying more information is no longer an effective solution. It must be filtered, prioritised and presented in a way that supports rapid comprehension under pressure.

The modern cockpit is therefore no longer viewed as a collection of independent displays and controls, but as an integrated information environment designed around the pilot's decision-making process. Every display, warning and interface is evaluated not only for technical performance, but also for its contribution to situational awareness and workload management.

Ultimately, the cognitive cockpit is defined not by the amount of technology it contains, but by how effectively that technology supports human performance. As aircraft continue to generate ever greater volumes of information, the success of future cockpit design will depend on ensuring that technology serves the pilot rather than overwhelms them.

Engineering The Cognitive Cockpit

Designing a modern military cockpit is no longer simply about integrating more sensors or installing larger displays. It is about creating an environment in which pilots can interpret, prioritise and act on information with speed and confidence under the pressures of combat. Achieving this requires a multidisciplinary approach that combines aerospace engineering, software development, systems integration and human factors.

One of the most significant developments has been the move towards integrated display environments.

Large-area displays are replacing clusters of dedicated instruments, allowing information to be organised dynamically according to mission requirements rather than fixed cockpit layouts. Instead of scanning multiple independent displays, pilots receive a coherent tactical picture that can be reconfigured as the mission evolves, reducing workload and improving situational awareness.

Helmet-mounted display systems continue to play an equally important role. Modern designs project flight data, targeting information and sensor imagery directly into the pilot's field of view, reducing the need to look down at cockpit instruments during critical phases of flight. Achieving this capability demands exceptional engineering precision. Optical alignment must ensure that digital symbology remains accurately registered with the outside world, while display latency must be reduced to almost imperceptible levels to prevent disorientation during high-speed manoeuvring. Even helmet weight and centre of gravity require careful optimisation to minimise fatigue and neck strain during sustained high-G operations.

Behind the displays, increasingly powerful mission computers perform the complex task of integrating information from onboard sensors and external sources in real time. These systems must correlate radar tracks, infrared detections, electronic warfare data and navigation information while maintaining deterministic performance, cybersecurity and reliability under demanding operational conditions.

BAE Systems' Striker II Helmet Mounted Display System integrates full-colour digital symbology, precision head tracking and optional night vision into a lightweight modular design. Developed for modern fast-jet operations, it exemplifies the shift towards human-centred cockpit engineering, where critical flight and mission information is presented directly within the pilot's field of view.

To support continuous capability growth, manufacturers are increasingly adopting open, modular mission architectures. Rather than redesigning the cockpit each time a new sensor or weapon becomes available, software-defined systems allow new capabilities to be integrated through incremental upgrades. This approach reduces development costs, shortens upgrade cycles and enables aircraft to remain operationally relevant throughout decades of service.

Programmes such as BAE Systems' Project Intuity illustrate how manufacturers are exploring adaptive interfaces and human-machine interaction to reduce workload while preserving pilot authority.

As a result, cockpit engineering is increasingly measured not simply by computing power or display resolution, but by how effectively every component contributes to the pilot's understanding of the battlespace. Reliability, maintainability, software integrity and human-centred design have become as critical to combat effectiveness as traditional measures of aircraft performance.

The cognitive cockpit therefore represents more than a collection of advanced technologies. It is the product of an engineering philosophy that recognises the aircraft and pilot as a single integrated system, each designed to enhance the performance of the other.

The Human Advantage

The evolution of the cognitive cockpit reflects a broader change in military aviation. For much of the past century, advances in combat capability were measured by improve-ments in speed, ma-noeuvrability, sensors and weapons. While these remain essential, the ability to exploit those capabilities has become equally important.

As aircraft generate and exchange ever greater vol-umes of information, the effectiveness of the pilot has become a critical element of overall system performance. This shift has placed human-centred design at the heart of cockpit development. Every aspect of the modern cockpit—from display layouts and mission software to helmet-mounted systems and control interfaces—is increasingly engineered to reduce workload, improve situational awareness and support faster, more informed decision-making. The objective is not simply to provide more information, but to present it in ways that match how pilots naturally perceive, process and respond under operational pressure.

The same philosophy is shaping the next generation of combat aircraft. Artificial intelligence, adaptive interfaces and advanced mission management systems are expected to assume more routine functions, allowing pilots to concentrate on tactical judgement and mission execution. Rather than replacing human decision-making, these technologies are intended to enhance it by filtering complexity and presenting information in a more intuitive and meaningful way.

Ultimately, the cognitive cockpit recognises that the aircraft and the pilot cannot be considered separately. The performance of one increasingly depends upon the effectiveness of the other. However advanced sensors, computing power or software may become, they achieve their greatest value only when they enhance the pilot's ability to understand the battlespace, exercise judgement and act decisively.

Saab's Targo Helmet Mounted Display System equips Gripen E pilots with advanced head-tracking and helmet-mounted cueing capabilities, allowing flight, navigation and targeting information to be projected directly into the pilot's field of view. Designed to minimise weight while maximising situational awareness, Targo reflects the industry's continued focus on integrating technology around the pilot.

Ultimately, the cognitive cockpit represents more than the next generation of military cockpit design. It reflects a fundamental recognition that future air power depends not only on more capable aircraft, but on enabling pilots to exploit those capabilities with speed, confidence and precision.

From the earliest flying helmets to today's integrated mission systems, cockpit evolution has consistently pursued the same objective: reducing workload while enhancing situational awareness. As technology continues to advance, the measure of success will not be how much information an aircraft can generate, but how effectively it helps the pilot understand, decide and act.

In the end, the most important system in any combat aircraft remains the person in the cockpit. The cognitive cockpit exists not to replace that human advantage, but to ensure it remains decisive.

BEYOND SPEED

Lockheed Martin's Next Generation Glide Body reflects a broader evolution in how advanced defence systems are being designed, produced and sustained.

For much of the past decade, hypersonic weapons have been defined by one characteristic: speed. Capable of sustained flight at speeds above Mach 5, they have become symbols of technological competition, strategic deterrence and military advantage.

As hypersonic programmes mature, however, governments and defence manufacturers are increasingly focused on whether these systems can be produced efficiently, integrated into existing military architectures and sustained throughout their operational lives. Manufacturing capacity, affordability and long-term sustainment are increasingly being considered alongside raw performance.

Lockheed Martin's recently announced Next Generation Glide Body (NXGB) illustrates this shift. Rather than highlighting aerodynamic performance alone, the company has emphasised manufacturability and production from the earliest stages of development.

A Programme Still In Development

According to Lockheed Martin, the NXGB is a long-range hypersonic glide body designed for launch from multiple platforms, with objectives including greater range, improved survivability, lower production costs and scalable manufacturing.

The programme has completed its Preliminary Design Review and is expected to begin flight demonstrations in 2027. Its operational capabilities remain to be validated.

Manufacturing Moves To The Fore

Lockheed Martin says the NXGB follows a "manufacturing-first" approach, with production and supply-chain planning incorporated from the outset.

This reflects a broader defence trend in which programmes are judged not only by performance but also by affordability, production efficiency and scalability.

Designing For Long-Term Adaptability

The NXGB also adopts a Modular Open Systems Approach (MOSA), intended to simplify future upgrades and integration.

Modular architectures allow technologies to evolve without redesigning entire platforms, reflecting a wider move towards more adaptable defence systems.

Looking Ahead

The NXGB remains under development, and many of its intended benefits will only be confirmed through future testing.

Nevertheless, the programme highlights a significant change in defence engineering. Innovation is increasingly measured not only by what advanced systems can achieve in flight, but by how effectively they can be manufactured, integrated and sustained throughout decades of service.

In the coming years, those industrial capabilities may become as strategically significant as advances in speed and performance.

Image Courtesy of © Lockheed Martin

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PERSISTENT EYES IN THE SKY

CONNECTED UAV ECOSYSTEMS ARE REDEFINING SECURITY, INFRASTRUCTURE AND DEFENCE

By Judi Rodokanakis

An Industry Perspective by Dean Polley, CEO of SASS Holdings and Chairman of the AfBAA UAS Committee.

Every day, organisations responsible for protecting critical infrastructure are asked to make faster decisions across environments that are larger, more complex and increasingly interconnected. Mines stretch across thousands of hectares. Energy networks span entire regions. Borders, ports and transport corridors demand continuous vigilance, while the resources available to monitor them remain finite.

For much of the past decade, unmanned aerial vehicles have helped extend the reach of human observation across these environments. Drones have become indispensable tools for surveying inaccessible terrain, inspecting infrastructure, supporting emergency response and enhancing security operations.

Improvements in endurance, sensor technology and autonomous flight have steadily expanded their capabilities, allowing organisations to gather information more safely, efficiently and at a fraction of the cost of many traditional methods.

Yet as the technology has matured, the challenge has begun to change. For many organisations, collecting aerial data is no longer the primary objective. The greater task is transforming that data into meaningful operational intelligence: information that can be shared across an organisation, interpreted in context and acted upon while

it still has value. The question is no longer simply whether an aircraft can fly further or carry a better camera, but how aerial intelligence can become an integrated, continuous part of operational decision-making.

Every technological revolution eventually reaches a point where the technology itself becomes less important than the system surrounding it. Computers ceased to be isolated machines when they became connected through networks. Mobile phones evolved from communication devices into digital platforms.

Dean Polley argues that unmanned aviation is approaching the same moment. Increasingly, organisations will invest not simply in aircraft, but in the intelligence architectures that make those aircraft operationally valuable.

This transition is already evident in sectors where scale, complexity and resilience are strategic priorities.

Large mining operations require continuous oversight of sprawling sites. Utility providers must monitor geographically dispersed networks while minimising risk to personnel. Security organisations are expected to maintain persistent situational awareness across extensive operational areas, while defence planners seek to integrate unmanned systems into broader command-and-control structures. Although each sector faces its own demands, they are converging around a common requirement: turning information into timely, informed action.

DJI Matrice 4D drones. Image Courtesy of SASS © Dean Polley

DJI Doc Mobile Operations. Image © Dean Polley

It is within this context that Polley sees commercial unmanned aviation entering another pivotal stage. Recently appointed Chairman of the Unmanned Aircraft Systems Committee of the African Business Aviation Association, he has spent more than a decade developing UAV solutions across Africa, particularly within mining, industrial inspection, security and critical infrastructure. Over time, his focus has moved beyond asking what drones can do towards a different question: how can unmanned aviation become part of the way an organisation operates every day?

"The drone is only one part of the solution," he says. "Where the industry is going is building connected ecosystems."

In this transition, the aircraft gradually ceases to be the centre of the story and becomes one component within a larger framework designed to deliver something more valuable than imagery alone: persistent situational awareness.

Technology has always evolved in layers. Aircraft extended the reach of people. Sensors extended the reach of aircraft. Networks extended the reach of information. Polley sees connected UAV systems as the next layer in that progression - not replacing the technologies that came before, but bringing them together into a single operational capability.

A Different Way Of Thinking

Polley's perspective did not emerge from theory or technology forecasts. It evolved through years of working alongside organisations whose operational challenges extended far beyond simply flying drones.

Across mining, industrial inspection, security and critical infrastructure, he repeatedly encountered the same problem: organisations were becoming increasingly effective at collecting aerial data, yet often struggled to convert that information into continuous operational awareness.

Drone multi-sensor camera. Image © Dean Polley

Early commercial deployments demonstrated the value of the aircraft itself. Drones could inspect infrastructure more safely than sending personnel into hazardous environments, survey vast areas in a fraction of the time required by conventional methods and give security teams an aerial perspective that had previously been difficult or prohibitively expensive to achieve. As those capabilities matured, however, the conversation began to change.

Polley recalls a period when discussions centred on endurance, payload, camera specifications and wind resistance. He draws the comparison from an earlier interest in professional photography: clients did not ask which camera he used; they wanted the outcome. He sees UAV services moving in the same direction.

"They simply want the service and the outcome," he says. How the operator achieves it increasingly becomes the responsibility of the specialist.

That operational model works exceptionally well until scale changes the equation. In smaller applications, an individual drone remains an effective tool. Surveyors, photographers, inspectors and many commercial operators continue to deploy aircraft mission by mission, returning with imagery that fulfills a clearly defined objective. There is nothing inherently wrong with that approach; it remains entirely appropriate for thousands of operators around the world.

When an organisation is responsible for monitoring thousands of hectares of mining infrastructure, securing extensive industrial facilities or maintaining oversight of geographically dispersed assets, isolated missions begin to reveal their limitations. Information is no longer required only at the end of a flight. It is needed continuously, often by multiple stakeholders, and increasingly forms part of broader operational decision-making. As scale increases, so does the need for persistence, coordination and integration.

Experience taught Polley to look beyond the aircraft and towards the systems surrounding it: communications infrastructure, software platforms, command centres and operational workflows capable of transforming isolated flights into a continuous source of intelligence.

The problem was no longer how to make a drone perform a more complex mission. It was how to embed unmanned aviation within the operational fabric of an organisation.

That conclusion has been reinforced by enterprise deployments where success depends upon moving information quickly and reliably between the people collecting it and those responsible for making decisions, with the drone becoming one element in a wider decision-support framework serving security, engineering, environmental management and executive oversight at the same time.

His AfBAA appointment comes as these questions are becoming more relevant across the continent. As African industries invest in digital infrastructure, automation and more resilient operating models, unmanned aviation must evolve alongside them. The challenge is not only integrating drones into African airspace; it is integrating unmanned systems into the daily decision-making processes of the organisations they serve.

Aircraft will continue to improve, sensors will become more sophisticated and artificial intelligence will assume a growing role. Yet, in Polley's assessment, those advances matter most when people, platforms and information are connected within a coherent systems architecture.

It is this approach, rather than the aircraft in isolation, that he sees defining the next phase of enterprise UAV operations.

The Operational Shift

The evolution Polley describes is not about replacing one generation of aircraft with another. It is about rethinking the operating model around them. For much of the commercial UAV industry's development, success was measured by the completion of individual missions. A pilot travelled to site with an aircraft, batteries, charging equipment and the supporting technology required for the task. Once the mission was completed, the aircraft returned, the data was downloaded, reports were prepared and the team moved on to the next assignment.

That single-mission model still delivers exceptional value at smaller scale. At enterprise scale, however, the requirement is different.

Large mining operations, industrial facilities and critical infrastructure cannot always be managed through aerial inspections undertaken days or weeks apart. Security teams require continuous visibility across extensive areas. Engineers need frequent access to current information. Environmental managers monitor changing conditions, while operational leaders depend upon accurate, near-real-time intelligence to support decisions affecting safety, productivity and business continuity.

"The question changes," Polley explains. "You are no longer asking how well the aircraft performs a mission. You are asking how the organisation maintains awareness of everything that is happening across the operation."

That distinction fundamentally alters the role of the aircraft. Instead of existing as an independent asset deployed when required, it becomes one component within a permanently available aerial capability.

DJI Doc. Image © Dean Polley

Autonomous docking stations allow aircraft to launch, recover and recharge without requiring a pilot to travel to site. Mission-management platforms schedule routine inspections, while communications networks transfer information directly into cloud environments where it becomes accessible to authorised personnel.

Operators remain responsible for supervising missions, but from central command facilities capable of managing multiple aircraft across multiple locations.

As Polley puts it, "What we're moving towards is removing the pilot and all that equipment from the field and putting them into a command centre." The aim is not to remove people from the operational equation, but to reposition them where their expertise can be applied more effectively.

Mining provides the clearest evidence of why this transition is occurring. Years of working in the sector exposed Polley to security, engineering and environmental teams for whom waiting until the next scheduled flight was often no longer sufficient.

Traditional mine-based operations may require dedicated field teams, multiple vehicles, battery systems, security escorts and repeated movement between operational areas simply to maintain routine aerial coverage. A permanently installed network changes that equation.

Aircraft can launch automatically for scheduled surveys or respond to an operational requirement, return to recharge and prepare for the next mission without the entire team having to mobilise again.

The implications extend beyond efficiency. Moving personnel out of repetitive field deployments reduces exposure to operational risk while allowing skilled pilots to supervise multiple assets from a safer, centralised environment. Data also becomes available more quickly, moving directly from the aircraft into an enterprise platform that gives every stakeholder the same operational picture.

Polley's practical example is deliberately simple. Under a conventional workflow, a pilot lands, removes an SD card, returns to an office, downloads the imagery and transfers it to another platform for processing.

Within an integrated architecture, the aircraft lands and the data moves automatically into the back end, where it can be processed, shared and viewed by authorised stakeholders. The difference is not merely convenience; it is the time between observation and action.

A high-resolution image stored on a memory card may document what happened. A connected operational network enables an organisation to understand what is happening now and respond before a developing situation becomes a larger problem. This is the real shift from individual missions to persistent capability.

Although mining has provided many of the early opportunities to develop this approach, the same principles apply to utility networks, critical infrastructure, industrial plants, ports, airports and logistics hubs. Each faces the challenge of maintaining reliable awareness across environments that are becoming larger, more complex and more interconnected.

The technologies supporting those environments will continue to evolve, but their greatest value will emerge only when aircraft, people, communications and information operate together as a single decision-support framework — what Polley sees defining the next phase of enterprise unmanned aviation. In many respects, unmanned aviation is following the same transformation that reshaped information technology over the past three decades: organisations no longer invest only in isolated devices, but in integrated systems that improve performance across the enterprise.

Beyond Technology

At this point, the conversation ceases to be about drones altogether. Although Polley's work is rooted in commercial enterprise, the principles underpinning connected UAV operations are increasingly relevant wherever organisations are responsible for protecting people, infrastructure and critical assets. Whether the objective is securing a mining operation, monitoring a transmission network, safeguarding an industrial facility or supporting national security, the underlying challenge is remarkably similar.

The technologies employed in each sector may differ, but the operational requirement is converging: the drone is no longer the end product, but one sensor within a broader architecture designed to support those responsible for acting on the information.

This shift is already visible in enterprise digital transformation. Mining companies are integrating aerial intelligence with operational management systems. Infrastructure operators are looking beyond scheduled inspections towards more continuous monitoring of critical assets, while utility providers combine aerial imagery, sensor data and predictive analytics to improve maintenance planning and reduce operational risk.

A similar trajectory is evident in security and defence. The operational demands of military organisations differ significantly from those of commercial enterprise, and standalone aircraft will continue to fulfil many tactical roles. Even so, modern defence increasingly relies upon networked unmanned systems that share information across wider command-and-control architectures. The common principle is integration: success depends not only on the performance of an individual aircraft, but also on how securely and quickly its information reaches those responsible for acting upon it.

The same applies to border security and the protection of strategic infrastructure. A single aircraft can observe a defined area for a limited period. A coordinated network can sustain awareness, hand responsibility between assets and give command personnel a more continuous operational picture.

Persistence, in this sense, is not the endurance of one machine. It is the resilience of the system.

The discussion also extends beyond technology itself. As automation, artificial intelligence and autonomous systems continue to mature, Polley distinguishes between automating processes and replacing human judgement. He is cautious about allowing artificial intelligence to make aviation decisions without oversight, observing in

DJI Flighthub2 Screen. Image © Dean Polley the interview that automated missions still require a pilot to monitor the flight and intervene when circumstances demand it.

Artificial intelligence does not replace operational judgement; it amplifies it. By processing enormous volumes of imagery, identifying anomalies and highlighting events that require attention, AI allows experienced operators to focus on interpreting information rather than searching for it. In a security environment, software may flag unusual movement or behaviour for closer inspection. During a long surveillance mission, it may identify an object that a fatigued human operator could overlook. In data analysis, it can review flight histories and identify patterns that would be impractical to evaluate manually.

Responsibility for understanding context and deciding what happens next remains human. Algorithms may detect movement, but they do not necessarily understand intent. Software can identify an anomaly, but an experienced operator must interpret its operational significance, coordinate a response and remain accountable for the decision.

The human role therefore evolves rather than disappears. Remote pilots become systems operators capable of moving between sites from a single command centre. Analysts turn large volumes of raw data into usable intelligence. Maintenance technicians service docking stations, rotate batteries and ensure aircraft remain airworthy. Operations managers coordinate missions and reporting, while information specialists oversee data continuity, access and analysis.

This change may also address some of the human limitations Polley has observed in field operations. Repetitive security patrols can expose pilots to long night shifts, severe weather, monotony and, in high-risk environments, direct physical danger — hazards a command-centre model removes, while allowing teams to rotate between sites and broaden their operational experience.

Far from eliminating employment, a growing operational network creates demand for different skills. Certification to fly an aircraft is only the first step. Security, cargo, mapping and industrial inspection each require specialised operational knowledge. As the systems expand, organisations need pilots, analysts, technicians, managers and engineers who understand not only the aircraft but the wider environment in which it operates.

Ultimately, the future of unmanned aviation will be shaped not by autonomous aircraft operating independently of people, but by the strength of the partnership between human expertise and connected technology — systems designed to support judgement, not replace it, with better information delivered faster and in richer context.

For organisations responsible for protecting critical infrastructure, managing complex industrial environments or supporting national security, that partnership — not the airframe — may prove to be the most significant innovation of all. The real transformation is not taking place in the aircraft. It is taking place in the quality of the decisions those aircraft enable.

Looking Ahead

Throughout aviation history, major technological advances have eventually changed how organisations think about operations rather than merely improving the machines themselves. Radar transformed air defence by extending awareness beyond the horizon.

Satellite navigation changed how aircraft moved across the globe. Digital communications connected people, platforms and information in ways that reshaped both civil and military aviation.

Polley sees unmanned aviation approaching a comparable moment. For more than a decade, the industry has rightly celebrated advances in performance, endurance, sensors and autonomy. Those innovations established the credibility of commercial UAV operations and demonstrated that unmanned aircraft could perform tasks that were once difficult, expensive or hazardous for people to undertake. The next chapter, however, will be shaped by how effectively organisations integrate those systems into their wider operational thinking.

Information itself is becoming one of the most valuable operational assets. Organisations protecting critical infrastructure, securing industrial operations, managing national resources or supporting defence objectives no longer need only snapshots of activity — they need continuous awareness they can act on with confidence.

This is the real significance of the operational model Polley describes: not another isolated technological development, but a framework for turning information into faster, better-informed decisions.

That perspective speaks directly to the themes shaping this edition of World Airnews. Across defence, security and critical infrastructure, innovation is no longer measured solely by the sophistication of an individual technology. Increasingly, it is judged by whether that technology strengthens resilience, improves situational awareness and enables better decisions in an uncertain and increasingly complex world.

For decades, the drone has been the symbol of unmanned aviation. Dean Polley does not expect it to remain the centre of the story. As enterprise, security and defence environments become more interconnected, the aircraft will gradually become one component within larger systems designed to deliver something far more valuable than flight alone: persistent awareness, informed judgement and operational resilience.

The aircraft will still capture attention. It will continue to fly further, carry more capable sensors and perform increasingly complex tasks. Yet its strategic contribution will be determined by what happens beyond the airframe - how information moves, how people interpret it and how quickly an organisation can respond.

The future of unmanned aviation, Polley argues, will ultimately be defined not by what drones can do, but by the quality of the decisions they enable.

Flexrotor Demonstration. Image Courtesy of © Airbus

FLEXROTOR DEMONSTRATES THE OPERATIONAL POTENTIAL OF VTOL UAS

How Airbus Helicopters is combining vertical lift with fixed-wing endurance to redefine expeditionary intelligence, surveillance and reconnaissance.

By Robin Rabec

Persistent intelligence, surveillance and reconnaissance (ISR) has traditionally demanded compromise. Operators could deploy fixed-wing unmanned aircraft capable of remaining airborne for many hours, but only where suitable launch infrastructure existed.

Alternatively, rotary-wing platforms could operate from confined locations, but with significantly reduced endurance and range. Today, however, military and security organisations require both capabilities in a single platform—one able to deploy rapidly from austere locations while sustaining the endurance needed for persistent surveillance. That changing operational requirement formed the backdrop to Airbus Helicopters' recent demonstration of its Flexrotor vertical take-off and landing (VTOL) uncrewed aircraft system (UAS) at the Denel Overberg Test Range in the Western Cape. Rather than simply introducing another unmanned aircraft, the demonstration illustrated a broader shift under way across military aviation, where operational flexibility, autonomous mission execution and logistical efficiency are becoming as important as aircraft performance itself.

As armed forces, border agencies and civil authorities increasingly seek persistent aerial intelligence without the infrastructure demands associated with conventional aircraft, systems such as Flexrotor demonstrate how advances in autonomy and expeditionary design are reshaping the future of aerial surveillance.

Designed For Expeditionary Operations

One of the defining characteristics of the Flexrotor is its ability to operate independently of traditional aviation infrastructure. Unlike conventional fixed-wing unmanned aircraft that rely on catapult launch systems, runways or recovery nets, the Flexrotor requires a launch and recovery area measuring just 3.7 metres by 3.7 metres, allowing it to deploy from locations where conventional aircraft simply cannot operate.

This compact footprint significantly expands operational flexibility. The aircraft can be launched from naval vessels, remote clearings, mountainous terrain, isolated forward operating bases or temporary field locations without the need for extensive ground preparation or specialist support equipment.

According to Xavier Girey of Airbus Helicopters, this capability lies at the heart of the aircraft's operational philosophy.

"The big characteristic of this aircraft is its ability to take off and land automatically and vertically in a confined area, convert into horizontal flight and remain airborne for between 12 and 14 hours with a very small logistical footprint."

That combination of vertical take-off capability and efficient fixed-wing cruise enables operators to position surveillance assets much closer to the area of interest. Rather than relying on established airfields located hundreds of kilometres away, surveillance missions can originate from temporary operating locations established close to evolving operational requirements.

This expeditionary approach reflects a broader trend in modern defence planning. Military forces are placing growing emphasis on distributed operations, in which smaller, highly mobile units operate independently across wide geographical areas. Aircraft capable of deploying rapidly from austere environments give commanders greater operational agility while reducing dependence on vulnerable fixed infrastructure.

Although developed primarily for military ISR missions, these characteristics are equally valuable for civil operators responding to natural disasters, environmental emergencies or security incidents in remote regions where aviation infrastructure may be unavailable or compromised.

Reducing The Human Burden

Autonomy has become one of the defining characteristics of contemporary unmanned aviation. While endurance and payload capacity remain important, the ability to reduce operator workload now determines how effectively unmanned systems can be integrated into routine operations.

Airbus Helicopters has therefore focused much of the Flexrotor's development on simplifying mission execution rather than increasing pilot workload.

The aircraft conducts fully automated vertical take-off, transition to forward flight, mission execution and recovery, while an intuitive ground control interface allows operators to concentrate on mission objectives rather than aircraft management.

"The aim is for the aircraft to take off automatically and land automatically," explained Girey. "We want this aircraft to be operated by any customer with minimum training. We have worked extensively on reducing workload and improving the human-machine interface to make it easy to use."

This philosophy reflects one of the most significant developments in military aviation. Increasing autonomy is steadily shifting the operator's role away from traditional piloting towards mission management and decision-making — supervising autonomous systems while focusing on interpreting sensor information, coordinating assets and responding to emerging operational requirements.

The result is more than improved efficiency. Simplified operation reduces training requirements, lowers operating costs and enables organisations with relatively small aviation teams to field sophisticated surveillance capabilities that would previously have required specialist operators.

As autonomous technologies continue to mature, aircraft such as Flexrotor illustrate how future unmanned systems are likely to function—not as remotely piloted aircraft in the traditional sense, but as intelligent aerial platforms capable of independently executing complex missions under human supervision.

Long-Endurance Intelligence Gathering

Endurance remains one of the defining measures of surveillance capability, particularly where persistent observation is required over extended periods.

Power is provided by a compact 28 cc heavy-fuel two-stroke engine driving a 2.1-metre variable-pitch propeller mounted at the front of the fuselage. During vertical take-off and landing, dedicated lift thrusters provide the necessary vertical propulsion before the aircraft transitions into efficient wing-borne flight.

The hybrid configuration combines the operational flexibility associated with rotorcraft during launch and recovery with the fuel efficiency of a fixed-wing aircraft once established in cruise. This allows the Flexrotor to remain airborne for between 12 and 14 hours, depending on mission profile, while operating at altitudes of up to 21,000 feet.

Mission altitude, however, is determined less by aircraft capability than by operational requirements.

"If you are looking for a person in the water during a rescue operation, you would not fly at 21,000 feet because you need to identify the target," said Girey. "If you are looking for illegal fishing activity or vehicles involved in poaching, then higher operating altitudes become appropriate."

That flexibility enables operators to optimise surveillance according to sensor performance, environmental conditions and mission objectives. Lower altitudes provide greater target resolution for search and rescue or tactical reconnaissance, while higher operating levels increase area coverage for maritime surveillance, border monitoring and environmental observation.

The aircraft's endurance also reflects the growing emphasis on persistent intelligence gathering. Rather than relying on repeated sorties by multiple aircraft, modern ISR now favours continuous observation over extended periods, giving commanders and emergency services uninterrupted situational awareness.

This ability to remain on station for many hours with minimal logistical support significantly enhances operational effectiveness while reducing the cost and complexity traditionally associated with sustained aerial surveillance.

Payload Flexibility Expands Mission Capability

No surveillance aircraft is defined solely by its endurance. Ultimately, its value lies in the quality of information it can collect and deliver to decision-makers.

The Flexrotor has therefore been designed as a modular intelligence platform capable of integrating a range of mission-specific payloads according to customer requirements. Electro-optical and infrared sensors allow the aircraft to conduct surveillance during both daylight and night-time operations, while onboard mission management systems enable continuous tracking of selected targets.

One particularly valuable feature is the aircraft's ability to maintain sensor focus independently of its flight path. Operators can alter orbit direction, airspeed and flight profile while the sensor remains locked on the area of interest, allowing continuous observation without requiring constant manual aircraft adjustments.

This capability enhances situational awareness while reducing operator workload, particularly during complex surveillance missions involving moving targets or evolving operational environments.

The modular architecture also allows the aircraft to adapt to a wide variety of operational roles. Depending on payload configuration, the same platform can support border security, maritime surveillance, environmental monitoring, disaster assessment or infrastructure inspection without fundamental changes to the aircraft itself.

This versatility reflects one of the defining trends in modern unmanned aviation. Rather than developing highly specialised aircraft for individual missions, manufacturers increasingly favour adaptable platforms capable of supporting multiple users across both defence and civilian sectors. For operators facing diverse operational requirements and constrained budgets, that flexibility offers a significant advantage in maximising capability while minimising fleet complexity.

Why It Matters In Southern Africa

While the Flexrotor has been developed as a tactical intelligence, surveillance and reconnaissance platform,

Flexrotor © Airbus -
CLICK HERE: To View The South African Launch

many of the operational challenges it addresses are equally relevant across Southern Africa. The region encompasses vast coastlines, extensive land borders, remote conservation areas and critical infrastructure that often lie far from established aviation facilities.

Monitoring these environments efficiently remains a persistent challenge for both security agencies and civilian authorities.

South Africa alone is responsible for safeguarding thousands of kilometres of coastline and international borders, while neighbouring states face similar demands across sparsely populated terrain where conventional surveillance assets can be expensive to operate and difficult to sustain. In many instances, the challenge is not the availability of sophisticated sensors, but the ability to place those sensors over the area of interest quickly and keep them there for extended periods.

Platforms capable of launching from confined locations without prepared runways offer a fundamentally different operational model. Rather than deploying from centralised airbases, aircraft can operate from temporary forward locations established close to the mission area, reducing transit times and increasing the proportion of each flight devoted to surveillance rather than travel.

For maritime authorities, this translates into improved monitoring of coastal shipping lanes, fisheries protection and search and rescue operations. Border agencies gain additional flexibility when observing remote crossing points, while environmental organisations can support anti-poaching operations or monitor protected areas without the logistical burden associated with larger manned aircraft.

Civil protection agencies may find equally valuable applications. Following floods, wildfires or severe storms, rapid aerial assessment is often essential to directing emergency resources. Aircraft capable of remaining airborne throughout an entire operational period while transmitting real-time imagery can provide decision-makers with continuously updated situational awareness as conditions evolve.

The demonstration at Overberg therefore represented more than the introduction of a new unmanned aircraft. It highlighted how advances in autonomous aviation are creating practical surveillance tools that can support both defence and civil resilience across regions where geography frequently challenges conventional aviation operations.

Looking Beyond The Demonstration

The significance of the Flexrotor extends beyond its individual performance figures. Endurance, payload capacity and autonomous flight are no longer exceptional in themselves; increasingly, it is the integration of these capabilities into an expeditionary, easily deployable system that defines operational value.

Across military aviation, surveillance is evolving from isolated airborne missions into distributed intelligence networks in which multiple autonomous platforms contribute to a shared operational picture. Aircraft are becoming nodes within a wider ecosystem, collecting, processing and transmitting information that supports decision-making across land, sea and air domains. In this environment, flexibility can prove as valuable as outright performance.

The Flexrotor reflects this broader shift. Its ability to launch from confined locations, transition seamlessly into efficient fixed-wing flight and remain airborne for extended periods enables operators to establish persistent surveillance with a fraction of the infrastructure traditionally associated with airborne ISR.
At the same time, its dual-use potential illustrates another important trend shaping modern aerospace.

Technologies originally developed for defence increasingly find application in civilian sectors including disaster management, environmental protection, maritime safety and critical infrastructure monitoring. As governments seek greater value from advanced aviation systems, platforms capable of supporting multiple operational roles are becoming more attractive investments.

The demonstration at the Denel Overberg Test Range therefore offered more than an opportunity to observe a new aircraft in flight. It provided a glimpse into the direction in which unmanned aviation is evolving—towards autonomous, highly mobile systems capable of delivering persistent intelligence wherever it is needed, without the infrastructure constraints that have traditionally limited aerial surveillance.

For operators facing increasingly complex security and environmental challenges, that combination of endurance, mobility and operational simplicity may prove to be one of the defining characteristics of the next generation of uncrewed aviation.

MISSION MODULARITY

WHY TOMORROW'S TACTICAL UNCREWED AIRCRAFT WILL BE DEFINED BY ADAPTABILITY, NOT AIRFRAMES

Modern military operations are changing faster than traditional aircraft development cycles can accommodate. As threats evolve, budgets tighten and missions become more interconnected, defence organisations are placing greater emphasis on adaptable platforms capable of supporting multiple operational roles. Mission modularity is emerging as one of the defining trends in tactical uncrewed aviation—not because it promises a single solution to every requirement, but because it offers a more flexible approach to integrating new technologies and responding to a fast-changing battlespace.

By WAN Editorial Team

For much of aviation history, military aircraft have typically been designed around a primary operational purpose. Reconnaissance aircraft collected intelligence, transport aircraft moved personnel and equipment, maritime patrol aircraft monitored vast stretches of ocean,

Artists Impression MV -75 Cheyene II © Bell

while electronic warfare platforms focused on disrupting or exploiting the electromagnetic spectrum. Although many aircraft evolved through successive upgrades or specialised variants, procurement programmes traditionally centred on platforms optimised for clearly defined operational roles. That approach is being reassessed.

Modern military operations evolve at a pace that conventional aircraft development often struggles to match. Designing, testing, certifying and introducing a new platform can take well over a decade, while operational requirements may change significantly within a few years—or, in some cases, much sooner.

Recent conflicts have demonstrated how rapidly electronic warfare techniques, autonomous capabilities and networked operations continue to evolve, placing increasing pressure on platforms designed around fixed assumptions.

Rather than asking how a new aircraft can perform a specific mission more effectively, defence organisations are now asking a broader question: how can a common platform continue to deliver operational value as missions, technologies and threat environments change? The answer increasingly lies in mission modularity.

Rather than viewing an aircraft as a finished product with fixed capabilities, manufacturers are developing platforms designed to accommodate evolving payloads, software and communications systems throughout their operational lives. In this approach, the airframe provides the foundation, while mission capability is shaped by the systems it carries and the digital architecture that supports them.

This represents more than a technological evolution. It reflects a broader shift in defence procurement, where adaptability is becoming a more important consideration alongside traditional measures such as endurance, payload capacity and range. Although modular approaches do not eliminate the challenges of certification, integration or long-term support, they can offer operators greater flexibility when introducing new mission equipment without replacing entire fleets.

The End Of The Single-Purpose Platform

The changing character of modern conflict has exposed the limitations of procurement models built around narrowly defined operational requirements. Aircraft have traditionally been developed to address anticipated mission profiles, but today's security environment is now characterised by rapid technological change and a wider variety of operational demands than many legacy programmes originally envisaged.

Recent conflicts have highlighted the pace at which electronic warfare techniques, communications networks and autonomous technologies continue to evolve. A platform optimised for one operational environment may require substantial upgrades to remain effective in another, particularly where new electronic threats, changing command structures or different mission priorities emerge.

This has encouraged many defence organisations to place greater emphasis on adaptability throughout an aircraft's service life. Rather than relying exclusively on fleets of highly specialised platforms, procurement strategies are giving more weight to systems capable of accommodating new sensors, software and mission equipment as operational requirements develop.

For tactical uncrewed aircraft, this evolution is especially significant. Unlike larger strategic platforms that often perform relatively stable mission sets over many years, tactical UAS frequently support operations where requirements can change rapidly. A platform employed for intelligence gathering during one phase of an operation may later be configured to provide communications relay, infrastructure surveillance or search-and-rescue support, depending on operational priorities and the equipment available.

This flexibility should not be confused with unlimited versatility. Mission reconfiguration still depends on appropriate payload integration, software compatibility, operator training and, where necessary, regulatory or military airworthiness approval. Nevertheless, the ability to adapt a common platform to different operational requirements is becoming a more important consideration for defence planners seeking to maximise capability while managing cost and logistical complexity.

The objective, increasingly, is not simply to build capable aircraft, but aircraft capable of remaining operationally relevant throughout changing missions, technologies and operational environments.

Beyond The Airframe

Mission modularity is often described in terms of interchangeable payloads, but the concept extends considerably further. Modern tactical UAS combine modular hardware with digital architectures intended to simplify the integration of new sensors, mission software and communications systems over time. While integration and certification remain essential parts of the process, these approaches can reduce the extent to which new capabilities require fundamental redesign of the aircraft itself.

In practical terms, this means that capability is becoming progressively less dependent on the airframe alone.

A common platform may be equipped with electro-optical and infrared sensors for intelligence, surveillance and reconnaissance during one deployment before later being configured with alternative payloads better suited to maritime surveillance, communications relay or other operational tasks. The precise range of capabilities depends on the systems integrated by individual operators, but the underlying philosophy remains consistent: invest in a common platform that can accommodate evolving mission requirements rather than maintaining multiple fleets designed around narrowly defined roles.

The potential benefits extend beyond operational flexibility.

Common airframes can simplify logistics, reduce the variety of spare parts required and streamline aspects of maintenance and operator training. At the same time,

CAPA X - Mission modularity. Image © Airbus

individual payloads, mission software and specialist sensors continue to require dedicated technical expertise, support arrangements and validation before entering operational service. Mission modularity therefore complements rather than replaces established engineering and certification disciplines.

This reflects a broader trend across aerospace and defence: digital integration and software now influence what an aircraft can achieve just as much as its aerodynamic design or propulsion system. New processing capabilities, mission applications and sensor technologies can often be incorporated progressively throughout a platform's service life, allowing operators to respond more effectively to changing operational needs without necessarily replacing the underlying aircraft.

The result is a subtle but important shift in design philosophy. The aircraft is no longer viewed solely as the finished capability. Instead, it becomes the foundation of a wider operational ecosystem—one in which software, sensors, communications and mission equipment increasingly determine how the platform contributes to the battlespace.

For tactical uncrewed aviation, that shift may prove every bit as significant as advances in propulsion, endurance or aerodynamic performance. It is changing how manufacturers design aircraft, how armed forces evaluate new capabilities and, increasingly, how future operational effectiveness is measured.

From ISR to Multi-Mission Operations

For many military operators, Intelligence, Surveillance and Reconnaissance (ISR) remains the principal role of tactical uncrewed aircraft. The ability to maintain persistent observation, monitor changing activity and provide commanders with timely situational awareness has fundamentally altered the tempo of modern operations. Yet ISR itself is evolving beyond the traditional concept of simply collecting imagery.

Tactical UAS combine electro-optical and infrared cameras with radar, communications systems and electronic intelligence sensors to provide a more comprehensive understanding of the operating environment. Advances in onboard processing allow selected data to be filtered, prioritised and analysed before transmission, helping reduce bandwidth demands and enabling operators to focus more quickly on information of operational significance.

ISR is becoming one component of a broader mission architecture rather than the sole purpose of the aircraft.

A platform supporting border surveillance during one deployment may subsequently be configured for maritime observation, communications relay, infrastructure inspection or humanitarian disaster assessment, depending on operational priorities and the payloads available. The transition between these roles still requires appropriate mission planning, equipment integration and operational validation, but modular architectures make such flexibility increasingly practical.

This reflects the reality of contemporary military operations. Peacekeeping, border security, disaster relief, counter-insurgency and conventional military activities frequently overlap, often requiring assets to perform multiple tasks during the course of a deployment rather than remaining dedicated to a single operational function.

Mission modularity provides a framework for responding to that complexity. Instead of defining capability solely by the aircraft itself, it allows capability to evolve through the systems integrated with the platform over time.

Interoperability: Building The Connected Battlespace

Mission modularity extends beyond the aircraft and its payloads. Equally important is the ability of tactical UAS to operate as part of a wider operational network.

Rather than functioning as isolated reconnaissance assets, modern uncrewed aircraft increasingly contribute to an interconnected battlespace linking air, land and maritime forces through shared information networks. Where communications infrastructure, security protocols and common data standards permit, information gathered by a tactical UAS can be distributed simultaneously to headquarters, frontline commanders and other operational assets, creating a more coherent understanding of rapidly developing situations.

This emphasis on interoperability is becoming a more important consideration in defence procurement.

Open digital architectures and standardised interfaces can reduce dependence on proprietary technologies while making it easier to integrate new payloads, communications equipment and software throughout a platform's operational life. They do not eliminate the complexities of certification, intellectual property or systems integration, but they can provide operators with greater flexibility when incorporating emerging technologies from multiple suppliers.

The operational implications are significant.

Rather than replacing an aircraft to accommodate advances in sensing, communications or onboard processing, operators may be able to upgrade specific mission systems while retaining the underlying platform. Over time, this approach has the potential to extend

operational relevance and improve responsiveness to changing mission requirements.

Interoperability also underpins the broader evolution towards multi-domain operations. Tactical UAS are increasingly expected not only to collect information, but to contribute to a wider operational picture shared across services and agencies. In this environment, the effectiveness of an uncrewed aircraft depends as much on how efficiently it exchanges information as on the performance of its sensors alone.

Capa-X: A Case Study In Mission Modularity

Few recent programmes illustrate these broader industry trends more clearly than CAPA-X, developed by Survey Copter as part of Airbus Helicopters' tactical uncrewed systems portfolio.

First unveiled at the SOFINS exhibition in France in March 2023, CAPA-X was presented not simply as another tactical drone, but as a modular platform designed to explore how a common airframe could support multiple operational roles through adaptable configurations and interchangeable mission equipment.

Its design reflects many of the principles now shaping tactical UAS development. The platform can be configured for conventional take-off and landing from a runway or adapted for vertical take-off and landing where operating space is restricted. Wing configurations may be tailored to favour endurance or higher-speed operations, while the payload bay is intended to accommodate different sensor combinations according to operational requirements.

The emphasis is not on creating a single aircraft capable of performing every conceivable mission, but on providing a modular mission architecture that allows operators to configure the platform for different tasks within defined engineering and operational constraints.

That philosophy received further recognition in March 2026, when the European Defence Agency (EDA) selected Airbus Helicopters, through Survey Copter, for its Multi-Mission Unmanned Aircraft System (M2UAS) project. The programme is intended to expand the capabilities of the CAPA-X platform while exploring how modular tactical UAS can better support future European defence requirements through greater adaptability and interoperability.

Whether CAPA-X ultimately achieves widespread operational adoption remains to be seen. Its significance today lies less in production numbers than in the broader design philosophy it represents. The programme illustrates how manufacturers are responding to customer requirements that place growing emphasis on adaptability, interoperability and long-term upgrade potential alongside traditional measures of performance.

Why It Matters For Africa

For many African operators, the principles underpinning mission modularity may prove particularly relevant.

The continent encompasses an extraordinary diversity of operational environments, security challenges and defence budgets. The requirements of a coastal maritime security agency differ substantially from those of an inland border force, a conservation authority or an air force supporting regional peacekeeping operations.

No single platform can satisfy every requirement, and procurement priorities inevitably vary between countries.

Nevertheless, many organisations face a common challenge: delivering multiple operational capabilities with limited resources.

Across large areas of the continent, agencies are responsible for monitoring extensive land borders, supporting maritime domain awareness, protecting critical infrastructure, assisting anti-poaching operations and responding to natural disasters—often across vast distances and with relatively small fleets. Procuring separate aircraft for each specialised role is seldom economically realistic. Mission modularity offers one possible response to this challenge.

A common tactical UAS platform, supported by different mission-specific payloads, has the potential to expand operational flexibility while simplifying aspects of fleet management and logistics. The precise balance between cost, capability and operational complexity will differ from one operator to another, but the underlying principle of adapting capability through mission equipment rather than replacing entire aircraft is increasingly relevant.

The concept also aligns with the growing importance of dual-use technologies.

Many sensors employed for security applications—including electro-optical imaging, mapping systems and communications relay equipment—can also support environmental monitoring, infrastructure inspection and emergency response. Realising these benefits depends upon appropriate regulatory frameworks, data governance and inter-agency cooperation, but the possibility of deriving value across both civil and security applications is becoming a more attractive proposition.

For African aviation and defence organisations, the discussion is therefore not simply about acquiring more sophisticated uncrewed aircraft. It is about investing in platforms capable of evolving alongside changing operational requirements while making the most effective use of limited resources.

Looking Beyond The Platform

The future of tactical uncrewed aviation is often described in terms of artificial intelligence, autonomous flight or increasingly sophisticated sensors. While each of these technologies will influence future capability, they all depend upon a more fundamental evolution in design philosophy.

The aircraft itself is becoming just one element within a broader operational ecosystem.

Future capability is likely to depend less on continually developing entirely new airframes and more on creating adaptable platforms capable of integrating new software, sensors and mission systems as technology evolves. Engineering, certification and operational assurance will remain essential, but modular approaches offer a pathway through which capability can develop incrementally rather than only through wholesale fleet replacement.

Mission modularity is therefore more than a technical innovation. It reflects a changing philosophy of military aviation—one that recognises adaptability as a defining component of operational effectiveness.

CAPA-X represents one expression of that philosophy, but similar thinking is emerging across the global defence aerospace industry. A growing number of manufacturers and procurement organisations are exploring platforms designed to accommodate evolving technologies rather than remaining fixed around a single configuration throughout their service lives.

Ultimately, the next generation of tactical uncrewed aircraft is unlikely to be judged solely by speed, endurance or payload capacity. Those characteristics will remain important, but they will increasingly be complemented by another measure of capability: the ability to evolve alongside the missions they are expected to perform.

In an operating environment where technology, threats and operational priorities continue to change at unprecedented speed, that adaptability may prove to be one of the defining characteristics of military aviation in the decade ahead.

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GROUND SYSTEMS MOVE TO THE FRONT LINE OF SPACE SECURITY

As the race for military advantage extends beyond the atmosphere, attention is increasingly shifting from the satellites orbiting overhead to the sophisticated ground systems that monitor, manage and protect them. In an era where space has become an operational domain in its own right, the ability to maintain continuous awareness of the orbital environment is emerging as one of the defining capabilities of modern defence.

By WAN Editorial Team

Kratos Defense & Security Solutions' recent US$100 million production contract for a modular Space Domain Awareness system is the latest indication that the future of military space operations will depend as much on resilient infrastructure on Earth as it does on the assets in orbit. There was a time when military space capability was measured by the number of satellites a nation could place into orbit. Today, that measure is no longer sufficient. As space becomes increasingly congested, contested and strategically important, military advantage depends as much on the ground infrastructure that supports space operations as it does on the satellites themselves.

That reality was highlighted recently when Kratos Defense & Security Solutions announced that it had been awarded an approximately US$100 million sole-source production contract for a modular Space Domain Awareness (SDA) system. The programme follows the successful demonstration of the technology and marks its transition into operational production. While the contract itself is significant, it also reflects a broader trend in modern defence: the growing importance of the ground segment in military space operations.

For many outside the defence and aerospace sectors, Space Domain Awareness remains an unfamiliar term.

In simple terms, it is the ability to detect, track, identify and understand activity in Earth orbit.

This includes monitoring operational satellites, orbital debris, launches and other objects moving through the increasingly crowded space environment. Maintaining an accurate picture of this activity is becoming essential for protecting the space-based systems upon which modern military operations depend.

Although satellites operate hundreds or even thousands of kilometres above the Earth, much of the intelligence, command and decision-making takes place on the ground. Ground stations receive telemetry, process sensor information, integrate data from multiple sources, monitor satellite health and provide operators with the situational awareness needed to make informed decisions. These facilities form the backbone of military space operations, transforming raw information into actionable intelligence.

The importance of these capabilities continues to grow as governments invest in resilient space architectures. Modern military aircraft, remotely piloted systems, precision-guided weapons and joint command networks all rely on satellites for navigation, communications, intelligence and timing. Protecting those space-based assets requires an equally robust capability to monitor and understand the orbital environment from the ground.

Kratos has described its newly awarded programme as a ground-based modular Space Domain Awareness system that has already demonstrated its operational effectiveness before entering production. While few technical details have been released because of security considerations, the contract demonstrates confidence in a system that has progressed beyond development into an operational capability.

Commenting on the award, Mike Johns, Senior Vice President at Kratos, said the company was proud to have developed, tested and demonstrated the system before moving into production, adding that customer confidence in the programme reflected its importance to future national security missions. Company President and Chief Executive Officer Eric DeMarco said the award forms part of what he believes is a generational recapitalisation of the United States' defence industrial base, particularly in strategic space systems, with an emphasis on rapidly deployable and affordable technologies capable of supporting evolving defence requirements.

The announcement is also indicative of a wider shift taking place across the defence sector. Increasingly, military capability is defined not only by aircraft, ships or satellites, but by the information networks that connect them. Space-based intelligence has become a critical enabler of operations across every domain, placing renewed emphasis on resilient command systems, sensor integration and the ability to process vast quantities of data quickly and accurately.

For military aviation, the implications are significant. Modern aircraft no longer operate as isolated platforms but as components within an integrated battlespace. Their effectiveness increasingly depends on uninterrupted access to satellite communications, positioning, intelligence and secure data links.

Maintaining confidence in those systems requires continuous awareness of the space environment and the ability to respond to emerging risks.

As investment in military space capabilities accelerates, so too will investment in the ground infrastructure that supports them. Kratos' latest contract is therefore more than a production award. It is another indication that the future of military advantage will be built upon an increasingly integrated relationship between space and the ground systems that sustain it.

FACTORIES WITHOUT WALLS

How the military's demand for low-cost drones is reshaping manufacturing—and redefining logistics

By WAN Editorial Team

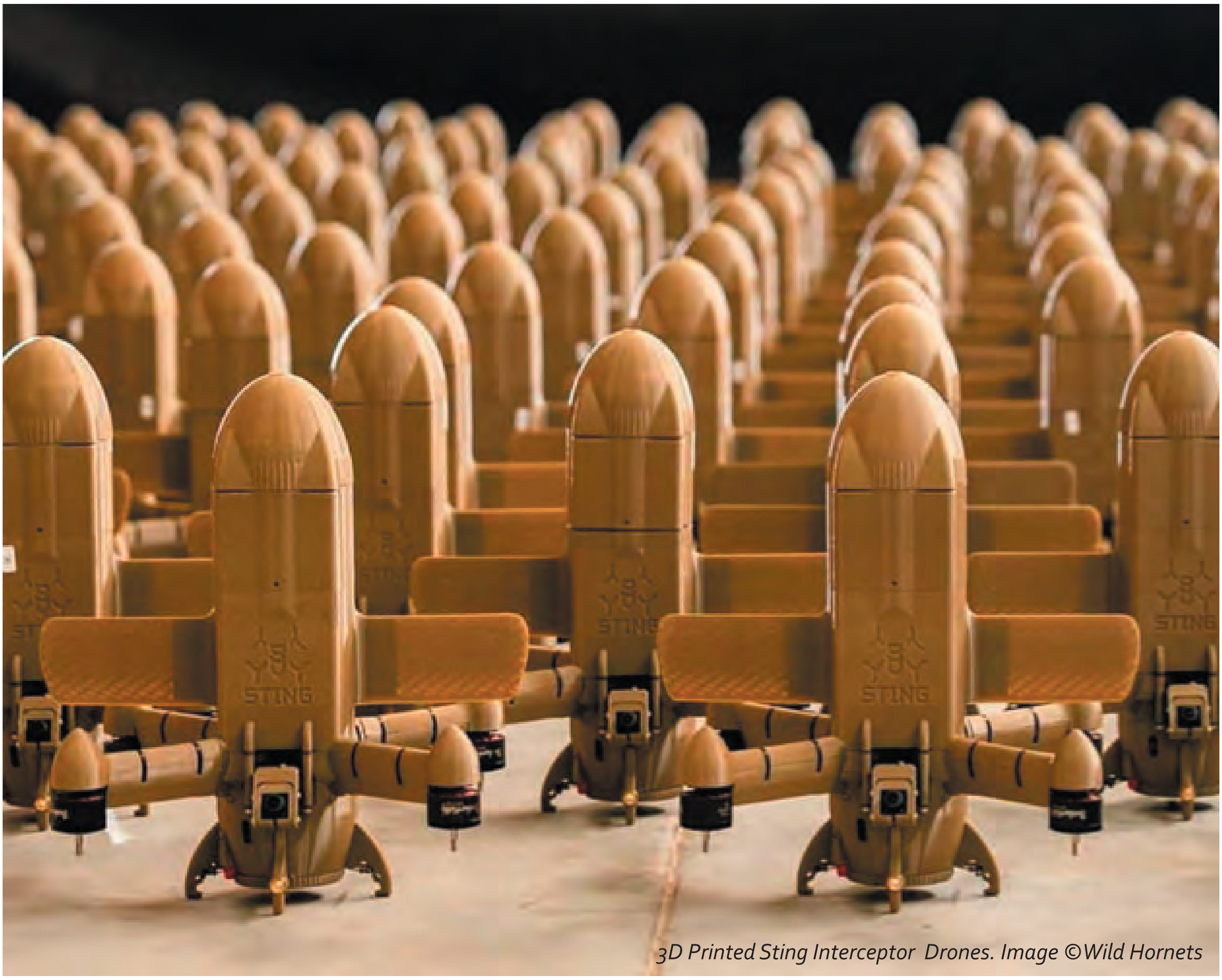
For generations, military logistics has been built around a simple assumption: factories manufacture, supply chains transport and armed forces consume. Aircraft, vehicles and equipment have relied on vast networks of warehouses, transport hubs and maintenance facilities to keep them operational. Today, that model is beginning to evolve. As defence programmes increasingly embrace distributed manufacturing, production is moving closer to the point of need—reshaping not only how military equipment is built, but how capability itself is sustained.

Recent market research forecasts significant growth in additive manufacturing for unmanned aerial systems, driven largely by increasing military demand for affordable tactical drones and the need to produce them more rapidly. The projected expansion reflects far more than a growing market for 3D printers. It points to a broader transformation taking place across defence manufacturing.

The growing use of additive manufacturing in military drone production is often presented as a story about technology. Yet the printers themselves are only part of a much larger evolution. As armed forces seek to manufacture affordable unmanned systems at scale, adapt designs more quickly and respond to changing operational requirements, manufacturing is beginning to move closer to where equipment is used.

The result is a subtle but significant shift in thinking. Manufacturing is no longer viewed solely as an industrial activity that takes place before deployment.

Increasingly, it is becoming part of the operational support system itself.



3D Printed Sting Interceptor Drones. Image ©Wild Hornets

When Manufacturing Had An Address

Throughout modern industrial history, manufacturing has been inseparable from geography. Aircraft factories, shipyards and defence plants concentrated expertise, tooling and production under one roof. Once completed, components embarked on lengthy journeys through depots, warehouses and transportation networks before finally reaching operational units.

Military logistics evolved around this reality. Success depended not only on producing equipment, but on sustaining the immense supply chains required to support it throughout its service life. Every replacement component represented inventory that had to be manufactured, stored, transported and tracked.

For decades, this model proved highly effective. It enabled the production of increasingly sophisticated aircraft and established global logistics networks capable of sustaining military operations across continents. Yet it also created an unavoidable dependency: every aircraft remained tied to the movement of physical parts.

The Supply Chain Becomes Part Of The Factory

Distributed manufacturing challenges that relationship.

Rather than treating manufacturing as a process confined to a central facility, selected production capability can be positioned much closer to where equipment is operating.

Instead of transporting completed components through multiple logistics nodes, secure digital design files can be transmitted to certified production facilities capable of manufacturing approved parts locally. The component no longer travels; the design does.

This represents far more than an improvement in manufacturing efficiency. It fundamentally changes the role of logistics.

Forward operating bases may no longer need to stock extensive inventories of rarely used components. Instead, they can maintain qualified raw production materials and certified manufacturing capability, producing selected parts as operational requirements arise. Lead times measured in weeks can, in some circumstances, be reduced to hours while reducing storage requirements and transport burdens.

Capability Replaces Geography

The significance of this transition extends well beyond additive manufacturing.

Three-dimensional printing has become the most visible technology enabling distributed production, but it is only one element of a much broader transformation. The real shift lies in separating manufacturing capability from geography.

Historically, industrial capability was measured by the size and output of factories. Increasingly, it is being defined by access to secure digital designs, qualified production systems, certified materials and validated manufacturing processes. Manufacturing is becoming something that can be deployed rather than simply visited.

For military planners, this creates an entirely different operational equation. Aircraft operating in remote locations may no longer be constrained solely by the distance separating them from major maintenance facilities. Instead, manufacturing capability itself becomes part of the deployed support infrastructure.

Why Defence Is Driving The Change

Few sectors place greater importance on logistics than defence.

Modern military operations rely on maintaining equipment across vast distances, often in contested environments where supply routes are vulnerable to disruption. Long-range precision weapons, cyber attacks and electronic warfare have exposed the vulnerabilities of highly centralised supply chains, encouraging armed forces to explore more resilient approaches to sustainment.

The rapid expansion of unmanned systems has accelerated this shift. Many tactical drones are designed for relatively short operational lives, making manufacturing cost, production speed and design flexibility as important as absolute longevity.

Manufacturing methods that allow rapid design revisions, shorter production cycles and localised production provide operational advantages that conventional industrial models struggle to match.

Rather than producing large inventories years in advance, manufacturers are increasingly investigating production models capable of responding directly to operational demand.

The Digital Warehouse

One of the most significant consequences of distributed manufacturing is the emergence of the digital inventory.

Traditionally, military organisations have invested heavily in physical stockpiles of spare parts to ensure operational readiness. Distributed manufacturing introduces a different concept: storing certified component designs digitally while maintaining inventories of qualified raw production materials, including metal powders, polymer feedstocks and composite materials.

Physical logistics does not disappear. Instead, its emphasis begins to shift from transporting thousands of unique spare parts towards supplying a smaller range of standardised manufacturing inputs capable of producing multiple components as required.

In this environment, the critical asset is no longer only the warehouse itself, but the integrity of the digital thread connecting design, certification and manufacture.

Secure transmission of design files, protection against cyber tampering and rigorous process control become as strategically important as safeguarding conventional supply depots.

Trusting The Process

One of the greatest challenges facing distributed aerospace manufacturing is not producing components, but certifying them.

Traditional airworthiness has long been linked to approved production facilities, tightly controlled manufacturing environments and established quality systems. Distributed manufacturing shifts much of that assurance from the factory to the manufacturing process itself.

Rather than certifying a component solely because it was produced at a particular location, regulators are increasingly focusing on validated combinations of digital design files, approved materials, calibrated equipment and tightly controlled production parameters. Continuous process monitoring, digital traceability and rigorous post-production inspection become essential elements of demonstrating that a component meets the required standard.

For flight-critical aerospace applications, confidence in the manufacturing process may ultimately prove just as important as confidence in the finished component.

Manufacturing At The Point Of Need

Perhaps the clearest illustration of this evolution is the development of deployable manufacturing systems.

Containerised production units housing additive manufacturing equipment, post-processing tools and inspection systems are increasingly being explored for expeditionary operations. Rather than waiting for replacement components to arrive from distant facilities, operators can manufacture selected parts much closer to where aircraft are deployed.

This capability, however, depends on considerably more than the printer itself. Qualified feedstock materials, reliable power supplies, post-processing equipment and inspection systems must also be available. Many aerospace components require additional machining, heat treatment or non-destructive inspection before they are approved for operational use. Distributed manufacturing therefore complements conventional logistics rather than replacing it entirely.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Nevertheless, for many non-flight-critical components and selected structural applications, the ability to manufacture parts closer to the point of need offers the potential to improve aircraft availability while reducing dependence on lengthy supply chains.

Beyond The Battlefield

Although defence applications are driving much of today's innovation, the implications extend well beyond military aviation.

Commercial operators supporting remote mining operations, offshore energy installations, humanitarian missions and isolated regional airports face many of the same logistical challenges. Reducing dependence on lengthy supply chains while improving aircraft availability offers clear operational and commercial advantages.

Maintenance, repair and overhaul providers are already evaluating how digital inventories and qualified additive manufacturing can support more responsive maintenance operations. As certification frameworks continue to evolve, distributed manufacturing is likely to become an increasingly valuable addition to the broader aerospace support ecosystem.

A Different Measure Of Industrial Strength

The military's growing demand for low-cost drones may have brought additive manufacturing into the defence spotlight, but its longer-term significance extends far beyond unmanned aircraft.

The evolution now taking place is not simply about producing parts differently. It is about redefining where manufacturing capability exists.

For generations, industrial strength was measured by the scale of factories and the efficiency of the supply chains that connected them. Today, manufacturing capability is becoming increasingly distributed across secure digital networks, certified production systems and deployable manufacturing cells.

The factory has not disappeared, nor has the need for global manufacturing and logistics networks. What is changing is where selected manufacturing capability can be deployed. As production becomes increasingly digital and distributed, manufacturing is evolving from a fixed location into an operational capability that complements traditional supply chains, strengthens resilience and brings production closer to the point of need.

For military aviation, this represents more than a technological advance. It reflects a fundamental shift in how aerospace capability is sustained. The most important product emerging from this evolution may not be a printed component at all, but a different understanding of where manufacturing begins—and where logistics ends.

SAAB GRIPEN E SELECTED FOR UKRAINE IN SWEDISH DEFENCE AGREEMENT

By WAN Editorial Team

Sweden commits 16 next-generation fighters in one of Europe's most significant military aviation decisions since the start of the conflict.

Saab has signed a contract with the Swedish Defence Materiel Administration (FMV) to supply 16 Gripen E multirole fighter aircraft to Ukraine under an agreement valued at approximately SEK 24.6 billion (US$2.5 billion). The aircraft are scheduled for delivery between 2029 and 2030, together with spare parts, support equipment and associated logistics.

The agreement is a significant milestone for both Saab and the Ukrainian Air Force. It marks the first confirmed export of the Gripen E—the latest generation of Sweden's indigenous fighter—and reflects Europe's continuing commitment to strengthening Ukraine's long-term air defence capability.

Unlike earlier military assistance focused on immediate operational requirements, the Gripen programme forms part of a broader effort to establish a sustainable, modern air force capable of operating alongside other Western aircraft entering Ukrainian service.

Micael Johansson, President and CEO of Saab, described the agreement as a major step in supporting Ukraine's future defence capabilities.

"I am deeply proud that Sweden and Saab can now enable the provision of Gripen E to Ukraine, bringing a world-class fighter that will transform the Ukrainian Air Force's capability. This will significantly strengthen Ukraine's air defence and help ensure the nation can protect its people and safeguard its future."

Designed For Dispersed Operations

The Gripen E differs from many contemporary fighter aircraft in its operational philosophy. Rather than relying exclusively on large, well-established air bases, the aircraft was designed to operate from dispersed locations, including sections of public roads and temporary runways—a concept that has grown more relevant in modern high-intensity conflict.

Rapid turnaround times, relatively low maintenance requirements and a small ground support footprint enable aircraft to return to service quickly while reducing

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logistical demands. These characteristics have long been central to Sweden's defence doctrine and have attracted growing international interest as militaries reconsider the vulnerability of fixed air bases.

The aircraft also incorporates an open, software-based architecture that allows systems and mission capabilities to be upgraded as operational requirements evolve, extending service life while reducing the need for major hardware modifications.

Strategic Significance

Beyond the aircraft themselves, the agreement carries broader strategic implications for European defence cooperation.

Sweden's decision follows its accession to NATO and reflects its growing role in supporting European security. The Gripen E programme also provides Saab with its first operational export customer for the aircraft, strengthening the platform's international profile as several nations continue evaluating future fighter acquisitions.

For Ukraine, the introduction of the Gripen E would complement a diversifying Western combat aircraft inventory, providing additional operational flexibility while strengthening interoperability with allied air forces over the longer term.

Looking Ahead

Although deliveries are not expected until 2029–2030, the contract signals that planning for Ukraine's future air capability extends well beyond immediate wartime requirements. Instead, it reflects a long-term investment in rebuilding an air force designed to operate alongside NATO-standard equipment and within an evolving European security framework.

For Saab, the agreement represents both an important export success and an opportunity to demonstrate the operational capabilities of its latest fighter in one of the world's most closely watched defence environments.

Source: Saab / Swedish Defence Materiel Administration (FMV)

MISSIONS BEGIN ON THE GROUND

By Sandra Kadded. Marketing & Communication Manager – Aviation, ATEQ Aviation

Behind Every Successful Mission

Every military aircraft represents a major national investment, but its true value lies in its ability to perform whenever required. Whether supporting national defence, humanitarian assistance or expeditionary operations, aircraft must remain safe, reliable and immediately available for deployment.

While public attention naturally focuses on aircraft in flight, operational readiness begins long before take-off. Maintenance teams depend on specialised ground support test equipment to verify that critical aircraft systems are functioning correctly before every mission.

Accurate and repeatable testing reduces unnecessary downtime, improves fleet availability and helps ensure aircraft are ready whenever operational demands arise.

These responsibilities are becoming increasingly complex. Modern military aircraft incorporate sophisticated technologies, operational tempos continue to increase, and maintenance is often conducted in demanding environments ranging from remote forward operating bases to naval vessels at sea. In this environment, dependable ground support equipment has become an indispensable element of military aviation.

Meeting the Demands of Defence Aviation

Military maintenance presents unique challenges that differ significantly from those faced in commercial aviation. Defence aircraft may need to deploy with little warning, requiring technicians to complete inspections rapidly while maintaining stringent military standards and preserving airworthiness.

Test equipment must also operate reliably under harsh conditions, including vibration, humidity, temperature extremes and confined maintenance spaces. These challenges are even greater aboard aircraft carriers and other naval platforms, where equipment must deliver consistent performance despite limited space and demanding maritime conditions.

To meet these requirements, maintenance personnel need portable, highly accurate testing systems capable of supporting multiple aircraft types while maintaining efficiency without compromising precision.

Engineering for Mission Readiness

With more than 18 years of experience in aviation ground support equipment, ATEQ Aviation develops precision testing solutions for military and civil operators, maintenance organisations, OEMs and armed forces around the world.

As part of the wider ATEQ Group, the aviation division specialises in precision measurement, testing and quality-control technologies that support flight-critical maintenance activities. Its expertise includes air data testing, avionics diagnostics, battery charging and analysis, as well as customised solutions developed for specialised defence applications.

A key strength of the company is its ability to adapt proven technologies to meet the unique operational requirements of military customers while maintaining consistent testing standards across diverse aircraft fleets.

Supporting the Full Maintenance Cycle

Modern military maintenance depends on versatile equipment capable of supporting multiple aircraft systems from a single platform.

ATEQ Aviation's ADSE series enables technicians to verify pitot-static systems, cabin pressure, angle-of-attack systems and air data instruments with high precision. Multi-channel capability allows several pressure tests to be completed simultaneously, improving maintenance efficiency and operational flexibility. The systems are supported by an extensive range of pitot-static adapters compatible with more than 400 aircraft types, including numerous military platforms.

The company's T-RX avionics testing platform provides comprehensive verification, calibration and troubleshooting capabilities for a wide range of electronic aircraft systems. Designed for maintenance organisations, OEMs and aircraft-on-ground (AOG) teams, the portable system enables broad diagnostic capability from a single platform.

Battery reliability is another essential aspect of military aircraft maintenance. ATEQ Aviation's Battery Charger Analyser (BCA) has been adapted for specialist naval operations, including aircraft carriers, where three-phase functionality and ruggedised construction enable reliable operation in compact, high-vibration environments. The programme demonstrates the company's ability to customise established technologies for highly specialised defence applications.

Supporting Defence Maintenance Worldwide

Maintaining military aircraft requires far more than advanced airframes and sophisticated onboard systems.

As defence aviation continues to evolve, reliable ground support test equipment will remain a fundamental component of operational readiness. By combining engineering expertise with adaptable testing solutions for a wide range of aircraft and operating environments, ATEQ Aviation continues to help defence organisations improve maintenance efficiency, minimise downtime and maximise fleet availability.

For more information visit: www.ateqsa.co.za

Loading humanitarian aid . Image Courtesy of © Tech. Sgt. G Gonzalez

THE SINEWS OF AIR POWER

Military aviation is often defined by the aircraft at the tip of the spear. Fighters, bombers and, more recently, stealth aircraft have dominated both public imagination and defence investment. Their speed, agility and striking power have become synonymous with national military capability, while advances in sensors, precision weapons and artificial intelligence continue to redefine what constitutes air superiority.

By WAN Editorial Team

Yet air power has never been sustained by combat aircraft alone.

Behind every sortie lies a vast and largely invisible system of transport aircraft, aerial refuelling tankers, maintenance teams, engineers, spare parts, fuel, ammunition and medical support. Every aircraft that takes to the skies depends upon a logistics network capable of moving people, equipment and supplies across thousands of kilometres, often at very short notice. Without it, even the most advanced fifth-generation fighter rapidly becomes an immobile asset, unable to generate combat power regardless of its technological sophistication.

Military professionals have long understood this reality. Tactical brilliance may win engagements, but logistics determines whether a campaign can be sustained. Air forces do not simply deploy aircraft; they deploy entire ecosystems that must continue functioning under demanding operational conditions. For generations, those ecosystems relied upon one critical assumption—that somewhere beyond the fighting there would always be secure airfields from which the logistics chain could operate. That assumption is rapidly disappearing.

The Transparent Battlefield

The character of warfare has changed fundamentally during the past two decades. Precision-guided weapons have become increasingly accurate and widely available, while commercial satellite constellations, unmanned aerial systems, electronic intelligence and sophisticated data fusion have made military activity more visible than ever before. The battlefield has become transparent.

Large, fixed military installations that once represented secure rear areas are now increasingly visible and vulnerable. Airfields, fuel farms, ammunition depots and maintenance facilities can often be identified long before a conflict begins and monitored throughout its duration. Recent conflicts have demonstrated that long-range precision strike can place logistics infrastructure at risk from the opening hours of hostilities, eroding the traditional distinction between the front line and the rear area.

For air force planners, the implications are profound. Success is no longer measured solely by how rapidly personnel or equipment can be transported into theatre. Increasingly, the challenge lies in sustaining those forces once they arrive, ensuring that fuel, munitions, spare parts and maintenance continue flowing despite persistent surveillance and the threat of long-range attack.

Logistics has therefore evolved from a supporting function into an operational capability in its own right. The modern contest is no longer simply about moving the greatest quantity of equipment over the greatest distance; it is about building supply networks capable of absorbing disruption, rerouting around damaged infrastructure and continuing to function under sustained pressure. Survivability has become every bit as important as payload.

Strategic Reach: The Doctrine Of Mass

Despite the growing emphasis on dispersed operations, there remains no substitute for strategic airlift. Heavy transport aircraft continue to perform missions that smaller platforms simply cannot replicate, moving armoured vehicles, helicopters, engineering equipment, humanitarian supplies and thousands of personnel across continents in a matter of hours. They provide the physical bridge between national industrial capacity and the operational theatre, allowing governments to reinforce allies, respond to crises and project military power far beyond their own borders.

This philosophy—the doctrine of mass—continues to underpin the world's largest military transport aircraft.

China's Xian Y-20 Kunpeng represents one of the most significant developments in strategic air mobility over the past decade. Developed domestically to reduce reliance on foreign transport aircraft, the Y-20 provides the People's Liberation Army Air Force (PLAAF) with an indigenous heavy airlift capability supporting military deployments, humanitarian assistance and strategic logistics across increasingly greater distances. With a maximum take-off weight of approximately 220 tonnes, it is capable of transporting heavy vehicles, engineering equipment and substantial troop contingents.

Its importance extends well beyond cargo transport.
The YY-20 aerial refuelling variant is emerging as one of the PLAAF's most significant force multipliers. Modern combat aircraft, including the J-20 Mighty Dragon, are ultimately constrained by fuel rather than weapons.

By extending endurance and operational radius, the YY-20 enables fighters to patrol further from home bases, remain on station for longer periods and sustain operations over maritime and remote theatres. In strategic terms, the tanker has become as important as the transport aircraft from which it was developed, illustrating that logistics is no longer confined to moving cargo—it is central to enabling combat operations.

The United States has long pursued the same philosophy through aircraft such as the Lockheed C-5M Super Galaxy and the Boeing C-17 Globemaster III. Although designed for different operational roles, both embody the principle that strategic mobility underpins military effectiveness. The C-5M remains one of the few aircraft capable of transporting outsized cargo, including main battle tanks and helicopters, while the C-17 combines substantial payload with greater operational flexibility, allowing it to operate from shorter and less developed airfields than its larger counterpart.

Collectively, these aircraft represent more than impressive feats of aerospace engineering. They embody a logistical doctrine built around concentration: concentrated infrastructure, maintenance and cargo throughput that enables extraordinary volumes of personnel and equipment to move with remarkable speed. Yet concentration also creates vulnerability.

Aircraft weighing well over 200 tonnes depend upon long, prepared runways, specialised maintenance facilities, extensive fuel storage and sophisticated ground support infrastructure. Each requirement creates a fixed point that can be observed, monitored and increasingly targeted. The very infrastructure that enables strategic airlift has become one of its greatest operational liabilities.

This does not diminish the importance of heavy transport aircraft. No existing platform can replace their ability to move strategic volumes of cargo rapidly across intercontinental distances. Instead, it demonstrates that strategic airlift can no longer be viewed in isolation.

Its effectiveness now depends upon a broader logistics architecture capable of dispersing, protecting and sustaining those capabilities once they arrive in theatre. The world's largest military transports therefore remain indispensable—but they are no longer sufficient on their own.

The future of military logistics will not abandon strategic reach. It will build upon it.

Operational Layer: Distributed Airlift – The Doctrine Of Dispersion

If strategic airlift provides the reach to move forces across continents, the operational layer determines whether those forces can be sustained once they enter the theatre of operations. It is here—between the strategic hub and the front line—that military logistics is undergoing perhaps its most significant transformation.
For much of the twentieth century, logistics followed a largely linear model. Heavy transport aircraft delivered personnel and equipment into major air bases, where supplies were consolidated before being distributed forward through established networks. The system depended upon relatively secure infrastructure, predictable supply routes and a limited number of established operating bases.

Today's operational environment presents a very different picture.

Rather than concentrating aircraft and supplies at a handful of major airfields, military planners increasingly favour a dispersed approach that distributes logistics across multiple locations. Smaller operating bases, expeditionary airfields, sections of highway and austere landing strips become part of a broader network designed to complicate enemy targeting and improve operational resilience. The objective is not to replace strategic airlift, but to ensure that the enormous quantities of cargo delivered by heavy transport aircraft can continue moving once they reach the theatre of operations. This is the principle of distributed airlift.

Adaptability Over Capacity

Unlike strategic airlifters, aircraft operating at the operational level must balance payload with flexibility. They require sufficient range to connect dispersed operating bases while remaining capable of using shorter or less developed runways. Equally important, they must operate with limited ground support, turn around rapidly between missions and transition easily between military and humanitarian tasks.

The defining question is no longer, "How much can this aircraft carry?" but rather, "How effectively can it sustain operations across a dispersed battlespace?" Increasingly, that answer is shaping procurement decisions around the world.

Distribution Rather Than Concentration

Perhaps no aircraft better illustrates this shift than the Embraer C-390 Millennium. Developed for air forces whose operational requirements differ from those of the world's largest military powers, the C-390 was designed to move troops, vehicles, humanitarian aid and military supplies rapidly between dispersed operating locations while remaining economical to operate throughout its service life. Rather than competing directly with the largest strategic transports, it deliberately occupies the space between heavy intercontinental airlifters and smaller tactical aircraft.

Powered by two high-bypass turbofan engines, the C-390 combines jet transport speeds with the ability to operate from semi-prepared runways and austere airfields. Its ability to be reconfigured quickly for troop transport, cargo operations, medical evacuation, humanitarian assistance or aerial refuelling as the KC-390 reflects the growing emphasis on operational flexibility rather than single-mission optimisation.

Its increasing adoption by operators including Brazil, Portugal, Hungary, the Netherlands, Austria, (couldn't verify these countries) the Czech Republic, Slovakia and Sweden reflects a broader recognition that responsiveness and versatility are becoming as valuable as maximum payload.

The Airbus A400M Atlas approaches the same challenge from a different direction. Designed to bridge the gap between tactical and strategic airlift, it combines substantial payload capacity with genuine rough-field capability. Heavy vehicles, helicopters and engineering

KC390 Millenium. Image Courtesy of ©Embraer

equipment can be transported directly into theatre before the aircraft transitions to tactical resupply, humanitarian assistance or special operations support. For many operators, its value lies precisely in its ability to perform both strategic and tactical missions within a single deployment.

No discussion of distributed airlift would be complete without the Lockheed Martin C-130J Super Hercules.

Few military aircraft have demonstrated the longevity or adaptability of the Hercules family. For more than seven decades, successive variants have served in virtually every operational environment, supporting troop transport, humanitarian relief, airborne operations, intelligence missions, medical evacuation and special operations. Although carrying less payload than either the C-390 or A400M, the C-130J's ability to operate reliably from short, rough and austere runways remains one of its defining strengths. For many air forces, its proven reliability, global support network and exceptional mission flexibility continue to make it the benchmark against which newer tactical transports are measured.

Building Resilience Through Distribution

Together, the C-390, A400M and C-130J illustrate a broader evolution in military thinking.

Future logistics will not depend upon a single aircraft dominating every mission. Instead, resilience is created by distributing capability across complementary platforms, each optimised for a particular stage of the logistics chain.

Heavy strategic transports continue to move immense quantities of equipment across continents.

Medium airlifters receive that cargo and distribute it throughout the operational theatre, often from dispersed or austere locations that reduce vulnerability to precision attack. By avoiding excessive concentration at any single airfield, commanders complicate an adversary's targeting process while maintaining the ability to continue operations even if individual bases are damaged or temporarily unusable.

The emphasis is no longer simply on moving supplies. It is on ensuring that the flow of logistics continues despite disruption.

This represents one of the most significant shifts in military air mobility since the advent of the jet transport.

Strategic reach remains indispensable, but it is now reinforced by operational agility. Together they form the first two layers of a resilient logistics network—one designed not only to project air power across the globe, but to keep it moving when every runway, supply route and operating base may already be under observation.

The final challenge, however, lies beyond even the most capable transport aircraft. Once supplies have been distributed throughout the theatre, they must still reach the soldiers, aircrews and forward operating units operating at the edge of the battlespace. It is here, in the hazardous "last mile", that military logistics enters its most demanding phase—and where rotary-wing aircraft, autonomous cargo systems and unmanned aerial vehicles are redefining the final link in the supply chain.

MOBILITY BEFORE FIREPOWER
AFRICAN AIR FORCES ARE INVESTING IN OPERATIONAL CAPABILITY

Across Africa, military aviation modernisation is often viewed through the lens of combat aircraft, advanced weapons and sophisticated surveillance systems. Yet the aircraft quietly transforming operational capability across the continent are frequently neither supersonic nor heavily armed. Instead, they are versatile helicopters and tactical transport aircraft designed to move people, equipment and humanitarian assistance wherever they are needed.


Image Courtesy of ©Uganda Airforce

Recent developments in Nigeria and Uganda illustrate this trend. Although involving very different aircraft, both acquisitions reflect a common strategic priority: investing in mobility, flexibility and operational readiness to meet the realities of modern African security operations.

Capability Designed for Today's Missions

African air forces operate in some of the world's most demanding environments. Counter-insurgency operations, border security, disaster relief, peace support missions and humanitarian assistance all require aircraft capable of operating from austere airfields, responding rapidly to changing situations and supporting forces over vast distances.

Rather than pursuing prestige platforms, many nations are strengthening the practical capabilities that underpin day-to-day military effectiveness.

Nigeria Expands Its Rotary-Wing Capability

The Nigerian Air Force (NAF) has completed Factory Acceptance Testing for three additional Leonardo AW109 Trekker Type B helicopters at the Leonardo Helicopters facility in Vergiate, Italy. Conducted between 29 June and 3 July 2026, the acceptance programme brings six of Nigeria's planned fleet of ten helicopters to delivery readiness.

A joint delegation from the Nigerian Air Force and the Ministry of Defence carried out detailed technical inspections and flight evaluations to confirm that the aircraft met contractual requirements before delivery.

Commenting on the milestone, Chief of the Air Staff, Air Marshal Sunday Kelvin Aneke, emphasised the importance of maintaining agile and technologically advanced air capabilities in response to evolving security threats.

The AW109 Trekker has become an increasingly attractive platform for military operators requiring a highly adaptable aircraft. Its combination of speed, manoeuvrability and relatively low operating costs allows it to perform a wide range of missions, including troop insertion, reconnaissance, command and control, casualty evacuation and internal security operations.

For Nigeria, where counter-terrorism operations and internal security remain national priorities, expanding the helicopter fleet strengthens the ability to deploy rapidly across geographically dispersed operational areas while providing valuable flexibility for both military and civil support missions.

Uganda Strengthens Tactical Airlift

While Nigeria has focused on rotary-wing mobility, Uganda has reinforced another equally important element of military capability: tactical transport.

On 10 July 2026, Uganda's Chief of Defence Forces, General Muhoozi Kainerugaba, officially commissioned a new LET L-410 NG transport aircraft into the Uganda People's Defence Forces (UPDF) Air Force at Entebbe Air Base.

Supplied by Czech defence company OMNIPOL, the aircraft represents a significant enhancement of the UPDF's tactical airlift capability. General Kainerugaba noted that the new aircraft will improve the Air Force's ability to conduct troop transport, medical evacuation and logistical support while extending operational reach throughout the region. He also highlighted the importance of maintaining the aircraft to the highest operational standards, observing that readiness depends as much on sustainment as on procurement.

Although the LET L-410 traces its origins to the 1960s, successive modernisation programmes have transformed it into a highly capable utility aircraft. The latest L-410 NG offers seating for up to 19 passengers while allowing crews to rapidly reconfigure the cabin for cargo, medical evacuation or mixed-role operations, making it particularly well suited to the diverse mission profiles encountered across Africa.

Different Aircraft, Shared Priorities

Viewed independently, both acquisitions represent relatively modest fleet expansions. Considered together, however, they reveal a broader pattern emerging across African military aviation.

Rather than concentrating solely on high-end combat platforms, many air forces are investing in aircraft that deliver practical operational value every day. Rotary-wing aircraft provide rapid response, battlefield mobility and support to ground forces, while tactical transport aircraft sustain logistics, humanitarian relief and medical evacuation across regions where road infrastructure may be limited or security conditions remain uncertain.

These capabilities are increasingly essential in an era where military operations often involve responding to insurgencies, supporting civil authorities during natural disasters and contributing to multinational peacekeeping missions as much as preparing for conventional interstate conflict.

Modern air power is measured not only by technological sophistication but also by the ability to sustain operations, move personnel efficiently and respond rapidly to evolving situations.

The Nigerian Air Force's expanding AW109 Trekker fleet and Uganda's introduction of the LET L-410 NG reflect this philosophy. Although serving different operational roles, both aircraft strengthen the mobility that underpins effective military operations.

As African defence forces continue to modernise, the emphasis is increasingly shifting towards platforms that deliver versatility, reliability and affordability. In many respects, these practical investments may prove more consequential than the acquisition of more glamorous combat systems.

In an increasingly unpredictable security environment, mobility remains one of the most valuable force multipliers an air force can possess.

TRUST BY DESIGN

Digital manufacturing is redefining trust in military aerospace.

For generations, military logistics has focused on protecting physical supply lines. Factories, ports, railways, fuel depots and transport routes have all been recognised as strategic assets because they sustain military capability. As aerospace manufacturing becomes increasingly digital and more closely connected through distributed production, however, another critical infrastructure is emerging—one that cannot be seen on a map. The designs, manufacturing data and engineering information that now underpin modern production have become strategic assets in their own right, placing cybersecurity at the heart of future manufacturing capability.

When Manufacturing Becomes Information

Distributed manufacturing is changing how selected aerospace components can be produced and supported.
Rather than relying solely on centralised production facilities and extensive inventories of spare parts, qualified manufacturing capability can increasingly be positioned closer to where equipment is operated. Secure digital design data, approved manufacturing processes and certified materials enable selected components to be produced on demand within controlled environments.

This approach has attracted growing attention as defence organisations seek greater resilience, shorter lead times and increased operational flexibility.

Yet it also introduces a fundamental shift in how manufacturing is viewed. Production is no longer defined exclusively by physical facilities. It becomes increasingly dependent on the integrity of the information that enables manufacturing to take place.

The Digital Thread

Central to this transformation is the concept of the digital thread.

Rather than treating engineering drawings, manufacturing instructions, inspection records and maintenance information as separate documents, the digital thread connects product and process information throughout much of an aircraft's lifecycle. Design, engineering, manufacturing, inspection and product support increasingly draw upon connected digital information that improves traceability, consistency and configuration control.

For aerospace manufacturers, this creates significant operational benefits. Engineering changes can be implemented more efficiently, manufacturing processes become more consistent and quality assurance gains greater visibility across the production lifecycle.
It also creates a new dependency.

If manufacturing increasingly depends upon trusted digital information, then protecting that information becomes inseparable from protecting manufacturing itself.

The New Strategic Infrastructure

Historically, industrial capability has depended on factories, tooling and skilled labour. Increasingly, it also depends on digital infrastructure.

Engineering databases, product lifecycle management systems, manufacturing execution systems and secure communications now form part of the industrial environment that supports modern aerospace production.

Digital design files represent far more than engineering drawings. They incorporate approved geometries, manufacturing parameters, inspection requirements and the technical information needed to produce a conforming component.

As manufacturing becomes more digitally dependent, these information assets increasingly function as part of the infrastructure supporting aerospace capability.

Protecting them is no longer solely an information technology challenge. It becomes an operational requirement.

Beyond Confidentiality

Cybersecurity within manufacturing extends beyond preventing unauthorised access to sensitive information.

The objective is equally to ensure that engineering data remains authentic, complete and available whenever authorised users require it. Protecting confidentiality prevents valuable intellectual property from being exposed, but maintaining integrity provides confidence that manufacturing information has not been altered, while ensuring availability allows production to continue when operationally required.

These three principles—confidentiality, integrity and availability—have long formed the foundation of cybersecurity. Within distributed manufacturing, they become equally important to manufacturing assurance.

A secure design that cannot be accessed during an operational deployment provides little practical value.

Likewise, manufacturing data that cannot be trusted undermines confidence in the production process itself.

Trust Becomes Manufacturing Assurance

Few industries demand higher levels of confidence than aerospace.

Aircraft components must conform precisely to approved designs and manufacturing specifications before entering service. Traditionally, that assurance has been achieved through tightly controlled production facilities, qualified personnel, approved materials and rigorous inspection processes.

Distributed manufacturing extends those same principles into the digital domain.

Confidence must now exist not only in the physical component, but throughout the information that supports its production. Secure design data, controlled software environments, approved manufacturing parameters, reliable traceability and robust quality management systems collectively support the evidence used to demonstrate conformity and, ultimately, airworthiness.The challenge is therefore not simply protecting data. It is protecting confidence in the manufacturing process itself.

Invisible supply lines

As manufacturing becomes increasingly digital, information joins raw materials as part of the supply chain.

Unlike conventional logistics, these supply routes are largely invisible. Engineering information may travel through secure communications networks to approved production facilities thousands of kilometres away, where qualified materials and certified manufacturing processes transform digital information into physical components.

These digital pathways do not replace conventional logistics. Aerospace manufacturing still depends upon qualified feedstock materials, specialised equipment, electronics and numerous components that cannot be produced locally. Instead, digital information becomes an additional supply line that enables selected manufacturing activities to take place closer to the point of need. The supply convoy has not disappeared. Part of it has become invisible.

Resilience By Design

The response to this evolving environment extends beyond stronger perimeter security.

Aerospace manufacturers are increasingly developing resilient digital manufacturing ecosystems that incorporate authentication, configuration control, continuous monitoring, digital traceability and rigorous process management throughout the production lifecycle. Rather than relying upon a single layer of protection, resilience is achieved through multiple layers of technical and organisational assurance.

This philosophy closely mirrors aviation safety itself. Aircraft achieve exceptionally high levels of reliability not because individual systems never fail, but because multiple layers of redundancy, verification and independent oversight work together to reduce risk.

Distributed manufacturing increasingly applies similar thinking to digital manufacturing environments.

Beyond Defence

Although many of these developments are being accelerated by defence requirements, their implications extend across the wider aerospace sector.

Commercial aircraft manufacturers, maintenance organisations and supply-chain partners are all expanding their use of connected engineering data, digital product definitions and advanced manufacturing technologies. Remote engineering support, digital inventory concepts and approved additive manufacturing applications are gradually becoming part of selected civil aerospace operations.

As manufacturing becomes increasingly software-enabled, protecting engineering information becomes a commercial necessity as well as a military concern.

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The Next Evolution Of Logistics

Distributed manufacturing has demonstrated that selected production capability no longer needs to remain confined within traditional factory walls.

Its continued success, however, depends upon something less visible than printers or production facilities. It depends upon trusted information.

For generations, military logistics measured success by the ability to move equipment safely across continents. Increasingly, success will also depend upon the ability to move trusted engineering information securely between designers, manufacturers and operators while preserving its integrity throughout the production process.

The factory has not disappeared. It has become increasingly connected.

And as manufacturing continues its digital evolution, cybersecurity is becoming far more than an information technology discipline. It is emerging as a fundamental element of manufacturing assurance, operational resilience and aerospace capability itself.

Image Courtesy of © Dimitris Palassis and Alexis Kontiveis

ICONS IN THE SKY MILITARY AIRCRAFT AS SYMBOLS OF IDENTITY

Military aircraft are designed to disappear. Every aspect of a modern combat aircraft is engineered to reduce its visibility. Radar-absorbent materials minimise electronic signatures, subdued grey finishes blend into the sky, and low-visibility national markings help ensure an aircraft remains as difficult to detect as possible. In an era defined by stealth, electronic warfare and increasingly sophisticated sensors, success often depends upon remaining unseen.

Yet, every year, some of the world's most capable military aircraft emerge from their hangars transformed into something entirely different. Fighters, transport aircraft and helicopters appear in striking commemorative colour schemes that celebrate history, squadron heritage, national milestones or aviation anniversaries. Aircraft designed for combat suddenly become centrepieces of international airshows and defence exhibitions, photographed by thousands and shared around the world.

At first glance, the contradiction appears obvious. Why would an air force deliberately make one of its most sophisticated assets impossible to ignore?

The answer lies far beyond aesthetics.

These aircraft are not simply painted; they are communicating. They project history, values, achievement and identity in a way few other military assets can. Long before a pilot starts the engines, the aircraft has already begun telling a story.

From Camouflage To Canvas

Throughout history, military organisations have relied upon symbols to define who they are. Regimental colours, naval ensigns, unit badges and medals have all served to preserve tradition, foster pride and strengthen esprit de corps. Air forces inherited those traditions but created something uniquely their own.

Unlike a flag or monument, an aircraft is a living symbol. It travels internationally, represents its nation before foreign audiences and demonstrates technological capability while simultaneously carrying the weight of history. During peacetime, commemorative aircraft become ambassadors as much as military assets, appearing at exercises, open days and airshows where they speak a universal visual language.

Their significance extends well beyond aviation enthusiasts. For the public, these aircraft provide a rare opportunity to engage with military history through something tangible and dynamic. For those who serve, they reinforce continuity between generations. For governments, they become instruments of defence di-

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plomacy, presenting not only military capability but also national identity. Every nation tells its story differently.

Greece: Mythology Takes Flight

Few air forces have embraced national heritage as effectively as the Hellenic Air Force.

Its most celebrated commemorative aircraft is undoubtedly the "Zeus" F-16C Block 52+ solo demonstration aircraft. Designed by Dimitris Palassis and Alexis Kontiveis, and meticulously applied by personnel from the Hellenic Air Force's 340 and 343 Squadrons at Souda Air Base, the aircraft combines the blue and white of the Greek flag with a soaring eagle motif and an imposing depiction of Zeus wielding lightning across the tail.

The aircraft has become one of Europe's most recognisable demonstration aircraft, appearing at major international airshows and earning widespread acclaim for both its artistic execution and flying display.

The Hellenic Air Force has also produced commemorative aircraft associated with its annual Archangel celebrations, honouring Archangels Michael and Gabriel, the patron saints of the service. These aircraft have featured carefully designed anniversary artwork, stylised wing motifs and squadron symbolism on aircraft including the A-7 Corsair II and Mirage 2000.

Rather than relying on spectacle alone, these liveries express the Hellenic Air Force's heritage while reflecting Greece's enduring cultural and spiritual traditions.

For Greece, commemorative aircraft become expressions of national identity, linking modern military capability with a civilisation whose history stretches back thousands of years.

Italy: Engineering Meets Art

Italy tells a different story. Where Greece celebrates mythology and heritage, the Aeronautica Militare often celebrates engineering excellence and industrial design. Its commemorative aircraft combine elegant graphic design with historic squadron insignia, reflecting a national culture where technical innovation and artistic expression have long existed side by side.

The Italian Air Force's centenary celebrations produced some of Europe's finest commemorative liveries. Eurofighter Typhoons carried distinctive anniversary schemes honouring a century of military aviation, while special aircraft highlighted Italy's internationally recognised aerospace industry and design heritage.

These aircraft communicate more than military professionalism. They project confidence in Italian engineering, manufacturing and creativity.

M345 C Image Courtesy of ©Leonardo

Image Courtesy of ©RAF

The United Kingdom: Remembrance In Flight

For the Royal Air Force, commemorative aircraft are often acts of remembrance.

As the world's oldest independent air force, the RAF possesses a heritage spanning both World Wars, the Cold War and today's increasingly complex security environment. Its special colour schemes frequently commemorate the Battle of Britain, historic squadrons, operational anniversaries and aircraft retiring after distinguished service.

Unlike many nations that favour full-airframe artwork, the RAF often adopts a more restrained approach. A specially marked fin, historic squadron crest or heritage camouflage scheme can evoke more than a century of service with remarkable subtlety.

The symbolism lies not in spectacle, but in continuity. Today's Typhoon and F-35 pilots inherit a legacy built by generations who flew Hurricanes, Spitfires, Mosquitos, Vulcans and Tornados before them.

The United States: The Power Of The Squadron

In the United States, commemorative aircraft celebrate the identity of the unit.

Across both the United States Air Force and the United States Navy, heritage aircraft honour squadrons, operational milestones and historic aircraft types.

Modern fighters frequently carry markings inspired by P-51 Mustangs, F-86 Sabres, F-4 Phantoms or other legendary aircraft, visually connecting today's aircrews with those who established the traditions of American air power.

The US Navy adds another distinctive tradition through its colourful Commanding Air Group (CAG) aircraft, whose striking tails and bold markings distinguish carrier air wings while reinforcing unit identity.

Meanwhile, the Thunderbirds and Blue Angels continue to demonstrate that military display aircraft are far more than entertainment. They serve as ambassadors for professionalism, precision and national confidence.

Image Courtesy of ©USAF DVIDS


The Su-27. Russian Knights Aerobatic Team. Image Courtesy of ©Wiki Commons

Russia And China: Symbols Of National Power

Russia and China present yet another visual philosophy. Russian commemorative aircraft frequently celebrate Victory Day, historic aviation units and major anniversaries. Aerobatic teams such as the Russian Knights and Swifts have become internationally recognised through their distinctive national colour schemes, reflecting continuity, sacrifice and military tradition.

China has traditionally favoured greater uniformity across operational aircraft, yet anniversary celebrations and public displays increasingly showcase carefully designed liveries that project technological achievement, discipline and national confidence. Aircraft from the Bayi Aerobatic Team have become important symbols of China's rapidly modernising aerospace capabilities.

Although their visual approaches differ considerably, both nations demonstrate that military aircraft can communicate ideas extending far beyond combat capability.

A Global Language Of Identity

Many smaller air forces have developed equally distinctive traditions.

Belgium has become renowned for producing some of Europe's most imaginative demonstration aircraft, while Poland regularly commemorates wartime resilience through anniversary schemes that reflect national history. Germany generally favours understated designs that emphasise professionalism and engineering excellence. Japan combines meticulous craftsmanship with respect for tradition, producing commemorative aircraft that celebrate aviation milestones with exceptional attention to detail.

South Africa has also embraced commemorative aircraft to mark important milestones within the South African Air Force, reflecting both its long aviation history and its continuing evolution within a democratic nation. These aircraft remind audiences that military aviation is not simply about projecting military power. It is equally about preserving institutional memory and celebrating those who have served.

No two nations tell exactly the same story. Yet every commemorative aircraft communicates something fundamental about the country that operates it.

The Enduring Message

As military aviation advances towards artificial intelligence, collaborative combat aircraft, autonomous systems and sixth-generation fighters, it is tempting to believe that technology alone defines the future of air power.

These remarkable aircraft suggest otherwise. Behind every aircraft stand the people who designed it, built it, maintained it and flew it. Behind every squadron lies generations of service, sacrifice and achievement. Behind every national marking is a story that reaches far beyond the runway.

That is why commemorative aircraft continue to resonate. They remind us that military aviation is not defined solely by technology, performance or combat capability. It is equally shaped by history, culture, tradition and the people who wear the uniform.

The camouflage may help an aircraft disappear. The stories carried on these extraordinary aircraft ensure they never will.

Image Courtesy of ©Rayno Snyman

!Ke e: /xarra //ke:– DIVERSE PEOPLE UNITE

By Rob Garbett. CEO Professional Group of Companies

South Africa's national motto, !Ke e: /xarra //ke, translates simply as Diverse people unite. It is a sentiment that reaches far beyond our country's history. I believe it also captures something fundamental about aviation.

Security is not a single discipline, nor is it the responsibility of one organisation. It is made up of many parts that all need to work together. Regulators, operators, airports, engineers, pilots, instructors, maintenance organisations and security specialists all have their own role to play. If one part weakens, the whole system is weakened.

That is why security continues to cast one of the longest shadows across our industry.

Terrorism remains a threat. Dangerous goods are still mishandled and undeclared through complacency or ignorance. We continue to see inadequately trained people being placed in positions where competence is critical. These are not isolated problems. They are symptoms of something much bigger.

Too often we allow indifference, lack of experience, poor training and, sometimes, the pursuit of profit ahead of responsibility to influence our decisions. We often look for technical solutions to what are, in reality, human problems. Technology certainly has an important role to play, but it will never replace professionalism, accountability or a genuine passion for doing things properly.

Perhaps one of our greatest challenges is that we remain more divided than we should be.

Security Is Everybody's Responsibility

Security cannot rest solely on the shoulders of the South African Civil Aviation Authority, nor should operators, airports or security companies believe it is someone else's responsibility. Every one of us has a role to play because a weakness anywhere in the aviation system eventually becomes a weakness for everyone.

South Africa is fortunate to have many organisations representing different sectors of aviation. The SACAA, together with our industry associations, all make valuable contributions. Yet there are times when we seem to work alongside one another rather than with one another.

We often find ourselves united only when regulation affects our businesses or when commercial interests are under pressure. That is understandable—we all have members or businesses to protect—but aviation deserves something bigger than that.

Our diversity should be one of our greatest strengths, not one of our weaknesses. We may represent different sectors of aviation, and in many cases we compete with one another commercially, but every one of us depends on a safe, secure and healthy aviation industry.

I have attended more meetings than I care to remember over the years and, I confess, there have been occasions when I have suffered from what I call "meeting fatigue". Yet I have also learnt that getting people around a table, talking openly and listening to one another often achieves far more than exchanging strongly worded emails. Face-to-face discussion still has enormous value.

Working Together

There are already excellent examples of this cooperation.

The Civil Aviation Regulations Committee (CARCom), Aero Club of South Africa, the Board of Airline Representatives of South Africa (BARSA), the Commercial Aviation Association of Southern Africa (CAASA), the Airlines Association of Southern Africa (AASA), together with several other organisations, demonstrate that groups representing different—and sometimes competing—interests can work together remarkably well when there is a common objective.

These organisations already contribute valuable technical knowledge and practical experience to the industry. Perhaps there is an opportunity to build on that cooperation.

For many years I have wondered whether aviation would benefit from a broader forum dedicated specifically to security—not another regulator, nor another organisation with enforcement powers, but a forum that could draw together the considerable experience that already exists throughout our industry.

Perhaps the National Airspace Committee (NASCOM), which already advises the SACAA on airspace matters and includes representatives from the SACAA, ATNS, ACSA, Aero Club, CAASA, BARSA, AASA and others, could from time to time place aviation security on its agenda and invite recommendations from across the industry.

It may sound ambitious. Then again, Nelson Mandela reminded us: "It always seems impossible until it's done."

I think aviation security deserves exactly that kind of thinking.

General Aviation: Where Aviation Begins

When we talk about aviation security, we naturally think about airlines, airports passengers and cargo operations.

Yet general aviation is just as important because it is where much of our industry begins.

The airline sector has the advantage of relatively stable passenger traffic and business travel. General aviation, however, has had to weather increasingly difficult economic conditions over the past fifteen years.

The small family businesses—the "Mom, Dad, son, daughter and cousin" enterprises—continue to carry much of the industry's weight. They operate maintenance organisations, charter companies, flying clubs and many of our smaller flight schools. They may not attract headlines, but they remain the breeding ground for tomorrow's pilots, engineers and aviation professionals.

If these businesses continue to struggle, the effects reach much further than their own balance sheets. The pipeline of future aviators becomes smaller, experience becomes harder to replace and, ultimately, the whole industry feels the consequences.

That is why I believe security and sustainability go hand in hand. A secure aviation industry depends not only on sound regulation and good procedures, but on healthy aviation businesses that can afford to invest in training, maintain high standards and encourage the next generation.

Where Passion Begins

For many of us, our love of aviation started at a small country airfield or local airshow.

Watching aircraft perform, hearing the engines, smelling aviation fuel and meeting pilots whose enthusiasm was contagious created memories that lasted a lifetime.

Those smaller airshows are now under increasing pressure.

The cost of fuel continues to rise. Older aircraft face increasing regulatory and financial pressures. Many of the colourful personalities who inspired generations of young aviators have disappeared from the scene. The remarkable pool of pilots produced by a thriving South African Air Force is no longer what it once was, while many of our colleagues have left for what we jokingly call "greener"—or perhaps "bluer!!"—pastures.

Some return, discovering the grass was not quite as green and the skies not necessarily any bluer. Many do not, and we lose decades of valuable experience.

Events such as Africa Aerospace and Defence (AAD) continue to attract thousands of young visitors, which is encouraging. What concerns me, however, is the growing belief among some manufacturers that digital marketing or private demonstrations are more effective than flying displays. Perhaps they are.

But standing beside a runway, watching aircraft perform, is about far more than selling aeroplanes.

Somewhere in that crowd is a youngster who will become tomorrow's pilot, engineer, aircraft owner, technician or customer. That spark of inspiration cannot be created by a website or a brochure.

Diverse People Unite

Which brings me back to where I started.

!Ke e: /xarra //ke – Diverse people unite.

Those four words carry a message that aviation would do well to remember.

Security is not something the regulator can deliver on its own, nor can operators, airports or associations achieve it independently. Every one of us has a responsibility to protect this remarkable industry.

We have no shortage of experience, knowledge or passion in South African aviation.

Perhaps what we need a little more of is unity of purpose.

If we can work together more effectively—sharing ideas, listening to one another and recognising that our common interests are greater than our individual differences—we will not only build a more secure aviation industry, but a stronger one for generations to come.

After all, aviation has always been about bringing people together. This is also how we should protect it.