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BEECHCRAFT M-346N TARGETS U.S. NAVY JET TRAINING

Textron Aviation Defense has unveiled the Beechcraft M-346N as its "ready-now" contender for the U.S. Navy's Undergraduate Jet Training System (UJTS). Developed in partnership with Leonardo, the twin-engine jet brings proven performance from the M-346 platform, already in service with 4th and 5th generation air forces worldwide. Featuring digital fly-by-wire controls, Auto-GCAS, advanced avionics, and a Live-Virtual-Constructive training ecosystem with AI-driven adaptive learning, the M-346N is positioned as a complete solution to bridge student pilots from basic training to carrier-based fighter operations. IMAGE: Courtesy of BEECHCRAFT

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THE SHIFTING BATTLEFIELD IN THE SKIES: DRONES, DETERRENCE & THE DEFENCE EDGE

From proxy conflicts to great-power posturing, and from cyberattacks to autonomous drone strikes, modern warfare is no longer a distant threat — it is a daily reality, unfolding in fragmented theatres across the globe. This edition investigates the aviation technologies and doctrines reshaping military readiness in a world on edge.

There is a sense in the air — a shifting of gears. Not quite full-scale war, but not quite peace either.

From the drone-scarred fields of Eastern Europe to the militarised skies of the Indo-Pacific, the language of power is increasingly written in the form of jet trails and satellite links. New technologies, from autonomous UAV swarms to hypersonic propulsion systems and AI-assisted combat platforms, are reshaping what it means to project force — and to defend against it.

But the battlefront has also shifted into the unseen: into cyberspace, into radio frequencies, and into the tight data loops of next-generation aircraft. Electronic warfare, spoofing, and cyber sabotage are now part of daily defence vocabulary. For every fighter jet launched or drone deployed, there's a line of code operating behind the scenes, influencing outcomes without firing a shot.

This issue explores the machinery behind the rumours — and the realities — of war. We examine how military aircraft are evolving under pressure, how UAVs are changing the rules of engagement, and how air forces across the globe are preparing for a world that feels increasingly unsteady.

We do not seek to glorify conflict — but we cannot ignore its contours. To understand the future of aviation, we must confront the growing role it plays in global security, deterrence, and sometimes, unfortunately, destruction.

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THE GREAT FRAGMENTATION: PEACE PLUMMETS AS NEW ERA OF CONFLICT TAKES SHAPE

The world is facing its most unstable geopolitical era since the end of World War II. That is the stark warning issued in the 2025 Global Peace Index (GPI), released by the Institute for Economics & Peace. This year's report paints a picture of accelerating fragmentation, rising conflict, and the erosion of multilateral influence—an alarming shift away from coordinated global governance toward a fractured and uncertain future.

From surging armed conflicts to the disruptive rise of military-grade drone technology, the global landscape is entering what analysts are calling The Great Fragmentation—a seismic restructuring of international power dynamics, where warfare is more accessible, conflicts are harder to contain, and peace is increasingly elusive.

A Historic Low for Peace

The headline finding is sobering: global peace is now at its lowest level since the index began. With 59 active state-based conflicts and 152,000 conflict-related deaths recorded in 2024, the conditions preceding war; such as rising tensions, military build-ups, and political instability—are the worst seen since the 1940s.

The GPI reveals that 87 countries experienced deteriorations in peacefulness in the past year alone. A staggering 17 nations recorded over 1,000 internal conflict deaths in 2024—an indicator of widespread instability.

"The concept of 'forever wars' is more real than at any stage in history," said Steve Killelea, Founder and Executive Chairman of the IEP.
"We are witnessing the emergence of a new international order, one that is fragmented, uncertain, and more dangerous."

Conflict Becomes Global, Asymmetric—and Cheap

While conventional conflicts persist, a new form of warfare is rapidly reshaping how violence is waged. Cheap, autonomous, and AI-enabled drone technology is levelling the battlefield. Countries like Ukraine, for example, are projected to produce more than 1.5 million drones this year alone and plan to produce 2.5 million drones—many of which are capable of executing precision strikes at a fraction of the cost of traditional weapon systems.

From just six drone manufacturers in 2022, the sector has exploded to over 200 companies by 2024. These systems have made it possible for insurgent groups to inflict high-value damage using technology that costs only a few hundred dollars.

In the current conflict in Ukraine, drone strikes have increased 127-fold since the early days of the war, turning the region into a laboratory for next-generation combat. Swarming drones, autonomous navigation, and real-time battlefield data are not just reshaping tactics—they are rewriting the very doctrine of modern warfare.

This asymmetry fundamentally alters the strategic balance between state and non-state actors. Small militia groups, armed with drones and improvised devices, can now challenge conventional militaries and sustain protracted conflicts with limited resources. Once widely adopted, this technology could make "forever wars" a structural feature of the international security landscape.

Economic and Strategic Consequences

Beyond the human cost, the economic impact of violence reached $19.97 trillion in 2024—equivalent to 11.6% of global GDP. Military expenditure alone accounted for $2.7 trillion. Paradoxically, global spending on conflict prevention is near a 20-year low, with peacekeeping efforts making up just 0.52% of military spending.

Countries worst hit by conflict have seen GDP contractions of up to 30% in a single year, largely due to dislocated trade, destroyed infrastructure, and reduced investor confidence. With international cooperation on the wane and debt mounting in fragile states, the economic sustainability of many regions hangs in the balance.

Middle Powers Rise, Traditional Powers Retreat

Another driver of fragmentation is the emergence of powerful middle-tier nations—countries like India, Saudi Arabia, Türkiye, South Africa, and Brazil—whose regional influence has grown significantly. The number of globally influential states has nearly tripled since the end of the Cold War, from 13 to 34. However, their rise has also heightened localised competition, leading to more regional rivalries and less coherent global coordination.

In parallel, the post-Cold War global order led by the West is losing traction. Europe's military expenditure is now four times greater than Russia's, yet its combined military capacity is only 33% higher—an inefficiency exacerbated by disjointed command systems and a lack of unified strategic vision.

Meanwhile, China's rise may be reaching its limits. Although it has gained the most influence of any nation since the Cold War, its gross debt now sits near 300% of GDP and foreign direct investment has fallen to a 20-year low, raising questions about the sustainability of its geopolitical ambitions.

Regional Fault Lines

- **MENA Region:** Continues to be the least peaceful region globally. Sudan, Yemen, Syria, and Israel all rank in the bottom ten of the index.
- **Sub-Saharan Africa:** 35 of 43 countries have engaged in conflict in the past five years, with economic fragility exacerbated by debt servicing ratios exceeding 40%.
- **South Asia:** Saw the steepest drop in peacefulness, with tensions in Kashmir nearly triggering war between nuclear-armed India and Pakistan after a terror attack in April 2025.
- **South America:** A rare bright spot, with Peru leading improvements due to declining civil unrest.

The Sahel region has emerged as the world's terrorism epicentre, where proxy conflicts and arms shipments are fuelling instability. The Africa Corps' supply of tanks, artillery, and aircraft to Mali, circumventing sanctions, underscores how regional conflicts are now shaped by external interests and informal power structures.

A Critical Inflection Point

Perhaps the most concerning takeaway from the 2025 GPI is not just that the world is becoming less peaceful—but that the very architecture of peace is eroding.

Foreign aid is declining, trust in institutions is faltering, and the multilateral frameworks designed to prevent war are increasingly viewed as ineffective.

This is not merely a temporary dip in global stability—it may be the beginning of a new geopolitical era in which the cost, duration, and nature of warfare are transformed by emerging technology, shifting alliances, and eroding norms.

As Steve Killelea cautioned: "*The world is at a tipping point. Whether this becomes a descent into long-term disorder or the beginning of a new balance will depend on how quickly the international community can adapt—and whether it chooses to act at all.*"

In the skies and on the ground, the 21st-century battlefield is no longer defined by size, strength, or even borders. It is fragmented, autonomous, and perpetual—an era of war without end.

Sprint X-Plane Image© BELL

BELL ADVANCES TO PHASE 2 OF DARPA'S SPRINT X-PLANE PROGRAM

Bell Textron Inc., a subsidiary of Textron Inc. (NYSE: TXT), has been awarded funding to proceed to Phase 2 of the Defense Advanced Research Projects Agency's (DARPA) Speed and Runway Independent Technologies (SPRINT) X-Plane program. This critical phase will see Bell complete the design, construction, ground testing, and certification of a cutting-edge X-plane demonstrator.

Phase 2 builds on the momentum from Phases 1A and 1B, during which Bell finalised the conceptual and preliminary design of its proposed aircraft. The ultimate aim of the SPRINT program is to develop and demonstrate a high-speed vertical takeoff and landing (HSVTOL) platform capable of cruising between 400 and 450 knots while maintaining the flexibility to hover and operate from unprepared, austere environments.

"Bell is honoured to have been selected for the next phase of DARPA's SPRINT program and is excited to demonstrate a brand-new aircraft with the first-ever stop/fold technology," said Jason Hurst, senior vice president, Engineering. *"This is an achievement we've been working towards for over 10 years, as we've leveraged our nearly 90-year history of X-plane development to bring new technology to our warfighters."*

To prepare for this stage, Bell has already undertaken extensive risk-reduction efforts. These include successful demonstrations of folding rotor systems, integrated propulsion, and advanced flight control technologies. Critical testing took place at Holloman Air Force Base and in wind tunnel facilities at the National Institute for Aviation Research (NIAR) at Wichita State University.

Bell's selection for Phase 2 continues its legacy of innovation in vertical lift technology. The company has long been at the forefront of VTOL development with pioneering projects such as the X-14, X-22, XV-3 and XV-15—programmes that have laid the groundwork for today's advanced tiltrotor and high-speed rotorcraft technologies.

Flight testing of the demonstrator aircraft is slated for Phase 3 of the program. If successful, the platform could redefine speed and flexibility for future military operations, offering a new frontier in runway-independent capability.

FLASHPOINTS: AERIAL IMPLICATIONS OF GEOPOLITICAL HOTSPOTS

The first signs of conflict are increasingly airborne. The geopolitical climate, airspace has become a barometer of unrest — and a theatre of escalation.

Taiwan Strait: High Alert in the Pacific Status – July 2025

China's pressure campaign on Taiwan has intensified. In June alone, Taiwan recorded a 40% increase in PLA aircraft entering its ADIZ. US and allied forces conducted joint exercises in the Philippine Sea, prompting a sharp response from Beijing.

Aviation impact:

- Taiwan's upgraded F-16Vs are flying near-daily intercept missions
- Advanced Chinese drones and EW aircraft are testing Taiwanese responses
- Civil carriers continue to reroute commercial traffic around contested zones
- Satellite-backed ISR operations have surged across the East China Sea

The Sahel: Aerial Sovereignty Under Strain. Status – July 2025

In Niger, a fragile military-led transition is compounded by growing insurgent activity in the tri-border region. The withdrawal of French forces has created an operational gap, filled increasingly by drone-led counterinsurgency operations, including systems supplied by non-Western defence contractors.

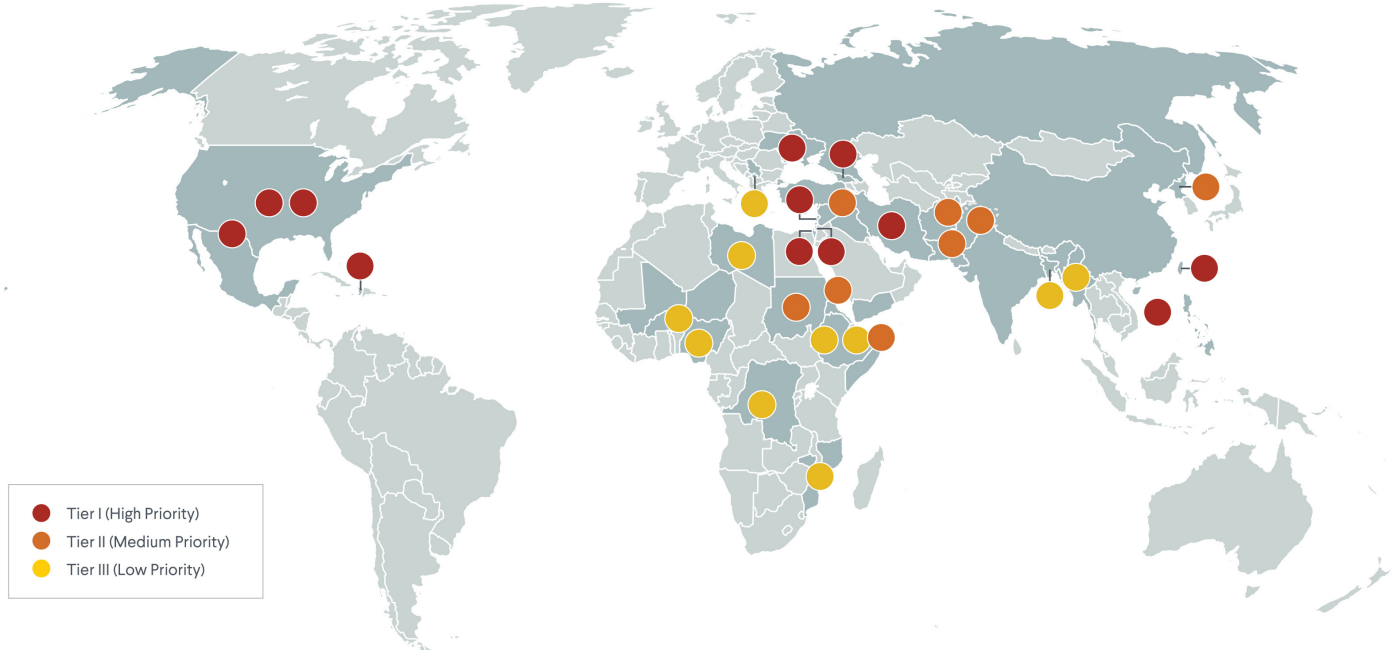
Aviation impact:

- Armed UAVs now dominate the Sahel's combat environment
- African nations are investing in sovereign drone capabilities
- Civil aviation remains limited, with escalating security premiums
- Business jets are being used for NGO, diplomatic, and medevac operations in high-risk areas

Ukraine: Protracted Conflict, Evolving Air Tactics. Status – July 2025

The conflict has shifted into a war of attrition. Ukraine has begun deploying the first wave of F-16s, supported

The Top Conflicts to Watch in 2025



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To learn more about ongoing conflicts, visit "global Conflict Tracker" at cfr.org/globalconflicttracker

Timeline of Escalation – Key Flashpoint Developments (Jan–Jul 2025)

Date	Region	Event / Development
Jan 2025	Gaza	Renewed airstrikes after a breakdown in talks lead to three days of aerial engagement.
Feb 2025	Sahel (Burkina Faso–Niger)	Drone strike attributed to non-state actors targets convoy near Niamey.
Mar 2025	Taiwan Strait	PLA conducts largest air incursion to date — 48 aircraft breach ADIZ in a single day.
Apr 2025	Red Sea	Three merchant vessels attacked by loitering munitions; air patrols intensified by coalition forces.
May 2025		UkraineUkraine receives first operational F-16s; training bases fully integrated in Poland and Slovakia.
Jun 2025		Eastern Mediterranean Israeli Iron Dome intercepts swarm drone attack launched from southern Lebanon.
Jul 2025	Sahel	Joint ECOWAS drone surveillance mission launched across tri-border area to counter insurgent movement.

by NATO logistics hubs in Poland and Romania. Russia has responded by strengthening its layered air defences and expanding EW interference zones.

Aviation impact:

- Ukrainian pilots are flying Western jets in complex airspace with heavy anti-air threats
- Drones remain critical on both sides — now with AI-assisted targeting
- NATO airspace coordination has become more robust, especially over Eastern Europe
- Ukraine's air doctrine is influencing defence planning across Europe, Africa, and the Middle East

Gaza and the Eastern Mediterranean: Persistent Tension. Status – July 2025:

Despite ongoing ceasefire negotiations, intermittent rocket fire and airstrikes persist between Gaza-based factions and Israel. Lebanon's southern airspace has also seen increased drone activity linked to proxy groups.

Aviation impact:

- The Israeli Air Force maintains daily patrols and targeted strike readiness
- New counter-UAV technologies are being deployed around critical infrastructure
- Regional commercial flights remain subject to short-notice advisories and rerouting
- Defence contractors are showcasing rapid-response and precision ISR solutions tailored to urban conflict zones

Red Sea and Bab el-Mandeb: Strategic Chokepoint Under Threat. Status – July 2025:

Houthi-aligned forces in Yemen have resumed long-range drone and missile attacks on Red Sea commercial traffic. The joint naval task force Operation Prosperity Guardian has increased its aerial component to counter these threats.

Aviation impact:

- Maritime patrol aircraft (MPAs), including P-8 Poseidons and drones, monitor shipping lanes daily
- Civil aviation routes between Europe, the Gulf, and East Africa remain under constant review
- Drone-based reconnaissance from coalition and private defence actors is expanding
- The situation is accelerating demand for shipborne VTOL UAVs and airborne ISR platforms

The Sky as a Strategic Indicator

As of July 2025, the skies above these flashpoints are anything but neutral. The convergence of military, unmanned, and commercial air operations in contested zones reflects a global shift — where deterrence, disruption, and dominance all begin with airpower.

Geopolitical volatility is shaping airspace itself — and vigilance is no longer optional, it's operational doctrine.

AIR SUPERIORITY VS. AIR DENIAL: EVOLVING DOCTRINE IN 2025

Modern aerial warfare is undergoing a paradigm shift. The classic model; achieve air superiority and dominate the skies with manned fighters, has been increasingly challenged by a new reality: drone saturation, low-cost swarm munitions, hypersonic threats, and advanced air denial systems. Nations are now redefining air dominance doctrine under this 21st-century context.

From Air Superiority to Air Access

Traditionally, air superiority has meant the ability to conduct operations at will in enemy airspace, with minimal interference. This was underpinned by cutting-edge fighter jets, beyond-visual-range missiles, and large-scale control of the electromagnetic spectrum. However, the proliferation of integrated air defence systems (IADS), like Russia's S-400 and China's HQ-9B, combined with modern electronic warfare (EW), has shifted the emphasis toward contested access.

Western doctrine, particularly from NATO and the U.S., now refers increasingly to *"temporary air superiority"* or *"air access windows."* These are short-lived periods during which a combination of electronic suppression, kinetic strikes, and decoy drones neutralise enough air defences to allow limited air operations. As *RAND noted in a 2024 report, "the assumption of uncontested skies is no longer operationally sound in any peer-to-peer or near-peer conflict."

Predator Image© KAI

Drone Saturation: The Great Equaliser

In Ukraine, Libya, and Nagorno-Karabakh, we've witnessed the levelling impact of drone proliferation. Systems like the Turkish Bayraktar TB2, Iran's Shahed-136, and U.S.-made Switchblade loitering munitions have demonstrated that even modestly equipped forces can deny aerial freedom to superior air forces.

Ukraine's ability to delay Russian air operations in contested regions has relied not on jets, but on a distributed network of man-portable air defence systems (MANPADS), radar-guided SAMs, and drone reconnaissance. These have created what some analysts term a "democratic air denial zone," where air operations are costly and time-limited.

Layered Denial Strategies

Countries facing technologically superior adversaries have increasingly turned to layered defence doctrines. Iran and North Korea, for example, are investing in redundancy-heavy, decentralised air defence strategies; employing everything from truck-mounted SAMs to decoy radars and domestically produced drones to complicate strike planning.

China's concept of "System Destruction Warfare" combines cyber, space, kinetic, and EW strikes to blind and fragment enemy capabilities before a single aircraft even takes off. Meanwhile, Taiwan has developed a mobile and hidden air defence matrix, with indigenous Sky Sword II missiles and truck-mounted radars, to deny air access without requiring air superiority.

The Decline of Platform-Centric Doctrine

With the rise of distributed threats, modern doctrine is less about the aircraft and more about the network. Instead of fielding lone, high-value assets like the F-22 or Su-57 deep into enemy territory, newer doctrines favour disaggregated systems.

The U.S. Next Generation Air Dominance (NGAD) programme is a case in point—combining manned "mothership" aircraft with autonomous wingman drones to complicate enemy targeting and extend combat reach.

Similarly, Israel's use of AI-enabled drones for real-time strike decisions, or China's reported deployment of semi-autonomous swarms in exercises near Taiwan, suggest that manned aircraft will increasingly operate at the centre of a wider digital kill web.

Hypersonics and Missile Ambiguity

Adding another layer of complexity are hypersonic glide vehicles (HGVs) and dual-use ballistic missiles, which blur the line between air and missile domains.

Russia's Kinzhal and China's DF-ZF systems can strike with high speed and unpredictability, placing immense strain on traditional air defence infrastructure.

The U.S. and allies are responding with multi-layered missile defence strategies, incorporating interceptors like the THAAD and Patriot systems alongside directed-energy weapons under development.

The Strategic Outlook: Balanced Dominance

As 2025 unfolds, the global trend is toward a hybrid approach: limited, high-tech air superiority operations paired with resilient denial tactics. Countries are preparing for wars where the skies are never truly clear and operational success depends on creating—and exploiting—brief openings. The question is no longer who owns the skies—but for how long, and at what cost?

**"RAND" refers to the RAND Corporation, a prominent American non-profit research organisation that provides analysis and policy recommendations to the United States Armed Forces and allied governments. RAND is known for its in-depth, evidence-based reports on defence, security, technology, and strategic policy.*

THE RISE OF REGIONAL AIR DOMINANCE

How UAE, India, Turkey and South Korea are Redrawing the Fighter Jet Map

As global defence dynamics shift in the wake of supply chain constraints, stalled joint programmes, and rising geopolitical tensions, four nations are reshaping the regional balance of power through strategic investments in military aviation: the United Arab Emirates, India, Turkey, and South Korea.

While each is operating under vastly different political and economic conditions, a common thread unites them — a determination to assert greater independence and influence through next-generation airpower.

India: Bridging the Capability Gap

India's Air Force, long seen as a regional heavyweight, is facing increasing pressure to replenish and modernise its combat fleet. With squadron strength reduced to 31 — well below the sanctioned 42 — the Indian Ministry of Defence has fast-tracked a raft of acquisitions and indigenous programmes.

The rollout of the Tejas Mk 1A, an upgraded version of the homegrown light combat aircraft, is expected to begin later this year, with 83 aircraft on order. Meanwhile, development of the stealthy Advanced Medium Combat Aircraft (AMCA) continues, with prototype work targeted for 2028.

India is also enhancing its aerial surveillance and command capability. The Netra Mk II AEW&C programme, in tandem with the new Akashteer integrated command-and-control system, aims to provide better situational awareness, digital battlefield management and fast reaction times — key in a region where both China and Pakistan are investing heavily in drone and missile capabilities.

Russia, still a key defence partner, has offered India a co-production stake in its Su-57 fifth-generation fighter. While discussions remain exploratory, the proposition underscores India's hybrid approach: developing its own platforms while remaining open to strategic collaborations.

UAE: Quietly Building Strategic Partnerships

The United Arab Emirates, a Gulf state more

Tejas MK 1A. Image© India Air Force

often associated with high-end Western defence procurements, has signalled its intent to move into a more active role in fighter development. In a move that surprised many, Abu Dhabi signed a letter of intent with South Korea to explore participation in the KF 21 Boramae programme — a 4.5-generation fighter with stealth-ready capabilities.

This potential collaboration offers the UAE more than just hardware. It places the country at the centre of a growing Asian defence production ecosystem, with long-term prospects for local assembly, technology transfer, and even re-export.

Should this agreement solidify, it will represent a strategic pivot away from sole reliance on Western platforms, while offering the Emirates a future path toward indigenous production.

KF 21. Image© KAI

South Korea: Export Potential Takes Flight

South Korea's KF 21 programme, led by Korea Aerospace Industries (KAI), is moving from prototype to production with striking efficiency. The first serially produced Block I aircraft are due to enter service in 2026, with 40 jets ordered so far. Development of the Block II variant, featuring enhanced stealth and air to ground capabilities, is already under way with a production goal of 2028–2032.

Backed by a longstanding alliance with the United States and partially funded by Indonesia, the KF 21 is positioned to become a serious export contender. The interest from the UAE, alongside other regional inquiries, suggests that South Korea is successfully leveraging its technological edge and diplomatic neutrality to secure a foothold in the global fighter market.

The eventual KF 21EX variant is being pitched as a true fifth-generation (5.5) aircraft — with internal weapons bays, full stealth shaping, and integrated network warfare capabilities.

Turkey: The TF-Kaan Enters the Frame

After being removed from the F-35 programme in 2019, Turkey accelerated development of its own stealth fighter. The TF Kaan, built by Turkish Aerospace Industries (TAI), completed its maiden flight in 2024 and is expected to enter limited series production by 2028. Far more than a consolation project, TF Kaan is now a national priority. It is backed by significant domestic investment and supported by a growing network of potential export partners, including Azerbaijan, Malaysia, Saudi Arabia, and Indonesia.

What sets Turkey apart is its willingness to offer co-development and assembly options to partner nations — a model echoing what the US and Europe did in the 20th century, but with far fewer geopolitical strings attached. Turkey's ambitions are clear: establish itself as a defence technology exporter and a regional military-industrial hub.

A Shift Toward Multipolar Airpower

This emerging cohort of fighter-producing nations is changing the global aerospace equation. The narrative is no longer solely dictated by Washington, Moscow, or Beijing. Increasingly, countries with strong regional interests, industrial capabilities, and geopolitical agency are staking their own claims to air dominance.

Eyes on the Sky

The rise of regional air dominance is not only altering the military balance in Asia and the Middle East — it is redefining how next-generation fighter development is approached. These nations are blending sovereign capability with selective partnerships, prioritising long-term industrial value as much as tactical advantage.

For legacy manufacturers, the message is clear: the market is becoming more competitive, more fragmented, and far more dynamic.

For the rest of the world, it's time to watch the skies — because the next major shift in aerial power projection might not come from the usual suspects.

Nation	Programme(s)	Key Milestones	Strategic Goal
India	Tejas Mk 1A, AMCA, Su-57 (proposed)	Deliveries by 2026; AMCA prototype by 2028	Fill squadron gap, project regional deterrence
UAE	KF 21 partnership (potential)	LoI signed in 2025	Enter defence production, diversify supply base
South Korea	KF 21 Boramae, KF 21EX	First 40 aircraft by 2028	Compete globally, bolster alliance with US, Indonesia
Turkey	TF Kaan	Initial production expected by 2028–29	Strategic independence, position as export leader


Artists Impression F-47 Image© BOEING

NGAD: THE F 47 USHERS IN A NEW ERA OF AIR DOMINANCE

Sixth-Generation Stealth Fighter Enters Initial Production.

The United States has advanced its air superiority strategy with the rollout of the Next Generation Air Dominance (NGAD) programme—a sixth-generation fighter aircraft known unofficially as the F 47, under development by Boeing. Designed to replace the aging F 22 Raptor, the NGAD platform will be central to a broader "system of systems" aimed at dominating contested airspaces in future conflicts.

The aircraft's development forms part of a classified but high-priority programme that aims to ensure U.S. strategic advantage, particularly in theatres facing near-peer threats such as China in the Indo-Pacific region. According to U.S. Secretary of the Air Force Frank Kendall, NGAD will deliver "transformational capabilities" to the U.S. Air Force by the early 2030s.

Beyond a Fighter: A Networked "Family of Systems"

What sets the NGAD initiative apart from its predecessors is its manned-unmanned teaming model. At the heart of this concept is the introduction of

Collaborative Combat Aircraft (CCAs)—uncrewed, AI-enabled wingmen that will operate alongside the manned F 47 fighter. These CCAs will execute a range of roles including surveillance, electronic warfare, and precision strikes, thereby expanding the operational envelope of the manned aircraft while keeping human pilots out of the most dangerous zones.

The system's open architecture also allows for rapid updates and modular integration of future technologies—part of the U.S. Air Force's strategy to avoid the decades-long platform stagnation seen with legacy programmes like the F 22 and F 35.

According to Defense News, the NGAD programme aims not just to introduce a new fighter, but to pioneer a new combat ecosystem defined by distributed lethality, stealth, and networked resilience.

$20 Billion Contract and Production Timeline

Initial production began in 2025 under a contract reported to be worth approximately $19.8 billion, making it one of the largest investments in military aviation in over a decade. Although the full technical specifications of the F 47 remain classified, U.S. defence sources have confirmed that it will feature next-generation stealth shaping, adaptive engine technology, and advanced data fusion systems.

A full operational capability is targeted for the early 2030s, with some components—such as CCAs and networking infrastructure—possibly being fielded sooner. Reports suggest the U.S. Air Force is pursuing

a Digital Century Series approach, using advanced modelling and simulation to speed up prototyping and development cycles.

Strategic Deployment: The Indo-Pacific Front Line

The NGAD platform is being tailored for use in the Indo-Pacific theatre, where the U.S. faces increasing competition from China's expanding air and missile forces. With China's fifth-generation J 20 stealth fighter and unmanned systems gaining prominence, the U.S. aims to maintain its technological edge through platforms like NGAD, which offer extended range, low observability, and autonomous coordination.

The region's vast geography and growing air defence challenges demand a fighter with not just advanced combat capabilities, but also long endurance and deep penetration potential—traits the NGAD is being explicitly designed to meet.

A Leap Into Sixth-Generation Air Warfare

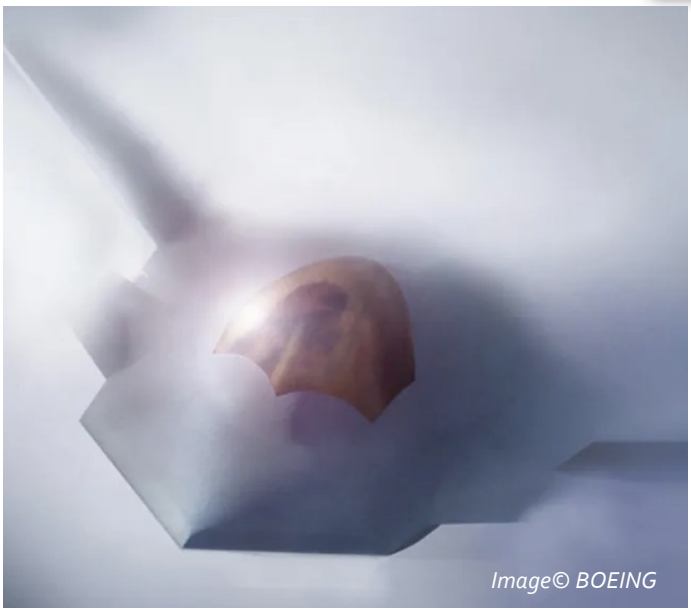
The NGAD programme represents more than an aircraft; it symbolises a shift in U.S. defence strategy toward multi-domain, data-driven combat operations. As geopolitical tensions mount in a multi-polar world, the emergence of platforms like the F 47 marks the beginning of sixth-generation air warfare—fusing manned and unmanned systems, artificial intelligence, and cyber warfare into an integrated force.

With production now underway and a clear strategic vision guiding its development, the NGAD programme is set to redefine the future of air dominance—not just for the U.S., but for its allies navigating an increasingly complex global security landscape.

Notes:

- NGAD is not yet operational, so data reflects projections based on official U.S. Air Force statements and analyst expectations.
- J 20 capabilities are improving rapidly but remain classified; its true stealth and systems integration level are debated.
- Su 57 production remains limited and has not yet reached full operational capability.
- Rafale F4 and Gripen E represent the peak of fourth-gen+ versatility and modernisation, but lack full stealth characteristics.

F 22 Raptor. Image© WIKI Commons



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J-10C Multirole Fighter Image© Chengdu Aerospace Corporation

CHINA'S AIR POWER: PRECISION, SPEED, AND STRATEGIC REACH

In a world where military strength is defined not just by numbers, but by technological superiority and rapid deployment, China's armed forces are no longer in a phase of development—they are fully deployed, battle-ready, and engineered to overwhelm adversaries before they can respond. The transformation of the People's Liberation Army Air Force (PLAAF) into a modern, high-tech force is not theoretical. It is real, operational, and reshaping the global balance of power.

The Backbone: J-10C – Precision and Versatility

Leading the charge is the Chengdu J-10C, a multirole fighter that has become a cornerstone of China's frontline air fleet. This agile aircraft measures 55 feet 5 inches in length and is capable of both air-to-air combat and precision ground strikes. With a top speed of Mach 1.8–2.0 and an operational range of 1,100–1,500 km for combat missions., it is designed to engage targets at a distance and dominate regional airspace.

The J-10C is armed with PL-10 and PL-15 missiles, offering a formidable combination of short-range dogfighting capability and long-range interception power. Its Active Electronically Scanned Array (AESA) radar enables it to lock onto multiple targets—even under heavy electronic warfare conditions—while stealth-enhancing features like radar-absorbent materials and a reduced radar cross-section canopy improve its survivability.

Equipped with a modern fly-by-wire control system, the J-10C is capable of high-speed manoeuvres in any weather, day or night. It has been combat tested, and regular software and avionics upgrades have kept it at the cutting edge of Chinese air power. Far more than just a fast aircraft, it is a precision weapon built for the realities of 21st-century warfare.

The Spearhead: J-20 Mighty Dragon – Stealth and Superiority

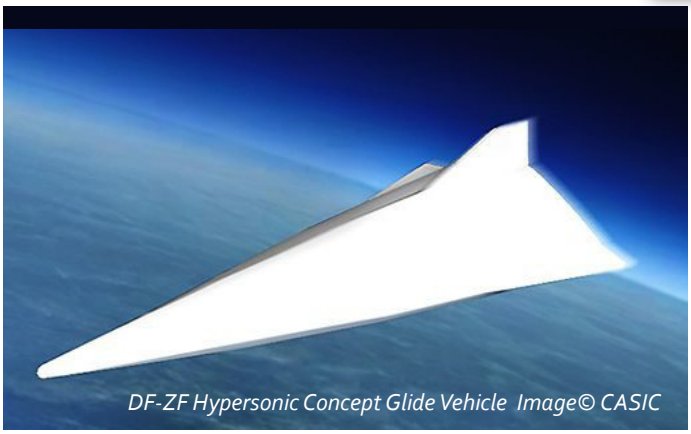
If the J-10C is the backbone of China's Air Force, the J-20 "Mighty Dragon" is its spearhead. Designed as a direct competitor to the American F-22 Raptor, the J-20 is China's most advanced stealth fighter to date. This twin-engine, delta-canard design stretches 66.9 feet in length, reported to reach approximately Mach 2, and can fly over 2,700 km, miles without refuelling.

Armed with PL-10 and PL-15 air-to-air missiles, the J-20 stores all weaponry inside internal bays to minimise its radar signature. Advanced technologies like AESA radar, infrared search and track (IRST), and sensor fusion allow the aircraft to detect and engage targets beyond visual range—often before it has been detected itself.

With thrust vectoring for tight turns, low observable coatings, and integrated systems designed for both evasion and lethality, the J-20 represents a leap forward in Chinese air dominance. Already active in multiple squadrons, it signals China's intent to not only match but exceed Western capabilities in stealth and electronic warfare.

The Game-Changer: DF-ZF Hypersonic Glide Vehicle

While fighters dominate the skies, China's ambitions extend beyond conventional air combat. The DF-ZF hypersonic glide vehicle, launched atop the DF-17 ballistic missile, is a strategic weapon that changes the calculus of global defence planning. Estimated at 18 to 20 feet in length, the DF-ZF achieves hypersonic speeds between Mach 5 and Mach 10 (3,800 to 7,700+ km/h) , and can strike targets up to 1,200 miles away.

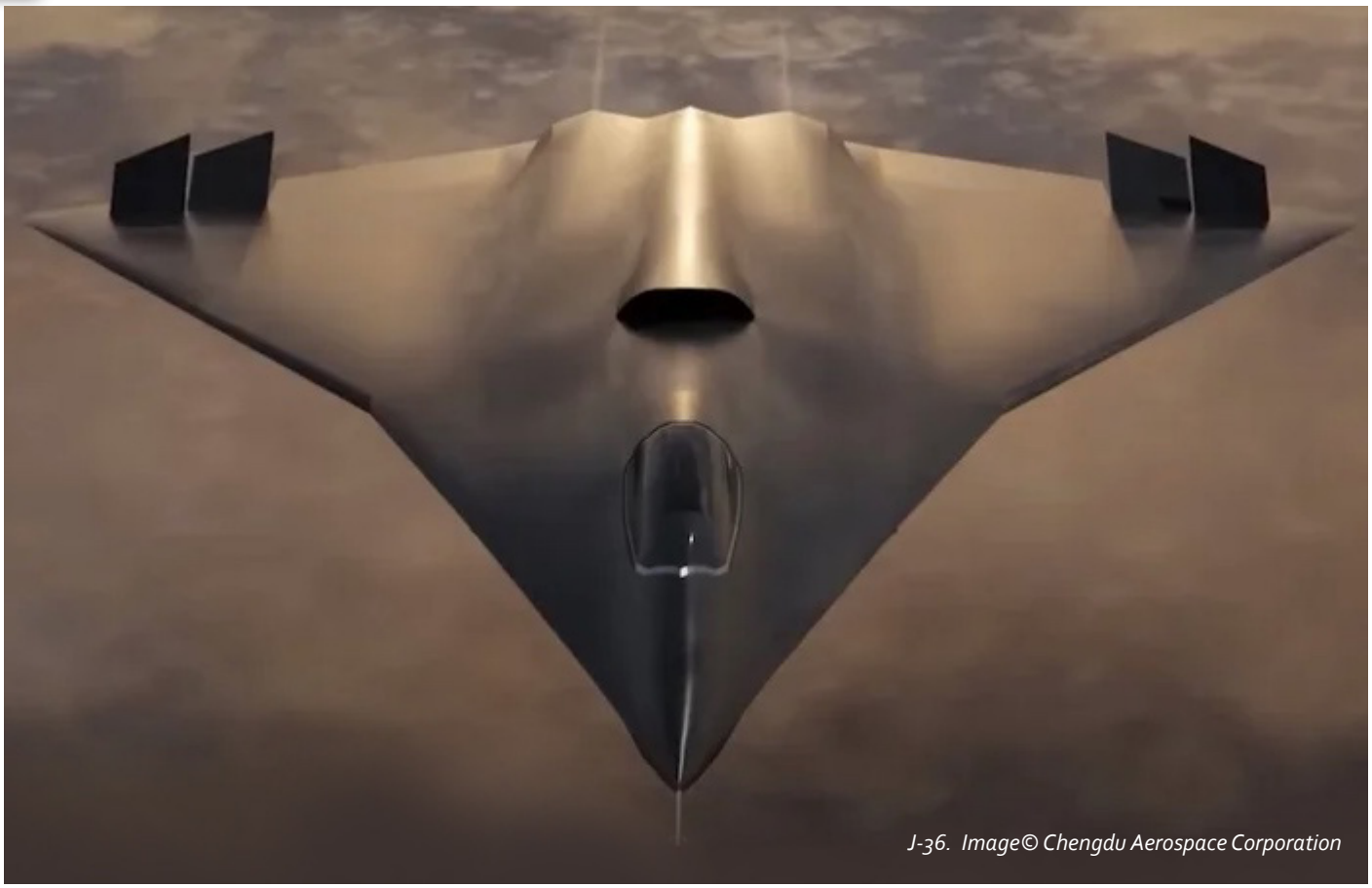


DF-ZF Hypersonic Concept Glide Vehicle Image© CASIC

What sets the DF-ZF apart is not just its speed, but its unpredictability. After launch, it detaches and glides at low altitudes through the atmosphere, changing direction mid-flight to evade radar and missile defences. Capable of carrying either conventional or nuclear warheads, it presents a dual-use threat suited for both tactical and strategic missions.

Deployed on mobile launchers, the DF-ZF can be rapidly repositioned, making it difficult to detect or neutralise preemptively. Its unpredictable flight path and extreme velocity make it virtually impossible to intercept

J-20 Mighty Dragon. Image© Chengdu Aerospace Corporation



J-36. Image© Chengdu Aerospace Corporation

using current defensive systems—a clear statement that China has developed a credible first-strike capability.

Next-Gen Development: The J-36 and the Sixth-Generation Frontier

As China consolidates its fifth-generation capabilities, it is also looking ahead. Enter the J-36, a highly secretive and still largely speculative project believed to represent China's sixth-generation fighter ambitions. Though yet to be officially confirmed, multiple sightings and leaked images suggest that Chengdu Aerospace Corporation (CAC) is leading the development of this futuristic platform.

Described as a large, tailless stealth aircraft, the J-36 is thought to incorporate cutting-edge technologies aimed at achieving dominance in both long-range strike and command and control operations. It reportedly features a tri-jet engine configuration—a rare and unconventional design element that may offer enhanced thrust and endurance. With a projected length of 22 metres and wingspan of 20 metres, this aircraft is considerably larger than today's tactical fighters.

Its said that features may include:

- Advanced low-observable design with radar-absorbent coatings and minimal radar cross-section,
- Diverterless supersonic inlets (DSI) for reduced drag and enhanced stealth,
- Internal weapons bays designed for larger payloads and multi-role flexibility,
- Potential for CATOBAR (catapult-assisted takeoff and barrier arrested recovery) operations, hinting at a naval carrier-based variant,
- Side-by-side crew seating, possibly indicating enhanced onboard processing or joint pilot-operator roles in contested airspace.

Perhaps most significantly, the J-36 is widely viewed as China's answer to the U.S. Next Generation Air Dominance (NGAD) platform—both in concept and capability. It is thought to be a key part of China's broader strategy not only to match but potentially outpace U.S. air power in future theatres of operation.

While official confirmation remains elusive, the emergence of the J-36 underscores a clear message: China's aerospace development is accelerating, and it is preparing to define the next era of aerial warfare.

A New Global Aerospace Reality

China's arsenal is no longer rising—it is ready. With platforms like the J-10C and J-20 in active service, hypersonic systems like the DF-ZF deployed, and sixth-generation concepts like the J-36 in development, Beijing has positioned itself at the forefront of military aerospace technology. These weapons are fast, precise, and strategically integrated, fundamentally altering the global security environment.

The future of air combat may not be decided in distant decades. It is already being shaped—by speed, stealth, and surprise—in the skies over China.

CBRN DEFENSE MARKET POISED FOR STEADY GROWTH AMID RISING GLOBAL THREATS

By: Market and Markets

The global Chemical, Biological, Radiological, and Nuclear (CBRN) Defense market is projected to grow from USD 16.1 billion in 2023 to USD 21.4 billion by 2028, reflecting a compound annual growth rate (CAGR) of 5.8%. This steady growth trajectory underscores a heightened global emphasis on preparedness and response to unconventional threats.

CBRN defence solutions are increasingly vital for governments, armed forces, and emergency responders who rely on advanced systems for the detection, identification, and neutralisation of CBRN and high-yield explosive threats. The market's evolution is strongly linked to geopolitical instability, growing military budgets, and the demand for comprehensive protection strategies.

Technology Integration and Market Dynamics

On the supply side, the integration of modern technologies such as virtual reality, augmented reality, and the Internet of Things (IoT) is shaping the future of CBRN defence. These tools enhance training, operational readiness, and situational awareness, particularly in high-risk environments.

Key industry players driving this innovation include:

- Thales Group (France)
- Rheinmetall Defence (Germany)
- Smiths Group PLC (UK)
- Bruker Corporation (US)
- Teledyne FLIR LLC (US)

Their contributions range from advanced detection systems to wearable protection and simulation equipment.

Chemical Threats Dominate Market Share

Of the five primary CBRN threat categories—chemical, biological, radiological, nuclear, and explosives—the chemical segment is expected to maintain the largest share from 2023 to 2028. The surge in global chemical warfare threats has accelerated demand for detection systems and protective gear capable of defending against toxic industrial chemicals (TICs), toxic industrial materials (TIMs), and chemical warfare agents (CWAs).

Core components in this segment include hazmat suits, gas masks, gloves, and field-portable chemical detectors, all designed to ensure frontline safety in volatile environments.

Protective Wearables Lead Equipment Demand

Within the equipment category, protective wearables are projected to dominate. These encompass a wide array of essential gear including respiratory systems, escape devices, protective clothing, and accessories. Designed for both military and civilian use, such gear forms the first line of defence in high-threat scenarios.

Other equipment segments include detection and monitoring systems, decontamination units, simulation tools, and information management software—each playing a critical role in an integrated CBRN defence strategy.

Asia Pacific Takes the Lead

The Asia Pacific region is forecasted to hold the largest market share through to 2028. Rising regional instability and an uptick in terror-related incidents have compelled nations such as India and China to ramp up their CBRN preparedness. Increased defence spending, coupled with the expansion of military capabilities and biowarfare programs, is fuelling demand across the region.

Strategic investments in CBRN defence—targeted at enhancing armed forces, border security, and emergency response systems—are reshaping the security landscape across Asia Pacific.

As threats evolve and unconventional warfare becomes a growing concern, the CBRN Defence market is positioned as a critical sector within global defence planning. Driven by innovation, increased awareness, and strategic investment, the market is set to maintain steady growth over the next five years—reinforcing the essential role of preparedness in the modern threat environment.

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THE NEW ARSENAL: WHAT DEFENCE OEMS ARE SELLING IN 2025

As defence budgets expand in response to rising geopolitical tensions, the world's major original equipment manufacturers (OEMs) are accelerating innovation and production. In 2025, the global arms market is defined by the rapid development of autonomous systems, advanced air and missile defence technologies, electronic warfare capabilities, and integrated AI solutions—products now shaping the future battlespace.

Strategic Growth Among Western OEMs

Across the United States, industry leaders like Boeing, Northrop Grumman, and RTX (formerly Raytheon Technologies) are capitalising on robust demand from the Pentagon and allied governments. Boeing is leading the charge on the Next Generation Air Dominance (NGAD) programme, with a contract reportedly worth around US$20 billion to deliver stealth-capable manned fighters designed to operate alongside autonomous drones. This sixth-generation aircraft initiative reflects a broader move toward collaborative combat aviation, where AI and human pilots share the cockpit space—virtually or physically.

Northrop Grumman, meanwhile, is scaling up production of its B-21 Raider stealth bomber and precision munitions portfolio, citing strong global interest. The company recently raised its 2025 earnings forecast due to a surge in long-range strike capability procurement. RTX continues to dominate in the missile defence domain with its Patriot and NASAMS systems, maintaining a multibillion-dollar backlog driven by ongoing conflict in Ukraine and the Indo-Pacific region.

European Manufacturers Boost Output

In Europe, the Swedish manufacturer Saab has fast-tracked production capacity to meet increased demand for the Gripen E fighter, as well as ground-based air defence and surveillance systems. Forecasting 16 to 20 percent sales growth in 2025, Saab's order book includes customers in Eastern Europe and Latin America seeking to modernise their air forces.

Germany's MBDA has expanded its Enforcer missile family, including the new DefendAir variant tailored for counter-unmanned aerial system (C-UAS) operations.

This compact, shoulder-fired missile is already under contract with the German Army, reinforcing Europe's shift toward lightweight, deployable defence solutions suited for both urban warfare and border protection.

The Rise of Emerging Market OEMs

A notable trend at global defence exhibitions such as IDEX (Abu Dhabi) and AUSA Global Force (USA) is the prominence of non-Western OEMs offering innovative and often lower-cost alternatives.

B21 RAIDER Image© Northrop Grumman

AI in MIlitary Drones IMAGE ©: Market & Markets

Estonia's Milrem Robotics unveiled its HAVOC 8×8 robotic combat vehicle—an unmanned, hybrid-electric platform designed for reconnaissance, resupply, and direct fire missions. UAE's EDGE Group and Halcon showcased the SkyKnight short-range air defence system and a new line of precision-guided munitions, alongside upgraded AJBAN MK2 tactical vehicles.

From Turkey, ASELSAN has introduced the ALKAR automatic mortar system and ATOM 25 mm airburst munitions, catering to both NATO-standard and indigenous armed forces. South Korea's Hanwha Aerospace is making inroads in naval propulsion, energy storage, and medium-range SAM systems—markets once dominated by Western OEMs.

Digital Warfare and Integrated AI

While hardware remains central, software is rapidly becoming the defining edge. Palantir Technologies and Leidos are pioneering AI-enabled battlefield decision platforms, supporting predictive logistics, threat analysis, and real-time command and control systems.

These technologies are being rolled out across NATO exercises and command centres in Europe and the Indo-Pacific.

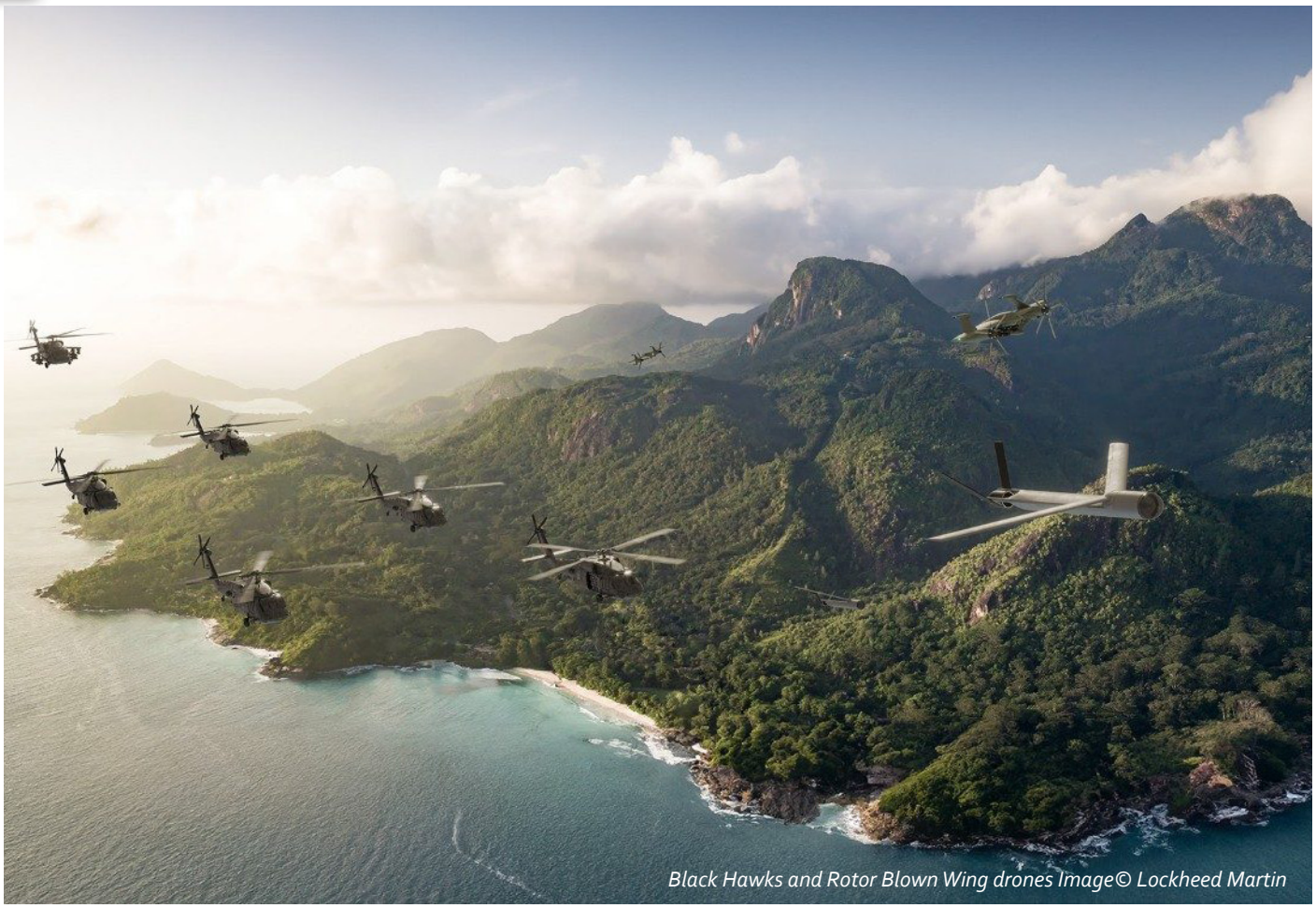
Electronic warfare and electromagnetic spectrum dominance are also gaining priority. Canada's Allen-Vanguard introduced a flexible RF cyber-electromagnetic activity (CEMA) solution, designed to counter drone swarms, jammers, and improvised threats in multi-domain environments.

Interoperability and Modular Design

Across the board, modularity and cross-platform compatibility are key drivers in procurement. The U.S. Army's recent push for a "common launcher" capable of firing NATO-aligned munitions, hypersonic weapons, and even directed-energy payloads reflects a wider strategy: reducing logistics burden while increasing flexibility in coalition operations.

As defence OEMs adapt to a rapidly shifting threat landscape, 2025's new arsenal reflects a decisive shift toward autonomy, digital integration, and agile defence platforms. Whether through AI-enabled aircraft, robotic ground vehicles, or smart munitions, the next generation of military systems is no longer defined by raw firepower alone—but by adaptability, intelligence, and interoperability.

In a world increasingly shaped by hybrid warfare and contested domains, these offerings form the backbone of future joint operations and defence strategies. From Washington to Warsaw, and Seoul to Stockholm, the global defence industry is evolving—not only in what it builds, but in how it enables warfighters to operate, think, and survive in tomorrow's battlespace.



Black Hawks and Rotor Blown Wing drones Image© Lockheed Martin

CREWED-UNCREWED TEAMING: TRANSFORMING U.S ARMY AVIATION

Operating in the Indo-Pacific presents some of the most challenging conditions for ground forces anywhere in the world. The region is a patchwork of dense rainforests, rugged mountains, and dispersed island chains that create ideal cover for adversaries. Severe weather, heavy vegetation, and complex terrain limit visibility and make traditional intelligence, surveillance, and reconnaissance (ISR) operations far more difficult.

Against this backdrop, the U.S. U.S Army is developing and deploying a capability that could reshape how it fights and sustains forces in these environments: crewed-uncrewed teaming (C-UT). By combining piloted aircraft with autonomous and remotely piloted drones, the U.S Army aims to achieve a new level of awareness, flexibility, and precision in the lower-tier air/ground domain—the critical slice of airspace between the surface and 1,000 feet.

This approach is designed to give commanders a clearer, faster, and more reliable picture of the battlefield, while reducing risk to personnel and expanding operational reach.

Sharper Eyes, Faster Response

Consider a scenario over the dense forests of a contested Indo-Pacific island. A UH-60 Black Hawk helicopter approaches low and fast, avoiding radar detection while staying below treetop level. Before reaching the forward edge of the battlefield, the crew deploys Launched Effects (LE) drones)—small, agile unmanned aircraft that immediately disperse into the surrounding airspace.

These drones fan out to conduct reconnaissance, scanning the terrain for hidden enemy positions or ambushes. They relay live video and sensor data back to the Black Hawk, which in turn acts as a flying command node, connecting the drones to both ground forces and higher-echelon command posts.

In the operations centre, digital battle screens light up as new ISR feeds come online. Concealed enemy units—previously undetectable due to dense vegetation—are now visible. This allows commanders to allocate resources and target threats quickly. Attack

helicopters, artillery batteries, or long-range rocket systems such as HIMARS can be tasked with precision strikes before the adversary even realises it has been located.

On the ground, platoon leaders and infantry units benefit as well. Connected to the same network, they can assume control of nearby drones to scan the terrain immediately ahead. This provides a constantly updated picture of potential threats and hazards, improving the safety and speed of manoeuvre in contested environments.

The result is a force that can see farther, decide faster, and strike first, all while minimising exposure to risk.

Reimagining Logistics in Contested Skies

The benefits of crewed-uncrewed teaming extend beyond reconnaissance and targeting. Logistics—the lifeblood of any military operation—is also being transformed.

Forward operating bases and mobile logistics hubs in the Indo-Pacific must often operate under the threat of enemy surveillance or missile attack. Resupplying front-line units with ammunition, fuel, and medical supplies has traditionally required manned helicopters to fly through dangerous airspace.

C-UT provides a safer, more flexible alternative. In the emerging concept of operations, Black Hawks are paired with Rotor Blown Wing (RBW) drones—innovative tail-sitting aircraft capable of taking off and landing like a helicopter, but cruising like a fixed-wing plane. In practice, this means that piloted Black Hawks and autonomous RBW drones can work together to deliver thousands of pounds of cargo directly to the point of need, even in contested areas. Supplies that once required high-risk manned flights can now be delivered autonomously or semi-autonomously, reducing exposure for flight crews and increasing the tempo of resupply missions.

The Technology Behind the Transformation

The U.S. U.S Army has articulated a clear vision for how crewed-uncrewed teaming can transform both combat and support operations. Lockheed Martin and U.S Army test units have been actively developing and trialling these capabilities in real-world conditions.

To fully realise the potential of C-UT, three key areas are being prioritised:

1. Modernising the Black Hawk

- Engine upgrades will increase payload, range, and lift capacity, crucial for the vast distances of the Indo-Pacific.
- Onboard drone integration will allow Black Hawks to serve as forward-deployed launch and control nodes for uncrewed aircraft.
- Modular Open Systems Approach (MOSA) digital architecture will enable rapid upgrades and seamless integration with new uncrewed systems.

With these enhancements, the Black Hawk becomes more than a troop and cargo carrier—it becomes a central hub in a networked battlespace. Initial federated mission command capability is expected by early 2026, giving commanders the ability to coordinate air and ground assets simultaneously.

2. Cultivating a Diverse Fleet of Uncrewed Systems

- Modern battlefields demand a spectrum of uncrewed solutions. Small, expendable drones can be used for close ISR or as decoys in contested airspace. Larger, more survivable vertical take-off drones can conduct deep reconnaissance or deliver logistics payloads over long distances.
- On the ground, unmanned vehicles can carry extra supplies, scout ahead, and extend the sensory reach of advancing units.
- By leveraging industry innovation and rapid prototyping, the U.S Army is moving toward a flexible, multi-layered uncrewed ecosystem.

3. Embracing Scalable Autonomy

- Autonomy is not about replacing human pilots but enhancing their capability. Lockheed Martin's MATRIX™ technology allows aircraft to navigate, avoid obstacles, and conduct portions of missions autonomously.
- Pilots gain enhanced situational awareness in poor weather, darkness, or degraded visual environments.

Autonomous flight modes can take control when pilots need to focus on mission-critical tasks.Fully autonomous drones can provide extra lift, extend sensing networks, and support strike missions without exposing crewed assets.

Innovation as Deterrence

This networked, integrated approach to U.S Army aviation offers more than just tactical advantages and strategic implications.

By proving that its platforms can operate effectively in complex and contested environments, it signals that any attempt by potential adversareis to deny terrain will face a rapid and coordinated response.

With crewed-uncrewed teaming, the U.S Army is not only preparing for the future of warfare; it is actively reshaping it.

This feature incorporates information from a Lockheed Martin article by Stephanie C. Hill, published in October 2024, and has been adapted for World Airnews readers Stephanie Hill at this time was President, Lockheed Martin Rotary and Mission Systems.

BLACK HAWK AND APACHE: THE ICONS OF MILITARY ROTORCRAFT IN 2025

As of mid-2025, two helicopters dominate the global military aviation landscape—one for its legendary utility and battlefield resilience, the other for unmatched firepower and digital integration. The Sikorsky UH-60 Black Hawk and the Boeing AH-64E Apache Guardian represent the pinnacle of current rotary-wing capabilities while pointing the way forward through modernisation and AI integration. Together, they embody the evolving nature of multi-domain warfare, mission flexibility, and international interoperability.

UH-60 Black Hawk: A Global Workhorse Gets Smarter
When the mission is on the line, few platforms are as trusted as the Black Hawk. Rugged, versatile, and globally recognised, this helicopter is the backbone of utility aviation for over 30 countries. With more than 3,940 operational units worldwide, the UH-60 continues to deliver across a range of roles: troop transport, casualty evacuation, extraction, disaster response, and special operations.

Proven, Adaptable, and Battle-Tested

Built from the ground up to military specifications—not adapted from civilian models—the Black Hawk thrives in the toughest conditions. Its combat record speaks for itself: over 15 million flight hours, with five million in combat, and more than 5,000 aircraft built for 36 nations.

Key mission configurations include:

- **Combat Assault:** Armoured protection, external weapons, and troop delivery
- **Medevac/Search and Rescue:** Rescue hoist, EO/IR sensors, and weather-resilient avionics
- **Firefighting:** Bambi water Bucket and C2 coordination
- **Special Operations:** Fast-roping, extended-range tanks, low-visibility systems
- **Logistics and Utility Transport:** Up to 12 combat troops or 4,080 kg of cargo

Modernisation: AI and Autonomy on the Horizon

What keeps the Black Hawk at the forefront is its commitment to evolving. Through a collaboration with Skyryse, the U.S. Army is testing SkyOS, a universal flight operating system designed to simplify pilot workloads and introduce pilot-optional autonomy.

This opens pathways to reduced human error, shorter training pipelines, and expanded autonomous logistics capabilities.

In addition, new features include:

- Improved turbine engines with 50% more power
- Modular Open Systems Architecture (MOSA) for seamless tech upgrades
- Autonomy support for degraded visual environments

Sikorski UH-60 BLACK HAWK Image© Lockheed Martin Sikorski

- Digital Sustainment Twin for predictive maintenance, and fleet readiness and improved training
- Launched Effects Integration: Unmanned teaming and ISR sharing

The Black Hawk isn't just staying relevant after 50 years, it's preparing for the battles of the 2060s.

AH-64E Apache Guardian: Precision and Lethality Redefined

While the Black Hawk owns the utility crown, the Boeing AH-64 Apache remains the undisputed champion of the battlefield strike mission. Since its introduction in 1984, the Apache has evolved into the world's most advanced multi-role attack helicopter, with over 1,280 units delivered and five million flight hours, including 1.3 million in combat.

AH-64E Version 6: MDO Ready

The current production model, the AH-64E v6, is fully tailored for Multi-Domain Operations (MDO), potentially even in cyber space—combining long-range lethality, digital interoperability, and network-centric warfare capability.

Core features include:

- Advanced targeting sensors and modular digital architecture, with fire control radar
- T700-GE-701D engines with upgraded transmissions
- Drone/UAV teaming via manned-unmanned interface
- Joint Tactical Information Distribution System (JTIDS)

AH-64E Apache. Image© Boeing

- Composite rotor blades and improved survivability

With a top speed of 150+ knots, ceiling of 20,000 ft, and payloads including 16 Hellfire missiles, 76 2.75" rockets, and 1,200 rounds for the 30mm chain gun, the Apache is optimized for high-precision, high-risk missions.

A Global Strike Asset

The Apache fleet is expanding rapidly—recently inducted by India in July 2025—and is increasingly integrated into networked battle strategies. Australia, for example, is pairing its Apaches with armed drones for extended reach and survivability.

Each new model builds on the legacy:

- **AH-64A (1984–1997):** Introduced core systems; over 900 units built
- **AH-64D Longbow (1997–2013):** Radar-guided targeting and night/all-weather ops
- **AH-64E v6:** Modular, AI-connected, combat-proven
- **Modernised Apache (Next Gen):** Leverages MOSA and legacy production to provide a cost-effective, high-endurance strike solution well into the 2060s

The Emerging Rotorcraft Horizon

While the Black Hawk and Apache dominate in 2025, several next-gen platforms are on the horizon:

- **Bell V-280 Valor (FLRAA winner):** Tiltrotor design for speed (>280 knots) and range (>900 nm), set to replace the Black Hawk from 2031 onward
- **Sikorsky-Boeing Defiant X:** Coaxial rotor prototype with rear prop, stealthier flight, and speeds over 250 knots
- **Airbus H160M Guépard:** Unified tri-service European helicopter with low acoustic/radar profile
- **CH-53K King Stallion:** The heaviest lift helicopter in production, critical for USMC logistics
- **KAI Surion, Leonardo AW249, and KA-52M Alligator** round out regional innovations with advanced avionics, UAV pairing, and survivability enhancements

Final Verdict: Recognition, Reach, and Readiness

Most Recognised Overall: UH-60 Black Hawk
Its ubiquity, mission breadth, and modernization pipeline make the Black Hawk the most universally recognised and operationally relied-upon helicopter in the world.

Most Lethal and Advanced: AH-64E Apache Guardian
For strike and attack roles, the Apache's digital brainpower and combat record make it the unrivalled choice for frontline air dominance.

Both helicopters prove that even decades-old airframes—when continuously evolved—can remain critical to 21st-century warfare. With AI, autonomy, and open systems on the rise, the Black Hawk and Apache are not just legacy icons—they're also blueprints for the future of rotary-wing combat aviation.

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AIRBUS BEGINS FLIGHT TESTS FOR H160M GUÉPARD

Airbus Helicopters has officially launched the flight test campaign of its highly anticipated H160M Guépard, marking a major milestone in France's Joint Light Helicopter programme. The maiden flight was conducted by test pilot Samuel Chartier and flight test engineers Nicolas Certain, Laurent Maruejols, and Alban Corpron, and celebrated during a formal ceremony at Airbus Helicopters' headquarters.

Chosen by the French Ministry of Armed Forces to replace five legacy helicopter types, the H160M will serve as a common platform across all three military branches—Army, Navy, and Air and Space Force. France intends to acquire 169 units under this modernisation initiative.

A Modern Military Variant with Proven Pedigree

The H160M is derived from the civil H160, which has been in service for more than three years. Branded the Guépard (Cheetah) by the French military, this 6-tonne class aircraft is engineered for a wide range of operational scenarios. The civilian version has already proven its reliability in demanding maritime environments, particularly through the French Navy's use of six H160s on search and rescue missions—demonstrating high availability and strong performance.

"The start of the flight test campaign is a major milestone for the H160M programme," said Bruno Even, CEO of Airbus Helicopters. "The H160M is an aircraft tailored for tomorrow's military operations: reliable, agile, highly connected, and equipped with the latest generation of sensors and weaponry. Most importantly, it is highly scalable and can adapt to changing operational contexts."

Flight Testing and Programme Development

To expedite development, Airbus is constructing three H160M prototypes. The first prototype—now in flight testing—will focus on validating flight performance and is scheduled to conduct firing trials in 2026. The second prototype is nearing completion and will be dedicated to hot and cold weather testing. These phased trials are designed to refine operational readiness ahead of full-scale production and delivery.

Airbus H160M Guépard Image© Airbus

Advanced Technologies and Capabilities

Powered by Safran's Arrano engines, the H160M incorporates 68 patented innovations to reduce environmental footprint, improve safety, and lower maintenance and operational costs. It is also the first Airbus helicopter to feature native drone cooperation capability, enhancing its ability to operate as part of integrated multi-domain operations.

The H160M's mission system is developed in-house by Airbus, while the Thales FlytX avionics suite offers full situational awareness, enabling operations in degraded environments. Safran's Euroflir 410 electro-optical system and Thales' AirMaster C radar further augment its sensor payload, delivering high-precision reconnaissance and targeting capabilities.

In terms of survivability, the Guépard is equipped with a comprehensive self-protection suite designed to operate across the electromagnetic and optical spectrums. Automatic threat detection and decoy deployment systems enhance its survivability in contested environments.

Armed for the Mission

Airbus' HForce modular weapon system enables the H160M to be armed with a versatile range of effectors. The helicopter can carry 12.7 mm machine gun pods and guided rockets, as well as 7.62 mm pintle-mounted or articulated machine guns for precision engagement. These capabilities position the H160M as a multi-role platform suitable for attack, support, and rapid response operations.

Initial deliveries of the H160M to the French Armed Forces are scheduled to begin in late 2028. Airbus will provide operational support and maintenance services for at least the first ten years of deployment, ensuring mission readiness and fleet availability.

As France moves to streamline and modernise its military rotorcraft fleet, the H160M Guépard emerges not just as a replacement platform, but as a leap forward in terms of capability, connectivity, and operational adaptability—embodying the next generation of military aviation excellence.

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Autonomous Military Drone. Image© Numalis

THE DRONE WARS: UNMANNED SYSTEMS ON THE FRONTLINES

The landscape of modern warfare has been irrevocably transformed by the proliferation of drones—unmanned aerial vehicles (UAVs) that now dominate battlefields across the globe. From intelligence, surveillance, and reconnaissance (ISR) to kamikaze strikes, UAVs have become indispensable tools for both state and non-state actors. This feature delves into the multifaceted role of drones in contemporary conflicts, with a particular focus on the ongoing Russia-Ukraine war, and examines the ethical and strategic implications of their widespread use.

The Rise of Drones in Modern Warfare

Drones have democratised access to advanced military capabilities, enabling smaller nations and non-state actors to challenge established military powers. Their versatility allows for a range of operations, from surveillance to direct strikes, all while minimising the risk to human operators. This shift has led to a reevaluation of traditional military doctrines and strategies.

The Russia-Ukraine War

The conflict between Russia and Ukraine has become a proving ground for drone warfare. Ukraine has pioneered the integration of drones into its military operations, establishing a dedicated drone warfare unit and are aiming to produce over a million drones in a single year. These UAVs are employed for various purposes, including reconnaissance, artillery spotting, and direct strikes, proving highly effective at targeting enemy positions.

On the other side, Russia has escalated its use of drones, launching nightly swarms that sometimes exceed 700 units. These drones, often modified Iranian Shahed models, are equipped with thermobaric warheads and are capable of autonomous operation using artificial intelligence. This strategy has overwhelmed Ukrainian defences and marked a significant shift in Russia's military tactics.

The Role of Autonomy and Artificial Intelligence
The integration of artificial intelligence into drone systems has enhanced their capabilities, allowing for autonomous decision-making and swarm tactics. These advancements pose strategic challenges to traditional state militaries, whose doctrines are often slower to adapt to technological innovations.

However, the rapid development and deployment of AI-driven drones raise significant ethical and legal concerns. The potential for autonomous systems to make life-and-death decisions without human oversight challenges existing frameworks of accountability and international law.

Ethical and Strategic Implications

The proliferation of drones has introduced new dynamics to warfare, including the potential for increased civilian casualties and the erosion of traditional combat norms.

The use of drones in targeted killings, for instance, has sparked debates over sovereignty, accountability, and the rules of engagement.

Moreover, the accessibility of drone technology has lowered the barriers to entry for armed conflict, enabling a wider array of actors to engage in warfare. This democratisation of destruction has implications for global security and the future of conflict.

As drone technology continues to evolve, so too will its role in warfare. The future may see the development of fully autonomous drone swarms capable of executing complex missions without human intervention. This prospect necessitates urgent discussions on the establishment of international norms and regulations to govern the use of such technologies.

In conclusion, drones have ushered in a new era of warfare, characterised by increased autonomy and the integration of artificial intelligence. While they offer strategic advantages, they also present profound ethical and legal challenges that must be addressed to ensure that their use aligns with international standards and human rights principles

MILKOR AND HANWHA SYSTEMS SIGN AGREEMENT FOR AESA RADAR INTEGRATION ON THE MILKOR 380 UAV

By Florencia Lucero Heguy

South Korea's Hanwha Systems has signed a Memorandum of Understanding (MoU) to integrate its Active Electronically Scanned Array (AESA) Synthetic Aperture Radar (SAR) into the Milkor 380 Medium Altitude Long Endurance (MALE) Unmanned Aerial Vehicle (UAV).

This partnership, which seeks to offer a fully integrated, export-ready surveillance and reconnaissance solution to both regional and international markets, was signed this week at the Paris Air Show 2025. The memorandum of understanding was signed by Julian Coetzee, CEO of Milkor UAE, and Hyuck Park, Senior Vice President of Hanwha Systems' Defence Electronics Business Division.

Hanwha Systems stated that it brings extensive experience in AESA radar technology, having developed advanced airborne radar solutions. The integration of its SAR payload will provide the Milkor 380 with high-resolution imagery, Ground and Maritime Moving Target Indication (GMTI/MMTI), and all-weather reconnaissance capabilities, significantly enhancing its effectiveness in intelligence gathering and situational awareness.

For its part, Hanwha has experience working with South African companies, having hired Paramount Aerospace to help test the AESA radar being developed for the South Korean KF-21 Boramae fighter jet. The test flights aboard a modified Boeing 737 were conducted from Pretoria's Wonderboom National Airport.

As a MALE UAV, the Milkor 380 features a wingspan of 18.6 meters and a maximum takeoff weight of 1,500 kilograms, making it the largest aircraft of its type designed and built in Africa. Built for extended operations, it boasts a maximum endurance of 30 hours (when flying at 60 knots and an altitude of 10,000 feet above mean sea level) and a range of over 4,000 kilometres, making it ideal for long-range missions such as border surveillance, maritime patrols, and combat operations.

The UAV is equipped with dual redundant line-of-sight (LOS) communications systems that can maintain contact with its control unit up to 250 km, with seamless transition between line-of-sight and beyond-line-of-sight (BLOS) communications, such as SATCom.

Milkor has partnered with leading companies, such as Germany's Hensoldt, to integrate sophisticated sensor suites, including the ARGOS II HDT Airborne Observation System with laser designator capability. These sensors are designed for precision targeting in combat operations and enhance the UAV's intelligence gathering and electronic warfare capabilities. It can carry up to 220 kg of payload, including munitions, communication modules, and electronic warfare systems. It is powered by a Rotax 915iS turbocharged four-cylinder, four-stroke engine developing 135 hp, allowing it to reach a top speed of 250 km/h and a cruising speed of 110–150 km/h. The payload is 220 kg (without fuel), with a capacity of 80 kg on each outer wing hardpoint and 150 kg on each inner wing hardpoint. A underbelly station is designed to accommodate the larger payload, with a capacity of 400 kg. The nose of the aircraft can accommodate various electro-optical/infrared and radar sensors.

The Milkor 380 can be armed and has already been displayed with Al Tariq X-series precision-guided munitions, Halcon Desert Sting DS-16 guided bombs, and FZ602 laser-guided rocket launchers. A mock-up of a Milkor-developed missile has also been displayed beneath the aircraft, as Milkor is exploring in-house missile development.

Annual production of the UAVs is eight per year, with plans to reach sixteen units per year by 2026.

SHIFTING FRONTLINES: THE RAPID EVOLUTION OF MILITARY DRONE TECHNOLOGY

The landscape of modern warfare is undergoing a seismic shift, driven by rapid advances in unmanned aerial technologies. Military drones, once limited to reconnaissance roles, are now at the heart of multi-domain combat operations, thanks to breakthroughs in autonomy, artificial intelligence, stealth, and system integration. From long-endurance surveillance platforms to stealthy combat drones and loitering munitions, today's unmanned systems are reshaping tactics, capabilities, and the very nature of conflict.

Key Technological Advancements

At the core of this transformation is AI and machine learning, enabling drones to operate with increasing autonomy. These technologies allow platforms to analyse vast data sets in real time, respond to jamming and environmental threats, and make complex decisions mid-mission without direct human input. As this capability matures, many drones are already capable of launching, navigating, and striking targets autonomously.

Stealth and survivability have also become priorities. New-generation drones like Türkiye's ANKA-3 and Baykar's KIZILELMA employ low-observable designs and internal weapons bays to reduce radar, thermal, and

Artists impr

Bayraktar KIZELMA© BAYKAR

acoustic signatures. This makes them more survivable in contested airspace, enhancing their value in Suppression of Enemy Air Defences (SEAD) and strike missions.

Another game-changing development is drone swarming. By deploying coordinated groups of small, inexpensive UAVs, militaries can conduct complex ISR operations, overwhelm enemy defences, or execute distributed offensive tactics. These swarms, powered by decentralised AI, represent a significant leap in battlefield innovation.

ession of the Anduril Fury Autonomous Aircraft © Anduril & General Atomics

The concept of multi-domain integration is further reinforcing drone value. Modern UAVs are being connected across land, air, sea, cyber, and space domains to form a comprehensive and responsive operational network. This allows for faster decision-making and more effective coordination across diverse assets.

Extended endurance and smart payloads also define the latest platforms. New propulsion systems, solar-assisted flight, and modular weapon configurations mean that drones can now be tailored for a wide array of missions—often with the ability to switch roles mid-operation.

Case Studies in Innovation

One of the most advanced programmes is the U.S. Air Force's Collaborative Combat Aircraft (CCA) initiative, which is developing stealthy, AI-enabled "fighter drones" like the YFQ-42A and Anduril's YFQ-44A to operate alongside manned platforms. These systems aim to perform dangerous missions, increase force projection, and serve as loyal wingmen in high-threat environments.

In Türkiye, Baykar's Bayraktar KIZILELMA stands out as a next-generation carrier-capable UCAV. With a 1.5-ton payload, AESA radar, and autonomous flight control, it is being positioned as a key player in future air combat.

Its stealthy airframe, naval deployment capability, and growing range of munitions make it a formidable addition to regional aerial capabilities.

Also from Türkiye, TAI's ANKA-3 is expected to enter service in 2026. Designed with a flying wing configuration, it combines stealth, electronic warfare capabilities, and precision strike potential. The drone is optimised for roles such as ISR, air-to-air engagements, and SEAD missions. With AI-assisted flight control and a 10-hour endurance, the ANKA-3 illustrates Türkiye's growing technological sophistication.

On the global stage, General Atomics' MQ-9A "Reaper" remains one of the most widely used RPAs. Known for its long range and high payload, it supports missions from ISR to precision strikes. While highly capable, its vulnerability in contested environments has highlighted the need for enhanced survivability in future designs.

Israel's Harpy loitering munition, developed by IAI, offers a different approach. Designed to autonomously locate and destroy enemy radar systems, it represents


MQ-9 Reaper © General Atomics

a mature example of "fire-and-forget" technology. Its long loiter time and autonomous strike capabilities have proven effective in SEAD roles.

Turkey's Bayraktar TB2 has become globally recognised for its affordability and battlefield success, while the Kargu-2 loitering munition, which may have operated autonomously in Libya, has sparked global debate about the ethical implications of lethal autonomous weapons.

Looking Ahead

The trajectory of drone development points toward even greater autonomy by 2030. UAVs are expected to carry out increasingly complex missions with minimal human input, supported by secure communication links and resilient AI systems. However, this rise in autonomy is being balanced by a focus on human-machine teaming, ensuring that human operators remain integral to decision-making and mission planning.

As drone capabilities advance, so too must counter-drone technologies. From directed-energy weapons to AI-powered detection systems, militaries are investing heavily in defence against both state and non-state UAV threats.

From stealthy combat UCAVs to AI-powered loitering munitions and collaborative drone squadrons, the evolution of military drone technology is revolutionising modern warfare. These unmanned systems are no longer auxiliary tools—they are strategic assets shaping the battlespace across air, land, sea, and cyberspace. As nations race to harness these technologies, the future of aerial combat is not just unmanned—it is intelligent, integrated, and increasingly autonomous.


MQ-1 Predator Drone Image © General Atomics

SAFEGUARDING AFRICA'S AIRSPACE: ATOSPHERE'S VISION FOR A SECURE SKY

By Ratolajeso Sekano

In a continent buzzing with innovation and technological emergence, the skies are no longer a quiet frontier. Drones have revolutionized everything from delivery systems to surveillance, but with this evolution comes a growing dilemma—how to protect sensitive airspace from misuse. Uncontrolled drone activity has surged in Africa, and South Africa is no exception. It's against this backdrop that Atosphere steps forward—not as a finished product, but as a company in active development, crafting future-forward solutions for a safer aerial ecosystem.

Atosphere is more than a concept—it's a vision with momentum. Officially registered in early 2024, the firm is in its foundational phase, laying the groundwork for innovation in airspace defence through research, stakeholder partnerships, and strategic planning. Its mission: to enhance airspace security and operational efficiency through the development of responsive anti-drone technologies and specialised consultancy.

While licensing and certification—such as UASOC, ASL, and PSIRA—are still being pursued, Atosphere is taking measured steps to align with regulatory authorities like the South African Civil Aviation Authority (SACAA). This intentional and transparent approach sets the tone for a business that values compliance and collaboration as much as technical advancement.

Unregulated drone operations have become a pressing issue in South Africa. According to SACAA reports, incidents involving illegal drone use have disrupted commercial flights, invaded privacy around government facilities, and flew unauthorised over correctional institutions. The challenge is clear: many of these incidents happen in uncontrolled airspace, where enforcement is complex and preventative technology is scarce. Penalties for non-compliance are steep, yet the tools to protect airspace from rogue drones remain limited.

That's where Atosphere aims to make its impact. The company's developmental roadmap centers on locally engineered systems that will detect and mitigate unauthorised drone activity—providing responsive defence solutions tailored for African environments.

These systems will ultimately assist governments, aviation authorities, and private firms in identifying aerial threats and securing vulnerable zones. Atosphere also sees education and integration as essential layers in this airspace puzzle. The company is preparing to offer consultancy services that help organisations adopt drone technologies responsibly, comply with existing laws, and establish internal protocols for risk management.

Funders and investors looking to support meaningful transformation will find Atosphere's approach compelling. It is not a finished package ready to be shipped—it is a growing enterprise seeking collaborators to bring its blueprint to life. With funding between R2–3 million, the company plans to invest in continued research, facility development, stakeholder engagement, and regulatory alignment. This capital would also enable participation in industry exhibitions and training sessions, positioning Atosphere as a thought leader and catalyst for change within the drone defence market.

What makes Atosphere uniquely relevant is its dedication to context-aware innovation. Africa's airspace needs solutions that are affordable, scalable, and suited to both urban and rural challenges. While much of the technology in the global market is imported and often ill-suited for local realities, Atosphere strives to manufacture and deploy systems grounded in African needs and perspectives.

In addition to technological development, the firm is cultivating relationships with security consultants, aviation experts, and operational leaders who share its vision for comprehensive airspace protection

Atosphere's journey is just beginning, and that is precisely where the opportunity lies. Africa's airspace deserves more than reaction—it deserves resilience.

REDEFINING THE COMBAT COCKPIT: HOW HELMETS AND AI ARE REVOLUTIONISING MILITARY AVIATION

Striker II "Wearable Cockpit" Image © BAE Systems

The combat cockpit of 2025 looks markedly different from even a decade ago. No longer constrained by banks of fixed displays and mechanical switches, today's military pilot is increasingly navigating mission-critical data through the visor of a helmet. With augmented reality (AR), artificial intelligence (AI), and neuroadaptive interfaces leading the transformation, the cockpit has effectively moved onto the pilot's head—and even into their mind.

A Clear View: The Rise of AR-Driven Helmets

At the heart of this transformation are helmet-mounted display systems (HMDS), which project real-time flight, navigation, targeting, and threat information directly into the pilot's field of vision.

Hensoldt South Africa is collaborating with BAE Systems' to develop Striker II, representing the cutting edge. Designed with a "wearable cockpit" concept in mind, it enables reconfigurable AR symbology and eliminates reliance on traditional cockpit instruments. Voice, gesture, and touch controls streamline interaction and drastically improve adaptability during high-pressure operations.

Similarly, Thales' Scorpion Helmet-Mounted Cueing System (HMCS) brings 360-degree full-colour symbology that is fully conformal and stabilised to the pilot's line of sight. Already deployed on multiple aircraft, it offers custom overlays and is designed to retrofit a wide range of helmet shells. The Eurofighter HMSS Striker II builds on this, incorporating both raster and cursive symbology and integrating night vision capabilities—all while tracking pilot head movement for rapid cueing of sensors and weapons.

Arguably the most well-known of the genre is the F-35's HMDS, developed by Vision Systems International. Its integration of flight data, thermal imagery, night vision, and independent target cueing has transformed how pilots fly and fight. However, at roughly $400,000 per unit, cost and helmet weight remain ongoing concerns.

AI in the Cockpit: From Assistant to Autopilot

Beyond enhanced visuals, AI is rapidly redefining the role of the pilot. BAE's sixth-generation Tempest programme envisions a helmet that not only displays data, but also reads the pilot's biometric signals, including brain activity. Should a pilot become overwhelmed or incapacitated, AI could assume partial or full control of the aircraft.

The U.S. Air Force is already experimenting with AdaptiveCoPilot, a neuroadaptive interface that uses functional near-infrared spectroscopy (fNIRS) sensors and a large language model (LLM) to read the pilot's cognitive load and adjust displays accordingly. Early simulations suggest that this approach not only speeds up reaction times but also improves mission efficiency by managing task saturation.

In a more dramatic demonstration, an AI-controlled F-16 recently executed advanced aerial manoeuvres autonomously, showing how close we are to fully-integrated, manned-unmanned teaming. While human oversight remains crucial, such systems are expected to become key assets in contested airspace.

Modular Integration: Beyond Fighter Jets

These technologies are not limited to high-speed jets. The Integrated Visual Augmentation System (IVAS), originally developed by Microsoft and Anduril for U.S. infantry forces, is being adapted for aircrew in helicopters and UAV control stations. Using a combination of thermal, night vision, simulation, and tactical overlays, the IVAS helmet extends battlefield awareness across domains. Anduril's Lattice platform further enables real-time sensor fusion—useful for drone detection, electronic warfare alerts, and beyond.

The U.S. Navy's Improved Joint Helmet-Mounted Cueing System (IJHMCS), scheduled for delivery later this year, addresses a more practical concern—pilot fatigue. Its re-engineered balance and reduced weight help mitigate chronic neck and spine strain, particularly in fast jets such as the F/A-18 and EA-18G.

The Bigger Picture: Situational Awareness Meets Cognitive Efficiency

Taken together, these developments represent a significant shift in how military aviators process and act on data. The cockpit is evolving from a fixed space filled with dials to a dynamic, cognitive interface—where the line between human and machine is becoming increasingly blurred.

Key trends as of mid-2025 include:

- AR systems replacing traditional cockpit displays.
- AI enabling real-time decision support and adaptive workload management.
- Human-machine interfaces incorporating neuroadaptive sensors and hands-free control.
- Continued focus on ergonomics to address the physical burden of high-tech systems.

Final Approach

The military aviation community is witnessing a revolution not only in how aircraft are flown, but in how information is perceived and decisions are made.

While weight, cost, and complexity remain challenges, the trajectory is clear: the helmet is no longer just headgear—it's the cockpit, the control panel, and the mission computer all in one, these innovations ensure that pilots remain not only at the centre of the fight, but one step ahead of it.

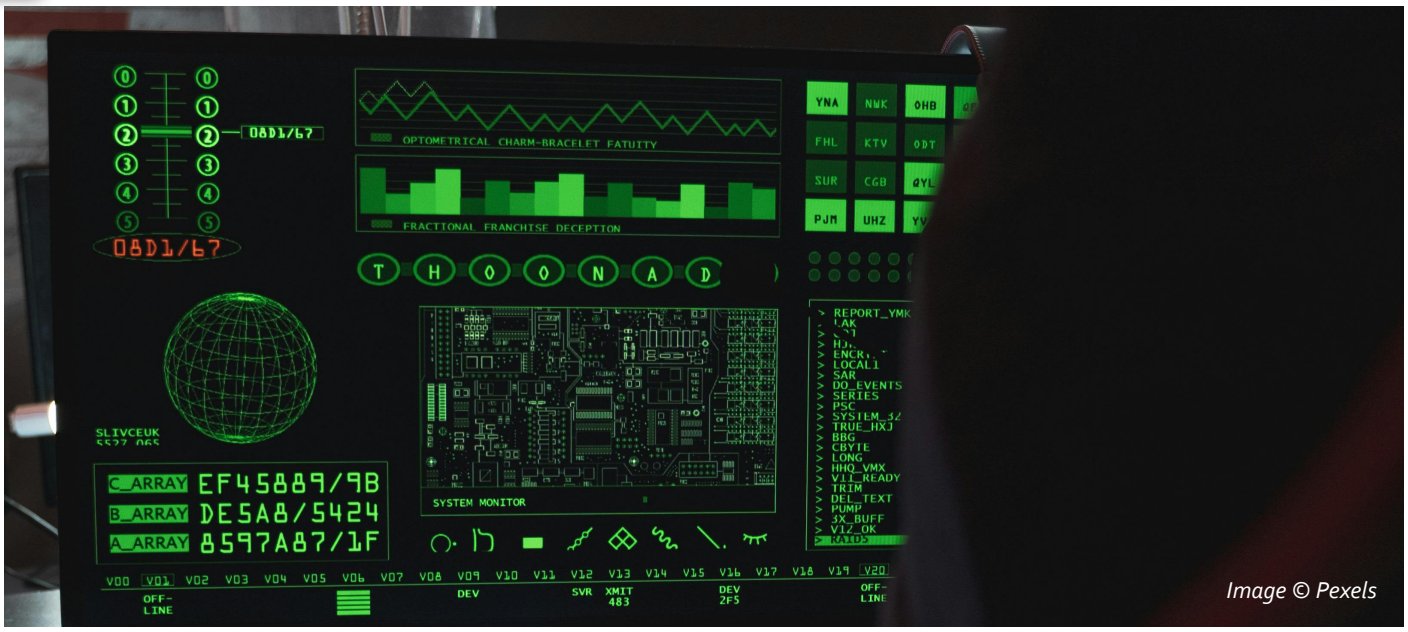


Image © Pexels

DIGITAL FRONTLINES: THE INVISIBLE WAR THREATENING AVIATION

In today's battlespace, war is no longer confined to the land, sea, or skies—it now unfolds in a fifth domain: cyberspace. From commercial aviation to military operations, the digital backbone of the global air network has become a target in a new kind of warfare—one fought with code, signals, and invisible algorithms. The tools of this modern arsenal include GPS spoofing, electronic jamming, and satellite interference. The threat is real, the battlefield is global, and the consequences could be catastrophic.

The Invisible Threat

While kinetic warfare still dominates headlines, cyber and electronic threats are quietly growing in scale and sophistication. In aviation, which is inherently dependent on precision navigation, communication, and data systems, these digital intrusions present an existential threat.

GPS spoofing—the deliberate broadcasting of false GPS signals—can mislead aircraft, misdirect drones, or scramble air traffic control systems. In recent years, several GPS anomalies have been recorded in conflict-prone regions, including Ukraine, the Middle East, and even parts of the South China Sea. In 2023 and 2024, NATO officials confirmed a significant uptick in GPS interference, particularly in Eastern Europe, where military aircraft encountered unexpected disruptions while flying near Russian borders.

Electronic jamming takes another form of disruption—denying access to key frequencies used for navigation and communication or interference signals are communicated. Civilian aircraft have reported interference over conflict zones, leading to temporary loss of positioning, affecting cockpit displays, and creating cascading risks in airspace safety.

More concerning is satellite hacking, where actors target the very infrastructure that aviation depends on. In early 2022, a cyberattack on the KA-SAT satellite network caused disruption across several European countries just as the war in Ukraine began.

Aviation analysts now warn that similar attacks on communication satellites used by aircraft could render wide-area coverage temporarily useless.

Commercial Aviation in the Crosshairs

The increasing reliance on "cockpit-to-cloud" systems in commercial aviation—digital platforms that link cockpit instrumentation with cloud-based analytics, maintenance logs, and air traffic systems—has opened new vulnerabilities. From flight planning software to onboard Wi-Fi systems, any breach could have operational consequences.

Airlines have already experienced wake-up calls. In 2024, a coordinated cyberattack attempt on multiple European airports' check-in and baggage systems caused delays across several nations. Though no aircraft were compromised, it revealed how attackers could target aviation infrastructure beyond just aircraft.

The International Civil Aviation Organization (ICAO) has since stepped up its guidance on aviation cybersecurity. New standards call for collaborative risk-

sharing among countries, airlines, and manufacturers. Still, the implementation is uneven across regions, with developing nations particularly vulnerable due to outdated infrastructure and limited resources.

Defence Forces React

Military air forces and OEMs (Original Equipment Manufacturers) are now investing heavily in resilient communications architectures, cyber-hardening of flight systems, and electronic countermeasures.

The U.S. Department of Defence, for example, has doubled funding for Resilient PNT (Positioning, Navigation, and Timing) systems, including the use of M-Code GPS—a military-grade encrypted signal that is resistant to jamming and spoofing. Europe is accelerating the development of the Galileo Public Regulated Service (PRS), designed to ensure secure satellite navigation for government-authorised users.

On the electronic warfare front, air forces are expanding their use of Electronic Support Measures (ESM) and Electronic Countermeasures (ECM). These include onboard sensors that detect interference or spoofing attempts, and systems that automatically reroute or insulate communications.

For example, the latest variants of the Eurofighter Typhoon and F-35 Lightning II are equipped with multi-layered defences including radar warning receivers, digital threat libraries, and cyber intrusion detection systems embedded in avionics.

OEMs like Airbus and Boeing are also integrating layered cybersecurity protocols into new airframes. This includes secure data buses, real-time diagnostics, and continuous software patching mechanisms. Boeing's Cybersecurity Intelligence Cell now operates around the clock to monitor potential threats to its platforms.

Global Responses and Gaps

International collaboration is improving but still faces significant challenges. Aviation cybersecurity remains fragmented, with military and civilian systems often operating in silos. The EU Agency for Cybersecurity (ENISA) and EUROCONTROL are now pushing for harmonised cybersecurity regulations across Europe's airspace, but progress has been slow.

In Africa, Asia, and parts of South America, limited cyber defences raise concerns about air traffic system vulnerabilities. Some ATC systems are over two decades old and lack encryption or redundancy, making them potential weak links in global aviation networks.

The private sector has begun to bridge the gap with AI-based cybersecurity solutions, predictive anomaly detection, and digital twins for cyber resilience testing. Still, without uniform standards and funding, many nations remain under prepared.

Conclusion: Vigilance in the Skies

As aviation becomes ever more interconnected, the stakes in the digital theatre of war are rising. Threats no longer need to board an aircraft or launch a missile—disruption can come from a distant laptop or a signal transmitted from the ground.

Ensuring aviation safety in this digital age will require a multi-layered defence posture, international cooperation, and proactive regulation. The cockpit of the future is not just vulnerable to storms or engine failures—it is now a node on the world's most contested battlefield: cyberspace.

In this invisible war, preparedness, collaboration, and continual innovation are the only paths to safety.

Eurofighter Typhoon Cockpit. Image © BAE systems

Image © Nigeria Defence Force

AFRICA'S UAV RACE: INDIGENOUS INNOVATION MEETS IMPORTED POWER

Across Africa's increasingly turbulent skies, a new race is taking shape—one powered not by fighter jets or helicopters, but by drones. From precision strikes in Sudan and surveillance operations in Kenya to home-grown engineering breakthroughs in Nigeria and South Africa, the continent's UAV landscape is shifting fast.

As of mid-2025, Africa is home to more than 35 indigenous drone designs, a rising cohort of private manufacturers, and deepening international partnerships. Meanwhile, imported UAV systems from China, Turkey, and Israel are reshaping battlefield dynamics across the Sahel, the Horn, and beyond.

This is the story of Africa's unmanned aerial evolution—a race defined by ambition, urgency, and geopolitical calculation.

South Africa, Nigeria and Ethiopia Lead Indigenous Drive

The push to build drones on African soil is gaining momentum. South Africa's aerospace sector remains at the forefront, with the Milkor 380—a medium-altitude, long-endurance UAV—now entering service. With a 4,000 km range, 18.6 m wingspan, and 30-hour endurance, it's the largest combat drone designed and developed on the continent to date. Milkor's long-term roadmap suggests ongoing integration with ISR and strike capabilities.

Nigeria, meanwhile, has taken bold steps toward UAV self-sufficiency. The Tsaigumi UAV, developed with Portuguese firm UAVision, has been operational for maritime surveillance and internal security since 2018. More recently, Nigeria unveiled the Damisa kamikaze drone and a locally engineered rifle-armed hexacopter, manufactured in collaboration with Briech UAS. These projects represent a shift from surveillance to offensive indigenous platforms.

Further north, Ethiopia made headlines in March 2025 with the launch of SkyWin Aeronautics Industry, a state-backed drone manufacturer based in Addis Ababa. While its operational output remains under scrutiny, the ambition is clear: produce drones for national and export markets, for both civilian and military use.

In the private sector, TerrHaptix, a Nigerian startup based in Abuja, has established a domestic drone production line capable of up to 10,000 units annually. Its Archer UAV targets defence, agriculture, logistics, and energy sectors, signalling that Africa's drone boom isn't limited to defence contractors or governments.

Collectively, the continent now supports 13 drone-producing companies in 7 countries, accounting for over 180 known units. While most are fixed-wing UAVs, multi-role rotary drones are gaining ground. (couldn't verify)

Foreign Firepower: The Imported Arsenal

Despite indigenous growth, much of Africa's aerial firepower still relies on imported UAVs—most notably from China, Turkey, and Israel.

China remains the dominant external supplier, with combat-proven models like the CH-3, CH-4, and CH-95 widely used by Algeria, Ethiopia, Nigeria, Sudan, and Morocco. These drones have seen frequent deployment in internal security and cross-border operations.

Turkey has also emerged as a strategic supplier, particularly through its Bayraktar TB2 system. Kenya took delivery of at least six TB2s in 2024, now used in counterinsurgency efforts against al-Shabab. Mali, Niger, Tunisia, and Ethiopia also operate Turkish drones. Notably, Mali's use of Bayraktar Akinci drones prompted a diplomatic rift with Algeria, which intercepted and downed a Malian-operated UAV in March 2025.

The United Arab Emirates and Iran have also made inroads via proxy channels. Sudan's paramilitary Rapid Support Forces (RSF) are operating Chinese FH-95 drones and Emirati-modified UAVs in combat against government positions—a stark example of how drone warfare is transforming internal conflicts into tech-driven proxy battles.

Intra-African Cooperation: A New Frontier

Perhaps the most significant development of 2025 is the emerging UAV cooperation between Nigeria and Ethiopia. In July, the two nations signed a strategic memorandum to co-develop an indigenous African combat drone, combining Nigeria's battlefield experience with Ethiopia's manufacturing capabilities at SkyWin.

This marks Africa's first major bilateral defence aerospace venture in the UAV sector. It includes shared research and development, pilot and technician training exchanges, and joint production plans aimed at reducing dependence on foreign platforms.

If successful, this could lay the groundwork for a broader continental drone framework—potentially under the African Union's security and technology agenda.

Drone Democracy or Drone Dystopia?

While UAV proliferation has brought newfound capability and strategic autonomy, it has also raised concerns. Inexpensive drones are changing the rules of war, enabling non-state actors and paramilitaries to challenge conventional forces.

In Ethiopia alone, more than 490 civilian casualties have been attributed to drone strikes since 2022, (couldn't verify date) raising questions about targeting protocols and accountability. The same technologies empowering African states to protect their borders are also being used in conflicts with little oversight or external scrutiny.

As AI-enhanced and autonomously navigated drones become more common, the potential for escalation—especially across disputed borders and within fragile states—rises exponentially.

Outlook: What's Next?

Africa's UAV race is just getting started. The coming years will likely see:

- Increased regulatory pressure on drone use in conflict zones, especially with rising civilian casualties.
- Wider civilian drone adoption across agriculture, infrastructure monitoring, and humanitarian delivery—particularly as companies like Zipline expand operations.
- Rising local investment in drone manufacturing hubs and training academies.
- A growing drone export market, particularly if
- Nigerian-Ethiopian or South African models gain traction in other African states.

The challenge will be balance: leveraging drone capabilities to strengthen sovereignty and economic development, without fuelling regional arms races or deepening instability.

Africa's UAV landscape in 2025 is dynamic, layered, and geopolitically significant. Indigenous production is gaining ground, foreign systems remain embedded in military doctrine, and cooperation between African powers is finally emerging.

Whether this trend leads to greater security and innovation—or becomes yet another frontier for proxy conflict and unchecked warfare—will depend on how nations manage the rapid evolution of this transformative technology.

For now, Africa's drone race is very much on—and the sky is no longer the limit.

Image © Nigeria Defence Force

EMBRAER EXPANDS ITS FOOTPRINT IN AFRICA: PROSPECTS BRIGHTEN FOR C 390 MILLENNIUM AND A 29 SUPER TUCANO

As African air forces seek versatile and cost-effective solutions to meet diverse operational demands, Brazilian aerospace manufacturer Embraer is steadily expanding its footprint across the continent. With its well-established A 29 Super Tucano and growing interest in the multi-role C 390 Millennium, Embraer is positioning itself as a competitive partner in the African defence landscape.

Establishing Roots with the A29

Embraer's presence in Africa is most firmly grounded through its light attack and training aircraft—the A 29 Super Tucano. Designed for counter-insurgency, border surveillance and pilot training missions, the A 29 has gained traction across Sub Saharan Africa, particularly in countries facing asymmetric threats and complex terrain.

To date, the Super Tucano is operational in at least seven African countries, including Nigeria, Ghana, Mali, Burkina Faso, Mauritania, Angola and Senegal. Nigeria's acquisition of 12 A 29s under a U.S. Foreign Military Sales (FMS) agreement was a watershed moment, boosting regional confidence in the aircraft's capabilities. Ghana, more recently, confirmed its order of five A 29s, with deliveries expected to begin by the end of 2025.

In December last year, Embraer announced a new contract with an undisclosed African nation for four more A 29s, suggesting steady demand and confidence in the platform. Across the continent, the Super Tucano's cost-efficiency, ruggedness, and multi-role profile continue to resonate with budget-conscious air forces.

Embraer's KC-390 'Millennium' military transport aircraft. Image ©Embraer

A-29 SuperTucano . Image © Embraer

C 390 Millennium: Africa's Next Strategic Airlifter?

While the A 29 opens doors, the larger and more strategic C 390 Millennium is rapidly becoming the focal point of Embraer's African ambitions. The aircraft has been showcased across key African capitals and military air shows, including its notable return to the Africa Aerospace and Defence (AAD) Expo at Waterkloof in 2024.

South Africa has emerged as a key contender in Embraer's campaign to secure a first African buyer for the C 390. The South African Air Force is actively evaluating the platform to replace its ageing C 130BZ Hercules fleet, with government and military delegations having toured Embraer's production facilities in Brazil. In a significant development, Embraer signed a Memorandum of Understanding (MoU) with South Africa's Denel Group in April 2024 to explore local assembly, maintenance, and industrial collaboration—a move that aligns with South Africa's defence industrialisation goals.

Elsewhere, Morocco is reported to have selected the C 390 as its next-generation airlifter, while Angola is also believed to be in talks with Embraer for a fleet of four aircraft. The company has also held discussions with defence officials from Rwanda, Egypt and other nations seeking to modernise their medium-lift and multi-mission capabilities.

With a payload capacity of 26 tonnes, aerial refuelling capability, and compatibility with unpaved runways, the C 390 offers a compelling proposition for African nations involved in peacekeeping, humanitarian operations, and rapid deployment missions. Its competitive operating costs and modular design add to its appeal in regions where budget constraints are as critical as mission flexibility.

Strategy Beyond Sales

Embraer's approach to Africa extends beyond direct sales. The company has been deliberate in engaging with regional stakeholders through training programmes, technical cooperation, and participation in forums such as the African Air Forces Forum and the Africa Aerospace and Defence Expo.

The agreement with Denel is a case in point. Beyond facilitating potential C 390 production or assembly in South Africa, the partnership could see expanded support for the A 29 fleet already in service across the region, further anchoring Embraer's presence.

With a proven light attack aircraft in widespread use and a strategic transport platform gaining serious interest, Embraer is carving out a credible position on the African continent. The combination of affordability, operational versatility and willingness to localise support makes the Brazilian OEM an increasingly attractive partner for African air forces facing evolving security challenges.

While no firm orders have yet been announced for the C 390 in Africa, ongoing high-level negotiations and industrial agreements suggest that it is only a matter of time before Embraer logs its first large transport aircraft sale on the continent.

One of the stars of the flying display was the Lockheed Martin F-35A. This example was flown by the United States Air Force with the aircraft coming from RAF Lakenheath in the UK. Many air forces around the world have ordered this fifth-generation stealth multirole combat aircraft.

MILITARY AND DEFENCE THEMES AT THE 2025 PARIS AIR SHOW

Photography BY: Stuart Haigh

At the 55th edition of the Paris Air Show, held at Le Bourget in June 2025, the unmistakable undercurrent was one of geopolitical tension and strategic recalibration. While civil aviation deals often dominate the headlines, it was the military and defence sector that commanded attention this year—both on the tarmac and behind closed doors. Amid conflicts in Eastern Europe, the Red Sea, and the Pacific, and with NATO partners reassessing force readiness, the event served as a timely barometer of the world's shifting defence priorities.

A Show of Force and Urgency

Nearly 45 percent of the exhibition space was devoted to defence systems—a clear indicator that warfighting capabilities are front and centre in current procurement strategies. More than 200 military delegations were present, underscoring the global demand for both advanced and scalable technologies. Exhibitors brought out their heavy hardware: combat-proven airframes, missile defence systems, tactical drones, and multi-domain integration platforms dominated the defence pavilions.

For the United States and its defence industry, the show was both a showcase and a signal. The Department of Defence displayed a formidable line-up, including the F 35A Lightning II, MQ 9 Reaper, KC 46 Pegasus, and P 8 Poseidon, projecting a strong message of allied readiness and air dominance. Interactive STEM and interoperability demonstrations echoed a strategic pivot toward technology transfer and allied capability building.

Lockheed Martin and Raytheon (RTX) focused on missile defence, announcing plans to ramp up production of PAC 3 and THAAD interceptors by over 40 percent (couldn't verify). This mirrors the global surge in demand for systems capable of countering increasingly complex aerial threats—from hypersonics to loitering munitions. European firms, including MBDA and Diehl Defence, also highlighted IRIS-T and CAMM-based systems (Common anti-air modular missile) tailored to NATO and export markets.

Legacy Platforms, New Missions

While the talk of next-generation systems persisted, there was a notable emphasis on revitalising existing

MQ9A USAF NY. In this modern era, UAV's or drones are a necessity in the war arena. Whether for surveillance, reconnaissance or combat missions, they have proved to be a vital asset.

platforms. Airbus used the show to highlight new roles for its A400M Atlas military transporter, positioning it as a future unmanned "mothership" capable of deploying UAVs and electronic warfare payloads. OCCAR partners France and Spain reaffirmed their commitment to the A400M, signalling sustained investment in modular upgrades and mission versatility.

Similarly, Sikorsky demonstrated advances in manned-unmanned teaming (MUM-T) with its UH-60 Black Hawk platform, showcasing autonomous navigation and tactical drone coordination as part of its roadmap for future rotorcraft warfare.

The unifying thread? Proven, adaptable platforms are being retrofitted to meet the demands of modern conflict—where electronic warfare, autonomous systems, and joint force integration are essential rather than optional.

The Drone Domain: A Battle for Sovereignty

The unmanned space was another battleground—both for contracts and for strategic independence.

Airbus unveiled its HTeaming concept, enabling rotary crews to command UAVs directly from the cockpit via tablet interfaces. Leonardo, in partnership with Turkey's Baykar, introduced LBA Systems, showcasing the TB 3 and Akinci UAVs. This collaboration points to the emergence of transregional alliances in the drone market, as nations seek to diversify supply and capability.

Meanwhile, Spain took a bold step toward defence sovereignty by presenting the MBDA-developed SIRTAP tactical ISR UAV—a European alternative aimed at reducing dependency on U.S. or Israeli-made systems. The system, due for delivery in 2027, has already drawn interest from several NATO allies keen to hedge their operational portfolios.

Politics and Presence: A Subplot in Plain Sight

Defence at Le Bourget this year was not without controversy. Four major Israeli firms—Elbit Systems, Rafael, Israel Aerospace Industries, and Uvision—were asked by the French government to conceal offensive weaponry from their displays. The move, reportedly in response to tensions in Gaza and diplomatic pressure, led to black-shrouded stands and diplomatic friction. The episode underscored how politics and policy can quickly reshape the direction optics—and opportunities—of global defence trade.

In contrast, countries such as Portugal, Lithuania, and the Netherlands made headlines for adding or upgrading fleets. Embraer's KC-390 Millennium, notably, was a standout winner. Portugal ordered a sixth aircraft, while Lithuania committed to three units, all configured for aeromedical and tactical use—a nod to hybrid mission demand in an increasingly unpredictable security landscape.

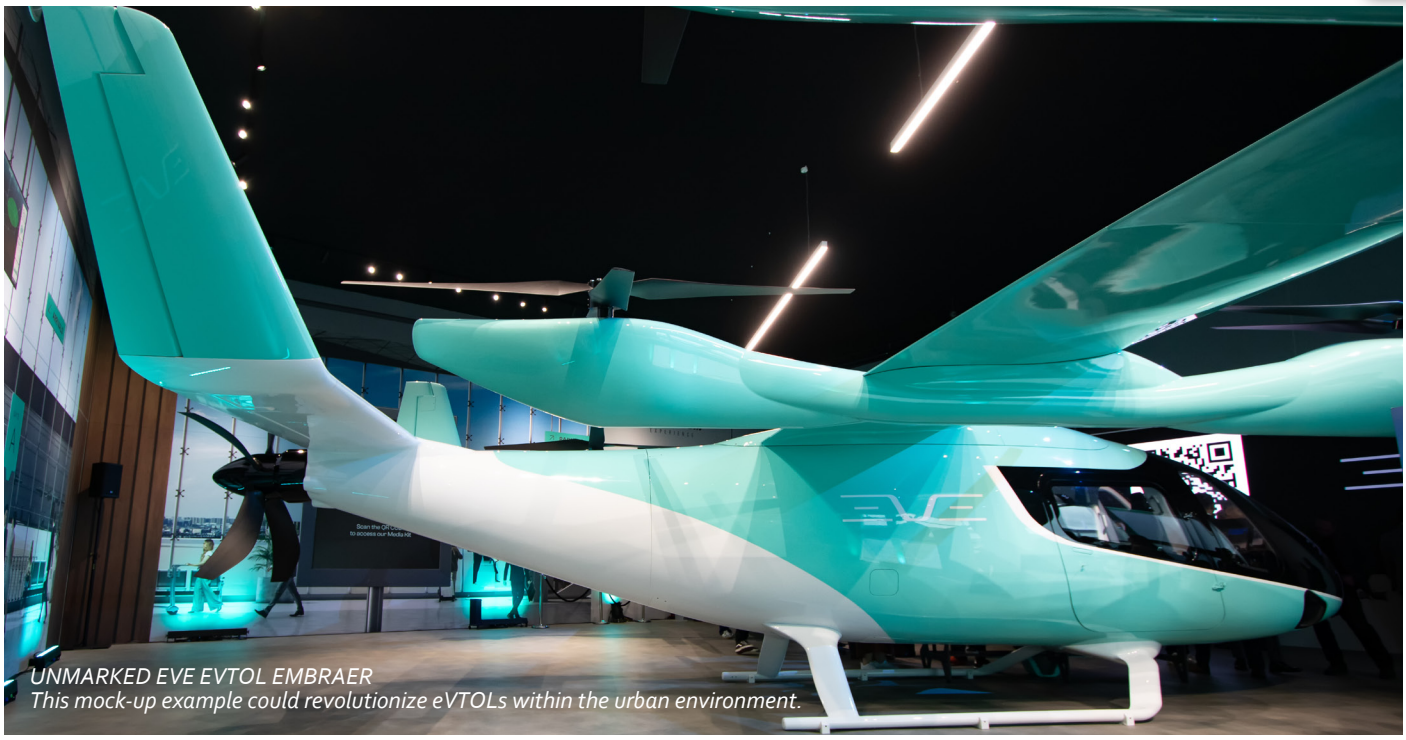
Defence in the Age of Denial and Deterrence

As war and rumours of war ripple through Europe, the Middle East, and the Indo-Pacific, the 2025 Paris Air Show laid bare a new reality: modern defence is no longer about preparing for distant conflict—it's about surviving tomorrow's.

The industry takeaway was clear. Governments are investing in interoperable, scalable, and quickly deployable systems. Suppliers are responding by reinforcing legacy fleets with digital integration, while developing unmanned and semi-autonomous capabilities that shift the battlespace from physical to cognitive. And in the shadows, politics continues to shape the boundaries of who gets to exhibit—and who gets to sell.

With defence budgets rising and operational urgency mounting, military aerospace is no longer a side-show at Paris. It is, increasingly, the main event.

N214BT CX300 PRIVATE. BETA Technologies is developing two very similar all electric aircraft that share 80% of their design characteristics. One will be a conventional take off aircraft with the other being a VTOL, vertical take-off or landing version. The manufacturer is looking for sales in the passenger as well as cargo market with interest also being shown by the military for use as an agile combat logistics aircraft.



UNMARKED EVE EVTOL EMBRAER
This mock-up example could revolutionize eVTOLs within the urban environment.

PTZTU TUCANO EMBRAER
The A-29 Super Tucano aircraft formed part of the static display.

FWRAC AH RACER AIRBUS HELICOPTERS
Airbus Helicopters demonstrated their 'Racer', a high speed compound helicopter.

PTZNG KC390 EMBRAER (ONE COCKPIT/ONE ON THE GORUND)
World Air News took to the skies above Paris during a demonstration flight by Embraer's KC-390 'Millennium' military transport aircraft. The advanced avionics and fly-by-wire flight controls help to reduce the pilots workload. It is similar to the Lockheed Marrtin C-130 Hercules, but is faster and can carry more payload. At the show, Embraer announced that the Portuguese Air Force had ordered a 6th example of this versatile aircraft. It has also been ordered by Brazil, South Korea and Czechia, Hungary, The Netherlands, Austria and Sweden within Europe.

AFRICA AEROSPACE AND DEFENCE CELEBRATE ITS 25TH ANNIVERSARY IN 2025.

In 2025, Africa Aerospace and Defence (AAD) celebrates a significant milestone, 25 years of influencing the future of aerospace and defence across the African continent. From its daring inception to evolving into one of the most significant exhibitions in the Southern Hemisphere, AAD has transformed into a representation of creativity, teamwork, and regional pride. As we mark this silver jubilee, we honour a legacy that has connected nations, advanced industries, and inspired generations.

In 2000, a pivotal moment in South Africa's defence and aviation history took place. The merger of Aerospace Africa and the Defence Exhibition of South Africa (DEXSA). This bold consolidation led to the formation of AAD.

The inaugural edition of AAD was jointly hosted by AMD, Armscor, and CAASA, with vital support from the National Government, the Department of Defence (DOD), and the Department of Trade, Industry and Competition (the DTIC). The event was the most extensive civil and military aerospace and defence exhibition ever held in Africa. This edition also marked a grand celebration of the South African Air Force's (SAAF) 80th anniversary, celebrated through an unforgettable Air Tattoo.

AAD has grown in leaps and bounds to become one of the leading global defence and aerospace exhibitions not only on the African continent, but worldwide, attracting over 400 exhibitors from more than 35 countries at its biennial event.

"In AAD 2024, we attracted 86 official delegations from over 36 countries, including various African nations and international participants who took part in previous editions, demonstrating AAD's broad international appeal and relevance. Next year, we will strengthen the legacy of a platform that has been tried and tested. We aim to increase representation from across the continent, showcasing the entire value chain," emphasises AAD Exhibition Director Nakedi Phasha.

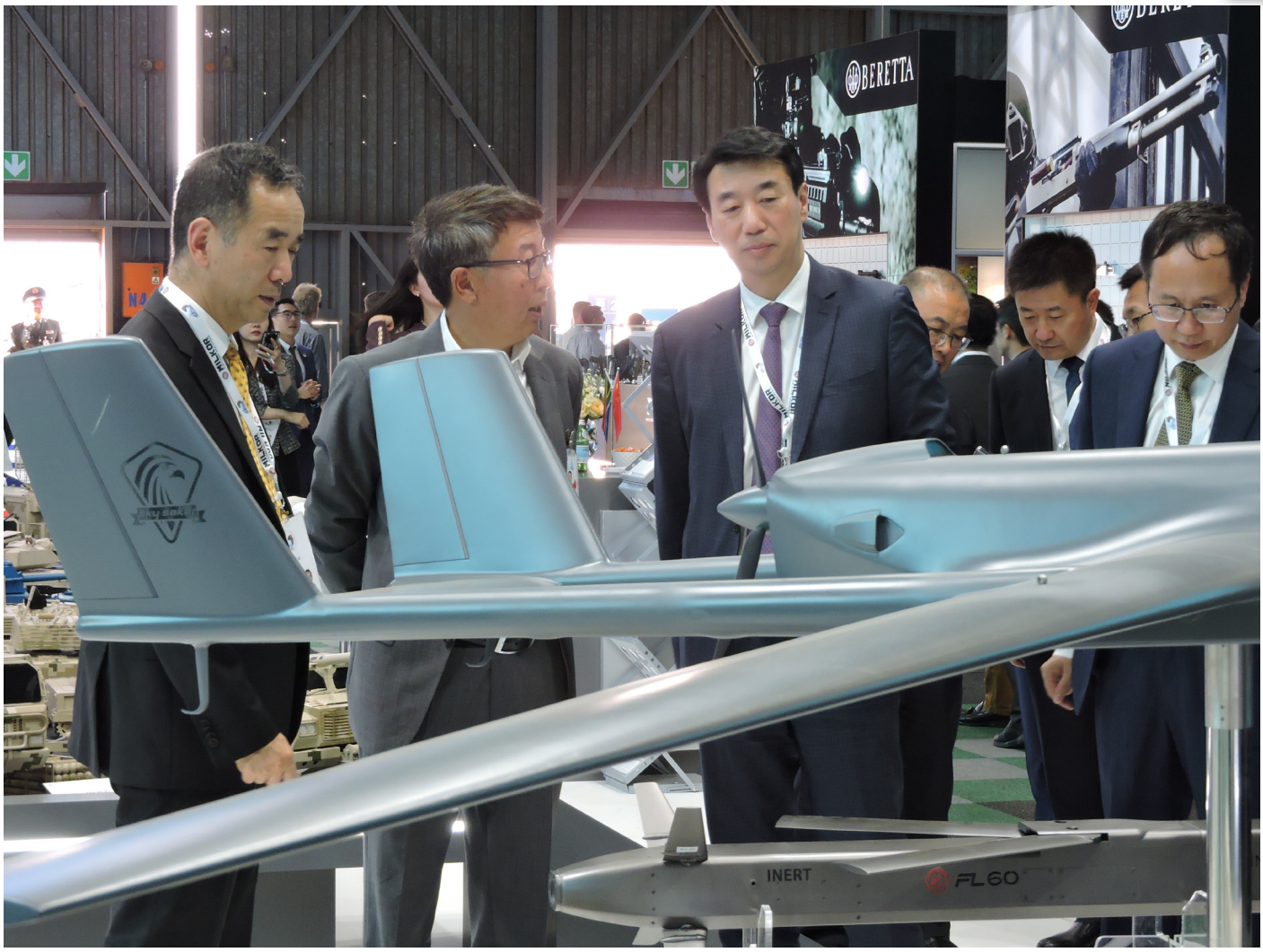
Reflecting on our progress and achievements, many words spring to mind: challenging, fulfilling, unexpected, humbling. But one word stands out above the rest is grateful.

We wish to sincerely thank all those who have supported us over the past quarter of a century, including our partners, employees, volunteers, investors, delegates, speakers, sponsors, and exhibitors. We could not have achieved this without you.

Thank you for your ongoing support, and we look forward to continuing our collaboration.

Cheers to our first 25 years, and many more to come.

Photography: AAD 2024 - by Tiaan van Niekerk for WAN


BERETTA
INERT
FL60


SEEKER UCAV


TURKISH AEROSPACE


THE DRONE SPECIALISTS
NTSUAVIATIONSOLUTIONS


NORINCO

SATELLITES AT WAR: SPACEPOWER AND THE MODERN BATTLEFIELD

As drone warfare escalates and strategic dominance extends beyond the atmosphere, the new frontier of conflict has moved vertically—into orbit. What was once a theatre for telecommunications, climate monitoring, and navigation has become a critical zone for intelligence, targeting, and command-and-control. The war in Ukraine has accelerated this shift dramatically, turning satellites into operational assets, battlegrounds, and — increasingly — targets.

From space-based radar to global connectivity and orbital surveillance, satellites are no longer silent observers. They are active participants, reshaping how wars are fought and how the sky is controlled.

Targeting from Orbit

Ukraine's ability to strike deep into Russian-controlled territory — including ammunition depots, airfields, and infrastructure nodes — has been supported by a persistent eye in the sky. Synthetic Aperture Radar (SAR) satellites, such as those provided by Finnish company ICEYE, allow Ukrainian forces to capture all-weather, day-and-night images with extraordinary resolution.

As of July 2025, over 4,000 radar satellite images have been captured under Kyiv's commercial partnerships. Approximately 40 percent of these are used for precision targeting. The result: actionable intelligence within hours, enabling real-time artillery coordination, drone swarm navigation, and special forces planning.

Satellite-backed intelligence is now the difference between static warfare and mobile precision. Ukraine's example is being studied — and emulated — by militaries across Europe, Africa, and Asia.

War by Wi-Fi: Communications in Conflict

When Russia targeted Ukraine's terrestrial infrastructure in the early phases of the war, many feared a collapse of battlefield communications. Instead, the arrival of thousands of Starlink terminals provided a resilient, satellite-based alternative. Mounted on vehicles, command posts, and even drones, these units enabled real-time connectivity across fragmented frontlines.

However, the reliance on commercial satellite networks raised new concerns. The blurred line between private technology and military dependency led to a reassessment in allied capitals. The European Union responded with the development of the IRIS²

constellation, aimed at offering sovereign, secure communications to member states. Sweden hasve also funded alternative systems such as Satcube, offering jamming-resistant uplinks for frontline command units. They have a strong presence in Germany.

The message is clear: satellite communications are now as critical as fuel and ammunition.

Satellites as Targets

With satellites now acting as both sensors and coordinators, they are increasingly being viewed as legitimate military targets. In May 2025, Russia deployed "Object C" — a suspected anti-satellite microsatellite that has been observed manoeuvring near U.S. and allied systems. China has launched its own early warning and proximity-response platforms, raising the spectre of orbital interception, spoofing, or even physical attacks on critical space assets.

These developments suggest a future where "orbital dogfights" are no longer theoretical. The concept of deterrence now extends far above national borders.

Drone Wars, Powered by Space

Drones have become the defining tool of modern conflict, but their effectiveness relies heavily on satellite infrastructure. Russia, keen to counter Ukraine's dominance in this area, has announced the launch of over 100 new satellites designed to support UAV operations — offering guidance, targeting, and relay capabilities for long-range and loitering munitions. These launches mark a new form of networked combat, where drones, satellites, and AI-driven decision platforms operate in a synchronised battle loop. It's a strategy being studied in real time by air forces from Cairo to Pretoria.

Alliances Go Orbital

One of the war's lasting effects may be the expansion of allied cooperation into the space domain. NATO's Allied Persistent Surveillance from Space (APSS) initiative, launched in 2025, formalises the sharing of remote sensing data among over 18 nations. The goal is to provide early warning and rapid situational awareness — not only for warfighting, but for border protection, migration tracking, and disaster response.

Defence-industrial partnerships have followed. Rheinmetall's SAR integration contracts with ICEYE, and Saab's new Earth observation initiatives, reflect how European industry is pivoting towards space-enabled conflict solutions.

Navigating the Future

As war moves from the battlefield to the stratosphere, the implications for aviation are profound. Air superiority is no longer just a matter of jets and missiles — it depends on who owns the data, who sees first, and who controls the signal.

For African and emerging-market air forces, the lessons are equally urgent. The future of deterrence may depend not only on runways and radars, but on space-based assets, secure downlinks, and resilient communications.

In this era of war and rumours of war, satellites have become both sword and shield. The next battles may be fought in orbit — long before a single engine starts on the tarmac below.

Image © : Pexels SpaceX


Image Courtesy of : Israel Aerospace Industries (IAI)

SUCCESSFUL LAUNCH FOR DROR-1 - ISRAEL'S NATIONAL COMMUNICATION SATELLITE

IAI developed the satellite that will provide Israel's satellite communication needs for years to come

Israel Aerospace Industries (IAI), a world-class aerospace and defence leader, has today (13/7/2025) successfully launched the State of Israel's national communications satellite, "Dror 1," into space, aboard a SpaceX Falcon 9 rocket from Cape Canaveral, Florida, USA. The satellite completed the launch process and initial positive diagnostic indications have now been received.

Over the coming weeks, upon entering orbit around the Earth, IAI engineers will perform a series of tests designed to verify the satellite's successful operation.

From then on, it will embark on its multi-year journey in space as the State of Israel's national communications satellite.

Boaz Levy, CEO and President of IAI: *"As Israel's space house, we at IAI are extremely proud of the development and successful launch into space of the State of Israel's "Dror 1" national communications satellite. "Dror 1" is the most advanced communications satellite ever built in Israel, designed to preserve this national strategic capability in the country while providing Israel with essential satellite communications capabilities for years to come. Israel's space program has evolved from vision to reality thanks to the creativity and innovation of IAI's employees, who have developed complex and groundbreaking technologies over the years. This satellite joins IAI's other communication and observation satellites in space, which meet the important needs of Israel, as well as those of additional customers. We are proud to demonstrate once again our technological expertise, made in Israel, this time as part of the global space industry."*

IAI is Israel's national space house. The company has been leading the national space program since the 1980s, with the launch of the first observation satellite, "Ofek 1." In addition, IAI has developed, manufactured and operated additional communications and observation satellites for scientific, civil and national missions in Israel and worldwide.

Dror 1" is Israel's national communications satellite developed and produced by IA I – one of the most advanced of its kind in the world, with innovative capabilities, operating at an altitude of approximately 36,000 km. The satellite will provide a solution for the State of Israel's communications needs for years to come. It includes advanced and unique communication capabilities that will enable flexibility in communications throughout its operating lifetime.

XQ-67A ADVANCES AUTONOMOUS FLIGHT AND INTEROPERABILITY IN U.S. AIR FORCE TEST

The U.S. Air Force Research Laboratory's (AFRL) XQ-67A, a second-generation Autonomous Collaborative Platform (ACP), has successfully completed a key flight test demonstrating advanced autonomous integration and real-time datalink interoperability in the California High Desert.

Developed by General Atomics Aeronautical Systems, Inc. (GA-ASI), the XQ-67A showcased its ability to operate government-owned autonomy software in combination with tactical datalink communications. This breakthrough enables the unmanned aircraft to dynamically execute missions and coordinate in real time with both crewed and uncrewed assets, marking a significant milestone in the development of scalable and modular autonomy solutions.

"This successful test underscores the Department's commitment to fielding autonomous systems that can integrate into joint operations using existing tactical networks," said Mike Atwood, Vice President of Advanced Programs at GA-ASI. "Government owned autonomy on the XQ-67A is a concrete step toward deployable, combat-relevant autonomy that works with and alongside crewed platforms."

During the flight, the aircraft completed a series of test points validating its mission systems—autonomy, mission computing, networking, power and thermal management, and datalinks. Crucially, the XQ-67A received situational updates via tactical datalink, demonstrating seamless coordination with other platforms.

The XQ-67A, along with its unmanned jet stablemates the MQ-20 Avenger® and YFQ-42A, is part of AFRL's broader strategy to explore "affordable mass" and platform sharing approaches for future airpower. The recent demonstration supports AFRL learning objectives and highlights how modular systems and trusted communications infrastructure can accelerate the transition of autonomy into operational use.

The test confirms the XQ-67A as a vital stepping-stone toward the U.S. Air Force's vision of integrated autonomous force structure supporting and augmenting manned aircraft in next-generation combat environments.

The-XQ-67A on display (GA-ASI photo)

The Commercial Aviation Association of Southern Africa

CAASA is a non-profit organisation formed in 1944 to promote and protect the commercial interests of the general aviation industry in South Africa

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