DEFENCE CONNECT

Outpacing the drone threat: Revolutionising air defence

As drones outpace traditional air defence, new technologies are emerging to detect, track, and neutralise threats, revolutionising how we safeguard the skies.

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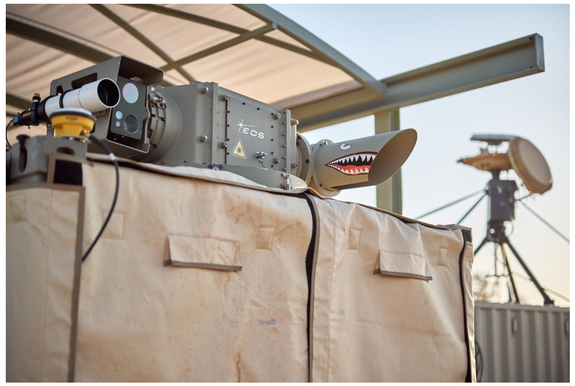


Welcome

DEFENCE TECHNOLOGY has always been a game of cat and mouse. Militaries and defence technology providers constantly innovate, striving to develop revolutionary capabilities that seize the initiative and disrupt the modern battlefield.

Drones fit well into the historical narrative of innovation – much like tanks in the First World War or the rapid evolution of air power leading into the Second World War.

But with every battlefield revolution comes counter innovation, as disruptive thinkers work tirelessly to keep soldiers, sailors and aviators safe.

Powered by big data and machine learning, this game of cat and mouse is accelerating. As explored throughout this e-book, it can take just days or weeks for a game-changing new technology to lose its edge and see its qualitative advantage neutralised.

Consider the opening days of Russia's brutal and unprovoked invasion of Ukraine in 2022. Both sides deployed costly drones that had a significant impact on the battlefield, including Ukraine's devastating strikes against Russia's convoy en route to Kyiv.

However, as both sides rapidly strengthened their air defence systems, the risk of losing these high-value drones led to their use being scaled back. In their place, we witnessed a remarkable surge in the development and deployment of first-person view drones.

In just a few short years, the character of drone warfare has been irreversibly transformed.

I extend my sincere thanks to the experts who shared their insights and helped make this e-book possible.

In particular, I am grateful to Andrew Wilson, chief executive officer of Advent Atum, for our discussion on automating the kill chain – from detection to engagement. I also thank Andreas Schwer, chief executive officer of Electro Optic Systems, for his valuable insights into the future of remote weapons stations and directed energy systems. Finally, my thanks to Jeremy Kenealy, director of growth and air defence at Anduril, for our conversation on developing a system of systems approach, integrating a range of sensors to provide commanders with full situational awareness on the battlefield.

As always, if you have any questions or would like to get in touch with the team at Defence Connect, please don't hesitate to reach out.

I hope you enjoy this e-book.

Liam Garman
Managing editor
Defence and Aerospace

Advent Atum

Ukraine’s air defence revolution: How automation and LAND 156 solutions are changing the battlefield

When Russia launched its full-scale invasion of Ukraine in 2022, the skies over Kyiv quickly became a battleground. Ukrainian defenders, relying on Soviet-era air defence systems such as the S-300 and Buk-M1, showed remarkable resilience despite overwhelming odds. But as the war progressed, the need for rapid modernisation became clear. Today, cutting-edge technologies are transforming Ukraine’s air defence capabilities, offering new levels of automation, efficiency and protection.

Advent Atum

A shifting battlefield

Modern warfare is now defined by the use of massed, low-cost drone swarms capable of overwhelming traditional air defence systems. Ukraine's forces, often operating in complex urban terrain, must continually reposition mobile air defence units to counter these aerial threats. Many of these systems are operated by young men and women, reflecting Ukraine's broad mobilisation effort.

On the third anniversary of Russia's invasion in February 2024, Ukraine faced a record-setting assault of 267 drones launched across the country, marking the largest drone attack of the war to date. While Kyiv was among the affected regions, the scale of the attack spanned the nation. This highlights how the drone threat has escalated and underscores the need for more adaptable and cost-effective defence solutions.

Conventional air defence systems require extensive manpower and logistics – often deploying costly missiles against threats that could be neutralised with more efficient options. This is where automation is becoming a game-changer.

Automation and the future of air defence

A breakthrough solution is emerging in the form of Advent Atum's HORAS Threat Detection and Engagement (TDE) system. Speaking on the Defence Connect podcast, CEO Andy Wilson described how HORAS is transforming Ukraine's air defence capabilities by fully automating the "kill chain" – the process of detecting, tracking, assessing and neutralising threats.

"HORAS TDE is an intelligent fire control system that detects, tracks, assesses and engages targets autonomously," Wilson says. "We've fully automated the kill chain, allowing for faster and more effective responses to airborne threats."

At the heart of HORAS is a powerful combination of active and passive sensing technologies, including radar, LiDAR, passive radar, RF detection and computer vision. By fusing these capabilities, the system provides operators with a real time, comprehensive view of the battlefield, enhancing accuracy and response times.

> **"We've fully automated the kill chain, allowing for faster and more effective responses to airborne threats."**

Andrew "Andy" Wilson
Chief executive officer of Advent Atum

Advent Atum

> **Any threat detected by HORAS is instantly visible to commanders, with critical data on range and classification."**

Andrew "Andy" Wilson
Chief executive officer of Advent Atum

A connected defence network

Beyond simply improving engagement, HORAS integrates seamlessly into broader battle management systems. This means that when HORAS detects a threat, that intelligence is instantly relayed across Ukraine's command networks, ensuring that decision makers have a complete operational picture.

"Not only does it automate the kill chain, but it also integrates with battle management systems," Wilson says. "Any threat detected by HORAS is instantly visible to commanders, with critical data on range and classification."

A key advantage of HORAS is its ability to remain undetectable. Many traditional air defence systems rely on sensors that emit electromagnetic signals, making them vulnerable to enemy detection and targeting. HORAS, however, incorporates passive sensing technologies, allowing it to operate covertly while still identifying and neutralising threats.

Beyond drones: A versatile weapon system

While HORAS is primarily deployed for counter-drone operations, its capabilities extend across multiple domains. The system can be used to automate weapons for engagements in air, sea and land combat, offering a versatile solution to a rapidly evolving battlefield.

Automation delivers several critical benefits: improved targeting accuracy, reduced collateral damage and better resource allocation. By increasing precision, HORAS allows Ukraine to use munitions more efficiently and direct expensive guided weapons towards larger, high-value threats.

"Modern air and missile defence is measured in cost-per-kill," Wilson says. "Missiles are incredibly expensive. If you have to use one against a drone, it's inefficient. HORAS prioritises engagements, ensuring that anti-aircraft gunfire – the most cost-effective option – is used first."

Staying ahead in the innovation race

Electronic warfare (EW) has played a significant role in countering drones, but adversaries are adapting quickly. Many modern drones are now equipped with AI-

driven navigation systems, allowing them to operate without relying on external signals that EW systems can disrupt. As a result, kinetic kill chains – where drones are physically destroyed – are becoming more critical than ever.

"We need to dramatically expand our industrial capacity to counter the growing drone threat," Wilson says. "EW still has its place, but drones are becoming more autonomous and harder to jam. In Ukraine, the innovation cycle is just 40 days – if you develop a capability today, a countermeasure will exist in just over a month."

HORAS also significantly improves the accuracy of legacy air defence platforms, increasing their effectiveness on the battlefield.

"Even with 60-year-old systems, we could and should improve the probability of a kill shot from 1 per cent to 30 per cent," Wilson says. "This is especially important in urban environments, where reducing the beaten zone helps protect civilians."

A long-term commitment to Ukraine's defence

Following a soft launch earlier this year, demand for HORAS has ramped up significantly. While no units have been sold yet, interest has accelerated to the point that Advent Atum has established a subsidiary in Ukraine, reinforcing its commitment to supporting the country's armed forces.

Expanded offerings: Detection, weapon systems and force protection

Advent Atum is also offering

military-grade drone detectors that outperform anything on the market – at a highly competitive price point. This capability represents the evolution of the original Tsukorok detector, redesigned to meet the Australian Army's requirements. Developed in partnership with Gnizdo and Drone Spices Ltd – two UK-based but Ukrainian-led companies – the Sugar V detector has proven itself superior to several incumbent systems. Weighing just 250 grams, the Sugar V is designed to fit in a standard SPR pouch and transmits drone detections to connected battle management systems and tactical assault kit networks.

In addition, Advent Atum is fielding a suite of remote weapon stations and weapon systems that are natively compatible with HORAS, specifically tailored for Australia's LAND 156 program. These offerings ensure seamless integration between sensors and effectors across mounted and dismounted platforms.

For force protection, Advent Atum is also advancing active protection system capabilities, expanding the utility of its AI fire control and threat detection solutions to protect high-value assets and front-line forces from guided munitions, loitering threats and direct-fire weapons.

Defending the skies, defining the future

As Ukraine continues its fight for sovereignty, technology like HORAS provides a decisive edge. By modernising air defence through automation, Ukraine is not only strengthening its immediate security but also setting a new standard for the future of warfare. The modern battlefield is evolving rapidly, demanding adaptable, efficient and precise solutions.

With innovations like HORAS, Ukraine is not just defending its airspace – it is shaping the next generation of global air defence. The future of warfare belongs to those who can outthink, outpace and outmanoeuvre the threats of tomorrow. And with companies like Advent Atum at the forefront, Ukraine is proving that technological superiority can be as critical as military might. ●

**The article has been edited for factual accuracy and updated to reflect current company developments.*

To learn more about Advent Atum, click here.

Directed energy, remote weapons stations: EOS unveils their antidote to drone swarms

The battlefield has changed – ever since the dawn of drone warfare. In just three years since Russia's invasion of Ukraine, the rapid proliferation of cheap, mass-produced drones has transformed the modern battlespace, forcing militaries and defence companies to rethink doctrine and develop new solutions to counter this emerging threat.

HISTORICALLY, AERIAL warfare was dominated by high-value platforms – fighter jets, attack helicopters and large, expensive drones like the multimillion dollar MQ-9 Reaper. The primary countermeasure? Missiles and rockets. But the shift towards low-cost drone swarms has rendered these traditional defences inefficient, unscalable and unsustainable.

“With the rise of small, inexpensive drones in large quantities, using high-cost missiles for defence became obsolete,” says Dr Andreas Schwer, CEO of Australian defence technology company Electro Optic Systems (EOS). “A new approach was needed.”

Drone swarms: Tomorrow’s battlefield

As drone warfare has evolved, countermeasures have been struggling to keep pace. The ability to detect, identify and neutralise threats within seconds have become paramount.

“The first wave of small drones appeared in limited numbers,” Schwer says. “Now, they are being deployed in massive swarms, targeting ground forces and infrastructure. Traditional air defence systems – missiles, rockets and electronic warfare – are struggling to keep up.”

Electronic warfare, once a key defence, is becoming less effective as drones are designed to operate independently, without reliance on external signals that can be jammed or spoofed. In response, kinetic countermeasures have once again taken centre stage.

EOS' first solution: The Slinger
To meet this challenge, EOS developed the Slinger, a remote weapon station designed to counter drone threats with unmatched speed and precision.

"The Slinger is an evolution of our highly successful R400 remote weapon station, known for its extreme accuracy and high probability of a first-hit kill," Schwer says. "Against drones, where the engagement window is only a few seconds, precision is everything."

The system seamlessly integrates into broader air defence networks, leveraging radar and sensor data for autonomous targeting. Once an enemy drone is detected, the Slinger locks on and eliminates the target within seconds.

> **"Against drones, where the engagement window is only a few seconds, precision is everything."**

Dr Andreas Schwer
Managing director and chief executive of Electro Optic Systems

"In a fully automated set-up, the Slinger connects to surveillance radars, receives target information and instantly engages. Once locked on, it operates independently, ensuring rapid response times," Schwer says. "For operations without radar support, it can still function effectively using onboard electro-optical and acoustic sensors."

The Slinger is already proving its value in Ukraine, where it has been deployed to defend critical infrastructure, including missile bases and radar stations near Kyiv.

The game-changer: High energy laser weapons

While kinetic solutions like the Slinger remain crucial, EOS is also pioneering directed energy weapons as the future of counter-drone warfare.

The appeal is simple: cost-effectiveness, speed and the ability to store enough energy for thousands of shots in a simple battery.

"Let's break it down," Schwer says to Defence Connect. "Shooting down a drone with a missile costs between $500,000 and $1 million. A rocket? About $15,000 to $25,000. A cannon round? Around $150. But a laser shot? Just $1."

EOS' laser system can neutralise drones at distances of two to three kilometres within seconds. "A 100-kilowatt laser can take down a drone in two to three seconds," Schwer says. "It then readjusts in half a second and moves on to the next target.

Within a minute, it can eliminate up to 20 drones."

It becomes even more attractive when considering how energy efficient the platform is, giving it the ability to engage hundreds – if not thousands – of targets with its battery solution.

"If you talk about an installation in an 8x8 infantry fighting vehicle, you can have more energy stored than what you need to kill 200 drones," he says. "If you talk about a containerised solution, to protect infrastructure, for example, you can talk about thousands of engagements."

Though the threat isn't just limited to the front lines. Inexpensive drones are increasingly being used to target high-value civilian and military infrastructure.

"It's not just battlefield defence," Schwer says. "Our systems are also deployed to protect key sites from drone attacks – missile bases, radar stations and other critical infrastructure. Some of the most valuable assets have been taken out by $2,000 drones."

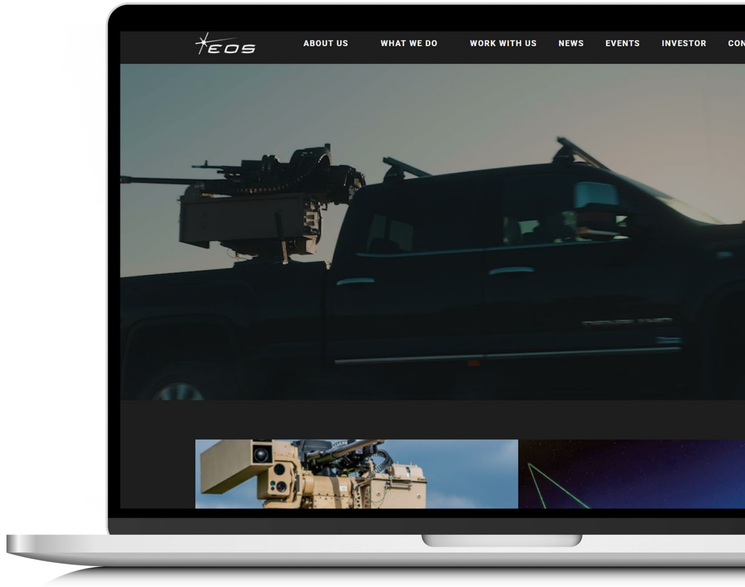
The global demand for counter-drone innovation

The rapid evolution of drone warfare has created an urgent demand for effective countermeasures. EOS, while headquartered in Australia, operates across the world, with the majority of its clients based overseas.

"Our main operations are in Australia, but 70–80 per cent of our business comes from international clients," Schwer has told Defence Connect.

As drone warfare continues to evolve, the need for innovative, cost-effective and scalable countermeasures will only grow. With solutions like the Slinger and advanced laser systems, EOS is positioning itself at the forefront of this new era – where speed, precision and adaptability define success on the battlefield. ●

To learn more about EOS, click here.



The next frontier in counter-drone warfare: Merging AI, sensors and software

The rapid evolution of drone technology has forced militaries and defence tech companies into a game of cat and mouse. As counter-drone systems improve, adversaries adapt – returning to old techniques while integrating cutting-edge innovations.

ONE OF the most significant shifts in modern drone warfare is the move away from sole reliance on radio frequency (RF) sensing. Advances in electromagnetic spectrum detection have pushed drone manufacturers to reduce RF emissions, relying instead on preset coordinates, onboard computing and artificial intelligence to complete missions. Some operators have even turned to low-tech solutions, such as tethering drones to multi-kilometre fibre optic cables to ensure a reduced signature and mitigating the risk of jamming attacks.

For defence technology providers like Anduril, the solution lies in a multi-layered approach. Its Lattice system, a software-driven command and control network, integrates diverse sensor inputs – from RF detection to electro-optic and infrared – creating a comprehensive and resilient battlespace awareness system. This fusion of technologies enhances situational awareness, ensuring that no single vulnerability can be exploited to compromise air defence.

The evolution of drone detection

Jeremy Kenealy, director of growth and air defence at Anduril Australia, recently spoke with Defence Connect about how drone warfare has changed and how counter-drone technology must adapt.

"A few years ago, RF detection was one of the most effective ways to track drones," Kenealy says. "But as drones evolved, their RF links became encrypted, more difficult to detect or even eliminated entirely. Some autonomous drones now operate with no RF emissions, making traditional detection methods ineffective."

Rather than relying on a single sensor type, Anduril's approach integrates multiple detection methods, compensating for the weaknesses of individual sensors. "There is no one perfect piece of hardware for air defence," Kenealy says.

"A camera can't see behind a tree, but an RF detector can pick up signals. A single system isn't enough. By fusing data from multiple sensors through software, we mitigate individual weaknesses and create a more robust counter-drone capability. We take a family of systems approach, and we think this is the most effective way to address these new threats."

In practical terms, this means that no matter how adversaries attempt

"Some operators have even turned to low-tech solutions, such as tethering drones to multi-kilometre fibre optic cables to ensure a reduced signature and mitigating the risk of jamming attacks."

to hide their drones – whether by removing RF emissions, using stealth coatings or flying in challenging terrain – Lattice can pull together data from various sources to create an accurate, real-time picture of the battlespace.

Software-driven defence

At the core of Anduril's counter-drone strategy is a software-first methodology. Unlike traditional defence contractors that focus on standalone hardware, Anduril emphasises open architecture and rapid software integration to adapt to evolving threats.

"Our primary product is our software system, Lattice, which controls and connects all of our different hardware systems," Kenealy says. "That means the hardware becomes agnostic. We solve most problems through software, then deploy the right hardware in the most effective way."

This approach is already being put to use in Australia. Last year, Anduril signed a three-year trial contract with the Royal Australian Air Force to deliver autonomous security capabilities for its Darwin base. Additionally, the company is investing in local manufacturing to produce its Ghost Shark extra-large autonomous undersea vehicle – an uncrewed underwater capability being developed under the Advanced Strategic Capabilities Accelerator's Mission Zero.

The Ghost Shark program represents a significant step forward in uncrewed undersea warfare, combining advanced autonomy, stealth and endurance. This initiative

by Anduril Australia showcases the company's commitment to rapidly iterating on defence solutions outside the traditional procurement cycle.

The changing face of drone warfare

The conflict in Ukraine has demonstrated the adaptability of both drone operators and counter-drone systems. Some forces have returned to older methods – such as using fibre optic cables to bypass RF detection – while others leverage AI-driven autonomy to complete missions with minimal external communication. This mix of high-tech and low-tech tactics keeps counter-drone developers on their toes.

"Some of the technology is getting more advanced, and some of it is regressing back," Kenealy says. "A great example is small drones in Ukraine using fibre optic cables to fly by wire instead of relying on RF links. That's a very old technology making a comeback in a modern battlefield."

These lessons are being rapidly incorporated into counter-drone strategies worldwide. As drone operators find new ways to evade detection, Anduril is continuously updating its Lattice software to integrate the latest advancements in artificial intelligence and machine learning. This ensures that military operators are not only reacting to threats but staying ahead of them.

Meanwhile, the cost disparity between drones and the assets they target continues to highlight the urgency of effective counter-drone measures. Kenealy recalls an

incident in Sudan where a $500 do-it-yourself drone destroyed a $100 million C-130 aircraft – a stark reminder of the asymmetric threat drones pose.

"The affordability of these systems makes them an attractive option for adversaries," he says. "If we don't have the ability to detect and neutralise them effectively, the financial and strategic consequences can be enormous."

The future: Teaming crewed and uncrewed systems

Looking ahead, Anduril aims to enhance the synergy between crewed and uncrewed systems. By integrating low-cost, attritable drones with high-value assets like the F-35, militaries can gain a strategic advantage through sheer numbers.

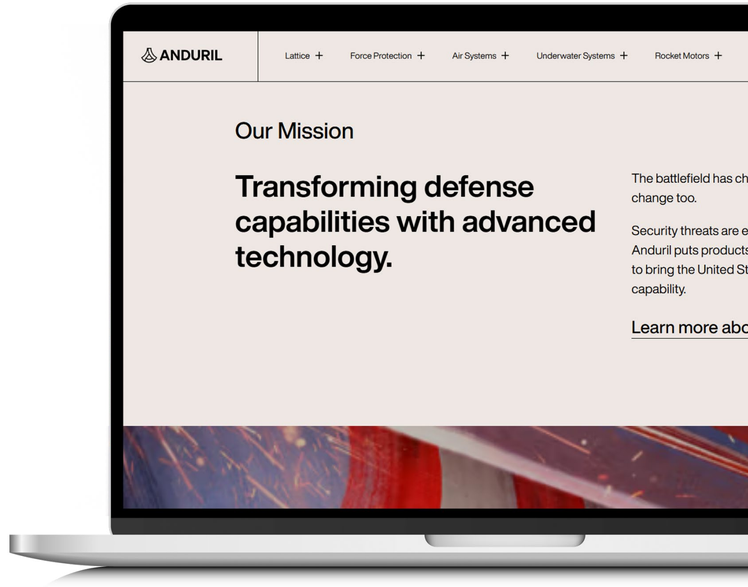
"You've got an F-35 running quarterback, with a swarm of lower-cost drones providing electronic warfare, surveillance, reconnaissance and strike capabilities," Kenealy says. "Mass and volume make defence much harder for the adversary, overwhelming their systems and depleting their resources faster."

This shift towards manned-unmanned teaming aligns with global defence trends, where major militaries are investing heavily in autonomous wingmen concepts. By leveraging AI and autonomy, future battlefields may see fewer pilots in direct combat and more remote-controlled or fully autonomous assets conducting high-risk missions.

As the battlefield continues to evolve, so too must the technology designed to defend against emerging threats. Anduril's Counter Intrusion and CounterUAS solutions, including its Lattice platform, represents the next step in counter-drone warfare – ensuring that militaries stay ahead in an increasingly complex and contested battlespace.

In a world where drones can be both high-tech and low-tech threats, one thing remains clear: defence technology must be as adaptable and resilient as the adversaries it seeks to counter. ●

To learn more about Anduril, click here.



Fact or fiction: Analysing the latest developments in Chinese military drones

The People's Republic of China (PRC) has been accelerating its innovation and production of military drones, with new models increasingly being introduced in a matter of months rather than years. However, distinguishing between genuine military advancements and state-controlled narratives can be a challenge.

CH-7 at Airshow China 2022.
Photo: Tao Ran, CH UAV of CASC

HISTORICALLY, CHINA has produced aircraft and armoured vehicles heavily influenced by Soviet designs. Yet, in recent years, the country has made significant strides into the realm of unmanned aerial vehicles (UAVs) and other drone technologies.

The development of attritable, counter-stealth and persistent UAVs marks a new direction in global military strategy by the PRC, positioning itself as a direct competitor to established air powers such as the United States and Russia. These advancements are seen as a strategic challenge to traditional air warfare dynamics.

One such development that has garnered attention is the Wuzhen-9 Divine Eagle airborne early warning drone, which has been spotted operating from the PLA's Hainan Island airbase in the South China Sea since December of last year. This long-range surveillance drone, which features a twin-boom design and a 35-metre wingspan, is powered by a single turbofan jet engine positioned between the tail fins. It is widely considered a noteworthy example of counter-stealth innovation from Shenyang Aircraft Corporation. Speculation also surrounds the presence of a SATCOM antenna embedded within the drone's port side "head".

Additionally, the PRC has made notable progress with the CH-9 combat drone, developed by the China Academy of Aerospace Aerodynamics. This platform is capable of carrying air-to-air and anti-ship missiles, bombs, torpedoes or loitering munitions and has been showcased at the China International Aviation & Aerospace Exhibition in Zhuhai.

Broadening its UAV portfolio, China also unveiled the Jetank, a next-generation large unmanned aerial utility platform, at Airshow China 2024. Manufactured by the Aviation Industry Corporation of China, the Jetank is designed to serve as a "swarm carrier", capable of carrying a variety of weapons, including anti-ship or air-to-air missiles, laser-guided bombs, glide bombs and smaller drones for reconnaissance, communication, electronic warfare or strike missions.

Another significant addition to China's drone capabilities is the WZ-8, a high-speed, high-altitude reconnaissance drone released in April 2023. Capable of reaching Mach 3 speeds and altitudes of up to 100,000 feet, the WZ-8 is considered the world's first hypersonic surveillance drone.

Among the PRC's most advanced UAVs is the CH-7 flying-wing stealth drone, which is believed to have completed its final development phase in late 2024 after its debut at Airshow China in 2018. The CH-7 is expected to carry precision-guided missiles and other munitions for high-value strike operations.

"The CH-7 is expected to carry precision-guided missiles and other munitions for high-value strike operations."

Finally, rounding out China's diverse UAV offerings is the Chengdu Wing Loong-3, a medium-altitude, long-endurance unmanned aerial combat vehicle. This system, which has been on display since 2022, features a design that closely resembles the General Atomics MQ-9 Reaper and is capable of carrying air-to-air missiles.

As China continues to enhance its drone capabilities, it raises questions about the broader implications for global air warfare and the strategic balance between major military powers.

Dr Malcolm Davis, Australian Strategic Policy Institute's defence strategy and national security senior analyst, speaking with Defence Connect on the subject, says the People's Liberation Army is investing heavily in uncrewed aerial system (UAS) for the domains of air, sea and to a lesser extent, land.

"In terms of air capabilities, the PLAAF are developing a range of UAS for a range of tasks, including strike, as well as ISR and long-endurance high-altitude reconnaissance, and the PLAN are also developing advanced UAS capabilities including carrier-launched systems for use with their Type 076 Class LHD," he says.

"The Chinese see UAS as a key element of PLA force structure that contributes greater mass to an already massive military capability, enhanced endurance in areas of military interest, and an ability to launch a range of offensive tasks as part of anti-access and area denial (A2/AD) operations within a counter intervention strategy along the first and second island chains.

"This PLA UAS capability is only going to increase in size and diversity and sophistication, and is challenging US and allied capability advantages, where the United States of America and its partners have been slower to

WZ-7 high-altitude reconnaissance drone.
Photo: CCTV News WeChat account

embrace the potential offered by UAS and have a smaller capability that is albeit still sophisticated.

"The United States is recognising the potential offered by Collaborative Combat Aircraft (CCA) which are now in early development as part of future generation air combat capability projects such as NGAD and F/A-XX, but so are the Chinese, with the Chinese developing similar capabilities – their CCA prototype is a virtual exact copy of the MQ-28 Ghost Bat, for example.

"The Chinese have developed their own equivalent to the MQ-4C Triton in the form of the unique WZ-9 Divine Eagle, which would support PLAN and PLARF ISR and targeting as part of A2/AD. As with the Triton, a large, slow UAV is vulnerable in contested airspace, but in China's case, they have the advantage of geography and a land-based force. The US and Australia must project platforms such as the Triton through heavily defended airspace and are unlikely to be able to deploy crewed fighters such as carrier-based F-35C or land-based F-35A close enough to threaten WZ-9.

"I think platforms like the WZ-9 are akin to 'pseudo satellites', able to exploit 'near space' (the region from the stratosphere upwards) for long-endurance ISR and targeting operations, and they'll be difficult to target if we can't get air or naval platforms within range.

"The use of drones by the PLAN is commonplace and such capabilities provide ships with 'over the horizon' targeting capabilities.

"The Chinese are moving rapidly in regard to UAS – probably more rapidly than what is happening in the United States and certainly much more rapidly than what is happening in Australia at the moment, where the department's approach is very slow paced.

"China recognises that it can boost military power through investing in UAS as 'high-volume, low-cost' capabilities – which can be armed and employed across the full spectrum of military tasks. China is far less constrained in the use of lethal autonomous weapon systems, including armed UAS, in terms of ethical, legal or moral constraints, as compared to Western democracies.

"When China talks about 'intelligentised warfare' as a next step in the PLA development, its thinking in terms of how it brings AI and UAS together in a manner that gives it decisive military advantage.

"So, Beijing will ignore any efforts by Western states to impose legal or regulatory measures to constrain the use of AI and UAS on the battlefield – even if we, democracies, are constrained by such measures. That could give states such as China a decisive military edge."

The US Department of Defense has previously identified the development of experimental aircraft and unmanned aerial systems as a key priority being seen in China.

"The PRC is advancing its domestic aviation industry through two major state-owned aircraft corporations, the China Aviation Industry Corporation (AVIC) and the Commercial Aircraft Corporation of China (COMAC)," the US DOD says in an annual 2024 report to the US Congress, titled *Military and Security Developments involving the People's Republic of China*.

"AVIC designs and produces the PRC's military aircraft, including the J-20 fifth-generation fighter, the Y-20 heavy transport and the future H-20 flying wing stealth bomber.

"In February 2024, AVIC displayed its Z-10 attack helicopter for the first time outside of the PRC at the Singapore Airshow. As of February, Pakistan is

the sole known export customer for the helicopter.

"COMAC produces large passenger aircraft and has begun to export the ARJ21 regional jet to Indonesia, in line with its efforts to expand into the international commercial airliner market. COMAC has delivered its first narrow-body C919 airliner to China Eastern Airlines but cooperation with Russia on the wide-body CR929 may be stalled because of the effects of Western sanctions on Russia.

"In early 2024, a model of the J-35 stealth fighter appeared on the deck of the PRC's first aircraft carrier, the Liaoning – a test bed for PLA carrier capabilities. Although the J-35 is in the development and prototype phase, it could be in operation in the coming years.

"The PRC's decades-long effort to improve domestic aircraft engine production is starting to produce results, with the J-10 and J-20 fighters beginning to switch to domestically produced WS-10 engines, although some Russian AL-31F engines may remain in use.

"As early as 2023, Chengdu Aircraft Industry Group began increasing the production capacity of the J-20 as it is building a new assembly plant to prepare for the subsequent further expansion of production.

"The PRC's first domestically produced high-bypass turbofan, the WS-20, has entered flight-testing on the Y-20 heavy transport aircraft and probably has begun to replace previously imported Russian engines.

"UAV development has proceeded rapidly with new flight tests of experimental craft, such as the Y-5U transport UAV. The PRC's military aviation industry has continued to export UAVs abroad, including its sale of nine armed drones to the Democratic Republic of Congo in 2023." ●

First batch of trainees learn how to use the border defence drone on the spot on 31 October 2019.
Photo: PRC Foreign Ministry/Song Peng

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