**1 . Date: 23-01-2025Fixed Wing - Solar ISR / ISTAR - HALE - General - AALTO launches milestone first stratospheric Zephyr flight from KenyaURL: https://www.flightglobal.com/aerospace/aalto-launches-milestone-first-stratospheric-zephyr-flight-from-kenya/161490.article**

Airbus subsidiary AALTO has launched its first stratospheric flight with a Zephyr air vehicle from a new operating base in Kenya.

Following its launch on 20 January, the solar-powered, ultra-long-endurance aircraft climbed to 60,000ft, for a sortie of an undisclosed duration. The longest Zephyr flight conducted to date lasted 64 days, with the aircraft able to reach a maximum altitude of 75,000ft.

“Over the coming days, AALTO will be conducting its first tests from the stratosphere this year,” the company said on 22 January.

The activity is being performed from the company’s purpose-built AALTOport launch and recovery facility in Kenya’s Laikipia County, construction of which was completed last year.

Notably, the current flight involved the use of a new launch platform named ELVIS, which enabled the 25m (82ft)-wingspan aircraft to get airborne. With a maximum take-off weight of 75kg (165lb), the Zephyr had previously been hand-launched by multiple ground crew.

“Through their support, national authorities led by the Kenya Space Agency and Kenya Civil Aviation Authority have demonstrated their vision to champion cutting-edge aerospace technologies,” says AALTO, while hailing the African nation’s “pioneering regulatory landscape”.

“It is a key milestone on our roadmap to utilise HAPS [high-altitude, pseudo satellites] to provide connectivity and Earth observation services to those that need it most,” AALTO says of the current test flight.

**2 . Date: 03-06-2024Solar ISR / ISTAR - HALE - Market - AALTO’s Zephyr programme to soar via $100m Japanese investmentURL: https://www.flightglobal.com/aerospace/aaltos-zephyr-programme-to-soar-via-100m-japanese-investment/158596.article**

Zephyr ultra-endurance air vehicle developer AALTO has secured a $100 million investment from a Japanese consortium including mobile services provider NTT DOCOMO.

Signed on 3 June, the agreement with Airbus-owned AALTO also involves Space Compass, Mizuho Bank and the Development Bank of Japan.

Described by its developer as a High Altitude Platform Station (HAPS), the solar-powered Zephyr is being offered for tasks including direct-to-device mobile connectivity and earth observation. With a 25m (82ft) wingspan, the lightweight aircraft can sustain round-the-clock operations at altitudes up to 75,000ft, with a flight endurance of more than two months already having been demonstrated.

“This investment marks the beginning of a strategic alliance to commercialise connectivity and earth observation services using HAPS in Japan and across Asia,” the UK-based company says. “It will also support the industrial and commercial roadmap for AALTO’s services, targeting launch in Japan and a global entry-into-service in 2026.”

“NTT DOCOMO continues to improve network quality and has been focused on establishing new technology frontiers that enhance access to connectivity services,” says chief technology officer Takaaki Sato. The provider currently has more than 89 million subscriptions for its network services.

“This technology brings together unique cutting-edge engineering with economics that are aligned to expand coverage to rural and remote areas, and support our collective response to natural disasters,” he adds.

“Japan has many remote islands and mountainous areas, where there are uneconomic connectivity solutions,” notes Space Compass co-chief executive Shigehiro Hori. “Our strategic relationship with AALTO, underpinned by technological innovation and the opportunity of the connectivity market, will help us build a new telecommunications infrastructure in these areas.”

AALTO and its Japanese backers began discussions in 2022 around potential collaboration, they reveal. The new financial support will be provided via the consortium’s HAPS Japan investment vehicle, “subject to closing conditions and regulatory approvals”.

“With world leaders in aviation and connectivity as shareholders, AALTO now has the combination of technological expertise and global reach to capitalise on the growth opportunities in substantial total addressable markets,” says AALTO chief executive Samer Halawi.

“This investment comes as AALTO moves into its next phase of development,” he adds. “This includes launching several customer missions over the coming year, establishing launch and landing sites for Zephyr, and advancing our certification process.”

“Airbus Defence & Space will remain AALTO’s majority shareholder,” the company notes.

**3 . Date: 29-08-2024Cargo - MALE - General - PlatformDufour Aerospace progresses Aero2 tiltwing developmentURL: https://www.flightglobal.com/aerospace/dufour-aerospace-progresses-aero2-tiltwing-development/159769.article**

Swiss advanced air mobility developer Dufour Aerospace has completed the first hover flight of the production-conforming version of its Aero2 tiltwing uncrewed air vehicle (UAV).

Announcing the milestone on 26 August, Zurich-based Dufour said the flight of the tiltwing, which it calls the X2.3, had taken place the previous week.

“This achievement is the result of years of research, development, and testing by our team, and I am so proud of them,” says Sascha Hardegger, chief executive of Dufour Aerospace.

Featuring a hybrid-electric powertrain, the Aero2 can carry a 40kg (88lb) payload on routes of up to 216nm (400km). Dufour sees applications for the platform including cargo transport and surveillance.

Dufour expects serial production of the UAV to begin next year following certification by the European Union Aviation Safety Agency.

It is also developing a seven-passenger tiltwing aircraft, the Aero3, which is anticpated to arrive in 2030.

**4 . Date: 23-02-2024ISR / ISTAR - HALE - General - PlatformHigh-flying AALTO preparing to meet stratospheric demand for Zephyr servicesURL: https://www.flightglobal.com/aerospace/high-flying-aalto-preparing-to-meet-stratospheric-demand-for-zephyr-services/157097.article**

Nestled in the corner of an anonymous industrial estate just metres outside the perimeter of the UK’s Farnborough airport, high-flying innovator AALTO’s production facility is gearing up for output of its unmanned Zephyr to take off.

Inside its Kelleher building, the result of the company’s work is an extraordinary sight. With a 25m (82ft) wingspan – roughly the same as an ATR 72 twin-turboprop – its ultra-endurance Zephyr 8 has a maximum take-off weight of just 75kg (165lb), and the aircraft can fly as high as 75,000ft, in the stratosphere.

Stripped of the two small electric motors, wing- mounted solar arrays and batteries that enable it to sustain round-the-clock operations, its bare airframe weighs in at only 30kg.

In 2022, a flight-test example flew nonstop for 64 days after being launched in the USA, covering a total distance of 140,000nm (259,000km). The aircraft narrowly failed to exceed an endurance record due to experiencing a subsystem failure as it laboured to remain above unusually high-altitude, storm-related turbulence recorded at around 57,000ft.

Equipped with a lightweight payload, the Zephyr is intended for use during tasks such as providing mobile phone signal coverage, online connectivity services, or Earth observation. Military applications could also include establishing secure communication networks.

Serving as a mast in the sky, a single Zephyr could enable the same mobile phone coverage as up to 250 ground-based towers in the most difficult terrain, AALTO claims. Crucially, this can be done more efficiently and at a much lower cost than using low-Earth orbit satellites, it adds.

AALTO is now working in pursuit of certification, while honing its industrial and operational plans for the programme, which traces its development roots back through Airbus Defence & Space and Qinetiq ownership and over 20 years.

The niche company now operates as a subsidiary of Airbus, which span it out in May 2022 but still retains full ownership.

“The idea is to grow the company, to bring in external partners as shareholders that will be strategic in nature, not just financial,” explains AALTO chief executive Samer Halawi.

“We have been engaged with a number of potential strategic partners, but we just want to make sure that we get it right,” he says. “Those conversations are ongoing, but the objective is not time-based – it is quality-based.”

Type certification via the UK Civil Aviation Authority (CAA) is currently targeted before the end of 2025, at which point the company wants to be ready to start delivering managed services to customers using fleets of the aircraft.

Central to this will be the establishment of potentially half-a-dozen so-called AALTOports around the globe. Each will serve not only as a launch and recovery point for the aircraft, but also host production and maintenance facilities.

“We need places around the world where the weather is favourable to us, and for the longest duration of the year as possible,” Halawi says. This multi-site plan means that “if we cannot take-off from one particular location, we go from another”, he says.

AALTO plans to establish its first such facility in Kenya, which came out on top following meteorological assessments, and also spans the equator, maximising potential for charging solar panels while airborne. Talks continue with Kenyan authorities.

“We are still looking as to where to put the other three, four or five hubs around the world,” Halawi says. Brazil is viewed as another possible location, while a suitable global spread also suggests that sites could be established in the Middle East and Asia-Pacific regions.

“It puts the country at the forefront of innovation, and brings high-level jobs,” Halawi says of the benefits available for potential hosts.

Meanwhile, AALTO’s lead engineers are working to perfect its manufacturing and assembly process. This will include appointing subcontractors to take on manufacturing at scale. Its industrialisation plan is bold, ultimately looking to complete one aircraft per week on the Farnborough assembly line alone.

“We need to bring in the best people from across the industry to make it a success, which is why Airbus carved AALTO out from the core and attracted the C-suite that we have,” says chief engineer Philip Briggs. “We have very different skills that will enable us to get to market in the most efficient way.”

Chief technology officer Pierre-Antoine Aubourg, for example, brings considerable such knowledge, having formerly worked as a production expert overseeing industrial transformation at Airbus Helicopters.

“We will outsource, so we can have a simpler final assembly line,” Briggs says. This also will be standardised at overseas locations – a practice which Halawi refers to as an “Ikea-type” assembly model.

The vehicle’s construction involves the use of lightweight carbonfibre components which are assembled to form the wing structure, which is then wired and covered in Mylar. The number of solar arrays and batteries installed can vary according to mission and endurance requirements.

Current payload options include the Airbus Defence & Space-developed Opaz Earth observation sensor, which weighs just 5kg. From 65,000ft, its coverage is roughly 22 x 11nm (40 x 20km), with a ground imaging resolution of 18cm. An alternative communications payload weighs up to 8kg.

The stratosphere poses unique operational challenges, with low atmospheric pressure, high temperatures during the day and extreme cold at night.

After hours spent in darkness, the aircraft’s batteries gradually regain the charge needed to enable the Zephyr to return to its maximum altitude of 75,000ft by around noon, and then begin to store excess capacity.

“Two hours before sunset, we stop charging, and then as it descends we convert the potential energy into kinetic energy, and throttle back the motors,” explains vice-president flight operations Rich Tyler. It then cruises through the night at around 60,000ft, “using less power than a standard microwave”.

“We have demonstrated in the stratosphere that we can use the payload overnight – that is the really difficult bit,” Briggs says.

AALTO has already tested battery life of up to 180 days, but aims to eventually be able to sustain nonstop flight for up to one year.

David Hansell, the company’s head of aviation, explains the complexity of seeking regulatory approval. “You are certificating an entirely new form of aviation,” he notes, pointing out that “the operator may be two continents away”.

While this means that regulators may be “a couple of steps behind industry”, he says: “it has been very positive so far, from the regulators, countries and up to ICAO”.

“There is an opportunity for the CAA and others to be at the forefront of technology, by certifying a very high level of innovation that at the same time is something that is really good for humanity – that is, offering a service that is connecting people,” Halawi says.

A key requirement will be for AALTO to secure parallel validation approvals from multiple authorities.

As an example of its progress, Tyler notes that “Over four days [in 2022], we exited the US National Airspace System and flew all the way down to Belize, operating in multiple flight information regions.

“We did live capture with multiple payloads, and took 14,500 images over 24 hours. We mapped an extensive geographic range during this mission, beyond the capabilities of a satellite.”

While commercial traffic will fly far below Zephyr vehicles, AALTO’s aircraft must be able to make their slow way to operating altitude after launch without causing inconvenience or risk to others.

Hansell has a unique perspective on the high-altitude sector, having also previously run aviation policy on the Google Loon project and worked on Facebook’s Aquila effort – both of which sought to broaden internet connectivity around the globe.

Facebook axed the solar-powered Aquila aircraft project in 2018, while Google called time on its Loon venture – which used high-altitude balloons – in 2021.

“For many good reasons, and for some outdated reasons, the model of certifying aircraft relies on a highly skilled crew sitting in a flightdeck having immediate control over that aircraft, and so regulators live in that world,” Hansell says.

“It is incumbent on us to go and prove every time that not only are we safe, but we are good partners in the airspace. We are not inconveniencing travellers or cargo, and people should never even know [that we are there] aside from the benefit that we give.”

“We are not flying over high-population areas or congested airspace,” Halawi adds. “We don’t carry passengers – we are way down the risk scale.”

Discussions with regulators include seeking the flexibility to move a vehicle off station and into a pre-defined temporary sanctuary area in the event of adverse weather, degraded performance or the interruption or loss of a communication link.

“The aircraft can fly autonomously for up to seven days,” Tyler notes. During this time, its operator can attempt to re-establish communication, or if required opt to terminate the platform. This would be achieved by placing the aircraft into a stall over a safe area, after which it is designed to descend in a controlled manner, which Tyler likens to a sycamore seed falling.

However, were it to encounter a structural failure, its batteries are tethered directly to the aircraft’s spine, and its wing will separate at its outer dihedral point, and “flutter down”.

AALTO has an in-house pilot training team and simulator which can mimic different weather phenomena and system failures. It has trained 100 operators to date – from experienced unmanned air vehicle pilots to others with no prior experience – with each completing a course lasting up to six weeks.

The company also has its own mission planner academy for the Zephyr’s other supporting personnel, who are trained to prepare for up to the next seven days of a flight’s activity. This is supported by the aircraft sending text messages about its status every 30s, with a system latency of roughly 5-6s.

But with the aircraft requiring little in the way of manual intervention, the company plans to eventually have one operator and mission planner taking responsibility for multiple vehicles simultaneously.

AALTO has entered its next round of activity, using a sub-scale low-level test vehicle. A first flight was conducted in mid-February, using a military range off the west coast of Wales.

“It uses exactly the same avionics as the larger aircraft,” Tyler says. “We are looking at changes in the flight-control system, and also the motor controller.”

But why does AALTO believe it can succeed when the financial and innovative might of two of the world’s leading technology players previously failed?

“Google Loon had the technology and they had a good market penetration, but when you use balloons, you cannot control exactly where they go,” Hansell notes. Facebook, meanwhile, incurred high costs by developing an aircraft with a 43m wingspan.

“They are mega companies with huge resources,” he says. “But at their core, Facebook and Google are not aviation companies. They do not think and operate the way aviation companies have for decades. We appreciate the economies of building aircraft, the timelines of return on investment, and the regulatory view of what is required to build and operate aircraft safely. We have the right balance of capability and performance.”

Notably, that capability also has matured over time: an earlier iteration of the Zephyr first reached the stratosphere in 2008, but it took another decade for the technology to fully catch up with design requirements.

Halawi views AALTO’s ability to offer customers a fully managed service as a clear differentiator in the market. Potential users should find the experience more akin to using a chauffeur than simply hiring a car, he suggests.

“What we are looking at is providing the service so that our customers are not concerned about aviation elements related to flying something, taking off from somewhere, doing the maintenance. It’s the application that is important, not the ownership of the vehicle.”

And with environmental considerations also of growing importance globally, he points to the solar- and battery-powered Zephyr’s green credentials. “We are offering a service that is completely sustainable, from beginning to end. We don’t need fuel to launch rockets or operate satellites.

“We think we are going to have more demand than we can supply at least initially, until we ramp up our production,” he says of the strength of market interest.

“We have already been engaged with a number of potential customers that are either working with us on demonstrating a certain capability or for whom we are running some actual missions,” he says. “They are big believers in what we are doing.”

The company has previously announced the sale of two Zephyr aircraft to the UK Ministry of Defence.

“Customer demand is very pent up,” says Briggs, who notes that AALTO also is contacted “whenever there is a natural disaster”, to see if the company could provide support for humanitarian response efforts.

“We are just on the cusp of exponential demand – certainly with the interest that we see and the work that we have planned for the next two years,” he says.

And for the longer-term, AALTO is studying the development of additional aircraft, potentially including a larger model which would offer increased endurance or a multi-payload capability.

**5 . Date: 25-09-2024Regulation - UK CAA outlines path to widespread UAS deploymentURL: https://www.flightglobal.com/aerospace/uk-caa-outlines-path-to-widespread-uas-deployment/160083.article**

UK regulators have set out the steps needed to open the country’s airspace for widespread operation of uncrewed air systems (UAS) by 2027 to “maximise [their] economic and social benefits”.

In its latest policy document, the Civil Aviation Authority (CAA) identifies the key regulatory changes and technologies required to enable beyond visual line of sight (BVLOS) operation of UAS to be “a routine part of aviation – ‘business as usual’ – across the UK”, it says.

Tests of BVLOS operations have to date been conducted in segregated airspace “due to the unmitigated risk of mid-air collision with other aircraft”.

That airspace is typically provided through the establishment of a ‘temporary danger area’ (TDA) – blocks of restricted airspace in place for no more than 90 days – but these are not a “practical long-term solution for a sustainable BVLOS business model” due to their inherent limitations, the CAA says.

Safety remains the priority, the agency says, so that “all airspace users are sufficiently protected, and the risk to people and property on the ground is reduced to acceptable levels”.

It sees the requirement for a “technical and operational solution” using detect-and-avoid (DAA) technologies to remove the need for TDAs and to enable “UAS operations within airspace that is safely shared with other aircraft”.

Taking a “technology-agnostic approach”, it sees the solution as a “combination of several components that are interoperable”, including: electronic conspicuity via ADS-B, an “assured” remote pilot station, robust command and control links, and DAA capabilities.

The DAA technology, it notes, “should be a capability that is at least equivalent to the ‘see-and-avoid’ principle used in manned aviation to avoid collision with other aircraft and obstacles”.

On top of which an air traffic management (ATM) system should be implemented in low-level airspace that includes “specific services for UAS as well as other value-added services for existing airspace users and other new vehicles such as electric vertical take-off and landing (eVTOL) aircraft”.

Operations in urban environments “where ground risk must be recognised and mitigated”, presents a further challenge, the CAA adds.

Overall, the changes to permit BVLOS operations are “intrinsically interconnected with and dependent on” the UK’s airspace modernisation strategy, the document adds.

“The CAA is already working with operators, aerospace industry, training organisations and service providers to enable them to develop multiple ways of solving each one of these technical challenges, and we welcome their innovation.”

It sees four primary workstreams: operational authorisations, vehicle flightworthiness, pilot competency, and airspace integration, all built on “foundation elements” of environmental impact, safety, physical security, and cybersecurity.

Vehicle flightworthiness “needs to be assessed and validated to form a part of the mitigation for ground risk”, it says, adding: “This assessment will review evidence relating to the design, build and testing of the UAS, helping to ensure that it is safe to fly the proposed operation.”

Under the Specific Operation Risk Assessment to be adopted by the CAA from 2025, features, particularly a robust DAA system, will allow a vehicle to access significantly larger amounts of airspace.

Pilot training will also be a key component, it adds; the CAA is proposing to introduce two new certification levels “to support a wider range of future operational scenarios”. Additionally, it proposes that in the initial phase of widespread BVLOS operations, one remote pilot controls only one UAS.

The CAA’s roadmap runs through three phases: demonstrate, scale, sustain.

Initial demonstration efforts are scheduled to commence this year and “will inform how the operations can be extended to enable routine operations by 2027.”

A glimpse into how successful airspace integration might look, and the hurdles to overcome, has been provided by a project called ALIAS – agile and integrated airspace system – carried out under the UK’s Future Flight Challenge programme.

Led by Volant Autonomy – a University of Bath spin-out – and running from 2022, the £3.7 million ($4.9 million) project culminated earlier this summer with a series of flight trials in Jersey in the Channel Islands.

“The overall objective of the project was to design, develop and demonstrate a viable integrated traffic management [ITM] system where crewed and uncrewed aircraft could operate in the same airspace, under the same operating principles.”

During the tests, a pair of SkyLift V-23 vertical take-off and landing fixed-wing UASs were flown from Jersey’s airport to demonstrate integration with existing airspace infrastructure.

In addition, ALIAS used a Diamond Aircraft DA-42 supplied by Draken Europe to test the interaction of crewed and uncrewed assets within the ITM system. Aircraft were equipped with Volant’s Traject ACAS sXu DAA system for the trials.

“The live crewed-uncrewed DAA demonstrated how new technologies can be adopted into the exiting airspace system under existing and exacting standards of assurance,” says Volant, noting that the testing is “believed to be the first of its kind in Europe”.

“Volant took up this challenge to develop a prototype ITM which was designed to demonstrate how, by adapting uncrewed technologies to existing airspace principles, commercial uncrewed operations are both viable and scalable,” it adds.

“Developing an ITM system is not just about adopting new technology and new regulations, but is as much about learning to operationally deploy new capabilities in order to solve real-world problems.”

**6 . Date: 31-10-2023Cargo - Tactical - General - PlatformBritish Antarctic Survey readies for future as it prepares for Ultra UAV trialsURL: https://www.flightglobal.com/civil-uavs/british-antarctic-survey-readies-for-future-as-it-prepares-for-ultra-uav-trials/155603.article**

The British Antarctic Survey (BAS) is gearing up for the start of a three-month trial early next year of a new uncrewed air vehicle (UAV) for surveying missions, as the organisation pushes to “do more science at lower cost”.

Part of a £4.7 million ($5.7 million) project called Swarm – 65% funded through the UK government’s Future Flight Challenge (FFC) – the initiative will see BAS operate a Windracers Ultra UAV from Rothera Research Station from January to March 2024.

Capable of carrying a 100kg (220lb) payload over distances of up to 540nm (1,000km), the fixed-wing Ultra will be equipped with a suite of modular sensors to enable BAS to carry out a broad spectrum of research.

“At BAS, we are changing our approach to science by increasing the use of autonomous platforms, such as UAVs and autonomous underwater vehicles, to collect data,” said Dr Dominic Hodgson, interim science director, at a 30 October event at the organisation’s Cambridge headquarters.

“By deploying unpiloted platforms, such as the Windracers Ultra, BAS has the potential to scale up airborne science and accelerate research, given the dramatic increases in flight time and geographic coverage that these enable’’.

BAS currently performs aerial surveying missions using a small fleet of De Havilland Canada DHC-6 Twin Otters. But it believes the introduction of the Ultra will offer significant cost and environmental benefits.

“We hope to prove that this platform is really capable of taking up some of the heavy lifting of scientific observation in Antarctica,” says Dr Tom Jordan, science lead for the Swarm project.

“We think we will be able to do more science at a lower cost, with a lower carbon footprint and with a lower logistical footprint.”

Fuel consumption for the petrol-engined Ultra is around 11 litres per hour, compared with 300 litres per hour for a Pratt & Whitney Canada PT6-powered Twin Otter, yielding a reduction in CO2 emissions per flight hour of around 90%, BAS calculates.

But the CO2 saving is not solely due to the lower fuel consumption: the Ultra will fly autonomously – monitored from the UK by a supervisory pilot – and has a lower maintenance requirement than the Twin Otters. All this means “less long-distance travel” for personnel or parts, says Carl Robinson, UAV/drones lead at BAS.

Although the organisation has been operating small multicopter drones for several years, the arrival of the Ultra is BAS’s “first chance to use a very capable uncrewed aircraft”, adds Robinson.

Originally designed for humanitarian relief missions, the 10m (32ft)-wingspan Ultra features a twin-boom configuration with a high T-tail to allow easy access to the 700-litre cargo compartment.

The Ultra is built from aluminium rather than composite as it is “very damage tolerant and very efficient to fabricate”, says Stephen Wright, Windracers co-founder and company chair.

“It’s also quite a lot cheaper – the more we spend on the aircraft the less we [have to] spend on the science or aid delivery.”

Wright says the Ultra is priced at around one-tenth of competing products, which can cost up to $8 million.

Systems are dual or triple redundant and the aircraft is sufficiently robust to operate from dirt or ice runways down to 100m in length, adds Rebecca Toomey, airworthiness lead at Windracers.

The Ultra’s autonomous flight-control system has been developed by Windracers’ sister company Distributed Avionics, and includes an automated take-off and landing capability. Power comes from a pair of 627cc four-stroke engines from US firm Briggs & Stratton.

While currently lacking an anti-ice system, the Ultra is fitted with sensors to detect icing conditions, says Toomey.

However, operations in the Antarctic are less likely to encounter the issue due to its dry and cold climate, she notes. “To be honest, there was greater icing risk in flights from Orkney.”

Those flights, carried out from Kirkwall airport and in Shetland in 2021 and 2022, were part of earlier FFC-backed projects to prove the viability of using drones for logistics services in the Scottish Islands.

To date, Windracers has built 10 Ultra aircraft – the second example is currently en route to the Antarctic – but has plans to set up a UK production facility capable of turning out 10 units per month.

Its metallic structure is built in India by an undisclosed partner, before being shipped to the UK for final assembly.

**7 . Date: 15-09-2023ISR / ISTAR - MALE - Partnership - 2Excel teams with IAI to clear path for Heron operation in UKURL: https://www.flightglobal.com/defence/2excel-teams-with-iai-to-clear-path-for-heron-operation-in-uk/154982.article**

UK-based 2Excel Aviation is to collaborate with Israel Aerospace Industries (IAI) to develop the use of unmanned air vehicles (UAVs) in unrestricted UK airspace.

Building on a November 2021 trial carried out in Aberporth, West Wales, with IAI’s Heron UAV, the initiative will seek to develop a regulatory roadmap for wider operation of the type on maritime search and rescue missions.

“Our number-one objective is to work with the UK regulator to start to overcome those barriers to entry,” says 2Excel co-founder and director Andy Offer.

He says working with a “really experienced OEM” like IAI is key if it is to “modify the aircraft in line with regulatory requirements”.

If all proceeds as planned, Offer is hopeful that a maritime version of the Heron could be operating as a customer demonstrator by mid-2024.

Moshe Levy, executive vice-president and general manager of IAI’s military aircraft group, says the company’s experience certifying civil aircraft will help the project.

“We are quite aware of the challenges ahead,” he says. “But a company with the experience and knowledge we have gained will be able to do it much faster.”

2Excel operates Beechcraft King Air fixed-wing aircraft as part of a search and rescue (SAR) contract on behalf of the UK Maritime and Coastguard Agency.

From next year it transitions to a new deal with the agency – SAR2G, working alongside Bristow Helicopters – which calls for the future use of unmanned systems.

“All we are doing is preparing for the future,” says Offer. “But a lot of our customer base would benefit from the persistence an uncrewed aircraft brings.”

Meanwhile, 2Excel continues its preparatory work ahead of the switch to the SAR2G contract, says co-founder and director Chris Norton.

That includes a switch to the King Air 350, from the smaller King Air 200 currently. “They will have more range, more endurance and more capacity,” says Norton. In addition, they will be equipped with the “cutting edge” Leonardo Osprey maritime radar, he adds.

Modification work on the new fleet is under way at Humberside airport, ahead of certification and service entry next year.

2Excel’s King Air fleet will be based at Humberside, Newquay and Prestwick airports, in part due to the closure last year of its former operational base at Doncaster-Sheffield.

In addition, 2Excel is working to stand up a new fixed-wing SAR capability in Ireland, again alongside lead contractor Bristow. That will see a pair of King Air 200s operated from Shannon airport.

Separately, the company is expecting a tender later this year from Oil Spill Response relating to the replacement of its current Boeing 727 assets (G-OSRA/B).

Norton thinks it will most likely respond with a 737-based solution, based on running costs and spare parts availability. However, other types will also be considered, he says.

**8 . Date: 06-01-2023Solar - HALE - General - Airbus readies high-flying Zephyr for 2024 service launchURL: https://www.flightglobal.com/defence/airbus-readies-high-flying-zephyr-for-2024-service-launch/151546.article**

Airbus will begin taking customer commitments for its Zephyr high-altitude platform station (HAPS) this year, with the production aircraft’s entry into service being targeted by the end of 2024.

“It is near final design and close to being certified,” says Airbus HAPS Connectivity Solutions chief executive Samer Halawi, who describes the company’s work on the unmanned aircraft as a 20-year-plus journey.

Airbus is offering to operate the high-altitude, long-endurance system in roles including mobile connectivity and persistent earth observation, along with meeting military requirements.

Halawi says the platform’s current 8kg (17.6lb) mobile connectivity payload can provide service to 100,000 people on the ground. “If you need more, we can add a second aircraft,” he adds.

“The mobile [network] operators don’t want to fly planes – they want to deliver a service,” he notes. “Our preference is to offer managed services, rather than just selling an aircraft.”

Speaking last month, Halawi said the company plans to launch services with around 18 aircraft, “but probably within a 10-year period we will have close to 1,000 aircraft in the air”.

The company envisions a constellation of Zephyr vehicles as supporting the provision of mobile services to the estimated 2.9 billion people currently with no or limited coverage, and also providing emergency 4G/5G coverage following natural disasters.

“We believe we are going to be saving and improving peoples’ lives every day,” says Halawi, who before joining Airbus was chief commercial officer at Intelsat.

Beyond providing connectivity services, the lightweight Zephyr can already operate carrying an Airbus-developed Opaz optical sensor payload. Weighing 5kg, this can deliver 18cm-resolution imagery.

Meanwhile, Halawi has provided further details about the 2022 loss of a Zephyr, some 64 days into a stratospheric test flight conducted from Yuma, Arizona. “The objective was to support a defence customer and test the air vehicle,” he says, without disclosing the client.

An unusual weather pattern including high-altitude storm activity resulted in turbulence at 57,000ft, which the solar- and battery-powered aircraft – also previously referred to as a “pseudo satellite”, due to its ability to operate above 60,000ft – struggled to remain above.

“It was working extra hard to maintain [altitude], and one component in one of the engines failed,” he reveals. The aircraft managed to continue flying for 1h using its remaining engine, but then was lost due to turbulence. The company has subsequently redesigned the engine component, he says.

Airbus says the more than two-month flight involving test aircraft Z8-2 saw it cover a distance of more than 140,000nm (259,000km).

Further flights are planned for 2023 to support the certification process for the production design, and also to expand on previous military trials. “We are going to fly over inhabited areas, over cities and from one place to another,” Halawi says; Airbus has previously used temporary military licences to conduct test flights.

The company is close to completing the final design of its production aircraft, which “is about to get certified”, he notes.

“Our plan is to go to 200- to 300-day flights in the coming year or two,” he adds, noting: “every technology is getting smaller and lighter, and batteries are also improving.”

Halawi also reveals that Airbus is working on the design of a larger Zephyr variant, which he expects to be available by 2026. This should have twice the payload capacity of the current design, he says.

**9 . Date: 15-02-2024Armed ISR / ISTAR - HALE - General - PlatformDelayed Eurodrone design review will happen later this year, Airbus saysURL: https://www.flightglobal.com/defence/delayed-eurodrone-design-review-will-happen-later-this-year-airbus-says/156939.article**

A delayed preliminary design review (PDR) for the three-nation Eurodrone project will be conducted later this year, lead industrial partner Airbus says.

“We continue to make progress on Eurodrone,” Airbus chief executive Guillaume Faury said during the company’s annual results briefing on 15 February.

“Even so, we have recently acknowledged some delays in design specifications. We are now working to complete the preliminary design review later this year, in order to enter into service by the end of this decade.”

A PDR activity scheduled to take place during September 2023 was postponed. Faury says work to freeze the unmanned system’s design “took more time, and we had some more challenges to come to this convergence between specification and design”.

An early-February equipment report published by the German defence ministry indicated that the PDR delay was the result of “ongoing co-ordination issues between the German main contractor Airbus Defence & Space and the French subcontractor Dassault”.

Playing down this suggestion, Faury says: “There is no communication issue with any of the different partners, but there are challenges in coming to convergence.”

A medium-altitude, long-endurance unmanned air vehicle, the Eurodrone is in development for the armed forces of France, Germany and Spain.

It is unclear if the rescheduled PDR activity could have a knock-on effect on the Eurodrone system’s planned critical design review, originally due to take place in September 2024.

**10 . Date: 22-04-2025H-Rotary - ISR / ISTAR - Tactical - Pitch - EDGE demonstrates unmanned Anavia HT-100 to Brazil’s militaryURL: https://www.flightglobal.com/defence/edge-demonstrates-unmanned-anavia-ht-100-to-brazils-military/162691.article**

EDGE’s Swiss subsidiary Anavia has demonstrated what its parent company describes as a “complex flight profile” with an HT-100 unmanned air vehicle for the Brazilian armed forces and police.

Recently conducted from the Brazilian army’s Restinga da Marambaia site near Rio de Janeiro, the activity “showcased the HT-100’s aerial prowess in rapidly and reliably delivering actionable tactical intelligence, surveillance and reconnaissance data in real-time”, EDGE says.

The United Arab Emirates’ defence house says the test flight involved demonstrating “a 15-minute readiness time from system activation to take-off”. Once airborne, the rotorcraft performed manoeuvres including “hovering, low-speed and low-altitude flight, figure-eight manoeuvres, and circular orbits”, spanning within- and beyond-visual line-of-sight operations.

With a maximum payload of 60kg (132lb) and a flight endurance of up to 6h, the vertical take-off and landing HT-100 is described by its developer as “a rapidly deployable alternative to manned rotorcraft for intelligence and data-gathering missions”.

Powered by a 20shp (15kW) turbine engine, it has an airframe length of 2.82m (10ft 9in), rotor diameter of 3.75m and can be operated at altitudes up to 13,100ft.

“For the defence and public security requirements in Latin America, the HT-100 offers a key solution across a range of operational contexts tailored to the region’s unique challenges,” says Tiago Silva, chief executive of EDGE’s Latin America office.

Anavia chief executive Jon Andri Joerg says the company’s goal is to “offer armed forces and security agencies a reliable and highly capable platform that performs with precision, even in the most demanding environments”.

EDGE holds a majority stake in Anavia, with its HT-100 and larger HT-750 systems both on order for the UAE’s armed forces. Deliveries are due to begin later this year under Abu Dhabi’s 200-unit contract, which was signed in late 2023.

**11 . Date: 01-02-2024Armed ISR / ISTAR - HALE - General - Germany blames Airbus and Dassault tensions for Eurodrone schedule slipURL: https://www.flightglobal.com/defence/germany-blames-airbus-and-dassault-tensions-for-eurodrone-schedule-slip/156750.article**

Germany has revealed fresh tensions between Airbus Defence & Space and erstwhile partner Dassault Aviation which it blames for creeping delays to the Eurodrone programme.

Writing in its latest annual equipment report, the German defence ministry says a deadline was missed to conclude a preliminary design review (PDR) for the multi-national development in September 2023.

It adds: “Currently, a key focus in the programme is to avoid further delays to the PDR due to ongoing co-ordination issues between the German main contractor Airbus D&S and the French subcontractor Dassault.”

If not resolved, those problems could also impact the critical design review (CDR) milestone – what the report describes as the “first termination milestone” in the contract – which is set for September this year.

“The main contractor Airbus D&S is trying to solve the existing problems regarding Dassault’s work comprehensively and promptly,” it says.

However, this is not the first time the two airframers have clashed, with the tri-national Future Combat Air System programme also marred by infighting over workshare and intellectual property concerns.

Although tensions appear to have eased on that programme, the challenges related to the Eurodrone development show the potential for future hiccups.

Work on the Eurodrone began in 2022 following a contract awarded to Airbus D&S by procurement agency OCCAR.

Powered by twin GE Aerospace Catalyst engines, the medium-altitude, long-endurance Eurodrone is being acquired by France, Germany, Italy and Spain with development work carried out by industrial champions Dassault, Airbus D&S, and Leonardo.

A maiden sortie is expected in January 2027, with a first aircraft and ground control station to be delivered to Germany in 2030.

A total of 20 systems – each consisting of three aircraft and ground infrastructure – will be acquired by the partner nations.

**12 . Date: 15-09-2023Armed ISR / ISTAR - Tactical - Contract - Jackal armed UAV scores first order with 160-unit Taiwan dealURL: https://www.flightglobal.com/defence/jackal-armed-uav-scores-first-order-with-160-unit-taiwan-deal/154979.article**

Flyby Technology – a UK-based developer of unmanned air vehicles (UAVs) – has scored a launch order for its armed Jackal drone, with a 160-unit commitment from Taiwan.

Jon Parker, founder and chief executive of the company, speaking to FlightGlobal from the DSEI show in London on 14 September, said the vertical take-off and landing Jackal is “just right for Taiwan” as it can operate across multiple domains, including maritime.

No details of the contract value have been disclosed, but Parker says the UAV is pitched at a price-point “between expendable and attritable”.

Parker also declines to reveal a delivery timetable, citing customer sensitivities, but points to the rapid development of the platform, which went from “zero to firing two missiles” within six months.

In tests disclosed in April, but conducted in October 2022, a pair of Thales Martlet lightweight multirole missiles were launched from the platform. The trials were carried out as part of a project sponsored by the Royal Air Force’s (RAF’s) Rapid Capabilities Office.

Parker says Flyby is keen to integrate additional weapons onto the Jackal and is in discussions with several missile suppliers.

Although Taipei has placed the first order for the Jackal, Parker says other potential customers could receive their aircraft first, given the challenges around localising production in Taiwan.

“There are other customers that might be able to get there quicker,” he adds.

Jackal has been developed in the UK, with input from Flyby’s Turkish sister company FlyBVLOS Technology.

Final assembly will also be in the UK and Flyby is talking to potential suppliers, including for the Jackal’s engines.

Power for the two pairs of rotors and the electric ducted fans currently comes from batteries, but production versions will instead use a turbogenerator. Maximum take-off weight is 105kg (231lb), which will rise to 155kg or above with the new propulsion system.

“There are some very big British names behind this,” says Parker, a former RAF fighter pilot.

He says Jackal’s role is “battlefield interdiction”, targeting armoured vehicles, aircraft or personnel.

“Our role is to go behind enemy lines and push everything so far back that it becomes irrelevant.”

Jackal will be capable of performing collaborative and swarming operations, and the company will also look to add manned-unmanned teaming capabilities.

Additionally, Flyby intends for the UAV to become a testbed for “new and exciting technologies”, he adds.

**13 . Date: 20-01-2023Armed ISR / ISTAR - MALE - Contract - PayloadNew signals intelligence role planned for Dutch ReapersURL: https://www.flightglobal.com/defence/new-signals-intelligence-role-planned-for-dutch-reapers/151740.article**

The Netherlands could acquire three signals intelligence (SIGINT)-gathering pods for its General Atomics Aeronautical Systems MQ-9 Reaper remotely piloted air vehicles, potentially for use from late this year.

Announced on 18 January and worth an estimated €50-100 million ($54-108 million), the deal “will strengthen intelligence, surveillance and reconnaissance capacity” for the Royal Netherlands Air Force, the nation’s defence ministry says.

Defence secretary Christophe van der Maat has informed the Dutch parliament of a proposed accelerated purchase, which requires approval before 31 January.

“If everything goes according to plan, the first pod will be delivered at the end of this year,” the defence ministry says. The equipment will also have an electronic support measures capability, it adds.

“This is important because of the situation on Europe’s eastern flank,” it adds, referring to the war in Ukraine. “By being able to build up an intelligence picture from the air with its own resources, the Netherlands will make an important contribution to the defence of the [NATO] alliance.”

Meanwhile, the defence ministry says its fleet of four Reapers recently passed a combined 1,000 flying hours.

Three of the aircraft are currently based on Curacao in the Caribbean, where a 40-strong detachment of personnel is conducting a test and evaluation activity which is scheduled to run until 1 July.

“After that they will focus again on the operational readiness of the Reaper,” it says.

The Netherlands in June 2022 announced that it will double its Reaper acquisition to eight air vehicles, and also proceed with adding the ability for these to deploy air-launched weapons. Its aircraft were originally purchased in an unarmed, surveillance-only configuration.

Additional equipment plans for the fleet include the proposed acquisition of four communication relay pods and four maritime surveillance radars, the defence ministry notes.

**14 . Date: 12-12-2024Fixed Wing - Armed ISR / ISTAR - MALE - General - Poland to field unmanned MQ-9B SkyGuardian fleet from 2027URL: https://www.flightglobal.com/defence/poland-to-field-unmanned-mq-9b-skyguardian-fleet-from-2027/161101.article**

Poland is to replace its leased General Atomics Aeronautical Systems MQ-9A Reaper remotely piloted air systems via a contract for new MQ-9B SkyGuardians, Warsaw has announced.

Valuing the 12 December deal at around $310 million, Polish defence minister Wladyslaw Kosiniak-Kamysz says: “This is a significant expense, but we are investing in the highest quality equipment.

“The unmanned reconnaissance and strike system includes several MQ-9B SkyGuardian unmanned aerial platforms,” he says. “The delivery will be completed by the first quarter of 2027… however, we hope that it will happen earlier, which is what we are seeking from our proven partners.”

Kosiniak-Kamysz notes: “This is an investment in Polish security and co-operation with a strategic partner – the United States.”

Poland has operated leased MQ-9As since February 2023, under a deal valued at $70.6 million by General Atomics in late 2022. It is employing the type in the persistent intelligence, surveillance and reconnaissance role.

“The success of those missions opened the door for the purchase of the MQ-9B aircraft,” the company says. It confirms that the deal includes the provision of two ground control stations, along with a three-year support package.

Other European NATO customers for the MQ-9B include Belgium and the UK.

Poland’s MQ-9B acquisition is its latest step in a major series of defence investments, which also include 96 Boeing AH-64 Apache attack helicopters, 48 Korea Aerospace Industries FA-50GF/PL light-attack aircraft and 32 Lockheed Martin F-35A stealth fighters.

Story updated on 17 December with additional details from General Atomics Aeronautical Systems.

**15 . Date: 14-09-2023ISR / ISTAR - Tactical - General - PayloadSchiebel Camcopter gains Smith Myers Artemis systemURL: https://www.flightglobal.com/defence/schiebel-camcopter-gains-smith-myers-artemis-system/154950.article**

UK technology firm Smith Myers has successfully integrated its Artemis mobile phone detection and communications system onto the Schiebel Camcopter series of rotary-wing unmanned air vehicles (UAVs).

Displayed on a model of the Camcopter S-300 on the Schiebel stand at this week’s DSEI event in London, Artemis effectively turns the platform into a cell phone base station, improving location accuracy over traditional direction finding technology, says Andrew Munro, managing director of Smith Myers.

In addition, it allows a user to detect or communicate with up to 27 individual phone handsets per second, as well as displaying the nationality of the mobile phone. “It’s a real force multiplier for the operator,” says Munro.

Integration work with Schiebel took place earlier this year, culminating in a series of flight tests that began in July at the Austrian airframer’s Wiener Neustadt site. Power for the system is taken from the UAV’s engines and it uses existing communications links.

The twin antennae for Artemis are mounted on the underside of the aircraft’s tail boom.

Artemis is already used by the Royal Norwegian Air Force aboard its Leonardo Helicopters AW101 search and rescue fleet, alongside other operators including Italy and the United Arab Emirates on a variety of fixed- and rotary-wing platforms.

It will also be deployed from next year on aircraft operated by Bristow and 2Excel as part of their second-generation search and rescue contract with the UK coastguard.

In addition to large manned aircraft, the system has been integrated with small UAVs including the Teledyne FLIR SkyRanger R70.

Smith Myers sees other uses such a maritime patrol and border protection, or disaster relief operations.

Munro says the company has been working for the last 30 months on new hardware for Artemis to improve performance. “It will be smaller, lighter and faster,” he says. First fielding of the enhanced system is to take place in around 18 months, he adds.

**16 . Date: 21-02-2025Fixed Wing - Armed ISR / ISTAR - Small - General - ArmamentUkraine’s Skyeton unleashes UAV-released Remora glide weaponURL: https://www.flightglobal.com/defence/ukraines-skyeton-unleashes-uav-released-remora-glide-weapon/161921.article**

Ukrainian-formed uncrewed aerial vehicle (UAV) developer Skyeton has unveiled a lightweight glide munition optimised for carriage and release by its combat-proven Raybird platform.

First exhibited at the Xponential Europe show in Dusseldorf, Germany from 18-20 February, the winged Remora can carry a high-explosive warhead weighing 1.5-2.5kg (3.3-5.5lb), its developer says.

Skyeton chief executive Roman Knyazhenko describes the weapon as the “world’s first solution for small tactical UAVs (under 25kg) enabling the munition’s delivery deep into enemy territory”.

The company has not disclosed the design’s range performance, but says it is released at a velocity of 75kt (140km/h).

“The ability to control the munition both manually and autonomously after release allows for versatile mission profiles and target engagement,” Knyazhenko says.

Also at the Xponential Europe event, Skyeton displayed two additions to its GLE series of gimbals. The lightweight payloads – as carried by the Raybird – combine an electro-optical/infrared sensor and laser rangefinder to support intelligence, surveillance and reconnaissance, targeting and light strike tasks.

Skyeton cites a maximum 28h endurance for the Raybird, which it notes is in active use by the Ukrainian military during its defence against Russia’s three-year-long invasion.

**17 . Date: 17-11-2023Armed ISR / ISTAR - MALE - Pitch - Unmanned Mojave makes trials debut aboard UK’s HMS Prince of WalesURL: https://www.flightglobal.com/defence/unmanned-mojave-makes-trials-debut-aboard-uks-hms-prince-of-wales/155910.article**

General Atomics Aeronautical Systems’ Mojave unmanned air vehicle (UAV) has conducted an initial trial from the UK Royal Navy (RN) aircraft carrier HMS Prince of Wales.

Recently conducted off the US East Coast, the activity saw the 17m (55ft 8in)-wingspan and 9m-long, remotely-piloted aircraft land and take-off from the 65,000t vessel’s flight deck.

The unmanned Mojave is able to take off without using host vessel's ski jump ramp

Source: Crown Copyright

The Mojave is the largest UAV to have operated from a Royal Navy aircraft carrier's deck

Source: Crown Copyright

General Atomics' Mojave has a 17m wingspan

Source: Crown Copyright

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The developmental Mojave has a maximum take-off weight of 1,630kg (3,600lb), and is capable of carrying four Lockheed Martin AGM-114 Hellfire air-to-surface missiles for armed surveillance and strike tasks.

“The Mojave trial is the first time that a remotely piloted air system of this size has operated to and from an aircraft carrier outside of the United States [inventory],” says Rear Admiral James Parkin, the RN’s director develop.

“With so many international partners interested in the results of these trials, I am delighted that we are taking the lead in such exciting and important work to unlock the longer-term potential of the aircraft carrier and push it deep into the 21st Century as a highly-potent striking capability,” says Vice Admiral Martin Connell, the RN’s Second Sea Lord.

“During a deployment centred around experimentation and expanding the envelope of the Queen Elizabeth-class [aircraft carrier], this is one of the highlights,” says Commander Martin Russell, who heads air operations aboard HMS Prince of Wales.

During its current months-long deployment to the USA, the ship also has hosted expanded operating trials with the Lockheed Martin F-35B, and US Marine Corps assets including Bell Boeing MV-22 Osprey tiltrotors.

One of two aircraft carriers operated by the RN, the vessel is due to return to the UK during December.

Separately, the RN says the Schiebel S-100 Camcopter – to be named Peregrine in its service – will enter operational use in January 2024. The unmanned vertical take-off and landing aircraft will perform short-range surveillance operations.

**18 . Date: 18-07-2024General - Engine / PowersourceGE Aerospace exploring low-cost ‘disposable’ enginesURL: https://www.flightglobal.com/engines/ge-aerospace-exploring-low-cost-disposable-engines/159182.article**

Source: US Air Force

Business is booming at GE Aerospace.

As one of the primary suppliers of military aircraft engines, the company is benefiting from a global surge in demand for fighter jets and helicopters.

Aircraft powered by GE Aerospace engines include the Lockheed Martin F-16 fighter, Boeing P-8 maritime patrol jet, Sikorsky UH-60 utility helicopter and Boeing AH-64E attack rotorcraft.

“We’re on some very desirable platforms that are continuing to have both production in the US, as well as export opportunities internationally,” says Amy Gowder, chief executive of the defence and systems business at GE Aerospace.

The engine maker has also signed on as the propulsion supplier to major new programmes, including the Turkish Aerospace Industries Kaan fighter jet for Turkey, the Korea Aerospace Industries KF-21 stealth fighter and Boeing’s T-7A jet trainer for the US Air Force.

Earlier this year, GE Aerospace also delivered the first examples of the new T901 Improved Turbine Engine, which is to be used to modernise existing US fleets of Black Hawks and Apaches.

Sikorsky is expected to begin testing the first T901s installed in a UH-60 this year, with loose plans at GE Aerospace to be in full engine production by 2030, based on army funding decisions.

The company is now directing revenue from its robust backlog toward developing its next generation of products. “The existing business does create a cash flow we need to invest,” Gowder says.

Some of that investment gets targeted toward what Gowder calls baseline technologies that have general applications across the portfolio. Examples include additive manufacturing processes and development of advanced materials like ceramic matrix composites.

However, GE Aerospace is also applying research and development funds toward next-generation concepts, such as hypersonic propulsion and rotating detonation engines, with an eye toward future business.

“We try and understand where the market is going and what capabilities really would push our existing technology to the next stage,” Gowder says.

While exquisite products like hypersonic propulsion and adaptive jet engines for sixth-generation fighters are promising lines of business, GE Aerospace is also looking in the opposite direction.

The company sees opportunity to develop low-cost engines with shorter lifespans and lesser reliability requirements, Gowder says. These could be used to power new classes of cheap, uncrewed jets meant to team with conventionally piloted aircraft.

In the USA, the US Air Force calls the concept Collaborative Combat Aircraft (CCA). Earlier this year, the service selected General Atomics and Anduril to develop the first increment of CCA designs, with follow-up opportunities expected.

Unlike traditional military aircraft – incredibly expensive jets intended to fly for decades – CCAs are envisioned as costing about as much as guided missiles and potentially being classified as expendable, meaning the military would not necessarily expect them to return from missions. The Pentagon is still working out its vision for the concept.

But developing engines for such smaller, cheaper aircraft requires a new approach for GE Aerospace.

“I think it will really change our design guidelines and practices,” Gowder says ”Today, we design for reliability and maintainability.”

By contrast, to meet air force cost targets, CCA’s might require an engine that “doesn’t need to be maintained, that is almost disposable”, Gowder says, adding that development would likely prioritise performance and cost over reliability and maintainability.

“Less logistics, less maintenance, less life-cycle cost,” she says. “That really changes the way our engineers optimise the variables that they have to play with.”

Elsewhere, GE Aerospace is still pursuing the type of high-performance, long-life engines the company is best known for. At the forefront of this effort has been the XA100, an adaptive-cycle engine developed for the Lockheed Martin F-35 stealth fighter under the US Air Force’s Adaptive Engine Transition Program.

That system promised substantial improvements in thrust and acceleration, while simultaneously reducing fuel consumption, which GE Aerospace says it accomplishes by combining the best attributes of commercial engines and fighter jet propulsion into a single package.

The Pentagon ultimately opted not to retrofit F-35s with the XA100, instead opting for a less-intensive core upgrade to the F-35’s current Pratt & Whitney F135 engine. Still, GE Aerospace remains confident it can apply the XA100 technology to future fifth- and sixth-generation fighters.

Gowder’s biggest concern on that front is maintaining enough new and interesting work to maintain her company’s highly-specialised engineering workforce. This is particularly salient in light of recent uncertainty about the Pentagon’s commitment to sixth-generation fighter initiatives.

“Clarity is needed for workforce,” she says. “We can’t be in prototype mode or pay-for-design mode forever.”

**19 . Date: 18-04-2024Research - HALE - General - SoftwareDARPA tests dogfighting AI against human fighter pilotURL: https://www.flightglobal.com/fixed-wing/darpa-tests-dogfighting-ai-against-human-fighter-pilot/157885.article**

The Pentagon’s secretive technology development agency has for the first time pitted an artificial intelligence (AI) agent against a human fighter pilot in air combat drills.

The Defense Advanced Research Projects Agency (DARPA), working with the US Air Force (USAF) test pilot school, calls the tests a breakthrough in the efforts to automate close-range fighter manoeuvres and combat aviation more broadly.

Using a specially modified Lockheed Martin F-16D known as the X-62A VISTA, DARPA challenged an AI algorithm to engage in within-visual-range (WVR) combat – better known as dogfighting or turn fighting – against a flesh-and-blood fighter pilot in another F-16.

DARPA says the tests, disclosed on 17 April, took place in 2023 and marked the first time an AI system and human have gone head-to-head in WVR air combat.

The milestone was confirmed by the USAF, with the air force’s top civilian official describing the feat as a “transformational moment”.

“In 2023, the X-62A broke one of the most-significant barriers in combat aviation,” says air force secretary Frank Kendall. “The potential for autonomous air-to-air combat has been imaginable for decades, but the reality has remained a distant dream up until now.”

The USAF and DARPA have been using the X-62A Variable In-Flight Stability Test Aircraft for several years to develop and test autonomous flight technologies. According to Lockheed, an AI agent aboard the X-62A successfully logged more than 17 flight hours during evaluations in December 2022 at Edwards AFB in California.

Those tests apparently set the stage for the autonomous dogfighting exercise completed less than a year later in September 2023, also at Edwards.

DARPA says its Air Combat Evolution (ACE) team conducted 21 test flights between December 2022 and September 2023, making changes to over 100,000 lines of flight-critical software during that time – which it calls an “unprecedented pace of development”.

Work included development of new machine-learning methods to train and test the AI agent on a range of parameters, including flight-envelope protection, aerial- and ground-collision avoidance, combat-training rules, weapons-engagement zones and clear avenues of fire.

Initial flight safety was evaluated first using defensive manoeuvres before switching to offensive, high-aspect nose-to-nose engagements that involved the dogfighting jets within 610m (2,000ft) of each other at speeds of 1,043kt (1,931km/h).

In the interest of safety, the X-62A carried two human pilots who had abilty to disengage the AI, the air forces notes. But that safety back-up was not required “at any point” during the dogfights over Edwards.

“We have to be able to trust these algorithms to use them in a real-world setting,” says Lieutenant Colonel Ryan Hefron, ACE programme manager for DARPA.

Building trust is one of the programme’s major objectives, the agency says, with the ultimate goal being to enable human-machine teaming that will give friendly pilots an advantage in “increasingly complex air combat scenarios”.

The development of autonomous jets – called collaborative combat aircraft (CCA) within the USAF – has become a signature initiative for Kendall. The service selected five manufacturers in January to develop the first generation of CCA prototypes.

Several firms, including Boeing and Kratos, already have flight-capable autonomous jets undergoing evaluation. General Atomics Aeronautical Systems also recently announced a remotely piloted jet, with the potential to incorporate future autonomy.

The recent X-62A dogfighting exercise is meant to feed into the CCA development effort, providing an outlet to test and improve autonomous-fight-control software.

“Dogfighting was the problem to solve so we could start testing autonomous artificial intelligence systems in the air,” says Bill Gray, chief test pilot for the USAF. “Every lesson we’re learning applies to every task you could give to an autonomous system.”

Notably, DARPA says air combat requires a more-powerful and -flexible, autonomy agent than is required to complete more-predictable flying tasks, such as landing on aircraft carriers.

The agency says machine learning-based agents, including the type being used by the ACE programme, “possess remarkable capacity to characterise complex, non-linear relationships in large, multi-dimensional state spaces that lack explicit rules”.

Washington has set a goal of fielding thousands of such autonomous systems in the coming years, with an eye toward countering China’s numerical advantages in the Western Pacific, particularly with ships and precision missiles.

**20 . Date: 01-03-2023General - ArmamentBAE unveils low-cost precision munition for Australian rotorcraftURL: https://www.flightglobal.com/helicopters/bae-unveils-low-cost-precision-munition-for-australian-rotorcraft/152262.article**

The Australian arm of BAE Systems says it will develop a new low-cost, precision-guided weapon system for Australia’s armed forces.

BAE Systems Australia revealed the new sovereign munition initiative, which it calls “Razer”, at the Avalon Airshow near Melbourne on 28 February.

“Razer is a low cost air-launched precision-guided munition that is designed to transform a 40-50kg (88-110lb) standard non-guided munition into a precision air-launched weapon, at low cost,” BAE says.

The kit, which will be manufactured in Australia, includes a wing body assembly and GPS-enabled tail unit for guidance. BAE says the new munition is applicable for unmanned combat air vehicles (UCAVs) and rotary-wing aircraft.

“Razer can meet urgent local and overseas demand for low-cost sovereign munition solutions that could be deployed from the air,” says Ben Hudson, chief executive of BAE Systems Australia. “It could deliver a powerful and affordable battlefield strike capability for users globally.”

The move is part of an effort to boost the domestic production of defence articles within Australia. The Royal Australian Air Force and Boeing are currently developing the MQ-28 Ghost Bat autonomous jet – the first combat aircraft to be developed and produced in Australia in 50 years. That aircraft was publicly revealed for the first time on 28 February at Avalon.

BAE also has plans to develop a new Australia-produced vertical take-off and landing UCAV the company is calling Strix.

Although decisions about the possible export of defence products such as the MQ-28 and Razer will be made by Canberra at a later date, the Commonwealth’s industry partners are optimistic about the prospect.

“Design, development and production of these munitions will utilise our decades-long history of advanced manufacturing to establish and grow the country’s domestic capability and export market,” says Andrew Gresham, managing director of defence delivery for BAE Systems Australia.

The company notes potential export customers for Razer include the USA, the UK, Canada, Sweden, Norway and the Netherlands.

Precision munitions, and NATO’s stockpile of such high-tech weapons, have recently become a major topic of discussion in Western capitals. The alliance and its members have sent thousands of such munitions to Ukraine’s armed forces, in support of Kyiv’s defence against a year-long Russian invasion.

The rate of munition consumption in that conflict has raised fears among defence officials and private sector executives that the West’s defence industrial base lacks the capacity to adequately maintain ammunition supplies in a protracted conflict.

In the USA’s latest military budget, Congress empowered the Pentagon to acquire thousands more precision strike weapons – both to continue supporting Ukraine and to expand the Department of Defense’s own stockpiles.

Analysts say Washington and its allies would likely deplete such stocks within just a few weeks of an Indo-Pacific theatre conflict against China.

Australia and the USA are exploring unconventional solutions to the challenge, such as using air cargo assets to rapidly deploy ground-based precision munitions, such as Lockheed Martin’s High Mobility Artillery Rocket System, to strike high-value targets deep behind enemy lines – a concept known as a fire raid.

**21 . Date: 02-12-2024H-Rotary - ISR / ISTAR - Tactical - Contract - Bristow wins CAESAR contract extension for small boat surveillance in ChannelURL: https://www.flightglobal.com/helicopters/bristow-wins-caesar-contract-extension-for-small-boat-surveillance-in-channel/160950.article**

Bristow Helicopters will continue to deploy a range of surveillance aircraft over the English Channel to monitor small boat crossings under a one-year contract extension worth £8.4 million ($10.6 million).

Initially implemented in 2022, the Channel Aviation Emergency Search and Rescue (CAESAR) contract – part of the wider UKSARH service run by Bristow – was a response to the rising number of small boat crossings.

Bristow has provided crewed and uncrewed fixed-wing aircraft to monitor the Channel to build up a “multi-layered operational picture”, allowing HM Coastguard to prioritise rescue efforts, says a contract notification issued by the Maritime and Coastguard Agency (MCA).

Awarding that work to Bristow freed up other fixed-wing assets contracted to the MCA which had been performing the mission on an interim basis, it says.

Bristow will transition to a new search and rescue contract – UKSAR2G – between October 2024 and December 2026, which sees it “subsume” both the helicopter and fixed-wing elements; the latter will be provided by 2Excel Aviation.

Although this was meant to also include the Channel monitoring mission, data used to support the requirements for UKSAR2G ran only to 2019. As such, it “is not reflective of the current demand in the Channel”, says the contract notice.

“UKSAR2G service provision cannot meet the national requirement and address the demand in the Channel.”

Subsequent analysis by the MCA of data running until the end of 2023 only reinforces that view, the agency says.

With the CAESAR contract due to expire in February 2025 and Bristow requiring four-months’ notice of contract extension, the MCA says the “only achievable and responsible course of action” is to extend the current deal.

This “will provide time for the MCA to explore the options available with the UKSAR2G service to address any capability gap”, it adds.

Provision for an additional one-year extension is also included in the contract.

Bristow says it will deploy a pair of crewed Diamond Aircraft DA62s and four Schiebel Camcopter S-100 uncrewed rotary-wing air vehicles from Lydd airport in southeast England for the CAESAR mission.

In 2022, the MCA awarded Bristow a 10-year contract worth £1.6 billion to run UKSAR2G, which will see it operate 18 helicopters, six Beechcraft King Airs – subcontracted to 2Excel – and a single S-100.

**22 . Date: 27-01-2023ISR / ISTAR - MALE - General - PlatformDecember flight campaign helps VSR-700 towards next test milestoneURL: https://www.flightglobal.com/helicopters/december-flight-campaign-helps-vsr-700-towards-next-test-milestone/151824.article**

France has now accumulated more than 240 flight hours across 160 sorties with the VSR-700 unmanned air vehicle (UAV) demonstrator developed by Airbus Helicopters, as it prepares for its final series of shipborne tests later this year.

Revealing the milestone on 27 January, the French DGA defence procurement agency said the most recent test campaign took place in December 2022.

Conducted at the DGA’s missile test site on the Ile du Levant off the southern coast of France, the trials were designed to evaluate the VSR-700’s performance during overwater flights.

Evaluations ran from 7-15 December and consisted of nine flights totalling 9h. Over 25 engineers from across the DGA’s departments participated in the effort, including those from its Essais en vol flight-test unit. Staff from Airbus Helicopters, Naval Group and radar provider DIADES also contributed.

Based on a Guimbal Cabri G2 airframe, the VSR-700 has been taking part in a risk-reduction study for the French navy’s SDAM UAV programme.

Designed to fly for up to 8h, carrying two main payloads, the VSR-700 should also be capable of taking off and landing from a ship in conditions up to sea-state 5.

A previous round of testing in March 2022, consisting of 130 landings on a civilian vessel, validated the performance of the autonomous systems. This will be followed later this year by another flight-test campaign aboard a French navy frigate.

“These future tests will close the risk removal phase of the SDAM programme, making it possible to envisage its launch in production,” says the DGA.

Speaking to reporters on 25 January, Bruno Even, chief executive of Airbus Helicopters, said that the airframer was “fully ready to perform the sea demo with the French navy by the end of the first quarter”.

The next step, he says, will be to “secure the future of the SDAM programme” as part of the next LPM military spending plan currently being finalised by the French government.

“We strongly believe in the future of this programme. You see that one of the lessons from the war in Ukraine is the importance of drones in the future,” he says.

Airbus Helicopters is “committed” to the market and sees a contract from the French navy as key to opening the potential for export sales.

**23 . Date: 10-11-2023Market - Airbus launches autonomous aircraft division in the USAURL: https://www.flightglobal.com/military-uavs/airbus-launches-autonomous-aircraft-division-in-the-usa/155778.article**

French airframer Airbus is adding a new business unit dedicated to producing uncrewed aerial systems (UAS), with the US military as its primary sales target.

Airbus on 9 November said it will launch a new “purpose-built” business within the company’s US subsidiary that will be dedicated to uncrewed aviation systems.

“The future battle space is here, and our team is ensuring the war fighter is equipped with technology that allows them to make informed decisions to counter the threat,” says Robert Geckle, chief executive of Airbus US Space & Defense.

Airbus notes contemporary battlefields are dominated “not only by manned aircraft and expensive defence systems, but also by swarms of unmanned systems of varying shapes, sizes, autonomy and operational capabilities”.

Unmanned aerial vehicles (UAVs), including both remotely piloted and fully autonomous variants, are now a major focus of defence procurement at the Pentagon. In addition to a substantial fleet of existing platforms such as the General Atomics MQ-9 Reaper, the US Air Force and Navy are investing substantially in next-generation types like the Kratos XQ-58 Valkyrie and Boeing MQ-25 Stingray.

The Department of Defense in August also unveiled the so-called Replicator initiative, aimed at rapidly fielding thousands of low-cost autonomous combat systems.

“Replicator is meant to help us overcome [China’s] biggest advantage, which is mass,” said deputy secretary of defense Kathleen Hicks on 28 August. “More ships, more missiles, more people.”

Airbus is hoping to capitalise on the surging interest in uncrewed aircraft by establishing a greater presence in the world’s most-lucrative defence market, where the European manufacturer currently has more limited market share compared to rivals Boeing, Lockheed Martin and Northrop Grumman.

Airbus’s new UAS unit will be led by Brian Zarchin, a former US Army helicopter pilot who has been with Airbus since 2020. Previously, Zarchin oversaw business development for army programmes at UAV producer Insitu.

Zarchin says the new unit will focus on helping the Pentagon solve its “toughest UAS challenges, from surface to stratosphere”.

One area of particular promise for Airbus is the company’s Zephyr programme – a solar-powered, ultra-long endurance prototype capable of stratospheric flight.

Airbus developed the experimental type, known as a high-altitude pseudo-satellite, in partnership with the US Army. In 2022, Zephyr ended a non-stop 64-day flight 60,000 feet above the American desert southwest, after high-altitude storms forced the craft down

Airbus says the flight covered a distance of more than 140,000nm (259,000km).

The ultralight aircraft’s wings span 25m (82ft) and carry an array of solar panels to power Zephyr’s two wing-mounted propellers. The configuration used during the 64-day flight weighed less than 75kg (165lb), according to Airbus.

The company envisions the platform as providing communications and data connectivity to troops operating in remote areas and to recovery workers in disaster zones.

While Geckle describes Zephyr as the “foundational UAS programme” for the new Airbus business unit, he says the company plans to continue expanding its offerings.

“We envision multiple UAS solutions supporting a range of customer missions and operational needs,” he notes.

**24 . Date: 10-02-2025Partnership - Ascendance and Delair collaborate on hybrid UAV development for FranceURL: https://www.flightglobal.com/military-uavs/ascendance-and-delair-collaborate-on-hybrid-uav-development-for-france/161724.article**

Hybrid-electric propulsion developer Ascendance has joined forces with unmanned air vehicle (UAV) manufacturer Delair to develop a new observation platform for the French DGA defence procurement agency.

The Toulouse-based pair have adapted Delair’s DT46 UAV, replacing the standard battery-electric system with Ascendance’s Sterna hybrid powertrain; flight tests of the modified platform have already taken place.

Using the hybrid powertrain significantly increases endurance in vertical take-off and landing mode to over 5h 30min, up from 3h 30min in the standard configuration.

Additionally, the Sterna powertrain allows an operator to switch between using the thermal engine for fast transit flights at up to 53kt (100km/h) and the battery system for “unobtrusive observation phases”.

The pair have developed the DT46 Hybride to address the DGA’s modernisation of its Essais des missiles test centre in Biscarrosse, southwest France. It will be used to monitor launches from the site and for maritime surveillance.

Qualifying flights of the new UAV will take place in the spring from Biscarrosse.

A 4.5m (14ft 7in)-wingspan platform, the DT46 has a maximum take-off weight of 25kg (55lb) and can carry a 5kg payload.

**25 . Date: 19-01-2023Armed ISR / ISTAR - MALE - Contract - Baykar lands $370 million TB2 sale in KuwaitURL: https://www.flightglobal.com/military-uavs/baykar-lands-370-million-tb2-sale-in-kuwait/151701.article**

Turkish unmanned air vehicle (UAV) producer Baykar has secured a $370 million contract to supply its Bayraktar TB2 platform to Kuwait.

Revealing the contract on social media, the company did not state the number of systems to be supplied, but claims to have beaten competitors from China, Europe, and the USA.

The TB2 has become a notable success story for Baykar in the last 12 months, with Kyiv using the UAV to great effect against Russian forces following Moscow’s invasion of Ukraine last February.

The TB2 serves both as an intelligence, surveillance and reconnaissance platform and can also carry four laser-guided munitions, specifically the Roketsan MAM-L and MAM-C, says the company.

It can operate out to ranges of 161nm (300km) and has an endurance of 27h. Its operational altitude is in the range of 18,000-25,000ft.

The company claims that the TB2 has had over 400,000h of operational flight.

Separately, Baykar’s DIHA, a small, winged UAV capable of taking of and landing vertically, recently conducted a test flight to an altitude of 8,000ft.

DIHA takes off with electric motors, and then switches to a thermal engine for horizontal flight. The system has an endurance of 12h and can carry a 5kg (11lb) payload.

The company also continues development work on the Bayrakter Kizilelma, a high-speed unmanned combat air vehicle that had its first fight in November 2022, and with the Akinci, a large UAV powered by two turboprop engines that is already in service with Turkey.

**26 . Date: 09-02-2024Armed ISR / ISTAR - HALE - Contract - Canberra funds three more MQ-28A Ghost BatsURL: https://www.flightglobal.com/military-uavs/canberra-funds-three-more-mq-28a-ghost-bats/156868.article**

Australia is funding three additional Boeing MQ-28A Ghost Bat unmanned air vehicles as it eyes a demonstration campaign in 2025.

The three Block 2 MQ-28As will be produced locally, and feature improved sensor and payload options, according to Australia’s minister for defence industry Pat Conroy.

The effort sees Canberra putting A$399 million ($259 million) toward the programme. Conroy says that the funding will “go into developing the unique Australian technology that allows the Ghost Bats to work together with each other and with crewed aircraft as one team to achieve their mission”.

Canberra’s announcement follows news in January that Boeing, which has at least one MQ-28A in the USA, was one of the companies selected for the US Air Force’s Collaborative Combat Aircraft (CCA) programme.

In March 2023, Canberra entered an agreement with the USA to work on CCA development.

The first aircraft developed in Australia since the Second World War, the MQ-28A is seen as a key programme for Australian industry, involving over 350 jobs and 200 suppliers.

Australia’s Defence Strategic Review document in April 2023 also highlighted the importance of the programme, envisaged as operating as a “loyal wingman” alongside Royal Australian Air Force types such as the Lockheed Martin F-35A and Boeing E-7A Wedgetail airborne early warning and control aircraft.

Conroy adds that one objective for the programme, following a demonstration phase in 2025, will be the ability to produce MQ-28As at 10% of the cost of an aircraft such as the F-35A.

“The goal is to have the three Block 2 [aircraft] available for the really critical capability demonstration exercises next year,” says Conroy.

“They’ll allow air force to really evaluate how capable these aircraft are, how the systems work in co-operation with crewed aircraft, and then air force and government will look at making decisions about further deployment.”

Formerly known as the Airpower Teaming System, the MQ-28A programme was announced at the Avalon air show in 2019. The aircraft had its first flight in March 2021.

The Ghost Bat is designed so different payloads can be swapped in and out using a detachable nose feature.

**27 . Date: 26-04-2023General - SoftwareCollins developing digital brain for autonomous air-launched UAVsURL: https://www.flightglobal.com/military-uavs/collins-developing-digital-brain-for-autonomous-air-launched-uavs/153023.article**

Aviation systems provider Collins Aerospace is flight testing software that will control the US Army’s developmental Air Launched Effects (ALE) concept, including collaborative teaming between pilots in the air and the uncrewed autonomous vehicles.

As part of its Future Vertical Lift (FVL) modernisation initiative, the army is developing new rotorcraft and unmanned aerial vehicles (UAVs) to collaborate with them.

The ALE programme seeks to deliver a fully autonomous UAV system that can be launched from the new generation of army helicopters during flight. ALE vehicles would then provide reconnaissance and battlefield intelligence to pilots and commanders on the ground, plus lethal effects to engage enemy forces.

”ALE extends tactical and operational reach and lethality of manned assets, allowing them to remain outside of the range of enemy sensors and weapon systems while delivering kinetic and non-kinetic, lethal and non-lethal mission effects against multiple threats, as well as providing battle damage assessment data,” according to the army.

The concept is being targeted for the Future Attack Reconnaissance Aircraft (FARA), which will replace the Bell OH-58 Kiowa scout helicopter the army retired in 2013.

“ALE is kind of the scout for the scout,” says Dustin Engelhardt, a former army OH-58 pilot who now oversees business development for the ALE team at Collins.

While Collins is not developing the actual ALE vehicle, the Raytheon subsidiary was selected by the army in 2022 to be the mission systems provider for the programme.

That requires developing flight control software that will allow ALE vehicles to operate in a constellation or swarm, without being remotely piloted. The control system must also allow for so-called collaborative teaming, wherein a helicopter pilot can task the UAVs with a mission from the cockpit and then receive data in return.

“We’re really the brains of the system,” says Engelhardt.

That requires developing a robust communication link that is both encrypted and resistant to jamming. It must also be able to communicate with both classified and unclassified networks – a notoriously complex and bureaucratically fraught endeavour.

Last October, Collins flight-tested its developmental software using commercially available small drones at a private UAV testing facility in Pendleton, Oregon. Engelhardt describes those tests as “really successful overall”.

The challenge is complex. Engelhardt says based on the army’s requirements, Collins needs to design operating software that will enable ALE to receive a mission and decide how to best accomplish it, while also being able to respond to developments such as attrition and the dynamic battlefield environment.

“They can deal with degraded [communications], they can deal with members getting attrited, they can deal with new assets being added and continually re-optimising the plan,” is how Engelhardt describes Collins’ goal for the ALE autonomy system.

He reveals the company developed the initial code for that mission control system in just six months. Collins accomplished the feat by using a faster-than-real-time digital environment, wherein a 2h mission can be simulated in just 30s.

“We can run it thousands of times, quickly,” Engelhardt notes.

Such simulations allow Collins to rapidly test changes to the autonomy code without the time, expense and risk of sending up physical aircraft for each adjustment.

Engelhardt says the approach will also allow the rapid integration of new ALE payloads and tactics, based on real world battlefield developments.

“It’s just a really quick way to get those capabilities integrated and delivered out to the soldiers,” he notes.

The goal is for the autonomous flight control software to be “platform agnostic”, allowing it to operate the range of ALE systems the army envisions developing.

While the army is still developing its timeline for rolling out ALE, it aims to field the FVL aircraft that will team with the autonomous UAVs in the 2030s.

**28 . Date: 02-03-2023Armed ISR / ISTAR - MALE - Pitch - GA-ASI feels MQ-9B still essential for Australian armyURL: https://www.flightglobal.com/military-uavs/ga-asi-feels-mq-9b-still-essential-for-australian-army/152290.article**

General Atomics Aeronautical Systems (GA-ASI) remains hopeful of an MQ-9B SkyGuardian unmanned air vehicle (UAV) sale to Australia, following the cancellation of a major requirement in 2022.

Warren Ludwig, director international strategic development Australia and Southeast Asia at GA-ASI, says it is possible that Canberra’s upcoming Defence Strategic Review could see the platform reintroduced.

The MQ-9B had been selected for the Project Air 7003 requirement for the army, but in April 2022 Canberra abruptly cancelled the deal a few months before the expected signature of a letter of acceptance under the US government’s Foreign Military Sales process.

The original programme called for 12-16 examples to be obtained.

“We’ve still got people under contract in our industry team as a show of good will,” says Ludwig. “That whole industry team is just in abeyance.”

GA-ASI’s partners in the deal include a number of international and Australian companies, including Leidos, CAE, Quickstep, TAE Aerospace, and Raytheon Australia.

Ludwig feels that there remains a clear Australian need for the MQ-9B in a number of missions.

He observes that Canberra is obtaining the Lockheed Martin HIMARS system. “Long-range fires” such as HIMARS will require the targeting capability offered by the MQ-9B, particularly for mobile targets.

“There is no point having these fancy long-range fires if you can’t identify the target,” says Ludwig.

He adds that while Australia is obtaining the Northrop Grumman MQ-4C Triton, this aircraft will focus on strategic intelligence, surveillance and reconnaissance (ISR) over the ocean, while smaller systems do not offer sufficient range and endurance for army long-range fire missions.

He says that the MQ-9B can also enhance the situational awareness of Canberra’s pending fleet of Boeing AH-64E Apaches. He believes that the war in Ukraine has illustrated the challenges attack helicopters face on the modern battlefield, and that manned-unmanned teaming can greatly enhance an attack helicopter’s capabilities.

In addition, the MQ-9B can identify long-range targets passively in the maritime environment and pass them onto the “kill web”. The MQ-9B can also drop and monitor sonobuoys, freeing up valuable maritime patrol aircraft for other work.

The MQ-9B’s lower cost per flight hour especially lends it to this role, which Ludwig calls “dull and dirty”.

Apart from its hope that the Australian Army obtains MQ-9Bs, GA-ASI is also eyeing future ISR requirements from the Australian Border Force, for which it feels its aircraft is also well suited.

**29 . Date: 10-05-2023ISR / ISTAR - Small - Market - Insitu sees market for Integrator VTOL in Asia-PacificURL: https://www.flightglobal.com/military-uavs/insitu-sees-market-for-integrator-vtol-in-asia-pacific/153221.article**

Insitu, the Boeing-owned developer of unmanned air vehicles (UAVs), sees opportunities in the Asia-Pacific for the new vertical take-off and landing (VTOL) capability designed for its Integrator UAV.

Andrew Duggan, managing director of Insitu Pacific, notes that navies in the region tend to operate smaller warships with limited space available for helicopter and UAV options, and that the new VTOL system can save space aboard warships, while offering a long-endurance fixed-wing UAV capability.

“Users have been giving us feedback for a while that they want to operate a helicopter and a UAS (unmanned air system), and if they have no helicopter they want to still be able to have an aviation asset on the ship,” says Duggan.

Duggan spoke with FlightGlobal at the recent Imdex Asia naval show in Singapore.

In April, the company unveiled the Integrator VTOL, which combines the conventional Integrator airframe with a separate system to enable vertical take-off, known as the Flying Launch and Recovery System (FLARES).

Integrator now requires a pneumatic catapult for launch, but FLARES uses a detachable, all-electric quadcopter to lift the UAV and drop it at a sufficient height. The fixed-wing UAV then performs its mission.

The UAV is later recovered by an arresting cable carried aloft by FLARES. The arresting cable is designed to be higher than the superstructure of a warship – this feature also lends itself to operations in jungle and urban areas.

The entire package can be carried on a Lockheed Martin C-130 pallet or slung beneath a helicopter such as a Sikorsky UH-60 Black Hawk.

On the broader UAV market, Duggan notes that global sanctions regimes imposed on various state actors means that governments are increasingly interested in monitoring ships. This is especially important in Asia, where a vast portion of the world’s maritime trade is conducted.

“The agencies of the world want to understand what’s on a ship, has it been to an area that’s been questionable… or is it meeting up with another vessel in the middle of the strait somewhere,” he says.

“There’s a lot more interest in that kind of sanctions busting behaviour.”

He adds that the cost of electronics and sensors mean that smaller UAVs now offer capabilities that a few years ago were only available on much larger systems.

On the lessons the war in Ukraine hold for UAV makers such as Insitu, Duggan says that the conflict highlights the critical importance of electronic warfare. He contends that a small UAV such as Integrator is a very effective way of performing the electronic intelligence mission.

**30 . Date: 06-02-2025Fixed Wing - Armed ISR / ISTAR - HALE - General - Northrop Grumman prepares to deliver second and third MQ-4Cs to AustraliaURL: https://www.flightglobal.com/military-uavs/northrop-grumman-prepares-to-deliver-second-and-third-mq-4cs-to-australia/161689.article**

Defence manufacturer Northrop Grumman is preparing to deliver two MQ-4C Triton maritime surveillance uncrewed air vehicles (UAVs) to Australia.

Northrop said on 6 February one of the aircraft is undergoing final calibration testing at NAS Patuxent River in Maryland, while the second jet is being readied for a ferry flight to Patuxent River from a Northrop facility in Palmdale, California.

Following what the company describes as “robust flight testing and validation”, the two high-altitude, long-endurance (HALE) aircraft will be delivered to Australia later this year.

One MQ-4C is already in service with the Royal Australian Air Force (RAAF), having been delivered to RAAF Tindal in Australia’s Northern Territory in July 2024. That Triton, number AUS 1, completed the transfer flight under its own power in three segments.

The two Tritons undergoing final testing represent Australia’s second and third examples of a planned four-aircraft order. However, defence strategy documents from Canberra have indicated the RAAF’s MQ-4C fleet could expand to include six or seven aircraft.

Those remotely-piloted UAVs will be operated by Australia’s 09 Squadron, based RAAF Base Edinburgh in South Australia. The aircraft themselves will be stationed at RAAF Tindal – some 1,600 miles (2,570km) to the north on the periphery of potential conflict zones in the South China Sea and Southwest Pacific.

“The MQ-4C Triton will play a pivotal role in securing Australia’s strategic areas of interest, including our maritime approaches,” says RAAF chief Air Marshal Stephen Chappell.

Personnel from 09 Squadron have undergone partner training in Jacksonville, Florida with the US Navy (USN), which also operates a fleet of the long-endurance UAVs. Both services operate the MQ-4C alongside the Boeing P-8 Poseidon conventionally manned maritime patrol aircraft.

A crew of five ground operators control each Triton via secure satellite link. Each team includes an air vehicle operator, tactical coordinator, two mission payload operators and a signals intelligence coordinator. The towable trailer-based ground control station can be moved to forward locations as needed, a procedure the USN tested in 2021.

During that exercise an MQ-4C control centre was loaded into a US Air Force Boeing C-17 transport, which the Pentagon says allows the Triton to support operations “from nearly any US facility in the world”.

While Northrop and the USN do not disclose the range of the Triton, the navy says each jet boasts an flight endurance of more than 24h and cruising speed of 320kt (592km/h).

The MQ-4C is powered by a single Rolls-Royce AE3007H turbofan.

**31 . Date: 07-05-2024Cargo - MALE - General - PlatformPyka reveals militarised version of Pelican cargo UAVURL: https://www.flightglobal.com/military-uavs/pyka-reveals-militarised-version-of-pelican-cargo-uav/158161.article**

Electric aircraft start-up Pyka is expanding into the defence realm, teaming with mission systems provider Sierra Nevada to offer a militarised version of its Pelican Cargo uncrewed aircraft.

The Oakland, California manufacturer on 6 May said it will offer the autonomous air vehicle to the US military under the moniker Rumrunner, with Sierra Nevada providing the electric aircraft’s mission systems.

Pyka is targeting military logistics operations with the new offering, saying Rumrunner will have a cargo payload of up to 181kg (400lb), 173nm (321km) of range and “super short” take-off and landing capability.

Under the Pentagon’s definition, to qualify as short take-off and landing capable, an aircraft must be able to clear a 15.2m (50ft) obstacle within 450m of commencing take-off, and when landing must stop within 450m after passing over a 12.2m obstacle.

According to Pyka’s website, the Pelican Cargo civil UAV upon which Rumrunner is based can operate from a runway of just 250m, including gravel, dirt and grass surfaces.

“Rumrunner is a game changer for military sustainment operations,” the company says, “enabling dynamic logistics and operational energy support from points of distribution to points of need”.

Sierra Nevada vice-president of programmes Michael Bertman says his company chose to partner with Pyka because the Pelican Cargo is “significantly more capable” than any other platform currently available.

“It is the only all-electric, austere-environment cargo aircraft with that kind of range, payload capacity and cargo volume,” Bertman says.

Sierra Nevada argues that the lack of reliance on traditional liquid petroleum fuel will create a “more diverse, distributed and survivable supply chain” it expects will be of interest to the Pentagon.

Reducing the need to stage bulk fuel stocks in vulnerable, forward areas “significantly reduces the logistics tail normally associated with resupply operations”, Bertman argues.

The US military is evaluating several electric aircraft for potential service. Under its Agility Prime programme, the US Air Force is helping fund several developers of electric vertical take-off and landing aircraft, including Archer and Beta Technologies. That effort is also funding XWing, another California start-up seeking to deliver an autonomous light cargo aircraft.

The US Navy is already testing autonomous UAVs for delivering supplies to ships at sea under its Blue Water Logistics Maritime UAS programme.

Both the navy and the US Army are assessing the potential of a hybrid-electric short take-off and landing aircraft being developed by Virginia-based developer Electra, with an eye toward supporting logistics in contested environments.

**32 . Date: 18-12-2024MALE - Requirement - South Korea opens production centre for indigenous MUAV systemURL: https://www.flightglobal.com/military-uavs/south-korea-opens-production-centre-for-indigenous-muav-system/161158.article**

South Korea has opened a new production centre in Busan for the Korean Air Medium-Altitude Reconnaissance Unmanned Air Vehicle (MUAV).

A ceremony was held on 17 December to commemorate the opening of the facility, as well as the ceremonial drilling of the first hole in the production process, says Seoul’s Defense Acquisition Program Administration (DAPA).

Attendees from the Agency for Defense Development, DAPA, Hanwha Systems, Korean Air, and LIG Nex1 attended the event.

Following a production kick-off meeting in January, DAPA has obtained raw materials, components, and the production facility has been developed.

The aircraft – also designated KUS-FS – will be produced by the Korean Air Aerospace Division (KAL-ASD), which has a large presence adjacent to Busan’s international airport.

South Korea’sYonhap news agency quotes DAPA as saying that deliveries to the Republic of Korea Air Force will commence in 2027.

FlightGlobal understands that the initial role for MUAV will be monitoring North Korea using its synthetic aperture radar and electro-optical/infrared sensor. DAPA says that the type will also be deployed by South Korea’s coast guard and navy.

In addition to intelligence, surveillance and reconnaissance, other roles for the MUAV will include communications relay and electronic warfare.

Korean Air also lists parapublic missions such as maritime monitoring, border patrol, as well as environmental and scientific work.

According to KAL-ASD, the MUAV/KUS-FS system will include two to four UAVs and a ground control system. The aircraft is powered by a 1,200hp (895kW) engine and KAL-ASD does not provide details such as maximum take-off weight or endurance.

The MUAV’s dimensions are similar to those of the General Atomics Aeronautical Systems MQ-9 Reaper. The type features a wingspan of 25m (82ft) and a length of 13m.

**33 . Date: 22-08-2023Armed ISR / ISTAR - MALE - General - PlatformSouth Korea to produce large surveillance UAV from 2024URL: https://www.flightglobal.com/military-uavs/south-korea-to-produce-large-surveillance-uav-from-2024/154653.article**

Seoul has approved plans to start production of Korean Air’s indigenously-developed Medium-Altitude Unmanned Air Vehicle (MUAV).

The country’s Defense Project Promotion Committee recently cleared production of the MUAV, according to the South Korea’s Defense Acquisition Program Administration (DAPA).

Korean Air confirms that development of the MUAV – also designated KUS-FS – was completed in 2022, and that production will begin in 2024. Korean Air’s KAL-ASD unit has extensive MRO and aerospace capabilities.

DAPA envisages the MUAV providing a continuous intelligence, surveillance and reconnaissance capability on targets deep within North Korea. Moreover, local production will support the country’s domestic aerospace sector.

According to KAL-ASD, the KUS-FS system will include 2-4 UAVs and a ground control system. The KUS-FS is powered by a 1,200hp engine and KAL-ASD does not provide details such as maximum take-off weight or endurance.

Korean Air has several activities in the UAV space.

In October 2022, it and Airbus Helicopters entered a memorandum of agreement to develop UAVs with a vertical take-off and landing capability for South Korea’s military, specifically shipborne UAVs for the country’s navy.

Two months earlier, in August 2022, South Korea’s Agency for Defense Development named Korean Air as the “preferred bidder” in a programme to develop a low observable UAV that will work with manned aircraft in combat.

The work envisages the development of “stealth UAV squadrons”.

**34 . Date: 11-10-2023Swarm - General - USAF paper explores Chinese research into drone swarmsURL: https://www.flightglobal.com/military-uavs/usaf-paper-explores-chinese-research-into-drone-swarms/155322.article**

A new US Air Force (USAF) study indicates that Chinese researchers are looking to address the challenges related to creating drone swarms for future combat missions.

The paper, written by USAF Major Emilie Stuart and published by the China Aerospace Studies Institute, defines swarms as several unmanned air vehicles collaborating to achieve missions.

Stuart stresses that such a swarm has yet to be tested in combat. While large numbers of drones have been used in conflicts, sometimes simultaneously, the systems are still individually controlled. Moreover, China’s leadership has given little public indication about how it views the potential for drone swarms, and how they may fit in with People’s Liberation Army doctrine.

True swarms include a degree of autonomous control generated using artificial intelligence/machine learning. Also, communications between drones allow them to function as a team absent from human input. Drone swarms must also possess accurate positioning and navigation, as well as a sufficient power supply.

Examining patent applications in China, Stuart observes that Chinese developers see many potential benefits from drone swarms, including image acquisition from multiple vantage points, reconnaissance, electronic countermeasures, and precision strikes.

Swarms can also be greater than the sum of their parts if each drone has a specific mission and decisions require “very little human intervention”.

Nonetheless, Chinese developers see challenges to deploying swarms, such as the balance between payload size and range, spectrum congestion, the failure of individual drones, and the impact of high-speed flight on connectivity. Communications delays will also occur as the size and range of swarms grows.

One topic developers grapple with is operations in challenging mission areas, such as in mountainous or urban terrain.

“The earliest drone swarm inventions focused on [command and control] and collaboration followed a few years later by those focused on navigation and path finding,” writes Stuart.

“This is logical because to create an efficient swarm, one would have to figure out the collaboration piece first as a foundation, then add mission sets and additional complexity, including path finding.”

Curiously, only one invention reviewed by Stuart addressed multi-mission swarms.

“However, this invention speaks more to the [command and control] structure of such a construct and does not speak to the specific missions set this structure would address, not the specific tasks,” writes Stuart.

“Most of these inventions likely exist at the classified level.”

**35 . Date: 26-09-2024Armed ISR / ISTAR - MALE - General - PlatformUS Marine Corps completes third XQ-58 test flightURL: https://www.flightglobal.com/military-uavs/us-marine-corps-completes-third-xq-58-test-flight/160102.article**

The US Marine Corps (USMC) has completed its third test flight of the Kratos XQ-58 Valkyrie autonomous jet aircraft.

Held on 20 September at Eglin AFB in Florida, the sortie saw the successful integration of the Link 16 data-communications system that will be critical to the effective deployment of future uncrewed fighters.

“The test demonstrated newly added Link 16 capabilities for the uncrewed collaborative combat aircraft prototype, marking the first time the Department of Defense controlled an air vehicle using off-board expeditionary methods,” the USMC said on 26 September.

Link 16 itself is not new; the USA and other NATO members use the system to facilitate secure communications between aircraft, naval ships and ground-based systems.

Collaborative combat aircraft is an umbrella term used by the Pentagon to describe the autonomous jets currently under development, primarily by the US Air Force.

Kratos was an early leader in the space, with its subsonic XQ-58 completing its first flight in 2019. Although the air force purchased several Valkyries for testing, the service ultimately selected proposals from General Atomics Aeronautical Systems and Anduril Industries as finalists to develop uncrewed aircraft under the Collaborative Combat Aircraft (CCA) programme.

Senior air force officials say those prototypes will make first flights in the coming year.

“At least one of them will be in our inventory in meaningful numbers in the next few years,” air force secretary Frank Kendall said on 16 September at the 2024 Air & Spaces Forces Association (AFA) conference near Washington, DC.

Meanwhile, the USMC is continuing test work on the XQ-58, including integration of the Link 16 tactical data system that is expected to enable communication with, and control of, CCAs. For example, Link 16 could allow Lockheed Martin F-35 pilots to receive sensor data from CCAs and task those aircraft with missions, such as engaging targets.

“Initial results indicate that the prototype met threshold requirements for autonomously exchanging relevant tactical information,” the USMC says of the latest XQ-58 test flight.

Based on that performance, the service says it will fly the Valkyrie again in October during exercises named Emerald Flag 2024. The pilotless jet will be used to demonstrate “cooperative kill chain closure”, pairing manned and unmanned lethal strike platforms.

“The XQ-58A has proven itself ready”, the USMC says, noting Emerald Flag will mark the first time such autonomous systems have been so utilised in large-scale exercises.

The USMC has previously said it plans for six XQ-58 test flights, the first of which was completed in 2023.

**36 . Date: 16-07-2024Tanker - HALE - General - US Navy installs first MQ-25 control station on aircraft carrierURL: https://www.flightglobal.com/military-uavs/us-navy-installs-first-mq-25-control-station-on-aircraft-carrier/159605.article**

The first unmanned aircraft control station has been fitted in a US Navy (USN) aircraft carrier – a major milestone in the service’s journey to integrate uncrewed jets into the carrier air wing.

The Naval Air Systems Command said on 15 August it completed installation of the first MD-5E ground control station (CGS) aboard the USS George HW Bush, where it will be used to control the forthcoming Boeing MQ-25 Stingray autonomous refuelling jet.

The GCS, which was developed for the navy by Lockheed Martin, will form the heart of a new Unmanned Air Warfare Center (UAWC) onboard the Bush, with the Stingray being the initial target for operations.

“These systems will initially support the MQ-25, but also future unmanned systems such as collaborative combat aircraft,” says Captain Daniel Fucito, the USN’s programme manager for unmanned carrier aviation systems.

Although the MQ-25 is designed to launch, fly its pre-loaded missions and return to the carrier autonomously, the navy says the GCS will be “critical” to the uncrewed refueller’s operations – controlling the tanker jet from the aircraft carrier.

Boeing is also testing software that would allow the MQ-25 to be controlled by F/A-18 pilots while airborne.

The USN has already established its first Unmanned Carrier-Launched Multi-Role Squadron at NAS Patuxent River, Maryland to oversee the training of ground-based MQ-25 operators – which the navy has dubbed “Air Vehicle Pilots”, despite the autonomous nature of the Stingray. Operators are to monitor the aircraft rather than directly control flight.

The MQ-25 represents the first uncrewed aircraft planned for operational service on USN aircraft carriers. With a planned fleet of 76 aircraft, the navy will use the Stingray to provide air-to-air refuelling support to its carrier-based fighter squadrons.

That role is currently filled by the F/A-18E/F Super Hornet, which requires diverting one of the strike fighters from availability for combat sorties.

“The MQ-25 system is designed to change the carrier air wing at its core and change the way the navy fights, increasing the lethality of the air wing and carrier strike group,” Emily Mooren, commander of the navy’s MQ-25 training squadron, said in February.

Boeing delivered the first Stingray example – a ground-based test article – to the USN in March. The company currently assembles Stingrays within its F-15EX assembly site near St Louis Missouri, where flying MQ-25 aircraft are currently in production.

Boeing is nearing completion on a new assembly facility dedicated solely to the MQ-25, expected to open this year in nearby Mascoutah, Illinois.

Under the latest procurement schedule, the USN plans to reach initial operational capability on the MQ-25 fleet in the second half of 2026 – with 13 aircraft delivered.

The navy carried out deck handling tests using a Boeing-owned MQ-25 in 2021, also aboard the Bush. According to the service, that ship will also lead sea trials for the new UAWC starting in early 2025. A simulated CGS test was held aboard the aircraft carrier USS Abraham Lincoln in January.

Using the company-owned demonstrator, Boeing has already proven the ability of the MQ-25 to top-up three carrier-based aircraft: the F/A-18, Lockheed F-35C and Northrop Grumman E-2D Hawkeye.

**37 . Date: 15-03-2024Tanker - HALE - General - US Navy takes delivery of first MQ-25 autonomous refuellerURL: https://www.flightglobal.com/military-uavs/us-navy-takes-delivery-of-first-mq-25-autonomous-refueller/157393.article**

For the first time ever, the US Navy has a carrier-based aircraft that does not require a pilot.

The service has taken delivery of the first MQ-25 Stingray autonomous refueller from manufacturer Boeing.

“We’ve delivered the first US Navy MQ-25 Stingray for testing,” Boeing said on 21 February. “The unmanned carrier-based refueller will now undergo a rigorous airframe integrity evaluation.”

Boeing also shared a photo of an unfinished MQ-25 showing an unpainted fuselage and wheel assemblies waiting to be attached to landing gear. The company will assemble MQ-25s at a 27,870 sq m (300,000 sq ft) facility near St. Louis, Missouri.

The latest fiscal year 2025 budget documents indicate the navy plans to acquire 76 Stingrays, including five test articles. At least 67 aircraft are projected to be operational models.

While the USA’s other military services have widely adopted uncrewed aircraft, the unique requirements of operating from the US Navy’s catapult assisted take-off/barrier arrested recovery aircraft carriers has limited UAS adoption in the service.

The MQ-25 represents the navy’s first operational carrier-based UAS, capable of launching and recovering in the same manner as the service’s crewed fighters.

However, unlike Boeing F/A-18s and Lockheed Martin F-35Cs, the MQ-25 will operate without a pilot onboard. The Stingray also eschews a remote pilot, using advanced flight control algorithms and planning software to execute missions and return to the carrier autonomously.

MQ-25s will take over the job of refuelling fighter aircraft at sea. That role is currently filled by F/A-18 Super Hornets, which are reassigned from combat duty to act as ad hoc tankers.

The navy says the addition of the MQ-25’s tanker capability will help mitigate a shortage of available combat aircraft and reduce fatigue on the service’s Super Hornet airframes, extending the operational lifetime of the multi-role strike fighter.

A test version of the MQ-25 has successfully refuelled the F/A-18, F-35C and Northrop Grumman E-2D Hawkeye. The USN plans to have Stingrays supporting air wings on both its Nimitz- and Ford-class aircraft carriers.

The Stingray will have a secondary duty of performing intelligence, surveillance and reconnaissance missions, according to the navy.

“MQ-25 will have the ability to refuel all carrier based fixed wing aircraft capable of aerial refuelling and pass sensor data to other aircraft, naval vessels and ground forces,” the service says in its FY25 budget request.

A Boeing-owned test example of the MQ-25 completed the type’s its first flight in 2019 from MidAmerica St. Louis airport in Mascoutah, Illinois.

The navy carried out deck handling tests using the same Boeing owned MQ-25 in 2021, aboard the USS George H W Bush Nimitz-class aircraft carrier.

Under the latest schedule, the navy plans to reach initial operational capability on the MQ-25 fleet in the second half of 2026 – with 13 aircraft delivered.

In addition to the example delivered in February, the service has requested to acquire three MQ-25s in the yet-to-be-approved FY2024 budget and the latest FY2025 budget.

Current long-range plans call for three aircraft per year to be delivered through 2027, after which the annual procurement will start to ramp up. The latest budget documents forecast a buy of seven MQ-25s in 2029.