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UK aims for a place in space

The UK has big spaceflight ambitions and is hoping the commercial sector can provide the extra thrust needed. "We were one of the first space-faring nations, but we've allowed ourselves to slip," says Thales Alenia Space UK's Andrew Stanniland, part of the Space Alliance bidding to ensure a successful blast-off for the country's nascent commercial space industry.

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Gliding principles

Airbus to use hydrogen-burning engine-less aircraft to test impact on environment

David Kaminski-Morrow

Airbus is to start test flights with a hydrogen-burning glider this winter in order to assess the potential emissions and contrail effects from a scaled-up hydrogen-fuelled engine.

Two modified Schempp-Hirth Arcus-J gliders – one fitted with a bespoke gaseous hydrogen combustion engine and the other with a conventional kerosene engine – will be flown over North Dakota for the 'Blue Condor' project, intended to provide a quick insight into the impact of future propulsion technology.

The glider would not use the hydrogen engine for thrust, Sandra Bour Schaeffer, the chief of Airbus's UpNext innovation arm, told *Flight Daily News* yesterday. It would be towed and the engine lit at altitude, with a chase aircraft from German aerospace laboratory DLR in trail to measure the exhaust composition.

Although hydrogen engines produce no carbon dioxide, the tests will provide data about expected higher water-vapour content – perhaps 2.5 times – as well as nitrous oxide levels, and this will be extrapolated to the scale of a large zero-emission aircraft.

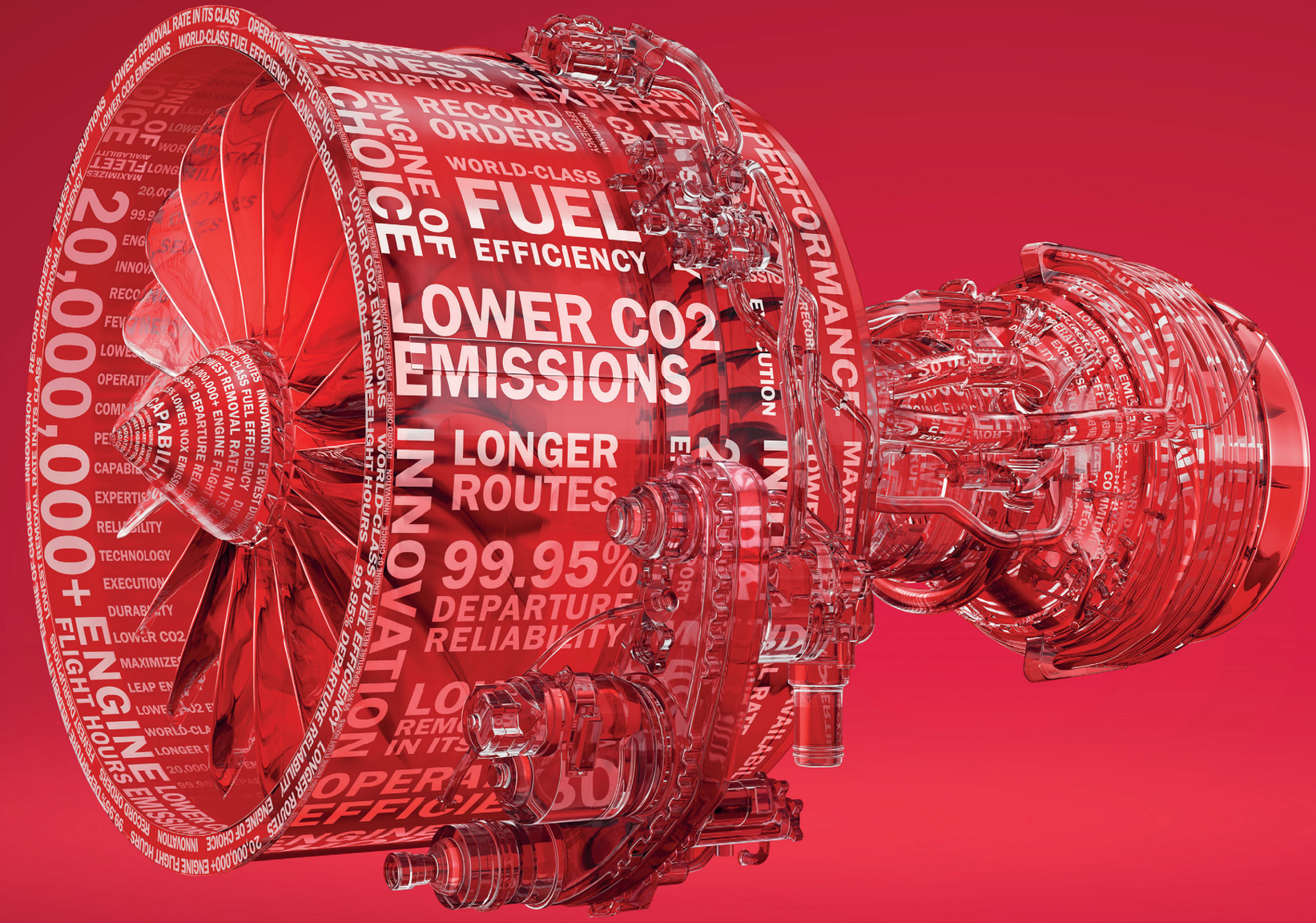
"This is one important step in getting a better understanding and feeding our models," says Schaeffer.

One of the glider's two pilot seats will be removed to fit a hydrogen tank, which will carry fuel for a 1h measurement burn, both in climb and at typical cruise levels of 35,000ft.

Glider modification and the test flights will be conducted by atmospheric science research company Perlan Project.

"A glider is the perfect aircraft to carry the engine," says Airbus chief technical officer Sabine Klauke, pointing out that it has no emissions of its own to interfere.

Initial tests will begin towards the end of this year and the campaign will conclude by spring 2023. Klauke says the information will assist with the process of shaping future engine designs to optimise and regulate hydrogen combustion, while mitigating undesired emissions.



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Scherer stresses virtue in silence but insists air show is not 'quiet'

Lewis Harper

Airbus chief commercial officer Christian Scherer has defended Airbus' aircraft order performance at the show by highlighting its announcements across the year so far.

Speaking as EasyJet confirmed an order for 56 Airbus A320neo jets yesterday – a deal first outlined in June – Scherer insisted "it's not a quiet air show" for the airframer, which has been doing plenty of work in the "private rooms" in its chalet.

Furthermore, Scherer is relaxed about the lack of order announcements.

"If you are asking 'where are the Airbus announcements?', I remind you... that we have clicked way past 500 orders so far this year and we're quite satisfied with that," he states.

"We don't need to make a lot of noise. We can do business quietly. That's what we're doing."

Asked about rival Boeing's slate of orders from the show, Scherer says he prefers to speak about Airbus, but states that "it was about time for Boeing to pick up some steam". He adds: "The other thing is, rehashing old orders – okay, that's not what we're doing."

Christian Scherer (*right*) alongside EasyJet's Kenton Jarvid

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EasyJet's order, which came following shareholder approval, was the last of three commercial aircraft announcements yesterday.

Boeing was the source for one of them, as Azerbaijan Airlines signed a preliminary deal to acquire a further four 787-8s.

The airline already operates a pair of 787-8s and Boeing notes that the new commitment forms part of the airline's intention to grow its 787 fleet to 10 examples by 2030.

The other commitment came from Central African carrier Afrijet, which ordered a further ATR 72-600 that is due for delivery later this year.

The fresh deal takes to six the number of ATR 72-600s the Gabonese carrier will operate.

Wednesday's orders took total aircraft announcements at this year's show, including tentative deals confirmed as firm business, to 374. Most of those orders, including EasyJet's, represent repeat business for an aircraft type.

While low-cost carriers have been prominent in ordering aircraft at air shows over recent years, EasyJet's purchase – which also saw it convert 18 orders in the backlog to the larger A321neo – was the first from the sector at this year's event.

Airbus lifted by Wing of Tomorrow prototype progress

A first full-size wing demonstrator developed and built under the multi-national Airbus Wing of Tomorrow programme has been delivered.

Completion of the first of three prototypes involved the integration of more than 100 different component and manufacturing technologies.

Airbus is using the programme to mature next-generation technologies, including a folding wingtip. Additionally, it introduces a new industrial assembly system with a key aim of validating automated manufacturing techniques.

Sabine Klauke, Airbus chief technical officer, says: "Wing of Tomorrow brings a completely different build philosophy to the way we currently assemble wings and is a crucial part of our R&T portfolio that will help us assess the industrial feasibility of wing production in the future."

While the project is an international effort, the UK is leading the programme and it features suppliers including GKN Aerospace.

Airbus sees the new industrial system as potentially halving the amount of assembly work required.

UK space industry seeks launch customers

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Telespazio and Thales Alenia Space are teaming up on a UK government initiative to boost commercial space activity.

The firms, subsidiaries of Italian manufacturer Leonardo and France's Thales, announced that their partnership – known as Space Alliance – will invest nearly $20 billion in the UK's commercial space sector.

"Space Alliance will be able to act as a catalyst for this growth," says Thales Alenia Space's UK chief executive Andrew Stanniland. "Our plan will see us develop valuable intellectual property in the UK."

Stanniland's counterpart, Telespazio UK chief executive Mark Hewer, says the alliance will leverage its expertise in fields like satellite communications and earth observation to provide added value for commercial and military customers.

The Space Alliance was a product of the UK government's National Space Strategy, released in 2021.

The aim of the strategy is to foster growth in the country's private space sector and the economic potential surrounding it. One of the early goals is the development of domestic launch capability.

In the far north of Scotland, the start-up SaxaVord says it has that achievement close at hand.

The company is building a $51 million commercial spaceport on the Lamba Ness peninsula in Shetland that will be the site of the first-ever vertical launch complex on UK soil. The company plans to conduct its first launch before the end of the year.

Shetland's geographically isolated position in the far north of Europe is a "massive advantage", says SaxaVord spaceport operations director Scott Hammond (*pictured*).

SaxaVord is currently approved for up to 30 launches per year. Hammond says two customers have already confirmed and he expects the company will reach that capacity in fairly short order.

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Headlines

Star turns

Although Farnborough's flying display was smaller than previous years, there were still plenty of highlights for eager spectators

Top tips: Boeing's 737 Max 10

Republic of Korea Air Force's Black Eagles perform flypast

Less bother when you hover – Lockheed F-35B

Composed composite A350-900

Chinook shows heavy-lift credentials

E190-E2 TechShark cruises for sales

TAI's T129 Atak helicopter

Boeing's next big thing – 777X

Avmax sees Universal appeal

Jon Hemmerdinger

Start-up Universal Hydrogen has landed an order from a Canadian aircraft lessor to equip 20 regional turboprops with hydrogen propulsion systems.

Universal also says it still plans this year to complete first flight of a De Havilland Canada Dash 8 powered by its hydrogen fuel cell powertrain. California-based Universal will also supply hydrogen fuel for the converted turboprops, it says.

Calgary-based leasing firm Avmax Aircraft Leasing placed the order for 20 conversions, which can be either ATR 72-600s or Dash 8-300s.

Following the Avmax deal, Universal holds orders and options for about 200 ATR and Dash 8 conversions, although the latest commitment is the first in Canada.

Universal Hydrogen

Universal chief commercial officer Rod Williams says the order is notable because Canadian airlines operate more ATRs and Dash 8s than carriers in any country. "Canada is the number one market for turboprops globally," he says.

Universal is pursuing supplemental type certification (STC) for its conversions. It aims to secure its first STC in 2025 and to deliver its first converted aircraft – an ATR – the same year.

The company has acquired both an ATR and Dash 8 for testing. It plans to commence flight testing "between now and the end of the year", using the Dash 8 operating from Moses Lake in Washington, says Williams. Once flight testing starts, Williams says the pace of development and testing will accelerate.

Started by former Airbus and United Technologies executive Paul Eremenko, Universal is among several companies creating novel propulsion systems for Dash 8 and ATR turboprops. But unlike competitors, Universal is taking a broader view by also developing a distribution network and capsule loading system for the hydrogen fuel.

Several weeks ago, Universal opened an office in Toulouse, France. The company has currently secured $85 million in financing, Williams adds.

Phantom Works in autonomy push

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Boeing's Phantom Works business sees autonomy as an important force enabler in future conflicts, and is seeking to rapidly advance the technology for military customers.

Steve Nordlund (*pictured*), vice-president and general manager of Phantom Works, says Boeing's rapid prototyping unit has gone far beyond its origins developing fighter aircraft and has now adopted the tagline "From Seabed to Space".

"Over time we have grown," says Nordlund. "It has been an organisation focused on understanding what our customers' missions are, and moving out on new technologies, new capabilities to go solve their warfighting problems and providing them with the most advanced weapons systems that technology will allow us to have."

Given Phantom Works' remit, a large number of the projects it works on are highly classified. Nonetheless, Nordlund offers the Boeing Australia MQ-28A unmanned air vehicle as a good example of how the unit helped push the envelope in developing a new aircraft. Announced at the Avalon air show in March 2019, the first prototype was rapidly developed and conducted its maiden flight in February 2021.

Nordlund does not discuss details about the programme, but the MQ-28A is envisaged as a loyal wingman operating autonomously or with manned aircraft.

"We see a lot of high growth going on in what I call the next chapter of autonomy," he adds. "As we start to look at the threats that are facing us and our allies, autonomy will play a bigger and bigger role. And it will be counted on as a force multiplier for our customers to enable the mission."

IAI nets new order for special mission aircraft from NATO member

Israel Aerospace Industries (IAI) has secured a deal to supply an unnamed European customer with special mission aircraft.

Valued at over $200 million, the contract is from a NATO country, says IAI. The company did not name the customer, or provide details about the aircraft type, number of airframes, or delivery timeline.

IAI's Elta Systems business, which specialises in radars and intelligence-gathering technology, will develop the aircraft.

While IAI provides few details, it suggests the mission for the aircraft will be intelligence collection.

"Time and time again, IAI continues to prove its ground-breaking capabilities, which have high global demand and worldwide appreciation," says chief executive Boaz Levy.

"This contract, at the centre of which are advanced special mission aircraft, is another testament to our unique technologies which are a crucial strategic component to every military utilising them."

IAI vice-president Yoav Tourgeman adds: "Our ongoing commitment to provide cutting-edge technologies to our customers, with advanced detection and classification capabilities, will enable success even in the most complicated missions."

IAI provides special mission aircraft in four categories through the addition of military systems to business jets: airborne early warning and control, air-to-ground surveillance, maritime patrol, and signals intelligence.

Besides its domestic customer, IAI has previously supplied special mission aircraft to Italy and Singapore.

Beacon shows the way

Embraer has secured two more customers for its Beacon digital maintenance platform following fresh agreements with Spanish carrier Binter Canarias and US operator JetBlue Airways.

The new platform aims to support maintenance operations and accelerate an aircraft's return-to-service time by digitising existing processes. Republic Airways was launch customer for the system, while Aeromexico Connect in April started to test Beacon for key maintenance bases.

Binter will now carry out a trial beginning this September of the Beacon system, marking its first European deployment.

"Beacon is building a new framework to enable the industry to stay connected," explained head of Beacon, Marco Cesarino during a briefing yesterday.

"The conventional flow is 100% analogue and is super-fragmented. Our solution is... to digitalise these analogue processes end-to-end.

"The new business models and ways to interact changes how the world operates," he adds. "There is a huge opportunity to innovate workflows when it comes to operations. This industry has a gap 'below the wing in how it operates'."

Beacon is the third project developed out of the EmbraerX technology initiative.

London's Air Ambulance sees H135 as capital idea

Dominic Perry

Airbus Helicopters has secured an order for two H135 light-twins from London's Air Ambulance Charity (LAAC) as the capital's emergency medical services provider updates its fleet.

Currently an operator of the MD Helicopters MD 902, LAAC will take delivery of the new rotorcraft in September and October 2024.

Charles Newitt, LAAC deputy chief executive, says the charity ran an exhaustive two-year tender, which came down to a run-off between the H135 and the Leonardo Helicopters AW109 Trekker.

Newitt says the selection of the H135 was made after a "very tight" competition against a "very good" rival bid. "It was very close but ultimately we looked to Airbus," he says.

Charles Newitt (*left*) and Gary Clark of Airbus Helicopters celebrate order

BillyPix

"We decided that the H135 just met the operating requirements slightly better, particularly for [operations in] London."

Medical interiors will be provided by Bucher Leichtbau, but LAAC has taken the unusual step of only equipping the aircraft with a temporary stretcher located in the rear of the cabin. This came after analysis showed that only 8% of casualties were transported to hospital by helicopter.

Newitt says although LAAC's pilots would have preferred new or upgraded MD 902s, with the US manufacturer going through a restructuring process, the operator identified "supportability issues going forward".

Captain Neil Jeffers, LAAC chief pilot, adds: "If the MD 902 had been developed as well as Airbus Helicopters has developed its aircraft it would have been an obvious choice for us.

"But we forecast that in the future we expect to see some critical parts that would be problematic should they not be available."

Newitt says the charity has also evaluated the potential use of electric vertical take-off and landing aircraft. However, he believes they are "still a few years off" for emergency medical services operations.

LAAC raised a total of £15 million ($18 million) for the new helicopters, which will also come with a support package from Airbus Helicopters.

Clear Logic to growth

BillyPix

Italian tier one supplier Logic is marking its 60th anniversary at the show by announcing its latest acquisition.

The Milan-based company has taken a majority stake in Gelco, a manufacturer of electronic modules and components for aircraft and missile engines. Logic, which already owns subsidiaries Blu Electronic and Gemelli, has revenues of around $47 million, 250 employees and four sites in Italy.

Chief executive Alessandro Franzoni (*right*) says the company's expansion programme began five years ago. "We are very proud to have completed this first stage of our strategic development plan," he says. "This will provide the group with a solid base to continue the process towards an international footprint."

The group's philosophy is to acquire businesses that help Logic both broaden its product offering, but also its vertical integration, says Franzoni.

Alice readied for take-off

Eviation is tracking towards a first flight, likely next month, of its all-electric Alice aircraft and is running ground tests of the prototype at its Moses Lake test base.

Arlington, Washington-based Eviation relocated the test article to Moses Lake in early June having completed initial ground tests in May.

Following reassembly of the aircraft – which had its propellers, electric power units, wings and batteries removed for the transit to Moses Lake – "stationary tests are well under way", says Gregory Davis, Eviation's interim chief executive.

In addition, the company has 'flown' a simulated profile of the maiden sortie "from an energy management perspective".

First flight "is going to be this summer", says Davis, indicating a probable August deadline.

Davis says that the move to Moses Lake "has been on the cards since I joined the company over a year ago".

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Interim CEO Davis is positive on performance

"We moved the experimental aircraft to an experimental flight-test facility for experimental flight testing," Davis says.

Work continues on the certification path for Alice with the US regulator and Eviation has also begun engaging with the European Union Aviation Safety Agency.

Davis is confident the aircraft will hit its performance targets, but points out that operators will never fly the aircraft at its 250kt (463km/h) maximum speed on routes of 400nm (740km) with nine passengers on board.

He points out that most routes in the segment are no longer than 2h flight time: "When we are looking at the design that's what we need to hit to satisfy the bulk of the market.

"What we need to do is build an airplane our customers are going to use every day."

Orders for Alice have so far been received from US regional operator Cape Air (75) and DHL (12) and Eviation is working to grow the backlog.

"We are getting a lot of traction for all three variants. Our attendance at EBACE [in May] drove a lot of good leads to us and we are having extremely good conversations here as well," says Loic Questiaux, head of EMEA sales.

Riding the rails

A start-up that has developed a novel way of towing airliners to and from the gate, using a subsurface, electric monorail, is hoping to secure its first airport customers.

Colorado-based Aircraft Towing Systems has patented the technology and is running a trial at its local general aviation airport in Ardmore. However, the company is in talks with a number of major international hubs, says chief executive Vince Howie.

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System could slash airline fuel bills, says Howie

"We are confident we can secure our first sales in 2023," he says.

The system involves digging channels under the taxiway and installing a monorail. The aircraft's nosewheel is secured, in much the same way as it would be to conventional tow trucks, to bogies that run underground.

The product, which was invented by Polish entrepreneur Stan Malicki in 2016, has been developed by ATS, founded by Howie, whose career has involved 29 years with the US Air Force and five years as the defence director for the State of Oklahoma.

Installing the system at a major airport would cost around $150 million.

However, airports could recoup this investment in a few years through increased landing fees for airlines.

They, in turn, would benefit from "massively reduced fuel bills", says Howie.

Although there are a number of electrically-powered tow trucks on the market, this is the first system that is based on an underground monorail, says Howie, making it more reliable and faster.

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Building a world that works

De Havilland debates reviving Dash 8-400

Canadian manufacturer is also evaluating when to restart Twin Otter production

Jon Hemmerdinger

De Havilland Canada has launched a review of its DHC-6 Twin Otter programme and intends later this year to do the same for its Dash 8-400 regional turboprop.

The Canadian airframer will evaluate its supply chains and potential updates to both types.

It will also decide when to restart Twin Otter production, and whether to begin making Dash 8-400s again, says De Havilland Canada's vice-president of sales and marketing Philippe Poutissou.

De Havilland Canada says Dash 8 production could restart around mid-decade, if conditions allow. Production would likely happen in Calgary, Alberta, where De Havilland Canada produces Twin Otters, Poutissou said at the show yesterday.

De Havilland Canada had produced Dash 8-400s at a facility in the Downsview section of Toronto. It stopped producing Dash 8s and Twin Otters amid the pandemic, and exited the Downsview site this year. The move had been expected because De Havilland Canada's lease at Downsview was set to expire.

"As we move towards resuming production, an extensive business case and global supply chain review has been undertaken on the DHC-6 Twin Otter, with results expected in the near future, including a decision on when to re-start production," De Havilland Canada tells FlightGlobal.

Poutissou adds that De Havilland Canada intends to produce Twin Otters "well into the future".

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The Twin Otter on the static display

The fate of the Dash 8 has been more uncertain, partly because De Havilland Canada needs a new facility for production, and also due to questions about demand.

"There remain a significant number of aircraft that have not returned to service, and our first priority is getting them back into service," says the airframer. "We need to make sure that the customer demand is in place and that the global supply chain is in place to support a restart of production.

"It is possible that production could start by the middle of the decade, but only under conditions where the customer demand is there and the supply chain issues are resolved such that we could meet customer deadlines," it adds.

The reviews come as De Havilland Canada and others are exploring equipping Twin Otters and Dash 8s with electric- and hydrogen-based powerplants.

Late last year the manufacturer said it had partnered with advanced-propulsion company ZeroAvia to develop a 2MW hydrogen-electric propulsion system for Dash 8-400s, with service entry as soon as 2026. Additionally, US carrier Alaska Airlines has said it plans to equip a Dash 8-400 with ZeroAvia's system, and Universal Hydrogen is working on a Dash 8 hydrogen conversion project.

Separately, ZeroAvia has suggested its technology is suitable for Twin Otters, and in 2019 electric aircraft developer Ampaire and Ikhana Aircraft Services said they were jointly studying the feasibility of equipping Twin Otters with hybrid-electric propulsion.

De Havilland Canada's parent Longview Aviation Capital acquired the Dash 8 programme from Bombardier in 2019.

Meanwhile, the firm has rolled out three new options for converting Dash 8-400 turboprops into cargo aircraft, a move coming as increasing numbers of used Dash 8s hit secondary markets.

The Canadian airframer has also revealed an increased-weight Dash 8-400 variant.

"We believe that the time is right to extend the lives of these aircraft," says Poutissou.

During the pandemic, De Havilland Canada pivoted toward cargo by rolling out a relatively straightforward cargo conversion called the "Cargo Combi".

The newly released cargo options include a "Quick Change" conversion. It involves the instalation of cargo nets in the passenger cabin and the addition of a fire-detection system, meaning the aircraft does not require flight attendants in the cabin, says Poutissou. Service entry is scheduled for year-end.

Another new variant is the Dash 8-400 "Package Freighter", which involves removing the aircraft's passenger cabin to free up more cargo space. De Havilland Canada pegs service entry by end-2023.

By the end of 2024, the airframer plans to introduce a full freighter variant of the Dash 8-400 option. It will have a large cargo door measuring 109in x 69in (2.8m x 1.8m), and be capable of carrying cargo pallets and containers.

The airframer says the three updates will be available through service bulletins, meaning they can be completed by airlines, maintenance providers, or De Havilland Canada itself.

Poutissou notes many Dash 8-400s are around 20 years old, meaning they are nearing the end of their lives as passenger aircraft. Also, airlines grounded some of the turboprops during the pandemic. As a result, increasing numbers of airframes are available for cargo conversions, he says.

Nearly 440 Dash 8-400s remain in airline service, with 140 in storage, according to Cirium fleets data.

Also during the air show, De Havilland Canada said it completed an engineering project that increases the Dash 8-400's maximum take-off weight by 907kg (2,000lb), and ups its payload capacity by 1,360kg.

KAI's grand ambition for FA-50 sales

Greg Waldron

Korea Aerospace Industries (KAI) aims to sell 1,000 FA-50 advanced jet trainer/light fighters over the next decade.

"Our goal for FA-50 exports to the world is 1,000 units within 10 years," says Lee Bong Keun, vice-president and general manager of KAI's international business division.

This number includes requirements from the US Air Force (USAF) and US Navy for additional training aircraft, as well as the need for "red air" aircraft to serve in aggressor missions.

Lee also sees opportunities to replace obsolete Northrop F-5 fighters in service with global air forces. In addition, Russia's international isolation following its invasion of Ukraine could mean that countries may look to replace ageing Russian equipment with alternatives such as the FA-50.

In June, KAI and Lockheed Martin entered into an agreement to enhance the international marketing of the T-50, on which the FA-50 is based.

"As a light combat aircraft, the FA-50 is proven and mature," adds Lee. "Frankly, we're better than other competitors."

The Philippine air force, which operates 12 FA-50s, has used the type in combat operations against insurgents on the southern island of Mindanao.

Lee adds that Manila is considering doubling its fleet to 24 examples, and that dialogue has taken place about this possibility.

Thailand, which operates 14 T-50THs and has orders for two, also represents potential for additional sales because it will need to replace its F-5 and Dassault Alpha Jet fleets.

The FA-50 is equipped with a multi-mode radar, glass cockpit, fly-by-wire controls, and is powered by a single GE Aviation F404 engine. It also has a radar warning receiver, a countermeasures dispensing system, and a Link 16 tactical datalink. KAI says it is also capable of air-to-air refuelling – in late 2020 Cobham Mission Systems said it would deliver an inflight refuelling capability for the type.

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Lee: FA-50 is proven and mature

The FA-50 can also carry a range of precision munitions.

Boeing, for its part, has also expressed bullishness in the market for the trainer/light-attack market. In 2019, it projected that its T-7 – which beat a Lockheed-derived T-50A in the USAF's pivotal T-X competition – will enjoy 2,600 sales over its lifetime.

Cirium fleets data indicates that there are 210 T-50 variants in service globally, of which the majority (146) serve with the Republic of Korea Air Force. International operators include Indonesia, Iraq, the Philippines, and Thailand. Lockheed is also listed as operating two examples.

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Martin-Baker shows KF-21 ejection seat

Martin-Baker is showing the KR18A ejection seat, the local designation for its Mk18 product it has developed for the Korea Aerospace Industries KF-21 Boramae fighter, which made its first flight on Tuesday.

The seat, on display at the company's stand at the Farnborough air show, is capable of safely ejecting a full range of pilot sizes, says Steve Roberts (*pictured*), head of business development at the UK firm.

In addition to displaying the seat itself, the company has also brought the 'forebody' testing vehicle. The company has two KF-21 forebodies, representing the single- and twin-seat variants of the South Korean fighter. In addition to the ejection seat, Martin-Baker also provides the KF-21's canopy ejection system.

Following precursor testing, the forebodies are used for a minimum of eight tests, ejecting dummies.

An engineer for three decades, Roberts describes the complex physics that the seat must deal with when activated by a pilot. "We try to minimise acceleration for the small occupant, and maximise velocity for the big guy," says Roberts.

A pilot's size and other factors also impact the deployment of the parachute: higher acceleration (indicating a lighter pilot) means a slower parachute deployment, while lower acceleration (indicating a heavier pilot) means a faster parachute deployment.

The programme represents a significant opportunity for Martin Baker. KAI has said that 120 examples are likely to go to the Republic of Korea Air Force, and 50 to partner Indonesia.

KAI also wants to market the twin-engined type on the international market.

Collins gets electric with Airlander

Collins Aerospace has produced a prototype of the 500kW electric motor is it developing to power the Hybrid Air Vehicles Airlander 10 airship.

The US aerospace giant has also started "basic characterisation testing" of the powerplant – a 2,000rpm permanent magnet electric motor – the company said at the show yesterday.

Collins is designing the motor at its electric controls and motor systems centre of excellence in Solihull, UK; testing is being performed at a facility at the University of Nottingham.

The motor will have "specific power density levels of 9kW per kilogram, and 98% efficiency, through the use of a novel motor topology and composite construction", Collins says.

Airlander 10 is an in-development helium-lift airship that will be capable of carrying 100 passengers or 10t of cargo. Hybrid Air Vehicles aims first to produce a hybrid-electric version, with two fuel-burning engines and two Collins 500kW motors, for operational debut in 2026.

It plans to have an all-electric variant with four of the electric motors operating in 2030.

VX4 ready to go Vertical

Dominic Perry

Vertical Aerospace is readying its VX4 prototype for a first flight later this summer, having commenced ground tests of the electric vertical take-off and landing (eVTOL) aircraft.

Eduardo Dominguez Puerta, chief commercial officer at the Bristol, UK-based developer, says power-on of the flight-test asset has already been achieved.

He adds: "We are currently in the process of getting the prototype ready and very soon we should enter into the flight-test campaign."

Ground tests have been running "quite aggressively", says Puerta, and follow on the heels of earlier windtunnel and component-level evaluations.

Service entry for the baseline four-passenger air taxi model is set for 2025, with other variants to follow.

Vertical on 18 July signed an agreement with Babcock International to examine the potential for emergency medical and cargo transport variants of the VX4.

Puerta says the companies will learn from the initial passenger operation of the aircraft and will then "know what can be done and understand the addressable market for those uses [and] how much and how quickly we will go into that".

Phil Craig, managing director of UK aviation at Babcock, says before committing to an order for the VX4, it will have to "understand its capability and range and what the limitations are".

Vertical has been assembling its initial flight-test prototype at the Bristol-located Global Technology Centre (GTC) of wing and wiring system supplier GKN Aerospace.

GKN designed and manufactured the electrical wiring interconnection system (EWIS) at its facility in Hoogerheide in the Netherlands and then delivered it to the GTC for installation.

UK-headquartered GKN's next step will be to manufacture and integrate the wing and EWIS for the certifiable aircraft.

Michael Cervenka, president of Vertical says: "We are delighted with the tremendous support and expertise GKN has provided in helping us assemble the demonstrator aircraft in their world-class Global Technology Centre."

Vertical – which has a full-size VX4 mock-up on its Farnborough air show stand – at this stage intends to build the aircraft in the UK.

"There would need to be a damn-good reason not to do it near Bristol," Cervenka says.

Vertical has also selected CAE as its global training provider. The Canadian firm will design and develop a training programme and be the exclusive training device provider for the VX4.

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ATR has chosen the engine for its 42- and 72-600 variants

BillyPix

PW127XT certification nears

Certification of the updated XT variant of the Pratt & Whitney Canada PW127 turboprop is "imminent", the engine manufacturer says.

Maria Della Posta, president of Pratt & Whitney Canada, says Transport Canada approval for the latest XT variant of the PW127 engine is "imminent", later clarifying that as September.

More than 70% of the paperwork required has been submitted to the regulator, she told a Farnborough media briefing.

An initial production engine has already been delivered to ATR, Della Posta adds and "production is already sold out for two years".

P&WC promises a 3% fuel-burn saving from the updated powerplant, plus 20% lower maintenance costs and 40% more time on wing.

ATR has selected the XT variants of the PW127M and N models for its ATR 42- and 72-600, and Deutsche Aircraft the PW127S for its D328eco.

BillyPix

FG's green screen team

For each day of Farnborough FlightGlobal's video team of Mark Pilling and James Robbins has been scouring the flight line, halls, and press conferences to deliver the headlines on the topic of aviation sustainability here at the show.

From a preview filmed aboard Embraer's E190-E2 airliner the day before the show kicked off, with four editions in total, FlightGlobal's Sustainability programme, sponsored by CAE, has featured the news from the established OEMs to the upstarts in the advanced air mobility sector.

As the industry targets net-zero emissions by 2050, Farnborough 2022 is the air show where sustainability has truly risen to the top of the agenda and FlightGlobal has it covered.

The programmes are available to watch on www.flightglobal.com.

Stirling service for Aeralis

Craig Hoyle

Aeralis has added Stirling Dynamics to its team of partners involved in the design and development of a modular family of UK-developed light jets.

Signed at the show on 19 July, the agreement will see Stirling Dynamics "conduct loads and flutter analysis to support optimum aircraft design and to withstand the manoeuvres and conditions required initially from a jet trainer configuration", the Bristol-based airframe developer says.

"We are delighted to have support from such a strong engineering partner, particularly one with so much expertise in complex and innovative engineering design," says Aeralis chief executive Tristan Crawford, who signed the agreement with Stirling Dynamics managing director Jeff Hoyle.

Engineering partners: Hoyle and Crawford

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An Expleo Group company, Stirling Dynamics has provided specialist engineering services in support of more than 70 aircraft types since its formation in 1987. Its staff also will support Aeralis's aerodynamic design team, and "model the flight control system based on system requirements to size the flight control system actuators".

"We are proud to share our experience across the flight sciences to support the development of a game-changing and landmark new aircraft design," says Stirling Dynamics vice-president Bandula Pathinayake.

Aeralis will later this year conduct the preliminary design review for an advanced jet trainer demonstrator, and expects to conduct a first flight of the design during 2025.

USA shakes on new F-35 deal

The US military has reached an agreement with Lockheed Martin over the procurement of several new lots of F-35 fifth-generation fighters.

Speaking at the show, Erin Moseley, vice-president of strategy for Lockheed's aeronautics business, confirmed that a deal for 375 aircraft as part of Lots 15 through 17 has been reached.

The Lockheed Martin F-35 is regarded as the most-expensive weapons procurement programme in history

"In the midst of continued Covid-19 impacts and decreased F-35 quantities, the F-35 enterprise was able to achieve a cost per-jet lower than record-breaking inflation trends," Mosely says.

"This price also includes modernised hardware needed to power Block 4 capabilities, which ensure the F-35 remains the world's most capable aircraft in production today," she adds.

The Pentagon also praised the deal, with Department of Defense acquisitions chief William LaPlante saying that the final details will soon be forthcoming.

"We are pleased to announce that the Department and Lockheed Martin reached a handshake agreement for the next F-35 lot buy on a basis of 375 aircraft," says LaPlante. "We are looking forward to providing specific details at contract award."

375 jets are covered by agreement

Falcon Photography

Lockheed notes that while the so-called handshake agreement is on the basis of 375 aircraft, the final quantity may change based on any adjustments made by the US Congress in the fiscal year 2023 budget, and on any orders requested by international partners.

Delivery is expected to take place over a three-year period. Neither Lockheed nor the Pentagon would immediately divulge the per-unit price, but both say such details will be made public in the final contract.

The price of each F-35 varies for the advanced jet's conventional, carrier and short take-off and vertical landing variants, but has generally declined since production first began in 2007, when it soared above $200 million per aircraft.

Research by equity analysis firm Jefferies estimates a current per-jet sticker price of around $82 million. That would make the 375-unit contract worth some $30 billion to Lockheed.

Jefferies notes that ongoing inflation in the USA, additional costs related to the Covid pandemic, and the higher cost of F-35 Block 4 capabilities have all contributed to pushing the price higher from levels quoted in the pre-pandemic years.

Airbus selects L3Harris for A320 full flight simulator

Airbus has picked L3Harris Technologies to supply a new A320-familly full flight simulator (FFS) for its Toulouse training centre.

The Reality7e FFS provides a suite of maintenance and support utilities, including a secure customer portal that details software versions for future upgrades and enhancements, reducing the airline's lifetime ownership costs.

L3Harris Commercial Aviation president Alan Crawford says: "L3Harris's collaboration with Airbus serves as a milestone in our pilot training commitment to customers. The Reality7e simulator will be the most sophisticated high-fidelity L3Harris training device for Airbus platforms, providing airlines ease and flexibility to train their pilots."

Red the news today?

Our red-suited distribution team have been busy all week delivering *Flight Daily News* to show visitors every morning. They are pictured outside the chalet of sponsor CAE.

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Boeing senses big demand for 737 surveillance jets

BillyPix

Greg Waldron

Boeing sees a tough geopolitical environment driving demand for its 737-derived P-8A Poseidon and E-7 Wedgetail.

Tim Flood (*pictured*), Boeing's senior regional director international business development for Europe and the Americas, says there is significant interest in the P-8 in the Asia-Pacific, Europe, and the Middle East.

"I would just say clearly there is a strong and growing threat across the globe," says Flood.

He says the anti-submarine warfare (ASW) and surveillance capabilities of the P-8 are particularly relevant, and believes that European nations are going to increasingly focus on these missions.

Flood also notes the P-8's growth potential, observing that it has an 18sq m (200sq ft) space reserve, 25% cooling reserve, and 6% power reserve. This allows for additional capabilities to be added as necessary.

Boeing, however, recognises that the US Navy's programme of record for the type is winding down. Still, Flood says the P-8A is in a "good spot" from a production perspective, and that demand for the ASW type and the E-7 airborne early warning and control aircraft remain "very healthy".

He attributes this to the US Air Force's planned acquisition of the E-7, as well as international interest in both aircraft.

The E-7 is operated by Australia, South Korea and Turkey. The UK has also ordered three examples.

Five nations operate the P-8: Australia, India, Norway, the UK, and USA. In addition, Germany, New Zealand and South Korea have placed orders.

Lilium's fjord focus

Lilium is partnering with AAP Aviation Group to develop an electric vertical take-off and landing (eVTOL) network in Scandinavia that will see the Norwegian firm order up to 40 Lilium Jets.

In addition, AAP – better known as a crew and training provider – will identify and develop suitable landing sites in the Nordic region.

Espen Hoiby, chief executive of AAP, says: "We have disrupted the aviation industry once before and are set do so again.

"Due to the mix of water, terrain and mountains, Norway is particularly suited to regional air mobility. With its vertical take-off and landing capability, high speed and regional range, the Lilium Jet can achieve hours of time savings compared with today's transportation modes."

Although the Lilium Jet will not have full icing protection due to weight considerations, Sebastien Borel, senior vice-president, commercial, says the aircraft will be less prone to the phenomenon due to it typically flying below 5,000ft.

Nordic customers "will [still] be able to operate for the majority of the year", he says.

The Lilium Jet has cleared the preliminary design review gate and the company is now working towards the critical design review next year, says Borel.

Lilium earlier in 2022 announced a change to the configuration of the Lilium Jet's propulsion system, reducing the number of electric fans from 36 to 30. It also pushed back service entry until 2025.

Tests of the company's Phoenix 2 unmanned technology continue at a facility in Andalusia in southern Spain. Borel says the test programme is "making good progress" with the jet flying on average "several times per week".

The key transition of the main wing from vertical to forward flight "happened exactly as we hoped", adds Borel. A full transition, which also sees the canard rotating, will be achieved "later this year" alongside higher-speed flights.

Manned production-conforming prototypes are planned to arrive from 2023.

Lilium revealed two additional partnerships at Farnborough: a deal with Belgian firm ASL Group for six Lilium Jets and a five-unit commitment from Andalusian VIP operator Helity Copter Airlines.

***Left to right*: Fredrik Ogard, Espen Hoiby (CEO AAP), Lilium's Sebastien Borel and Daniel Wiegand**

BillyPix

BAE trials Tempest tech

BAE Systems has built a representative forward fuselage for the Tempest/Future Combat Air System (FCAS) to explore advanced manufacturing capabilities.

Dave Holmes, manufacturing director at BAE, stresses that the objective of the exercise was not necessarily to produce the forward fuselage itself, but rather to generate data that will inform advanced production capabilities, which will involve a heavy reliance on robotics and additive manufacturing.

Advanced production capabilities will be essential to build Tempest efficiently and cost-effectively, and potentially avoid the schedule and cost challenges experienced by legacy aircraft programmes.

The forward fuselage section, which is on display in BAE's pavilion at Farnborough, was largely built by robots, and explores the use of new materials, as well as reducing waste in the manufacturing process.

"We initiated a project about two-and-a-half years ago that was designed to look at whether we could produce a sixth-generation lookalike product," says Holmes. "So we picked a forward fuselage because it is a complicated primary structure."

The forward fuselage was produced at the company's Warton facility in Lancashire. Holmes says that the company created a "collaboration space" and invited participation from dozens of small and medium-sized companies, academics, and other contributors.

"We set down a bold ambition about what we wanted to do, and said everyone can bring their tech into that environment, and we'll try to harness it, try to integrate it together, and see what the outcome would look like," he says.

ITA ramps up with Airbus

Lazzerini expects to finish the year with 76 aircraft

ITA's A350 on the static

BillyPix

Lewis Harper

Italian carrier ITA Airways expects to receive its first Airbus A220s and A320neos in the fourth quarter, as it continues to ramp-up operations following its October 2021 launch.

The Alitalia successor's chief executive Fabio Lazzerini outlined the carrier's fleet plans at the show, where an ITA Airbus A350-900 is on the static display.

Lazzerini explains that having started the year with 52 aircraft, ITA expects to end 2022 with 76 in service, boosted by two new types.

The carrier's first four A220s are due to arrive on 1 October – it has both variants of the narrowbody on order – followed by its first A320neo on 1 November.

Having introduced its first A350-900 earlier in 2022, "it's going to be a year with three different entries into service of new aircraft", Lazzerini says.

The airline's A350-900 fleet will rise to six by late July early August, he adds.

ITA expects to have received 25 A220s by the end of its 2025-2026 business plan, Lazzerini says, "replacing mainly A319s". Alongside the incoming A320neos, the A220s will also replace older A320s.

Furthermore, ITA will begin taking its first A330neos in April next year, with its A330ceos due to be phased out "by the end of 2025", according to Lazzerini.

The SkyTeam carrier is updating its fleet as it awaits news on whether a consortium featuring Lufthansa and shipping firm MSC Group, or one containing Air France-KLM, Delta Air Lines and investment firm Certares, will take control of the business.

"The government is analysing the offers and will decide which road to take in the near future," Lazzerini says.

Cirium fleets data suggests ITA has 64 aircraft in service today, comprising 28 A320s, 18 A319s, eight A330-200s, four A350-900s, four Bombardier CRJ1000s and two Embraer E190s.

Cirium lists ITA's outstanding orders as including 23 A320neos, 17 A330-900s, 13 A220-100s, nine A220-300s and nine A321neos.

Lazzerini notes that even though most of its aircraft are Alitalia-branded, ITA is fully committed to establishing its brand on the international stage.

ITA – which now says its name is pronounced as 'eeta', rather than being an acronym of Italia Trasporto Aereo – secured the rights to the Alitalia brand and website domain for €90 million ($92 million) on the eve of its first day of operations in October 2021.

Lazzerini says the ITA name is a "fresh start" for the operator, while acknowledging that "we still need to make it very well known outside of Italy".

"We are investing in this. This is the new brand – it's a new airline," he states.

Nevertheless, while ITA's purchase of the Alitalia brand was initially for "practical reasons" because all of its launch aircraft sported its predecessor's livery – and its crew wore Alitalia clothing – Lazzerini says the carrier has bigger plans for the old name.

"We have a couple of very nice and creative ideas," he says. "It's a brand which has a value and... we think we can leverage very well the power of that brand.

"Alitalia will have a separate project later."

He further clarifies that the Alitalia-branded aircraft still parked at ITA's Rome Fiumicino hub are under the ownership of its predecessor business.

Sight savers

Orbis UK is the official charity partner for the 2022 show.

The charity operates the Orbis Flying Eye Hospital, a state-of-the-art ophthalmic training hospital aboard a McDonnell Douglas MD-10 aircraft, which in 2022 celebrates 40 years since it first took flight.

Orbis UK director of fundraising and communications Colman Cawe says: "Being the official charity partner for Farnborough International Airshow gives Orbis an incredible opportunity to raise awareness of our work on this global platform."

In the past four decades, Orbis has also supported the establishment and improvement of 76 pediatric eye care centres, 340 dedicated eye care hospitals, 157 vision centres and 33 energy efficient green vision centres. It has also treated millions of people and trained thousands of medics in eye health care worldwide.

Globally 1.1 billion people live with sight loss and blindness, and 90% of it is avoidable, Orbis says. Since 1982, Orbis's experts and volunteers in ophthalmic care have trained the next generation of ophthalmologists, nurses, anesthetists, and eye health workers.

Orbis currently runs long-term programmes in 19 countries: Bangladesh, Bolivia, Chile, China, Ethiopia, Ghana, Guyana, India, Indonesia, Kenya, Malawi, Mongolia, Nepal, Peru, Rwanda, Tanzania, Uganda, Vietnam and Zambia.

Orbis

Mitsubishi gets claws into Jaguar radar

Craig Hoyle

Leonardo has identified Mitsubishi Electric as its partner for the Jaguar advanced radar demonstrator project being advanced by the UK and Japan in support of their respective future manned fighter projects.

"Jaguar represents the first big building block of an international radar programme that meets the ambitions laid out by Japan and the UK as part of F-X/FCAS [Future Combat Air System] discussions," Leonardo says.

Andrew Howard, the company's director major air programmes, describes Jaguar as a "pathfinder for the wider collaboration", with work taking place at "a deep, cutting-edge engineering level".

"What we are trying to achieve with Jaguar is high-powered, miniaturisation and digitisation of the radar antenna head," he explains.

"The partners have agreed workshare and both Leonardo UK and Mitsubishi Electric have signed contracts with their respective national defence ministries in order to progress development work," Leonardo says.

Howard says the goal is to produce a multi-function RF system (MRFS), marking a "sixth-generation radar" evolution beyond the ECRS Mk2 active electronically scanned array on order for the Royal Air Force's Tranche 3 Eurofighter Typhoons.

"Our vision for MRFS is getting more power in less space with greater capability, to provide better information flows," he says.

Other key elements include what the company names ISANKE & ICS – an integrated sensing and non-kinetic effects & integrated communications system. Howard describes this as "a new layer of sensor integration" which will combine inputs from the aircraft's radar, electro-optical and infrared search and track sensors, and its defensive aids system.

"ISANKE is all of the sensors, deeply integrated across the platform through a digital backbone," Howard explains. "It is providing a better outcome to the aircrew, and allows information to be shared on and off platform."

The capability delivered by this advance will be "substantially greater than what's gone before", he says.

"What we have seen so far have been very promising results. We are getting an awful lot more radar capability than we would have done a generation ago," he notes.

Howard expects the technology to be trialled aboard the UK Tempest programme's Boeing 757-based Excalibur flying testbed in the 2026-2028 timeframe, with Japan also to conduct its own tests with the sensor.

"The pace of progress to date has been really positive. The relationship with Melco [Mitsubishi Electric] is showing that we can do it."

In December 2021 Japan and the UK signed a broader memorandum of co-operation around future combat aircraft, also including airframe and propulsion technologies. The Jaguar pact was initiated in February, but Howard says the relationship between Leonardo UK and Mitsubishi Electric dates back to 2018.

Leonardo leads sensor work on Tempest

BAE Systems

ATR forecasts big future for turboprops

ATR expects the aviation industry will require 2,450 turboprop aircraft over the next 20 years as demand for regional connections and lower-emission air transport increases.

Releasing its latest outlook on 19 July, the Toulouse-based airframer also expects a rising demand for turboprop freighters.

"The forecast demonstrates that essential connectivity is needed both for emerging and mature markets now and in the future," says Fabrice Vautier, senior vice-president commercial at ATR.

"The biggest driver of demand is airlines modernising their fleets to meet the highest environmental standards while making air transport accessible to all," he says.

Turboprop passenger aircraft with at least 30 seats currently make up 40% of the regional passenger fleet worldwide, and the number of aircraft is set to rise to 2,660 in 2041 – up from 1,950 in 2022. Asia-Pacific, China and Latin America will see the biggest increases, the company anticipates.

Currently, about 45% of all airports rely exclusively on regional aircraft, and 34% only on turboprops.

Turboprops configured for cargo operations will also play a larger role in the future, ATR says.

ATR had 17 passenger-to-freighter conversions in 2021, and the freighter fleet today comprises 140 airframes. ATR expects this to rise to 550 freighters by 2041.

"Freighters have come to play an essential role in supporting regional communities, partly due to the acceleration of the digital economy and e-commerce," the company says.

With the increasing focus on sustainability in aviation, ATR is also preparing to launch its ATR Evo hybrid-electric upgrade, which the firm says can slash fuel burn by up to 20% over current models. ATR hopes to begin the programme in 2023, with the goal of the aircraft entering the market by 2030.

"This will become another step to flying more responsibly, paving the way to a decarbonised future for aviation," ATR chief executive Stefano Bortoli says.

Bortoli: Paving the way for decarbonised aviation

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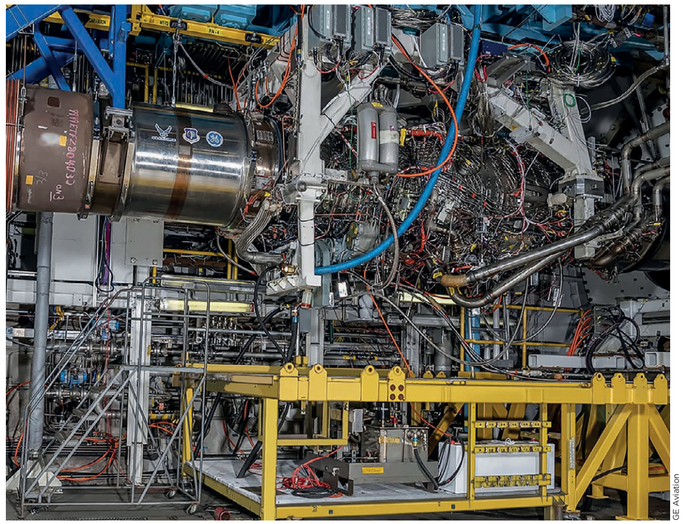
Ryan Finnerty

F-35 engine battle heats up



GE Aviation

The fifth-generation Lockheed Martin F-35 fighter could have a new engine by the end of the decade as propulsion specialists advance their technolgy developments efforts.

GE Aviation has been developing a next-generation adaptive engine for the F-35 under a 2016 US Air Force (USAF) contract, as a potential upgrade to the jet's current Pratt & Whitney F135 powerplant.

Speaking at the show, the head of advanced projects at GE Aviation's Edison Works, David Tweedie, said that his company can have the currently-experimental XA100 engine (*pictured*) flying on F-35s by the end of this decade.

"The technology is ready," Tweedie says. "We have a mature capability that we didn't have eight years ago," referring to the start of the USAF's Advanced Engine Transition Programme (AETP) contract in 2016.

Under that project, both GE and P&W were given $1 billion to fund research and development into producing an improved F-35 engine that could provide greater speed, longer endurance and improved power output for the advanced fighter.

Eight years later, Tweedie says the two working prototypes of GE's XA100 engine indicate the system could boost the F-35's range by 30% and give the jet 20-40% faster acceleration. It also offers double the current amount of power for cooling the suite of increasingly powerful on-board electronics.

"This is not an incremental improvement, but a fundamental change", Tweedie says of the advancements in the XA100. He described the design as the next evolution in propulsion technology, equating it to the transition from piston engines to turbojets and ultimately to the modern turbofan.

GE made a deliberate choice when selecting XA100 as the engine's official designation, Tweedie notes.

"This not an F-series engine", he says, referring to the line of engines that powered such iconic combat aircraft as the Grumman F-14 Tomcat, Boeing F-15 Eagle and the Lockheed F-16 Fighting Falcon.

"This is the first A-series engine", Tweedie says.

While much of the design remains a secret, GE says what makes it revolutionary is the ability to combine the thrust performance of a traditional fighter engine with the fuel efficiency of a long-haul commercial powerplant.

To achieve this, Tweedie says engineers at Edison Works developed an adaptive system that automatically adjusts the air bypass ratio of the engine while in flight. This allows the aircraft to generate high levels of thrust and acceleration when needed, such as a dogfight, but also operate with much greater fuel efficiency during periods of lower performance demand, like air patrols or long-distance cruising.

The XA100 also incorporates three independent streams of airflow and ceramic matrix composite components with substantially increased thermal tolerance.

While the XA100 was designed under a USAF contract for the service's fleet of conventional take-off and landing F-35As, Tweedie says GE made the decision to engineer the powerplant to also fit the needs the US Navy's F-35C catapult-assisted-take-off-but-arrested-recovery (CATOBAR) carrier variant.

The company achieved "100% part number common" engines that can work for both F-35A and F-35C, according to Tweedie, with no need for a structural redesign in either aircraft.

The F-35B variant, with its complex short take-off and vertical landing engine, is not currently compatible with either the XA100 or the Pratt & Whitney Enhanced Engine Package (EEP).

However, Tweedie notes that his team is exploring the potential capability improvements, and associated costs, that could come from some day integrating the GE engine into the STOVL F-35.

GE is positioning the XA100 as a potential block upgrade for the F-35 fleet, mid-way through the airframe's lifecycle run. The company claims that the USAF alone could reap savings of $10 billion in fuel and maintenance costs if the service adopts the engine for its F-35As in the late 2020s.

P&W argues that modifications to the current F135 engine, developed through AETP funding, can improve efficiency and performance at a far-lower cost than a wholesale replacement of the F-35 powerplant.

The company says its F135 EEP can deliver "meaningful propulsion capability" to the F-35, without the technical or cost risks of an entirely new engine.

P&W claims its EEP will result in $40 billion in lifecycle cost savings over the lifetime of the F-35 fleet.

Whatever decision the USAF ultimately makes is likely to be heavily influenced by politics in Washington.

The 2022 National Defense Authorization Act, the law passed by US Congress that governs military spending, required the USAF to develop a "competitive acquisition strategy" for integrating an AETP-derived propulsion system to the USAF's F-35A fleet, beginning no later than 2027.

Lewis Harper/FlightGlobal

Tasew: Considering conversion plan

Ethiopian close to upsizing A350-900s

Ethiopian Airlines is at the "final stage" of discussions to convert four of its Airbus A350-900 commitments to the larger-1000 variant of the twinjet.

The carrier's chief executive Mesfin Tasew made the observation at the show yesterday, where he was marking the signing of a landing-gear maintenance deal with Boeing Global Services.

"We are seriously considering to convert four of the existing orders for the A350 aircraft from -900 to -1000," Tasew says.

"It is at final stage of discussions."

Ethiopian has long discussed placing an order for either the A350-1000 or Boeing 777X.

Earlier this year, it signed a tentative agreement to take five 777X freighters.

Cirium fleets data suggests Ethiopian has 18 A350-900s in service, with six outstanding firm orders.

Jon Hemmerdinger

Gulfstream to fly G500 in effort to lift restrictions

Gulfstream

Twinjet is part of Gulfstream's large exhibit at the show

Gulfstream expects to fly a G500 with the US Federal Aviation Administration (FAA) this week as part of efforts to lift landing restrictions on that jet and its G600 sister stemming from two hard landings.

Mark Burns, president of the Savannah-based airframer, expects the FAA could lift those restrictions, which prohibit landings in all but calm wind, in September.

Gulfstream is working to roll out a software update that addresses the issue, and the FAA has shifted some staff from focusing on G700 certification to validate the software change, Burns adds. "We've reached the point where we will begin flying with the FAA this week to validate the software," he says. "Our schedule is to lift the restrictions in September... I think we are still on track to do that."

FlightGlobal reported in May that Gulfstream had restricted G500s to landing only when wind speeds do not exceed 15kt (28km/h). It also prohibited landings when gusts exceed 5kt. Gulfstream issued the provisions in flight manual updates.

Days later, the FAA formalised the restrictions in airworthiness directives that applied to G500s and G600s – some 120 US-registered jets in total. The pair share similar flight-control systems.

The moves were in response to hard landings in February 2020 and April 2022.

Both incidents involved erroneous activation of the jets' angle-of-attack (AoA) "limiter" function (also called the alpha limiter), which is designed to prevent stalls.

The systems activated due to "rapid, large and oscillating pilot control inputs near approach reference speeds, induced by unstable atmospheric conditions and gusty winds", the FAA said. This resulted in the AoA limiter overriding "the pilot control input", the regulator said. Gulfstream says its software fix will prevent such issues.

Burns says the FAA "has moved some resources" from the G700 to the G500/G600 software fix but downplays the impact of the shift on the G700's certification timetable.

"We don't feel like, in the long run, it should be a major impact," Burns says. "The software that we are working on for 500/600 – the enhancement, to lift the limitations – [is] actually the same software that is on the G700."

Gulfstream has not delayed its planned first G700 delivery beyond a three-to-six-month delay it disclosed in April, Burns notes. That shift puts the delivery in 2023.

Go for Wideroe as carrier joins Energia advisory board

Norwegian regional carrier Wideroe has joined Embraer's Energia Advisory Group – the first carrier to be associated with the Brazilian airframer's sustainability initiative.

The companies plan to work together to "define and establish the real-world requirements for sustainable, emission-free, and commercially viable, aviation".

Embraer last November unveiled the Energia family – four low- or zero-emission concept aircraft for the regional market – that it hopes to fly over the coming decades, including hybrid-, all-electric and hydrogen-powered models.

The Norwegian carrier has embarked on a series of initiatives aimed at developing new technologies, establishing a clean-sheet company, Wideroe Zero, to pursue these aircraft concepts.

"We established Wideroe Zero because we need the freedom to think afresh," says Andreas Kollbye Aks, the initative's chief executive. "Embraer's approach to sustainable aviation most closely aligns with our own, and this collaboration will get into the real-world detail, to shape the technology that will make zero-emission flight a reality."

"We want this aircraft desperately," he adds. "There is more and more pressure on us and [our customers] are more and more focused on environment, they expect this from us. It's fantastic how the industry is coming together to see this happen."

The Norwegian airline has been associated with Embraer for quite some time – it was also Embraer's global launch customer for the new-generation E190-E2 in 2018. It currently has three of the type in service.

"We're proud of our association with Wideroe, who have become a powerful voice globally in the drive for sustainable aviation," says Embraer Commercial Aviation chief executive Arjan Meijer. "Wideroe's expertise in, and commitment to, sustainable aviation is unrivalled. The experience they and subsequent group members bring to the programme will be a key foundation of Energia's successful development."

Earlier this year, Wideroe linked up with Embraer and Rolls-Royce on a 12-month study for a conceptual zero-emission regional aircraft, seeking to understand the propulsion and operational options for such types.

It had already joined Rolls-Royce and airframer Tecnam to develop an all-electric passenger aircraft, the P-Volt, by 2026, while also working with Embraer urban air mobility spin-out Eve on the potential operation of electric vertical take-off and landing aircraft in Scandinavia.

BillyPix

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The pandemic looked like a death blow for the A380, a year after Airbus said it was stopping production. But the type's return to service with many airlines shows the largest airliner still has a role to play

The giant is back

Arnold Aaron/Shutterstock

British Airways began reinstating its A380s last November

At the last Farnborough air show in 2018, Airbus was still talking up the prospects of its A380, insisting that the superjumbo was the only solution to the looming challenge of delivering high-volume capacity in slot-constrained airports. Airlines, it insisted, just had to make that logical leap and the type's enormous potential would eventually be unlocked.

It was not to be. Six months later, in January 2019, Airbus announced it was ending production of its most ambitious project, just 14 years after its first flight, the manufacturer finally admitting that it would never deliver enough aircraft to make the loss-making programme viable.

The start of the pandemic just over one year later appeared to hasten the prospect of the world's largest airliner disappearing from the skies for good, with Air France announcing in the early weeks of the crisis that it was speeding up by two years the retirement of its nine-strong A380 fleet.

Lufthansa was quick to follow, announcing that it too was parking its superjumbos for good. With the very future of long-haul travel in question, a thirsty, four-engine jet, designed to fly 500-plus passengers from one super-hub to another, seemed more irrelevant than ever.

Neither had ever enthusiastically embraced the A380, both airlines placing early orders seemingly as much as a political gesture to support Airbus's multi-billion-dollar gamble rather than any genuine belief in the type's potential to fundamentally alter long-haul air travel.

However, the speed of the recovery in recent months has taken many in the industry by surprise, and – combined with delays to other widebody programmes – has prompted some airlines to rethink their short-term fleet strategies, including reinstating A380s.

They include Lufthansa, which said in June it will reintroduce the type in summer 2023 to address the rise in demand for long-haul flights and delays to its on-order Boeing 777-9s. The German flag-carrier has eight A380s in storage in France and Spain after selling its remaining six examples.

Other operators that had furloughed – but not retired – their A380s have been bringing them back to service. They include British Airways, Qantas, Qatar Airways, and Singapore Airlines, as well as Korean Air and its compatriot Asiana.

BA reinstated four of its 12 A380s last November on its services to Miami and Los Angeles, accelerating its plans for their return after the USA – its most important overseas market – lifted its ban on European travellers.

Mario Hagen/Shutterstock

Qantas A380s at Victorville, California during the pandemic

Markus Mainka/Shutterstock

Emirates A380s at Dubai International

Qantas has begun returning six of its original dozen examples from storage, and will resume Melbourne to Los Angeles A380 operations this December following strong demand for inbound and outbound US travel after the country opened its borders. The Australian carrier has even begun a refresh of its A380 cabins, suggesting that the superjumbos will remain in service for some time.

In South Korea, Asiana, which has six examples, began flying A380s again late last month on services to Los Angeles and Bangkok after an "explosive" increase in passenger bookings coinciding with a shortage of seats.

Korean Air was due to begin flying its A380s from Seoul to New York this month, and to Hong Kong and Tokyo Narita from September. "Passengers love the plane and we have a lot of business class seats on it, so it is a very good aircraft to fly on high-demand routes," chief executive Walter Cho said in June.

Meanwhile, All Nippon Airways became the latest Asia-Pacific carrier to reactivate the superjumbo, when it returned its three A380s on its Tokyo Narita to Honolulu route on 1 July.

Not all airlines are so positive about the type though. Malaysia Airlines chief executive Izham Ismail said in June that the carrier is looking for buyers for its six A380s, noting: "The A380 is not in our network plan anymore."

Lufthansa said it was permanently parking its superjumbos

Sanit Rodriguez/Shutterstock

China Southern, China's only operator of the type, has suggested that its five A380s will never return to service after admitting last year that the aircraft were too large and costly to operate. Thai Airways is also retiring its six A380s.

All these airlines, of course, have one thing in common – the A380 has been a niche aircraft used on select, often slot-constrained or high-demand, long-haul routes. Other than Singapore Airlines, with 19 examples, no carrier has taken delivery of more than 12 aircraft – with one exception.

Emirates, with its fleet of 115 A380s, including the last one built, late in 2021, remains the biggest fan of the double-deck jet. Starting in 2008 (Singapore Airlines took the first A380 in 2007), Emirates has taken delivery of 123 examples, just under half of the 251 built. By the end of March it had reintroduced more than half of its A380s to service.

In June, Tim Clark, chief executive of the Dubai airline, was still casting doubt on Toulouse's decision to cancel the programme and that of other leading airlines not to embrace the type in sufficient numbers. He wonders how the industry will cope without a superjumbo in an era of soaring demand and slot-constrained airports, and believes the A350-100 is too small to top the Airbus range.

Speaking at the IATA summit in Doha, he said that if Boeing fails to certificate the 777X, its largest aircraft will be the 787-10. Noting that Emirates flies six A380s a day into Heathrow alone, he says that it would need two-and-a-half times the 787s to carry the same number of passengers.

However, aside from its operating costs, the A380 has always faced a number of obstacles to further market success, and, despite investing billions in developing the platform, Airbus never recouped its investment in what was arguably the most ambitious aircraft programme of modern times.

Newer-generation, two-engine widebodies, such as the A350 and the 787 offered superior economics over an aircraft that lacked flexibility, in that it could only feasibly be operated on high-demand hub-to-hub routes. When full, the A380 made perfect sense; with 200 empty seats it was a cash-burner.

Its limited appeal as a cargo transporter – as a result of its relatively small cargo hold and lack of a passenger-to-freighter option – has also been a drawback. This has contributed to the type's failure to establish a secondhand market, even as values have plummeted.

A handful of operators and lessors have talked up the potential of the aircraft on high-volume leisure charter or pilgrimage routes, but nothing has come of it, so far at least.

The A380's paradox, of course, is that, while most airlines have shunned it for its economics, passengers tend to love the sense of space, comfort and quietness it offers. As numbers decline, there might even be a novelty factor in flying the type, just as there was in the last days of the 747-400, adding to its appeal.

However, despite Emirates' continuing enthusiasm for the type and its current unexpected revival, A380 fleet numbers are only heading in one direction. Whether passengers will still be flying in the giant of the skies 20 or even 10 years from now is far from certain.

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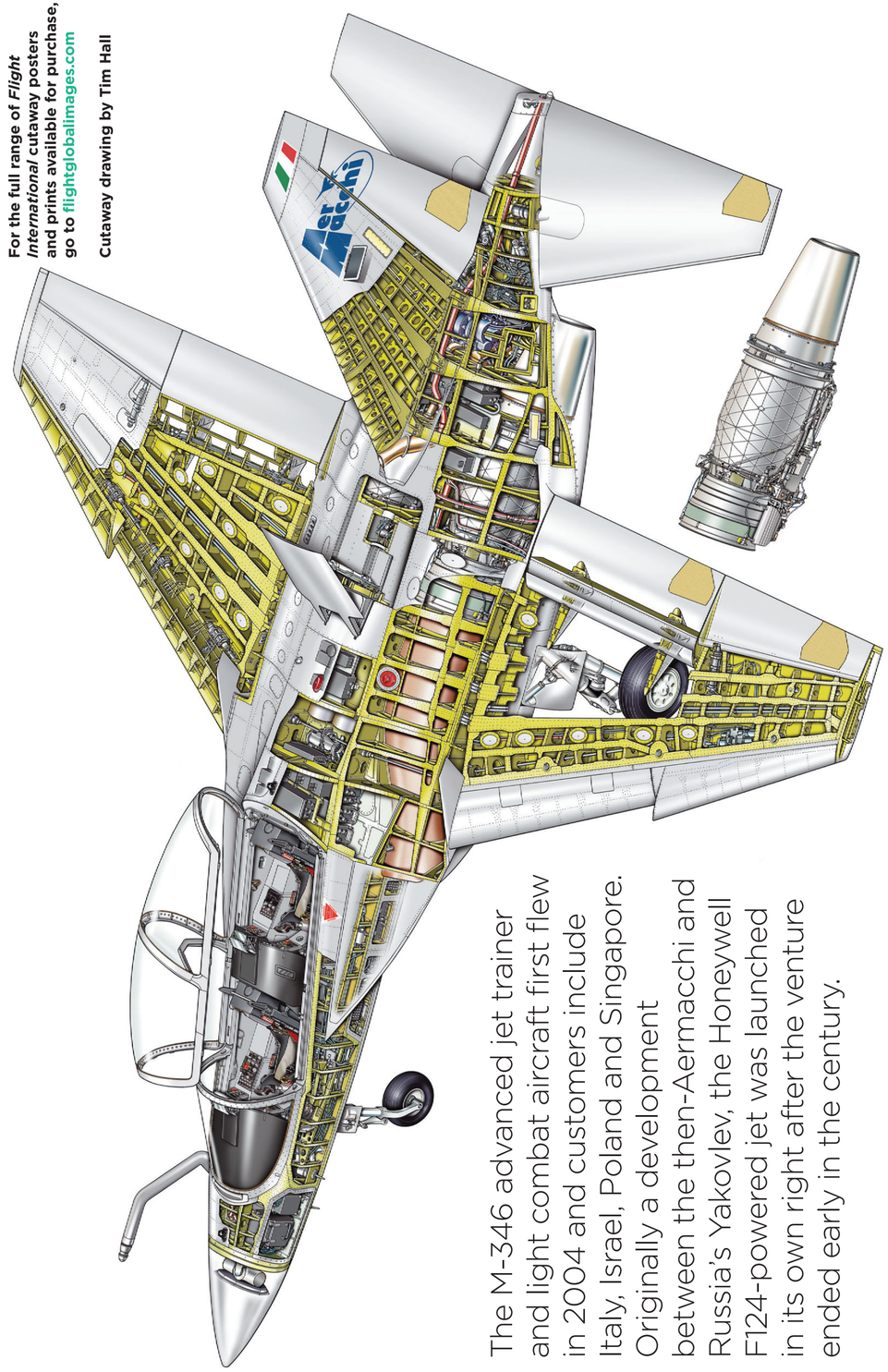
ANA is the latest Asian carrier to reinstate the double-decker

Leonardo M-346



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Cutaway drawing by Tim Hall

The M-346 advanced jet trainer and light combat aircraft first flew in 2004 and customers include Italy, Israel, Poland and Singapore. Originally a development between the then-Aermacchi and Russia's Yakovlev, the Honeywell F124-powered jet was launched in its own right after the venture ended early in the century.

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