

FLIGHT

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EVENING NEWS

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A DREAM LANDING

787 BBJ is biggest VVIP aircraft to appear at EBACE

► By ALAN PEAFORD and
MURDO MORRISON

The largest ever VVIP aircraft to appear at EBACE made a grand entrance on the static display today as the first privately-owned 787 Boeing Business Jet (BBJ) - dubbed the "DreamJet" after the type's commercial Dreamliner nomenclature - made its global debut.

The aircraft being handed over to Chinese operator Deer Jet and expected to enter service in the late summer is the first 787 to feature a complete VVIP cabin. Two other 787s are in government service: one in the Middle East and the other in Mexico, although neither has a VVIP interior.

The 'Dream team' behind the project appearing at a launch event on the eve of the show included Boeing, project management Kestrel Aviation Management, completion centre Greenpoint Technologies and Capital Airlines, the owner of DeerJet.

"This has been a remarkable partnership on a steep learning curve," says Stephen Vella, chief executive of Kestrel. "The project took 18 months from first touch to delivery."

The DreamJet is designed to carry 40 passengers between any two points in the world in a calm and comfortable environment.



▲ INSIDE JOB: The jet is the first Dreamliner to be fitted with a luxury interior

Designed by Pierre Jean Design Studio the soft colours and tones with no sharp edges - along with a quiet cabin and cabin pressure of 6,000 feet - make the 17h flight comfortable, says Vella.

BBJ president David Longridge says the 787 BBJ is unlike any other business jet on the market. "If you do a range chart out of Geneva, just

about the only major city it can't do is Sydney. From the passenger's point of view, number one, it's fast with a Mach 0.85 long range cruise speed, so it's the same as a Gulfstream," he says. "When we launched the first BBJ 20 years ago we said it was three times larger than a Gulfstream. Well, with 2,415 square feet of cabin space,

this 787 is three times larger than those BBJs.

"There are huge windows and a bunch of technology that makes it very different to today's business jets. None of these are made with carbonfibre. None have electric brakes. There is technology on the 787 that literally is on no other aircraft," he adds.

The DreamJet made the 5,000nm trip from the Greenpoint completions centre in Seattle to Geneva in 9.5h, cruising at 43,000ft at Mach 0.85 - with former BBJ chief executive Steve Taylor at the controls - and landed with enough fuel for another 3,500 miles according to Longridge. Tours of the aircraft will be by invitation only.

In the 20 years since Boeing set up its dedicated business jets division, the airframer has sold 164 BBJs, most of them 737s, and delivered 162. It has taken orders for 10 BBJ versions of the 737 Max, with the first set to be delivered into completion in late 2018.

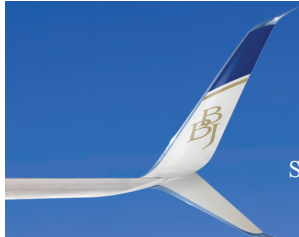
Boeing has sold 15 BBJ 787s in total, nine of which have been delivered to completion centres. Thirteen of them are based on the smaller 787-8, and two on the -9.

"We are working on a couple more deals," says Longridge, who says Boeing is targeting "one to three" sales a year of its widebody range, which also includes the 777 and its 777X successor, as well as the 747-8.

◀ ARRIVAL:
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Geneva at the
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AMAC COMPLETES JCB AERO TAKEOVER

Basel-based completions house AMAC Aerospace Switzerland is expanding with the acquisition of VIP interiors design and installation specialist JCB Aero. The move was announced at a press conference at the show this morning.

JCB is located at Auch, near Toulouse, on a private airport with 5,000m² of hangar space and 6,100m² of office and workshop space, including wood, lamination, upholstery and paint workshops.

AMAC chief executive Kadri Muhiddin describes JCB's capabilities as "the perfect complement", adding that "this acquisition will also provide benefits for AMAC's clients by having an additional facility and hangar in France".

AMAC acquired JCB from its founder and sole shareholder, Jean Claude Beaudet, who started the company in 1987. JCB specialises in Airbus Corporate Jets, Boeing Business Jets, Dassault Falcon 7X, Eurocopter and AgustaWestland interiors.

Daher displays its latest TBM



► **DEBUT:**
The TBM 930 was unveiled in Tarbes two months ago

Daher is showcasing its latest single-engined turboprop – the TBM 930 – at EBACE, less than two months after its unveiling at a dedicated customer event at the French airframer's Tarbes site in southwest France.

The \$4.1 million aircraft is an enhanced version of the \$3.9 million TBM 900, featuring Garmin's G3000 touch-screen glass flightdeck, a reconfigured cockpit, redesigned seating, upgraded interior trimmings and finishes and Daher's new bespoke e-copilot safety system – which is also a feature on

2016-built TBM 900s

The e-copilot is designed as a safety net around the TBM's flight envelope. It incorporates a sensor and angle of attack calculator, electronic stabilisation and protection systems, and under-speed protection.

Daher says its TBM duo "offer performance close to that of light business jets: maximum cruise speed of 330kt (610km), maximum range of 1,730nm and greater flexibility with their load-carrying capacity, and the ability to operate from small airports".

"The TBM 900 and TBM 930 can perform short-haul flights – such as a round-trip Paris-Cannes with a 3h flight time – that is similar to commercial airline routing, and a cost of approximately €3,000 in carrying six persons," it continues.

In anticipation of the impending approval of single-engined commercial operations in instrument meteorological conditions (SE-IMC), Daher introduced at the show this morning a new maintenance support package aimed commercial TBM operators. The pack-

age includes an extended version of its TBM Care Program to cover these companies' higher aircraft use rates, continuing airworthiness monitoring, a dedicated maintenance hotline, and a suite of training courses.

Speaking at a press conference this morning, senior vice president Nicolas Chabbert said: "This will create the possibility for single-turboprop aircraft to perform medevac flights or organ transportation in Europe at a cost that makes Daher's TBM ambulance version highly attractive."

TEXTRON MAKES MOVE TO JOIN SINGLES CLUB

Textron Aviation unveiled this morning the model of a new \$4.5 million aircraft that will compete for a market segment now split between the \$4.7 million Pilatus PC-12NG and the \$3.8 million Daher-Socata TBM900.

Many details of Textron Aviation's latest product are still shrouded in mystery, including the

► **By STEPHEN TRIMBLE**

name and even the brand – presumably, Cessna or Beechcraft – to be emblazoned on the new aircraft. Those details, along with a cabin mockup with full interior, will be announced at the next Oshkosh show in late July, says Kriya Shortt, Textron Aviation's senior vice president of marketing.

"This is a space where we don't have a product today," Shortt says.

But the features now available reveal the depth of Textron Aviation's commitment to compete in a market already claimed by two entrenched rivals. The single-engine turboprop will follow the example set by Cessna's Citation Latitude, which was introduced in a market with a focus on providing

extra space in the cabin and new technology where it can save the operator's money in the long-run.

It boasts a flat floor under a 1.47m (58in)-high ceiling in a cabin stretching 1.6m in diameter, or 8cm wider than the nearest competitor. Though initially advertised at NBAA with 1,500nm range and a 280kt maximum cruise speed, Textron Aviation has improved those values to 1,600nm range with a 285kt top speed. The aircraft is not designed to overtake the 330kt sprint offered by the TBM, but it could edge past the 280kt PC-12NG in a race.

With a cockpit furnished with the Garmin G3000 integrated flightdeck, the metallic-skinned aircraft features a new, 1,240shp turboprop engine in development by GE Aviation in the Czech Republic. The full authority digital engine control (FADEC)-equipped engine will be driven by a composite, five-bladed, 105in-diameter McCauley propeller, leveraging a product developed by another Textron division.

The aircraft will feature two entrances with the standard six-seat layout configuration offering four seats in a club format plus two aft cabin seats. It has a serving area in the front of the cabin and a belted lavatory in the rear. If those two amenities are removed, the aircraft can be reconfigured in a high-density, nine-seat layout.

Shh-ut that door

Bombardier has introduced a feature it says will make its Learjet 75 cabin up to eight decibels quieter – a pocket door that divides passengers from the cockpit and galley area. And David Coleal, president of Bombardier Business Aircraft is at EBACE to make a big noise about it.

The Learjet 75 is the first light business jet to offer the sliding divider, which has been granted a supplemental type certificate by the US Federal Aviation Administration and "creates a distinct private living space for passengers", he says.

The Canadian airframer – which has a Learjet 75 with the pocket door installed on display on the static – has also reiterated that it is fully committed to its Wichita-based brand, which it acquired in 1990, despite recent slow sales and the cancellation of the Learjet 85 programme.

"The Learjet name is synonymous

with pioneering spirit and pace-setting innovation, and we at Bombardier are continuing to build on this legacy to ensure an exciting and forward-focused future for Learjet aircraft," says Coleal. "We are still very active with Learjet."

However, Coleal says there is "zero chance" of reviving the Learjet 85, a mid-size, all-composite aircraft programme cancelled in 2015 after an extensive flight test programme as Bombardier began to run into funding difficulties with its delayed CSeries narrowbody.

Bombardier engineers can install the two-sided pocket door on the Learjet 75 by cutting the seat pitch on one of the forward-facing club seats by about 10cm. The company says there is a negligible weight penalty and the feature has the added benefit of keeping passengers warm in cold weather when the aircraft is parked and the door is open.



► **OPENING:**
Coleal with new cabin divider on the Learjet 75



► **BROLLY GOOD DEAL:** Across's Bianca Proszynsky with Pellegrini

SIGNING IN THE RAIN

► **By KATE SANSFIELD**

Mexican business aviation services provider Across signed a firm order at a rainy Palexpo static display this morning for 23 Embraer business jets, The order comprises eight Legacy 500s, eight Phenom 300s and seven Phenom 100Es – with a combined value of around \$260 million. One Phenom 300 and a Legacy 500 have already been delivered and a follow-on order for a similar number of aircraft is likely to be placed the Toluca-based company – which is also Embraer's Mexican sales agent,

“Embraer's business jets will become the backbone of Across's fractional ownership programme and charter services for customers worldwide who need to fly to Mexico or the Americas for business or leisure,” says Across founder and chief executive Pedro Corsi Amerlinck.

“The Phenoms and the Legacy 500 play an important role in the operation of the major fractional provider companies from the USA and Europe, and I'm thrilled we are

starting to offer these innovative business jets to enhance our customers' and partners' experience as well.”

Mexico has the largest installed base of business jets outside of the USA with an inventory of 900 aircraft – including 25 Embraer types – of which 54% are midsize jets, 36% light and 10% large-cabin, long-range types, Embraer reveals. “Around 80% of the Mexican fleet is over 10 years old and 10% of the inventory is between five to ten years old,” it adds.

Based on these statistics, “there is a potentially huge aircraft replacement market in the country”, says Embraer Executive Jets president and chief executive Marco Tulio Pellegrini. “This Across order will help to increase our exposure there. They are the right partner for us.”

Across's aircraft will be delivered over four years, replacing its fleet of Cessna Citation CJ3s, CJ4s, Sovereigns and XLSS.

IN BRIEF

GARMIN BEECHJET FITS NEARLY READY

Garmin announced today that a major avionics upgrade for the Beechjet 400A and Hawker 400XP is in the final stages of certification. The US Federal Aviation Administration has approved a type inspection authorisation for a G5000 avionics suite on the Beechjet, a key indicator the programme is in the final stages of approval for a supplemental type certificate, says Garmin.

The G5000 suite adds three high-resolution 12in flight displays with dual touch-screen controllers, while an early adopter incentive called the Premier Tech Package includes SVT and turbulence detection for the GWX 70 weather radar.

PAZOS CLEARS WAY FOR USA

San Juan, Puerto Rico fixed base operator Pazos is set to double its operation to include a full-service US Customs and Border Protection terminal. Speaking this morning at EBACE, Pazos president Jose Maldonado said jets will be able to park up immediately outside the new building at Luis Munoz International airport, set to open this autumn, allowing passengers to clear US customs “almost without touching the ramp”. Time to clear customs will be cut in half, he promised.

EUROPEAN GREEN LIGHT FOR PW307D

Pratt & Whitney Canada said today its PW307D engine for the Dassault Falcon 8X has received EASA type validation. This completes the validation process for the engine following Canadian and US accreditation last year. The 8X trijet flew for the first time in February and is expected to be certified this summer.

LONGITUDE FLAP DEAL FOR COLLINS

Rockwell Collins announced this morning that the new Cessna Citation Longitude will feature its horizontal stabiliser trim and flap actuation systems.

G600 TO FLY THIS YEAR



▲ **NEAL:** Terrific reliability

Gulfstream announced today that the scheduled first flight of the G600 business jet should come a few months early in the fourth quarter of 2016.

The new three-month window places the flying debut of the large cabin aircraft in the same timeframe as the NBAA annual convention in Orlando, Florida, in November.

“It's our goal to attempt to fly the G600 before the year is out,” Scott Neal, senior vice president of worldwide sales and marketing, says.

The new schedule advances first flight from the previously scheduled window in early 2017. But certification of the G600 remains fixed in 2018, with entry into service following in 2019. Gulfstream has joined the wing and empennage of the first G600 flight test aircraft in Savannah, Georgia, Neal says. The second flight test aircraft and the static test article is also in production.

The G600 will follow its shorter-range, sister aircraft, the G500, into flight test about 18 months later. Since completing first flight last May, the G500 has piled up nearly 250 flights and 1,000 flight hours, Neal says. Test pilots have flown the G500 up to Mach 0.995 and as long as 7.5h duration, he adds.

Despite adding a new cockpit system, including industry-first active control sidesticks, the G500 and G600 programmes have been demonstrating “terrific” reliability in flight and ground tests so far, Neal says. “It has been something we haven't seen before,” Neal says.

The improvement follows Gulfstream's decision to invest in an elaborate complex of ground-based systems and mechanical laboratories. More than 48,000h of testing has already been compiled on the G500 and G600 over the programme's eight-year history, he says.

Longer-legged BBJ could fill range gap

As Boeing Commercial Airplanes studies a longer-range version of the 737 Max 7, the company's business jet division is already looking at the potential redesign to fill a pre-existing gap in the VIP version of the single-aisle family.

“We are a very big piece of that conversation,” says Boeing Business Jets president David Longridge (pictured), speaking to journalists at EBACE today.

Three years ago, Longridge's predecessor, Steve Taylor, discussed plans for a new BBJ Max with 7,000nm range, which would combine the fuselage of the 737 Max 7 with the wing of the 737 Max 8.

Last year, Boeing launched the BBJ Max with the airframe and wing of the 737 Max 8,

but left a VIP version of the 737 Max 7 out of the product portfolio. More recently, however, Boeing Commercial Airplanes has acknowledged interest in slightly lengthening the fuselage of the 737 Max 7 for commercial customers to increase capacity and range, which might call for upgauging the wing to that of the larger 737 Max 8.

If Boeing relaunches the 737 Max 7 as a larger aircraft, that could play into the BBJ division's product development plans.

“It's a very active part of our future family plan,” Longridge says. “We are very much engaged in that discussion. Obviously, we want an airplane that will fly more than 7,000nm. That's what we're driving for. We hope to announcing something very soon – probably in the next few months.”



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Inairvation first for Flying Colours



▲ **PARTNERING:** Gillespie with director of sales Kevin Kilethermes

Canadian completions house Flying Colours has begun work on the first pre-engineered retrofit cabin for Bombardier Global business jets designed by Inairvation, the joint venture between Lufthansa Technik and Austria's F/LIST.

The project on a Global Express, for an undisclosed client, was confirmed in late April and the aircraft is due to arrive at Flying Colours' Peterborough, Ontario facility in the four quarter. Re-delivery is expected in the first quarter of next year. Flying Colours says the retrofit will

include Lufthansa Technik's Nice cabin management and in-flight entertainment system, and ergonomic side ledges from the Austrian company. The modules will be installed at Peterborough, and the company plans to certify the aircraft via a supplemental type certificate.

Existing seats will be replaced with Global 6000 frames, while a granite floor will be installed at the entrance galley area, including the forward and aft lavatories. Carbonfibre veneers will

be laid on the cabinetry.

“We are really pleased to have signed the first customer for the Inairvation offering,” says Eric Gillespie, executive vice president of Flying Colours. “Having worked with the customer before on a number of other projects, he trusts our engineering design experience. We explored a number of options for him but he chose the Inairvation concept knowing that combined with our interior capabilities it was the most cost- and time-efficient solution for him.”



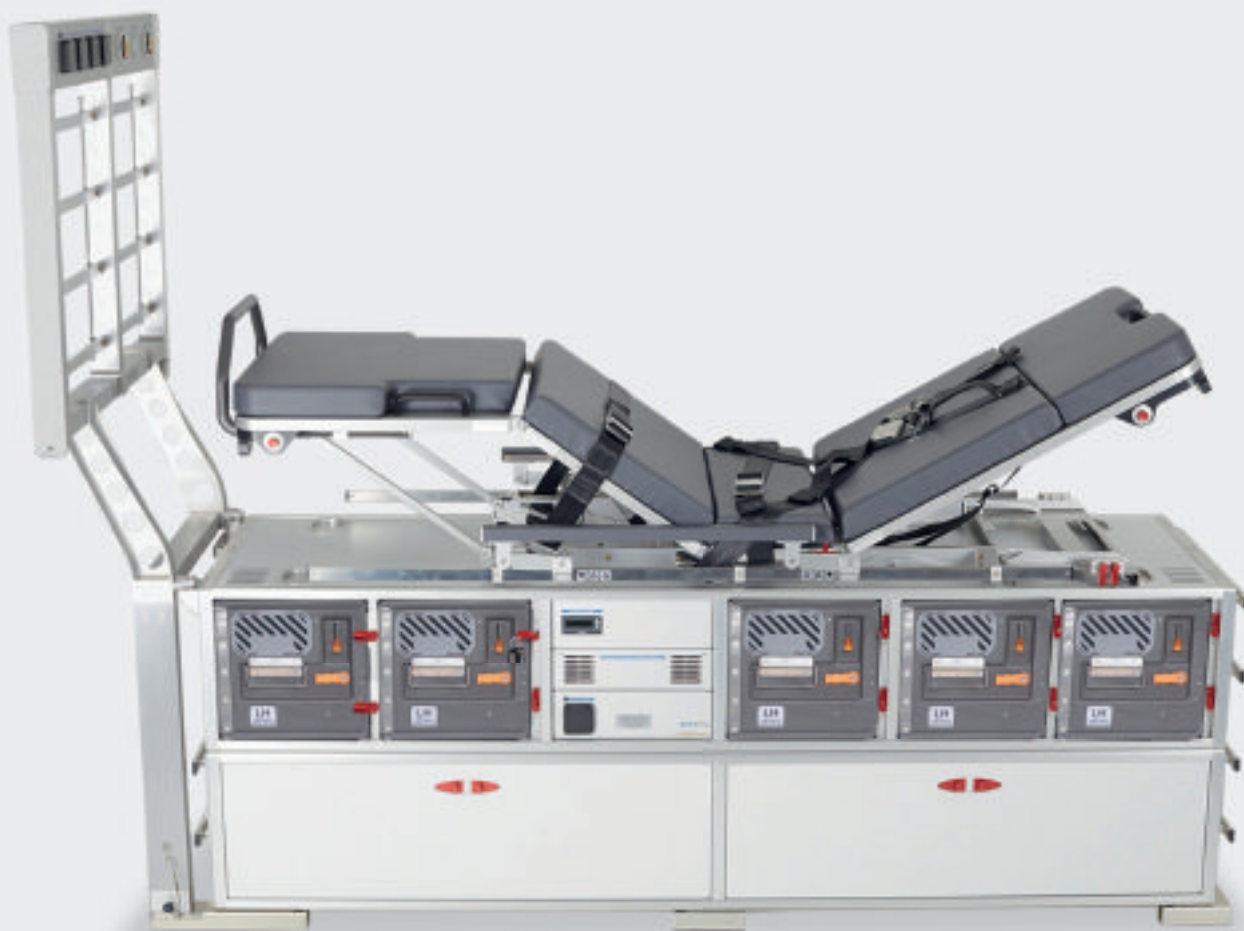
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MEBAA's perfect ten NEWS P8

NetJets takes Latitude on tour

As EBACE begins, fractional ownership giant NetJets Europe has launched a demonstration tour of its latest midsize offering – the Cessna Citation Latitude – and says the jet is already proving “extremely popular” with customers.

The 2,850nm (5,280km)-range aircraft twinjet is the second of a 2012 order for 25 Latitudes that will be distributed amongst the Lisbon, Portugal-headquartered fractional ownership operation and its US sister company. NetJets US began its Latitude demonstration tour in January, and will take delivery of its first customer-owned aircraft in June.

All models are equipped with the Berkshire Hathaway affiliated company's Signature Series bespoke interior.

On its inaugural flight from London Farnborough to Geneva on 22 May, NetJets Europe president Mark Wilson said: “NetJets was announced as the largest customer for the Latitude back in 2012. We now have 25 firm orders planned and an additional 125 optional orders available.”

NetJets Europe will take delivery of the first customer aircraft in September and a further two more units by the end of 2016. “The Latitude is proving to be a very popular choice of midsize aircraft for our customers,” says Wilson. “We are selling shares at a fast rate, reflecting our increasing market share in Europe.”

The company has 45 midsize aircraft including Hawker 750s, 800XPs, Citation XLSs and Bombardier Challenger 350s. NetJets Europe also operates 26 large-cabin, long-range jets – Gulfstream G550s, Dassault Falcon 2000s and Bombardier Global 6000s – and 11 Embraer Phenom 300s light jets. “We are taking new aircraft at a rate of around one a month,” says Wilson.



FLEXJET IS FLYING TOWARDS EUROPE

US fractional ownership firm heads over ocean

By STEPHEN TRIMBLE

Flexjet said at the show today it is expanding into the European market for the first time by the end of the year.

The Cleveland-based fractional-ownership firm also has appointed former Bombardier senior vice-president Raymond Jones as managing director - international. Directional Aviation acquired Flexjet from Bombardier nearly three years ago.

“Ray Jones’ all-encompassing knowledge of the international market will afford us a tremendous advantage as we establish a significant operation here in Europe,” says Kenn Ricci, Flexjet chairman.

Under a letter of intent expected to close later this year Flexjet will assume control of a European-based air operator certificate.

The company plans to begin operations in Europe with a fleet of locally-based Nextant Aerospace 400XT light twin-jets that feature new engines, avionics and interiors compared with the original Hawker 400, Jones tells *Flight Evening News*.

As the company's business grows, Flexjet plans to introduce ultra-long-range, large cabin aircraft for long-haul flying from European cities, Jones says. Options include the Bombardier Global Express, which Flexjet is displaying at



TEAM: Ray Jones with Michael Silvestro, Flexjet chief executive

the show with a recently-installed art deco-themed interior.

In the long-term, Flexjet also sees demand developing for a fleet of super mid-size aircraft to serve European customers, he adds.

The international expansion is prem-

ised upon conversations with Flexjet's largely US-based clientele, says Darnell Martin, president of charter company Flight Options, which is also owned by Directional Aviation.

These US operators frequently travel to Europe already using a US-based

Flexjet aircraft, then are forced to switch to local operators. Converting these operators to European-based Flexjet aircraft would ensure a predictable revenue stream of \$6 million annually, creating a base on which to grow local demand, says Martin.

JET AVIATION'S VISION TO KEEP CLIENTS APPY

Jet Aviation is launching an app for its VIP customers that allows them to make decisions on their completion project in real time, by providing updated three-dimensional visualisations.

The Swiss company says JetVision – which is being unveiled at the show tomorrow – “provides virtual access to a project from anywhere in the world, removing the traditional geographical limitations and challenges of project management”.

Adam White, senior director of engi-

neering and design at the Basel-based facility, says the innovation could shave up to two months off the “upfront definition time”.

He adds: “On an aluminium airframe, this stage could be eight to 10 months. Now we are quoting six to eight months with the use of this tool.”

White says the app was “borne out of our engagement” with the Airbus A350 and Boeing 787. “This drove a tremendous amount of R&D around 2014 on how we

deal with these new types,” he says.

“It led us to move from a 2-D to a 3-D environment with our engineers. We found we were enhancing our processes but the long pole pointed more and more at the decision-making process. There was a level of granularity that the principal was receiving that had a high potential of delaying the project.”

The General Dynamics subsidiary is providing demonstrations of JetVision on its stand.



▲ HANDY: The JetVision app

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More mobility for the world

GainJet gains jet to boost VIP fleet

GainJet Aviation has added a third Bombardier Challenger aircraft, a 605. SX-SHC joins a fleet at the Athens-based charter operator which includes the Gulfstream G650, G550, G450, Embraer Legacy 600, and Bombardier Challenger 604, plus executive airliners including a VIP Boeing 757-200 with 62 seats and a stateroom and a 737-400 with 64 seats.

GainJet president, Captain Ramsey Shaban says the new Challenger will complement its Challenger 604s which are primarily dedicated to medevac, and will "fill a void" by "supplying customers looking for a super mid-size long range VIP aircraft".



► **CHAIR-MEN:** Embraer Executive Jets president Marco Pellegrini and marketing chief Luciano Froes in the new cabin

Legacy 450 is looking good on the inside

An Embraer Legacy 450 touched down at Geneva Airport yesterday carrying a special cargo — the first full production interior for the mid-size jet at the EBACE convention.

The low-timed Legacy 450, co-captained by Jeremy Schneider and Michael Voelching, was excused from a North American marketing tour to travel across the Atlantic.

With three passengers and a flight attendant riding along, the Legacy 450 departed London-Stansted airport at 11:25 local time, touching down 1h 20min later at Geneva's airport.

The Legacy 450 made a debut appearance at EBACE

last year three months ahead of receiving type certification by Brazilian civil aviation authority ANAC.

But the aircraft on display last year was a member of the flight test fleet, which included a prototype version of the Legacy 450 interior along with special instrumentation for gathering data.

The Legacy 450 that arrived yesterday is the first to be displayed in Geneva with the full production interior available to customers.

The interior includes a three-seat divan opposite the entrance, a set of four seats in double-club configuration and two forward facing seats in the aft cabin.

MEBAA'S PERFECT TEN

Chairman marks 'milestone' for Middle East association

CORKS POPPING FOR F&E IN DUBAI

First come, first served. MEBAA show organiser, F&E Aerospace, has a limited number of bottles of Champagne to give to companies booking for the MEBAA show 2016 during EBACE only. Go too booth I040 to make the booking.



▲ **HAND IT TO HIM:** Ali Alnaqbi says MEBAA is "point of reference" in region

The Middle East Business Aviation Association (MEBAA) is celebrating its tenth anniversary and the association's founding chairman, Ali Alnaqbi is at EBACE to make sure the European business aviation community can join in the celebrations.

"It is an important milestone year for us," Alnaqbi says. "The Middle East business aviation industry is growing in terms of operators, aircraft but also in key services like FBOs, completions, MRO and so on. More than 50% of the business is with Europe. In the past 10 years we have come a long way."

When the group was founded a decade ago the grey market and a lack of awareness about the role of business aviation were the driving issues.

"We are now the point of reference for business aviation across the whole MENA region," Alnaqbi says. "Governments and the regulators now work with us. Things have

► **By ALAN PEAFORD**

changed a lot in the past 10 years."

At a MEBAA sponsored conference in Jeddah last month, the Saudi regulator's head of security, safety and air transport, Capt Abdullah Badr, called on the industry to identify and report those operating illegal charters.

"We are addressing issues and are much more open on what needs to be done," he says.

Currently, business aviation in the region represents a relatively small percentage of the global business fleet.

However, the number of business jets in the MENA region is predicted to grow over 80% by 2023, according to the Bombardier Business Aircraft Market Forecast. In addition, the value of the industry is predicted to reach \$1.2 billion by 2020.

Alnaqbi says government and industry support is necessary to allow the industry to grow at such a rate, with airport support,

landing slots and clearances all required to foster growth. "Three governments – UAE, Saudi Arabia, and Morocco – represent the majority of the business aviation market in the MENA region and are listening to our requests," he says. "Infrastructure changes and developments do not happen overnight, but the requirement has been identified, and we are working towards solutions that will benefit the industry and therefore the economy as a whole."

The flagship of MEBAA's events – the biennial show – will be taking place December 6-8 at the DWC airshow site in Dubai.

More than 9000 visitors are expected to visit the 460 exhibitors during the three day run, Alnaqbi says. "It is a great opportunity to bring the European and MENA region together," he said. The show will include a conference and formal networking sessions.

Don't get upset – FlightSafety has the training solution

FlightSafety International says at EBACE that it has expanded its upset prevention and recovery training programme to a number of new aircraft types.

"The inclusion of Cessna, King Air, and Pilatus aircraft as well as additional Gulfstream models demonstrates our commitment to enhance aviation safety and leadership in training and simulation technology," says David Davenport, executive vice president.

The training models developed and incorporated into the simulators include low speeds that replicate full aerodynamic stalls and extreme high speeds beyond VMO, the maximum airspeed at which an aircraft is certified to operate, and beyond MMO, the maximum operating Mach num-

ber of an aircraft.

Pilots safely experience historically accurate upset scenarios while very low to the ground as well as night and instrument meteorological conditions which would be far too dangerous to do in an aircraft," Davenport says.

Meanwhile, the company also announced it has been selected by Honeywell as its exclusive maintenance training provider. It will offer training for Honeywell engines, auxiliary power systems, avionics, satellite communications, and environmental control systems starting in June, at Dallas, Texas and Wichita, Kansas, and expanding next year to other centres in North America, the Asia-Pacific region, Europe and Africa.



▲ **COMMITMENT:** Programme extended to several new types



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▲ FRIEDRICH: On target to reach 2,000 this year

POWER BY HOUR IS PAYING OFF FOR R-R

Engine firm's aftercare programme nears milestone

Rolls-Royce is at EBACE poised to mark its 2,000th aircraft on its CorporateCare power-by-the-hour programme as the fleet of business aircraft powered by its engines continues to grow.

Although the UK propulsion specialist missed out to rivals Pratt & Whitney Canada and General Electric respectively on the in-development Gulfstream and Bombardier Global programmes, it has a strong position in the larger cabin segments thanks to the top-selling BR700

► By MURDO MORRISON

series-powered Gulfstream G550/650 and Global 5000/6000, as well as the Embraer Legacy 650 and Cessna Citation X, powered by the AE3007.

"For the last 16 years we have been the market leader in terms of deliveries in the segments we compete in," says Steve Friedrich, vice-president of R-R in North America. "And we are still well positioned for growth."

The number of aircraft enrolled on R-R's after-

care offering stood at 1,930 just before EBACE. "We have gone from 550 in 2005 to just over 1,000 in 2010, and we are on target to reach 2,000 this year," says Friedrich. "We are still getting 70% of all new deliveries."

Friedrich puts CorporateCare's growth down to operators appreciating "the intrinsic value of the product" and wanting to "take the risk out of their operation". He adds: "Our large-cabin customers are very demanding, so we have to deliver industry leading service."

He also maintains that the programme "increases velocity of on sales". When an aircraft covered by CorporateCare changes hands, Rolls-Royce will typically cancel the old contract and offer a new 10-year deal. "If the seller has been up to date with payments, there is not a transfer fee. The buyers simply signs a new contract," says Friedrich.

Rolls-Royce will also announce an expansion of its authorised service network at the show. There are presently 57 centres worldwide offering maintenance and aircraft-on-ground (AoG) assistance.

Airbus reveals its Easyfit option for ACJ350

Airbus today unveiled the Easyfit feature for the ACJ350, solving a dilemma posed by converting a composite-skinned fuselage VVIP business jet.

"The ACJ350 with Easyfit expands its corporate jet offering, giving customers a new way to take their business to the world," says Airbus chief operating officer-customer John Leahy.

The unveiling comes as an A350-900 flight test aircraft was scheduled to arrive today at Geneva airport, as

Airbus ramps up marking the ACJ version of the widebody with delivery slots available in three years.

Non-standard cabin elements in corporate jets, such as walls and bulkheads, are attached to stringers and frames embedded in the fuselage skins. Metallic skins are notable for having identical strength in all directions, making attachments of cabin elements fairly straightforward. Composite skins, however, are made up of

dozens of plies containing strengthened carbonfibre matrix. The individual plies are designed with unique strength properties, making non-standard attachments far more complex for a composite fuselage.

The Easyfit concept solves that problem by attaching metallic brackets to multiple locations of the stringers and frames. The additional weight, which Airbus says is negligible relative to overall size of the aircraft, makes at-

taching cabin elements as straightforward as if the fuselage was made of composite material.

Airbus launched the ACJ350 last year as the programme continues a years-long ramp-up for commercial customers. The first delivery slots become available in 2019, offering VVIP aircraft customers a platform with 370m³ of cabin space and up to 10,800nm range for the ultra-long-range version of the A350-900.



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Comlux bullish on widebodies
NEWS P14

IN BRIEF

TAG TEAM SET FOR RAPID RESPONSE

TAG Aviation has set up a mobile repair team it says can provide global AOG support from any of its European maintenance centres. "Our mobile repair team is able to provide a rapid response, with qualified experts on hand that have the same technical capabilities, authorisation and quality systems as we employ in our repair centres", says Philippe Rabier, maintenance sales director, TAG Aviation Europe. "Wherever in the world maintenance or repair is required our clients can feel confident that our mobile staff are able to quickly respond to their specific needs, ensuring greater flexibility and turnaround time."

AVFUEL PUMPS UP ITS EUROPEAN FBOS

Avfuel Network is at EBACE, having recruited four British Isles-based FBOs in the past year to take its total in Europe to 13. They are: Waterford airport in Ireland, The Private Jet Company in the Isle of Man, Birmingham-based Marshall Aviation Services, and Woodgate Aviation at Belfast. Eight of its FBO members are exhibiting on the Avfuel booth: Avflight, Banyan Air Service, Fargo Jet Center, Premier Jet Center, Shelthair, SouthAir Iceland, Air Service Basel and Duncan Aviation. "There's great value to exhibiting at EBACE," says CR Sincoc, Avfuel's managing director of international business development. "The European market is one of the world's larger aviation markets, and it's an area we believe we can provide a superior service to the industry."

JET CENTRE MAKES PROMISE ON PRICE

London City Airport says it has introduced a "new competitive pricing structure, giving business aviation customers even more reason to travel through the only private jet centre actually in London". The Docklands airport says it has reduced its rates by 60% in some instances and made sure its tariffs are "clear and all-inclusive". The airport says it offers a "90sec promise" to customers travelling through its Jet Centre with that time to get from car to aircraft on departure and aircraft to car on arrival.

AIR CULINAIRE'S LE BOURGET STARTER

Air Culinaire Worldwide has opened an in-flight catering facility at Paris-Le Bourget. The new 800m² facility is CE-Certified – the highest level of certification in the European market – and halal certified. "Our new kitchen, at the forefront of culinary technology, will allow us to meet the demands of private aviation operators over a large part of France," says Thierry Fournier, general manager, Air Culinaire Worldwide Paris.

LEGACY 500 IS A CITY SLICKER FOR FLEXJET



◀ STEEP STEP: Legacy 500 ready for LCY

On the eve of the EBACE convention, Flexjet demonstrated its newly-acquired Embraer Legacy 500 business jet has mastered the steep approach profile required to land at London City airport (LCY).

"I congratulate Flexjet on being the first Legacy 500 customer to operate at LCY," says Marco Tulio Pellegrini, president and chief executive of Embraer Executive Jets. "This new operational capability for London's financial

By STEPHEN TRIMBLE

district, one of Europe's major business aviation hubs, will offer our customers additional flexibility in the best-in-class midsize jet."

The approach glidepath angle to land at most airports is a steady 3°. To meet London City's stringent noise abatement standards however, the airport requires operators to descend at an accelerated 5.5° angle. Though steep compared to a normal glidepath,

the 5.5° approach is actually relaxed from London City's original requirement for a 7.5° angle, which allowed only the de Havilland Dash 7 turbo-prop to take-off and land from the relatively short downtown runway.

Last November, Embraer received approval from Brazilian civil aviation authority ANAC to operate the Legacy 500 on steep approaches. Follow-on approvals from the European Aviation Safety Agency (EASA) and London City also were obtained after a "com-

prehensive flight test campaign", Embraer says.

"London City Airport, with its easy access to the city's financial districts, is an important destination for Flexjet owners and clients who are making use of our rapidly growing international service offering," says Flexjet chief executive Michael Silvestro. "The Embraer Legacy 500, with its light environmental footprint and ability to meet strict noise limits, is the ideal aircraft to serve London City Airport."

API instals split scimitars to eight BBJs in first year



▲ TOP TIP: Product was certified in 2015

Eight Boeing Business Jets now wear split scimitar winglets within a year of the product receiving certification by the US Federal Aviation Administration, Aviation Partners says.

The retrofit, adding a scimitar-tipped ventral strake to the blended winglet, improves range more than 2% without adding fuel, the Seattle-based winglet specialist says. By improving the aerodynamics of the winglet, the split scimitar increases the lift efficiency of the wing without widening the span.

The upgrade for the BBJ competes for manufacturing capacity with the commercial market, where Aviation Partners Boeing has already retrofitted 700 Boeing 737NGs. In Europe, the retrofits are completed by EBACE exhibitors Lufthansa Technik and Sabena Technics.

"Due to the vast number of shipsets being consumed by APB's airline customers early planning is the key to securing a 2016 retrofit position for a BBJ," says Gary Dunn, API vice-president of sales and marketing.

Big aircraft, big business for TAG at Farnborough

TAG Farnborough Airport says it is handling more airliner-derived business jets, with movements of aircraft in the 50-80 MTOW category up 5% in the first quarter compared with the same period last year.

The UK's only dedicated business aviation airport has invested £1 million (\$1.45 million) in its terminal to cope with higher-volume business aviation flights, with a lounge now able to accommodate 80 passengers with a view of the airfield from a gallery seating area, as well as additional crew facilities. These include a snooze room with flat beds and a gym.

"We are well placed to take advantage of the increasing demand and continue to invest in our facilities to cater for larger aircraft, holding our position as the airport of choice when travelling through London for business," says chief executive Brandon O'Reilly.

MHS adds three jets to become number one

MHS Aviation is at EBACE having taken delivery of three business jets – a Bombardier Challenger 605, a Global Express XRS and a Challenger 300.

The new aircraft take MHS's fleet to 24 and the Munich-based company – which is exhibiting at the Avinode stand – says the fleet expansion makes it Germany's biggest executive charter operator.

The rest of its fleet includes three Gulfstreams – a G650, G550 and GV –

three Challenger 604s and three Bombardier Learjets, an Embraer Phenom 300 and 100, a Cessna Citation CJ3 and a CJ2+ as well as seven Dornier 328-100s and a VIP AgustaWestland 109 Grand.

"We are proud that more and more aircraft management customers are convinced by our excellent services, tailor-made solutions and best price-performance ratio," says chief executive Steffen Fries (pictured right).





▲ PERODEAU: Risks are low

PW800 is performing on target for P&WC

Pratt & Whitney Canada says its PW800 breakthrough engine in the 10,000lb-20,000lb-thrust (44.5-89kN) segment is performing in line with expectations on Gulfstream's four G500 test aircraft, with total flight hours now "well past" 2,000 and "climbing rapidly".

The engine – which began flight tests on P&WC's own Boeing 747 test aircraft in 2013 – has been flying on the new Gulfstream type since last year. The G500, which is powered by the PW814 variant, and its G600 stablemate, which will use the PW815, are due to enter service in 2017 and 2018 respectively.

The Gulfstream contract – quietly awarded as long ago as 2010, but not announced for another four years – was a significant fillip for P&WC, which had initially developed the engine for the Cessna Columbus before that programme was cancelled in 2009. Rolls-Royce had long been the Savannah-based airframer's incumbent engine supplier.

Although there are no other likely applications on the near horizon, Michael Perodeau, vice president of corporate and military aviation at P&WC, says the fact the engine's core is based on the successful PW1000G geared turbofan that powers the Airbus A320neo, Bombardier CSeries and Embraer E2 among others "derisks" the programme for potential customers.

"Although the PW800 has a direct drive fan rather than a geared one, we can get all the synergies from the learnings of the engine application. It means we can offer a large derisking of the programme for ourselves and our customers," he says.

The PW800 is not P&WC's entry into the large-cabin segment; its 4,700lb to 8,000lb-thrust PW300 series powers the Dassault Falcon 7X trijet, as well as its 8X successor, and is also the engine on the Cessna Citation Latitude and Sovereign. However, it is the most-powerful engine the Canadian company offers for business jets.

Meanwhile, the PW500 series powers the Cessna Citation XLS and Embraer Phenom 300. The Eclipse 550, Phenom 100 and Cessna Citation Mustang all use the smaller PW600.

COMLUX BULLISH ON WIDEBODIES

► **HIGH FLIERS:** This Airbus ACJ319 is the fourth head-of-state aircraft sold by Comlux, which now has former Airbus Military chief Domingo Ureña Raso (below) on its board



Comlux is undaunted by the slump in the completion market that has coincided with the unveiling in April of a widebody extension to its Comlux America centre in Indianapolis.

Richard Gaona, chief executive of the Swiss business aviation services group, says Comlux had "no other choice than to move up to widebodies" because of a drop in sales of Airbus Corporate Jets and Boeing Business Jets narrowbodies worldwide as buyers await Neo and Max versions

► **By MURDO MORRISON**

due towards the end of the decade.

The new hangar, able to take an aircraft up to the size of an Airbus A380, complements the existing facility, which can handle four narrowbodies.

Comlux America is carrying out its 12th completion project, on an ACJ330. Also undergoing completion in the Indianapolis facility are one of Comlux's own 737 BBJs and a Sukhoi Superjet-based SBJ.

While Gaona says Comlux will

have to work to secure a follow-on widebody contract, there is plenty of narrowbody completion work in the pipeline, he says. Comlux has three Airbus ACJ320neos and two BBJ Max 8s on order – which will have their interiors fitted at Indianapolis – and Gaona expects more narrowbody business as corporate versions of the Neo and Max arrive.

He is also confident about securing retrofit deals. "There are about 300 BBJs and ACJs in the marketplace. After a certain number of years, the

customers are keen to refurbish the cabin with the likes of internet connectivity," he says.

Comlux is announcing at EBACE that it has sold a pre-owned ACJ319 to the government of Slovakia. It is the fourth head-of-state aircraft it has supported in this way, after deals with Jordan, Kazakhstan and Malaysia.

Comlux has boosted its credentials in the government-owned aircraft market with the appointment to its board of former Airbus Military chief Domingo Ureña Raso.

London Heliport rebrands with NetJets deal

► **MY PAD:** NetJets hopes to profit from heliport partnership



London Heliport – the only Civil Aviation Authority certified heliport in the capital – is rebranding as NetJets London Heliport as part of an investment deal with the fractional operator.

NetJets says the facility is a "prime link" between the city and the surrounding airports the company serves. It also claims that interlinking flights between the heliport and London region airports increased by a fifth last year.

The heliport recently celebrated its 500,000th movement in its 59-year history.

Mark Wilson, president of NetJets Europe, says: "London is the very core of NetJets' European business – with over one third of our customers based here – so to cement our presence in the city with this partnership allows us to educate new audiences on the benefits of fractional jet ownership."

"We have seen a link between those using helicopters and private jets for some time and are pleased we can now partner with an establishment that shares our vision for customer service and attention to detail."

CHALLENGER 350 GETS RUAG PAINT TREATMENT

RUAG Aviation is claiming to be the first company in Europe to fully repaint a Bombardier Challenger 350 since the type's launch in 2013.

The project was commissioned by Windrose Air Jet Charter on behalf of

a customer, and involved repainting a brand-new Challenger 350 based on a personalised design scheme.

The Emmen, Switzerland-based firm says its partnership with Windrose spans many years.

► **PERSONAL TOUCH:** The repaint by RUAG was for a customer's own design



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► By KATE SANSFIELD

Not so long ago, it seemed not even a global financial crisis could stop demand for large-cabin business jets. As the market for light and mid-sized jets fell victim to recession in 2008, deliveries of the industry's largest and most expensive offerings continued apace. Speculators could take delivery of a large-cabin jet and flip it on the used market for a tidy profit.

A growing body of evidence suggests the large-cabin jet market peaked by the end of 2014 and is entering decline. Seven aircraft by three manufacturers account for all deliveries in the sector: the Bombardier Global 5000 and 6000, Dassault Falcon 900 and 7X and Gulfstream G450, G550 and G650. Deliveries fell 8% in 2015 compared to the previous year: the largest annual dip over a turbulent, 10-year period for the business aviation industry. Shipments are likely to decline further this year, given already announced production cutbacks for the Global series.

REVERSAL

The sudden change in fortune comes only a couple of years after large-cabin jets were almost single-handedly propping up the industry. As smaller aircraft struggled to recover their pre-2009 delivery peaks, the large-cabin sector moved from strength to strength. In 2006, the combined value of large-cabin deliveries accounted for 15% of the business jet market. By 2015, that proportion had doubled to 30%, making the industry more dependent on its most expensive products for growth.

The rise of large jets seemed as meteoric as it did peculiar, leading to odd statistics such as the \$54 million G550 leading the market not just in shipment value, but also the number of units delivered over a three-year period during that decade. Demand was so high it was not uncommon to hear of aircraft appreciating in value on delivery.

Only a few years later, the mood has shifted. Manufacturers that have not already acknowledged production cuts speak of holding rates steady, rather than continuing to grow.

"Supply is reaching demand," states Brian Foley, an independent market analyst. "Going forward we can't anticipate these excellent residual values."

Bombardier seemed first to feel the shift. In July, the Canadian and US manufacturer announced a cut in the Global production rate, from about 80 annually to about 50 this year. Bombardier also postponed entry into service of the Global 7000 by two years to 2018, as the company focused on the CSeries entry into service and production ramp-up.

Meanwhile, Dassault's deliveries of large-cabin jets dropped significantly. The 20 combined shipments of the Falcon 900 and 7X last year marked the company's lowest annual total since 2006, well below a peak of 65 units four years later, according to the General Aviation Manufacturers

BIG JETS, BIGGER PROBLEMS

The large-cabin segment is going through an unprecedented rough patch, as three manufacturers ramp back on production

Association. Less vulnerable, so far, has been Gulfstream's output, which last year fell only one delivery shy of matching an historic peak of 121 shipments in 2013.

BUOYED

The company's top line has been buoyed by the relatively recent introduction of the G650, in 2012, which continued a steady ramp-up to 59 deliveries last year.

"Gulfstream will probably be the last to feel the pinch," Foley says, citing the strength of the G650. There are signs, however, demand for Gulf-

stream jets is weakening. Public databases show 20 G650s for sale on the used market – about 12% of the delivered fleet. In general, the industry prefers a used inventory of less than 10%, to keep new aircraft pricing stable. More worryingly, the used G650 fleet available in early May included nine aircraft that were almost straight off Gulfstream's assembly line in Savannah, Georgia.

"Having nine aircraft [on the market] is a high number," says Daniel Hall, senior analyst of Flightglobal's Ascend consultancy. "It would indicate some really quite significant backlog risk at Gulfstream."

So far, Gulfstream's order backlog of G650s is holding firm, says Phebe Novakovic, chief executive of parent General Dynamics.

"The number of pre-owned 650s apparently on the market is higher than in the past but to the best of our knowledge, we have not lost a single sale to pre-owned aircraft," said Novakovic, speaking to analysts on a first-quarter earnings call last month.

Moreover, the G650 backlog is sold out for two years, she adds. If rates remain at 2015 levels, that translates to a backlog of around 120 aircraft.

"Remember, I think it's important to recall, the 650 has 100% market share for a market it created, and from my perspective would appear to [be] likely to remain in that position for the foreseeable future," Novakovic says. "It's still a hot plane and our demand is solid."

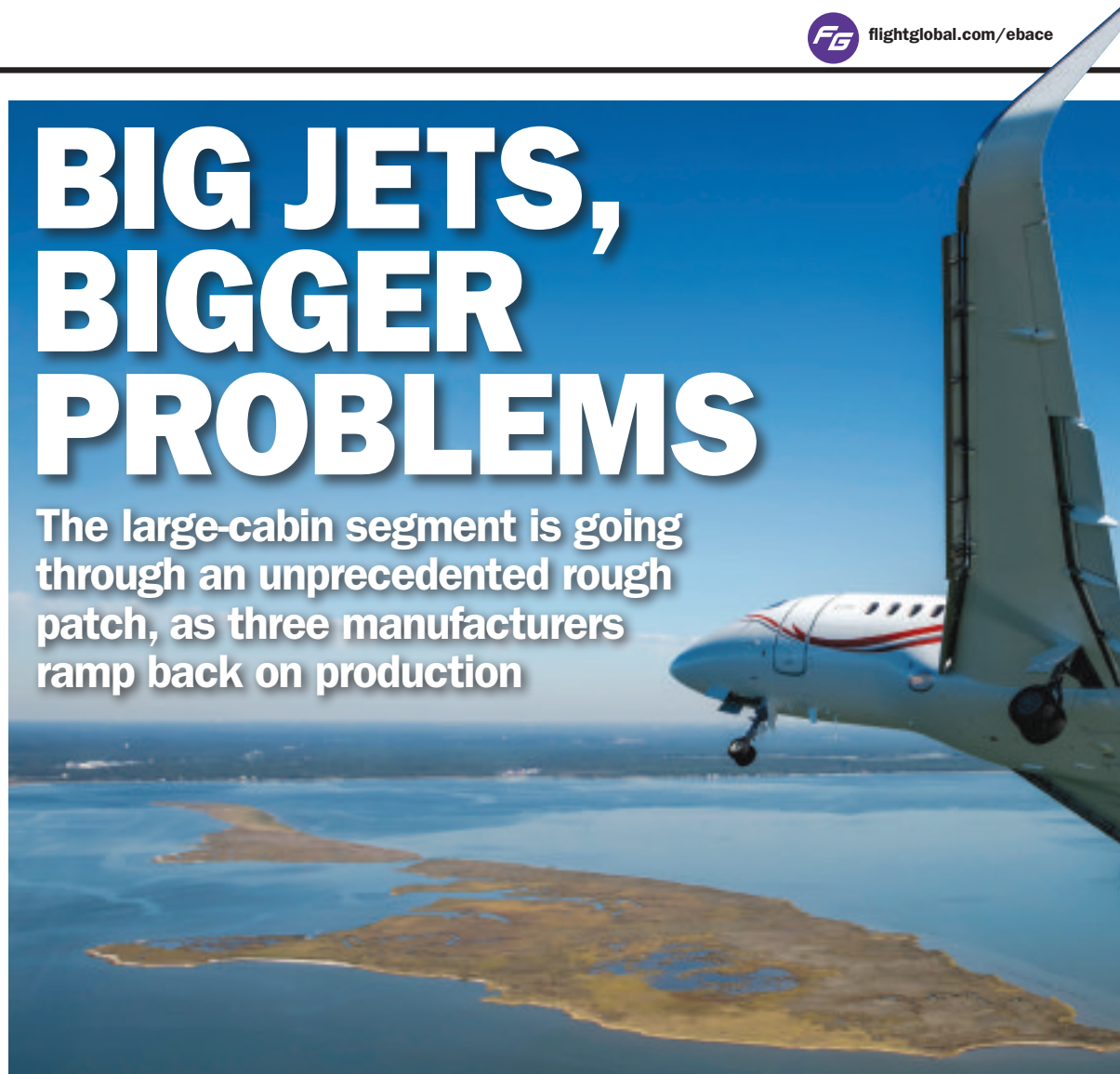
The picture for Gulfstream's two smaller large-cabin models – the G450 and G550 – is less clear. Novakovic says Gulfstream has adjusted pricing for the types, but demand remains "in line with expectations". The G550, in particular, is still seeing healthy demand in the market, she adds.

VENERABLE

The smallest version of Gulfstream's large-cabin family, however, is beginning to show its age. It delivered 22 G450s in 2015, with shipments down a third on two years earlier, Flightglobal's Fleets Analyzer database shows.

Demand pressure is showing in the used inventory. Typically, one-year changes in value average about 8%, says Hall. But for some vintage of the G450 and G550 – especially aircraft delivered from 2004-2006 – year-on-year value declines average 22%.

"That's really quite big," Hall says. "Nobody would have seen this coming for those types." Several explanations come up for the sudden shift



► NIMBLE: Gulfstream's smaller G450 is doing better than G650



◀ DESCENDING: The Falcon 900, together with the 7X, has seen deliveries fall in recent years

D. S. K. / ANSA

in fortunes in large-cabin jets, and few offer comfort to those hoping for a quick cyclical downturn followed by a rapid recovery.

Aside from large corporations, large-cabin jets also appealed to wealthy owners in emerging markets, such as Brazil, China and Russia. Those markets have been hit hard by the crash in oil and commodity prices, coupled by the rising strength of the dollar. That theory could help explain the curious glut of used G650s for sale with very little flight time on the airframe.

ORDERS

"A lot of G650 customers placed orders several years ago," Hall explains. "So circumstances have changed."

Others in the industry have suggested an alternative theory. A new class of mid-size jets offer certain amenities, including a flat-floor and inter-continental

range, once reserved for the likes of Gulfstreams, Globals and Falcons.

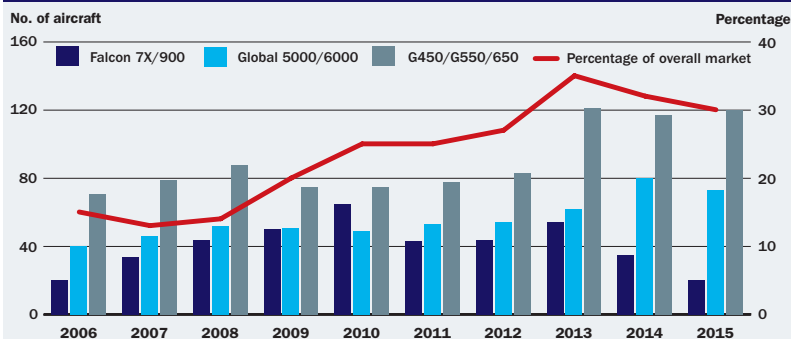
"It's not uncommon to see that same [customer] evaluating a Legacy 500," says Embraer chief executive Frederico Fleury Curado, speaking on a first-quarter earnings call.

More promisingly, some potential customers for large-cabin jets could be playing a waiting game. A swathe of models with new technology and better performance are in development. The introduction of the Falcon 8X this year leads the way. Others, such as the Global 7000 and Falcon 5X, will arrive in service later than expected. Gulfstream's G500 and G600 are also in flight test or entering assembly.

As customers wait, demand in the large-cabin sector is not likely to change soon.

"It's going to be a tough stretch for the next three years," Foley says. ■

LARGE-CABIN/LONG-RANGE BUSINESS JET DELIVERIES AND MARKET SHARE 2006-2015



SOURCE: Flightglobal's Fleets Analyzer, General Aviation Manufacturers Association



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LARGE CABIN VALUES ON A STEEP DESCENT

Big jets are being sold for much less on the used market, says Ascend

The secondhand values of large-cabin jets are falling faster than those of smaller counterparts, as high-end business aircraft take the biggest hit from a collapse in demand from emerging economies.

That is the finding of experts at Flightglobal's Ascend consultancy, who have assessed what used jets were selling for in the first quarter, compared with the same period last year.

While overall values fell 9.4% across the business aviation market, the largest types suffered far greater declines, with the price tag of a Gulfstream G550 falling an average of 16% (or up to 23% for the oldest vintage), and the G450 faring just as badly. Bombardier Globals have fallen by between 9% and 16% with the Global 5000 coming off worst.



◀ NEWER: The G650 is the latest big jet to join an over-served segment



First PC-24 set to make flying visit to EBACE for show debut

▶ **IN FOR THE DAY:** Pilatus' "super versatile jet" will appear briefly at show as it takes a short break from busy flight-test schedule

Pilatus's first PC-24 flight test aircraft is taking a brief break from its busy flight-test schedule to make its international show debut at EBACE.

Aircraft P01 will make a 100nm (160km) flight from Stans to Geneva on 24 May where it will be available to view for a few hours on the static display, alongside its venerable stablemate, the PC-12NG single-engined turboprop.

On Pilatus's stand, however, a full-scale mock-up of the PC-24 – with "a brand-new" BMW Designworks interior – will be on display for the duration of the show.

The public outing of aircraft registration HB-VXA comes three years after the eight-seat PC-24 was unveiled at the show. Its introduction not only marked Pilatus's first foray into the business jet space, but also created a new self-styled aircraft category, the "super versatile jet" (SVJ) – so called because of its short-runway perfor-

▶ **By KATE SANSFIELD**

mance and its ability to land on rough landing strips.

Pilatus says the PC-24 is the only aircraft to "combine the versatility of a turboprop with the cabin size of a medium light jet, and the performance of a light jet".

"The aircraft simply doesn't fit into any of the existing business jet categories. That's why we had to create a new one," Pilatus chairman Oscar Schwenk said at the 2013 unveiling. "Everything we've learned from the experience of our PC-12 operators is woven into the DNA of the PC-24."

Pilatus began working on the PC-24 programme at least two years before its launch, following demand from PC-12 customers for an aircraft that complemented the popular single-engined turboprop.

In May 2015, P01 made its inaugural flight from Buochs airport in Stans. The

following November it was joined by P02, registration HB-VXB. P03 – which is being built to production representative standards – will make its first flight "late in 2016", Pilatus says. This model will eventually be used as a customer demonstrator.

Powered by two Williams International FJ44-4A-turboprops, the PC-24 has a projected range of 1,950nm (3,610km), a take-off distance of 2,690ft (820m) and a landing distance of 2,525ft. This will enable it to operate from unpaved runways and grass strips. "This gives the aircraft access to more than 21,000 airports worldwide – 10% more than competing jets," Pilatus says.

The type also features Pilatus's Honeywell-based Advanced Cockpit Environment avionics system.

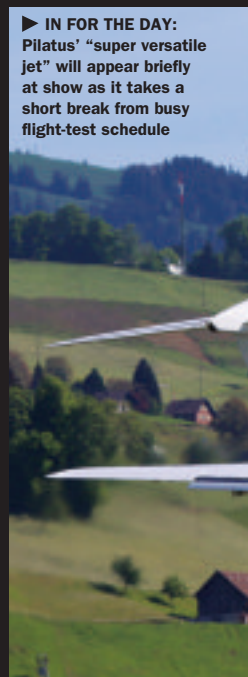
US and European Part/CS 23 certification are scheduled for 2017, leading to service entry soon after.

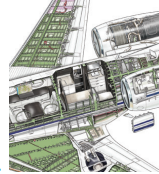
US operator PlaneSense is the launch customer for the clean-sheet design. The Portsmouth, New Hampshire-based fractional ownership company has an order for six PC-24s and is also the world's largest commercial operator of the PC-12NG single-engined turboprop, with a fleet of 34 aircraft.

The demand for the \$9 million PC-24 was so great that Pilatus sold the first two years of production – equivalent to 84 aircraft – within 36h of the orderbook being opened.

Other customers for first production wave include the Australian medical services provider, Royal Flying Doctor Service – also a long-standing PC-12 operator – Luxembourg fractional operator Jetfly and Abu Dhabi charter company Falcon Aviation Services.

Pilatus expects to reopen the orderbook in late 2019 to early 2020.





Gulfstream G500
CUTAWAY P21

The Falcon 7X had taken a 9% hit by January, with up to another 6% likely to have been shaved off values by the end of the quarter.

While all three airframers have attempted to address the problem by cutting production – Dassault Falcon deliveries fell by nearly a fifth over the period – inventory levels and weak demand in what has been the most bullish of markets in recent years are having an effect.

NO BLIP

A longer term look at the marketplace indicates this is no passing blip. Current market values (CMVs) for 10-year-old large-cabin types have fallen steadily since 2012. The CMV of a 10-year-old Global Express classic has plunged from \$27.5 million to \$18 million. A Global 5000 of the same age has fallen 24% in two years. Similar falls are seen for early-build, 10-year-old G550s, worth \$30 million in 2013 and trading today for around \$22 million.

The large-cabin segment, of course, is still a relatively new phenomenon. Until the mid-2000s, it was dominated by the Gulfstream GV and Bombardier Global Express, until the arrival of the G550. The Falcon 7X ended the duopoly just before the global financial crisis and today Gulfstream – which added the G650 in recent

years – represents just under half the global fleet.

Since 2008, production has continued to rise, at a faster pace. If the production trend from 1997 to 2008 had continued, 61 aircraft would have been added to the fleet each year. Instead, production has averaged 161 additional units per year since then, says Ascend senior analyst Daniel Hall.

“This was supported by emerging markets coming along, but perhaps now the damage is being felt with the secondary market and installed fleet size,” he adds. “Roughly speaking, it is the 2006 to 2009 vintages where we currently have greatest secondary market weakness. This is reflected in their high volumes for sale. If secondary market demand for a roughly 10-year-old large-cabin, long range aircraft cannot absorb inventory from an overall fleet size of 400 to 800 aircraft today, how will it absorb double this total fleet size in future years?”

CONVERGING FACTORS

According to Ascend, there are around 160 large-cabin, long range aircraft advertised for sale, 9% of the 1,800-strong fleet of all types of business jets the consultancy uses as its sample.

Interestingly, G550 inventory has actually reduced to around 33 aircraft, 6% of the fleet. “It is possible that many sellers gave up and removed their aircraft from the market. Dassault’s Falcon 7X has nearly 30 for sale, at 11% of the fleet – that will be one to watch this year.”

So do these figures suggest a short-term depression due to multiple factors converging, or a permanent shift and new reality?

“If emerging markets pick up, oil returns and currency stabilises, we’ll likely see healthier new demand,” says Hall. “However, we have never seen such a build-up of installed large-cabin, long range fleet, and maybe now we have proved there is too much.”

Flightglobal will be hosting a webinar in June in which Ascend consultants will go into the figures in more detail. The date is yet to be announced. Check flightglobal.com for details on how to register. ■

◀ **INDICATOR:**
The 7X saw a 9% year-on-year decline in values in January alone



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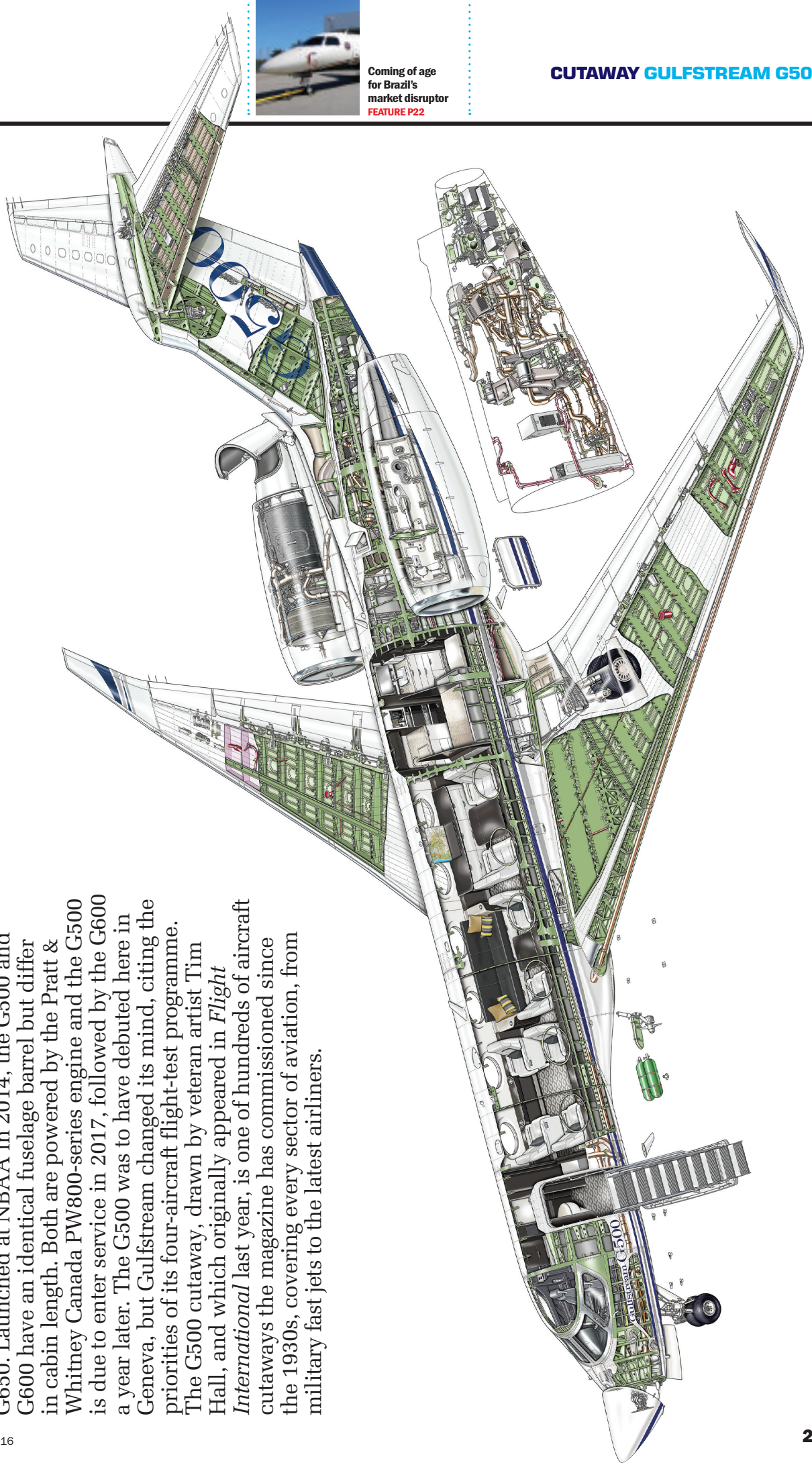
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GULFSTREAM G500

The G500 is the first of two new large-cabin types from the Savannah-based manufacturer and joins a portfolio that also comprises the G450, G550 and G650. Launched at NBAA in 2014, the G500 and G600 have an identical fuselage barrel but differ in cabin length. Both are powered by the Pratt & Whitney Canada PW800-series engine and the G500 is due to enter service in 2017, followed by the G600 a year later. The G500 was to have debuted here in Geneva, but Gulfstream changed its mind, citing the priorities of its four-aircraft flight-test programme. The G500 cutaway, drawn by veteran artist Tim Hall, and which originally appeared in *Flight International* last year, is one of hundreds of aircraft cutaways the magazine has commissioned since the 1930s, covering every sector of aviation, from military fast jets to the latest airliners.



► By **STEPHEN TRIMBLE**

Sixteen years is not such a long time in the aviation business. It might only cover the production of a single type, such as the Cessna Citation CJ2, for instance, which ceased production in January after a 16-year run.

The same period spans the entire history of Embraer Executive Jets, arguably the most disruptive force in business aviation over the last two tumultuous decades.

Within a single product cycle, Embraer has introduced major product lines in nearly every category of the business aviation market, survived a painful market downturn and established a substantial manufacturing and engineering presence in Florida.

"It's like a dream," says Marco Tulio Pellegrini, president and one of the founding employees of Embraer Executive Jets.

Speaking on 19 April at a ceremony marking the 1,000th delivery of an Embraer Executive Jets product, Pellegrini allowed himself to candidly reflect on how improbable such an occasion would have seemed even a decade ago.

GROWTH TRAJECTORY

"If you asked me [in 2005] if it would be possible to do all of this in 10 years I would say 'no'", Pellegrini says.

To understand Pellegrini's perspective, it helps to revisit the company's remarkable growth trajectory over a period when established business jet manufacturers struggled.

The history of Embraer Executive Jets actually begins two years before it was organised as a dedicated business unit in 2002.

Back then, Embraer was still riding the 50-seat regional jet boom of the late-1990s. Sensing an opportunity to capitalise on the hot-selling ERJ series, Embraer launched what was then branded simply as the Legacy, at the Farnborough air show in 2000.

The significance of that moment would have been easily overlooked during the Farnborough event itself, as all eyes were focused on the debut of the newly-organised EADS, now known as Airbus Group. Yet it would mark Embraer's first move into the business aviation market.

Pellegrini was still working on Embraer's production team, responsible for turning paper commercial designs into metallic reality in the fac-

COMING OF AGE FOR BRAZIL'S MARKET DISRUPTOR

Embraer shook up business aviation at the turn of the century. Now the airframer is marking its 1,000th executive jet delivery

tory. In 2002 he was recruited by the company's executives to join a new unit called Embraer Executive Jets, led by a former aviation analyst for the Brooke Group investment firm. When Pellegrini joined, there was no clear vision for moving beyond derivatives of the ERJ in the business jet market.

Moreover, Embraer also still knew very little about the business jet market. Its more experienced regional jet rival, Bombardier, had expanded into commercial aviation after finding success in the business aviation market with the Challenger 600. Embraer had no such pedigree, a fact that was all too apparent to Pellegrini.

UNDERSTANDING

"We brought the Legacy to the market in 2002, but we didn't know,"

Pellegrini says. "We didn't understand the customer requirements, and what's necessary to be successful. And I didn't know anything about executive aviation."

In retrospect, the original Legacy reflected Embraer's learning curve in the business jet market. The regional jet derivative found its niche, but the product's performance and interior would be revamped in 2012. By that time, however, Embraer Executive Jets had learned the market it served quite well, thanks to the launch of four clean-sheet aircraft types.

According to Pellegrini's recollection, the Phenom series began with two strikes against it. Originally conceptualised as an Eclipse-like air taxi, it would have to be reimaged as a slightly larger aircraft pitched against industry heavyweights, such as Cessna and Hawker Beechcraft, at the time owned by Raytheon. More ominously, the group's proposal to spend hundreds of millions to certificate a clean-sheet business jet landed like a thud in Embraer's boardroom, where then-chief executive Mauricio Botelho was already consumed by the expense and energy required to certificate the E170.

"Embraer was developing a 70-seat and a 100-seat plane, and we ap-

proached Mauricio and [said]: 'What do you think about this small four-seat configuration?' And he almost killed us," Pellegrini recalls. "Imagine a company that had been on the commercial side and [certificating] the E-Jet, and someone brings in an air taxi!"

Thankfully, Botelho didn't kill Pellegrini's team. But the air taxi concept had to go. It was at least four years before the cracks in Eclipse Aviation's air taxi-based business model would become clear, but Embraer was spared the same fate.

The manufacturer's narrow escape from the doomed air taxi market could be credited to a flash of executive foresight. But the Brazilian company received critical assistance from one of its customers.

GUIDANCE

Cleveland-based Flight Options, a fractional jet services provider, owns a portfolio of Embraer jets that now

includes six Legacy 600s, 36 Phenom 300s and a Legacy 450. In 2003, however, the company's most important contribution was to offer practical guidance on the needs of the business aviation market to Embraer.

"Without Flight Options I don't think we would be here today," says Pellegrini. "[It] allowed us to present the Legacy 600 value proposition, which was very good learning for us. We redesigned the interior, redesigned the spec and improved the range as well as the ceiling level."

Flight Options also helped Embraer shape the Phenom series from a clean sheet of paper, with the Phenom 100 as an entry-level and pilot training platform and the larger Phenom 300 as a versatile tool for business owners and fractional fleet operators.

By the time the Phenom 100 entered service in 2008, however, the market outlook appeared completely different than it had in 2005, when the makers of light jets were still riding a credit-fuelled boom in sales. By the end of 2008, the global financial crisis had wiped out the bottom of the business jet market. Still, the Phenom 100 entered service with a respectable backlog that would prove enduring.

The more expensive Phenom 300,

Now it is the time for executive aviation to generate the cash and to generate the results for the company

MARCO TULLIO PELLEGRINI
President, Embraer Executive Jets



▲ **VETERAN:** Pellegrini was a founding employee of Embraer Executive Jets



▲ **START POINT:** Manufacturer hoped to capitalise on popularity of its ERJ 135



◀ ROLL UP:
A ceremony
marked EEJ's
1,000th delivery

Embraer/Embraer AVE

Embraer continued to build momentum. Two more clean-sheet aircraft – the Legacy 450 and 500 – were in the early stages of development yet already redefining performance and technology in the super-light and midsize segments. The Lineage 1000, a VIP remake of the E190 regional jet, would join the redesigned Legacy 600 and Legacy 650. Finally, Embraer opened a new final assembly and engineering complex in Melbourne, Florida.

BUILDING JETS

In 2016, Embraer has seven products to offer the business aviation market, accounting for 17% of all deliveries by volume. For the first time in more than a decade the company is merely building business jets rather than developing new ones but it still has long-term ambitions.

The company acknowledges a gap in its portfolio for an ultra-long-range, large cabin jet, although that segment of the market has high barriers to entry. It has multiple options as it decides the next move, perhaps to respond to Textron Aviation's recent product expansion with the 4,000nm (7,400km)-range Cessna Citation Hemisphere.

For now, however, Embraer can enjoy the fruits of a remarkable 16-year run. "Now it is the time," says Pellegrini, "for executive aviation to generate the cash and to generate the results for the company." ■

however, would appear later in a shroud of uncertainty at Embraer. Although delivered with the performance and price Embraer had

promised in 2005, the market was slow to respond in the depths of an economic recession four years later.

"My bosses were asking, 'What's

wrong with this plane because you are not selling it?'" Pellegrini remembers.

They need not have worried. Although the Phenom 300 started

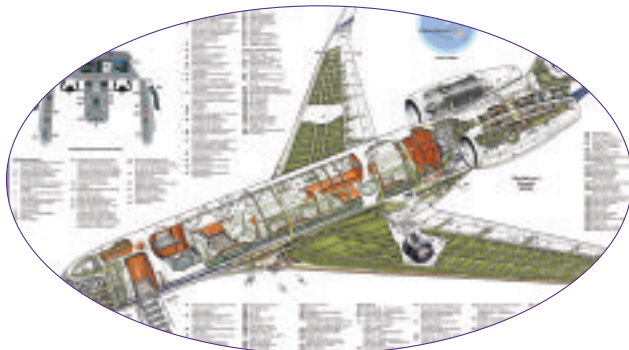
slowly, the type quickly made up ground, becoming the best-selling aircraft across the industry for the last two years.

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► CROP TOPS: The Thrush 510G agricultural aircraft is one of the main platforms for the H series engine

GE'S ENGINE CZECHS

► By MURDO MORRISON

The US company has given a new lease of life to the former Walter propulsion plant in Prague, turning it into its centre of excellence for its latest advanced turboprop

With its mix of brand-new, five-axis CNC equipment and hand-cranked milling machines – some dating from just after the Second World War – a tour of GE Aviation's Prague facility highlights the journey the one-time Walter Aircraft Engines has been on since becoming the US business's first overseas fully integrated manufacturing operation.

GE acquired the ailing Czech engine-maker and its M601 turboprop – which powers the Let Aircraft Industries L-410 among others – in 2008, and moved to the current factory next to the city's Letňany airport in 2010. Since then, GE has invested heavily in its central European subsidiary,

introducing modern machinery and US quality control processes.

It updated and relaunched the venerable M601 as the H family, and this year came the expected confirmation GE Aviation Prague had been chosen as design and production hub for the new advanced turboprop (ATP) engine, intended to take on the ubiquitous Pratt & Whitney Canada PT6A.

The 1,300shp (956kW) GE93 is set to power the still-to-launch Textron Aviation turboprop single to enter

service around the turn of the decade. The Wichita manufacturer confirmed the existence of the aircraft last July and GE's involvement in the programme in November.

FILLIP

GE's decision was a huge fillip for a Czech aerospace sector still to recover after the Soviet Union's

collapse closed a massive military and commercial market for manufacturers such as Aero Vodochody and Let Kunovice. Industries that once employed tens of thousands of engineers as well as many blue-collar workers were left scrambling for new customers and investment.

While both these firms have survived in a different guise – Aero Vodochody reinventing itself as an aerostructures specialist, and the now Russian-owned Let Aircraft Industries relaunching the L-410 – GE's move secures the future of the country's former propulsion

champion as a "centre of excellence", providing power for a new generation of turboprop aircraft.

GE is not announcing a timetable for the new engine family – Textron is expected to shed more light on its programme imminently. However, the project is

executive for business and general aviation turboprops at GE Aviation. "We are in heavy planning for the start-up of components, but we are not turning any parts yet," he says. "We expect to start building the first test engines next year." While GE is in discussions with the authorities over opening a new factory, production of the engine will begin at the current site. GE has a lease until the mid-2020s and there is room to expand.

For now, making the 750-850shp H80 and H75 and H85 derivatives, and servicing and upgrading legacy M601s are the main activities at Letňany. Based in an old, refurbished factory, and near several aerospace sites including those of Latécoère and Avia Propeller, some 400 staff are employed there.

The plant is unique to GE in being vertically integrated – the entire process, from milling components, through sub-assembly and final assembly, testing and customer dispatch, is under one roof. "We have a lot of capabilities. We are the only site outside the US that is fully EASA [European Aviation Safety Agency]-certificated for design and manufacturing," says operations leader Jason Kuiper.

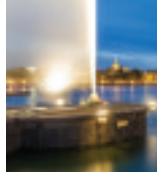
The factory produces 800 components for the H series, over half the entire part numbers. "We do screws up to parts that take eight months to

We expect to start building the first test engines next year

NORMAN BAKER
President and managing executive, GE Aviation (left)



▲ M-POWER: A freshly-overhauled and tested M-series turboprop engine is ready to be returned to its owner after work at GE's Eastern Europe base



make,” says Kuiper, “In fact, all the engine’s critical parts are made here except the combustor components and reduction gearbox, which come from the supply chain.”

It is a raw-material-to-finished-product process that is not without trials, admits Kuiper, a fluent Czech speaker who learned the language in the US military. He describes the factory as a “microcosm” of what would be a manufacturing chain spanning several sites for a larger GE engine. “I see it as a challenge but also a whole lot of fun.”

The H80, which received approval from EASA in 2011, was the first GE engine developed outside the USA to get its initial certification from the authority. The main changes to the four-decade-old M601 are blisks that are replacing bladed discs, new blades and the incorporation of lighter titanium instead of traditional stainless steel.

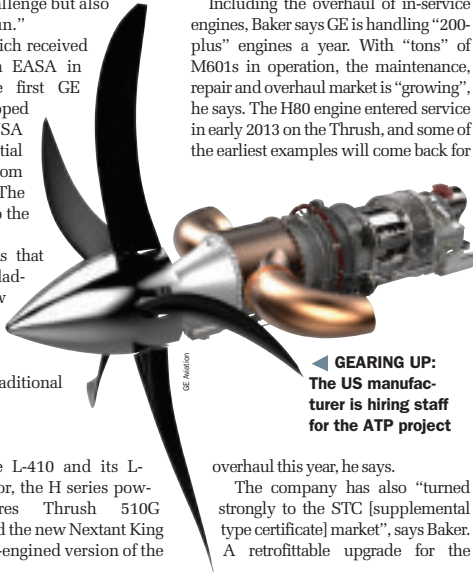
TESTING

As well as the L-410 and its L-410NG successor, the H series powers the Ayres Thrush 510G crop-sprayer and the new Nextant King Air G90XT, a re-engined version of the

King Air C90, currently in flight testing. Other applications are the single-engined Primus 150 from China’s CAIGA and the Rysachok utility twin produced by Russia’s Technoavia.

Baker is reluctant to disclose how many new engines the site is building, but it is clear the economic crisis in Russia – a major market for the L-410 – has hit sales. “We are geared up for 100 a year, but the Russian and the agricultural markets have been soft,” he says. “We expect to be ramping up again soon.”

Including the overhaul of in-service engines, Baker says GE is handling “200-plus” engines a year. With “tons” of M601s in operation, the maintenance, repair and overhaul market is “growing”, he says. The H80 engine entered service in early 2013 on the Thrush, and some of the earliest examples will come back for



GE Aviation
**GEARING UP:
The US manufacturer is hiring staff for the ATP project**

overhaul this year, he says.

The company has also “turned strongly to the STC [supplemental type certificate] market”, says Baker. A retrofittable upgrade for the



FINE DETAILS: There are more than 1,000 parts in the H-series turboprop engine

Thrush will be ready to install next year, and the variant is likely to be offered as standard on new-build aircraft. “We’ll let the market decide, but we expect it to move that way fairly quickly,” he says.

GE has also begun certification flights on a version incorporating an electric control system. “It’s not quite like FADEC [full authority digital engine control], but it reduces pilot workload and enhances the pleasure of flying,” says Baker. “The pilot is no longer trying to set torques and propeller speeds.”

GE has begun hiring manufacturing and engineering personnel for the ATP project. “There’s a flurry of activity for HR,” says Baker. With the Czech

Republic’s education system, low living costs and aerospace heritage, recruiting the right skills has not been difficult, although some staff have been lured from sister businesses in Italy and Poland.

Kuiper admits to the “odd skeleton we have had to tackle” in changing the culture of a workforce used to the hands-on production methods of Walter. Some were excellent craftsmen, says Kuiper: “The expression is that they had golden hands.” However, they were not necessarily used to the rigour of record keeping and quality control demanded by GE.

However, the advantages of having a workforce steeped in product knowl-

edge are invaluable, especially when almost the entire programme is handled in house.

“We have some guys here who were around at the certification of the M601 in 1975,” explains Kuiper, adding: “Others have retired but come back one or two days a week as consultants to share their expertise.”

That Walter heritage – combined with GE’s vast experience in industrial processes – will help create a virtuous circle as the new engine comes on stream, maintains Baker. “A lot of experience will go into the ATP,” he says. “But a lot of learning will also come back from the ATP to feed into what we are doing on the H series.” ■



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► **WATER SIGHT:**
The Jet D'Eau in
Lake Geneva

GENEVA: PERFECT FOR A CONVENTION



Geneva may not be the cheapest city in the world as anyone who has signed off a bill in one of the lake-front hotels – or even a backstreet bistro – will attest, but it is one of the most user-friendly for any convention attendee, including visitors to EBACE, and one of the more historically interesting in Europe.

Downtown Geneva is compact and walkable,

and generally safe, although those of a sensitive disposition may want to avoid the red light district between the main train station and the lakeside. The old town – the *Vieille Ville* – is on slightly higher ground a few streets back from the lake and consists of a maze of small streets and picturesque squares, with cafes, restaurants and museums.

If you have a day to spare during your stay,

and you've had enough of the spectacular view offered by the lake and its famous Jet D'Eau, or the nearby designer shops and expensive eateries, it is worth absorbing a bit of the old town's history, with buildings such as St Peter's Cathedral – where Protestant reformer John Calvin preached – that go back almost a thousand years. The Place du Bourg-de-Four is the site of the old Roman marketplace.

When it comes to getting around Geneva, visitors are provided with a free public transport pass – the *Palexpo* is only 10min and a single stop from the Gare Cornavin (central station), with many hotels either within walking distance or offering a free shuttle service. Otherwise, there is a shuttle bus directly to the *Palexpo* from several hotels, and from hall three to hall seven of the exhibition site itself.

A STRATEGY TO BEAT THE JAMS

Is satellite-based technology the answer to congestion at Europe's overcrowded airports? A session at 16.00 tomorrow in the Hall 5 Inspiration Zone will examine Europe's strategy addressing the problem.

The strategy has been welcomed as a serious attempt to improve the competitiveness of the region's air transport industry. However, it has also been criticised for a lack of internal focus and a bias towards major airlines and airports while doing little for general aviation.

Experts including Aline Bovier, director of Sion airport and Pascal Lhoest from Netjets,



▲ **UP AND DOWN:** Business aviation

will discuss the role of regional airports in alleviating traffic at major hubs, and how satellite-based technology enabling precision approaches could boost the efficiency of the airport network. The European Business

Aviation Association's own Brian Humphries is the moderator.

Just before that, at 14.00, panellists including Teal Group's Richard Aboulafia, Jean-Christophe Gallagher from Bombardier and Charles Schlumberger of the World Bank will debate why business aviation seems continually beset with rapid cycles of upturn and downturn, while the air transport sector has enjoyed a much smoother growth curve. "How have they coped with it and would such solutions work for us?" will be one of the questions for the speakers.



Be at your peak at the Palexpo

Fancy having your photo taken by the Alps, without having to don a rucksack and climbing boots?

The EBACE photo booth is back by popular demand, allowing you to strike your best Sound of Music pose in front of a mountain backdrop, and making

the folks back home believe you ventured beyond the comforts of the *Palexpo* and the hotels, bars and restaurants of downtown Geneva. The booth is between the EBAA and NBAA stands at A029 and is open daily from 10.30-midday and 13.30-16.00.



▲ **CLOSE AT HAND:** Embraer's Legacy 500 will be on display

Static set to get moving with 60 aircraft on show

EBACE kicks off officially tomorrow with the Opening General Session. Held in Room B, speakers include Bernard Kouchner, former French minister of foreign and European affairs in the Sarkozy government, and Patrick Ky, executive director of the European Aviation Safety Agency.

At 10.00, the static display opens. The great advantage of EBACE's location at Geneva's international airport over its US counterpart NBAA's Business Aircraft Convention and Exhibition is that all the aircraft are parked a short walk – rather than a 30min bus ride – from the exhibition.

The 60 aircraft on show include several debutants such as the seven-seat Diamond DA62, the newest twin-engine aircraft from the Austrian airframer; the Daher TBM 930, the latest version of the world's fastest single-engine turboprop from the Tarbes-based manufacturer, and the midsize Embraer Legacy 500.

At the other end of the spectrum, there's a chance to glimpse the Gulfstream G650ER, the top-of-the-range business jet from the US company and Dassault Aviation's soon-to-be certificated ultra long-range Falcon 8X flagship.

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