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Dassault rolled out the first Falcon 5X prototype on June 2 at its factory in Bordeaux before an audience of about 500 people. The French manufacturer expects to fly its most capacious business jet yet this summer.

## Falcon 5X rolls out, first flight imminent

by Thierry Dubois

Dassault unveiled the first prototype of the 5,200-nm Falcon 5X twinjet at its factory in Bordeaux, southwest France, on June 2 and is preparing to fly the aircraft this summer. Because of the development delay announced in March, Snecma now expects the Silvercrest engine will be certified in the summer of next year. Early last month, Dassault CEO Eric Trappier said, "We are targeting 2017 for certification, and then 2017 or early 2018 for entry into service." That schedule would see deliveries starting about six months later than originally anticipated.

The 5X cockpit features the first-ever combined vision system, in which supplier Elbit

merges synthetic and "real world" vision for enhanced situational awareness in poor weather and at night. Sensors scan the environment ahead in infrared, visible light and "almost radar" wavelengths, according to a Dassault executive. The multispectral array of sensors has a field of view of 35 degrees horizontal by 26.5 degrees vertical, and the field of view for the optional pair of head-up displays (HUD) is 40 degrees by 30 degrees. The pilot can set the contrast to adapt to various kinds of runway lighting. The system has been flying on another Falcon type at Dassault's flight-test center in Istres, in southeastern France.

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## Cessna set for Q3 Latitude deliveries

by Charles Alcock

Cessna earned FAA type certification for the Citation Latitude on June 6. The approval clears the way for deliveries of the new business jet to begin in the third quarter of this year. Among the first customers is fractional ownership provider NetJets, which has ordered up to 150 of the aircraft.

FAA certification was achieved a couple of weeks after the Latitude crossed the Atlantic Ocean for the first time in mid-May to make its European debut at the EBACE show in Geneva, Switzerland. The aircraft first flew in February last year, embarking on a fast-track test program that culminated in earning its type certificate on schedule. Four aircraft were involved in the test

program, logging 1,700 flight hours collectively.

According to Cessna, which is part of Textron Aviation, the Latitude offers a superior, flat-floor, stand-up cabin at the same price as smaller midsize

models. Its cabin is the widest yet of any Citation. The cockpit features Garmin 5000 avionics, also used on the Citation X+ and the Sovereign +.

During the EBACE show, *Continues on page 54 ►*



The Citation Latitude flew across the Atlantic to make its European debut at EBACE in May, just a couple of weeks ahead of completing FAA type certification.

## FAA wants more access to airman health records

by Matt Thurber

In response to the losses of Malaysia Flight 370 and Germanwings Flight 9525, the FAA is planning to "study the emotional and mental health of U.S. commercial pilots," the agency stated, in a joint effort with industry representatives. The joint effort will be undertaken by the Pilot Fitness Aviation Rulemaking Committee (ARC), which was formed by a recommendation of the Commercial Aviation Safety Team (Cast). The ARC is tasked with reporting its findings by year-end. (See article on page 12.)

In a separate but seemingly related effort, the FAA is conducting a market survey for a major update to its aeromedical

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### COMPLETION & REFURBISHMENT 2015 Special Report

The report highlights what interior designers, engineers, completion specialists and manufacturers have been doing to meet the rising expectations of customers. **page 20**

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<b>Embraer Legacy 500</b> AIN senior editor Matt Thurber traveled to Embraer's headquarters in São José dos Campos, Brazil, to fly the Legacy 500, and the fly-by-wire aircraft did not disappoint. <b>page 44</b>	<b>OEMs keeping customers happy</b> Whether flying a brand-new aircraft or a legacy model, buyers expect top-level support, and the manufacturers embrace modern tools and technologies to ensure that they provide it. <b>page 32</b>	<b>Paris Air Show wrap</b> Defense and transport companies turned out in force for the biennial event at Le Bourget, walking away with significant orders, while business aviation made a strong showing as well. <b>page 42</b>	<b>Cap on VA flight training benefits?</b> A proposed amendment to the post-9/11 GI Bill closes a loophole that allowed virtually unlimited VA funded flight training at public colleges, but it might do more harm than good. <b>page 62</b>



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## COMPLETION & REFURBISHMENT

2015 Special Report



Our annual roundup of who's doing what to meet the ever-changing expectations of those who ride in the cabins of the finest private aircraft ever to fly. **Page 20**

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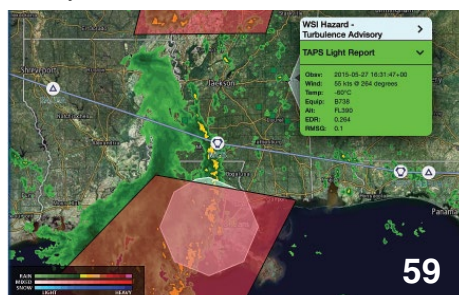
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### FLEXJET TAKES FIRST GULFSTREAMS

Flexjet took delivery of its first two Gulfstream G450LXis on June 23, marking the addition of the first non-Bombardier aircraft to the fractional provider's fleet. The deliveries are part of the firm order for 22 Gulfstreams—10 G450LXis, six G650LXis and six G500LXis—and options for 28 more that Flexjet placed in October. Flexjet's first G650LXi is expected to enter service early next year, followed by the G500LXi in 2018. The LXi-series Gulfstreams, exclusive to Flexjet, are outfitted with customized interiors that combine "unique touches and aesthetic themes" with a high level of "artisanal craftsmanship."

### SENATE CONFIRMS NEXT TSA LEADER

The Senate confirmed the nomination of U.S. Coast Guard veteran Peter Neffenger to head the Transportation Security Administration on June 22. The 81-1 confirmation vote came less than two months after President Barack Obama announced his intention to nominate Neffenger to succeed John Pistole as TSA administrator. Neffenger steps into his new role after 34 years of service with the Coast Guard, where he rose to the rank of vice admiral. While Neffenger has little track record in general aviation security, general aviation groups welcomed his nomination and praised the Senate for taking swift action on it. However, AOPA cautioned that general aviation might remain in the background in the near term as the new administrator must immediately turn his attention to recent security lapses at airline airports.

### GAMA SIGNS ON AS STRATAJET PARTNER

Stratajet, which has been preparing for full commercial launch of its online real-time booking platform this year, signed Gama Aviation as an operator partner. Under the agreement, Gama will integrate its scheduling systems with Stratajet's inventory-management software. By linking with operators, Stratajet can offer instant and accurately priced trips to customers. In turn, Stratajet is offering operators free use of its Stratafleet sales software, which provides pricing engines for development of internal quotes.

### CONTROLLER HIRING PRACTICES AUDITED

The U.S. DOT's Inspector General (IG) is auditing the FAA's air traffic controller hiring processes in light of last year's controversial changes to a system that had been in place for decades. The FAA plans to hire 3,200 new controllers over the next two years. Recently, both Congress and the media have expressed concerns

about the transparency and effectiveness of the FAA's revised processes. The IG audit will review the screening, training and placement of new controllers, and examine the FAA's justification for altering the hiring process last year.

### FORMER CARSON EXEC SENTENCED TO PRISON

Former Carson Helicopters vice president Steven Metheny was sentenced by a U.S. District Court in Medford, Ore., to 151 months in prison for making false statements and conspiracy to defraud the U.S. Forest Service (USFS). Metheny's statements became a significant part of the investigation into the 2008 crash of a Carson S-61 while it was performing firefighting services on behalf of the USFS in Northern California. The accident killed nine people and seriously injured four more. Metheny admitted that in 2008 he submitted bid proposals to the USFS with falsified weight-and-balance records to make Carson helicopters appear capable of meeting certain minimum payload specifications. The falsified weight-and-balance information was placed in the Carson aircraft flight manuals and later used by pilots who were unaware the data could cause them to operate beyond weight limitations, thereby endangering their safety.

### VISTAJET REACHES FLEET MILESTONE

VistaJet expanded its fleet of all-Bombardier aircraft to 50 last month with the delivery of another Global 6000. "As our worldwide growth continues, we look forward to adding more Bombardier business aircraft to our fleet," said company founder and chairman Thomas Flohr. In 2012, the company placed one of the biggest orders in private aviation history for 56 Globals with options on 86 more, worth a potential \$7.8 billion. It followed that up the next year with a \$1.035 billion order for up to 40 Challenger 350s.

### DASSAULT TO OPEN NEW PARTS CENTER

Dassault Falcon plans to open its fifth U.S. regional distribution center (RDC) by year-end in Louisville, Ky. The center will be located at UPS Worldport in Louisville, Dassault said, noting that this proximity to the shipper will let customers order parts as late as 10 p.m. for 8 a.m. delivery the following day. The center will house parts that are most frequently ordered by Falcon customers. Dassault operates 13 RDCs worldwide, housing an inventory of more than 300,000 unique part numbers. This enables a 98.5-percent spares service level (defined as the percentage of line items shipped that meet the customer's required date), Dassault said.

# EPA sets stage to regulate aircraft GHG emissions

by Kerry Lynch and Curt Epstein

In a step toward regulating aircraft greenhouse gas (GHG) emissions, the Environmental Protection Agency last month proposed a finding that emissions from certain types of aircraft contribute to air pollution that endangers public health and welfare.

The release of the proposed finding, detailed in an advance notice of proposed rulemaking (ANPRM), would compel the agency to regulate aircraft GHG emissions under the Clean Air Act. The proposal has been widely anticipated by industry since it also clears the way for the EPA to work in tandem with the International Civil Aviation Organization on the CO<sub>2</sub> standard. ICAO is expected to establish a standard in February next year that will cover not only new aircraft but possibly also those already in production.

The finding would apply to jet aircraft with a maximum takeoff mass (mtom) of 12,566 pounds (5,700 kilograms) or more and propeller-driven aircraft with a mtom of greater than 19,000 pounds (8,618 kilograms). In the ANPRM, the EPA also seeks comment on whether smaller aircraft should be included in an endangerment finding.

The EPA estimates that the "covered" aircraft account for 3 percent of total U.S. GHG emissions and "comprise the single largest transportation source in the U.S. that has not yet been regulated for GHG emissions." The EPA also expresses concern about estimates that aircraft GHG emissions could grow by as much as 50 percent over the next couple of decades.

"Newer-generation aircraft and engines are more efficient," noted Matthew DeWitt, a research engineer at the University of Dayton Research Institute's Von Ohain Fuels and Combustion Center. "But demand for aviation continues to grow globally, leading to the potential for more net greenhouse gas emissions even though aircraft and engines are becoming more efficient."

The agency notes that it has received from several environmental groups a citizen petition to issue such a finding.

The ANPRM sets the stage "for a possible subsequent domestic rulemaking process to adopt standards that are of at least equivalent stringency as the anticipated ICAO CO<sub>2</sub> standards," the agency said, noting that states would be required to adopt standards that are at least as stringent as the standard established by ICAO. "The EPA has worked diligently over the past four years within the ICAO/CAEP process on a range of technical issues regarding aircraft CO<sub>2</sub> emission standards," the agency said.

### International Standard versus Unilateral Standards

The ANPRM does not propose regulatory requirements, but seeks public input on emissions standards. Since it is focused on aircraft engine emission standards, it does not delve into operational requirements or address possible market-based measures that have been so controversial among operators.

Noting such standards "are still in the early stages of development," the EPA said public input would be helpful. Along with aircraft size, the agency questions whether the standards should apply to aircraft already in production or only new aircraft types.

An ICAO working group accepted the U.S. recommendation that the purpose of the international CO<sub>2</sub> emissions standard should be "to achieve CO<sub>2</sub> emissions reductions from the aviation sector beyond expected 'business as usual.'" The EPA seeks comment not only on that purpose, but also on how to achieve it.

The EPA is also seeking input on establishing a time frame for implementation of the standard, should it apply to in-production aircraft, since such requirements could necessitate redesign and/or recertification.

The ANPRM comes as the aviation industry has appealed to U.S. regulators to work with ICAO on a uniform standard, rather than establishing separate requirements. "Aviation is the most global of all industries, and it is important that aviation environmental standards be set by ICAO," said GAMA president and CEO Pete Bunce. "The EPA's draft finding recognizes this, and we agree with the agency's commitment to the ICAO process to finalize a CO<sub>2</sub> standard that is environmentally beneficial and that allows aviation to grow in a sustainable manner."

NBAA president and CEO Ed Bolen added, "The aviation community has long been committed to pursuing effective and workable efforts to lower the industry's carbon footprint. Over the past several decades the industry has enormously improved fuel efficiency, and continues to do so, through the development of new technologies, the promotion of flight procedures that reduce emissions and ongoing research and testing of alternate fuels."

Environmental groups, however, are urging the EPA to take its own action rather than wait for ICAO. "...Given the magnitude of the contribution of aircraft to climate change, the tentative approach that the EPA is considering is not up to the task," asserted Earthjustice attorney Sarah Burt. "We strongly urge the EPA to reconsider and to fulfill its Clean Air Act obligations by proposing a rule that accomplishes meaningful reductions in pollution from aircraft."

"As long as a fossil fuel or a hydrocarbon-based fuel is used for turbine-engine aircraft, which will be for the foreseeable future, the only way to cut total CO<sub>2</sub> emissions is to cut overall fuel usage," DeWitt told AIN. Among the currently viable options he indicated are gains in aircraft engine efficiency, modifications in the airframes themselves and the broader adoption of biofuel blends. □



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**■ Piaggio Realigns Management Structure**

Piaggio Aerospace set up a new organizational structure “based on four main pillars,” all reporting to CEO Carlo Logli and each managed by a “highly experienced” C-level executive. Under the new structure, CFO Giulio Di Negro is in charge of controlling, treasury, administration, the business and restructuring plan and procurement. Chief technical officer Giovanni Bertolone is responsible for technical engineering and the development strategy. COO Eligio Trombetta is focused on the aircraft and engines units, flight operations and common technical service. And chief commercial officer Francescomaria Tuccillo is responsible for sales, marketing and business development, communications and institutional relations and the customer service unit.

**■ Lawmaker Seeks Action on Depreciation**

House Ways and Means Committee member Pat Tiberi (R-Ohio) introduced a bill to extend permanently the 50-percent bonus depreciation provision covering certain capital equipment, including business aircraft. Tiberi said the measure would help improve access to capital and foster investments. Introduction follows House passage earlier this year of a bill to make permanent the Section 179 provision permitting small businesses to expense up to \$500,000 in investments rather than deducting them. The fate of these measures in the Senate, however, is unclear.

**■ Gulfstream Sees Steady Market for Mid- and Large-Cabin Models**

While deliveries dipped slightly in the first quarter, Gulfstream Aerospace executives are not seeing an appreciable difference in the market for their products. According to Mark Burns, who succeeded Larry Flynn as president of the aircraft manufacturer at the start of this month, “It was still a very good quarter.” The company expects deliveries to remain relatively flat this year. Scott Neal, senior vice president of sales and marketing, added that the company is seeing fairly solid activity on most of its product line, particularly the G650/650ER. While the new G500 and G600 capture attention, Neal maintains the G450 and G550 are still selling. The mid-cabins had languished until the G280 entered service, a green flag that boosted deliveries last year by about 10 aircraft. The market for the G150, however, remains “very slow.”

**■ NASA Coating Reduces Bug Residue**

A non-stick wing coating designed to shed insect residue recently tested by NASA and Boeing engineers reduced bug counts and residue by about 40 percent, compared with an uncoated control surface. Five of the most promising non-stick coatings out of some 200 developed by NASA Langley were recently tested by the engineers on Boeing’s ecoDemonstrator 757 in Shreveport, La., a location selected for its “significant bug population.” Since most insects fly relatively close to the ground, the non-stick coatings were tested over 15 flights from Shreveport Regional Airport that each included several takeoffs and landings.

**■ Fokker Teams with Comac on Bizliner**

Fokker Services has signed a contract with Chinese aircraft manufacturer Comac to convert the ARJ21-700 regional jet into a private jet. Comac last year announced the first customer for the business jet variant of its recently certified 90-seat airliner. The conversion will be jointly developed by Fokker and Comac in the Netherlands, while the final aircraft outfitting activities and deliveries will be done in Shanghai at Comac’s Shanghai Aircraft Manufacturing division.

# High-altitude O<sub>2</sub> rule: compliance conundrum

by Robert P. Mark

Most professional pilots are diligent about following the rules except, of course, on those relatively rare occasions when they don’t agree with them. One of the standouts among ignored rules is 91.211, which governs the use of supplemental oxygen, said Rick Miller, chief pilot for Merck Sharp & Dohme, at the recent Business Aviation Safety Summit. The rule requires that above 41,000 feet, one pilot must use the mask at all times even with another pilot in the cockpit.

The pragmatic reason behind 91.211 is to ensure pilots can maintain control of the aircraft in the event of a high-altitude explosive decompression. At 50,000 feet, the time of useful consciousness is a mere six to nine seconds, about the time that passes between pulling the power to idle over the threshold and touching down on the runway.

“This regulation as it applies to the use of supplemental oxygen above 41,000 feet is probably one of the clearest in Part 91,” he said. However, he maintained, non-compliance seems to be the norm, and incidents of non-compliance are not the result of pilots who don’t understand the rules, Miller noted. He cited an NTSB study of 500 Part 91 pilots that asked whether they use their masks above 41,000. Only 18 percent said yes.

“It’s important as a chief pilot to maintain a high level of safety and professionalism in my

organization and a good safety culture,” he added. “This regulation is one of the biggest challenges I’ve had over the years. But how do you operate a disciplined cockpit environment when people cherry pick the regulations they’ll follow? There must be a better way.”

If so many pilots ignore the rule, should the industry force it on violators, or should the rule be tweaked to align with Europe’s regulations, which recommend the use of oxygen above 41,000 feet? “The FAA and NTSB don’t seem concerned about addressing this situation,” Miller said. “I’m frustrated that I’m one of the few [chief pilots] out there forcing my pilots to comply. I don’t know why the FAA and NTSB don’t look at this more closely.” Miller is currently working with Gulfstream and others to better understand why there is so much disregard for the regulation, as well as potential solutions. One insight that emerged early in the session was that the quick-donning masks are normally considered emergency equipment. What company operates an aircraft regularly using a piece of emergency equipment?

Miller said the arguments for or against a change to the regulation must focus on determining the severity of the threat facing flight crews when they avoid wearing the masks at high altitude. “What’s our tolerance for this kind of situation when a rapid decompression could translate into the loss of lives?” Miller wondered, especially in light of the certification standards on many new high-altitude-capable aircraft? “[Manufacturers] had to prove a rapid decompression is a one in a billion chance. This is such a highly unlikely event it is really considered an acceptable risk.”

Changing the FAA’s mind about anything is no small challenge. Miller said some SMS risk assessments he conducted uncovered a list of problems created by wearing oxygen masks for extended periods at high altitude that he believes might support a change. A series of instant polls conducted at the summit by Francois Lassale of Vortex FSM added fuel to the fire for a pragmatic change to the 91.211 problems (see pie charts). □

**Do you flight plan below 41,000 feet to avoid dealing with the mask regulation?**



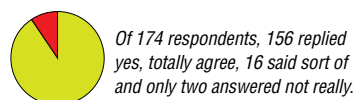
The idea of adding to airspace congestion at lower altitudes was raised, as was the extra fuel burned and the pollution created by operating at lower altitudes to circumvent the oxygen mask issue.

**Do you feel wearing an oxygen mask for an extended period of time adds to pilot fatigue?**



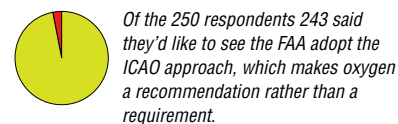
“So to protect against something we consider highly unlikely, we are exposing crews to increased fatigue in an already challenging environment,” commented one.

**Does an oxygen mask interfere with cockpit resource management?**

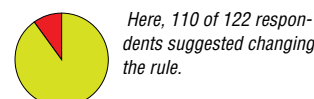


One example highlighted maneuvering around thunderstorms at night above FL430 and the difficulty with ATC communications and crew coordination during what turned out to be nearly eight hours of continual T-storm avoidance. It’s also important to note that even in the normal mode, the mask is using valuable oxygen at high altitudes. Pilots say they often run into difficulties at some destinations replenishing their supplies before a return leg.

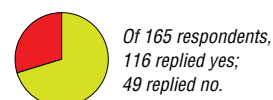
**How would you like to see the Part 91.211 rule altered?**



**Would you prefer to modify your aircraft’s oxygen system to address this issue better or see the FAA change the rule entirely?**

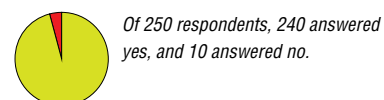


**Have you ever experienced physiological effects from extended use of an oxygen mask?**



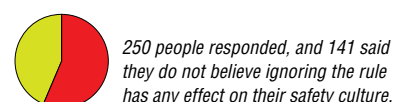
Many pilots cited significant bronchial irritation from prolonged use of oxygen.

**Do you worry about getting sick from using an [unclean] mask during flight or during training?**



Citing cleanliness issues alone, FedEx, United and ALPA not long ago petitioned the FAA to halt mask use up high. The agency denied their requests.

**Do you think ignoring 91.211 threatens a positive safety culture?**



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# AIRMANSHIP SKILLS

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– **Randy Gaston**, Vice President, Flight Operations  
Gulfstream Aerospace

*Randy Gaston has been with Gulfstream for more than 20 years and was chief test pilot during development of the GV. He is a graduate of the USAF Test Pilot School at Edwards AFB. Randy was test pilot with the FAA Aircraft Certification Office and chief test pilot for the B-1B bomber.*

As cockpit technology advances, one thing never changes: The Best Safety Device in Any Aircraft Is a Well-Trained Crew. The advanced-technology systems built into today's aircraft offer many benefits and advantages. While the understanding and appropriate use of automation are important, developing and maintaining core airmanship skills are paramount, especially in emergency situations. A crew's first focus in an emergency should be flying the aircraft and maintaining or working to return to stable flight. Only when the plane is under control should attention turn to analyzing the situation, determining the cause and, finally, taking corrective action. A new series of courses from FlightSafety enables crews to experience and recover from challenging situations – based on analysis of actual incidents – that demand solid flying skills, swift and accurate decisions and precise communication.

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**U.S. Bizav Flying Logs Modest Gain**

Business aviation flight activity in North America in May rose 1.1 percent year-over-year, according to data from aviation services group Argus International. By operator type, Part 135 flying climbed by 3.2 percent from a year ago, Part 91 activity slid 1 percent and fractional activity declined by 3.5 percent. By aircraft category, large-cabin jet flying surged by 4.7 percent year-over-year, while light jets saw an anemic 1-percent uptick and midsize jet activity dipped by 1.1-percent. Turboprop flying rose by 1.7 percent. Argus's TraqPak data logs serial-number-specific aircraft arrival and departure information on all IFR flights in the U.S. and Canada.

**UTC To Offload Sikorsky Business**

UTC will pursue the separation of its Sikorsky helicopter business, subject to final board approval, the company announced last month. "Our strategic review has confirmed that exiting the helicopter business is the best path forward for United Technologies," said UTC president and CEO Gregory Hayes. The U.S.-based group says that removing Sikorsky from its portfolio will "better position UTC to focus on providing high-technology systems and services to the aerospace and building industries." However, UTC still has to decide whether the move will be in the shape of a sale or a spinoff. That choice will probably be made by the end of this month, according to Hayes.

**FSI Sim Gets FAA Nod for Upset Training**

FlightSafety International's first full-flight simulator capable of re-creating flight parameters critical to the accurate representation of upset prevention and recovery training maneuvers (UPRT) received FAA qualification. The agency evaluated and qualified the expanded aerodynamic, flight control and motion models developed by FlightSafety and incorporated into the Gulfstream G550 simulator. As a result, FlightSafety will have the first full-flight simulator qualified for UPRT under AFS-205, FSTD Guidance Bulletin 11-05. The models are based on actual aircraft flight-test data, wind-tunnel testing and analytical data that includes low speeds replicating deep aerodynamic stalls and extreme high speeds beyond V<sub>MO</sub> and M<sub>MO</sub>.

**Nexcelle Delivers Global 7000 Nacelle**

GE Aviation and Safran joint-venture company Nexcelle delivered the first nacelle shipsets last month for the GE Aviation Passport engines on the flight-test Bombardier Global 7000. The shipset for the Global 7000 included the inlet, fan cowl and thrust reverser with its associated hydraulic actuation. Nexcelle's integrated system for the Passport features a one-piece extended aluminum inlet lip outer barrel; anti-ice system; single-piece extended composite inner barrel; simplified clamshell composite fan cowl; and a target-type thrust reverser.

**TRU To Provide Fusion Cockpit Training**

Textron Aviation selected sister company TRU Simulation + Training's ProFlight to be the training provider for new King Airs equipped with the Rockwell Collins touchscreen Pro Line Fusion flight deck. Training in a full-motion level D-qualified simulator will begin in September, coincident with entry-into-service of the first Pro Line Fusion-equipped King Air 250. Pilot training for the Fusion-equipped 350i/ER and C90GTx will be available when these models enter service in this year's fourth quarter and the second quarter of next year, respectively. Training will take place at ProFlight's facility in Lutz, Fla., near Tampa, and maintenance training will be available at the new TRU Maintenance Training Academy at the Textron Aviation campus in Wichita.

**GULFSTREAM G500 IS FLYING**

Our thanks to readers for pointing out the error on the front page of the June print issue of *Aviation International News*. Yes, the photo accompanying the news that Gulfstream flew its latest business jet for the first time shows not the new G500 but the GV chaseplane that observed it. (The chaseplane shown—N532SP, S/N 632—is one of few GVs to incorporate the optional seventh cabin window on the starboard side when it was built in 2001.) As every pilot knows, there are two types of aviator: those who have landed gear-up and those who have yet to. Various factors and players were links in this gear-up landing, but ultimately this student of aircraft recognition for the better part of 60 years missed it. I look at that front page, about as prominent a gear-up as grinding to a halt on the belly at Oshkosh during AirVenture, with much regret that it slipped through.—*N.M.*



**'Santa Monica East':  
HTO legal conflict ignites**

by Kerry Lynch

The Town of East Hampton is embroiled in a multi-pronged legal battle over restrictions that it adopted, but had not yet implemented, for East Hampton Airport (HTO). In April the town adopted a series of restrictions that include a nighttime curfew, an extended curfew for "noisy" aircraft and limits on summertime operations of "noisy" aircraft to one weekly. Most business jets and helicopters would qualify as "noisy" aircraft. The town, however, dropped its plan to ban helicopters outright.

In moving forward with the restrictions, the town cited thousands of noise complaints and claims it has political support for its efforts. House aviation subcommittee vice chair Lee Zeldin (R-N.Y.) earlier this year urged FAA Administrator Michael Huerta to stand by earlier promises that the agency will not enforce certain grant assurances, clearing the town to adopt the noise restrictions. And, the New York lawmaker successfully inserted a provision into the House Fiscal Year 2016 transportation appropriations bill essentially prohibiting the FAA from taking any administrative or civil action against the sponsor of HTO.

Airport backers, however, have long argued that the complaints stem from a minority; one household alone was responsible for 2,000 complaints, Jeff Smith, chairman of the Eastern Region Helicopter Council

(ERHC), testified during a hearing in East Hampton. HTO supporters, including the ERHC and national groups such as NBAA and HAI, filed a lawsuit calling the restrictions unfair, unreasonable and unjustly discriminatory.

"Despite repeated warnings to town officials from NBAA and other aviation interests that local airports do not have the authority to regulate the types of aircraft that can operate at that airport, East Hampton is setting the stage for years of costly litigation by attempting to implement severe operating restrictions at HTO," said NBAA COO Steve Brown. "East Hampton is bound by grant assurances and other regulations that require it to operate in compliance with federal aviation law and policy."

**Legal Decisions Pending**

The lawsuit seeks a temporary restraining order to prevent the restrictions from going into effect. The U.S. District Court in the Eastern District of New York heard arguments on May 18, and Judge Joanna Seybert initially indicated plans to issue a decision by June 8. But Seybert pushed off the decision for three weeks, citing the complexity of the issues. The town accordingly had agreed to hold off enforcement. "The Town Board remains confident that it will prevail in the litigation; however, out of respect for the judicial process, the Town has agreed to

continue not to enforce the local laws pending the court's decision," it said. The lawsuit is one of several legal and/or administrative actions that industry groups are taking to combat the restrictions. Earlier they filed a lawsuit to compel the FAA to ensure the restrictions complied with the law.

In addition, NBAA joined a number of aviation businesses in filing a Part 16 complaint urging the FAA to issue a cease-and-desist order and finding that the restrictions violate grant agreements. The Part 16 complaint further asks the FAA to "take corrective action subject to the suspension of further AIP grants and other appropriate enforcement measures."

The complaint argues that the town's restrictions would prohibit up to 23 percent of operations and "are likely to cripple the airport permanently—by driving existing tenants out of business and undercutting the airport budget."

As for the FAA, it has been examining the legality of the restrictions and whether they can be permitted. Although the agency had indicated a desire to work with the town on its noise issue, it backed the issuance of a temporary restraining order to give it time to review the issues. The agency wrote the court asking for the restraining order, saying it has not yet taken a view on the merits of the lawsuits, but believes "an injunction is necessary so that the FAA can properly consider [the] plaintiff's claims and the town restrictions, develop its position on the issues, and should the FAA determine the town restrictions are contrary to federal law(s) and/or FAA regulation(s)...commence appropriate enforcement action." □





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**EJM Expanding in Europe**

Aircraft charter management firm Executive Jet Management, which has a large U.S. presence, is making a big push into Europe this year. It received a European air operator certificate last year after establishing a regional base in Lisbon, Portugal, drawing on the operations headquarters of sister company NetJets Europe. EJM currently manages 208 aircraft in the U.S., but only seven in Europe and two in China. EJM is heavily concentrated in North America, Robert Molsbergen, EJM's president and COO for global aircraft management, told *AIN*, but the company is now looking to go global. "Our goal is to double the managed European fleet to 14 aircraft by the end of this year."

**VistaJet Completes Financing Offering**

VistaJet completed a \$300 million offering of unsecured notes that will help fund its aircraft acquisition activities and expansion plans. The offering, completed through VistaJet subsidiaries VistaJet Malta Finance and VistaJet Co. Finance, involves 7.750-percent senior unsecured notes due in 2020. In concert with its offering, VistaJet obtained corporate credit ratings of B+/Stable from Standard & Poors and B/Stable from Fitch. The offering comes as VistaJet moves on plans to expand worldwide. The company added 10 aircraft to its fleet in the first quarter, is launching its Chinese operation and is in the midst of nearly doubling its U.S. fleet this year.

**FAA to Pilots: Transponders on for Taxi**

The FAA published Safety Alert for Operators 15006 to ensure that pilots know they need to keep their transponders turned on in altitude-reporting mode even when operating on the ground in airport movement areas. At many airports in the U.S. the agency uses runway safety systems to determine the locations of aircraft and vehicles moving on the surface. These systems rely on data from transponders to obtain accurate aircraft and vehicle locations for greater safety and efficiency.

**Nextant Opens Resale Unit**

Nextant launched a resale division to help find buyers for its remanufactured aircraft that come on the market. The Cleveland, Ohio-based company rolled out Nextant Resale in late May, offering its first aircraft—a 2012 Nextant 400XT with 1,400 hours' total time since remanufacturing—for \$4.55 million, about \$1 million shy of a newly remanufactured 400XTi. The purchase price includes new interior soft goods and exterior paint stipend.

**Airbus Books ACJ319neo Order**

Airbus wrote its first order for an Airbus ACJ319neo, from Riyadh-based Alpha Star. Delivery of the aircraft is anticipated in the second quarter of 2019. The aircraft will be used to help expand the company's private charter operation. The order is the second for a corporate variant of Airbus's recently launched "neo" series. Airbus launched the ACJneo during EBACE with an order from Farnborough-based operator Acropolis Aviation for an ACJ320neo. That aircraft will be delivered in 2018 and outfitted for 19 passengers.

**Milestone Signs for Airbus, Bell Helos**

Milestone Aviation, the GE Capital Services company that specializes in rotorcraft operational leasing, signed deals with Airbus Helicopters and Bell Helicopter last month at the Paris Air Show. A previously announced agreement for five optional Airbus H175s has been fattened to firm orders for 10 and options on 18. With Bell, Milestone signed a letter of intent for twenty 525 Relentless medium twins. If the letter of intent converts into a firm order, deliveries will start in late 2017.

# FAA to expand Data Comm system

by Curt Epstein

After more than two years of testing, the FAA's controller-pilot datalink communication (CPDLC) system (DataComm for short), a text-based ATC-to-cockpit communication system, is set to expand from its initial two trial locations to another 50 airports across the country by the end of next year, according to FAA Administrator Michael Huerta. The voluntary-participation system promises to streamline the departure clearance process at busy airports, especially during disruptive periods caused by weather or general congestion.

The current departure clearance method, under which a controller verbally relays a reroute via radio to the cockpit, the pilot writes the information down and then reads it back to the controller, is a process

that can introduce hear-back and/or readback errors, requiring clarification and correction. Once the information is confirmed, the pilot has to enter the new route into the aircraft's flight management system (FMS) manually and in many cases communicate this change to the company dispatcher, who performs fuel calculations, before approving the reroute. Under



*The DataComm system streamlines the departure reroute clearance procedure with new routing sent directly to the aircraft's flight management system.*

the DataComm procedure, the tower sends a CPDLC message directly into the FMS of a properly equipped aircraft, and the system, in turn, alerts the pilot. At the same time a duplicate message containing the routing information is sent to the operator's dispatch. The pilot simply has to press a button to accept the change.

In cases of flight-plan rerouting clearance, the new system in place at Newark and Memphis International Airports has demonstrated savings averaging six to 12 minutes, according to its pilot users, which include United Airlines, UPS and FedEx, resulting in reduced fuel burn and swifter departures. In addition, because the communication is swift and clear, aircraft that are given reroutes through the DataComm system normally do not have to leave the departure queue.

The program draws on technology that already exists as opposed to asking the airlines to do something new, said Jesse Wijntjes, the FAA's DataComm program manager. "Some of that is as simple as activating software in boxes they already have; sometimes it might require adding a new radio or another piece of gear."

**Business Aviation Application**

While the technology, part of the broader NextGen suite of ATC improvements, is aimed primarily at airlines, properly equipped business aircraft are welcome to use it as well, said the FAA. DataComm uses the proven Fans-based architecture already present in most oceanic aircraft, including modern long-range business jets. Approximately 925 airliners/freighters and 225 private/business aircraft are properly equipped to use the technology, according to the FAA. The agency hopes to reach a "critical mass" of 1,900 or more DataComm-capable commercial aircraft in the system, approximately 20 percent of the eligible population, a point it believes will yield a significant reduction in controller workload, as it rolls out the system in other cities at a cost of \$7 million per airport.

Later this summer, DataComm will be available at Houston Hobby, Houston Intercontinental and Salt Lake City International, said Huerta, who added this is just the beginning of the anticipated functionality that the technology will provide. A second phase of the program will target en route flight-plan changes, and is expected to debut in 2019 or 2020. □

**DAE EYES GROWTH IN LEASING BUSINESS WITH STANDARDAERO SALE**

Dubai Aerospace Enterprise (DAE) is focusing on its leasing and local activities with the sale of maintenance, repair and overhaul heavyweight StandardAero to private equity firm Veritas Capital. The company announced in late May it had reached agreement to sell 100 percent of StandardAero to Veritas.

The definitive agreement comes eight years after DAE acquired the company from The Carlyle Group in 2007 as part of a \$1.9 billion deal that involved the eventual spinoff of what is now the Landmark Aviation chain of FBOs.

DAE, only a year old at the time, had called the acquisition an important step in its goal of establishing itself as an aerospace power, enabling it to take advantage of MRO growth opportunities around the world. But within three years there was chatter that DAE was looking to shop StandardAero. A year later, in 2011, DAE sold its 30-percent stake in MRO provider SR Technics to Mubadala. DAE later acknowledged it was in talks with BBA Aviation about a potential merger with StandardAero, but those negotiations ultimately collapsed when the parties were unable to come to terms.

Terms of the private transaction to Veritas were not disclosed. Veritas is acquiring one of the largest independent MRO and completions providers catering to business and general aviation, commercial and defense markets, with 13 facilities and 50 sales and field service locations. StandardAero brings in annual revenue of \$1.6 billion, forming the

majority of DAE's overall revenue of \$2.112 billion.

DAE profits jumped 43 percent last year, a result of not only improved margins at StandardAero but also an expansion of its leasing business, the company had reported. DAE managing director Khalifa AlDaboos said the sale to Veritas "will allow StandardAero to accelerate its growth by leveraging Veritas's global relationships and in-market presence." In turn, the sale will enable DAE to "redeploy capital" to focus on building its Dubai-anchored footprint and acquiring aircraft assets in its leasing portfolio, which is now approaching \$3.7 billion, AlDaboos added.

**Aerospace Platform**

Veritas invests primarily in middle-market companies with a focus on half a dozen or so industries, including aerospace. Veritas managing partner Ramzi Musallam said StandardAero will become a cornerstone investment of its recently established Veritas Capital Fund V and create a platform for its investment in commercial and military aerospace. "We are excited for the opportunity to partner with StandardAero's leadership team to help drive its next phase of growth, including expanding the company's presence globally," Musallam said.

"StandardAero is fundamentally a strong business, and this change in ownership will ensure that we continue to achieve our business plans and build an aggressive trajectory for growth," said StandardAero CEO Russell Ford. —K.L.





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■ **Daher Hopes for Single-Engine Nod from EASA Next Year**

Daher is hoping for a fast, positive conclusion to the industry's prolonged effort to have single-engine IFR commercial flights approved at the European level. For single-engine commercial service, Daher wants to draw on the experience gathered by France-based Voldirect. Since 2013, the French DGAC has allowed the company to operate one TBM 850 for passenger transport. EASA executive director Patrick Ky is supportive, but Daher said the devil is in the details since all member states have to agree. After the EASA publishes an opinion on the NPA018 EU-OPS, it will be submitted to the European Commission within six to nine months. Daher expects a revised EU-OPS regulation next year.

■ **Scheduled SVFR Ban at IAD Withdrawn**

The FAA withdrew a direct final rule that would have prohibited Special VFR starting May 26 for fixed-wing aircraft at Washington Dulles International Airport (IAD). The FAA issued the requirement as a direct final rule because the continued growth in the number of IAD instrument operations and complex airspace has long qualified the airport for this restriction. The ban was revoked because the agency received one adverse comment. Under the agency "direct final rule" process, any negative comments the FAA receives serve to revoke the rule and possibly initiate a full NPRM process. The commenter, a pilot, said that the blanket prohibition of SVFR was "inappropriate and unnecessary," saying IAD tower should approve or disapprove SVFR case by case.

■ **Helicopter Safety Teams Forms Partnership in Brazil**

The International Helicopter Safety Team (IHST) recently established an enhanced safety partnership in Brazil—between the current IHST Brazil group and Brazilian civil aviation authority ANAC—with the creation of the Brazilian Helicopter Safety Team (BHST). BHST will follow IHST guidelines, mission and goals, as well as ANAC regulations and orientation.

■ **Tailboom Motion-detection System Available from ACSR**

A fatal tailboom separation on a Bell UH-1B in 2013 inspired Aircraft Structural Repair (ACSR) of Stevensville, Mont., to design the Bart tailboom motion-detection system. Bart is currently being offered under FAA Form 337 field approval pending supplemental type certificate approval. The system installs via a fuselage plug and consists of a rod encased in tubing attached to the interior of the tailboom and extending forward into the fuselage where a micro switch is attached to the airframe. If an upper left-hand tailboom fitting, longeron or attach bolt fails, the switch illuminates the master caution panel indicating "tailboom," prompting an immediate landing.

■ **FreeFlight Adds ForeFlight Compatibility to Rangr ADS-B**

The FreeFlight Rangr ADS-B system can now display ADS-B IN weather and traffic information on the ForeFlight Mobile iPad app (Version 7.1). Both the Rangr Blue Box and Lite systems offer the new compatibility with ForeFlight. "With the ForeFlight 7.1 software update, we are now able to deliver the full integration our customers have been asking for," said FreeFlight Systems president and CEO Tim Taylor. "Both companies worked intensely and collaboratively to ensure this was done the right way, and we are pleased to have our name associated with ForeFlight."

# FAA assembles ARC on pilot mental health issues

by Bill Carey

The FAA has formed an aviation rulemaking committee (ARC) to make recommendations within six months on pilot mental health and screening issues. The agency said it assembled the expert group as a result of the disappearance of Malaysia Airlines Flight MH370 in March last year and the crash of Germanwings Flight 9525 this March.

"U.S. pilots undergo robust medical screening, but recent accidents in other parts of the world prompted the FAA to take a new look at the important issue of pilot fitness," the agency announced on May 27. The high-level Commercial Aviation Safety Team, an industry and government collaboration founded in 1998, recommended forming the Pilot Fitness ARC.

ARCs are temporary advisory committees, but their recommendations are typically used by the FAA in crafting regulations. The

Pilot Fitness ARC "will examine issues including the awareness and reporting of emotional and mental health, the methods used to evaluate pilot emotional and mental health, and barriers to reporting such issues," the FAA said. The charter creating the ARC also establishes a working group of medical professionals that will report to the committee.

Based on the committee's recommendations, the FAA said it might consider changing medical methods, aircraft design, policies and procedures, pilot training and testing, or training of aerospace medical examiners. It might also advise industry groups on taking action.

Malaysia Airlines MH370, a Boeing 777-200 that disappeared from radar on March 8 last year while flying from Kuala Lumpur to Beijing, has still not been found. The copilot of Germanwings Flight 9525, an Airbus

A320, is thought to have deliberately crashed the aircraft in the French Alps on March 24.

The FAA did not name the individuals who will serve on the Pilot Fitness ARC, but provided a list of the organizations that will be represented on the committee. These are the Aerospace Industries Association, Airlines for America, the Air Line Pilots Association, the Coalition of Airline Pilots Associations, the Flight Safety Foundation, the International Air Transport Association (IATA), the National Air Carrier Association and the Regional Airline Association. The FAA and Transport Canada will also participate. The ARC's meetings will not be open to the public.

Responding to the FAA announcement, IATA issued the following statement: "Safety is the industry's top priority. IATA is pleased to have the opportunity to contribute to this important initiative on pilot fitness. Working together through collaborative processes based on global standards and best practices has been the industry's model for decades and it has helped make aviation the safest form of long-distance travel the world has ever known." □

## FAA wants to see medical records

▶ *Continued from page 1*

technology infrastructure called the Aerospace Medicine Safety Information System (Amsis). One of the functions of Amsis will be for the FAA's Office of Aerospace Medicine (AAM) to "use the Amsis to develop a new information system for tracking and analyzing a broad selection of medical information associated with pilots, air traffic controllers and other aviation-related personnel."

One way that Amsis will perform this tracking is to tap various sources of data to help the AAM make better decisions about the medical qualification of pilots. Or as the FAA explained, "Amsis will provide better data accessibility and a greater ability to analyze medical information and denial data to identify safety trends that could impact system safety."

To accomplish this mission, the FAA added, "Specifically, Amsis is intended to reduce accidents and improve safety by:

- Reducing falsification of health records and preventing pilots or ATCSs (air traffic control specialists) from operating in the [National Airspace System] when they have medical conditions hazardous to aviation safety;
- Improving the ability to

analyze medical data and identify and mitigate hazards related to specific and/or systemic airmen and ATCS health issues;

- Improving the ability to match airmen and ATCS medical records with the electronic health records of other government agencies and departments;
- Ensuring the accuracy and integrity of airmen and ATCS medical data;
- Leveraging the National Health Information Network (NHIN), Health Information Exchange (HIE) system medical records, and ad hoc, regional and multi-regional HIEs, to improve the accuracy of airmen and ATCS medical data; and
- Improving the surveillance and oversight of designees and aviation industry substance-abuse programs."

### Information Exchange

As of June 15, the FAA had not answered AIN's questions about exactly which "electronic health records of other government agencies and departments" it intends to match with airmen and ATCS medical data. There are strict regulations that prevent sharing of medical data except under specific circumstances and generally requiring the permission of the person to whom the data belongs. These are codified under the Health Insurance Portability and Accountability Act of 1996 (HIPAA). However, part of

the Amsis effort, as the FAA stated above, is "Leveraging the National Health Information Network (NHIN)," among other information sources. The NHIN is actually properly termed "Nationwide" and not "National" and is a program of the Office of the National Coordinator for Health Information Technology, "established in 2004 to improve the quality and efficiency of healthcare by establishing a mechanism for nationwide health information exchange." A means of linking organizations to the NHIN has been developed, called the Connect gateway. "Members of the NHIN Cooperative plan to use the NHIN to support secure health information exchange at national, state and local levels," according to Connect.

Some of the 18 federal agencies involved in Connect include: Department of Health and Human Services; Centers for Disease Control and Prevention; National Institutes of Health; Department of Commerce; Department of Defense; Department of State; Department of the Treasury; Department of Veterans Affairs; Office of Personnel Management; and the Social Security Administration. AIN could not find any link between the FAA or the Department of Transportation and Connect, but it is clear from the FAA's Amsis plans that it wants access

*Continues on page 14* ▶





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## FAA wants to see medical records

► Continued from page 12

to electronic health records from “other government agencies and departments.” Connect could be one way to do so.

The Pilot Fitness ARC tasked with studying “the emotional

and mental health of U.S. commercial pilots” is composed of government and industry experts. According to the FAA, “The ARC will examine issues including the awareness and reporting of emotional and mental health issues, the methods used to evaluate pilot emotional and mental health, and barriers to reporting such issues.”

The FAA said that “Based on the group’s recommendations, the FAA may consider changes to medical methods, aircraft design, policies and procedures, pilot training and testing, training for Aerospace Medical Examiners, or potential actions that may be taken by professional, airline or union groups.”

One of the ARC members is Dr. Quay Snyder, president and CEO of Aviation Medicine Advisory Service, who is working with NBAA on aeromedical issues, as a member of the association’s safety committee.

Doug Carr, NBAA vice president of safety, security, operations and regulation, sees the ARC’s work as important,

especially for dealing with how to manage the issue of fitness for duty. “It’s not just are you or are you not tired?” he said. ARCs are not open to the public, but the public will have an opportunity to comment on any proposed regulations that result from the group’s work.

With regard to the FAA’s Amsis efforts and the possible sharing of electronic health records that might be involved, Carr said, “We don’t have a lot to say at this point. It’s a process that we hope will help speed up getting pilots their medical [certificates] and facilitate getting the records needed to support [that]. We don’t think it’s going to be carte blanche authority to get medical records from anywhere. The fact that I had a physical exam for work, while required to be disclosed, does not mean the FAA will be able to go to my physician and get my records. I think we’re a little way off from understanding what this means at a practical level.”

### Value of Shared Info

With advancements in technology, there is no question that medical information is becoming not only more widely available but also more easily shared electronically. The Germanwings Flight 9525 crash raises questions about the extent of authorities’ right to dig into a pilot’s medical records. Could that crash have been prevented if medical information had been shared with the airline, regulators and aeromedical licensing parties?

This is not a new issue. Civilian pilots have flown suicidal missions before; in fact, there was just such an accident on Feb. 9, 1982, when a pilot attempted to commit suicide by flying a Japan Airlines DC-8 into Tokyo Bay on the approach. The pilot survived, but 24 of the other 173 people on board did not. According to “The Suicidal Pilot Who Survived” by Dietrich Alexander and published last month by the OZY website, the airline never learned the true nature of the pilot’s depression.

According to Alexander’s article, “In the aftermath of the crash, Japan Airlines says it set up a committee dedicated to reviewing ‘both the physical and mental health of flight crew for ensuring safe flight operations,’ and has an established support system in place, including psychiatric expertise.” □

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# Industry experts weigh in on outcome of Part 23 rewrite

by Kerry Lynch

**It's no surprise the GA manufacturing industry likes the idea of a less complex certification process for its products, but what's in it for the customer? Pending specifics from the FAA in the form of an NPRM about a new Part 23, the jury is still out.**

As the FAA readies its sweeping proposal to rewrite Part 23 certification standards for light aircraft, industry leaders have high hopes that the final rule could jumpstart the sagging lighter end of the general aviation industry, bring new technology to market and possibly even take a bite out of cost for aircraft buyers and operators.

The agency has targeted year-end for release of the Part 23 notice of proposed rulemaking, with the stated goal of "twice the safety at half the cost." Believed to have been coined by an FAA official during a working group meeting, that goal has become the mantra for nearly everyone involved in the effort.

"The FAA and our global aviation partners are committed to streamlining the certification process for general aviation airplanes while enhancing safety throughout the world," said FAA Administrator Michael Huerta. "The FAA is working on completing its proposal as quickly as possible."

Manufacturers, long struggling with lengthy wait times and unpredictability in their certification processes, have pushed hard for the overhaul. Moving toward a performance-based approach that allows the top experts, rather than strictly regulators, to help set the standards holds the promise of long-term cost and safety benefits.

But industry leaders caution that "half the cost" does not necessarily mean new aircraft will be arriving on the market with prices dramatically lower than those today. In fact, many acknowledge that until the FAA releases an NPRM, it will be difficult to tell how far the benefits will extend.

## A Boost for Industry

Rob Hackman, vice president of regulatory affairs for the Aircraft Owners and Pilots Association, said his association does not expect to see the price of the aircraft drop in half. But he does see significant tangible and intangible benefits.

For starters, he said, the rule change will strengthen what has been an ailing light aircraft sector, he said. A stronger manufacturing sector means a stronger industry overall, said Hackman, who participated on the Part 23 Rewrite Aviation Rulemaking Committee that developed the recommendations for the upcoming proposal.

In more concrete terms, improved bottom lines and a clearer path to certification will encourage new technology, he said, noting the industry has seen few new Part 23 piston aircraft designed in

the past several decades. Also, it provides important safety equipment an easier path to market. The process is designed to help not only with approval of new equipment, but also supplemental type certification.

"It is good for the industry," added Kenneth Byrnes, chairman of Embry-Riddle Aeronautical University's Flight Training Department. "The rising cost of the certification process has slowed safety innovation."

Byrnes pointed to the aging piston fleet and the few new entrants to the market. "We still have the same basic airframes, the same basic engines. We are not seeing any advancement," he said adding. "A lot of manufacturers are still using old airframes that have been around forever."

While the airframes haven't changed, prices have—some by as much as 300 percent in the past two decades, he said, a number he attributes mostly to the cost of upgrading avionics panels.

"If [the rewrite] does bring costs down, it's huge for the training industry," Byrnes said. He points to research showing cost remains a significant barrier to bringing in new students and a factor in a number of student dropouts. Since ERAU recently refreshed its single-engine fleet, it might be another seven years before it undertakes the process again. Byrnes is hoping that the prices will have at least



Cirrus SR22

stabilized by that time, which in effect would be a price drop.

At the same time though, Byrnes underscored the importance of being able to bring new technologies and avionics to market sooner. In addition to his ERAU duties, Byrnes participated in the FAA's 2020 ADS-B working group. Certification remains a stumbling block for installation, he said. Byrnes noted that while manufacturers such as Garmin have developed ADS-B products, those products must be certified on each of the various airframes. The TSO and STC processes are time consuming, holding back the effort, he said, adding that this is true of all safety equipment. "I think that's why people still use magnetos in their airplanes."

King Schools co-owner Martha King agreed, noting that new technology attracts new interest in the market. She observed that flat-panel technology, such as Garmin's G1000, has stirred interest in the training market, and that newer-technology aircraft do the same.

King also noted that the Part 23 effort presents an opportunity for regulators worldwide to take a new look at general

aviation. The rewrite has been an international effort that has involved participation from regulatory agencies in Europe, China and Brazil, among others. Too often, international authorities tend to regulate general aviation as commercial aviation, she said. "There's a general tendency for authority to bring regulations from [the more stringent] Part 25 into Part 23." This can make development prohibitive and discourage innovation, she said. "It will be a big deal in the U.S. if it helps get new technology to market faster. I don't know whether it will bring down costs, but I do know costs need to come down."

## Changes Evident Now

The Experimental Aircraft Association's Sean Elliott notes that until the notice of proposed rulemaking is released, it will be difficult to determine just how far the changes will extend. The FAA has provided a few clues, supporting the European Aviation Safety Agency advanced notice of proposed rulemaking that established a template for changes in Europe's CS-23 (the counterpart to Part 23).

But even without a rulemaking, Elliott believes the rewrite has already begun to make a difference. "We can point to a shift in culture and philosophy at the FAA." He cites the angle-of-attack indicator. Early last year the agency released guidance designed to simplify the approval process for installation of AoA instrumentation, in a primary example of cost improvement. The owner of an experimental aircraft had been able to install an AoA indicator for about \$800 without the price of undergoing supplemental type certification approval. For a certified aircraft requiring STC approval the price would swell more than six-fold to about \$5,000.

Where it does not help—at least not yet—is with field approvals, Hackman said. Byrnes agreed, saying that if the field approval process can be streamlined and expanded, then the industry can move out of antiquated equipment. But instead, he said, the number of field approvals has shrunk.

Elliott concludes that while "no one single thing is going to turn the decline in general aviation," a Part 23 rewrite stands to build momentum for the industry. "It's not only the cost aspect, but the safety aspect," he said, and it has to happen. □



Bonanza G36



Piper Warrior



# FlightSafety PC-12 sims offer realistic experience

by Matt Thurber

With the exception of flying the real airplane, there is nothing more fun and challenging than a session in a full-motion simulator with a highly experienced instructor who is intimately familiar with the modeled airplane—in this case the Pilatus PC-12. FlightSafety International invited AIN to Dallas to sample the full-motion PC-12, the first such simulator available for new and returning pilots of the Pilatus single-engine turboprop.

FlightSafety placed the PC-12 NG simulator into service at its Dallas learning center about two-and-a-half years ago, followed by the legacy PC-12/47 Series 10 simulator last July. Both are full-motion level-D simulators with electric motion and control loading technology. The NG is equipped with the Honeywell Apex integrated glass cockpit, while the legacy simulator covers older models with BendixKing EFIS 40 avionics. The NG model was busy with a customer during my visit, so instructors Tom Evans and Dan Noyes and I took the regular PC-12/47 for a refresher flight.

My last experience in the PC-12 was a few years ago when I attended the initial training program at factory training provider SimCom, which offers fixed-base PC-12 training devices that do an excellent job of replicating the airplane. I flew a real PC-12 afterwards and found that the training devices provided a great introduction to the airplane.

## Pre-training Prep

FlightSafety has two locations at DFW Airport in Dallas with 30 simulators between them. The larger learning center, where the two PC-12 simulators are housed, also has two PC-12 classrooms and averages four initial PC-12 training courses per month. Students (or their employers) who sign up for a three-year commitment receive a 32-gigabyte iPad loaded with all the PC-12 documents, including FlightSafety's app used to store and access training materials. This allows students to prepare before arriving for class and also saves having to lug around a stack of books. All updates to the material are automatically downloaded by the app, so documents are always current.

For learning the Honeywell Apex flight deck in the PC-12 NG, Honeywell provides its training materials, under a reciprocal agreement with FlightSafety. A new feature being added soon for the PC-12 is flashcards on the iPad, which includes a self-assessment grading system that rates the student's knowledge. Flashcards are already in use on other programs. The iFlightDeck section of the FlightSafety app replaces the big cockpit poster with interactive graphics. Touch any section of the flight deck and it provides detailed descriptions, and the switches and buttons

move to light up applicable crew alerting system (CAS) messages.

The PC-12 is not a typical FlightSafety program, in terms of the variety of pilots who fly the beefy turboprop, ranging from owner-pilots to corporate, aeromedical, freight and even military organizations such as the Air Force's 319th Special Operations Squadron and Canada's Royal Canadian Mounted Police.

Initial PC-12 students spend the first five days in ground school. For the NG, students study the Apex avionics for the first two days, and on the second day they spend four hours in the simulator to practice using the avionics. NG students can speed their learning by running the Honeywell Apex computer training program supplied on their computers, and this is also available in the classroom and Internet cafe. The simulator portion includes 10 hours of pilot-flying training, either in five two-hour or two three-hour and two two-hour sessions, plus another 10 hours of pilot-monitoring. Part 135 pilots or ATP candidates get an additional two training sessions.

Many PC-12 trainees are owner-operators flying single-pilot. "They need to know the systems and how they interact," said PC-12 program manager John



*FlightSafety's PC-12 simulator gives owner-pilots access to professional-level training and a no-risk chance to experience emergencies.*

Patterson. "We try to elevate the bar [for owner-pilots]," he added, so they learn more about what it's like to fly as a professional. For many new PC-12 pilots, the experience at FlightSafety is their first exposure to a full-motion simulator and also to professional-level training. While there is no type-rating requirement in the U.S. for complex airplanes such as the PC-12, "We're here to try to give you information and help you feel better when you put your family in the aircraft," he said. "You retain it much better when you've been through it [in the simulator]."

In the classroom, Noyes backs up his explanations with animated dynamic systems presentations developed by FlightSafety's on-site designers. Detailed photos and diagrams of systems and components show students not only where items are located but also how they relate to associated components and other systems. For example, students



*During the pilot's session, SimVu records actions in the cockpit to use as an instructional tool during the debriefing.*

can view the actual PT6 engine fuel heat exchanger instead of a block diagram that outlines just the location. Other examples include a detailed diagram of the torque limiter, with an animation showing what happens when "Py" air is bled off, and a diagram of the oil system that is more detailed than Pratt & Whitney Canada's own materials. Another dynamic graphic shows the engine driving the propeller and all the resulting mechanical permutations.

For students who want to dive in even deeper, the Dallas learning center has an engine training facility where PC-12 pilots can learn more than they ever wanted to know about the PT6.

The classroom training with the dynamic graphics on the instructor's screens and also on students' displays makes it easier to conduct scenario-based training. The instructors like to teach students how to deal with CAS lights or messages, as a method to illustrate the particular system involved.

## View from the Left Seat

When it's time to fly in the simulator, FlightSafety instructors have a tool called SimVu that records the action in the cockpit. During the debriefing after simulator flights, the SimVu recording can be played back, and it replays not only the cockpit video and audio but also the positions of flight and engine controls and cockpit equipment. SimVu recordings are automatically deleted afterwards and never stored.

The PC-12 legacy sim is equipped with the latest high-resolution visual display, FlightSafety's Vital 1100; the PC-12 NG sim has a Vital X visual system.

Evans set us up for takeoff from Runway 17 at Montrose Regional Airport in Colorado, and right away he started in with the challenges. After a normal takeoff, he failed the engine to see whether I could conserve the energy in the big PC-12 and bring it back around to land on Runway 35. This happened a few times, ending when I came in way too high on one approach and touched down near the end of Runway 31 and blew all three tires trying to stop before the end of the pavement.

These maneuvers are not intended to teach pilots how to do a turnback after losing an engine on takeoff, but are just good handling practice, and they helped me regain the feel for flying the PC-12. The simulator felt a lot like flying a real

airplane, and the Vital 1100 visual display, with its ability to replicate clouds and terrain accurately, added to the realism.

We practiced an idle rollback on the PT6, which means that I had to "catch" the engine with the manual override using the emergency power (EPL) lever before power dropped below 50 percent. This requires a light touch on the EPL, which controls the fuel valve directly, and is a great example of how a simulator helps pilots practice events that can't be replicated in the airplane and without worrying about destroying expensive components. Evans then ran me through the airborne engine restart procedure.

At 10,700 feet, Evans produced yet another engine failure, and I glided down for a landing on Runway 13. With plenty of time to get set up, Evans suggested that I try gliding with the autopilot on, and that worked well, leaving me more time to focus on hitting the right milestones to get to the runway safely.

Evans repositioned the PC-12 on the localizer/DME approach to Aspen's Runway 15, and this was a great exercise because I quickly learned that I had to dump the nose after passing DOYPE intersection to have any chance of descending another 4,000 feet to make the runway. We flew the approach twice. The first time, I was hopelessly high because I didn't descend aggressively; the PC-12 likes to fly. The second time worked much better, but I had to lower the nose about 20 degrees to lose altitude in time to land. After the flight, we reviewed some of the maneuvers on SimVu, then Evans pushed the delete button.

The FlightSafety PC-12 instructor team serves as a resource not only for clients' technical questions but also for Pilatus itself. For example, the Royal Canadian Mounted Police experienced a failure of the number-one avionics bus, and the instructors were able to help pinpoint a relay that caused the problem. In another case, they were able to help Pilatus test pilots understand a CAS message problem on the PC-12 NG, where a stack of messages in some cases scrolled off the page on the display, leaving the root cause message viewable only by scrolling toward the bottom of the list, something that might be difficult for a single pilot during an emergency.

"We love this program," Patterson concluded after my flight. "We're always trying to make it better." □



# Business aviation pioneer Otto Pobanz dies at 93

by Kerry Lynch

Business aviation pioneer Otto Pobanz died June 12, in his sleep, at the age of 93. He

leaves a legacy for serving as a long-time business aviation pilot, safety expert and acoustic

specialist. "Otto represented what makes business aviation great. He was professional, personable, energetic, thoughtful and totally engaged," said NBAA president and CEO Ed Bolen. "He made a lasting impact on technology adoption, flight department management and practices, and on NBAA. Otto will be greatly missed."

Inspired by Charles Lindbergh's 1927 solo flight across the Atlantic, Pobanz began flight lessons at the age of 16 in a Taylor Cub and by the time he was 19 had amassed more than 1,000 hours. He was one of only three commissioned officers under 21 in the U.S. Navy during World War II. His corporate flight department experience traces to



Otto Pobanz made his mark on business aviation through his work on numerous safety initiatives.

the 1950s, when he became an executive pilot/captain for RCA in 1956. A year later he became chief pilot and flight operations manager for Federated Department Stores, beginning a 30-year oldcareer there.

He became active in numerous safety issues, serving on government/industry panels addressing proper management of NiCad batteries and the development of cockpit resource management. Safety concerns led Pobanz to help initiate development of Learjet 24/25 thrust reversers. Charged with reducing the cabin noise of Federated's Challenger 600, he led a team of engineering and product manufacturers to reduce interior noise levels while surpassing flammability and toxicity standards.

As a result of this effort, he later served on an FAA panel that led to new flammability standards and co-invented with ATR the Exo-Grid Interior isolation system for the Boeing Business Jet and Bombardier aircraft, as well as hydraulic noise-attenuation technology for the 600-series Challenger and the Gulfstream II/III.

He served on the NBAA board of directors from 1972 to 1983. The late John Winant, who served as president of the association, wrote, "Pobanz's subsequent long service on the Board was distinguished by his inquisitive mind and by the constant flow of ideas and suggestions it generated. He was a great, creative source of energy." □



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GDC Technics has secured its third completion project for the Boeing 787.

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## Completion centers are busy

*The need to travel and the desire for comfort and connectedness meet in glorious harmony in the cabins of today's business aircraft. Meanwhile, on the ground interior designers, engineers, completion specialists and myriad manufacturers strive to meet the ever-rising expectations and changing tastes of those who buy and fly on the finest conveyances mankind has ever ridden. This report highlights the products, services and developments that made a mark on the completions and refurbishment industry and its customers in the past year.*

Organizational changes have accompanied work on single-aisles and widebodies for multiple completion centers at **Advent Aerospace** (AA) of Largo, Fla., formerly Yankee Pacific Aerospace. In April one of the company's three divisions, component manufacturer Advent Aircraft Systems, was spun off, leaving interior structures companies Jormac Aerospace and Cabin Innovations in the fold.

Steve Jourdenais, named AA president last December, said the spin-off won't affect the company's completions work. Jormac, in Largo, manufactures interior components such as ceilings, walls and showers, while Texas-based Cabin Innovations makes galleys and lavatories for BBJs and ACJ319s up. Jourdenais said Cabin Innovations will be "expanding its refurbishment capabilities" into the business jet market. Jormac is developing latches that can work as either a quick release latch or a decompression latch, and Cabin Innovations will offer first-class seat surround pods used in some private and commercial aircraft. AA is currently providing interior structures for several 747-8s and a 787 Dreamliner. "We're never

allowed to disclose what completion center," Jourdenais said when asked. In a given year AA typically works on three to four widebodies and the same number of single-aisles, Jourdenais said, though he expects work to climb next year with more 787 projects and the Airbus A350's service entry. Global demand for single-aisle and widebody completion services remained strong in the past year, with many providers expanding, reorganizing and introducing new offerings to take advantage of anticipated

continued growth in the market. Here's the view on recent and upcoming developments from key players in the space.

**Aeria Luxury Interiors** inducted its first green BBJ last November, and is "well down the road" in the completion process, said Ron Soret, general manager of completions for the San Antonio firm. The company is also preparing to accept a Boeing widebody (type and owner undisclosed) for an interior refurbishment project. Concurrently, Aeria, ST Aerospace's

private interiors brand, is performing a combination of interior work, maintenance and avionics upgrades for two Boeing 757s and a BBJ. Similar refurbishment projects are "in the pipeline," and Soret sees more such work ahead as the BBJ fleet (which began entering service in 1999) matures.

Aeria's 3-D printer, acquired last year, is proving invaluable, creating a variety of "conceptual, decorative, cosmetic and one-off parts," as well as production parts such as connector brackets and ducts for the ventilation system, Soret said. All Aeria's single seat armrests are 3-D printed, saving fabrication time and labor. He expects such equipment to make "a significant contribution to interiors in the future."

Aeria has established a refurbishment facility in Singapore for regional clientele, and is in the process of adding an interior design space and sales and marketing offices to the hangar complex. Construction began in May.

Looking ahead, Soret said

the Middle East market remains strong, though China and Asia are coming online "a little slower" than hoped.

Basel's **Amac Aerospace** closed out last year with redelivery of its first 747-8 completion, outfitted in "premium airliner configuration" for an undisclosed Asian head of state. Though Amac has its own design team, the owner provided the design package and specifications for the project and requested a proposal. (Amac had previously performed an ACJ319 completion and maintenance services for the customer.) The aft cabin of the -8 has a mix of first and business class airliner seats, while the forward cabin features a main lounge, office, and two bedrooms and lavatories with showers. CMS and IFE systems provide high-speed Internet access and control via personal devices. A humidification system helps keep the cabin comfortable; wood veneers provide soothing visual and tactile accents. Food and refreshments are provided from seven galleys.

Amac Group COO Bernd Schramm said a 747 completion costs about four to five times the \$35 million to \$45 million price of an



Aeria has several completions and refurbishment projects in the works and anticipates being even busier in the coming years as owners look to refresh older aircraft.



Amac Aerospace has seen demand from Asian clients build and has developed designs that reflect the aesthetic of customers in the region.



ACJ319 completion, commensurate with the difference in size.

Amac, like other completion centers, says demand is strong for IFE and connectivity. Last September Amac won a contract to upgrade the IFE system on a 737-7BC with new monitors and hi-def speaker system, and more IFE/CMS work may be on the way. "Now we are talking [to customers] about mobile phone usage in the cabin, fully digital entertainment systems, satcom, and Ku- and Ka-band installations," said Schramm.

As this issue went to press Amac was on the verge of completing a green Airbus ACJ319 for a customer in Asia, scheduled for delivery in the second quarter. The interior features "quite a bit of carbon fiber," said Schramm, adding that "it's difficult to find the quality [of carbon fiber] that meets our expectations."

**Associated Air Center (AAC)** of Tempe, Ariz., joined the list of facilities performing completions on the Boeing 787, inducting a 787-8 for a head-of-state completion in October. AAC president James Colleary described the challenges of dealing with the composite structures and advanced systems on the 787 as "a whole new ball game," noting the engineering, tooling and technical capabilities required for the composite airframe. Redelivery is expected by year-end. AAC is also in the process of completing a 747-8.

In another milestone, last September AAC delivered its first green Airbus widebody completion, an A330-200 for an undisclosed head of state. The interior, installed at the company's Love Field facility

in Dallas, includes a high-speed connectivity platform and high-def IFE system, full front and rear galleys, a complete zonal drier and humidification system, sound insulation throughout the cabin and a standup shower. Anticipating more such work, Colleary said AAC has added staff and expanded its facilities "to accommodate this and future widebodies."

AAC is awaiting delivery of a green ACJ320 next month. Interior design and technical specification development is almost done. The layout includes a custom forward galley, master bedroom and lavatory, a three-zone main lounge and mid-cabin principal's lavatory. The IFE system features large bulkhead-mounted LED screens, with audio and video on demand (Avod) and surround sound. Satcom broadband and global system for mobile communications (GSM) will support passenger connectivity. The aft cabin hosts a staff area, galley and passenger lavatory.

**Greenpoint Technologies** is on track to claim the first private 787 completion and redelivery, planned for next year. It's one of two 787-8 completions the company is currently performing. Redelivery of the second is slated for 2017, and the company says both programs are ahead of schedule. Greenpoint sees the market remaining strong as 747-8s continue to "hold capacity" and 787 production proceeds. However, low oil prices, unrest in the Middle East and China's austerity campaign are "pushing opportunities to the right," said Christine Hadley, senior



Having started its completion business with a focus on single-aisle aircraft, Comlux has rounded out its service offerings and can outfit widebodies as well.

manager of marketing.

Demand is strong for personal cabin designs that feature efficient use of cabin space, comfortable seating, media integration and state-of-the-art technology, particularly high-speed connectivity (Ka-band) and streaming IFE. Recent completion projects incorporate touches such as electric sensor doors, Oled (organic light-emitting diode) digital walls, hand-painted gold leaf ceiling coves and chandeliers.

For its 747-8 program, Greenpoint recently obtained the first European Aviation Safety Agency (EASA) supplemental type certificate (STC) for an Aeroloft, the eight-berth sleeping area above the aft main cabin Greenpoint developed for the jumbo. A second Aeroloft certification is under

way, and two more are expected by year-end.

In June last year Zodiac Aerospace bought the Boeing widebody completion specialist, and this spring Greenpoint Technologies merged with sister companies Odyssey Aerospace and Services to form an expanded Greenpoint Technologies Corp. The merger unites Greenpoint's cabinetry and machining facilities in Denton, Texas, and its manufacturing and testing facility in Marysville, Wash., with the corporate headquarters in Kirkland, Wash.. The divisions were already operating as a unified company, according to Greenpoint CEO Scott Goodey, as the teams at each facility "work together on every program, representing true vertical integration. We are 'one Greenpoint' and it's efficient to combine our business processes to reflect this."

Greenpoint Aerospace, a business jet MRO facility in Denton, Texas, continues to operate as an independent division servicing private, corporate and military aircraft.

Last December Zurich-based Comlux the Aviation Group ordered two BBJ Max 8s for its charter business. No surprise the company turned to its **Comlux America** completion center in Indianapolis to handle

the interior design and installation. Currently in development at Boeing, the first Max 8 is expected to roll off the assembly line in 2018; no date for delivery of Comlux's jets has been announced.

Meanwhile, Comlux America announced at MEBA 2014 its first widebody completion contract, an A330 scheduled for induction this September. To meet the needs of this and future widebody projects, Comlux America is expanding its current hangar by some 19,000 sq ft, to 157,000 sq ft, large enough to house any widebody along with six single-aisle bizliners simultaneously. Project completion is slated for this year's fourth quarter.

"We are now capable of doing any type of narrow- or widebody completions, making us an even stronger player in the industry and on an equal playing field with our biggest competitors," said Richard Gaona, Comlux Group chairman and CEO.

Comlux America in the past year also signed contracts for a green ACJ320 completion and a BBJ refurbishment for a Chinese customer, while delivering a BBJ and ACJ321 completion for an Asian and Central Asia customer, respectively. The BBJ cabin features "ultra-modern" custom electric POD seats made by Iacobucci and four different cabin configurations that convert lounges and offices into bedrooms and sleeping quarters.

The ACJ321 is the first of its type ever completed, according

*Continues on next page ►*



Greenpoint showed off its Boeing 787-9 Azure 1/20th-scale model Dreamliner at MEBA 2014. The Azure interior features open living space with a forward master suite, private office, and two aft mini suites for guest accommodations.

AIN's annual special report on cabin electronics and online connectivity, the rapidly evolving frontier of cabin completion technology, will appear in next month's issue. ■



► *Continued from preceding page*

to Comlux, and was performed under an “extremely strict timeline for redelivery.” Comlux America met the schedule, and also beat the weight and sound level targets. Thanks to weight reduction and sharklet-equipped wings, the jet now has more range.

In March, Scott Meyer, former COO, was promoted to CEO of the U.S. facility.

Comlux has seen demand in Asia for its cabin completion and refurbishment services rise since opening a Hong Kong office in 2012, Gaona said. The first contract came after Comlux assisted an owner negotiate purchase of three aircraft, with the client selecting the company for the completions “just after the signatures” went on the sales agreement.

A year after establishing its Original Equipment Innovation product division, backed by €200 million in R&D funding, **Lufthansa Technik** (LHT) has introduced a host of new partnerships and products.

This May at EBACE, LHT announced teaming with Mercedes-Benz Style to jointly develop “an entirely innovative, luxurious and integrated cabin concept” for short- and medium-haul aircraft. Their interior concept features a dynamic, spiral layout, creating new independent spatial zones without the traditional arrangement of seat and wall elements, according to the companies. Target customers are “global clientele with a strong affinity for unique

design.” The partners describe the interior as “organic and homogeneous, like a DNA helix,” with furniture merging with the cabin interior. Windows are concealed by so-called black panels, inspired by the screen design in the Mercedes-Benz S-class. Mercedes-Benz Magic Sky technology allows the panels to be dimmed electrically from transparent to black. The companies will evaluate the general level of market interest while developing details of the design concept over coming months.

Also at EBACE this spring, LHT and Airbus Corporate Jets (ACJ) introduced the Elite ACJ319 modular cabin, based on the companies’ successful ACJ318 Elite (19 deliveries to date). The Elite offers predefined layouts and modular design elements as well as color and material options, promising lower costs and faster delivery times compared with customized completions. The baseline configuration consists of a crew-rest/entourage area and executive lounge with full-flat club seating and berthable divans, and mid-cabin lavatory with private office that converts to a bedroom. A master bathroom is aft. Beyond the basic design, the ACJ319 Elite has more than 20 layout and systems options, and thanks to the length of the cabin can accommodate an optional executive office as an additional private room, unavailable in the ACJ318 Elite.

LHT also offers its own Leadership Select concept, a cost-conscious, modular

concept adaptable for interior completions of the ACJ319 and BBJ2. Launched at EBACE last year, Leadership Select offers a multitude of cabin elements customers can mix and match. “This reflects the new customer base coming up, a lot younger in age,” said Wieland Timm, LHT’s director of sales, VIP and special mission aircraft. “It started in the Russian region, now it’s in Asia,” among what he calls “the iPhone generation.” To help customers envision what the completed Leadership Select interior will look like, Lufthansa Technik has been demonstrating an online tool customers can use to select elements and design their own single-aisle aircraft cabins.

This doesn’t mean the bespoke market is hurting. “The widebody aircraft are mostly head-of-state customers or rich individuals,” Timm said. “They are interested in economic ups and downs, but they are more or less stable.”

Chair, LHT seats that are adaptable to passenger aircraft of all kinds, another product that made its debut at EBACE last year, is now “coming into fruition,” said Timm. Other offerings range from the practical to the fanciful. LHT has introduced a next-generation patient transport unit, designed to meet the medical needs of any passenger traveling on a private airliner, and has also introduced a “fireplace” for private jet interiors. “We can make dreams fly,” Timm said, underscoring the message the fireplace is meant to send. It’s not real fire, but it can



*Jet Aviation Basel has developed for widebody aircraft a plug-and-play in-flight dishwasher with a three-minute wash cycle that runs on three liters of water.*

ANDREW WINCH

produce heat and alter the intensity of the “flames.”

As for traditional completion projects, LHT is finishing two head-of-state 747-8 projects and is in “concrete” discussions about completions with more 747-8 customers, said Timm. The company also added a new product for its extensive 747-8 service portfolio: the Aircraft Production Inspection Program, an independent production inspection offered to all private customers, airlines and leasing companies.

Meanwhile, Lufthansa Technik’s single-aisle completion subsidiary in the U.S., BizJet International, will perform an ACJ319 completion in cooperation with the bespoke division of Hermes, for an undisclosed customer from Taiwan. The seats and divans will be designed

and upholstered by Hermes craftsmen in Paris, and the interior will feature exclusive Hermes fabric on bulkheads and curtains.

**Jet Aviation Basel** (JAB) is celebrating recent completion wins. It was contracted in May to perform both the first completion on a private 787-9 for a customer in the Middle East, and head-of-state completions on an A319 and A330 for a Middle East operator.

The 787-9 will be delivered to JAB this year with redelivery in 2018. JAB’s “precise understanding of the data required by Boeing to validate the modification of systems and structures” will help ensure a smooth progress, said Neil Boyle, noting JAB engineers began working with Boeing in 2011 to prepare for completions on the composite 787 airframe. “Developing this degree of engineering specification so early in a project is unprecedented,” said Boyle, v-p and general manager of JAB’s completions center. “As a basis of comparison, such engineering maturity is typically attained only with traditional metallic aircraft by the final design review. In this sense, Jet Aviation truly is writing the rule book for completing carbon-fiber aircraft.”

Completion project management and interior design services will be performed by EH Aviation Advisors in cooperation with Andrew Winch Designs. The head-of-state interior features a master bedroom, bathroom and office suite, and large open-plan dining and living area, as well as rooms for guests. The interior will feature a global communications system, and state-of-the-art lighting,



DAIMLER

*Expect to see more innovative cabin concepts from the LHT-Mercedes team, which has set its sights on “global clientele with a strong affinity for unique design.”*

*Continues on page 24 ►*



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heating and sound-proofing.

The A319 and A330 completions will be performed for Riyadh-based Alpha Star Aviation Services, one of the Kingdom's major private aviation services providers, and both interiors are being designed by the Basel Design Studio. The green aircraft will be delivered to Basel in the fourth quarter, and once completed it will be available for charter.

Earlier this year JAB redelivered a long-range BBJ1, its 25th custom-completed BBJ. To help meet the jet's long-range mission requirements, JAB engineers drew on technology improvements gleaned from 787 project development to develop a sound insulation technique that cut insulation weight by 30 percent, resulting in longer range and a quieter cabin. The BBJ1's modern minimalistic interior design contrasts white and taupe tones against black wood, with sting-ray skin inlays emphasizing the custom-made furniture. Following completion and certification of the interior, the BBJ1 received what Jet Aviation Basel calls the most complex paint livery it has ever executed, a sleek black to gray fade-out livery of 19 mixed design colors that link

the interior and exterior colors. Both interior and exterior design concepts were created in-house by the Jet Aviation Design Studio.

In another Boeing win, in April Boeing Business Jets selected the company after what JAB called "intensive and competitive bidding" for completions of two 777-300s for an undisclosed Asian customer. Work began immediately and is scheduled for completion in the third quarter of 2018. Since 1999 JAB has completed 25 Boeing interiors, the last earlier this year. Before the year is out JAB will also deliver an A340-600 and ACJ320, and the company has a strong backlog, with a spate of inductions starting next year, said Matt Woollaston, JAB's v-p for completion sales and marketing.

**Jet Aviation St. Louis** (JASL) marked its 220th business jet interior completion last fall, less than two years after breaking the 200 barrier. "And we're proud to say that all but one of the deliveries was on schedule," said Chuck Krugh, JASL senior v-p and general manager. "We've kept building the pace of completions with a series of continuous improvements initiatives

and 5S and Lean technologies at every level of the process." The majority of the completions—117 aircraft—have been performed since 2008, despite the global recession that began that year. JASL is an authorized Challenger and Global completions center.

JASL is also active in the refurbishment market, and Krugh says it's "reached the perfect balance among the completions and the maintenance and refurb sides of the house." The company sees a continuing trend toward detailed personalization, with new cabin features ranging from electric pocket doors in mid-cabin bulkheads to powered shades on windows in the bulkheads, new side-ledge designs, and heated seats and floor mats.

Dennis Gilbreth, JASL director of MRO operations and completions, said he's seeing the return of the pop-up seat in the credenza that was popular many years ago. "This is our own design and we've done five recently," said Gilbreth. Customers are introducing new materials, such as carbon fiber, stainless steel and anodized aluminum. Darker woods are becoming more popular, as are other exotics such as pearwood. Satin finish on wood elements is more requested than gloss.

Customers are getting bolder with their exterior paint design and colors, as the paint scheme JAB recently applied to the BBJ1 attests.

Meanwhile, JASL now has more than 225 completions to its credit.

At EBACE last year, Mohammad Alzeer announced rebranding Gore Design Completions, the widebody completion specialist, as **GDC Technics**, along with ambitious plans for reorganization and global expansion. At the annual May event this year, Alzeer, general partner of GDC Technics, who together with his partners bought the San Antonio-based company two years ago, announced the company won its third 787 completion contract. The company is establishing facilities in Europe and the Middle East, and a facility in Africa (Morocco) is imminent.

Alzeer declined to identify the 787-8 customer but called the contract "a game changer, as it involves developing a new prestigious first-class cabin that integrates new cutting-edge technologies with maximum luxury found only in VIP aircraft." GDC is scheduled to



The BBJ has proved a significant platform for Pats Aircraft Systems, which expects to see even more demand for its services when the BBJ Max enters service in 2017.

take delivery of the green aircraft in 2017.

Completion work on the first two 787s and a 777-300ER is under way, and GDC also has a contract to refurbish a BBJ1.

GDC built a new 850,000-sq-ft facility at Alliance Airport in Fort Worth, Texas, and after investing \$20 million in restructuring, development and expanding its engineering and certifications capabilities, is now a "100-percent Catia environment," Alzeer said.

While GDC has no plans to move from its home, maintaining an international presence is essential, Alzeer said. The company bought a German engineering firm (now GDC Munich) and is opening a Casablanca facility and as part of that strategy. "Our demand is global," Alzeer said. "We have customers in China, the Middle East, in the U.S., in Central Asia. The weakness we had is that we were not close to customers."

Hong Kong-based **Haeco Private Jet Solutions** (HPJS), formerly Taeco Cabin Completion Center, launched its new corporate identity at MEBA last December and since has proceeded to unveil new interior designs for widebody and single-aisle private jets incorporating Asian aesthetics and influences. The company's new name aims to underscore HPJS's suite of services covering the entire lifecycle of an aircraft.

Haeco's Xiao Yao design concept for ACJs brings feng shui principles used in traditional Chinese architecture to the aircraft cabin, expressed in curving lines and the relative positioning of living and sleeping areas.

"Ultimately, the objective is to serve wealthy individuals in China," said Henry Chan, commercial v-p of the Chinese company. The Xiao Yao interior would require 18 to 24 months, "only marginally longer than a

traditional green cabin completion," said Chan.

Xiao Yao is complemented by Haeco's widebody "East meets West" concept, which combines traditional Asian design elements with Western motifs, introduced at EBACE this spring. Based on the A330-200 cabin, the interior concept is adaptable to any widebody, said Chan. The Asian design elements include latticework and silk-embroidered Fromental wallpaper with dragon and bamboo representations, while Western style can be seen in its bold color contrasts of matte gold and pale green, and open, clean lines. The dining room features a sushi bar. "It's a new gourmet concept," Chan said. "If you swing by Tokyo, you can buy fresh catch of the day" and have it prepared on board. The aft cabin provides a private room, master area with en suite bath, and an exercise area with treadmill and stationary bicycle.

To translate its concepts into reality, HPJS's Haeco Xiamen MRO facility at East Gaoqi International Airport in Xiamen has six hangars, each capable of simultaneously accommodating two widebodies and one single-aisle aircraft. HPJS, the only company in Asia that is both an Airbus and Boeing approved completion facility, has access to EASA validation STC approvals through a working arrangement between the EASA and HKCAD (Hong Kong Civil Aviation Department), and FAA certification services in the U.S. through its San Antonio, Texas facility.

A year ago **Pats Aircraft Systems** was acquired by Moelis Capital Partners (MCP) of New York City, a bullish sign for the widebody and BBJ completion markets. Pats is currently performing a head-of-state completion on a new BBJ2, inducted

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Haeco Private Jet Solutions showed off its "East Meets West" widebody cabin concept, combining traditional Asian design elements with Western motifs, at EBACE. In addition to more typical amenities, the cabin features a sushi bar in the dining room.





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## Lufthansa Technik

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in October, for an undisclosed Asia-Pacific-based customer. The aircraft is being outfitted with Honeywell Aerospace's Ovation Select CMS, providing control of in-flight entertainment and environmental conditions such as lighting, temperature and window shades from a touchscreen at their seats

or from their personal mobile device. According to Honeywell, this is the sixth Ovation Select installation on a BBJ. The aircraft will be "among the most elegant and well equipped in operation once delivered" late this year, said John Eichten, Pats's senior v-p of sales.

This year Pats received its fifth consecutive Diamond Award



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*Lufthansa Technik is completing two 747-8 projects. Details are confidential, but the final product will satisfy even the most demanding passenger.*

of Excellence from the FAA for commitment to aviation safety through maintenance technician training, and hosted a celebratory luncheon for its more than 300 employees and guests, among them personnel from the FAA Flight Standards District Office.

The Georgetown, Del.-based company remains focused on BBJ completions, and is looking for more customers overseas, though it might put more emphasis on its refurbishment business, according to John Martin, Pats president and CEO. The company's auxiliary tank installations, which provide an entrée for pitching its completions capabilities, have slowed in recent quarters, but Martin sees a rebound ahead when the BBJ Max becomes available in 2018.

A new player has entered the greenspace with the debut of **Sierra Completions** at the NBAA Convention last fall. The Sierra Nevada (SNC) subsidiary aims to focus on the composite widebody completion market, and expects to receive its first contract by the end of this year. "There is a global customer demand for a financially and technically strong, proven performance partner in this market segment, and we are committed to being the premier global partner," said Sierra Completions president Jon Burgoyne. "While the aircraft completions market is a highly specialized segment with a demanding clientele, we have the backing of SNC, which has been in the aerospace and defense business for more than 50 years, and has modified and integrated 200 aircraft of various sizes," Burgoyne said.

Work will be performed at Sierra's planned \$88 million completions complex at the Colorado Aerospace Park at Colorado Springs Airport, which will be capable of performing completions on the Airbus A350 and Boeing 747 and 787. SNC expects the facility will employ more than 2,100 people within five years. □

*Report continues on page 28 ►*



What do aircraft operators want from their interiors? Customization. Who can make most any goal and budget a reality with creative solutions? Duncan Aviation.

## Meet Lori

An aircraft designer from Duncan Aviation's Battle Creek, Michigan, location, says every business aircraft operates differently, challenging her to come up with unique solutions daily.

"The key to developing the best solution is interviewing the customers to uncover their main priorities," says Lori. "Some customers come in with exactly what they want, but after looking at the aircraft and considering its use, I usually see something they haven't considered." That's the type of knowledge that only comes with nearly a decade of experience.

Lori says her team can accommodate most requests, but they like as much lead time as possible to minimize the aircraft's downtime. Duncan Aviation's team members can order parts and complete the engineering, as well as most designs, before the aircraft inputs, making the process smoother for everyone.

"Even something small, like ordering parts for new china inserts can require a few weeks, so operators are always happier in the end if they plan ahead," says Lori.

For the rest of the story visit  
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Greenpoint Aerospace is performing interior work ranging from minor upgrades to complete refurbishments and service on various aircraft. This Falcon cabin was one of the company's recent projects.

## Refurbishment Specialists

Carbon fiber, iPad apps and maintenance downtime are among the ingredients driving a robust refurbishment market. Here are highlights of the past year from some of these turnaround specialists.

A Cessna Citation 650 was the canvas for a complete interior refurbishment performed by Spirit Aeronautics. The do-over incorporated carbon-fiber inlays, blackened wood laminates, high-gloss coatings and brushed nickel-plating, details typically seen only on larger business jets. Seats were covered in complementary graphite charcoal gray leather over multi-layer hand shaped foam, and the two-tone block pattern carpet was crafted to give the illusion of depth, enhancing the perceived size of the walkways.

"The client was attracted to clean European styling combined with western comfort, which is challenging in an aircraft of this size," said Tony Bailey, president and COO of the Columbus, Ohio company. Furthermore, "The client did not want to change the certification basis of the aircraft, so we had to look for stylings that gave a minimalist impression without adding or removing any of the current furnishings."

Constant Aviation finished 2014 with delivery of a custom refurbished Beechjet, its 11th of the year. Constant replaced all soft goods and designed and installed new drink rails, window lines and passenger service units. A three-place divan was added, the lavatory extended and new galley installed. The Cleveland-based refurbisher, a Directional Aviation Capital company, has also begun using a custom iPad app that allows "the customer to virtually walk through the

new interior, and ensures that they will be pleased with the outcome," said John Shirley, director of interior operations.

Bombardier completion specialist Flying Colours is converting eight CRJs into executive aircraft with the assistance of technicians in training from China's Sparkle Roll Aviation. This is the first project under a partnership agreement announced at ABACE 2014. The conversions are being performed at Flying Colours' facility in Peterborough, Ontario, Canada, and the interiors range from executive configuration to shuttle. The first three jets will be finished as mixed-class, with half corporate shuttle, half VIP combo interiors, all featuring ebony seat leather and black trim with rose gold plating, and an exterior custom scheme with a mauve palette. Interior designs of the remaining five are being finalized. The long-term plan calls for transferring the CRJ conversion work to China. Future projects have not been announced.

Fokker Services is performing a head-of-state completion on a BBJ2 for an undisclosed Asian customer under a contract with Boeing concluded in December. Work is under way at its Netherlands facility with redelivery scheduled for August next year. The award "will bring our relationship with Boeing to new levels," said Johan van Dorst, sales director for Fokker's completion and conversion business. Fokker's

SkyView panoramic window, developed for the BBJ and introduced at EBACE '14, also displays the companies' growing ties. Fokker announced its first order for the jumbo port-hole installations at EBACE this spring. Spanning the space of three standard windows, as many as four SkyView windows can be installed in a BBJ.

MRO provider Greenpoint Aerospace (sister company of widebody completion specialist Greenpoint Technologies) is performing interior work ranging from minor upgrades to complete refurbishments on some 20 business aircraft. Based at Denton Municipal Airport in Texas, Greenpoint has OEM approvals to service Challengers, Learjets, Gulfstreams, Hawkers, Beechcraft, Citations, PC-12s and Avantis, and its paint facility accommodates Global/ GIV-size aircraft.

Ruag Aviation's Geneva maintenance facility, under contract to Malaysian MRO provider Airod, performed a major refurbishment of a Falcon 900 owned by the Royal Malaysian Air Force. The full cabin renovation coincided with an extensive 4C check and upgrade of the avionics systems. It includes new seating and LED lighting, along with installation of Vision Systems' new electronic dimming window shades, and a Honeywell Ovation cabin management system, Ruag's first installation of that CMS in a Falcon 900. An Airshow 4000 and Satcom 7000 system were also added to the cabin.

Threshold Aviation Group of Chino, Calif., is planning to "flip" a Citation CJ2 purchased with structural damage to its wings, the latest of some 50 "distressed" aircraft

the MRO provider has bought, refurbished and resold over the past 15 years, said COO Tom Bressan. Last year Threshold refurbished and resold a Europe-based Citation CJ3 with an extensive blue stain on its belly from a lavatory leak. Threshold de-mated the wings using tooling company technicians designed and built for the project. After inspecting, cleaning and reassembling the aircraft, the company refreshed the interior and repainted the exterior. The CJ3 is "back in airworthy condition with no issues," according to Bressan.

West Star Aviation had a record year, performing 35 refurbishments in 2014, half of them major projects such as complete soft goods replacements and cabinetry renovations, along with IFE and avionics upgrades. The Alton, Ill.-based MRO is "getting away from partials," said Debi Cunningham, v-p of marketing and interior design, as those projects tend to "blossom into full interiors. Customers see you can't do a partial [refurbishment] and think everything else will look good." Some of the upgrades amount to downsiz-

The major refurbishment projects Jet Aviation Basel (JAB) performed in the past year included a trio of BBJs. One required a configuration modification, performed according to a plan created by JAB Design Studio, and the others received complete CMS and IFE system replacements. Customers who formerly used maintenance time only for repairs now "want to use their aircraft downtime for refurbishment projects, including new interior designs, reupholstery, technology upgrades or even a new cabin layout," said Vincent Rongier, JAB's head of refurbishment, modification and upgrades.

"Several" 747s and BBJs, an ACJ, and multiple Gulfstreams, Falcons and Bombardier aircraft are currently in the hangars or scheduled to arrive later in the year for retrofit, modification and upgrade services, Rongier said.

Concurrently, JAB has upgraded its facilities and capabilities, the enhancements spanning the upholstery, paint, wheel, repair, survival-equipment and interior shops.

Gulfstream Aerospace captures a large share of refurb-



Flying Colours has carved a niche for itself converting airliners, such as the Bombardier CRJ, to executive use and landed several such contracts this year.

ing. "We're seeing a trend: airplanes come in with ovens and all kinds of fancy galley equipment, and we're taking it out and going back to microwaves." The company refurbished its first Global at Alton this spring, a project that included removing the shower. Meanwhile, customers are asking for more automotive styling in the cabin. "They want seats refurbished in high-end Ferrari, Maserati and Bentley styling," Cunningham said.

West Star also completed a major refurbishment of its own facilities, including a \$6 million maintenance hangar and accessory shop renovation and a \$1 million wood and upholstery shop expansion. A new \$9 million paint shop at its Grand Junction, Colo. facility opened last month.

ishment services for its pre-owned aircraft. Approximately 70 percent are custom projects, but for customers who want to minimize refurbishment downtime, Gulfstream offers its Portfolio Collection, a branded, in-stock collection of materials, patterns, finishes and colors encompassing all interior elements. The collection is constantly evaluated to include current design trends; this year alone more than 50 new fabrics were added to the collection before summer, complemented by new leathers, said Matthew Huhn, director of product support business and program support. The collection is particularly helpful for pre-owned aircraft buyers, who aren't able to plan a completion in advance. □



## The OEMs

OEMs set the standards that define state-of-the-art business aircraft interiors, and the work of their interior design departments is critical to sales success. Here's what manufacturers are doing to keep their interiors contemporary amidst constantly changing tastes and rising expectations.

**Bombardier's** interior design teams are highlighting the Global 7000, Challenger 650 and Learjet 75 this year. Customer reaction to the full-scale mock up of the Global 7000 interior introduced last spring affirmed the team's design direction, said Brad Nolan, Bombardier's director of product planning and strategy. Inspired by grand homes, yachts and five-star hotels, the mock-up's four-zone configuration is "one of a thousand possible combinations" of cabin layouts, said Tim Fagan, Bombardier's manager of industrial design. The longer-range, shorter-fuselage Global 8000 will have a three-zone cabin; the models are slated for service in 2016 and 2017, respectively.

The prototype interior of the Challenger 650 made its debut at EBACE in May, modeled on the Challenger 350 introduced a year ago. Both cabins incorporate new lie-flat seats, redesigned galley, side ledges and intuitive side ledge-mounted passenger control units.

In the Learjet line, Nolan cited the Learjet 75, the updated

Learjet 45, certified in late 2013, calling it "a brand-new airplane from a customer standpoint," with its flat-floor interior allowing two distinct floor plans; options include double club seating, and the now standard LHT Nice CMS from Lufthansa Technik installed on Challengers.

**Dassault Falcon** design teams are spec-ing interiors for the 8X, scheduled for certification in the middle of next year, said Judy Miller, manager of aircraft interior design at the company's U.S. headquarters in Teterboro, N.J. Added space in the stretched version of the 7X cabin creates opportunities for an enlarged crew rest space in the front and a "cozy corner" with a small divan in the aft cabin.

Meanwhile, the teams "are just now starting to meet with customers" about the interiors of the 5X, the clean-sheet, wider-cabin Falcon expected to enter service in 2017, Miller said. The wider cabin has a "different and unique geometry" designers are exploiting in several ways, such as using larger patterns on carpeting to create a feeling of extra space.

Early this year Dassault Falcon upgraded its Teterboro Design Center to improve the completion selection process. The company has also introduced the Falcon Configurator for the selection process, a 3-D visualization tool that provides a virtual walkthrough of a Falcon cabin with different layouts, colors furnishings and other options, so customers can "see" and compare how various interiors look and function.

Dassault Falcon's completion center in Little Rock, Ark., is in the midst of a major expansion in preparation for the expected onslaught of 8X and 5X completions.

Seated aboard an **Embraer** Legacy 500, Jay Beever, the Brazilian OEM's v-p for interior design, pointed to the metal cup holders, all recessed into the



As Dassault designers lay out the cabin of the clean-sheet Falcon 5X, above, they are certain to consider convenient storage/power for passengers' essential devices.



Recognizing that not all customers want a customized interior—or the extensive planning and downtime that goes with it—Airbus offers its standardized Summit layout.



Gulfstream displayed this mock-up of the G600 interior at last year's NBAA Convention, where it sought feedback from potential customers. The cabin of the G600 can have as many as four living areas and a crew rest area.

rich wood veneer, rather than atop the surface as usually positioned in business jets. "The key is to have layers of detail—metal, wood, leather—the primary, secondary and tertiary accents," he said, talking about the overall look and feel of the interior. Indeed, those accents are repeated throughout the cabin, which also highlights strips of exposed machined aluminum from the airframe. Beever came to Embraer in 2012 after heading Gulfstream's interior department; the Legacy 500, certified last summer, and the Legacy 450, slated for certification this year, are the first interiors fully reflecting his design ethos, and the direction Embraer's interiors are headed. Aesthetics aren't the only concern.

Interior panels, easily removable for aircraft servicing, have floating gaps, minimizing the effects of normal airframe shrinkage and expansion. Underneath the surface, industrial design has simplified the interior production process, for example ensuring the French stitching on the leather seats can be performed simply and perfectly every time. "This interior assembles so much faster than any in the past, and it comes out easily," said Beever. "You need the airplane up and running. All these parts are designed for dispatch and reliability."

**Gulfstream** is emphasizing "more opportunities for personalization" in its completions, said Tray Crow, the OEM's director of interior design, while also focusing on the G500 and G600 programs, announced last October. A full-scale cabin mockup of the G600 shown at the NBAA Convention last year drew "a lot of feedback from prospects and buyers," said Cindy Halsey (formerly of Textron Aviation), who was named v-p of customer completions and designs last

October and charged with ensuring customers have a "world-class completion experience." The G500 has three living areas and the G600 has up to four, and an optional crew rest area. Both will feature a new seat design, and some architecture from the Elite interiors developed for the new G650 and later applied to the G550 and G450 will be incorporated in the new models.

Gulfstream also introduced a cabin configurator iPad app last fall. "We're using it as a tool during the outfitting definition process," said William Gay, director for customer completions. The company also opened a new design center at its Long Beach, Calif. facility last fall, to provide greater support to West Coast customers in selecting interiors and paint options for their aircraft.

**Textron Aviation's** reorganization of its interior design processes over the past year "allows us to be more customer focused," said Christi Tannahill, now senior v-p for turboprops and interior design. Interior specialists are readying for the production flow of the Citation Latitude, which received FAA type certification last month; it has the widest and the first new Citation fuselage cross section in four decades. The six-foot, flat-floor Latitude cabin offers either club or double side-facing couch seating, and six styling choices of leather, fabric and veneer. Slim-contour ergonomic seating delivers comfort while adding cabin space, and wireless in-cabin communication and entertainment is provided by Cessna's Clairity CMS.

During the first quarter of this year Textron introduced a new interior for the Cessna Caravan, providing a club seating option and reducing empty weight by 55 pounds. Textron is developing modular tables to complement the club seating

arrangement. In the third quarter Textron will begin refreshing King Air 250 and 350 interiors with Wi-Fi and, for domestic deliveries, Talk and Text service. Wi-Fi will be available as an option for C90s.

Textron has streamlined its interior selection process over the past year. Tannahill said 70 percent of completions are directed by the design team, with 30 percent of customers seeking a more customized look and hands-on involvement in the projects.

**Airbus Corporate Jets** introduced its A330-200 Summit interior at the NBAA Convention in October, offering more capacity in both the forward VIP section and an airline-style seating aft area. Standard layouts provide options for office, VIP seating and conference area in the front, followed by business class seating for an owner's advisors and guests, with economy seating for support staff in the rear. Summit brings the cost of a VIP A330 to less than \$200 million and shortens completions time to between 24 and 30 months. The concept could be installed at any completion center with widebody capabilities, but Airbus would install the airline-style seating during production to lower cost and time.

Split scimitar winglets are now standard equipment on BBJs, making it the first fleet that will be so outfitted. The winglets—designed, developed and certified by **Aviation Partners Boeing** (APB)—also will be offered for retrofit on in-service BBJs by Aviation Partners (API). The new winglets take the existing blended winglet and add a scimitar tip and downward strake, providing 2.2 percent more range on a 6,000-nm flight. The first in-service BBJ with split scimitar winglets (owned by API) was displayed at EBACE this year. □

Report continues on next page ►



## Connected cabin key for happy pax

Connectivity has been this year's buzzword, as customers demand onboard entertainment, Wi-Fi and communication capabilities. Completions and refurbishment specialists and system and service providers are simultaneously leading and following

the charge, as milestone developments illustrate.

Taking advantage of the brand recognition of its airline Wi-Fi service, the former **Aircell** rebranded itself as **Gogo Business Aviation** last fall and enhanced its Gogo Vision In-Flight Entertainment

and Connectivity (IFEC) service, enabling on-demand viewing of some 200 movies from major studios and episodes of top TV shows through passengers' smart devices. Gogo Vision is available in North America and Europe. Content is uploaded to Gogo's onboard

UCS 5000 Smart Router/Media Server, either via thumb drive or wirelessly via Gogo Cloud at select Signature Flight Support locations in the U.S., said John Wade, executive v-p and general manager of Gogo Business Aviation. The Colorado company will introduce a product for individual hangars later this year that enables automatic

content refreshment. The service costs \$400 per month for content, and a \$10 per movie or \$5 per TV show viewing fee. About 40 business jets are currently outfitted with Gogo Vision. NetJets will install the system on at least 650 of its new Signature Series aircraft.

**Satcom Direct** launched GlobalVT at EBACE, a connectivity service enabling use of personal smartphones for phone calls, texting and data services aboard business jets from take-off to landing anywhere in the world. GlobalVT works through Satcom Direct's SDR router via Inmarsat SwiftBroadband or ViaSat Yonder service, and is compatible with both iOS and Android phones. More than 100 business jets currently have SDRs, and the Florida company has supplemental type certificates (STCs) for installation on all OEMs' business aircraft.

The SDR router costs \$35,000 and weighs 8.6 pounds. Installation requires three days to a week. Satcom charges a one-time GlobalVT license for the phone service and a monthly fee, and users also pay roaming charges incurred for the phone calls and texting. Chris Moore, Satcom's chief commercial officer, said costs will vary depending on service plans.

Sita and OnAir partnered earlier this year as **Sita OnAir** launched their e-Aircraft nose-to-tail solutions for applications including passenger connectivity and control, streamlining cabin and cockpit operations, and optimizing maintenance and flight operations. The e-Aircraft solutions provide passenger access to content from onboard servers (OnAir Play) via personal devices, and use of their own smartphones to make and receive calls (Mobile OnAir). With Mobile OnAir, phone charges are sent to the phone's owner, rather than the aircraft operator.

**Sabena Technics** is collaborating with Honeywell to develop, certify and install Honeywell's Ka-band JetWave satcom hardware on a widebody aircraft owned by an undisclosed customer. JetWave supports Inmarsat's Jet ConneX (JX) global Wi-Fi connectivity service, scheduled to go live in the second half of next year. The system and service supports video conferencing, transfer of large files and streaming video via Inmarsat's JX service. Paris-based Sabena Technics will offer the system for other bizliners, along with customized service packages. □



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## Specialty Services

Hong Kong-based aviation service provider **Metrojet is collaborating with Tai Ping Carpets International** (both are Kadoorie Group companies) to bring personalized carpets to customers' jets. "A high-quality customized carpet embellishes the overall décor of a new jet, and refreshes the look and feel of pre-owned business jets," said Björn Näf, Metrojet CEO.

Michigan's Scott Group **Custom Carpets** introduced two new collections for interior refurbishments: its Handmade Collection combines sophisticated neutral tones with accents of metallic silks, while the Express II Collection of updated colors is intended for designers who need fast turn-around from order to delivery.

**Jeff Bonner Research & Development** offers a pleated window shade created for the Boeing 787 Dreamliner, and an "easy install" pocket door. Both are available in manual or electric versions, the latter using an ultra-quiet motor with manual override option.

**Vision Systems'** Nuance electronically dimmable window can dim from clear to dark in less than five seconds, the company reported. Using suspended particle device technology, the Nuance window reduces light, glare, heat and damaging UV rays entering the cabin.

New York's **Townsend Leather Company's** new lines for aircraft interiors include the Corked Cowhide Collection, featuring European bull hides; the Fifth Avenue line of lightly pigmented leather; and the new Softina Cowhide, a full-grain aniline leather.

Italian seat manufacturer **Iacobucci** is offering its Aerospace Gusto Oven, a certified induction oven series capable of producing "five-star restaurant"-quality meals. "If you want to have what we call the Academy of Taste, or Gusto, on board, there's no other choice," said a company spokesman.

**Pac Seating Systems** of Florida will provide all seats for two 787s and one BBJ for completion specialist GDC Technics. Pac plans more seat models for the 787's unique floor track system, company director Andrew Perl said.

**Yasava** introduced Aiana Wave, the latest in its Aiana line of custom seats that use gravity as a source of energy. The Swiss company signed six letters of intent at EBACE in May to supply the seats for aircraft including ACJs and BBJs, to be firmed up on initial EASA/FAA certification.

**Custom Control Concepts** of

Kent, Wash., unveiled a lightweight, space-saving surround-sound system developed using 3-D printing technology. The system creates deeper, richer tones from smaller speakers, custom designed for each installation, according to the specialty

IFE/CMS manufacturer.

**Tanury Industries** of Rhode Island, which lays claim to being the first aviation plating company to obtain an FAA repair station certificate, is expanding its services beyond "VIP jet interiors," to "a yacht, palace, restaurant—anything requiring high-end metal finishing," said company chairman Thomas Tanury. □



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# OEMs harness technology to enhance maintenance

by Matt Thurber

**Growing fleets and the longevity of aircraft pose continual challenges to the manufacturers of business aircraft. Not only do the buyers of new turboprops and jets expect top-level customer support, but buyers of some of the oldest aircraft still sporting a current manufacturer's nameplate**

**have expectations that they will be able to find parts and get answers to technical questions. These issues put product support at the forefront for manufacturers and, indeed, at some the ranks of upper management are filled with the names of leaders who are known for their skills at taking care of customers' aircraft.**

AIN interviewed the five major business jet OEMs to assess the current state of their product-support efforts and to learn how they are using modern technology and tools to deliver support that their customers need and expect. (AIN's annual Product Support Survey Report on how readers rate manufacturers' efforts to take care of their aircraft, avionics and engines will appear in the next three issues.)

One interesting change that has occurred is that all new aircraft come with much more sophisticated data collection and distribution systems than did previous-generation aircraft, and they provide reams more information for OEMs and maintainers. OEMs use this information not only to speed delivery of parts and service when maintenance troubles occur during flight, but also to further continual efforts to reduce maintenance costs by lengthening inspection and service intervals. The OEMs are pushing these efforts to their suppliers as well.

A side benefit of all these efforts is that newer aircraft require fewer technicians, coinciding with the demographic shortage of personnel that is affecting all segments of aviation.

This article focuses on certain aspects of each of the companies interviewed, but it should be noted that these

manufacturers offer many similar services, such as mobile response units, capturing and dissemination of maintenance data, MSG-3 analysis, videos of maintenance tasks and so on.

### Bombardier

Bombardier rolled out its new Aircraft Health Management System (AHMS) in May, and it represents a significant change in how the company approaches the capture and use of maintenance data.

Modern aircraft generate so much data that it's easy to become dazzled by technology and all the opportunities for what can be done with that data. With AHMS Bombardier has created a more utilitarian system that matches the needs of the customer. "If we allow the technology to dazzle us," said Andy Nureddin, vice president of customer services and support, "we lose what we're trying to deliver to the end customer. If I'm a director of maintenance, what do I want of the health monitoring and health management systems on the aircraft?"

AHMS consists of four key tenets: connectivity, real-time monitoring, privacy and data analysis. The real-time monitoring element is currently available on the Learjet 70/75, and all AHMS features will be available on the Global 7000/8000 when they enter service.



An iPad is just as common on the shop floor as it is in the cabin, as companies' maintenance organizations put new technology to work to enhance the customer experience.

Bombardier is developing AHMS for the Global 5000/6000 and Challenger series. "Platforms vary in their degree of readiness," he said, but all new models will be AHMS-ready by the end of next year.

The connectivity element has to do not only with aircraft being more Internet-capable but also more electronic. Bombardier wants to ensure that when real-time data is being sent to or from the airplane, the process is managed carefully because the cost of not doing so could be excessive.

"The next biggest thing on the director of maintenance's mind," Nureddin said, "is real-time monitoring of health as [the airplane] is flying." As part of the support package when a new airplane is delivered, Bombardier will provide real-time health monitoring, if the customer wants that service. If pilots receive a CAS message that might require maintenance, real-time monitoring would allow that information to be sent to the operator's base and Bombardier's customer response center, he said, "so we can collaborate on the resolution immediately."

Bombardier is using real-time monitoring not just to notify interested parties of a problem but also to provide resolution information. That means attaching to the problem notification a list of the most likely troubleshooting from Bombardier's SmartFix Plus system, noting whether the problem is "MEL-able" or go/no-go or anything else about what might be required to fix it. This is much quicker than the previous process: pilot calls technician via satcom, technician pores through manuals hunting for the solution, pilot waits. "All this is to unburden the customer and provide real-time awareness and a path to resolution," he said. "The idea here is to give all the tools to our customer."

Next is data security and privacy, and this is becoming an important issue for owners of any product that can gather and share data. Bombardier has carved out a clear policy for data security and privacy. "A basic tenet of our approach is that the customer owns the data," Nureddin said. "The customer can allow us in or not want us in their business. This is

a sharp dichotomy from the consumer world of the Internet. We're taking a good corporate citizenship approach, to say your privacy and your data are yours. We don't retain it if you don't want us to, and we don't manipulate it if you don't want us to. It's the do-no-harm approach."

Finally, the huge volume of data that is recorded by modern airplanes has to be handled efficiently. "We're able to record tens of thousands of parameters," said Nureddin. "What do you do with this bulk data?" What Bombardier is doing is making sure that it is prepared for new ways to use the data. "We want to be able to manipulate this data to provide solutions, from health monitoring in its truest sense to predictive maintenance, tracking hours and cycles, FOQA [flight operational quality assurance] feeding and getting credit for having a FOQA system." Bombardier's goal is to provide applications and solutions for putting this data to work—services it might charge for, such as FOQA analysis.

Bombardier wants customers to share this data with the factory because it will ultimately help lower operating costs and improve uptime. Not only can customers get back in the air sooner, but Bombardier can use the data to extend maintenance intervals, understand failure trends and improve component reliability. "Give us access to your data," Nureddin said. "We will treat it with respect."

### Dassault Falcon

A well trained technician is the best front-line support you can have," said Dean Anderson, director of service network and maintenance training for Dassault Falcon. "If we can improve the level of training for not only our customer technicians, but also our service center technicians, our field reps and service engineers, that has an impact on reducing the number of delays and cancellations."

Anderson, who oversees 13 Falcon service centers in the Western Hemisphere and is responsible for worldwide maintenance training, is also the interface between Dassault and





training providers CAE SimuFlite and FlightSafety International.

In 2002, Anderson said, “we initiated a big project to work with the training providers to bring a level of accountability and standardization for training, both in maintenance and pilot training.” Falcon customers were complaining that the training provider materials were becoming disconnected from the manufacturer’s knowledge about how the airplanes are designed and how systems are supposed to work. When a new model entered service, a core cadre of instructors would work closely with Dassault Falcon to provide a quality training experience. But normal movement always happens and the experienced instructors would be replaced by new teachers who didn’t have the same connections with the Falcon factory, and the tribal knowledge would be lost. “We found back then that training varied from instructor to instructor in the same organization,” he explained.

The solution was to improve standardization, and Anderson’s team came up with the Falcon Training Policy Manual (FTPM). In addition to standardizing the training process, it also requires accountability from the training providers, to ensure that they embrace the process. “We used to have a lot of customer complaints to senior management,” Anderson said. “We’ve essentially stopped all that. This tells us that customers are receiving better value for their training.”

Training providers have to implement a change-management process to incorporate new information from Falcon Jet, he explained. “We’re talking about a process to ensure the training they’re delivering is to the latest information, and to show us as an OEM that the training content is there.” This means that as soon as Dassault Falcon issues a modification, service bulletin, service advisory or customer communiqué, the information is quickly made available to the students learning about the particular Falcon. “This requires a big commitment by the training providers, but in the end our mutual customers receive better value for their training,” he said.

The FTPM process was well under way as newer Falcon models entered service and worked well with them, especially because the process was incorporated

during the design of the airplanes, not as an afterthought. On the 5X program, Anderson said, “The first thing we did was get with the program office and absorb as much of the design information as possible, including changes from [our] understanding of prior airplanes, which helps us build the training specifications that we put forward.”

Earlier on the 7X program, Falcon Jet used the then-new FTPM process to introduce some competition among training providers FlightSafety and CAE. FlightSafety had been the entitlement training provider for Falcon Jet until then, but CAE won the bidding for the 7X. “This helped control cost increases in training,” he said, “and also pitted one training provider against the other with a sense of pride in developing the best product.” Since then, 7X operators have been able to choose between the two training providers, both of which participate in the FTPM process.

Now Anderson’s team is working on further improvements to the maintenance training process, and this is reinforced in the FTPM. The idea is to teach technicians what they need to know and eliminate redundant information to keep training times reasonable. For example, any technician should know how a hydraulic pump works; this does not need to be covered during type-specific training. “All he needs to know now is does the pump make pressure or not,” Anderson pointed out. “He can only replace the pump. We have to recognize there’s only a limited amount of time we can take for training.” Even so, initial technician training events have grown to four weeks from two, as modern jets have become more complex. “We’ve compressed [the training] to make sure it isn’t even longer.”

Falcon Jet is taking advantage of distance-learning technology to help with the effort to keep training event times to a minimum. With the 8X and 5X programs, the company is adding more distance learning so technicians won’t have to spend so much time away. “We intend to introduce a level of distance learning to shave a week out of the length [of initial training] by training them on general familiarization content before they come to the training center,” he said. Falcon Jet is also planning to offer shorter video-based



training with the introduction of the 5X. “I see it as the wave of the future,” Anderson said.

### Embraer Executive Jets

With a growing fleet in Europe and Africa, Embraer Executive Jets is doubling the size of its Paris Le Bourget maintenance, repair and overhaul (MRO) facility and moving it to a more convenient location on the airport. The new facility will serve all Embraer business jets, including the new fly-by-wire Legacy 500 and 450. As many as 12 jets of various sizes will fit in the new building.

“Le Bourget has been the largest hub for bizjets in Europe since 2005,” said Waldir Gonçalves, vice president of customer support and services for executive jets. “It’s important to be there. We need to have adequate [facilities] to accommodate fleet growth, so we need to have good space and infrastructure to accommodate our growth there. Today we don’t have space in the current hangar for the Lineage 1000, [but] we’ll have this in the new MRO.”

The new facility will open in the second half of next year and replace the existing Embraer MRO hangar at Le Bourget. The current facility is located completely inside the secure area of Le Bourget, across from the airport’s many FBOs, and thus is somewhat inconvenient as customers have to go through full security checks to access the facility from outside the airport. In addition to space for new customer offices, the new facility will accommodate new backshop space for more services such as component repair and overhaul. “We want to move to the one-stop-shop concept in the future,” he said, “so we planned the building to increase the business of MRO, not only the ‘M’ [maintenance].”

Embraer currently has six factory-owned service centers and 69 authorized service centers around the world. Many of the authorized centers are ready to service the new Legacy 500 and the 450 when it enters service later this year. The first Legacy 500 in China will be delivered this year, he said, and there is already an authorized service center in Beijing. There are 42 Embraer field representatives worldwide. “These people are really important because they are close to the customer and experiencing their lives and

knowing their needs and representing Embraer,” he said.

Last year, Embraer opened its newest owned service center in Sorocaba, Brazil, which also features an Embraer FBO. “The FBO and MRO are a huge investment to support Brazil,” he said. “We did have this need because we have a lot of airplanes flying in Brazil.”

Eight global parts distribution centers support the fleet, along with 55 on-site stocking locations to bring parts closer to customers. “Parts availability is over 96 percent,” Gonçalves said. “We are investing a lot because as soon as you know what is the problem, you need to have the parts, so the parts must be there and delivered quickly.”

To further aid customers who aren’t based near an Embraer facility, the company has deployed mobile response units, three in the U.S. (including one at Teterboro Airport), one in Brazil and one in Europe. “We can do line maintenance, AOG rescue, troubleshooting, minor scheduled maintenance, parts changes and service bulletin implementation,” he said.

Embraer’s 24/7 customer contact center in São José dos Campos, Brazil, has been open five years and now handles more than 10,000 interactions per month. Embraer’s standard sets a maximum of six seconds for one of the contact center experts to pick up a ringing telephone, 15 minutes for email responses and two hours for a complete answer to the customer’s question or issue. Embraer uses Salesforce software to ensure that contact-center experts and field service representatives stay abreast of customer issues, but one person at the contact center is assigned to be the event coordinator. “He follows every AOG to make sure the plan is as it should be,” said Emerson Leite, manager of the contact center.

The contact center’s mission is to take care of customers, and the 45 people who work the center’s three shifts are empowered to help as needed. “It’s customer-driven,” said Everton Vicente de Lima, director of contact center and technical support engineering. “It’s case by case, but there is no restriction on supporting the customer. That is key.”

“We don’t charge extra for this,” Leite said. “Customers understand that if they engage with us, we’re going to

*Continues on next page* ▶





► Continued from preceding page provide an answer.”

The optional Aircraft Health Analysis and Diagnosis system is available for all Embraer business jets and can be used to transmit maintenance and usage data directly to Embraer, either via datalink while flying, via Wi-Fi on the ground or by downloading from an SD card.

## Gulfstream

Gulfstream's product support efforts can best be summed up by its Fast acronym, which stands for Field and Airborne Support Teams. "That covers a number of things," said Derek Zimmerman, vice president of product support and materials, including field service representatives

around the world, parts distribution centers and Gulfstream's two Fast jets and mobile service trucks. "We're trying to maximize customer uptime," he said. "If we can be where they are, that maximizes their ability to use their airplane." (Zimmerman became president of Gulfstream product support on July 1, succeeding Mark Burns,

who was promoted to president of Gulfstream.)

Nearly 70 Gulfstream field service reps work closely with operators in the field, but the frontline for product support is the 24/7 customer call center at Gulfstream headquarters in Savannah, Ga., which is also supported by satellite locations such as Hong Kong, London,



Dallas and Long Beach, Calif. The call centers handle tens of thousands of calls per month and calls are funneled through the centers so customers don't have to figure out a map of Gulfstream to know who to contact, Zimmerman explained. The Savannah call center is equipped with a graphical flight simulator that replicates Gulfstream cockpits to aid in troubleshooting. The satellite locations not only help handle problems with locally based personnel but also serve as the first responder for problems that can be shared later with Savannah for final resolution.

Gulfstream has taken modern technology a step further to support customers and not only puts material such as videos online but also runs the Gulfstream Product Support Network to share information with its far-flung operators. "We're trying to make sure people have every last ounce of data," said Zimmerman. Videos cover operational and technical issues, and the latter are organized by ATA chapter to make them easy to find. The studio created more than 200 videos last year.

This kind of content helps technicians see how to perform a specific task and helps new employees learn Gulfstream tricks and tips. The studio experts are also available to record operator conference sessions, which are then shared with all Gulfstream operators. Gulfstream holds an operators conference in Savannah every other year, Zimmerman noted, "but not everybody can come, so last year we recorded all of [the sessions]." He noted that "a lot" can change from year to year, and customers don't attend every event. "Keep[ing] that information fresh is always a challenge," he said.

"Video is still a frontier that

Continues on page 36 ►



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► *Continued from page 34*  
 we're exploring," he added, "and every day we find a new application. It's a real opportunity and one that we're continuing to expand. We did the first broadcast at the operator conference in 2012, and since then it's grown exponentially to other places that we're able to use the technology. When we

do regional forums, we pick our sites to make sure that we've got a high-bandwidth connection back to the studio so we can move the information back and forth, so we can bring people on screen, we can ask questions and we can show information."

Gulfstream has 11 company-owned service centers and four component repair facilities, and

sister GD company Jet Aviation has seven factory-authorized service centers. "We're doing 80 percent or more of the touch labor inside our service centers," he said. The company's Brunswick, Ga. location opened a new facility in June, and in Long Beach Gulfstream is adding a 19,000-sq-ft maintenance hangar and another 10,000 sq



*Gulfstream, like many other OEMs, deploys mobile teams to address AOGs.*

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ft of support and office space. Last year Gulfstream opened a factory service center in Sorocaba, Brazil. A massive new 406,000-sq-ft parts distribution center will open soon at the Savannah campus.

Gulfstream pioneered the use of aircraft for customer support in 2002 and now has two Fast G150s covering North America, the Caribbean and even South America on occasion. "There is no specific charge for the airplane," said Zimmerman. "It's part of our suite of services." The Fast 1 truck, a technician's dream toolbox on big-rig wheels, is based in Savannah and deploys as needed to support operators, especially for big-ticket events where a lot of Gulfstreams congregate. Smaller Fast trucks are based in the San Francisco area, Houston and White Plains/Teterboro.

### Textron Aviation

Like all aircraft manufacturers, Textron Aviation strives to control operating costs for owners of its aircraft by reducing the cost of maintenance. Since the original Sovereign program, Cessna invited customer service experts to join the advance design team to ensure that maintenance is considered from the beginning of the design process. The customer service team members use a set of standards developed in-house, called Maintenance Reduction by Design, and this has helped Cessna extend maintenance intervals and component lives to help bring down maintenance costs. These principles are also being applied to Cessna sister division Beechcraft under the Textron Aviation banner.

"We're now trying to get to 800 hours or greater [for inspection intervals]," said Brad Thress, senior vice president of customer service. But hourly intervals aren't the only target; for large fleet operators, not having to do something to a component more than once a year helps keep costs down. "We look at every component," he said, "and use our experience as well."

*Continues on page 38 ►*





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► Continued from page 36

An example is a hydraulic pump, which was designed not to leak more than 30 drops per hour. “That’s not satisfactory for the customer,” he pointed out, “because they don’t want drops on the floor.” From a maintainability perspective, that pump should be designed not to leak as much. The

nitrogen-filled accumulators on hydraulic pumps likewise add to maintenance costs because they need to be serviced occasionally to keep the nitrogen charge at the right level. But Textron engineers worked with the component vendor on a welded accumulator that doesn’t require recharging.

Engineers also look at alloys

used to manufacture the airframe, and the Maintenance Reduction by Design “bible” addresses corrosion resistance from the early stages. “We get into a study of weight versus cost,” Thress explained. “We look at the structural side and the systems side.”

For calculation of maintenance intervals, Textron



Textron uses a set of standards called Maintenance Reduction by Design to help extend maintenance intervals.

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Aviation, like all business jet manufacturers, uses the MSG-3 (Maintenance Steering Group) process to eliminate redundant inspection and maintenance. “The whole philosophy is ‘Why am I inspecting this component?’” Thress said. “If the failure mode is benign, I don’t need to look at it. If it’s critical, then the proven reliability of the component will tell me when I should be looking at it.” MSG-3 is combined with system safety analysis, which analyzes hazard classes of possible failures, according to Thress. “This may drive a closer maintenance interval than something benign. We have to get all the design and failure modes analyzed by the system safety group and couple that with MSG to come up with intervals.”

These intervals are re-examined and adjusted based on feedback from operators and service centers. Since the customer team joined engineers and applied the Maintenance Reduction by Design process for the Sovereign, maintenance intervals on subsequent models have grown longer, and this has driven direct operating costs down 20 to 30 percent, according to Thress. “It’s a change in philosophy. Don’t tear something up to make sure it’s OK [and] then put it back together. Also, I don’t have to hire as many technicians as the fleet continues to grow.”

Engineers have driven further improvements in the maintenance process by reducing the number of crew alerting system (CAS) messages provided to pilots. As the cost of sensors dropped, engineers at first took advantage of them by capturing a lot of redundant information—a valve was either open or closed, even when this meant nothing to the pilot.

“I think we over-reported,” Thress conceded. “We created a lot of indications that said, ‘I’m indicating your system is operating normally.’ Why? In the early 2000s, this became an irritant for some customers. We went back to the philosophy of a quiet-dark cockpit. Unless I need to take action, don’t tell me about it.” Since then, the number of CAS messages has dropped dramatically. □



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## Looking beyond Brazil

by Ian Sheppard

LABACE comes once again to Conghonas Airport in São Paulo next month (August 11-13), bringing with it hopes that Latin American business aviation can build a modern fleet and infrastructure.

It will be the 12th time the LABACE conference and exhibition has been held, and with the past three the feeling has been spreading that the event has outgrown its home airport,

not least because of encroaching low-cost carriers. In addition, a hangar collapse last year hardly instilled confidence in the aging buildings at the site. Suggestions that the event should move to Campo de Marte airfield, in the north of the city and closer to the financial district, seem to have fallen on deaf ears again despite the availability of a far



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more modern exhibition center close to that location. Whether LABACE has outgrown Conghonas is certain to be a question at this year's event.

In recent years LABACE has been a distinctly Brazilian affair, being run by ABAG (the Brazilian General Aviation Association). Even the keynote speeches have focused on Brazil rather than the wider South and Central American region despite the fact that some countries, such as Mexico, have thriving bizav sectors. Visitors to the relatively small show will be looking for something more this time around, with perhaps a broader array of international visitors.

#### Show Size Remains Static

When Eduardo Marson Ferreira, chairman of ABAG and president of Helibras, opened his third LABACE in August 2014 he said there were 70 aircraft at the event and some 14,000 visitors were expected. This year's show is shaping up to be about the same size.

"LABACE 2015 will be bigger than 2013 but no bigger than 2014," Ricardo Nogueira, director general of ABAG, told AIN last month. "We've already sold as much space as 2013, but we have no more space available than in 2014."

While some traditional participants have dropped out or reduced their exhibit space as a result of the current economic malaise, he said there will be new participants, both Brazilian and international. They have all asked that their participation be kept confidential for present.

Topics on the agenda at this year's event are likely to be safety and airport access. The latter has been a big issue for business aviation in past years, so attendees will be looking for evidence of progress in this regard. □



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PHOTOS: DAVID MINTOSH

## Air transport sector takes center stage

AIN Staff Report

Business aviation hosted its major European event in Geneva in May, and while the industry these days casts a smaller shadow at the Paris Air Show than it once did, it nonetheless made its presence felt at Le Bourget last month. As it often does, the air transport industry took center stage at this year's show.

**Dassault Falcon's** new flagship, the 8X, made its public debut on home territory last month, as S/N 001, still in certification flight-test, was put through its paces every day over Le Bourget Airport in the show's flying display. Unveiled last December, the ultra-long-range, large-cabin 8X, a lengthened and upgraded version of the 7X, first flew on February 6.

Certification of the \$58 million aircraft, powered by a trio of P&WC PW307D turbofans, is anticipated in the second half of next year, with delivery of the first production aircraft to Serge Dassault, chairman and

CEO of Groupe Dassault, following soon after.

Italian manufacturer **Piaggio** signed two contracts to supply the new-generation Avanti Evo twin turboprop to charter customers. UK-based Zenith Aviation signed an order for an Avanti Evo for delivery in October and took options on seven more. In addition, Rozmey Air became the second Malaysian customer for the type. The company was established earlier this year to begin charter operations, and the Evo, slated for delivery before year-end, will be based in the north of the country at Sultan Abdul Halim Airport in Alor Setar.

At the larger end of the spectrum, customers also expressed interest in bizliners. **Boeing Business Jets** announced the sale of the first BBJ Max 9—to an undisclosed European customer. The announcement comes a year after Boeing launched the BBJ Max as the newest edition to its bizliner product line. Its first

order, received in April last year, was for a BBJ Max 8. The sale of the Max 9 marks the fifth BBJ Max order. All previous orders are for the BBJ Max 8, the first of which will be delivered in 2018.

**Viking Air** used the occasion of the show to announce new sales representatives. UK-based aviation sales and marketing firm Liftec will serve as the Twin Otter 400 sales representative for eastern Europe, the Commonwealth of Independent States (excluding Russia) and the Baltic states. Viking has appointed Hanbaek Aerospace of Seoul the sales representative for South Korea.

### Air Transport

**Bombardier** reported in Paris that the CSeries certification program is around 70 percent complete. "All flight-test risks are now behind us," said CSeries vice president and general manager Rob Dewar. As of June 15, the Canadian airframer had logged 1,881 flight-test hours and more than 30,000 cycles in structural testing. Bombardier claims that the CSeries jets will not only be 20 percent more fuel efficient than current production single-aisles but also deliver a 10-percent advantage over their

re-engined rivals, the Airbus A320neo and Boeing 737 Max.

CSeries launch operator Swiss upgraded 10 of its 30 firm orders for the CS100 to the larger CS300. The change adds about \$90 million to the value of the deal, as the CS300 is priced at around \$72 million versus \$63 million for the CS100. "With its size and its low operating costs, the CS300 ideally complements the CS100 and the rest of our European fleet," said Swiss CEO Harry Hohmeister.

"With both versions of the new CSeries in our ranks, we can be highly flexible in tailoring capacity to demand on our European routes." The first CS100 is planned for delivery to Swiss after certification is achieved at the end of this year. Swiss is slated to receive 10 CS100s in 2016, 10 CS300s in 2017 and then 10 of either type in 2018 (with a decision on the final batch still to be determined).

Canada's WestAir announced it has signed a firm order for five Q400 twin turboprops. These are

converted options, and deliveries will be made next year and into 2017. The carrier had previously placed a firm order for one Q400 in March this year.

**Embraer** notched up orders from several customers for its E-Jet series. The Brazilian manufacturer revealed orders from SkyWest Airlines (eight E175s to fly with Alaska Airlines), Colorful Guizhou Airlines (up to 17 E190s), United Airlines (E175s for United Express) and lessor Aircastle (up to 50 E2s).

The SkyWest aircraft will be flown by Alaska Airlines under a capacity purchase agreement (CPA) with Alaska Airlines. The contract is worth an estimated \$355 million, said Embraer. The commitment follows a similar order under a CPA for seven aircraft last November, with the first of those aircraft slated to enter service with Alaska Airlines next month. Both represent the firming up of contracts from an initial SkyWest order consisting of 40 firm and 60 "reconfirmable" placed in May 2013.

Dassault's Falcon 8X made an appearance during the flying displays.



Good news continues to roll in for Bombardier's CSeries program. Swiss upgraded its order for 10 CS100s to the larger CS300 on display at the show.



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MARK WAGNER



Representing Embraer's line of regional jets at the Paris Air Show was this ERJ135 in the static display area.

The order from Colorful Guizhou Airlines consists of seven firm plus options on 10 more, with potential value estimated at \$834 million. The first aircraft is scheduled for delivery this year. Guizhou is Embraer's fifth E-Jet customer in China. The United Airlines order consists of a firm order for 10 aircraft worth around \$444 million. Embraer said that United's latest acquisition is on top of a 2013 order for 30 E175s. The order from Aircastle Holding consists of 15 E190-E2s and 10 E195-E2s plus purchase rights for 25 more, making it an order for potentially 50 aircraft. Deliveries to the lessor are scheduled to start in 2018, with Aircastle receiving "roughly seven" aircraft a year through 2021. The new orders bring the E-Jets E2 backlog to 267 firm plus options and purchase rights on another 373, said Embraer.

Franco-Italian turboprop maker ATR arrived in Paris with high expectations, and it was not disappointed. On the first day of the show in a deal worth \$496 million, Japan Air Commuter signed an order for eight ATR 42-600s, plus an option for one more and purchase rights for another 14. This is the first business ATR has won in Japan, and the aircraft are expected to enter service in 2017. The same day, ATR announced that Spain's Binter Canarias had agreed to buy another six ATR 72-600s. Deliveries of these aircraft will start later this year and be completed by 2017, joining the 16 ATRs already operated by the Canary Islands-based carrier.

The company also signed a deal with Bahamasair, which has not operated ATRs previously, for three ATR 42-600s and two ATR 72-600s. Scheduled for delivery by year-end, the pair of 70-seat ATR 72s will complement Bahamasair's Boeing 737s flying international routes, while the 50-seat ATR 42s will connect the islands within the Bahamas.

More business for ATR came from long-time ATR operator Air Madagascar, involving three ATR 72-600s. With the arrival

of two more the airline plans to lease, the airplanes allow Air Madagascar to renew its current fleet, now consisting of one ATR 42-500 and a pair of ATR 72-500s, and increase the number of seats available on its main domestic routes.

Cebu Pacific Air of the Philippines became the launch customer for the new high-density

cabin version of the ATR 72-600 with an order for 16 of the twin turboprops. The deal includes options on 10 more, which would take its value to \$673 million.

Finally, Sweden-based Braathens Aviation signed a contract for five ATR 72-600s and options for 10 more, to replace its aging Saab 2000 fleet

(deliveries will start at the end of the year); and Air New Zealand, having received its seventh ATR 72-600 at the show, confirmed that it had ordered one more ATR 72-600, taking its total order tally for the type to 14. All told, by the time the show wrapped, ATR expected to announce orders worth \$1.98 billion. □

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## Pilot Report:

# Embraer Legacy 500

by Matt Thurber

**Fly-by-wire comes to midsize aircraft, and it is a smooth transition.**

In early April, **AIN** senior editor Matt Thurber traveled to Embraer's headquarters in São José dos Campos, Brazil, to fly the Legacy 500 with test pilot Eduardo Camelier.

Eight years ago, then-executive vice president of Embraer Executive Jets Luis Carlos Affonso surprised NBAA show attendees by unveiling concepts for two completely new jets, dubbed mid-light and mid-size; a year later these became the Legacy 450 and 500. The new jets not only signaled the company's efforts to build a larger presence in the business jet market but also a commitment to fly-by-wire flight control technology that is not available in jets in that class.

At the time, it was unlikely that anyone at Embraer knew that Cessna designers would soon begin sketching the design for a flat-floor cabin jet—the Latitude—that would prove to be a direct competitor to the Legacy 450. And the Embraer prognosticators would not learn until years later that one of the competing midsize jets—the Learjet 85—would eventually suffer a program pause that many in the industry believe will never be un-paused.

What Embraer leaders did see was an opportunity to carve out new niches in the market with two business jets that share 95 percent commonality, differing only in cabin length and range, and that have fly-by-wire

(FBW) flight controls, the latest Pro Line Fusion avionics from Rockwell Collins, Honeywell Ovation Select cabin management system and Honeywell HTF7500E engines.

The Legacy 500 (officially EMB-550) received Brazilian ANAC certification last August and was certified by the FAA last October and by the EASA in December. The Legacy 450 is slated to enter service by year-end.

At first glance, the Legacy 500 looks large, and in many ways it is. The flat floor, for example, adds a spacious feel to the 826-cu-ft cabin, which is larger than that of the Citation Sovereign+ at 620 cu ft but smaller than the Challenger 300/350 at 860 cu ft and the Gulfstream G280, the largest at 935 cu ft. Of the three competitors, only the Challenger has a flat-floor cabin, and this feature seems to be gaining traction as a popular differentiator.

The Legacy 500's Pro Line Fusion-equipped flight deck is not only roomy but also uncluttered and logically laid out to address sound human-factors principles. Sidestick controls help maximize cockpit space, too: removing the bulky yokes saves space, weight and mechanical complexity and gives free

rein to seat designers who no longer have to cut a channel in the front of the seat to accommodate a yoke's aft movement. The sidesticks also open room for stowable tables in front of each pilot. The Rockwell Collins HGS-3500 compact head-up display will be an option when it is certified later this year.

Embraer designers elected to eliminate a steering tiller to save space and not interfere with the sidesticks. The nosewheel steering mechanism is electro-hydraulic, but also steer-by-wire, and can swivel 62 degrees either side at slow speeds, narrowing to just 4 degrees at high speeds. Cockpit windows are extra large and provide excellent visibility.

The 110-cu-ft external baggage compartment is quite high off the ground, but accessible via an optional (but free) ladder that fits neatly into the door. Optional heating is available for the unpressurized baggage compartment. An additional 45 cu ft of baggage space is available inside the cabin, aft of the lavatory, and this offers plenty of space to handle carry-on luggage accessible during flight.

### Cabin Features

Small touches reveal the intent of Embraer designers to lavish



attention on the interior and exterior. For example, no lightning diversion strips are visible on the smooth unblemished radome; engineers figured out a way to provide the lightning protection even with the strips embedded in the radome's composite skin.

Inside the cabin, attention to detail is even more pronounced, with List Components & Furniture granite-veneer flooring in the forward galley area and lavatory, power outlets and tablet or magazine pockets at each seat and a carefully fitted milled end piece where the bulkheads meet the cabin shell and valence, designed to look good no matter how interior components shift around slightly as the fuselage stretches and shrinks during normal operations.

As it is in many modern business jets, the emergency exit is in the lavatory. The interior baggage area aft of the lavatory is flanked by electronics bays that free up space in the forward cabin for more room for the galley and cabinets. Large windows are fitted with mechanical shades, but Embraer plans to offer electronic dimming shades

as an option. To prevent freezing of lavatory and galley reservoirs when the aircraft is to be parked in cold climates, the pilot can push a button in the cockpit in flight to pump clean reservoir water overboard.

As it did with the Legacy 650 and Lineage 1000, Embraer selected Honeywell's Ovation cabin management system for the new Legacys, and it is controllable from passenger control units or iOS and Android devices. Auxiliary panels allow connection of a variety of devices using interfaces such as HDMI, USB, RCA, VGA and 3.5-mm audio. Ovation offers full-HD video and surround-sound audio. Connectivity options include Aircell's Gogo Business Aviation air-to-ground broadband Internet system and Cobham SwiftBroadband or ICG Iridium satcom.

Both 17.5- or 19-inch monitors are available for the forward and aft bulkheads, and each seat has a receptacle mount for a nine-inch monitor as well as passenger control units. The forward-facing VIP seat in the first club section has a master control



unit that can also adjust cabin temperature and a handset for the ICG Iridium satcom.

Embraer put an enormous amount of effort into quieting the new Legacys, both inside and outside the cabin. The Honeywell 36-150 APU is mounted with high-performance isolators to block noise, and the HTF7500E turbofans are also mounted on soft engine mounts for the same purpose. The cockpit profile is aerodynamically smoothed to minimize wind noise and the main landing gear is fully covered, a first for Embraer. External antennas are mounted fore and aft and away from the occupied part of the cabin, also to minimize noise. Mufflers in the environmental control system vent lines help, too, as does an inflatable main door seal. The single air-cycle machine is mounted well away from the cabin, and the pressurization outflow valve is mounted with a noise barrier for maximum quietness. Interior insulation includes skin-damping material, a sound-barrier layer and panel isolators on interior panels and low-noise carpet pad. The hydraulic systems have attenuators and are also soft-mounted. The location of electrical equipment in the bays next to the interior aft baggage area also cuts noise.

The result of all these efforts “sets a new benchmark for cabin noise levels,” according to Alvadi Serpa, who is in charge of product strategy for Embraer Executive Jets. “It’s three to four decibels

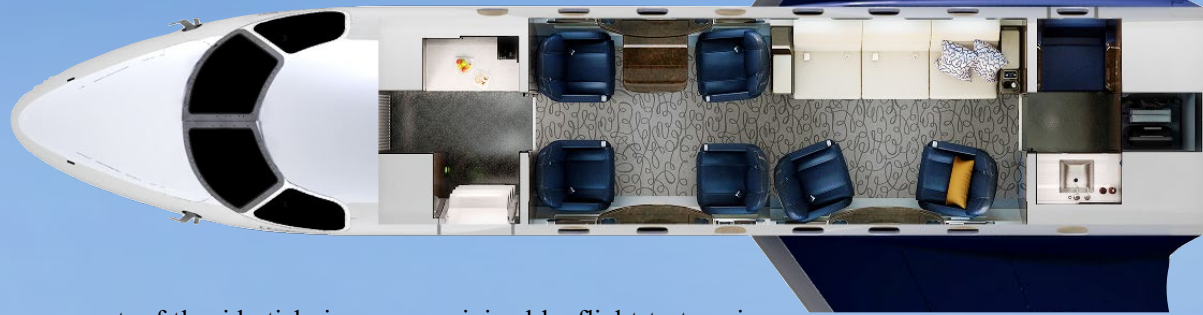
lower than the Challenger 300,” he said. During the flight in the Legacy 500, I moved to the rear-most seat of the cabin’s aft divan and was able to speak with and hear clearly flight-test engineer Gustavo Paixão, who was sitting in the forward-most, aft-facing club seat.

Standard seating is eight in two double-clubs, with one optional belted lavatory seat. The aft club can be replaced by one or two three-place divans that are approved for takeoff and landing. The forward cabinet across from the galley can be replaced by either a single passenger seat or a fold-up jump-seat, which brings the maximum to 12 seats.

### Flying the FBW

Before we flew the Legacy 500, Camelier ran me through the planned flight profile in the flight-test simulator. This proved to be a great introduction to the airplane and the FBW controls and made the following day’s flight much more productive. The simulator uses the same aerodynamic modeling as the airplane and the device is still used for certification and testing.

In the simulator I found that it took a little practice to get used to the flight path stable FBW system. With this design, when flying in the normal flight envelope the pilot simply sets the desired flight path with the sidestick then lets the stick return to its spring-loaded neutral position. The flight path will then stick, and subsequent



Legacy 500 with single divan.

movements of the sidestick simply nudge the Legacy into a different flight path. For a pilot accustomed to maintaining the desired attitude by constantly making tiny yoke movements, adjusting to the Legacy FBW took a little time. Once I got used to it, however, I found that the handling made flying much easier. In any bank in the normal envelope up to 33 degrees, for example, the Legacy motors along without losing altitude and with no need to crank back on the stick to stay level.

We spent some more time in the simulator performing maneuvers that highlighted the Legacy 500’s capabilities, including steep turns, speed brake modulation, overspeed and bank angle protection, steady heading sideslip with full rudder, accelerated high-incidence handling with full aft pitch, simulated engine failure on climb-out and go-around and practice with Embraer’s patented tactile control steering (TCS) trim system, which in landing configuration automatically trims the airplane to match the selected speed, and finally a high-performance landing with maximum braking.

### The Real Airplane

When it came time to fly the Legacy 500, Camelier and I

were joined by flight-test engineer Paixão and demonstration/instructor pilot Rafael Ricardo. With 7,780 pounds of fuel (about half tanks), two pilots and two crew, the Legacy 500 weighed just over 32,000 pounds at takeoff, well below the 37,919-pound maximum takeoff weight.

The weather at São José dos Campos Airport was VFR with scattered clouds and 21 degrees C, about 10 degrees warmer than ISA. With flaps 1 set, we planned an initial climb directly to FL450. V1 was 112 knots, rotation speed 117 knots and V2 124 knots, as automatically calculated by the Pro Line Fusion avionics once we inserted the weight-and-balance data. The calculated takeoff and landing performance data is not just for advisory purposes, and the Fusion system sends the speeds directly to the PFD. During flight, the weight-and-balance page shows a constantly updated center of gravity as fuel burns off and it will generate an alert if there is an out-of-balance condition.

The Legacy 500 fly-by-wire is a fully closed-loop system and provides envelope-protection features that prevent the pilot from exceeding certain limits. In an open-loop system, a movement of the flight control yoke or stick or rudder pedals always produces the same movement of the flight control surfaces, Camelier explained. In a closed-loop system, the pilot is commanding “a performance that the airplane will give the pilot.” For example, if the pilot pulls the sidestick aft in the Legacy 500, he may be commanding, say, a 1.2-g pullup. The flight control computer looks at the resulting pullup and if it isn’t 1.2 g, the system constantly makes adjustments to the elevators to achieve the commanded 1.2 g.

In an open-loop system, the pilot would have to make these corrections constantly. The same is true for banking. “If the pilot gives a half command to the left with flaps up,” he said, “it’s like 15 degrees per second of roll rate. If during that roll for whatever reason the rate starts to increase or decrease, with this constant loop of feedback, the ailerons and roll spoilers will be constantly moving to adjust to 15 degrees per second of roll rate.”

There are two flight envelopes designed into the FBW system, normal and limit. In the normal mode, the stick moves relatively easily until the limits are reached (33 degrees bank, plus 30 and minus 15 degrees pitch), VMO and 1.13 Vs (stall speed). The pilot can steer outside the normal envelope into the limit envelope, but would need to hold pressure on the sidestick to do so.

The sticks are spring-loaded to provide some control feel, and they always return to the centered position when released. What is key about flying the Legacy 500 is that the FBW system maintains a stable flight path. Whenever the pilot allows the stick to return to neutral, the airplane will remain on whatever flight path was selected. The FBW system also automatically trims and compensates for pitch and yaw during turns and for roll during sideslips.

At 65 knots on takeoff, the FBW switches to takeoff law. According to Camelier, “This is basically a pitch-rate control with pitch damping to help the pilot stop at whatever pitch he wants. For each sidestick movement in the longitudinal axis duration rotation, that pilot is commanding a pitch rate to the airplane. We found this to be the best control law for rotation and for capturing a steady pitch attitude.” About three to five seconds after takeoff, the FBW switches to the normal flight mode (Nz control law) and remains that way until configured for landing. In Nz control law, trimming is always automatic.

After a smooth takeoff aided by the Rockwell Collins autothrottles, we rocketed up to FL450 in just 20 minutes, thanks to our light weight and the powerful 7,036-pound-thrust Honeywell turbofans. I tried some turns and got used to controlling the flight path with the sidestick. We stabilized at Mach 0.80, burning 350 pounds of fuel per side.

Since I had already flown the simulator, the Legacy 500 felt comfortable almost immediately and I didn’t find that the flight path stable philosophy detracted in any way from

Continues on next page ▶



The Legacy 500’s fly-by-wire flight controls replace space-hogging yokes, allowing designers to design more comfortable seats, add cupholders and even under-panel tables. The red button on the stick assigns priority to whichever pilot pushes the button. Rockwell Collins Pro Line Fusion avionics are intuitively easy to operate, including (left) creating custom holds at any waypoint.



## Embraer Legacy 500

► Continued from preceding page

the jet's pleasant handling characteristics. I quickly adapted to a feather-light touch on the sidestick, and that's all that is needed for most maneuvers.

We descended to a block altitude below 25,000 feet to try some maneuvers and I was able to experience a variety of the Legacy 500's unique FBW characteristics, including pushing the stick into the limit envelope during steep turns, an approach to stall and recovery, wind-up turns, overspeed protection and flying in direct mode as opposed to normal.

What I found most interesting during this part of the flight was that I was able to rack the Legacy 500's controls around in a way that would be impossible in a jet with conventional flight controls. Camelier had me set up a 30-degree bank then snap the sidestick fully aft to the stop. The Legacy settled at its maximum angle-of-attack of 4 percent above the stall speed. At higher speeds, around 250 kias, the FBW will allow only a 2.5-g pullup with flaps zero. With any amount of flaps deployed, the load limit is 2.0 g, to protect the airframe from excessive loads.

With full flaps and gear down and throttles at idle, I pulled the sidestick all the way back. The Legacy just sat there contentedly showing about 90 knots on the

airspeed tape, in low-speed protection mode, and I was still able to make banked turns.

On the other end of the envelope, Camelier put the pedal to the metal to demonstrate the overspeed protection. The airspeed climbed to about 330 kias, just above the 320-knot, Mach 0.83 VMO/MMO, and then the overspeed protection kicked in and pulled the nose up to keep the speed from building. I had to push the sidestick forward to stay in that regime, but the FBW wouldn't let the airplane go faster. Camelier had me bank the airplane while experiencing the overspeed protection, and the Legacy 500 handled that perfectly. In both the stall and overspeed protection modes, the Legacy remains fully maneuverable.

### Mode Control

There are only two modes to the FBW, normal or direct. All flying is done in normal mode, which provides all the protections such as workload reduction with autotrim, path maintenance, engine failure transient reduction, angle-of-attack limiter, overspeed protection and load factor protection. Direct mode gives the pilot full control of the airplane without any envelope



protection and should be used only in an emergency.

The Legacy 500 will default to direct mode if both flight-control computers fail or if for some reason the flight-control computers decide that direct mode is necessary. Normally the flight-control computers drive eight remote electronic units, and if both of the flight-control computers fail, the remote electronic units run the direct-mode flight laws themselves and thus take over the switch to direct mode.

The Legacy 500's yaw damper is always on. Camelier explained: "Even in direct mode we always have yaw damping. We know that business jets normally have Dutch roll issues, and in this airplane we designed the flight control system so that even in the worst case you always have yaw damping."

Without the normal mode protections, in direct mode the only aid is a stall warning because the pilot can stall the airplane in that mode. In direct mode, Paixão explained, essentially "you have a gain schedule of surface deflection as a function of airspeed."

Pilots can select direct mode by pushing a button on the console between the seats, and in that case will need to trim the pitch with a rocker switch on the console. This would be the only time that the pitch trim would be used. When pilots activate direct mode—which they should never do, Camelier pointed out—a CAS message stays on and can be removed only as a maintenance action on the ground.

When we tried direct mode, it felt strange to fly the Legacy 500 by commanding the flight control surfaces instead of using the FBW's normal mode. The Legacy seemed light on the controls in direct mode, but certainly it wouldn't take long to get comfortable with it. I did some turns, then an approach to stall, and recovered with pitch and power, then returned to normal mode with a push of the button on the console.

We also tested simultaneous movement of the sidesticks, which are not interconnected mechanically or electronically, at least not in such a way that they move together. While the sidesticks operate independently, there are protections for when both pilots actuate the controls at the same time. If both pilots move the stick in the same axis at the same time, the command is summed. But whenever there is a dual input, an aural warning sounds, a CAS message illuminates and both sticks vibrate. One pilot can take over priority by pushing a button on the top right of the stick, and a CAS message shows which stick has priority.

### Opposing Sticks

To demonstrate this further, Camelier counted to three and I moved my sidestick full left and he moved his full right. They canceled each other out, and the airplane stayed on its flight path. We also saw the CAS message, heard the audio alert and felt the stick vibration. Then I turned left with a 30-degree bank and he moved his sidestick to the right, so the summation returned the bank to 15 degrees.

The sidesticks have a priority button for locking out the other sidestick. While we were both providing inputs, I pushed my priority button and Camelier flopped his stick around and it did nothing. I held my priority button for 20 seconds, let go, and my sidestick remained the priority. Then hitting either button on the left or right sidestick stops the priority operation.

### Legacy Landing

Returning to São José dos Campos, we shot an Rnav approach to Runway 15, landed and then did a touch-and-go. This gave me a good feel for the TCS trim system, which is available in landing configuration. By pressing the TCS trim button on the sidestick, the Legacy 500 automatically retracts for whatever speed is showing on the airspeed tape. A green arrow on the tape shows the newly trimmed speed. What I liked about TCS trim is that I didn't have to push

or pull the sidestick then trim off the pressure; rather, I just pitched to get the desired speed, then pushed the TCS button and all is stable.

During the second approach, at 200 feet above the ground we simulated an engine failure, and I was able to experience the FBW system's ability to apply most of the rudder needed to handle the asymmetric thrust, leaving a bit of rudder for the pilot to keep him in the loop. The idea here is that while Embraer could have designed the FBW to handle the entire asymmetric thrust compensation with no pilot input required, proper human-factors design meant that stepping on the rudder, even just a tiny bit, helps keep the pilot well in the loop on the engine failure.

To help the pilot, the lateral force indicator (triangular sideslip indicator on top of the PFD) turns blue after landing gear retraction with one engine inop. Stepping on the applicable rudder centers the indicator to provide optimum sideslip for a single-engine climb. "Sometimes in a [conventional] airplane you don't know exactly how much pedal to put in," he explained, "and you have to leave the sideslip indicator just slightly off. Here we tell the pilot, 'OK, for the optimum condition, all you have to do is align the triangle.'"

On the final landing, we switched on the autobraking system to medium and landed with full flaps. After touching down on the mainwheels, I pushed the stick forward fairly quickly, and the FBW system automatically—and gently—put the nosewheel on the ground, and the autobrakes kicked in and brought us to a rapid and short stop, aided by the powerful anti-skid carbon brakes.

This is the first real FBW aircraft that I have flown (not a simulator), and I was surprised not only at how easy it flies but how well it handles. I wasn't sure what to expect, but the Legacy 500 does exactly what the pilot asks for and does so smoothly and effectively. I never felt out of the loop or that the FBW was doing something I didn't expect. I don't think it will take pilots long to learn the Legacy 500, and if this flight was any indication they are going to enjoy the process immensely. □

### Embraer Legacy 500 (EMB-550) Specifications and Performance

Price (typically completed and equipped)	\$19.995 million (2015 baseline price)
Engines (2)	Honeywell HTF7500E, 7,036 lbs
Passengers (typical)	2 crew + 8 pax
Range (w/NBAA reserves, 200-nm alternate)	3,125 nm at 433 ktas
High-speed cruise	466 ktas/Mach 0.82
Long-range cruise	433 ktas
Fuel capacity	13,058 lbs
Max payload w/full fuel	1,600 lbs
Ceiling (certified)	45,000 ft
Cabin altitude at ceiling	6,000 ft
Max takeoff weight	37,919 lbs
Balanced field length at mtow (sea level, standard)	4,084 ft
Landing distance	2,122 ft
Length	68.1 ft
Wingspan	66.4 ft
Height	21.2 ft
Cabin	Volume: 826 cu ft
	Width: 6.8 ft
	Height: 6.0 ft
	Length (seating area): 27.3 ft
Baggage capacity	155 cu ft/419 lbs
FAA certification (basis, date)	FAR Part 25, amendment 129 (10/20/14)
Number delivered	5 (through 1Q/15)





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# NetJets pilots welcome new leaders

by Kerry Lynch

NetJets pilot union representatives are “cautiously optimistic” that recent leadership changes at the fractional provider could help rebuild strained labor relations and possibly lead

to a quicker resolution of contract negotiations. On June 1 NetJets announced the sudden departure of chairman and CEO Jordan Hansell and the return of two senior executives

to take the helm of the company. Adam Johnson, who left the company a month earlier, rejoined NetJets as CEO just before he was set to take a new role with another company. Also returning to his

role as president and COO was Bill Noe, who departed NetJets two months prior.

NetJets did not comment on the reasons behind the departure, but Hansell moved on to become executive chairman of a Columbus, Ohio-based insurance marketer that he helped found a year earlier and served on the board.



NetJets CEO Adam Johnson



NetJets president and COO Bill Noe



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Hansell will be charged with expanding the executive and capital structure of the firm, Quick-Insured, to fuel its growth, the company said. “I am very excited to have the opportunity to join in the creation of something new that is clearly so needed in the marketplace,” he said.

In a statement, Hansell said that NetJets is well positioned for future success and “to grab hold of the opportunities before it. I wish my colleagues across the company every future success; they are a remarkable group of people who operate an extraordinary company.”

### Labor Relations

Hansell had taken the reins of NetJets in 2011 as the company was returning to profitability in the wake of the economic downturn. Under his leadership, NetJets has been streamlining its fleet with new Signature Series models and posted continued gains in revenue and profit. But his leadership also has been marred with labor strife that has led to lawsuits and mediation.

Hundreds of NetJets pilots, represented by the NetJets Association of Shared Aircraft Pilots (NJASAP), had picketed in front of Omaha’s CenturyLink Center during the recent annual shareholders meeting of parent company Berkshire Hathaway to protest the protracted contract negotiations. NJASAP president Pedro Leroux recently reported that 98 percent of the pilots voted “no confidence” in Hansell, with 94 percent of NJASAP members participating in the vote.

The labor strife also led to the firing of a vice president in April for his role in anti-union

Continues on page 50 ▶





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## GEORGE NEAL ENTERS GUINNESS RECORD BOOK AS OLDEST ACTIVE PILOT

George Neal, a long-time de Havilland Aircraft of Canada test pilot, has set a new aviation record, qualifying as the oldest active, licensed pilot on Earth. Neal is entering the *Guinness Book of World Records* for remaining a pilot at 96 years and 194 days as of his qualifying flight on June 2 this year. Neal has held a Canadian pilot certificate since 1936, amassing more

than 15,000 hours on 150 aircraft types.

Many of those hours came while he was a test pilot for de Havilland Canada. Joining the company in 1947, he was pilot-in-command for the first flights of the DHC-3 Otter, CS2F Tracker and DHC-4 Caribou, and he served as part of the flight-test teams for the DHC-1 Chipmunk, DHC-2 Beaver, DHC-6 Twin Otter,

DHC-5 Buffalo, Dash 7 and Dash 8.

Tom Appleton, chairman of Canada's Aviation Hall of Fame and former de Havilland Canada/Bombardier executive, submitted the Guinness record application. "George's experience is unparalleled in the world of aviation," Appleton said. "We are proud of his airborne exploits, which seem to go on indefinitely." —K.L.



George Neal, 93-and-a-half years of age, is officially the oldest active pilot in the world. The Guinness book says so.

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## NetJets pilots welcome leaders

► Continued from page 48

activities. NetJets said at the time that the firing was a single incident unrelated to other management changes.

NJASAP's Leroux called the leadership transition "an opportunity for the company to restore the trust of all employees." The company and pilots union representatives had already begun mediation, with further meetings scheduled throughout the year. But Leroux believes that, with outreach from the new leadership, a deal could be reached over the next few months. That outreach began almost immediately. Shortly after stepping into his new role, Johnson contacted the union to set up a meeting. The last time labor leaders formally met with Hansell was in December 2011, NJASAP said. Leroux praised Johnson's past efforts to work with labor. But he cautioned, "Time will tell whether the new team has been empowered to work with employee unions."

Noting that both Johnson and Noe are long-time company executives, NetJets said bringing them back underscores its commitment to both its owners and employees.

"Just a few months ago I left NetJets for a 'can't say no' sort of opportunity," said Noe, who had served with the company since 1993 and originally became president and COO of NetJets Inc. in 2006. "The only thing that could have caused me to reconsider that decision was the chance to return to the company where I've worked for 22 years in a role that touches every department, every function and which lets me have a direct impact on our future success."

"NetJets has been my passion for nearly two decades," added Johnson, who joined the company in 1996 and also had been president of NetJets Inc. with responsibilities for marketing, sales, owner services and Marquis Jet. "We have an exciting opportunity to build on the strong performance the company achieved under Jordan's leadership." □



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# Industry courts tomorrow's leaders

by Matt Thurber

Among the work done by members of the NBAA Corporate Aviation Management Committee (CAMC), one of the key areas is bringing new blood into the industry, a task assigned to

the Professional Development subcommittee. Co-chairs Tara Harl and Dan Wolfe lead the subcommittee's efforts, including updates to the Pipeline Guide, "an initiative that seeks to identify

issues in the workforce and provide solutions to those issues." Other subcommittee work includes helping flight departments set up and manage internship programs and oversight of

the CAMC Leadership Conference and Baldwin scholarships.

Harl, a pilot who has run flight departments and a management company, holds a Ph.D. from Kansas State University and is a consultant, and Wolfe is director of aviation for Nationwide Insurance.

The Pipeline Guide was first published in 2010, but Harl and



Jeannine Falter, Duncan Aviation v-p of business development

Wolfe are working on updating the guide and eventually turning it into a more modern toolkit, something that could be an app for mobile devices instead of a static document. The updated guide will be available on NBAA's CAMC webpage once it is reviewed at NBAA headquarters.

"Dan and I both believe internships and apprenticeships are a magical portal to get industry to meet these college students and young entry-level employees," Harl said. "They also give young folks first-hand knowledge of the industry and networking [opportunities]. We have seen it change attitudes at flight departments when young people are there; it boosts morale."

In Harl's opinion, not enough flight departments understand the benefits of internships and apprenticeships. "We struggle to get our industry to understand that," she said, noting that company legal departments often shut down flight-department internships because of unspecified liability concerns.

## Education and Outreach Efforts

Harl promotes internships as much as possible because business aviation is facing a huge shortage of new entrants into the career pipeline. "We have a tsunami hitting us in three areas," she explained. First, all the baby boomers, the most educated group of Americans, are reaching retirement age. Second, the changing demographics facing an industry that tends to self-select from a shrinking population of white males. Finally, "We have a public school system that is failing us, not only in Stem [science, technology, engineering and mathematics] but also in other areas." For the latter issue, Harl is particularly concerned that children who live in lower socio-economic



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environments experience the worst schools in the U.S. “We’ve got to start looking at these issues and address them or we’re going to be in a pickle.”

Business aviation, she said, is “a phenomenal career opportunity. And business aviation needs people from all walks of life. The perception is that if you’re not a white male you can’t get in. It’s an education issue, to get the word out.”

While Harl is disappointed that more flight departments aren’t helping to promote business aviation careers, she urges people in this industry to work with college and high-school students, local groups such as the Boy Scouts, Girl Scouts, Boys & Girls clubs, church youth groups and so on. For those who might qualify for a scholarship, promoting the Leadership Conference and Baldwin scholarships would be a big help, because typically there are few applicants. “Somehow we’re not getting the word out,” she noted.

Each of the five scholarship winners this year received \$2,000 to attend the annual Leadership Conference, which not only exposes them to career and networking opportunities but also gives flight department attendees a chance to meet potential future employees and leaders. Scholarship money was donated by United Technologies, CAMC members and an anonymous donor.

Jeannine Falter, Duncan Aviation’s v-p of business development, was the 2015 Leadership Conference chair and is well aware of the pipeline issues facing business aviation. Duncan Aviation has proved that finding new talent can be done, and the company spends a lot of resources not only on promoting aviation careers but also on developing new leaders from the ranks of its employees.

“It’s interesting how so few young people know about our industry,” she said. “If they don’t have a family member who works on [business aircraft], then business aviation is not on their radar. Catching them early is important.” Duncan holds career fairs and invites students from nearby states to visit, as well as aviation vendors to “come and talk about what the industry is all about,” she said. Duncan also hosts interns at all of its locations, with about 20 to 25 at the company’s Lincoln, Neb. headquarters every summer. “It’s a great experience and gets us great exposure, too,” she said. “We hire a lot of them.” ■

## FAA LAUNCHES RUNWAY INCURSION MITIGATION PROGRAM

Building on its progress in improving runway safety at U.S. airports over the past 15 years, the FAA last month kicked off a new national initiative to address one of its top safety priorities. The Runway Incursion Mitigation (RIM) program is intended to identify airport risk factors that might contribute to a runway incursion and develop strategies to help mitigate those risks.

Incursions occur when an aircraft, vehicle or person accidentally enters the protected area of the active runway, potentially conflicting with takeoffs and landings. According to the FAA, on average between three and four incursions occur daily in the U.S., and among the risk factors that contribute to the problem are unclear runway markings and airport signage as well as

runway or taxiway layout.

Through the RIM program, the FAA will focus on reducing runway incursions by addressing risks at specific locations at the airport that have a history of runway incursions. The agency plans to work with airports to develop strategies to mitigate runway incursions at these locations over the next 10 to 15 years. ■



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Dassault is targeting 2017 certification for the 5X, with entry into service to follow in 2018.

THERRY DUBOIS

## Falcon 5X rolls out

► Continued from page 1

The 5X's cockpit windows are 30 percent larger than those on previous Falcons. "This provides enhanced visibility on a visual approach and allows you to better anticipate your flight path," chief test pilot Philippe Deleume told *AIN*. Flight control surfaces include flaperons, combining flaps and ailerons. On a steep approach, they allow the pilot to fly the attitude independent from the slope angle, explained Olivier Villa, Dassault's senior v-p for civil aircraft.

The curved trailing edge will increase buffet margin by 15 percent without raising weight or reducing flexibility, according to the manufacturer. The curved shape is also said to deliver a better lift-to-drag ratio than a trailing edge with a broken line. Another consideration in designing the trailing edge has been to tailor the airflow to a twin-engine configuration.

### Maintenance Enhancements

The Falcon 5X will feature an onboard real-time self-diagnosis system dubbed FalconScan. Previous Falcons used onboard diagnostics to monitor hundreds of parameters; the 5X's system will monitor more than 10,000.

Lacking only telemetry, FalconScan is not far removed from a complete array of flight-test instruments. "We used to identify potential failure scenarios and monitored parameters accordingly. Now we follow every parameter, making it easier for us to understand a new problem," Villa said. FalconScan will be used most often by maintenance technicians, for preventive and corrective maintenance, but pilots might also find it useful during a stop-over where there is no maintenance facility, according to the company. FalconScan

## Q3 Latitude deliveries

► Continued from page 1

Cessna announced a 150-nm boost to the aircraft's long-range cruise range, bringing it to 2,850 nm (high-speed cruise range is 2,700 nm). This means that range is up by approximately 35 percent compared with the 2,000-nm limit Cessna announced in 2011. In the latest in a series of performance improvements, the manufacturer managed to reduce takeoff and landing distance for the new model to 3,580 feet (compared with the projected 3,660 feet).

"From inception, we looked at every aspect of how we design, build and deliver new products to the market with the goal

is in addition to FalconBroadcast, which provides real-time notification of inflight events and maintenance status via satellite.

During the flight-test campaign, approximately 1,000 analog parameters will be followed, along with "dozens of thousands of digital parameters," explained David Dugail, the engineer in charge of flight-test equipment for the Falcon 5X. Synthetic views will be displayed for the crew.

Thanks to advances in flight-test equipment, it will be easier for the pilots to perform some maneuvers accurately. "We can more easily follow a planned flight path accurate to four inches," Dugail said. This is useful when gathering acoustic data for the cabin interior, for which requirements are stringent, he explained. Separately, a lot of instrumentation relates to system reliability testing. Three aircraft will participate in the flight-test program.

Dassault CEO Trappier lays claim to the 5X having the largest cabin cross section of any purpose-built business jet. Although its 8.5-foot width is the same as the G650's, the French aircraft trumps the Gulfstream in height by one inch. Dassault wants to make the most of this cabin space and is looking beyond merely wider seats. For example, "working with diagonal lines, you can install extra-wide TV screens," a salesman explained to *AIN*. A double bed—as opposed to a foldable bed—can be installed permanently and still leave a passageway by its side, as required for certification, he pointed out.

CAE is building simulators (two initially) for pilot training, CEO Marc Parent told *AIN*. The level-D devices will use a full-electric motion system.

The Falcon 5X has a projected range of 5,200 nm at Mach 0.80 and a top speed of Mach 0.90. □

to further improve upon the key attributes that make the Citation so highly esteemed," said Textron Aviation president and CEO Scott Ernest. "Throughout the certification program, the Latitude demonstrated breakthrough results, which are evident in the aircraft's performance and value. And now customers can experience firsthand how the Latitude can reduce operating costs [by up to 20 percent], while increasing productivity and profitability for their businesses."

During the trip to the EBACE show, the Latitude flew non-stop from St. John, Newfoundland, to Valencia, Spain, in just over five hours. It is expected to make its South American debut at the LABACE show in São Paulo next month. □



# From the back seat to the cockpit

by Curt Epstein

In the not-so-distant past, Fiona Horne would turn right when she boarded a business aircraft. In her native Australia, she was a true rock star, lead singer of the popular '90s band Def FX, then a television personality, actress and author. Yet today, in her current job as marketing manager and soon-to-be tour pilot for St. Croix-based charter provider and FBO Bohlke International Airways, she often finds herself at the controls of the aircraft.

It is a strange evolution for the woman who helped christen Richard Branson's Virgin Blue (now Virgin Australia). Horne is an inveterate thrill seeker who holds a world skydiving record, and a master scuba diver who practices fire dancing in her spare time, but for her the idea of becoming a pilot was late in coming. In 2001 she moved to Los Angeles, and a friend there who was a CFI and owned a Decathlon would often take her aerobatic flying, which sparked the idea of earning her own pilot certificate.

## Ready for Act II

"I passed my checkride April 22, 2013, in a little Cessna 172 in Bakersfield, Calif., and it was at that time I decided I wanted to leave the entertainment industry and start a whole new career in aviation," Horne said. While in St. Croix visiting a pilot friend she met during her training in Bakersfield, who had landed a job flying seaplanes for Caribbean airline Seaborne, she became smitten with the island and impulsively moved there.

Fueling her passion for flying, she took to renting Bohlke's Diamond DA-20 for jaunts around the islands and decided to approach the company for a job. On the strength of publicity skills earned during her career, she was hired to fill the position of marketing manager.

So far her transformation from performer to member of the private aviation industry has been smooth. "I enjoy my life more now because I feel closer to it," she said. "As an entertainer you've got so many other people always involved in who and what you are, and now I'm just me, living on an island, flying airplanes in paradise and working for a great company."

Since moving to St. Croix two years ago, Horne has added 200 hours to her logbook. Having just completed her commercial written exam, she is looking ahead to her checkride for the

VFR commercial, slated for this summer. "I'll be the scenic tour operator for the company I work for, and my goal then is to get my instrument rating," she noted. Once she gains more flight hours,

she expects to add her multi-engine rating. "Then I can start flying in the right seat in the King Air in our fleet, and after that I can start flying in the right seat in the Citation," she said. □



When Fiona Horne was ready to take on new challenges, it was flying that called to her.

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## Town cannot seize airport, rules NJ appellate judge

by Mark Phelps

With all the bad news about New Jersey airports, it looks like the good guys' side has finally won one.

In early May, Somerset County Appellate Court Judge Paul W. Armstrong ruled on an ordinance passed by the town of Readington to condemn and then "instant take" 625 acres of land from the Solberg family by eminent domain. The Solbergs' property contains their family-owned and -operated airport (KSBJ), founded by Thor Solberg in 1939. The airport is currently owned and operated by his children, Thor Solberg, Jr.; Lorraine Solberg; and Suzy Solberg Nagle. Thor Solberg Sr. set a record as the first to fly an airplane (a Loening C-2-C Air Yacht amphibian named the Lief Erikson) from America to his native Norway. His route retraced the voyage of the aircraft's namesake, nearly 500 years before Columbus's Atlantic crossing.

The township of Readington's request was the latest in a long string of attempts, dating back more than two decades, to take over the Solbergs' land, ostensibly to preserve open space. This time, Judge Armstrong left no doubt as to the court's opinion of the town's real motivation.

His opinion states, in part: "An objective scrutiny of the collective testimony of the elected officials involved in the architecture and implementation of the eminent domain ordinance concerning the SHA property reveals a studied attempt to obscure the true purpose of the condemnors in the instant taking. The Court finds this testimony, as a whole, to be unforthright, evasive, untrustworthy, argumentative, lacking credibility and therefore

unworthy of belief. Moreover, the resultant lack of transparency in governmental actions of Readington Township has subverted an open political process thus weakening the protection of all its citizens' private property rights including the Solberg family. That is to say the condemnation was singularly initiated to secure Township control over airport operations."

### 'Calculated Action'

Judge Armstrong went on to indicate that the township's action was a calculated reaction to the Solbergs' plans to improve the airport, including extending its paved runway to 4,950 feet from 3,000 feet, and the township's motivation was underhanded. He concluded: "Such behavior undermines the integrity of the municipal government's stated public purpose behind Ordinance 25-2006 and demonstrates bad faith. Accordingly, the taking is invalid in its entirety."

The Readington town leadership has been criticized for the "millions of dollars" in legal fees it spent on the airport acquisition plan, all paid with taxpayer funds. In addition, the court ruling calls on the town to compensate the Solbergs for their legal fees over the years, also estimated in the millions of dollars, which will be paid from township taxes.

A statement from the Solberg family included this excerpt: "None of this was necessary. It was the result of the myopic view that Solberg Airport was going to become another La Guardia being drummed into the collective psyche of too many citizens misled by the Township leadership." □

## Hadid expands Africa footprint with office at Bangui Airport

by Peter Shaw-Smith

Hadid International Services has opened an office in Bangui, capital of the Central African Republic, at the invitation of the country's Civil Aviation Authority. "We [now] have a physical presence on the ground in Bangui Airport," said Issa Zuriqi, Hadid's regional director of Africa, Asia and Australia, speaking to AIN at Aviation Africa 2015 in Dubai recently. Under its agreement with the CAA, Hadid will be the exclusive provider of overflight and landing permits in the country.

"The strategically located Central African Republic [CAR] offers an advantageous base in Africa for Hadid's African operations. Whether flying from North to South or East to West Africa, all operators will cross the Central African airspace," it said. "In the past four months requests have in some cases tripled for overflight and

landing permits, handling services, fueling, hotels and airport transfers," said Chakib Boudjemaa, business development manager for Africa and Middle East at Hadid.

Hadid has African offices in Niger, Algeria and Libya and a physical presence in Djibouti, Congo (Brazzaville and Kinshasa), Ethiopia and South Africa, Zuriqi said.

Business aviation is growing in Ethiopia, he noted. "Ethiopia is considered a good hub for commercial and business aviation. Because of what Ethiopian Airlines is doing on the ground there, they are becoming more advanced every day."

In addition, Zuriqi confirmed that Djibouti is opening at least one new airport to make room for commercial operations. "They have a plan to bring FBOs in," he said. □





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## NEWS UPDATE

### Falcon 5X To Feature CVS

Dassault and Elbit have unveiled new details on the Falcon 5X's combined vision system (CVS). In the CVS, Elbit merges synthetic and "real world" vision for enhanced situational awareness in poor weather and at night. Sensors include infrared, visible light and "almost radar" wavelengths—well beyond the usual infrared sensors in conventional enhanced vision systems (EVS), according to Dassault. The multispectral array of sensors has a field of view of 35 degrees horizontal by 26.5 degrees vertical, while the field of view for the head-up display (HUD) is 40 by 30 degrees. The pilot can set the contrast to adapt to various kinds of runway lighting. Elbit's fourth-generation multispectral EVS detects incandescent and LED runway lights, with provisions to support color display. The CVS has been designed to reduce landing minimums to 1,000-foot RVR and 50-foot decision height. On the ground, the pilot receives an alert in case of a potential runway incursion, thanks to an EVS motion-detection algorithm.

### FAA Outlines Concerns With Airborne Network Security

The FAA has issued a draft Advisory Circular outlining a method for developing an Aircraft Network Security Program (ANSP) to meet requirements for security of data systems on new and modified aircraft and those considered "e-enabled." This refers, the FAA notes, "to an aircraft with wireless communication technology that exchanges information with various critical and non-critical aircraft systems as well as outside systems." The AC highlights a specific concern with aircraft using Transmission Control Protocol (TCP)/Internet Protocol (IP) connectivity instead of other means such as Arinc 429 busses for connecting flight-critical avionics systems. The ANSP is necessary, according to the FAA, because, "As with other TCP/IP applications, a real threat exists that may be intentional or unintentional with a detrimental effect on system performance. These effects may range from reduced performance, denial of service or criminal activity." Developing an ANSP will require preventing unauthorized external access to aircraft networks, identification and assessment of security threats, prevention of inadvertent or malicious changes to aircraft networks and prevention of unauthorized access by onboard sources.

### Avidyne Updates iPad IFD Trainer

Avidyne has released the latest version of its free iPad application, which replicates the operation of the new IFD540/440 FMS/GPS/navcoms so pilots can learn how to use the units or try them out on the ground. Two versions of the app are available with either an Americas or international database. The app's new version includes the 10.1 software upgrade, which adds functionality, including "ADS-B/FIS-B weather, scrollable data blocks, expanded checklists, rubber-banding of the active flight-plan leg and multiple-user customization, multiple checklists, user settings, user-defined waypoints, routes and more," according to Avidyne. The new software load and the IFD440 were expected to receive FAA certification at the end of last month. —Matt Thurber

## Nations act to protect their satellite industries

by John Sheridan

When ICAO introduced the Global Navigation Satellite System (GNSS) concept in 1993, it was to establish an earth-girdling network of navigation satellite constellations that would provide service "for the foreseeable future on a continuous worldwide basis, free of direct user fees." The U.S. and Russia were first to sign up in 1996, followed several years later by Europe, China, Japan and India, which planned to launch constellations of their own. By 2020, there should be six constellations and close to 150 navigation satellites criss-crossing the Earth.

That planned abundance was welcomed in the early days, because receiver technology was initially limited to simultaneously tracking just four satellites from a single constellation, which occasionally resulted in coverage gaps, or "holes," caused by poor fix geometry. But with many more satellites destined to enter orbit, ICAO expected that constellation "interoperability" would allow that gap to be filled by an aircraft's receiver acquiring signals from better positioned satellites in another constellation, such as using three GPS satellites and one from the European Galileo constellation.

But holes are no longer a challenge. With approximately 30 GPS satellites in orbit, today's advanced-technology airborne GPS receivers can simultaneously process signals from as many as 15 of them, with each incrementally refining the GPS position, without accessing another constellation. However, multi-constellation, multi-frequency (MCMF) operation remains a valuable technique, widely used in geophysical surveying and similar tasks where centimeter accuracy or better is required. Now, some airline people are reportedly promoting MCMF avionics. Superficially, that sounds smart. But some avionics experts assert it would be expensive overkill.

### Market Protectionism

While GPS holes are no longer a concern, market protectionism is. In November 2012, Russia announced at ICAO that all Russian-registered aircraft planning to use satellite navigation would be required to use Russian-built Glonass receivers. GPS receivers could be used only if they were integrated with (built into) Glonass receivers. The use of stand-alone GPS receivers would be illegal in Russian aircraft, ships and in certain other applications, although personal use would be permitted.

While acknowledging that it was Russia's right to impose such sanctions, the U.S. delegation at ICAO strongly opposed the move as contrary to ICAO's position that the world's airspace and its supporting systems should be available to all. Nevertheless, the Russian representatives refused to back down. Unspoken was their concern that without such a ruling, Russia's fledgling satellite receiver industry would be stillborn, in the face of its massive U.S. competitors.

Logically, the next protectionist shoe to drop would appear to be China's. With foreign-built small, lightweight GPS receiver modules now selling at commodity levels, a Chinese-packaged GPS/BeiDou/cell-phone could outsell almost all the competition. China doesn't build avionics (yet), but U.S. general aviation could offer intriguing possibilities.

Protectionism can take many forms. In December last year the Federal Communications Commission (FCC) announced that using foreign satellite signals in the U.S. required prior FCC approval and that foreign-built satellite receivers would require FCC inspection before being licensed for use in U.S. territory. GPS industry officials worry that U.S. GPS manufacturers exporting to a country that builds its own satellite equipment might run into reciprocal "difficulties."

Yet the market is irresistible. No one knows how many satnav receivers have been produced, but one estimate says that by 2030 one in three people on Earth will own one. □

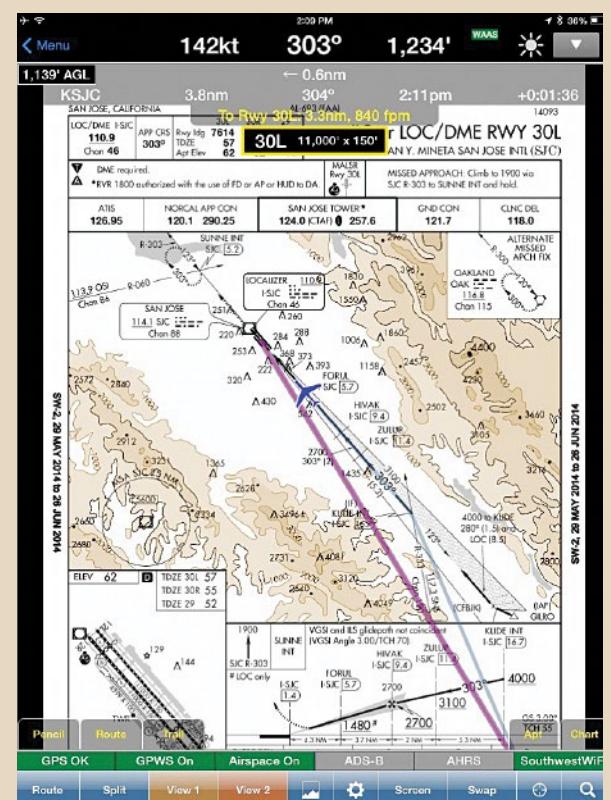
### APPLE IOS 8.3 CAUSES GPS INCOMPATIBILITY ISSUES

After upgrading to Version 8.3 of Apple's iOS mobile operating system, pilots who use Apple devices coupled wirelessly to external GPS receivers found that many of these receivers no longer worked with their iPads and iPhones. Manufacturers of external GPS devices reported widespread problems with iOS 8.3. The next version of iOS, 8.4, due out soon, reportedly has fixed the compatibility problem.

GPS makers Dual Electronics, Bad Elf and Garmin reported compatibility problems with iOS 8.3. Garmin released a firmware update that resolved issues with its GLO external GPS. Dual Electronics users were able to use a workaround that allowed Hilton Software's WingX Pro7 app to work with Dual's XGPS units. And the problem seemed to affect some Bad Elf GPSs but not the Bad Elf Pro+.

WingX Pro7 was able to get iOS 8.3 to work with the Dual XGPS160 and XGPS160 because, "In addition to the standard Core Location Services offered by Apple's iOS...our engineering team built an alternate method to get location data from the XGPS150 and XGPS160 into WingX Pro7. This simple fix tells iOS not to use the broken Core Location Services to send GPS data to WingX Pro7; instead WingX Pro7 uses the alternate method and it works," explained Hilton Software.

Avionics & Systems Integration Group issued a customer bulletin, reminding iPad users that its flyTab XFB system isn't subject to problems such as the GPS incompatibility issue in iOS 8.3. This is because the flyTab system doesn't use wireless communication between the iPad and sensors such as GPS, but is hard-wired to these sensors installed in the aircraft. —M.T.



WingX Pro7 developer Hilton Software created a workaround to fix GPS incompatibility problems with iOS 8.3.



# Connected aircraft tap into real-time weather info

by Matt Thurber

Until recently, passengers in a modern airliner could tap into far more information about weather than was available to the crew piloting their airplane. Passenger connectivity speeds have grown rapidly, and because of the slow pace of regulator approval, far more useful and powerful information has been available on passengers' mobile devices via the Internet, but that is finally changing.

"There is pent-up demand," said Mark Miller, senior vice president and general manager of aviation for weather information provider WSI. Cockpit connectivity is nearing a tipping point. Aircraft are being equipped for a lot of cabin connectivity purposes, but tapping into it for the cockpit is in "various stages of getting to fruition."

In addition to providing weather information for a variety of industries, WSI offers the Pilotbrief service online as well as on an iPad app. WSI, a division of The Weather Company,

also provides the weather data for the FAA's ADS-B IN Flight Information Services-Broadcast system, as well as for the Sirius XM WX system.

For business aircraft operators flying under Part 91, there generally aren't regulatory restrictions preventing pilots from using in-flight Internet connectivity available through air-to-ground telecom or satcom systems. The same is not true for commercial aircraft operators, although the FAA does provide guidance on the subject. Advisory Circular 00-63A acknowledges that electronic flight bags (EFBs) are "an acceptable means to view METI [meteorological information] and AI [aeronautical information] in the cockpit."

However, the agency notes that because software and data connectivity are required, the EFB must be classified as Class 2 with Type B software "and requires an authorization for use via OpSpec/MSpec/Letter of Authorization (LOA) A061, Use

of Electronic Flight Bag."

In addition, for Part 121 operators regulations about record retention apply, and the operator should have a network security plan to ensure data confidentiality, integrity and availability when pilots are accessing the cabin Internet system. The AC also points out that pilots should not use airborne Internet to access non-pertinent information.

"At the end of the day, airlines have to work with their principal inspectors to get approval for their implementation," said Miller. "The guidelines provide a framework, but that's open to interpretation at the inspector level. That's the challenge our customers are facing." Feedback from WSI customers indicates, however, that regulators worldwide are becoming more amenable to pilots using the Internet to access valuable weather information.

## Aviation Center

To provide the information that its customers want, WSI has its own aviation center where 35 aviation meteorologists monitor weather and a variety of hazards such as turbulence, convection, volcanic ash and dust and provide alerts. With many of its customer airlines, WSI receives the

operations' flight plans, releases and schedules so the preflight briefing can include the latest weather information tailored to the flight plan. This information is also available as an overlay in Pilotbrief for improved pilot situational awareness, Miller explained. And if the operator has airborne connectivity, pilots can more easily receive continuous updates and adjust the flight path as necessary.

One piece of information that is becoming more refined via WSI is turbulence. WSI installs its Turbulence Auto-Pirep System (Taps) in the aircraft. Taps monitors accelerometers already in the aircraft and records turbulence that exceeds a specified threshold, and the information is sent back to WSI. Currently the turbulence information is transmitted via Acars, and more than 650 airline aircraft operated by airlines in North America, over the North Pacific and even one in China are participating.

Miller said the turbulence information will be available in the Pilotbrief app, or it can be accessed by dispatchers who can communicate it to the flight crew. "Taps is a set of algorithms encoded into the condition trend monitoring system in the aircraft," he said. "There's no

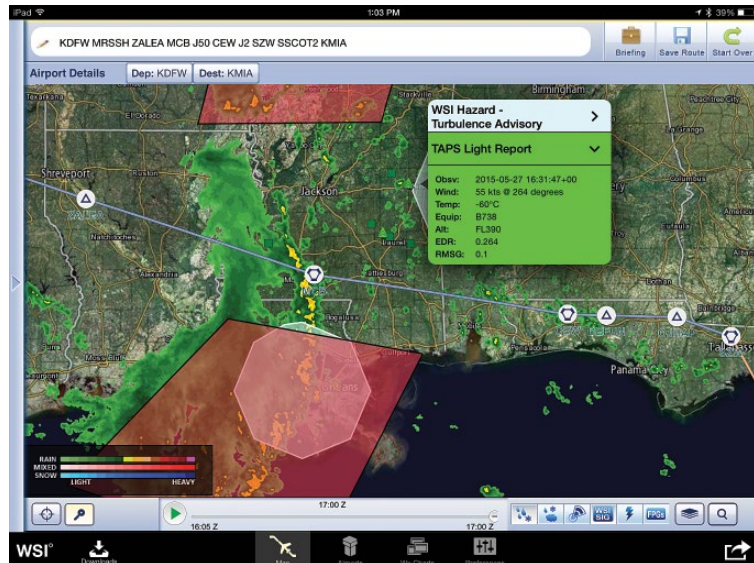
hardware and no [added] sensor, and it has a very low cost to get up and running." WSI is hoping to have Taps installed on 1,000 aircraft by year-end.

While it could work on business jets, too, Taps is better suited to large fleets, he said. "Customers that have launched Taps are seeing a significant reduction in crew injuries and maintenance costs from turbulence."

WSI is also tapping into winds aloft data provided by connected aircraft. "There are a number of different applications you can envision for connected aircraft," he said. "And there is equal value for data coming back; the aircraft becomes a node on the network, and we have a continuous flow of information to and from the aircraft."

For pilots who use the Pilotbrief app, especially flying business jets with airborne Internet access, WSI is working on optimizing the data flow to avoid high data charges. One way to do this is to host mapping data, which doesn't change much, onboard a server on the aircraft and download only the updated weather data.

"Everybody is motivated to optimize that experience for the ultimate end user, who is the pilot," Miller said. "To me it's one of these transformative times in aviation, the convergence of technology and the potential to unlock so much in terms of safety and efficiency." □



WSI's Pilotbrief will include turbulence information derived from the company's Turbulence Auto-Pirep System (Taps) installed in a number of airliners. Taps uses systems installed in the aircraft to measure turbulence beyond specified parameters.



## ASPEN AVIONICS ACQUIRES GPS MANUFACTURER

Aspen Avionics has purchased Accord Technology, which manufactures the NexNav GPS sensors and was the first GPS manufacturer to receive FAA authorization for meeting Technical Standard Order C145c.

Accord Technology manufactures a line of three GPS receivers: the NexNav Mini, NexNav Max and NexNav Micro. The company is a joint venture of Accord Software & Systems of Bangalore, India, and AvValues of Phoenix and is a supplier to many avionics manufacturers. Aspen Avionics will retain the Accord offices and production facility in Phoenix, and the combined companies will be named Aspen Avionics, while retaining the NexNav brand name. AvValues founder Hal Adams will be executive vice president of business development for the new company.

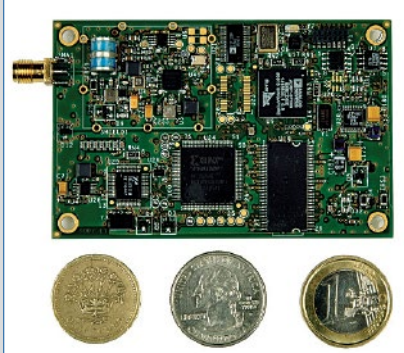
"This is going to give us access to GPS technology for the expansion of our product line," said Aspen Avionics president and CEO John Uczekaj. "Aspen is heavily involved in the general aviation community with [glass] displays and ADS-B, but one thing we've been lacking is GPS. This is going to give us access to GPS technology for expansion of our product line and for future ADS-B platforms, both fixed-wing and

helicopter, and future UAVs that will need ADS-B." The acquisition also positions Aspen Avionics to enter markets for aircraft larger than the primarily piston-powered airplanes and light helicopters it has been targeting with its Evolution displays.

Evolution installations currently use a non-certified GPS as an emergency backup, with navigation position information provided by connection to certified GPS receivers installed in navigators made by other avionics manufacturers. ADS-B installations also require a TSO-C145c-compliant GPS.

The new Aspen Avionics will continue its policy of working with other vendors and not cloaking its technology under proprietary constraints. "We are an open-systems company," Uczekaj said. "We've always worked well with others, and we'll continue that strategy."

For other customers, such as avionics manufacturers that use GPS sensors for their navigation systems, Aspen Avionics will "continue with all Accord initiatives," he said. "This is a great opportunity for the Accord GPS line. We expect to expand our business in a lot of markets where GPS technology is useful in aviation." —M.T.





## NEWS UPDATE

### Sierra Nevada Unveils Plans To Build Dornier 328 in Turkey

Sierra Nevada has signed a memorandum of understanding with the Turkish Ministry of Transport, Maritime Affairs & Communications to build the now out-of-production Dornier 328s in Turkey. Sierra Nevada plans to design an upgrade to the 328Jet and turboprop and collaborate with Turkish engineers to produce the country's first domestically built passenger aircraft. The design of what the company calls a new high-tech aircraft, the 628 series, would start at the same time as production of the 328 series. The 628 jet and turboprop would carry roughly double the 32-passenger seating capacity of the 328s.

Based in Sparks, Nev., Sierra Nevada plans to collaborate with Savunma Teknolojileri Mühendislik ve Ticaret (STM) on an upgrade of the existing Dornier 328, marketed under the name TRJ328 for the jet version and T328 for the turboprop version. Sierra Nevada subsidiaries 328 Support Services, 3S Certification and 3S Engineering would support the parent company in the aircraft's manufacture and serial production, including helping to establish a European Aviation Safety Agency (EASA)-approved 21G aircraft production facility in Turkey.

### ACMG: Freighter Demand Growing

As demand for freighter aircraft continues to trend higher, the air freight market will need about 125 new freighters per year to meet growth and replacement needs over the next 20 years, according to a forecast issued in late May by consultancy Air Cargo Management Group. ACMG's forecast for this year assumes 4.5-percent annual growth in freight ton-kilometers. The projection compares favorably to the average of 95 freighters added per year from 1990 to 2014.

Even under an extreme case in which air cargo demand stagnated to zero growth over the next 20 years, ACMG calculates a need for about 60 more freighters per year to offset the capacity of freighters retired from the existing fleet.

### Delta Air Lines Takes First Heavyweight A330-300

In late May Airbus delivered to Delta Air Lines an A330-300 certified to take off at a maximum weight of 242 metric tons, making the Atlanta-based airline the first to receive the aircraft type from among 11 customers for the option. Delta has chosen the GE CF6-80E1 to power its new A330-300.

Launched in 2012, the increased-takeoff-weight A330-200 and A330-300 incorporate a new aerodynamic package, engine improvements and, in the -300 version, an optional center fuel tank. The upgrades on the A330-300 allow for an extended range of up to 6,100 nm while offering up to 2 percent less fuel consumption.

Airbus's biggest A330 customer in North America, Delta flies both Airbus narrowbodies and widebodies, including 57 A319ceos and 69 A320ceos, plus 11 A330-200s and 21 A330-300s. In addition to nine more A330-300s and 45 A321ceos scheduled for delivery to Delta, the airline ordered 25 A350-900 and 25 A330-900neos last year.

"The 242-ton A330 clearly paves the way for the A330neo and A350 XWB to join Delta's fleet in the next few years," said Airbus COO for customers John Leahy. —Gregory Polek

## Pilot group cries foul on European airlines' policies

by Gregory Polek

A high-level European Commission conference in Brussels titled "A Social Agenda for Transport" has elicited some damning commentary from the European Cockpit Association (ECA) over what it considers the failure of the airline industry to recognize its social responsibilities to its pilots. In a statement timed to coincide with the start of last month's conference, the ECA called on the commission to address poor working conditions for pilots, growing unemployment, so-called "social dumping," a rapid increase of "atypical" employment, social and fiscal engineering and "questionable" company structures.

"When it comes to social issues in European air transport, it is time that we deal with the reality of what actually happens in our sector," said ECA president Dirk Polloczek, "And let's admit it: this reality is ugly."

The reality, claims the ECA, encompasses a regulatory environment that allows for so-called flags of

convenience, where airlines can "shop around" for the most lenient labor and taxation law or oversight regimes. Meanwhile, in what the ECA calls a "race to the bottom," some airlines have started to pass their responsibilities for social-security contributions and taxes onto their employees under "pay to fly" schemes, or "self-sponsored line training" that requires newly trained pilots to buy a package of flight hours to gain flight experience.

The ECA also cited a recent EU-funded study by the University of Ghent showing that one in six European pilots works on an "atypical" basis, through temporary agencies as self-employed pilots, or on a zero-hours contract with no pay guarantee. According to the ECA, airlines use so-called self employment among pilots as a disguise for regular employment, thereby evading their legal social responsibilities. The Ghent University study notes the prevalence of the practice among

young pilots and those flying for certain low-fare airlines. Forty percent of 20- to 30-year-old pilots fly as self-employed contractors, according to the study, and seven out of 10 of all self-employed pilots work for low-fare airlines.

"Flags of convenience, bogus self-employment and pay-to-fly are harmful practices that destroy jobs in Europe, carve out tax and social-security payments in EU member states, and force other airlines to follow the example if they don't want to be wiped out of the market," ECA vice president Jon Horne said at the EU Commission conference last month. "Atypical employment should concern not only the industry, but all European citizens and decision-makers... Whether looking at the 'place of business' that determines tax and regulation, employment status, or aircrew 'home base,' current rules and loopholes permit unscrupulous operators to present on paper a smokescreen that obscures and bears little relation to what is actually going on. We must move to a situation where an assessment of reality governs how airlines and crews are handled."

The ECA has called for an immediate ban on pay-to-fly schemes and zero-hours contracts for aircrew, and laws ensuring that employers must declare a genuine home base from which pilots derive their legal rights. It also called for the EC to top its "to-do" list with a definitive halt on "bogus" self-employment and other forms of what it calls social engineering. Finally, it said, European law must eliminate flags of convenience by strengthening the "principal place of business" as a reality of establishment, not a choice by the airline. □



## Embraer looks long term to support aircraft values

by Gregory Polek

Embraer's incremental approach to its product placement endeavors appears to have served it well, not only in the number of orders its E-Jet line of narrowbody jets has collected over the years, but also in the company's ability to support the residual values of the airplanes already in service. Now as it prepares its new E2 line for entry into service starting in the first half of 2018, Embraer thinks it has positioned itself for a long production run without satiating the market's appetite for the current line of E-Jets.

Embraer Commercial Aviation chief commercial officer John Slattery attributes the strong start to the E2 program to Embraer's strategy of avoiding direct competition with

Boeing and Airbus and its decision to adapt the E-Jet airframe rather than introduce a "clean sheet" design. In contrast, Embraer's main competitor, Canada's Bombardier, promotes its CSeries jet as just the kind of clean-sheet exercise it believes the market needs. While the question of which approach ultimately proves the more prudent remains open for now, the range and ready availability of financing instruments to customers could offer a clue to at least the level of confidence shown by the financial community in the products and the companies that stand behind them.

During an industry finance conference in Phoenix earlier this year, Bombardier Commercial Aircraft

vice president of business acquisition Ross Mitchell insisted that "a lot of people are interested in financing the CSeries," notwithstanding criticism from its primary competitor over the company's historically heavy reliance on export credit agency backing. Of course, Embraer turns to its own credit agency as well for a bit less than 20 percent of its sales, but Slattery warned of overreliance on ECA financing.

"They play an important role, and I would also say that Embraer is grateful for the support that we get from the Brazilian government, specifically through BNDES in their support of our program," Slattery told AIN. "I do believe that...there is a positive correlation...of poor residual values when you have programs that have an overreliance on ECA financing."

The reason, said Slattery, lies in the benefits inherent in the financial community's familiarity and commitment with the asset. If an export

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credit agency accounts for the asset's primary source of financing, a crisis in confidence develops. "The investor community gets nervous if the only form of debt financing is the sovereign ECA, [and] that probably doesn't bode well for long-term residual values, and that becomes a self-fulfilling prophecy," noted Slattery.

### Broadening the Operator Base

Still, for Embraer, the most important driver of residual values lies with a broad operator base, and, according to Slattery, the company has set a "hard-wired plan" to expand the number of E-Jet operators from 68 today to at least 100 by the fourth quarter of 2017. Already, customer diversity does not appear to present a problem. "We have airlines operating in 48 countries, operating as LCCs, operating as network carriers or legacy carriers, operating as regional airlines...so there's a diversity of business plans...airlines with a diversity of business plans operating in all five continents," said Slattery.

But while E-Jets account for 80 percent of the in-service jets carrying fewer than 130 seats in China, for example, Embraer's penetration of the Asia-Pacific market remains relatively shallow,

prompting management recently to commit substantial attention and resources toward that region. "I'm confident of our ability over the next 24 months to open up new customers in Asia-Pacific outside the Chinese market," said Slattery. "We have significantly beefed up our human resources in our Singapore office to address that market, and I'm excited about what's in the works out there."

Embraer recently secured its first sale in Indonesia, a market Slattery calls "custom-built" for E-Jets because of the country's geography and demographics. The new customer, Kalstar Aviation, also launched the ATR turboprop in the Indonesian market, where airlines such as Garuda and Lion Air have given the Franco-Italian airframer some of its biggest sales to date.

Of course, ATR can trace the success of its ATR 72-600 largely to operators' familiarity and positive experience with the not dissimilar ATR 72-500, and systems commonality between the E1s and E2s accounts for yet another important factor in ensuring residual values of Embraer's installed base, added Slattery. In the cockpit, similar Honeywell Primus Epic avionics systems promise a relatively seamless pilot transition from one model to the other. Pilots moving from the E1 to



Embraer E175s fly in the colors of all three U.S. legacy carriers, including United Airlines.

the E2 will not need extra simulator training, for example. "That's actually got a positive impact on residual values of the E1s, because airlines can continue to operate the E1s with great confidence, knowing that even as they introduce the E2, airlines can [deploy] their pilots comfortably, moving between the E1 and E2, in the exact same way Airbus will experience with the Ceo and the Neo and Boeing with the NG and the Max," explained Slattery.

Finally, by the time the Pratt & Whitney PW1000G "geared turbofan" finds its way into service with the first E190-E2 in the first half of 2018, variants of it will already have flown many hours on the Bombardier CSeries and Airbus A320. Although not a GTF pioneer, Embraer can reasonably claim that the experience of earlier

operators will help alleviate "teething pains," instilling still more confidence in the airplanes' reliability within the airline market and on the part of financiers.

"By the time Pratt & Whitney's geared turbofan gets to us, it will have roughly two and a half million hours on other platforms," said Slattery. "That engine is well tested by the time we get to it."

On the question of on-time certification of the E190E2 in the first half of 2018, Slattery compared Embraer's prospects with those of Boeing and Airbus, both of whose re-engined narrowbodies appear firmly on or ahead of their original schedules. "We're confident that Embraer will enjoy the same discipline with our entry into service," he said. "And our customers are voting with their checkbooks." □

## Bombardier Commercial boss sets record straight on CSeries

Since assuming the post of president of Bombardier Commercial Aircraft in April, Fred Cromer has spent much of his early tenure assessing the strengths and weaknesses of an organization that has drawn its share of criticism over the CSeries' slow industrial and commercial progress. But now that the program appears to have found some momentum in terms of its certification effort, Cromer can set his sights on ensuring the company's readiness to support the airplane in the field and ultimately establish a foundation on which Bombardier can cultivate confidence among potential customers and financiers. Finally registering orders for 300 airplanes by the time the CSeries gains certification—a target set by Bombardier hierarchy well before Cromer joined the company—certainly would aid his cause, as would helping to secure financing for one of the program's largest customers, Russia's Ilyushin Finance (IFC).

In an interview with AIN in early April, IFC general director and co-owner Alexander Roubtsov said he had begun reconsidering his company's commercial commitments to the CSeries in response not only to Canadian sanctions placed on Russia for its annexation of Crimea and alleged support of separatists in eastern Ukraine, but also because of his concerns about Bombardier's readiness for high-quantity production, the availability of delivery slots and airline acceptance of the product.

Of course, Bombardier intends to dispel skepticism about its ability to maintain the pace of industrial progress it now

appears to have achieved, and Cromer told AIN in an interview in late May that the manufacturer intends to behave "proactively" to ensure that the CSeries finds a position in the Russian market.

"Rather than sit around and be hopeful that sanctions will be lifted, we're going to be a little more proactive and figure out with our Russian customers and our potential Russian customers a way to help them secure financing," said Cromer.

### EIS Planning

In the meantime, Bombardier and its newly announced launch operator—Lufthansa Group subsidiary Swiss International Airlines—continue preparations for entry into service in the first half of next year. Cromer characterized as "natural" the decision by Lufthansa not only to become the launch customer but also to

commit to making Swiss the first operator given the long relationship Bombardier has cultivated with the European airline over the years, starting with service entry of the first 50-seat CRJ in 1992.

"The lines of communication are open...and this sort of feedback loop as the airplane goes into service is going to be extremely important to us," said Cromer. "It's critical...to have that level of communication with the OEM is going to be key. They're pretty sophisticated with Lufthansa behind them, [and with] Lufthansa Technik as part of that family as well. I think we're well positioned to be extremely successful with entry into service."

Cromer should know, given his experience with fleet planning and acquisition at Northwest Airlines and Continental Airlines, then as CFO of Continental Express and, finally, CFO and president of International Lease Finance (ILFC). While working on the airline side of the business gave Cromer a broad exposure to North America, his experience at ILFC, half of whose business resides in Europe and 25 percent in Asia, lends him a global

perspective that Bombardier felt it needed for the CSeries program.

"So developing the network with all the international carriers on top of what I already had in North America is something that I bring now to Bombardier in terms of a customer connection as well as a finance background, so I can get a little creative when we think about how to finance airplanes into a new customer, as well as understand what an airline goes through in making a fleet decision," explained Cromer.

On criticism from competitors and some market analysts about the level of export credit agency financing on which Bombardier historically has relied, Cromer noted that although "at times" customers will avail themselves of such support, no CSeries customers have yet received ECA financing.

"We're actually seeing a lot of interest from the leasing community," said Cromer. "Over the last year we signed on with five lessors and they are certainly helping our customers source solutions to the financing challenges facing the industry. As for ECA use, we are no different from any other OEM in that regard."

Although Bombardier fully intends to gain certification by year-end, it has given itself a substantial time buffer to ensure on-time EIS. The cautious approach would seem warranted, as potential customers exhibit what Cromer called a "wait-and-see attitude" until certification authorities issue their approvals.

Having finished more than 60 percent of its needed flight-test hours and 70 percent of its certification requirements, the program by all accounts from Bombardier executives has performed as expected.

"The CSeries is performing beautifully, [and I'm] impressed with the data we are seeing," said Cromer. □



The Bombardier CS300 takes off from Mirabel, Canada, on its February 27 first flight.



## NEWS UPDATE

### ■ Seca Takes New Name

Engine maintenance, repair and overhaul specialist Seca has changed its name to Vector Aerospace France. Based near Paris Le Bourget Airport, the company supports turboprops and turboshafts and is a designated overhaul facility for the Pratt & Whitney Canada PT6A and PW100 series. It is also an approved OEM warranty repair station for Barfield, Christie, Crane Aerospace, Goodrich, Honeywell and Moog. Vector Aerospace France provides dynamic component repair support for the Airbus Helicopters Alouette and Gazelle. Vector Aerospace is an Airbus Helicopters subsidiary, which integrated Seca into Vector in 2011.

### ■ CHC S-92 Conducts First LPV Approach in Norway

A CHC Helikopter Service Sikorsky S-92 equipped with dual Universal Avionics SBAS-flight management systems recently performed the first localizer performance with vertical guidance (LPV) approach to Runway 07 in Florø, Norway. Florø, in support of the offshore oil and gas industry, is the first Norwegian airport to be equipped with LPV. CHC's S-92 is equipped with dual Universal Avionics UNS-1Espw SBAS-FMS and uses four-axis fully coupled modes in the pseudo-ILS mode down to circling minimums.

### ■ Bell Opens New Training Campus

Bell Helicopter opened its new 86,000-sq-ft training academy building last month. The facility features full flight simulators, new and updated flight technology demonstrators, a maintenance hangar, training area and classroom, dedicated tower and flight line. Since 1946, Bell has trained more than 130,000 people from 135 countries.

### ■ The K-Max Returns

Kaman Aerospace has announced plans to restart production of the K-Max external heavy-lift helicopter with an initial production run of 10 ships. Price is estimated at \$7.5- to \$8.5 million per unit, and deliveries are slated to begin in 2017. Kaman certified the K-Max in 1994 but shuttered the production line in 2003 after building just 38. The K-Max has recently gained popularity with the U.S. Marine Corps for aerial unmanned delivery.

### ■ Sikorsky To Cut 1,400 Jobs

Sikorsky is cutting approximately 1,400 production-related jobs. "Sustained falls in oil prices continue to drive significant declines in capital investments by oil companies in offshore oil exploration projects," a spokesman explained. The consequence is reduced production of medium and heavy helicopters. Demand also remains soft for "certain international military products." The 1,400 layoffs target a mix of employees and contractors and affect Sikorsky's facilities in Poland, Pennsylvania and Connecticut. The measure was effective in May and will take place over the following 12 months.

### ■ AW189 Logs 600 Hrs in Six Months

In just six months since it was delivered to North Sea offshore energy operator Bel Air of Denmark, an AgustaWestland AW189 has logged 600 hours. The total delivered fleet of 16 helicopters had logged 3,500 hours as of early June. —T.D., M.H.



A proposed cap on flight training benefits for veterans could have significant negative consequences, warn opponents of the plan.

## Abuses drive cap on VA-paid flight training

by Mark Huber

On May 21 the U.S. House Veterans Affairs Committee voted to cap public college tuition and flight-training benefits under the post-9/11 G.I. Bill to \$20,235 per year for qualified U.S. military veterans, with an amendment to grandfather all veterans currently enrolled in flight-training programs for two years. The \$20,235 cap already applies to private and nonprofit schools. The imposition of that cap in 2011 forced private schools with aviation programs to partner with public institutions and/or their agents to provide the flight-training portion of their curricula. The new amendment is designed to close a loophole in the current law that permitted virtually unlimited Veterans Administration (VA) funding of courses taken at public colleges or their affiliates, including flight-training fees.

Aviation alphabet groups vociferously opposed the tuition and fee cap as "an overreaction that imperils not just veterans in helicopter flight-training degree programs, but all flight training degrees." The proposal is part of a larger bill (H.R. 475) dealing with reform of the VA that will now go to the full House for consideration. Committee member Rep. Brad Wenstrup (R-Ohio) said the amendment is necessary "to curb skyrocketing prices" in light of past abuses that included the VA paying more than \$534,000 for flight-training fees and tuition for one student for one year; he added that prices at flight schools receiving VA funding jumped by an average of 87 percent between 2013 and 2014.

There are 22.2 million U.S. veterans, 6.2 million of them from the Gulf War era. Those veterans have a median age of 40. The Veterans

Administration is one of the fastest-growing elements of the federal budget. The Fiscal Year 2016 budget request for the VA is \$168.8 billion. The VA's 2014 budget was \$152.7 billion, of which \$86.1 billion went toward mandatory benefits, including disability benefit compensation and education benefits such as the Montgomery GI Bill; the Post-9/11 GI Bill; and a new education program, the Veterans Retraining Assistance Program (VRAP), which provides financial support to individuals between 35 and 60 years old. Last year the VA processed 4.3 million education benefit claims, up 6.5-percent from 2013, when the VA spent \$10.267 billion on these benefits. Altogether, an estimated 1 million veterans received education benefits in 2014 worth more than \$12 billion at some 12,149 schools. While flight-training benefits are a minuscule part of this total, their year-over-year rise greatly exceeded the educational benefit rate of increase as a whole.



Matt Zuccaro, HAI president

### Education Benefits

According to data provided to AIN by the VA, the agency spent \$42 million on tuition and fees in FY 2013 on behalf of 1,713 veterans enrolled in flight training programs at public institutions of higher learning (IHLs); it spent \$80 million on behalf of 1,884 veterans in those same programs in FY2014. In FY2014, there were 111 VA-approved public IHLs with flight programs. While all public and nonprofit accredited IHLs are eligible for use of benefits, the states approve for-profit and other programs for use of the federal GI Bill benefit on behalf of the VA.

According to the FAA, there were 120,285 student pilots in the U.S. at

the end of 2013. Those subsidized by the VA represented less than 2 percent of the total. Nevertheless, in a statement distributed on June 9, Helicopter Association International (HAI) president Matt Zuccaro insisted, "Veterans using these programs represent one of the best prospects for rebuilding a declining pilot population." AIN reached out to an HAI spokesman for comment on June 5 via telephone. That call was not returned. We then reached out to Zuccaro directly via e-mail on June 9, which was not acknowledged.

Given the VA and FAA data, the argument that capping VA flight benefits would somehow significantly impede the aviation industry's ability to address a looming pilot shortage could be seen as dubious.

However, Zuccaro and others who oppose the tuition caps make another argument that will perhaps have more emotional resonance: one of basic fairness. "The GI Bill was there for me after my service in Vietnam. Now HAI is committed to making sure it's there to meet the needs of today's veterans," Zuccaro wrote in the June 9 public statement.

Embry-Riddle Aeronautical University (Prescott) chancellor Dr. Frank Ayers made the same point in an interview with AIN on June 8. "We have students whose main motivation to join the military was to obtain the [VA] benefits to become pilots. They came back and now they're doing flight training and the rules are about to change. Would they have made a different decision [to enlist] five years ago if they knew the benefits wouldn't be there when they got out?"

ERAU provides in-aircraft training to veterans through its association with Dodge City Community College and Universal Helicopters. Ayers estimates that of approximately 2,035 students at ERAU Prescott, 50 to 60 are veterans "guest flying" with Dodge City and Universal, as a work-around to the ban on VA benefits being used to finance flight training at private schools. Last year ERAU Daytona received \$16.65 million in education reimbursement from the VA while Prescott netted \$4.326 million, according to the VA. All of those



funds were used for tuition reimbursement for non-flight training curricula under the \$20,235 private school cap, which does not completely cover the cost of annual tuition of approximately \$30,000, according to Ayers, who said that ERAU offers veterans—approximately 10 percent of ERAU’s overall population—scholarships and a discount to make up the difference. “

Not all veterans attending ERAU enroll in flight-training programs. Overall, approximately 20 percent of ERAU students are in flight-training programs, with 90 percent of those in fixed-wing training and the remainder in helicopters. This closely mirrors national apportionments for fixed- versus rotary-wing flight training. Flight training costs at ERAU are billed hourly and not included in the cost of basic tuition. Undergraduate students in the fixed-wing flight training sequence can obtain ratings up to a restricted airline transport pilot (ATP) rating upon graduation. (Pilots must be 23 years of age and have at least 1,500 hours total time to qualify for a regular ATP.) The additional flight training costs average \$60,000 to \$80,000 over the course of a four-year degree enrollment, Ayers said. In-aircraft rotary-wing flight training averages approximately twice the cost of fixed-wing training.

#### Cooperation of Affiliates

According to a VA spokesman, “Flight programs, like other programs at IHLs, are not subject to an annual tuition and fee cap, as long as those classes count toward graduation. The issue that has been the topic of some congressional debate is that this permits two- and four-year degree granting institutions to contract with a flight training company, and with no statutory limit to the amount of tuition and fees that can be charged per student.”

According to Veterans Affairs Committee chairman Rep. Jeff Miller (R-Fla.), the VA began noting what it considered abuses with regard to flight programs last year and approached the committee seeking legislative redress. In prepared testimony submitted to the committee, the VA noted that it is “concerned about high tuition and fee payments for enrollment in degree programs involving flight training at public IHLs. Education benefit payments for these types of programs have increased tremendously with the implementation of Public Law 111-377 (a.k.a. the Post 9/11 GI Bill, enacted in 2011), and in some cases, public institutions seem to be targeting veterans with their flight-related training programs. There has been a significant increase in flight training centers, specifically those that offer helicopter training, that have contracted with public IHLs to offer flight-related degrees. Sometimes these programs charge higher prices than those that would be charged if the student had chosen to attend the vocational flight school for the same training. Additionally, the VA has noticed that a growing number of VA beneficiaries are taking flight courses as electives. In most cases, these courses are not specifically required for the veteran’s degree.”

Ayers, Zuccaro and other critics of the new proposed cap argue that flight training benefit program abuses were the result of lax enforcement of existing rules and mismanagement by the VA. “Lax enforcement of existing VA regulations coupled with liberal policies allowed some flight schools to charge the VA far more than was the intent of the Post 9/11 GI Bill. The bill is intended to train a veteran in

any course of study to a point that he or she can enter the civilian workforce. In the aviation industry, that generally means a commercial pilot with flight instructor and flight instructor-instrument certificates,” Zuccaro wrote in HAI’s June 9 public statement. “Congress must not single out our industry based on a few isolated incidents caused by inept VA management of college flight-training programs.”

Ayers points out that some of the huge overcharges cited by the Veterans Affairs Committee and widely reported in the media in the months leading up to the May hearings were the result of unscrupulous schools providing primary training in turbine-powered aircraft, as opposed to the piston-powered aircraft that are more cost-effective and appropriate vehicles for private pilot and single-engine instrument ratings. In some cases those schools were also violating the VA’s “85-15” rule, which provides that non-veterans account for at least 15 percent of the student body in schools receiving VA benefits. The 85-15 rule exists to prevent schools from forming strictly to enroll veterans. The VA has disqualified at least one flight school for violating the 85-15 rule.

#### Concern about Consequences

However, in the minds of Ayers and others in the industry, the proposed cure of a tuition cap is worse than the disease. “This would appear to stop veterans from doing flight training almost anywhere,” he said.

In his public statement, Zuccaro asserted that the proposed cap on flight training is discriminatory. “No other public collegiate degree program faces such a cap. Moreover, the \$20,000 annual cap is

inadequate, and student loans to make up the difference are nonexistent.”

That argument seems to have gained some traction on the Veterans Affairs Committee. Not all committee members agreed that imposing the \$20,235 cap was appropriate and modified legislative language is likely.

Committee member Rep. Dina Titus (D-Nev.) noted that the cap would adversely affect veterans pursuing helicopter training. “This language drastically limits the ability of veterans to attend pilot training schools. I’m concerned that [with] this cap in place, most veterans who are interested in using their GI Bill for helicopter training won’t be able to do it.” Titus also pointed out that loans for student flight training don’t qualify for government-backed guarantees, are considered unsecured, are difficult to obtain and carry annual interest rates of more than 12 percent, or three times that of a government-backed student loan. “It’s almost impossible for a student to get these loans,” she added.

Ranking member Rep. Corrine Brown (D-Fla.) expressed dissatisfaction with the cap and hinted that she would push for changes before it reached the House floor. “There is still work to be done before this bill reaches the House floor. It is clear there are still some issues that need to be addressed.”

The measure is also in for scrutiny in the Senate. U.S. Sen. John McCain (R-Ariz.) has met with flight school leaders in his state and indicated his opposition to the proposed cap when/if the legislation finds its way over to the upper chamber.

Ayers said that simply enforcing existing rules would solve the problem. “The real issue (for flight schools enrolling veterans) is: Do you follow the rules or don’t you follow the rules? If you don’t follow the rules, you get these one-year, \$500,000 flight training bills.” □



Veterans Affairs Committee chairman Rep. Jeff Miller

## Sikorsky S-97 Raider enters flight-test phase

by Thierry Dubois

Sikorsky’s S-97 Raider semi-compound helicopter made its first flight on May 22. A follow-on to the X2 demonstrator, the S-97 combines two rigid coaxial, contra-rotating rotors and a pusher propeller to achieve speeds unattainable by a conventional rotorcraft.

The maiden sortie took place at the manufacturer’s development flight center in West Palm Beach, Fla. It lasted approximately one hour, during which pilot Bill Fell and copilot Kevin Bredenbeck took the aircraft through a series of maneuvers designed to test hover and low speeds. With its first flight now in the logbook, the Raider is moving on to “demonstrating key

performance parameters critical to future combat operations, including armed reconnaissance, light assault, light attack and special operations,” Sikorsky said, referring to the needs of the U.S. Army.

Based on the X2, the S-97 can be developed into a multi-mission configuration to carry six troops and external weapons. Cruise speed is predicted to reach 240 knots.

“With the Raider’s unmatched combination of speed, maneuverability and acoustic signature, Sikorsky Aircraft is ideally positioned to provide the military with essential mission-specific capabilities. With this flight, we have started the demonstration of



The Sikorsky S-97 Raider made its first flight in May.

solutions not only to near-term capability gaps but also for future vertical lift needs,” said Samir Mehta, president of Sikorsky Defense Systems and Services.

In addition to military missions, Sikorsky is exploring commercial applications for the S-97. “In a commercial role, applications could include executive transport, offshore oil support, search-and-rescue and medevac. The speed of the S-97 Raider makes it an interesting option,”

Chris Van Buiten, vice president of Sikorsky Innovations, told *AIN*. Another appealing feature is that the S-97 is relatively quiet. Compared with a conventional helicopter, the rotor has a lower blade tip speed, there is no tail rotor and the pusher propeller can be shut off during hovering and operations at normal helicopter flight speeds.

The program is 100 percent funded by Sikorsky and its 53 industry partners. For the

single-engine rotorcraft, GE Aviation provided the YT706-GE-700R, a T700/CT7 derivative. The 2,500- to 3,000-shp, Fadec-controlled engine is currently used in the Sikorsky MH-60M for the U.S. Army Special Forces. United Technologies Aerospace Systems provided the flight-control computers, air data system and prop drive. Triumph provided the gearbox.

“The S-97 is much more production-representative than the X2. While the X2 was a single-seater, the S-97 has two flight crew and room for six passengers in a flexible, open cabin,” Van Buiten said. The X2 was designed to prove the physics of the X2 configuration; the Raider is designed to demonstrate the operational value to customers. According to Van Buiten, significant improvements have been made in several areas of the design.

Final assembly of a second prototype is scheduled for completion this year. □



# Airbus Helicopters reveals X6 concept

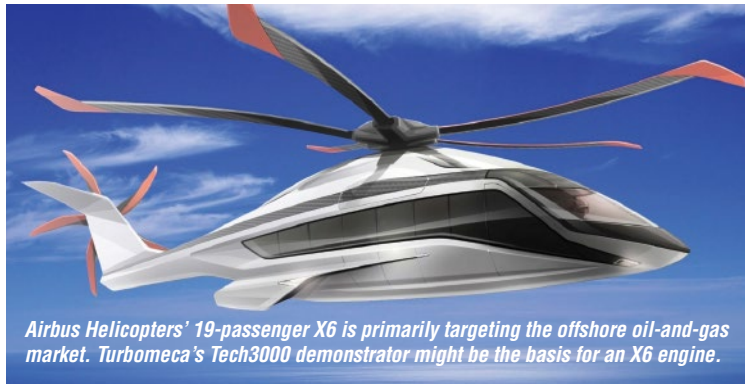
by Thierry Dubois

Airbus Helicopters unveiled the first artist rendering of the long-awaited X6 at the Paris Air Show last month. The X6 is a heavy helicopter now entering a two-year “concept phase” that Airbus hopes will lead to service entry in the next decade as a 19-seat replacement for the H225 Super Puma in the oil-and-gas market.

Guillaume Faury, president and CEO of the manufacturer, said the new twin-engine helicopter will feature fly-by-wire controls. “It makes sense on a heavy helicopter,” he said, “driving a lot of capabilities,” among them improved safety

as the result of reduced crew workload, integrated systems working together and enhanced envelope protection. For its first civil rotorcraft with fly-by-wire controls, Airbus Helicopters is drawing on its experience with the military NH90 and on sister company Airbus, the pioneer in FBW for airliners.

Faury did not say which engines the twin will use, but he hinted that some are available—in the right power class—from both Pratt & Whitney Canada and Turbomeca. The latter company has been running extensive tests on its Tech3000 demonstrator, in the



Airbus Helicopters' 19-passenger X6 is primarily targeting the offshore oil-and-gas market. Turbomeca's Tech3000 demonstrator might be the basis for an X6 engine.

3,000-shp category, aimed at 10-metric-ton-plus helicopters such as the X6.

“Key technologies of the compressor have already been validated and tests of the combustor and turbine are under way,” the Safran subsidiary said. Full engine tests integrating these new technologies will start at the end of the year. “We are especially assessing new materials for the combustor and high-pressure airfoils,” Philippe

Couteaux, Turbomeca's executive vice president for strategy and development, told AIN. The principle of a demonstrator is to bring these technologies to readiness level six, “to ensure we ‘de-risk’ the next step—full-scale development,” he added.

In addition to burning less fuel (25 percent less, Airbus hopes) than the H225, the X6 will be able to fly farther and offer a more comfortable cabin, Faury said. The company is

placing particular emphasis on noise reduction, both for passengers and for the environment. “We want this helicopter to be a good citizen,” he said, alluding to the market potential for helicopter airlines.

Airbus is seeking customer input during the concept phase, but it has already decided to integrate full decoupling. In addition to offshore oil-and-gas operators, Airbus expects to find clients in the search-and-rescue, VIP and commercial transport markets. The X6 “will reach the market when the H225 is still in production,” Faury said, partly because a military version of the X6 is farther out and the H225M will continue to be in demand until it arrives. Airbus Helicopters says its new design office in Poland will be involved in the X6 program at an early stage. □

# Russian models OK'd for commercial ops

by Thierry Dubois

With receipt of the final approvals required for commercial passenger operations, Russian Helicopters was set to begin delivering the first Ansat and Ka-226T light twins in May.

The Ansat was awarded a type certificate in 2013, but for cargo flights only. Last December, the Interstate Aviation Committee's Aviation Register (IAC AR) extended the approval to commercial passenger transport. Deliveries are to start “in the nearest time.” Russian Helicopters received orders from Tulpar Helicopters and Vector Aviation for three and two Ansat, respectively.

The Ansat can fly at a maximum of 148 knots and has a range (at lower speed) of “more than 270 nm.” The EMS version can accommodate one patient and medical equipment, with enough space for two medics to work, according to the company. The Ansat has a metal fuselage and fiberglass rotor blades.

Certified in March (at least four years later than originally predicted), the Ka-226T is a significantly modified Ka-226, with two Faded-controlled Turbomeca Arrius 2G1 turbo-shafts. The new engines provide 20 percent more power than the originals and allow the helicopter to be certified under transport Category A, which means

engine failure does not call for an immediate emergency landing. The Ka-226T also has a new VR-226N main gearbox and new avionics. The EMS variant has space for one patient and two medics, and a large aft door facilitates loading of stretchers. The Ka-226T has a maximum speed of 119 knots and a range of 270 nm.

During flight-tests in the Himalayas, the Ka-226T reached an altitude of 23,600 feet. The coaxial-rotor design eliminates the power-robbing tail rotor, putting more energy into the main rotors for performance and maneuverability and allowing operations in tight spaces, according to Russian Helicopters. It will be produced at Kumertau Aviation Production Enterprise.

“We are entering a sector of the helicopter industry in which, for a long while, we had no presence. Today we are offering helicopter operators two new light models. These helicopters boast a great diversity of potential uses on the commercial market, thanks to their technical characteristics,” said Russian Helicopters CEO Alexander Mikheev.

### Program Progress Reports

With certification of two models in hand, the company is making progress on its other products: the upgraded Mi-26T2

heavy twin is nearing the production phase; and the Mi-171A2 medium twin program is benefiting from use of a “flying laboratory.” Preparatory work is currently under way at Rostvertol (a Russian Helicopters subsidiary) for production of the Mi-26T2. Throughout last year, the Mil Moscow Helicopter Plant conducted additional flight-tests on the Mi-26T2 prototype for an unidentified customer. An initial phase of flight-testing concluded in 2011.

The upgraded version is equipped with five multifunction LCDs, backup electromechanical instruments and an enhanced digital communications suite. Video displays offer visual monitoring of the cargo on the external sling. The T2 requires only two or three crewmembers compared with five on the Mi-26T. The helicopter is equipped with air conditioning and heating systems.

An Mi-26T recently completed a mission to transport the 31,000-pound fuselage of an Mi-26. It took Rostvertol-Avia Airlines nine days to fly it from Yoshkar-Ola to Rostov-on-Don

for repair work. The Mi-26T can carry 44,000 pounds as an internal or external load.

The Mi-171A2 flying laboratory has concluded the second phase of preliminary flight-tests. A total of 67 ground runs and 72 flights were carried out at Russian Helicopters' Mil Moscow Helicopter Plant. Phase one logged 43 flights. The second phase of tests saw the installation of VK2500PS-03 engines and BARK-6V7S digital control systems, and a modified stabilizer and tail rotor. The tests confirmed that the helicopter's performance characteristics met the design specs, according to the manufacturer.

The flying laboratory is now being re-equipped for tethered ground testing. This phase of tests will focus on the rotor transmission and control mechanisms to establish whether they meet AP-29 certification requirements.

The first prototype of the Mi-171A2 will simultaneously undergo preliminary tests, with 42 of the 178 planned flights completed since November. The second prototype of the

Mi-171A2 will join the flight-test program soon.

Unlike the flying laboratory, the first and second Mi-171A2 prototypes are equipped with an integrated digital KBO-17 avionics suite developed by Ulyanovsk Instrument Design Bureau. The manufacturer expects the Mi-171A2 to reach production standard next year.

As for the Mi-38 heavy twin, flight-tests continue with “a number of prototypes,” said Russian Helicopters. Kazan Helicopters has started assembling the first production Mi-38 and Russian certification is expected by year-end. Initially intended to be a replacement for the Mi-8/17, the Mi-38 is now being marketed as a step up from those machines.

### Customer-support Initiatives

Separately, Russian Helicopters says it has launched a new effort in customer support. Helicopter Service (a Russian Helicopters company) and consulting firm Strategy Partners Group signed an agreement to provide the manufacturer with “consulting services in developing an after-sales service and maintenance strategy for Russian-made helicopters through 2030.”

One of the objectives is to boost support revenue to 35 percent of total revenue, Strategy Partners Group associate Mikhail Grigoriev said. “Underdeveloped after-sale services are an Achilles heel in Russia's aircraft and helicopter construction industries,” he noted. □

Vladimir Karnozov contributed to this article.



The Ka-226T, which has more power than its predecessor, has a maximum speed of 119 knots and a range of 270 nm.



# In the Works

by Matt Thurber

There has never been a shortage of innovators in aviation, champing at the bit to come up with new aircraft. The urge to fly higher, faster and farther lives on. Here are some of the new designs in development—from those still on computer screens to those deep into their flight-test programs.

## Flaris LAR 1

Podgórzyn, Poland-based Flaris announced at last month's Paris Air Show that it has selected the Williams FJ33-5A to power its LAR 1 five-seat single-engine very light jet. The prototype was originally fitted with a 1,460-pound-thrust Pratt & Whitney Canada PW610F, but LAR 1 project director Rafał Ładzinski told AIN last year that the aircraft requires an engine that could produce at least 1,506 pounds of thrust.

With the new engine, target performance specs are mostly unchanged: 820-foot takeoff distance from a grass field, 380-knot top cruise speed, 62-knot stall speed, 1,543-pound empty weight and 3,300-pound mtow. It has lowered the certified ceiling to 28,000 feet from 46,000 feet and boosted the maximum range to 1,700 nm from 1,350 nm. FAA and EASA type certification is still planned for next year.

## Textron Aviation Large-cabin Jet?

Amid industry chatter that it is planning to offer a large-cabin jet to the business aviation market, Textron Aviation's Cessna Citation division has been quiet about future products, including the next jet in the lineup, the Longitude. Recent news reports suggest that

there might be a follow-on to the Longitude, but there is also speculation that the Longitude itself might be subject to a redesign.

The information available from Textron Aviation about the Longitude puts it in a class with aircraft such as the Challenger 650, Legacy 650 and Falcon 2000LX. The Longitude's anticipated performance is close to that of the Falcon 2000LX, but the heavier Longitude has a longer cabin and will likely have more cabin volume. However, where the Longitude comes up short compared with these jets is in its 77-inch cabin width. All have flat-floor cabins, which are becoming more popular.

These differences raise an interesting question, and that is whether Textron Aviation leadership and designers are rethinking the Longitude's cabin dimensions or what a new jet larger than the Longitude might look like. A May 11 Bloomberg Business article quoted Textron CEO Scott Donnelly saying that a Textron Aviation team is working on such a product. While this sounds intriguing, aircraft manufacturers are always evaluating future products years ahead of launch and entry-into-service dates, so this comes as no big surprise. Asked about these plans, a Textron Aviation spokeswoman declined to comment.

Cessna's Citation division has always been conservative, basing many new models on earlier airplanes. The Longitude follows this strategy, building on the Latitude's new flat-floor fuselage and offering significantly longer range and more speed without having to design a clean-sheet airplane. The Latitude's performance turned out to be far better than originally promised, too, and this could be the case with the Longitude.

Cessna made a brief foray into the large-cabin market with the cancelled Columbus program. The Columbus would have been Cessna's first "hybrid" fly-by-wire airplane, with some flight controls employing FBW. Range was projected at 4,000 nm at Mach .80, with seating for up to 10 passengers. Cabin height was 6.1 feet, width 6.8 feet and length 36.3 feet.

Given the trends in large-cabin jets, one would expect a new Citation model to expand on the cabin interior dimensions of the Latitude/Longitude and Columbus. It is unlikely that the Columbus design offers much to contribute to that effort, although it is interesting to note that the Longitude will have fly-by-wire rudder, spoilers and brakes, the same FBW systems planned for the Columbus. □

## BUSINESS & UTILITY TURBOPROPS

<b>Aviation Alliance – Excalibur 421</b> (7/14 p. 6)	Re-engining Cessna 421 with P&WC PT6A-135As plus aerodynamic and other improvements. Price \$2.6 million. Cert. timeline pending.
<b>Diamond – DA50-JP7</b> (3/15 p. 10)	Two versions: Tundra for unpaved runways, takeoff distance 650 feet; and training/private owner model, high-speed cruise 230 knots. Seven seats. Powered by 465-shp Motor Sich AI450S. First flight 1/19/15. Cert. est. second half 2016.
<b>Epic Aircraft – E1000</b> (5/15 p. 52)	Single-engine all-composite turboprop, based on the Epic LT kit-built airplane. P&WC PT6-67 engine, Garmin G1000 avionics, \$2.75 million. Cert. est. fourth quarter 2015, deliveries early 2016.
<b>Evektor – EV-55</b> (8/14 p. 44)	Nine- to 14-passenger twin turboprop. CMC SmartDeck avionics. First flight 6/24/11. Program has received new Malaysian funding. Cert. est. 2017.
<b>Mahindra – Airvan 10</b> (5/15 p. 52)	10-seat single-engine turboprop, powered by RR250. First flight 5/1/12. Cert. late 2015, first in Australia, followed by FAA.
<b>Mahindra – Airvan 18</b> (11/13 p. 38)	Resurrection of the Australian twin-turboprop Nomad program. Entry into service in 2015.
<b>Mallard Aircraft – Turbine Mallard</b> (6/14 p. 52)	Twin-turboprop amphibian, conventional all-metal construction, Rockwell Collins avionics, P&WC PT6 engines. Entry into service had been targeted for second quarter 2015.
<b>Nextant – G90XT</b> (2/14 p. 4)	Remanufactured King Air C90A with new 750-shp GE H75 engines. Garmin G1000 flight deck with single-lever power controls, and remanufactured airframe. First flight 1/13/15. Certification 2Q/15.
<b>One Aviation – Kestrel 350</b> (5/15 p. 1)	Six- to eight-seat composite single, powered by Honeywell TPE331-14GR. Garmin G3000 avionics. Earliest delivery est. 2016. Program led by Alan Klapmeier.
<b>Privateer Industries – Privateer</b> (6/14 p. 52)	Single-engine composite amphibian with dual sponsons, GE M601 pusher powerplant. Now under construction in partnership with Comp Air. First flight estimated 2015.

Numbers in parentheses in left column indicate issue and page of previous reference in AIN.

## BUSINESS & PERSONAL JETS

<b>Aerion – AS2</b> (10/14 pg. 1)	Supersonic three-engine business jet; Mach 1.6 max speed; 5,300 nm max range. 9/22/14 alliance with Airbus aims for service entry 2Q/22.
<b>Beechcraft – 400XP</b> (3/14 p. 12)	Hawker 400A/400XP re-engined with Williams FJ44-4A-32, choice of Garmin G5000 or Rockwell Collins Pro Line 21 avionics and new winglets. First delivery mid-2015.
<b>Bombardier – Challenger 650</b> (11/14 p. 1)	Improved version of the Challenger 600 series, powered by 9,220-pound-thrust GE CF34-3B MTO, with 4,000-nm range and Rockwell Collins Pro Line Fusion flight deck. EIS 2H/15.
<b>Bombardier – Global 7000</b> (8/14 p. 44)	7,300-nm range, 59.6-ft-long cabin, GE Passport engines, Rockwell Collins Pro Line Fusion-based Global Vision avionics. Projected service entry in 2016 might be delayed.
<b>Bombardier – Global 8000</b> (8/14 p. 44)	7,900-nm range, 50.6-ft-long cabin, GE Passport engines, Rockwell Collins Pro Line Fusion-based Global Vision avionics. Projected service entry in 2017 might be delayed.
<b>Bombardier – Learjet 85</b> (2/15 p. 1)	Mach 0.82 midsize jet, 3,000-nm range, eight-passenger stand-up cabin. All-composite construction. First flight 4/9/14, since then 100-plus hours in more than 60 flights logged. Program "paused" 1/15/15.
<b>Cessna – Citation Latitude</b> (3/15 p. 16)	Midsize, Garmin G5000 avionics, autothrottles, powered by P&WC PW306D. Range: 2,500 nm. \$14.995 million. First flight 2/18/14. FAA cert. 6/5/15 and service entry 3Q/15.
<b>Cessna – Citation Longitude</b> (10/13 p. 36)	Longer than the Latitude, Snecma Silvercrest engines, Garmin G5000 avionics. FBW spoilers, rudders, brakes. First flight est. 2016.
<b>Cirrus – Vision SF50</b> (2/15 p. 42)	All-composite, \$1.96 million single-engine jet powered by Williams FJ33-4 turbofan. Cirrus Perspective (Garmin) avionics. First flight 7/3/08. First flight of conforming SF50 3/25/14. Cert. and delivery est. 4Q 2015.
<b>Dassault – Falcon 5X</b> (6/14 p. 52)	Twin-engine fly-by-wire large-cabin jet, powered by Snecma Silvercrest engines, Honeywell EASy flight deck. Rolled out 6/2/15. First flight est. mid-2015. Cert. est. and service entry first half 2017.
<b>Dassault – Falcon 8X</b> (5/15 p. 52)	Trijet, derivative of 7X with longer fuselage and 6,450-nm range. First flight 2/6/15, cert. mid-2016.
<b>Diamond – D-Jet</b> (4/13 p. 50)	Five-seat, all-composite single-engine jet; first flight 4/18/06; powered by 1,900-pound-thrust Williams FJ33. Program on hold for lack of funding.
<b>Embraer – Legacy 450</b> (4/14 p. 62)	Seven-seat, all-metal fly-by-wire twinjet, Honeywell HTF7500E engines. High-speed cruise Mach 0.82. First flight 12/28/13. Cert. and service entry 4Q 2015.
<b>Flaris – LAR 01</b> (4/15 p. 50)	Composite single-engine jet, five seats, Williams International FJ33-5A. \$1.5 million, 1,700 nm range. Taxi tests begun 02/15. FAA/EASA cert. est. 2016.
<b>Gulfstream – G500</b> (6/15 p. 1)	Pratt & Whitney Canada PW800 engines, Honeywell-based, touchscreen-control Symmetry flight deck, sidestick fly-by-wire, 5,000 nm at long-range cruise (Mach 0.85). Fuselage sized between G550 and G650. First flight 5/18/15, service entry 2018.
<b>Gulfstream – G600</b> (4/15 p. 50)	Same technology and engines (but higher thrust) as G500, 6,200 nm range at Mach 0.85. First flight 2017, service entry 2019.
<b>Honda – HondaJet</b> (5/15 p. 8)	Twin GE Honda HF120 engines mounted in overwing configuration, composite fuselage, metal wings. Conforming prototype first flight 12/20/10. FAA provisional cert. 03/27/15. Full type certification due "in the next few months."
<b>HyperMach Aerospace – SonicStar</b> (7/11 p. 18)	Mach 3.6, powered by SonicBlue electric-turbine hybrid engines. First flight est. 2021.
<b>Pilatus – PC-24</b> (6/15 p. 4)	All-metal jet powered by a pair of Williams FJ44-4As and designed for short and unimproved runways. Features Honeywell Primus Apex avionics. Rollout 8/1/14. First flight 5/11/15. EASA and FAA cert. est. 2017.
<b>Spike Aerospace – S-512</b> (4/15 p. 50)	Twin-engine, 12- to 18-passenger, 4,000+ nm range, Mach 1.6 supersonic business jet. Service entry five to seven years from program launch, current est. 2020.
<b>Stratos Aircraft – 714</b> (2/11 p. 6)	Composite fuselage, powered by one Williams FJ44-3AP. Four occupants, 1,500-nm range, 410-knot cruise. Wind-tunnel testing completed. Certification timeline not available.
<b>Supersonic Aerospace – QSST</b> (11/13 p. 36)	Proposed low-boom supersonic (Mach 1.8) business jet; unveiled at NBAA 2004; development plans pending.
<b>SyberJet – SJ30i</b> (6/14 p. 13)	Production to resume in late 2016 with new SyberVision cockpit, based on Honeywell Epic 2.0 avionics suite.

Numbers in parentheses in left column indicate issue and page of previous reference in AIN.



Maintenance News



*TAG Aviation Maintenance Services is the new organization encompassing all the company's maintenance ops.*

### TAG AVIATION UNITES MAINTENANCE OPERATIONS

TAG Aviation unified all eight of its maintenance centers under the name TAG Aviation Maintenance Services. The reorganization reflects the scope of maintenance services that it offers across Europe, as well as in Asia and Africa. TAG Aviation has heavy maintenance centers in Geneva and Farnborough and offers comprehensive maintenance services in Sion, Paris, Clermont-Ferrand, Madrid, Hong Kong and Lomé in Togo. All provide 24/7 service.

The company is approved by all major business aircraft manufacturers and has certification to work on more than 60 types. TAG Aviation Maintenance Services offers airframe and avionics support, troubleshooting and ramp services, as well as 10 specialist workshops that include a paint shop, interior refurbishment and non-destructive testing.

"The new name provides clarity and reflects the capabilities and capacity we offer across our maintenance network. We are able to deliver a full range of maintenance at six locations in Europe as well as in Hong Kong and Togo. Our team is available at all times to support clients no matter where they are in the world and is able to respond quickly to their specific needs, including major aircraft modifications and interior refurbishment," said TAG Aviation Engineering and FBO Services president Frank Madignier.

### FAA PROPOSES CIVIL PENALTY AGAINST AIR METHODS

The FAA has proposed a \$91,500 civil penalty against Air Methods of Englewood, Colo., for allegedly operating a Bell 407 when it was not in compliance with Federal Aviation Regulations. The FAA alleges that Air Methods operated the aircraft on four flights in October 2014 when a required torque check inspection on its

tail-rotor drive shaft components was overdue. As a result, the aircraft was not in an airworthy condition during those flights, the FAA alleges. The agency further alleges that after the company performed the inspection, it failed to update the aircraft logbooks to show the inspection had been done and indicate when the next one was due. Air Methods has been in communication with the FAA about the case.

Mike Allen, Air Methods' president, told AIN, "Air Methods is further investigating these allegations and the FAA has our full cooperation in the matter. What we know is that the allegations included flights in a Bell 407 and that the aircraft mentioned is in compliance. We take safety seriously and the safe return of our crews and the patients we serve is and always will be our highest priority at Air Methods."

### FORMER WECO EMPLOYEE SENTENCED FOR REPAIR FRAUD

United States District Judge John A. Mendez sentenced Jerry Edward Kuwata, the former operations manager at Weco Aerospace Systems, to one year in prison for conspiring with others to conceal facts from customers and the FAA about Weco's fraudulent aircraft repairs between October 2006 and February 2008. Weco was an FAA-certified repair business with facilities in Lincoln and Burbank, Calif., and was authorized to work on certain types of aircraft parts, including starter generators and converters.

According to court records, Weco employees regularly failed to follow FAA regulations in repairing and overhauling the aircraft parts. In many cases, Weco did not even have equipment capable of performing required tests. Weco employees at both locations nonetheless performed repairs and returned parts to customers, falsely certifying that the parts had passed tests and had been repaired in accordance with FAA standards.

There have been no known instances in which a fraudulent Weco repair resulted in an aircraft accident. However, Weco customers who testified at the trial of Weco's owner, William Hugh Weygandt, consistently testified that once they learned of the fraudulent repairs, they removed all Weco-repaired parts from their aircraft to address safety concerns. A federal jury found Weygandt guilty of conspiracy to commit fraud involving aircraft parts repair, and last July he was sentenced to 2.5 years in prison. Former Weco executives Michael Dennis Maupin and Anthony Vincent Zito previously pleaded guilty to federal offenses in connection with the conspiracy. They are awaiting sentencing.

### WEST STAR AVIATION BOOSTS PAINT CAPACITY AT GJT SITE

Grand Junction, Colo.-based West Star Aviation held an open house last month to showcase its new 45,000-sq-ft, two-bay paint facility. Dave Krogman, general manager, told AIN, "Several things went into the decision to add a second, larger facility. We have had far more demand than capacity but, equally important, the industry is moving toward larger aircraft and global travel. We always want to move forward with our customers. They're moving into larger aircraft and they expect us to be able to take care of their maintenance requirements, including paint."

While the new facility is already heavily booked, Krogman said there are still some openings for this year. The previous three-bay facility accommodates aircraft the size of a Falcon 900 and turns out 88 aircraft a year. The new facility can accommodate aircraft as large as the G650 and Global 7000. It will raise the MRO's paint throughput by 32 aircraft annually.



*West Star Aviation held a grand opening of its new paint facility at Grand Junction last month.*

### JET AVIATION EXPANDS MAINTENANCE CAPABILITIES

New approvals and new facilities announced at EBACE underline the expansion of services offered by Jet Aviation's FBO, modification and maintenance network. The EASA recently granted approval for the company's Vienna MRO facility to provide base maintenance support for the Challenger 300, and line

maintenance for the Global 5000. These approvals add to those for line maintenance work for the Learjet, line and base work for the Citation series, and AOG services.

Jet Aviation opened its 43,000-sq-ft facility at Vienna International last September. The Vienna facility has plans to add more aircraft types to its service offering in the near future.

The company's Moscow-Vnukovo MRO site has also received EASA approval to provide line maintenance for the Falcon 900EX EASy. Jet Aviation's Moscow shop holds approvals for line maintenance, defect rectification and AOG services for Bombardier, Embraer, Gulfstream and Hawker aircraft.

In the Middle East, Jet Aviation Saudi Arabia recently added a nickel-cadmium (NiCad) battery shop to its facilities, allowing it to check, charge and overhaul most batteries at its Jeddah facility rather than outsourcing the work. "Our goal is to provide our clients the best support possible, and the battery shop is our latest initiative aimed at improving efficiency and reducing aircraft downtime," said Alain Champonnois, v-p and general manager of Jet Aviation Saudi Arabia.



*A new battery shop in Saudi Arabia is among several new capabilities Jet Aviation added around the world.*

### NBAA SUPPORTS RULE TO EASE RVSM MX PROGRAM APPROVAL

NBAA welcomed the FAA's issuance of a notice of proposed rulemaking (NPRM) that would eliminate a costly and time-consuming requirement for operators to develop and submit a separate maintenance program for equipment required to operate in reduced vertical separation minimums (RVSM) airspace. The NPRM follows a joint industry-agency effort to streamline requirements for business aviation operators seeking RVSM approvals.

Currently, FAR Part 91 operators seeking RVSM approval must develop and submit to their local Flight Standards District Office (FSDO) a separate maintenance program for RVSM-related equipment in addition to other aircraft maintenance requirements. However, the proliferation and acceptance of RVSM-related equipment on business aircraft have made that requirement a costly and time-consuming redundancy for both operators and FSDO inspectors.

"RVSM was brand new when the initial rule was implemented in 2005, and the FAA initially took a



deliberately cautious approach toward maintaining this critical—and, at the time, largely unfamiliar—equipment,” said Mark Larsen, NBAA senior manager of safety and flight operations. “Today, RVSM is an integral and recognized aspect of aircraft systems, with required maintenance on this equipment covered by other approved regular-maintenance programs and regulations.”

#### WISCONSIN STUDENTS WIN GAMA DESIGN COMPETITION

For the third year, the General Aviation Manufacturers Association (GAMA) has sponsored the GAMA/Build A Plane Aviation Design Challenge. The event is designed to give young men and women exposure to aviation and career opportunities in aircraft maintenance, engineering, manufacturing and piloting.

The competition attracted 74 schools in 31 states and Washington, D.C., and each team was required to have at least one male student and one female student. The schools used “Fly to Learn” curricula and training, including software powered by X-Plane, and then modified a Glasair Sportsman to fly from one airport to another, delivering a maximum payload as quickly and efficiently as possible. Winners were decided by the airplane’s performance, an essay that described how the students applied the aviation knowledge they gained in the curricula and how their changes to the airplane promoted efficiency during the flight.

This year’s winners, the Chef Homeschoolers team from Cuba City, Wis., included students Abri Badger, Colton Koester, Nathan Koester and Jonathan Smythe, teacher Tom Smythe and chaperone Steve Badger. They will spend an all-expense-paid two weeks building a Glasair Sportsman at Glasair Aviation in Arlington, Wash., as part of the science, technology, engineering and math (Stem) competition.

#### GULFSTREAM EXPANDING LONG BEACH FACILITY

Gulfstream is once again expanding the maintenance and support space at its facility in Long Beach, Calif. The expansion, which will include a 19,000-sq-ft maintenance hangar and another 10,000 sq ft of support and office space, is expected to accommodate the addition of 50 jobs in

Gulfstream’s product support organization. The new hangar will be large enough to fit three large-cabin Gulfstreams at once, with accompanying ramp space for up to 10 aircraft. Gulfstream anticipates the new hangar will be operational by late summer.

#### STANDARDAERO ADDING SERVICES AT WINNIPEG

StandardAero’s Winnipeg, Canada component repair facility is slated for a multimillion-dollar investment that will add capabilities to its plating line. Manny Atwal, v-p of StandardAero Components

in Canada, told *AIN* that the plating facility will expand by 20 percent to 3,000 sq ft. An improved layout and design will provide better process flow and room for R&D.

Its Winnipeg site is adding 38 tanks—a combination of solution and rinse tanks—that will allow it to provide

more stripping and plating processes for chrome, electroless nickel, sulfamate nickel (hard and soft), cadmium (bright and non-bright), silver, copper and tin plating for aerospace parts and components. The project is slated to be finished by September. □



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## Hot Section Opinion

TORQUED by John Goglia

### Lessons from a train wreck: cabin safety does matter

I don't normally write about accidents outside aviation, but there are times that we can learn from events in other transportation modes. Certainly some of the big issues today—fatigue and use of PDAs—cross transportation modes. So while we have a low accident rate in aviation, we can study other transportation accidents to see what lessons there may be for us.

Not too long ago, I wrote about the lessons we could learn in the aviation industry from the faulty GM ignition switch debacle. An internal report prepared for General Motors highlighted problems that we in aviation would be well advised to take note of. (See "Guarding against a culture of complacency," *AIN*, August 2014, page 61.) GM is facing civil liability lawsuits and civil penalties, and there are media reports that the U.S. Attorney in Manhattan is preparing criminal charges against GM and possibly some of its former employees—all the more reason to pay attention to GM's internal report.

The deadly crash of Amtrak's Northeast Regional Train 188 traveling from Washington, D.C., to New York City perhaps provides another opportunity for us to learn—or even re-learn—some lessons about the importance of cabin safety and high-tech versus low-tech approaches to transportation risks. Passengers on the train recounted horrifying images of seats tearing loose from their floor mountings and passengers flying across the train, landing in luggage racks or, worse, hurtling through windows. In the end, the toll was eight people dead and more than 200 injured.

#### Look for Low-tech Solutions

Much of the media focus has been on the technology that could have prevented the speeding train from reaching 106 mph, as reported by the NTSB after examining the train's black-box data. That speed was more than twice the authorized speed for that section of track as it entered a curve. The technology that could have stopped the speeding train—known as positive train control or automatic train control—is not new. It has been mandated by Congress since 2008. But the technology is expensive and encountered a number of obstacles, including negotiating for the frequency spectrum needed to operate the wireless system. Although the law requires that the system be operational by year-end, the GAO reported approximately a year ago that most railroads will not have

the equipment fully operational by the deadline.

The NTSB has pushed for this technology, and I support it as well. It likely would have prevented Northeast Regional Train 188 from gaining the fatal speed on the curve. The system works via transponders on the track that relay information to a control center and then back to the locomotive. If the train is traveling, for example, too fast for the section of track, the engineer would first receive an alert. Absent an appropriate response, the train's on-board computer would take over and stop the train.

But while the focus has been on this high-tech solution, some low-tech solutions to improving train car safety have been largely ignored. And while these solutions might not have prevented all the deaths or injuries, they likely would have prevented many injuries and even deaths, especially in the cars that were not severely mangled.

Amtrak and other railroad companies would do well to look at the remarkable improvements in passenger safety—and reductions in passenger deaths and injuries—that resulted from improvements in aircraft cabin safety. Some of these

improvements included redesigning and hardening the attachment points so that seats would not detach in the event of rapid deceleration; improvements in seat design to lessen impact injuries; use of less toxic and less flammable materials; and the use of automatically lighted exit ways. And, of course, the use of seat belts (in a properly redesigned railroad car) would prevent a large number of injuries inflicted on passengers as they literally fly out of their seats in a derailment or other sudden stoppage. We can see the success of these efforts in aviation in the many runway excursion accidents that have resulted in few injuries and even fewer deaths.

There is much that railroads can learn from aviation in terms of cabin safety, in particular for ensuring that everything and everyone stays firmly restrained if the ride gets rough. In aviation, this ranges from insisting that maintenance is properly performed on seats and seat belts (and that these items aren't given short shrift in the rush to move airplanes as quickly and economically as possible) to ensuring vigilance by flight attendants on takeoff and landing that items are properly stored and not blocking passenger egress in the event of an emergency.

And, of course, I could not end an article on cabin safety without a plea for our most vulnerable passengers—those under the age of two—the only ones not required to be properly restrained on takeoff and landing or during turbulence. ■

*The opinions expressed in this column are those of the author and not necessarily endorsed by AIN.*



John Goglia is a former member of the NTSB and currently a safety consultant. He welcomes your e-mails at [gogliaj@yahoo.com](mailto:gogliaj@yahoo.com).



# NATA takes on misfueling errors

by Curt Epstein

On August 27 last year a Cessna 421C on a medevac flight crashed on initial climb out of Las Cruces, N.M., killing the pilot, two medical workers and the patient. Less than six months later, that sequence was repeated when a Piper PA-46 Malibu went down just after takeoff from Felts Field Airport in Spokane, Wash., killing the lone occupant. In both accidents, piston-powered aircraft had been mistakenly fueled with jet-A instead of avgas before departure, according to the NTSB, which has not yet issued its final report on either crash.

Misfueling is the delivery of the wrong type, grade or quantity of fuel, or distributing it in the aircraft in a way the pilot is not expecting, and in its Safety 1st Professional Line Service Training program, the National Air Transportation Association (NATA) says it repeatedly highlights the dangers of misfueling aircraft. The online course emphasizes the need for line technicians to continually verify the correct fuel before beginning to pump it, yet the 421 and Malibu accidents have prompted the association to spotlight what remains a persistent danger.

"How many misfuelings were caught by the line tech, or by the line supervisor or by the guy who was running up his engine and it started to run rough?" asked Michael France, NATA's director of safety and training, adding that only the most disastrous cases are reported. "It happens more frequently than we know, and that's the message that we have to get across to business owners, to understand there's a lot of risk here."

## Check and Check Again

As it prepares a new misfueling awareness campaign, NATA is urging the industry to adopt EI 1597, a set of recommended overwing fueling protocols established by the London-based Energy Institute. As described at NATA's recent Advanced Line Service Regional Workshop at Teterboro Airport, the current guidance centers around three areas: fuel orders, selective nozzles and procedures.

To be considered valid, fuel orders—whether taken over the radio by a CSR or delivered by the pilot—must include, each and every time, the fuel type, grade, quantity, how it is to be distributed and the N number of the aircraft. According to NATA,

gone are the days when a pilot's casual "Give me 25 a side" would be considered adequate. While seasoned line service workers can identify most types of aircraft by sight, NATA is calling for an

end to such guesswork and asking refuelers instead to rely on registration number rather than aircraft model, especially in cases where similar looking airframes

*Continues on page 73 ▶*



*Following several fatal misfueling accidents, NATA is looking to emphasize the protocols to prevent the wrong fuel from ending up in an aircraft's tanks.*

## E<sup>2</sup> = Exceeding Expectations In Performance Upgrades



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Chris Turner, President  
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## FBO and Airport News

### MILLION AIR TO EXPAND NETWORK

Houston-based Million Air broke ground last month on a 20-acre FBO at Austin-Bergstrom International Airport, Texas. It will include a 17,000-sq-ft terminal with a spacious passenger lounge, a private club, pilot lounge, flight-planning room and A/V-equipped conference rooms. A 6,750-sq-ft arrivals canopy will shelter aircraft from the elements, while the more than seven acres of ramp space will provide ample parking. The facility will also include 42,000 sq ft of service facilities and transient aircraft hangar space along with five private customizable long-term lease hangars totaling 82,000 sq ft, each with separate parking and entrance, capable of housing up to a G550. When complete in September next year, the location will be Million Air's 29th, and its fourth in Texas.

### KAISERAIR OAKLAND NOW A DCA GATEWAY FACILITY

KaiserAir Oakland, in the San Francisco Bay Area, is now a Washington Reagan National Airport (DCA) gateway facility for qualified aircraft operators. This makes KaiserAir one of only a handful of independent FBOs in California to receive DCA Access Standard Security Program (DASSP) qualification from the TSA. "The TSA has been great to work with during the lengthy application and vetting process," said KaiserAir Oakland general manager Otto Wright. "As an operator of business aircraft ourselves, we understand the unique challenges presented by DCA operations. This is an exciting development as it will allow DASSP-qualified operators to depart directly from KaiserAir Oakland."

An area of the company's FBO has been designated sterile for DCA flights. The facility is available immediately for DCA access flights, Wright said, and special arrangements can be made in advance to ensure proper slot requests and passenger confidentiality.

### TAC AIR TO BUILD NEW TERMINAL

Tac Air will break ground this month on a new terminal at Little Rock's Bill and Hillary Clinton National Airport, part of its \$11 million redevelopment and expansion project at the Arkansas capital's airport. The approximately

10,000-sq-ft building will feature a conference room, pilot lounge, flight-planning area and passenger waiting lounge along with a theater room, pilot snooze rooms and outdoor patio.

Last year, Tac Air acquired the former Supermarine FBO at the airport, and in February announced that it had purchased the FBO services portion of competitor Central Flying Service, in essence becoming the lone service provider at LIT at the time. Local FBO operator Fly Arkansas expects to open a new FBO there next month in the former Hawker Beechcraft facility.

### AIR ELITE EXPANDS NETWORK

Air Elite, the World Fuel Services-sponsored network of FBOs, has bolstered its roster with the addition of six members in six countries. World-Way Aviation in Sorocaba, Brazil; Fireblade Aviation in Johannesburg, South Africa; Caribbean Support and Flight Services in Barranquilla, Colombia; Mexico's Cabo San Lucas International Airport; Jet Aviation Bahamas; and Fort Collins-Loveland jetCenter in Loveland, Colo., are the latest to join the group, which was established in late 2011 from the remains of the former Exxon Aviat network.

The Air Elite Network has added nine locations in the past six months, bringing the total number of FBOs in the group to 43 worldwide. To maintain the standards of the network, each location must meet specific criteria for customer service and the quality of their facility to be considered for acceptance.

### BALI FBO BEGINS OPERATIONS

ExecuJet Indonesia, a joint venture between ExecuJet Aviation Group and Indonesia-based Dimitri Utama Abadi, has begun operations at its purpose-built 32,000-sq-ft FBO terminal at Bali International Airport. The location is the first to be opened under a 2012 agreement with the state-owned aviation company for ExecuJet to design, build and manage GA terminals at up to 13 Indonesian airports. The location also has a newly constructed apron of more than 700,000 sq ft for aircraft parking.

"There has been strong demand for aircraft handling services since we began operating in Bali in 2013, and we are seeing a new trend for larger private aircraft and specialized charters," said

Gary Forster, ExecuJet's Bali FBO manager. "We now directly handle 30 percent of all VIP movements in Bali. As it is such a popular destination for tourism, events and conferences, as well as being a good tech stop location, we expect the number of movements to rise even further this year."

### UTAH AIRPORT PUTS WRAPS ON RUNWAY REHAB PROJECT

Heber City Municipal Airport-Russ McDonald Field in Utah has completed a multi-million-dollar reconstruction and resurfacing project on its 6,900-foot runway, which also saw the entire runway lighting system replaced, as well as the turnoff taxi lights. A second phase of the project saw the six-acre apron for OK3 Air, the lone FBO on the field, demolished and replaced, causing the service provider to close for six weeks as the work progressed. It reopened early last month for daylight operations only, pending the relocation of the airport's lighting vault. The majority of the project was funded by FAA grants, and the city of Heber covered the remainder.

"The restoration project was expensive and will be hugely beneficial to OK3 Air customers," said airport manager Terry Loboscheksky. "We

want to make certain that pilots are aware that we're open for business." The airport is a gateway to Utah's ski country and an arrival point for the annual Sundance Film Festival.

### RENOVATIONS COMPLETE AT NIAGARA FALLS AIRPORT FBO

Calspan Air Services, the lone FBO at New York's Niagara Falls International Airport, has completed a \$100,000, three-month renovation project on the 40-year-old facility. Included in the work was a gutting of the customer service area and offices, the removal of unnecessary walls, the installation of a kitchen, conference room and bathrooms, as well creation of a new pilot lounge with snooze room. Allocation of some additional hangars on the field takes heated hangar space for transient aircraft to 40,000 sq ft.

In 2013, Buffalo-based Calspan Aerospace, which performs aircraft research, modifications and flight-testing among its offerings, won the contract to provide FBO services at the airport. The location's maintenance division recently received its Part 145 certification. The FBO provides all fueling at the mixed-use airport.



As part of a recent renovation project, Calspan Air Services expanded its hangar space for transient aircraft at Niagara Falls.

### CHARTER NEWS NOTES

- > **Priester Aviation**, celebrating its 70th anniversary this year, **has added six aircraft to its charter/management fleet.** Four jets joined the charter fleet: a Learjet 45 and 45XR (Chicago), a Citation Excel (Chattanooga, Tenn.) and a Hawker 4000 (Kansas City, Mo.). A G650 and Learjet 60 joined the management fleet.
- > **Landmark Aviation's fleet also grew by seven jets**, four of which are available for charter. The additions are two Falcon 2000s and one 900C, two Challenger 300s and one 604 and a G550.
- > Qualified BlackJet members can sign up for **free helicopter shuttle flights between Manhattan and the Hamptons** this summer. The service began in June and runs until Labor Day (September 7).
- > **International Jet Management and MENA Aerospace Enterprises subsidiary MAE Aircraft Management have launched a Bahrain-based joint venture** "to promote, sell and coordinate VIP and corporate travel on chartered business jets." The venture will also expand availability of aircraft management services in the Middle East.
- > The **Baltic Air Charter Association has endorsed the Argus certified charter broker program**, and Argus has arranged for two Europe-based auditors who can vet charter brokers based on the continent.
- > With growing demand for flight support services, **Jet Aviation's fleet has grown by 12 jets** this year: six G650s and two G450s, one Global 6000, a Falcon 7X and 900 and one Lineage 1000.
- > Swiss charter operator **Vertis Aviation has added a G550** to its fleet, based in Prague, to support central Europe- and Russia-based clients. G-Jet will operate the G550 for Vertis.
- > **Cavendish Trust signed a management contract to place a G550 with ExecuJet Aviation Group.** This is ExecuJet's first G550, and the jet will be based between the Middle East and Europe.
- > **Key Air's charter fleet now has a Falcon 7X** equipped to carry up to 14 passengers and available for charter worldwide. ■



ExecuJet Indonesia recently began operations at Bali International Airport.



This artist's rendering depicts Meridian's planned Hayward Executive facility from the ramp side.



## JETEX EXTENDS FBO CHAIN WITH CHILEAN LOCATION

Jetex Flight Support is expanding its FBO chain with a joint-venture facility in Santiago, Chile. Under the agreement, Jetex and Chile-based Santiago FBO S.A. will jointly operate an FBO at Arturo Merino Benítez International Airport (SCL). Notably, Santiago is the host city for the final matches of the American Cup football tournament, which concludes this month. The move expands Jetex's presence in Latin America beyond São Paulo, Brazil, where it currently provides fueling services and is establishing an operations center at Catarina Executive Airport with Brazilian real estate company JHSF. With the new Chilean facility, customers operating in the region will benefit from the combination of the Santiago FBO's knowledge of the local marketplace and Jetex's international trip-planning expertise, according to the companies. Services and facilities at the new FBO will include ground handling, aircraft parking, catering, fueling services and a VIP lounge, as well as a 15,070-sq-ft hangar. Immigration and customs clearance will also be available on site.

## NORTHERN IRELAND AIRPORT ADDS NEW FBO FACILITY

Global Trek Aviation, a new FBO at Belfast International Airport, has begun operations. The facility is staffed 24/7 and has ramp equipment to support any size aircraft as well as a dedicated fuel truck, operated by NATA Safety 1st trained and Gulfstream-certified ground handling staff. The large ramp provides discreet parking directly adjacent to the terminal. The nearly 2,000-sq-ft terminal is Wi-Fi equipped and features several computer work stations as well as a pilot lounge and shower facilities. The Airside passenger lounge provides complimentary refreshments and a dedicated golf representative who can arrange for preferential greens fees at any local course. UK Border Force/Customs pre-clearance is available.

## MERIDIAN STARTS SECOND LOCATION

Teterboro, N.J.-based aviation services provider Meridian will break ground this month on its second FBO location and first on the West Coast. It will set up shop at Hayward Executive Airport, which is home to more than 350

aircraft. When it opens in the summer next year, the \$10 million facility will bring the number of FBOs at the airport to two. The initial phase of the project calls for construction of a 6,300-sq-ft terminal with a private conference room, crew lounge and snooze rooms, 30,000 sq ft of hangar able to accommodate G650/Global 7000-size aircraft, a fuel tank farm and 3.5 acres of ramp space. Later phases will add 12,000 sq ft to the FBO space, another 80,000 sq ft of hangarage and seven acres more ramp area. The location will be the West Coast base for Meridian's aircraft management division and will provide maintenance.

## SHELTAIR EXPANDS FLORIDA FOOTPRINT

Sheltair, which operates FBOs in New York, Florida and Georgia, has acquired the 23-acre Landmark Aviation FBO at Florida's Ocala International Airport, the lone service provider on the field. The location is Sheltair's 10th in the Sunshine State and its 16th overall. The current facility has more than 42,000 sq ft of hangar space and can accommodate midsize business jets such as Hawkers, and a 6,000-sq-ft terminal with a 46-seat restaurant. As part of the 30-year lease agreement, Sheltair will loan the city \$4 million, which will fund the construction of a new 18,000-sq-ft multi-use terminal. It will house rental car agencies and a restaurant as well as airline charter check-in and waiting areas.

## WYOMING AIRPORT COMPLETES MAJOR FBO RENOVATION

Cowboy Aviation, the airport-owned FBO at Wyoming's Laramie Regional Airport, completed an upgrade from its previous 1940s era 1,500-sq-ft structure to a newly built 4,000-sq-ft terminal last month. The \$2.3 million project, which took 18 months, included ramp drainage and lighting, along with new fencing and gates around the Avfuel-branded FBO, a new parking lot where the former terminal building once stood, and landscaping. The facility has 40,000 sq ft of hangar space and can accommodate aircraft up to a Citation X. The new building provides a passenger lounge/lobby, pilot lounge with full crew kitchen, a 15-seat A/V-equipped conference room, and a pair of snooze rooms. The 8,500-foot runway at an altitude of 7,200 feet msl adds to the location's appeal as a quick-turn tech stop for cross-country flights. □

## FBO PROFILE: Landmark New Orleans

### FACILITY AT LAKEFRONT EMERGES STRONGER AFTER MAJOR STORMS

Next month marks the 10th anniversary of Hurricane Katrina, which caused massive flooding in New Orleans and surrounding areas. New Orleans Lakefront Airport (NEW) was extensively damaged by the storm, and a decade later that legacy is reflected in the number of new structures on the field,

aircraft and 10 acres of ramp.

While transient aircraft use the FBO's main apron, the former Hawthorne terminal offices and hangars are home to Landmark's based aircraft, a dozen of them turbines ranging from a pair of GIVs to a PC-12. They are serviced by four jet-A tankers (three 5,000- and one 3,000-gallon) that draw from the airport-owned Shell fuel farm. The location also has a pair of 1,200-gallon



Landmark operates from a recently remodeled terminal at Lakefront.

among them the building currently housing the Landmark Aviation FBO. For the past 22 years Addie Fanguy has served as general manager of the facility, through its changes from a Million Air location to Odyssey Aviation and most recently to Landmark in 2011. The first four or five years after the storm were painful for the airport business operators at NEW, Fanguy recalls, but things are once again looking up.

"There were a lot of obsolete hangars on this airport, and the airport authority didn't have the money to start reconstruction," he told *AIN*. "Like they say, sometimes from tragedy comes positive things, and this was the positive thing here. The federal government invested probably \$55 million in this airport, and with that we got all these new hangars."

After the storm, Fanguy's facility operated first out of a trailer and then from a cramped office in one of the less damaged hangars; the new Odyssey Aviation terminal was built in 2010 on the opposite side of the field from its original location. Landmark acquired it soon after but was forced to begin a \$1.2 million renovation project on the 15,000-sq-ft terminal to repair damage from 2012's Hurricane Isaac, which roared ashore on the seventh anniversary of Katrina. In addition to stripping down the interior wallboard and replacing furniture and carpeting, the company modified the footprint of some customer areas. The Houston-based company then spent more than half a million dollars replacing all the ground service equipment.

### Expansion Continues

Landmark also secured the lease on the airport's newly built Bastian Mitchell Hangar, which replaced a pair of structures destroyed by Katrina. Earlier this year, the number of FBOs on the field dropped to two when Landmark bought competitor Hawthorne Global Aviation's location, expanding its footprint at NEW to 550,000 sq ft and adding 100,000 sq ft of hangar space for G650-size

100LL trucks. All told, the location pumps 1.4 million gallons of fuel a year. In addition to NATA Safety 1st certification, the company's line service staff undergoes 40 hours of proprietary online training.

The modern terminal, open 24/7, provides a passenger lobby, concierge service, onsite car rental, a 12-seat A/V-equipped conference room, spacious pilots' lounge with three snooze rooms and two flight-planning areas. Wi-Fi is provided throughout the FBO. Dish and linen washing service is available, along with aircraft detailing.

Though the Gulf oilfield industry is top among the FBO's based clientele, there is plenty of private aviation traffic for events such as Mardi Gras, Jazz Fest and the Essence Festival, as well as the city's sports teams (the NFL's Saints and LSU football) and numerous conventions.

Such events can push operations at the FBO from 500 aircraft a month to 800, and helping last-minute arrivals during the peaks is when the FBO's staff shifts into high gear, explained Fanguy. "We train our customer service reps to understand what the pilots go through. People own airplanes so they can move about when they want to move about, and a lot of times the pilots get thrown into situations they have no control over," he observed. "[Our staff does] a great job of getting rooms and cars for the crews and sometimes even the passengers."

The FBO's CSR staff stays updated on all the events taking place in the Big Easy and its many attractions. This fall, with the World War II museum downtown marking the 70th anniversary of the Allied victory, the FBO will host a vintage warbird fly-in.

One thing that had been missing at Lakefront since Katrina is set to return, with U.S. Customs and Immigration service at the general aviation airport expected to resume in October from a dedicated 2,000-sq-ft office in the airport's newly restored 1930s-era main terminal. —C.E.



## PRELIMINARY REPORTS

### KING AIR DAMAGED IN GEAR-UP LANDING

**Beechcraft King Air 200, May 16, 2015, Carlsbad, Calif.**—The commercial pilot and sole occupant of the aircraft was not injured when he landed at McClellan-Palomar Airport at 3:48 p.m. with the gear still retracted. The wings of the aircraft were substantially damaged. The Part 91 flight had departed Palm Springs, Calif., in VFR conditions at about 3:15 p.m., destined for Santa Ana. The pilot reported experiencing a loss of electrical power about 10 minutes later and headed westbound VFR, on top of the clouds, until reaching the coastline. He then headed south toward Carlsbad with limited radio communications. After receiving a green light from the tower controller, he proceeded inbound and did not realize the landing gear was retracted until it was too late.

### LONGRANGER EXPERIENCES MECHANICAL FAILURE ON TAKEOFF

**Bell 206L-3, Kearny, N.J., May 20, 2015**—The helicopter was substantially damaged during a hard landing following loss of control in the hover moments after takeoff from the Helo Kearny Heliport. The sole-occupant pilot was not injured. He said he entered a 20-foot hover before departure from the helipad to contact ATC for clearance into the overlying airspace. But before he could speak, the helicopter began yawing to the right.

The pilot attempted to correct the rotation with left pedal input, but the helicopter spun three complete revolutions to the right. The pilot rolled off the power and raised the collective before the helicopter landed hard on the helipad, still yawing to the right. During the landing, the tail rotor contacted the ground and the main rotor hit the tailboom. Subsequent examination revealed a section of the tail-rotor drive-shaft had separated as well as damage to the tailboom, tail-rotor blades, left vertical fin and vertical stabilizer.

The helicopter was registered to Meridian Helicopters and operated by New York Helicopter. The operator had recently leased the helicopter, which had previously experienced a hard landing in Chile. The helicopter had been operated for about 16 hours following both an annual and a hard-landing inspection before the accident.

### ALL ABOARD METRO PERISH IN TAKEOFF ACCIDENT

**Swearingen SA226-TC Metro II, near Querétaro Airport, Mexico, June 2, 2015**—The Metro had just departed the airport on a post-maintenance test flight when it crashed on to a highway and burst into flames about seven miles southwest of Mexico City. All five people on board the aircraft died in the accident.

### HAWKER 800 SHOT DOWN BY COLOMBIAN FIGHTER

**Hawker 800, near Puerto Colombia, May 20, 2015**—A video released by the Flight Safety Foundation's Aviation Safety Network recorded the final moments of a Hawker 800 with the right engine ablaze before it plunged into the water off the northern coast of Colombia following an intercept by a

Colombian Air Force aircraft. The Hawker was reported to have departed Venezuela and to have been en route to Central America at the time it was intercepted for operating illegally in Colombian airspace. Sources said approximately 2,600 pounds of drugs and four bodies were found floating near the wreckage.

### ASTAR CRASH IN NEPAL CLAIMS FOUR

**Airbus Helicopters AS350B3, Sindhupalchowk district, Nepal, June 2, 2015**—All four people aboard the helicopter were killed when it crashed during a UN humanitarian relief mission. The aircraft was destroyed in a post-crash fire, and the accident is under investigation.

### CARAVAN DAMAGED IN LANDING ACCIDENT

**Cessna 208B, May 19, 2015, Mandeng airstrip, South Sudan**—After touchdown on the airstrip, the Caravan's right wing separated and the left wing and landing gear were extensively damaged. The number of people in the aircraft at the time of the accident is unknown, as is the extent of injuries, if any, to anyone on board.

A source reported the northwest-southeast airstrip measures 328 feet by 2,624 feet and is composed of black cotton soil. People and animals are known to cross the landing area regularly. The short length of the airstrip restricts Airworks, the company that operates the aircraft on UN humanitarian relief missions, to carrying no more than four passengers on any flight. The aircraft is also restricted to operating with a minimal fuel load.

### LEARJET GROUND LOOPS ON LANDING

**Learjet 35, Newport News, Va., May 12, 2015**—The aircraft, operated by Phoenix Air Group, experienced a runway excursion and subsequent ground loop while landing at Williamsburg International Airport. No injuries to the two-person crew were reported.

### IRISH PUMA CRASHES DURING TRAINING

**Airbus Helicopters SA330J Puma, Pristina Airport, Kosovo, May 11, 2015**—The Irish civilian-registered helicopter, on charter to the Eulex security mission in Kosovo, crashed at Pristina Airport on a training exercise during which the pilots were simulating engine failure after passing the landing decision point. After a firm touchdown the helicopter bounced, touched down again, veered off and tipped over on its right side and was substantially damaged. One of the five people aboard was injured. The Puma's tailboom was severed during the accident.

### HELICOPTER CRASHES DURING POWERLINE INSPECTION

**MD 500, Bocognano, Corse, France, May 18, 2015**—The helicopter, owned and operated by Visimind/Heliwest Finland, was on a powerline cleaning and inspection mission for French power company EDF at approximately 9:30 a.m. when it crashed for reasons as yet unknown. The left skid collapsed during the accident although EDF said the helicopter did not touch the powerlines during the flight. Both crewmembers suffered unclassified injuries. □

## FINAL REPORTS

### AG HELICOPTER FLEW INTO TERRAIN

**Bell OH-58C, New Athens, Ill., May 12, 2011**—The NTSB determined that the helicopter crashed into terrain because the pilot failed to attain sufficient altitude to clear the hills while maneuvering. The helicopter, operating under Part 137, was assigned to spray a wheat field in an area of rolling hills.

Witnesses reported the aircraft had just lifted off from a support truck for another spraying circuit when the support truck workers heard a noise and looked in the direction of the helicopter. They saw the helicopter rotating without its tailboom attached. The post-crash investigation revealed evidence a main rotor blade had struck the tailboom, severing it from the helicopter.

Based on the available information, investigators concluded it is likely the pilot inadvertently flew the helicopter into the rising terrain, which caused the main rotor blades to flex downward and sever the tailboom. The loss of the tailboom left the pilot with no anti-torque control and hence no way to prevent the helicopter from rotating uncontrollably. The pilot died in the accident.

### KING AIR DAMAGED IN SEVERE TURBULENCE

**Beechcraft King Air C90, Camden, S.C., May 27, 2011**—The pilot's decision to proceed toward an area of bad weather when better routes were available was the cause of an encounter with severe turbulence that left the Part 91 turboprop substantially damaged, according to the Safety Board. None of the five people on board was injured.

The pilot reported intermittent periods of light turbulence during the climb-out from Charleston, S.C. (CHS). About 100 miles northwest of CHS, the turboprop's radar showed an area of weather ahead that prompted the pilot to ask for a turn 45 degrees left for avoidance. Because of traffic, ATC would approve only 30 degrees. The pilot accepted but soon realized he would need to deviate by at least 30 to 45 degrees and attempted to make that request.

Other aircraft on frequency apparently blocked the pilot's transmissions and the turn approval was never received. Despite the pilot making the turn he sought, the aircraft encountered severe weather for approximately two minutes. The pilot said the aircraft performed normally and landed normally after the encounter.

Post-flight examination determined the King Air's wing spar had been substantially damaged by the weather encounter. The NTSB also said that because the aircraft carried significant weather-detection technology, the pilot was likely aware of the areas of significant weather long before he reached them, as well as the less significant weather to the northeast and south. He was also aware of the clear weather through which he had just flown. ■

### G200 LANDING GEAR COLLAPSED ON TOUCHDOWN

**Gulfstream G200, Newburgh, N.Y., May 27, 2011**—The NTSB cited the flight crew as the major cause of an accident that caused the right main landing gear of the aircraft to collapse on arrival. None of the three people aboard the aircraft was injured.

The aircraft, owned and operated by a fractional provider, was being operated under Part 91. Before the incident flight, the flight crew completed an uneventful repositioning flight. During the incident flight, while on a visual approach to Westchester County Airport, the second-in-command attempted to lower the landing gear, but the system did not show three down and locked. The crew entered a holding pattern and began the landing gear down lock indication failure checklist, but failed to complete it before they were distracted by a hydraulic overheat condition on which they focused their attention. When the SIC returned to the down lock failure checklist, hydraulic pressure was too low for the gear to cycle. The crew then performed the emergency gear extension checklist and headed to Stewart, where the runway is longer. While all three gear extended, only the nosegear indicated locked. The right main landing gear collapsed on touchdown, but the crew was able to keep the aircraft on the runway.

During post-accident examination, the landing-gear handle was found one-eighth to one-quarter of an inch short of the full down position. When the landing-gear selector handle was positioned full up, followed by full down during a test, the gear cycled successfully, indicating that, had the flight crew placed the handle in the full down position, the landing gear would likely have operated normally. When the landing-gear selector handle was positioned where it was found, the landing gear extended, but did not lock.

The inspection also showed a hydraulic bypass had occurred, with a resulting rise in hydraulic fluid temperature and a fall in hydraulic fluid pressure. The hydraulic bypass was most likely the reason that the landing gear did not lock when the emergency gear extension procedure was followed. Although the rigging of the landing gear selector valve arm was found to be two degrees outside specifications, the fact that the landing gear was successfully cycled numerous times with this discrepancy indicated to the Board that it was not a contributing factor to this incident.

After the incident, the airplane manufacturer revised several checklists by replacing the terms "normal" and "low" with numerical values. Additionally, the landing gear down lock indication failure and the emergency landing gear extension checklists were revised to provide more guidance for ensuring the landing gear handle is positioned full down. Lastly, the emergency landing gear extension checklist was expanded to include failure of the blow-down procedure to extend and lock all three landing gear. ■

*The material on this page is based on the NTSB's report (preliminary, factual or final) of each accident or, in the case of recent accidents, on information obtained from the FAA or local authorities. It is not intended to judge or evaluate the ability of any person, living or dead, and is presented here for informational purposes.*



## AIRBUS EXPECTS TO DELIVER FIRST E-FAN IN 2017

Airbus Group, through its Voltair subsidiary, is the first major manufacturer to join the growing number of companies that aspire to create a new, more environmentally friendly way of flying, and last month it showed off the E-Fan 1.0 electric aircraft at the Paris Air Show. Airbus sees the E-Fan program as a first step toward larger electric or hybrid aircraft.

The production version, the E-Fan 2.0, will offer two seats side-by-side and weigh less than 600 kg (1,323 pounds), the upper weight limit for the light sport airplane category in which Airbus plans to have it certified. It will be powered by

two 30- to 40-kW motors, up from 30 kW on each of the demonstrator's motors. The current official estimate on endurance is 75 minutes (including reserve).

Fully charging the E-Fan 2.0 on the ground will take one hour—good news for flying clubs or schools, as the aircraft should be able to fly five hours per day. Thanks to its quiet electric motors and ducted fans, the aircraft should also be able to fly more often without upsetting the airport neighbors. "The direct operating cost will be 30 percent lower than that of existing comparable aircraft," said Detlef Müller-Wiesner, who is

responsible for Airbus Group's E-Aircraft program directorate.

Total development cost is on the order of €50 million, shared among Airbus (€20 million) and partners, which include Safran, Zodiac and Siemens. Part of the cost is covered by launch aid from state and local authorities. The two-seat trainer will be produced in a factory to be built in Pau, southwest France. Construction of the factory will begin in the middle of next year, and the first production E-Fan 2.0 will be delivered toward the end of 2017, according to Müller-Wiesner. —T.D.

## NATA takes on misfueling errors

► Continued from page 69

have different fuel needs.

Once a complete fuel order is received, the line technician will verify it is correct by matching the wing fueling decal with the fuel decal on the truck before refueling. Absence of a wing fuel decal will demand a pause in the procedure. "If the refueler goes to verify and there's no wing decal, this is now a nonstandard situation and it's going to require a written and signed form from the pilot," said France, who noted that many FBOs have adopted similar policies. "[The refueler is] going to have to go into the lobby or the fuel desk and put in the tail number and the type of fuel the pilot wants; then he has to get a copy of it, otherwise fueling doesn't happen."

While the nozzles that dispense different types of fuel are shaped specifically to prevent insertion into the wrong filler apertures (in most cases, aside from some engine conversions), there are situations where a "duckbill" jet-A spout must be swapped for a "round" one to accommodate a specific aircraft. Under the guidelines, if the nozzle for what is believed to be the correct fuel doesn't fit the aircraft, it will also trigger a nonstandard fueling situation and require a pilot-signed form before the line technician can swap the nozzle and proceed. Once the fueling operation is completed, the nozzle will immediately be switched back to the original (a process that takes less than a minute). It will remain in place at all other times.

While these policies might lengthen the fueling process in some instances, the risk reduction is worth it, according to France. "Refueling is a process that involves a lot of different people," he said. "It involves the line service professional, customer service and the pilot. The solution to this problem goes beyond just making sure the line techs verify and don't assume." □



### Airframe MRO Services

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Number of choices—and prices—depends on the model you want

Despite an inventory build among pre-owned aircraft in the first half of the year, some models are downright hard to find. The acceptance and growth of business aviation has long since extended the boundaries of the U.S. Years ago 30 aircraft for sale signaled a saturated market, but with extensive production runs on many popular aircraft, in many instances 30 aircraft now accounts for only 10 percent of the fleet, as is the case with the Challenger 300.

With more than 500 in operation, the 34 G550s for sale represent 6 percent of the fleet. Only one third of the current Challenger 300 choices offered for sale are based in the U.S., followed by Europe with nearly as many and the remainder spread about other parts of the globe. The number of U.S.-based G550s for sale stands at 16, followed by Europe and Asia with nine and seven, respectively. One recent entry to the G550 market went under contract in about 30 days, which speaks to how active this model type is, contrary to the perception some have when they see more than 30 of a particular model type for sale.

A disparity between the two models above is in the quarterly value fluctuations as provided by Vref, which shows Challenger 300 values holding steady on all but the latest model year, while the G550 values show a negative seven-figure quarter-over-quarter change. Eight G550s have sold in the last six months and they ranged in price from \$25 million to just over \$48 million for a 2013 model. Six of the eight were N registered.

Though the production run of the 2000EX EASy is much smaller than that of the Challenger 300 and G550, its supply is slightly tighter, offering up just six to the used market, out of a fleet of just over 100. As you might expect, Europe controls two-thirds of the market offerings. None of the 26 EXs is currently for sale. EX EASy demand is high, with 12 selling over the last six months. Early EX variants are bringing either side of \$10 million while the later EX EASy models can command prices in the high \$20 million range.

Prices Slide for Some

Not every aircraft is faring as well, and the one model caught in a downdraft is the Global 6000. Even before the announced production line adjustment of the Global 5000 and Global 6000, sales activity in the used market was lackluster. The first recorded sale last year on a late model was more than \$50 million, but a subsequent

and comparable deal reportedly brought just \$48 million and more recently numbers circulating around two 2014 models were in the \$46 million range. The most recent sale occurred in June on a European-based 2011 model with 1,400 hours. One industry counterpart shared with me that on a recent search for an off-market 6000 he received a higher-than-normal response rate from potential sellers, which could add to the half dozen options currently for sale.

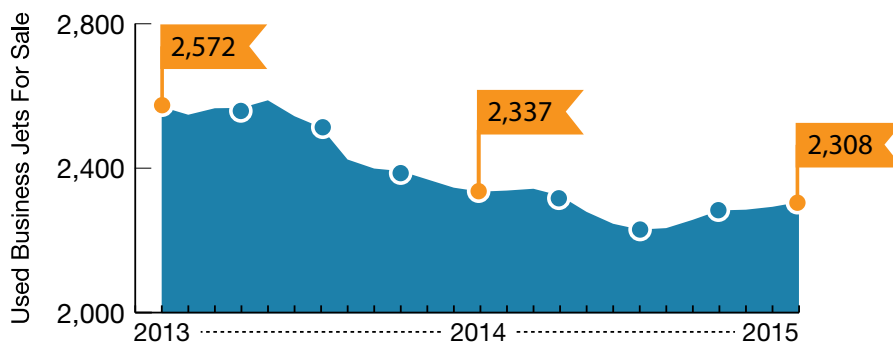
On the lighter side Learjet 45s are trending, with only 20 available now, down from 38 last September. Consider that only half of them are N registered, or just under 7 percent of the U.S.-based fleet, while globally that figure climbs a couple of percentage points. Sales over the last six months have ranged from \$1.2 million to \$2.9 million and have averaged \$2.22 million, according to research firm AircraftPost. The successor model Learjet 45XR is going in the opposite direction, increasing from 14 late last year to 22 today. The lack of sales over the past six months is one of the reasons. The few that sold averaged around \$3.5 million.

The G150 is also notable, dropping from 14 for sale last November to only five today. Eight have sold over the last six months and have ranged from a low of \$4.5 million to a high of \$8.5 million and an average of \$6 million. While the current Vref shows a knock in value of nearly \$300,000 across the board, I have to believe the next issue will reflect the sales activity.

With an inventory build during one of the more active quarters, we can expect to see a continuation of this as we transition to the slowest quarter of the year. How that will relate to pricing a few months from now is anyone's guess as the trends seem to have had only one direction for years. Talking with the owner/client of a GIV-SP, an aircraft whose prices have been battered, I had to convey that his aircraft might be worth as little as \$4 million, clearly much lower than he had anticipated; with this information he decided not to place his aircraft on the market now. Embellishing the numbers to a client to win a listing is deceptive in any market, but in the current market has the added distinction of being foolhardy. While it seems counterintuitive to provide a client with information that will likely talk him out of listing, it more than likely serves a greater good by not saturating the market with unsellable listings and false expectations. ■

Bryan Comstock is a cofounder and managing director of aircraft broker Jeteffect.

Two-year Inventory Trend



Sources: JetNet, AircraftPost

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## Within 6 Months

► July 14, 2015

NEW

### Proposals Could Lead to Changes in Drug-Testing Rules

The Department of Health and Human Services recently published two NPRMs that aim to revise the current drug-and-alcohol testing programs for federal employees, including those of the DOT. While the proposed changes would initially apply only to pilot, mechanic and flight attendant employees of the DOT/FAA, some agencies, including the DOT, are required to follow these guidelines in developing drug-testing programs for their regulated industries. However, the DOT could not adopt these or any other revisions to the drug/alcohol testing regulations without issuing its own NPRM.

► July 27, 2015

NEW

### Easing Applications To Operate in RVSM

This proposal would revise the FAA's requirements for an application to operate in reduced vertical separation minimum (RVSM) airspace by eliminating the "burden and expense" of developing, processing and receiving approval of RVSM maintenance programs. An applicant to operate in RVSM airspace would no longer be required to develop and submit an RVSM maintenance program solely for the purpose of an RVSM authorization. However, because of other FAA airworthiness regulations, all operators would continue to be required to maintain RVSM equipment in an airworthy condition. Comments are due July 27, 2015.

► September 2015

TENTATIVE

### Position Reporting Proposal From ICAO

Member countries of the International Civil Aviation Organization (ICAO) recommended the adoption of a tracking standard for aircraft crews that requires them to report their positions at 15-minute intervals. Adoption by the 36-state ICAO Council is expected as early as this fall. Operators would be able to comply with the mandate using existing and planned technologies and procedures, ICAO said. The proposal is considered a first step toward implementation of a more comprehensive three-tiered approach to tracking normal, abnormal and distress conditions.

► Dec. 1, 2015, and Jan. 1, 2017

### European Union Tcas Version 7.1 Directive

Turbine aircraft approved to carry at least 19 passengers, certified before April 1 last year and equipped with Tcas II version 7.0 must be upgraded to the latest version of 7.1 traffic alert and collision avoidance system software by Dec. 1, 2015. ICAO does not require that version 7.1 software be installed for international flights as a retrofit until Jan. 1, 2017. All other applicable airplanes were required to have 7.1 Tcas II software installed by April 1 last year.

► Dec. 31, 2015

### Deadline to Meet Stage 3 Noise Levels

Five months remain to the December 31 deadline after which jets with an mtow of up to 75,000 pounds may no longer operate in the contiguous U.S. unless they meet Stage 3 noise levels. When the rule was published on July 2, 2013, the FAA said the mandate affected 457 U.S.-registered owners of 599 principally Stage 2 business jets, though

several models can now be, or will be able to be, hushkitted or re-engined to meet Stage 3 before the deadline. The rule also applies to non-U.S.-registered aircraft.

## Within 12 Months

► April 22, 2016

### Helicopter Ambulance Control Centers

New FAR Part 135.619 requires operators with 10 or more helicopter air ambulances to have operations control centers beginning April 22, 2016. Operational control specialists must undergo an FAA-approved initial training program and pass a knowledge and practical test. The operations control center must at a minimum maintain two-way communications with pilots, provide pilots with weather briefings, monitor the progress of the flight and participate in the preflight risk analysis required under recently revised Part 135.617.

► May 4, 2016

NEW

### Upset Prevention and Recovery Training

Upset prevention and recovery training requirements for all European airlines and commercial business jet pilots are being developed by the European Aviation Safety Agency with an effective date of May 4, 2016. The new mandate, aimed at better preparing pilots to handle loss-of-control events potentially leading to accidents, is based on ICAO standards and recommended practices, as well as procedures being developed by the EASA in consultation with industry experts. Agency officials said that although loss-of-control events are rare, 97 percent of them over the past five years have caused fatal accidents.

► June 8, 2016, and June 7, 2020

### Europe ADS-B OUT Mandate

The earliest ADS-B OUT requirement in Europe is June 8, 2016, for new aircraft and June 7, 2020, for retrofit. The date for retrofits is about six months later than the U.S. ADS-B OUT mandate, which requires the equipment to be operational in aircraft that fly under IFR and where transponders are currently required starting Jan. 1, 2020.

## Beyond 12 Months

► Jan. 1, 2020

### U.S. Installation Deadline for ADS-B OUT Avionics

A final FAA rule requires installation of ADS-B OUT equipment by Jan. 1, 2020, for aircraft flying in Class A, B and C airspace. The equipment is designed to allow air traffic controllers to know where aircraft are with greater precision and reliability than current ATC radar.

► February 2020

### Controller-Pilot Datalink Com Delayed in Europe

Europe will postpone requiring aircraft operators to equip for controller-pilot datalink communications (CPDLC) for five years, until February 2020, to accommodate technical problems. The European Commission expects the entity managing the Single European Sky ATM Research (Sesar) effort will recommend remedial actions for ground infrastructure issues next year. Additionally, European Commission figures showed that only 40 percent of operators would have been ready to use CPDLC by the original deadline of Feb. 5, 2015. □



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For the rest of the story visit [www.DuncanAviation.aero/experience/paint.php](http://www.DuncanAviation.aero/experience/paint.php).



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Bombardier appointed **David Coleal** to replace **Eric Martel** as president of Bombardier Business Aircraft. Martel spent 13 years at the OEM and was promoted to lead the business jet division in late 2013. Coleal had served as president and general manager for Bombardier's Learjet division but left in 2011 to become executive v-p and general manager at Spirit Aerosystems. Bombardier also named former Pratt & Whitney executive **Jim Vounassis** vice president of operations strategy.

Gulfstream Aerospace named **Derek Zimmerman** to succeed **Mark Burns** as president of the product support organization. On July 1, Burns will take the helm of the company as president, stepping in as **Larry Flynn** retires. In addition, Gulfstream promoted **L.D. Buerger** to vice president of flight test.

Safran is turning over the leadership team at headquarters, along with leadership at its *Snecma*, *Turbomeca*, *Aircelle* and *Sagem* divisions. **Olivier Andriès** was appointed CEO of Snecma, **Bruno Even** becomes CEO of Turbomeca, **Jean-Paul Alary** CEO of Aircelle and **Martin Sion** CEO of Sagem. At Safran, **Stéphane Abrial** takes the new role of senior executive v-p of international and public affairs. Assisting Abrial in that role is **Bruno Cotté**, formerly executive v-p of European and international relations, and **Jean-Pierre Cojan**. **Pierre Fabre** becomes senior executive v-p of R&T and innovation, and **Alex Fain** was named corporate secretary. Also, **Eric Dalbiès** is executive v-p of strategy and M&A; **Jean-Jacques Orsini** executive v-p of performance and competitiveness; and **Bruno Pasini** deputy executive v-p of human resources.

The *Aerospace Industries Association* named former Exelis CEO and retired three-star general **David Melcher** its new president and CEO, effective June 8. He succeeds **Marion Blakey**, who stepped down earlier this year to become president and CEO of Rolls-Royce North America.

*Embry-Riddle Aeronautical University* named **John Watret** interim president following the recent retirement announcement from president and CEO John Johnson.

*Blackhawk Modifications* named **Bob Kromer** senior v-p of business development and dealer relations, and **Edwin Black** senior v-p of sales and marketing.

The *Westchester Aviation Association* selected **Brittany Davies** as executive director.

*FlightSafety International* appointed **Kyle Davis** executive director of marketing for business and commercial aviation training activities. The training company also appointed **Gerry McRae** executive director of business development; **Robert McGahan** director of business development, government training and simulation; and **Patrick Coulter** director of business development, commercial training and simulation. In addition, **Brian Moore** has been promoted to manager of its Wichita East training center. He succeeds Debbie Jones, who has retired.

*Cutter Aviation* appointed **Heather Wahl** director of human resources. The company also appointed **Daniel Kearns** to a regional aircraft management sales position.

*Ametek Singapore* appointed **Brian Hunter** to the newly created position of vice president of sales and marketing.

**Rana Das** has joined *Ametek MRO* as di-

visional vice president and general manager.

The *Flight Safety Foundation* (FSF) named **Mark Millam** vice president technical and **Christopher Rochette** senior manager of events and marketing. In addition, the FSF promoted **Greg Marshall** to vice president for global programs, **Frank Jackman** to vice president of communications and **Susan Lausch** to vice president of business operations.

## Final Flight

**Ken Colthorpe**, who spent nearly 30 years as a pilot and manager with Champion Spark Plug, died April 13 in Toledo, Ohio, at the age of 93. He had nearly 50 years of aviation experience, serving as a civilian flight instructor for the AAF during World War II and then delivering hundreds of aircraft to the U.S. and Africa for the Air Transport Command Ferrying Service. After the war Colthorpe joined China National Aviation, returning to China as the youngest airline captain and instructor flying DC-4s. By 1950 he had returned to the U.S. as co-owner and manager of the former Metcalf Flight Services before joining Champion as chief pilot two years later. During his 30-year career with Champion, he earned a number of jet type ratings, the Falcon 20 and Grumman Gulfstream II among them. He logged north of 21,000 hours and six million miles on five continents. ■

## Awards & Honors

The organizers of the European Business Aviation Convention & Exhibition (EBACE) honored four people who helped launch the annual business aviation event in Geneva. Honored were former National Business Aviation Association officials **Kathleen Blouin** and **Jack Olcott**, along with European Business Aviation Association executives **Fernand Francois** and **Brian Humphries**. Blouin joined NBAA in 1992 as senior manager of convention services and retired from her role as senior v-p of conventions and forums in 2014. Francois had served as CEO of EBAA from 1993-2004. Humphries became president of EBAA in 2007, but previously had served as its chair from 1996-2004 and its CEO from 2004-2007. Olcott was named NBAA's president in 1992 and served in that role for 11 years.

The Ninety-Nines announced that **Cecile Hatfield** is this year's recipient of the Aviation Industry Woman Of Excellence Award given by the International Aviation Women's Association (IAWA). Hatfield has served as general counsel to the Ninety-Nines for more than 20 years. She was the first woman to chair the American Bar Association Aviation And Space Law Committee and is the program chair of the annual Embry-Riddle Aviation Law and Insurance Symposium. She obtained her pilot certificate in 1963 and her instructor credentials soon after. ■

*ABS Jets* named **Lenka Nahlovska** supervisor of the charter and brokerage department.

**Eveline Bisson** joined *Metro Aviation* as director of transport business services.

**Derek Donahue** was appointed regional director for *Satcom Direct*.

*Circor Aerospace & Defense* appointed **Tony Najjar** group vice president of sales and marketing.

*West Star Aviation* appointed **Andy Waynick** director of interiors at its Columbia, S.C. location.

**Tim Reynolds** was named finance manager at *Bangor International Airport* (BGR) in Maine.

**Santiago Crespo** joined *Columbia Helicopters* as vice president of business development and marketing.

*Phillips 66 Aviation* appointed **Kimberly Ruth** director of programs development for general aviation and promoted **Kent Holman** to senior supply coordinator for general aviation marketing.

**Edward Vesely** was appointed senior director of sales for *Welsch Aviation*.

**Bruce Yolken** was appointed quality assurance manager for *Pasternack Enterprises*.

*Farsound Aviation* appointed **Dianne Jones** to the newly created position of vice president Americas.

*Women In Aviation International* elected three new board members: **Deborah Hecker** is a 737-800 first officer for American Airlines; **Marci Veronie**, vice president of sales and marketing at *Avemco Insurance*; and **Abingdon Welch**, founder and CEO of *The Abingdon Co.*

*Rockwell Collins* appointed **Steve Nieuwsma** vice president of corporate strategy. Most recently he was vice president of commercial systems engineering for the company. Succeeding Nieuwsma in that role is **Leigh Parker**, who previously served as senior director of commercial systems engineering avionics programs for the company.

*Executive Jet Management Europe* (EJME) named **Janus Kamradt** regional sales vice president.

*Gama Aviation* announced a series of senior executive changes and additions following the completion of its merger with Hangar 8 and IJC earlier this year. **Warren Gravell** was promoted to managing director of Europe. **Clive Prentice** joins the company as managing director of European ground operations from *Jets (UK)* and *Hawker Beechcraft*. **Ian Spreadbury** joins *Gama* from *Jet Aviation* to lead the European sales team. **Martin Ringrose** joins from the UK's Ministry of Defence to become managing director for the Middle East and Asia (ME&A). **Richard Lineveldt** will support Ringrose as general manager of ME&A air operations.

*Gulfstream Aerospace* appointed **Stan Dixon** to the newly created position of vice president of G650 continuous improvement. The company also appointed **Cobi Lane** general manager of its service center in Las Vegas.

**Paul Woodard** has joined *Executive Air-Share* as senior sales director.

*Airbus Helicopters* named **Terry Eichman** to lead the Customer Training Center.

**James Walker** was named vice president and general manager of *Professional Aviation Associates*. □



David Coleal



Mark Burns



Gerry McRae



Daniel Kearns



James Walker



**READERS WEIGH IN ON PILOT SHORTAGE**

Editor:  
I read Matt Thurber's article "What Pilot Shortage?" in the June issue of *AIN* (page 1).

There is no shortage or crisis, just ridiculous terms and conditions that don't attract candidates with the bare-minimum required experience. You want to stop the "crisis"? Offer proper terms and conditions and real career opportunities. Simple as that.

*Jamespilot (via ainonline.com)*

Editor:  
I used to manage a company that operated Part 91 aircraft and I was directly involved in the program, including recruiting and training pilots and mechanics. I have long followed the "ills" of commercial aviation since the famous "de-regulation" of the Carter era. I lay a substantial part of the shortage of qualified career pilots at the doorstep of unintended consequences of deregulation.

I am a conservative free-enterprise advocate. The federal government is way too big! I do believe, however, that there are two industries that require regulations and strict enforcement (either at the state or federal level): banking and commercial flying.

Since deregulation of airlines there has been a long race to the bottom in the U.S. in commercial aviation—few barriers to entry, buy any old fleet you want and no regulation of pricing. Roll-ups of airline companies into the now near monopolies in some markets cause distortions. The most glaring distortion is the entry-level salary of an aspiring pilot. Pilots are underpaid for the most part in the airlines. If a young person could look forward to a career that more resembled the careers of pilots in eras when being a pilot was a prestigious and well paid occupation, we would have more applicants with a longer-term vision of career opportunities.

There are many dedicated young people flying or trying to learn to fly commuters. These folks start at salaries that are less than half what any good taxi driver in most major cities can earn in a year! I don't see the lack of interest in a flying career as a defect in the attitudes [of the next generation]; the issue is that it takes too long to earn a respectable living as a professional airline pilot. Bankruptcies of airlines imply career instability for pilots.

We should return to the Civil Aeronautics Board to regulate and auction routes. Put a business model together that is similar to the one before deregulation. Airlines then were like regulated public utilities. Bond holders were practically guaranteed repayment of bonds as

there was supervision of the financial position of the regulated carriers. The FAA was a more hands-on "inspector" of the condition of aircraft. Airlines had financial stability and renewed their fleets more often. Pilots had the opportunity to work hard and earn a respectable retirement. Yes, fares were relatively high but those who could not afford

to fly rode the bus or train. An "entitlement" to a cheap air fare results in drastic cost-structure management of most airlines.

With rare exceptions, we will never have a happy and incentivized commercial pilot population given the current business models of the industry.

*Gary Jacobs*

Editor:  
Am I reading this right? "Our pilot candidates are worse than we've ever hired, and we want the FAA to let us lower our hiring standards"? This article neatly summarizes the airline industry approach to safety versus profits. We reached this point because Congress took away the right to

strike from airline unions. This gave airlines complete power to set worker pay and conditions. They set standards so low pilots became dangerously overworked and undertrained, causing crashes, and so underpaid that young people stopped entering the profession. So now we have

*Continues on next page ►*



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► *Continued from preceding page*

few young people to hire, and the airlines are predictably begging for lower safety standards, rather than making the profession desirable enough to attract workers.

Yes, this is a crisis, and Congress will probably give in to lobbying and let the FAA lower safety standards again. At some

point, does the industry ever stop and think about the incredible responsibility it has to the flying public, to keep them safe? Does it ever stop and look at the incredible gifts and freedoms it has and think it should be building a strong and reliable airline system for now and the future? Or does it always have to be

about profits? We are heading toward a situation that can only lead back to re-regulation.

*Inspector (via ainonline.com)*

## TWO PILOTS VS ONE

Editor:

I was stunned to read the article titled "Statistics Similar for Single- vs Two-Pilot Operations," by

Gordon Gilbert, in your June 2015 issue. In analyzing business jet operations using one versus two pilots, **AIN** did not consider the amount of flying conducted using one pilot versus two. I have no idea what proportion of business jet operations are conducted by one versus two pilots, but I do know that when Gilbert raises the ques-

tion in his article as to whether "single-pilot operations are inherently less safe than two-pilot missions," he can't come to any solid conclusion without including a look at the relative share of total flying (the number of legs flown, for example) conducted by both methods of operation. For example, if two-pilot operations accounted for two or three times as many legs of flying as single-pilot ops, that would greatly change the picture of the relative safety of single-pilot missions indicated in Gilbert's article. (And legs flown would be a better statistic to use than hours flown, since legs flown would deemphasize the typically safer cruise phase of flight.) I would be interested to see an analysis that takes this statistic into account. The analysis discussed in Gilbert's article has a big hole in it, and its value therefore suffers greatly.

*David S. Brown  
via ainonline.com*

Editor:

The report does not account for single- or two-pilot average annual flight time before accidents, and neither does it take into account if single pilots vs two are wearing more than one hat (owner-pilot businessman vs professional pilot[s] whose primary job is flying). In other words, do you fly the aircraft for a living or do you catch for the New York Yankees? Overall, based on 46 years of professional pilot experience, I have to say that this report, while offering some insight, is greatly flawed and could never be admissible as scientifically proven fact.

*Robert Griffith  
via LinkedIn*

Gordon Gilbert responds: *This report was intended to reveal statistics on the number of accidents involving one-pilot vs two-pilot jets. Regardless of other factors, including average annual crew flight-time, the results are as reported. Also, not all single-pilot flights were being flown by an owner or person who might wear other hats for the company. Some of the single-pilot accidents were being flown by "professional" (career) pilots. And some of these pilots, as well as some of the two-pilot crews, were also contract pilots flying for more than one company simultaneously. In any case, the statistics indicate single-pilot and two-pilot crews clearly have similar types of accident and frequently commit the same types of error.*

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An aerial, high-angle photograph of a white Dassault Falcon 900LX private jet flying over a wide river. The river's surface is shimmering with sunlight. To the right of the river, there is a dense green forest and a road with some buildings in the distance. The aircraft is viewed from a high angle, showing its three engines and swept-back wings.

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