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HondaJet receives FAA type certificate

by Matt Thurber

On December 9, FAA Administrator Michael Huerta presented the type certificate for the HondaJet to Michimasa Fujino, president and CEO of Honda Aircraft, at a ceremony held at the Honda Aircraft customer support facility at Piedmont Triad International Airport in Greensboro, N.C. More than 2,000 Honda Aircraft employees, suppliers, dealers and customers were in attendance as Huerta handed over a large ceremonial type certificate while confetti cannons spread multi-colored ticker tape over the stage and audience. "Today I'm very proud to announce that we reached an historical milestone in our program, FAA type certification," Fujino said. (The HondaJet had earned provisional FAA type certification on March 27 last year.)

Full FAA Part 23 type certification marks a major milestone on Fujino's journey, which began in 1986 when Honda sent him to the U.S. to begin an aviation research project. "Since that day I have devoted myself to design and build Honda's original airplane," he said. The prototype HondaJet made its first flight on Dec. 3, 2003, powered by Honda-designed engines that were the foundation of the GE Honda Aero HF120 that received FAA certification on Dec. 13, 2013. Delays in the HondaJet program, originally slated for certification in 2009 or 2010, stemmed in part from the engine, as some of the required flight-testing for certification couldn't begin until the engine was approved. The 2,095-pound-thrust engines are manufactured in Burlington, N.C., by GE Honda Aero Engines, a 50-50 joint venture between Honda and GE.

"The pivotal moment," Fujino said, "was the HondaJet world debut at AirVenture Oshkosh in 2005. We displayed the HondaJet as an experimental aircraft. At that time I

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CBP returns seized E90, but questions still linger

by Kerry Lynch

After what was described as a normal charter booking, this King Air was seized and held by U.S. officials.

U.S. CUSTOMS

Bethany, Okla.-based American Jet Charter recently reclaimed its King Air E90 after U.S. Customs and Border Protection (CBP) held the aircraft for 72 days. The CBP's Office of Air and Marine seized the aircraft, N48W, at McAllen Miller International Airport in Texas on September 6, saying the pilot was "in the process of smuggling" seven illegal aliens.

Jim Hensley, who founded American Jet Charter 30 years ago, told **AIN** he had flown the aircraft from its base at Wiley Post Airport in Bethany to McAllen to pick up seven passengers per a client booking. "I did a normal boarding procedure," he said, adding that nothing about the trip was unusual at that point. As Hensley was beginning to taxi out, ATC told him that CBP officials had asked to speak to him.

Hensley halted on the ramp and was met by a CBP agent, who he said appeared "surprised" that he had stopped. Hensley then instructed his passengers to wait while he responded to the agent.

Thus began what Hensley described as five hours of questioning about the trip. He was interrogated about the nature of the trip, where the passengers came from and why he did not determine whether they were documented.

Hensley said the interrogation surprised him because the trip originated in the U.S. and was to end in the U.S. He maintained to the CBP agent that he conducted the trip according to FAA regulations, and since the aircraft did not weigh more than 12,500 pounds it was not beholden to the security and background checks

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Cockpit Avionics

Business aviation's progress in the great race to equip for NextGen operations before the clock strikes midnight on Dec. 31, 2019. page 46

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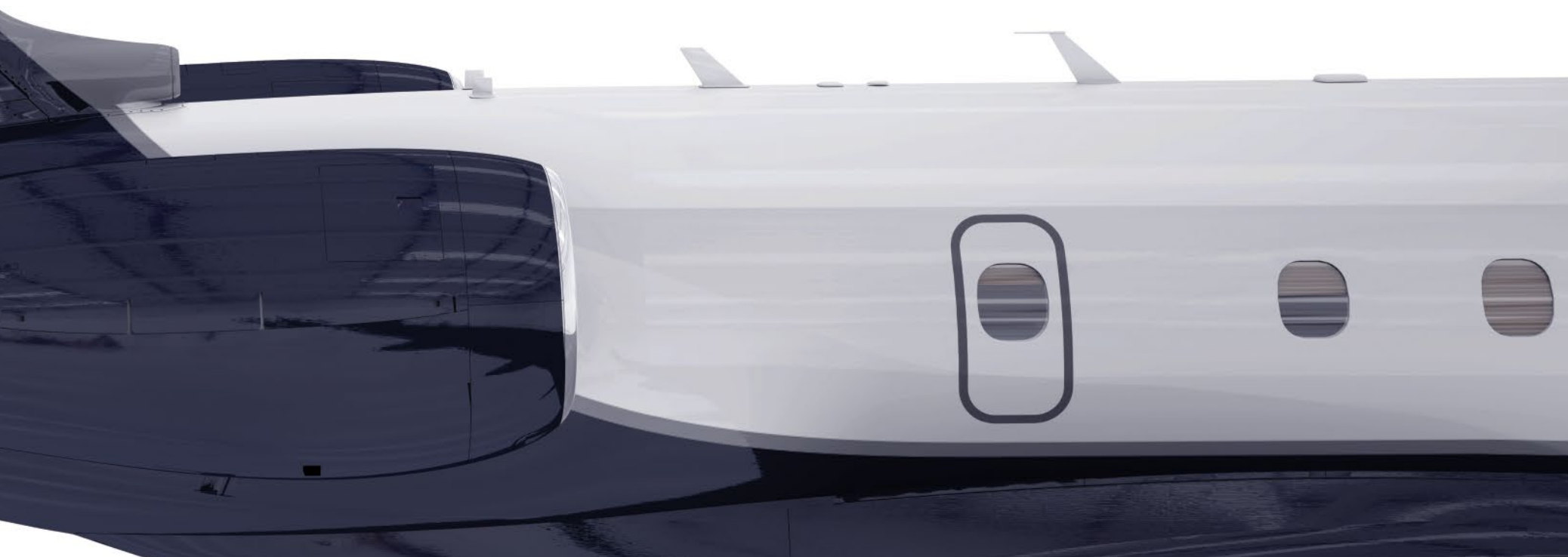


Inside this issue

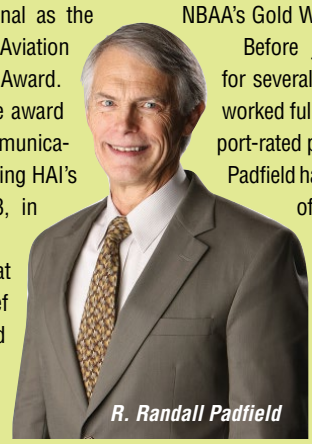
News Makers 2015

For our annual recap of the people and events that shaped the news over the past 12 months, this year we also take a look at what 2015 suggested about the future for aviation. **Page 20**

HAI TO HONOR PADFIELD FOR EXCELLENCE IN COMMUNICATIONS

R. Randall Padfield, who spent 22 years as an editor with AIN Publications, was selected by the Helicopter Association International as the 2016 winner of the Lightspeed Aviation Excellence in Communications Award. Part of HAI's Salute to Excellence award program, the Excellence in Communications Award will be presented during HAI's Heli-Expo, February 29-March 3, in Louisville, Ky.

Padfield retired from **AIN** at the end of 2014 as editor-in-chief and COO. While with **AIN**, he had overall responsibility for the editorial content of **Aviation International News** and **Business Jet Traveler** magazines. He has authored four books on aviation and was the 1998 winner of NBAA's Gold Wing aviation journalism award.


R. Randall Padfield

Before joining **AIN**, he wrote articles for several other aviation publications and worked full-time as a pilot. An airline transport-rated pilot in helicopters and airplanes, Padfield has logged more than 9,000 hours of flight time. Padfield trained and flew missions as a U.S. Air Force HH-3E rescue pilot, flew Sikorsky S-61s, Bell 212s and Aerospatiale AS332Ls for Helikopter Service of Norway and served as a pilot with Trump Air of New Jersey. ■

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As we go to press

CSERIES CERTIFIED

The Bombardier CSeries CS100 won type certification from Transport Canada on December 18, clearing the way for it to enter service with Swiss International Airlines during the second quarter. The approval came more than two years after first flight and follows more than 3,000 hours of flight-testing, validation of thousands of test results and authentication of design and performance data. Formally launched in July 2008 and originally scheduled for certification by the end of 2013, the CSeries suffered four separate delays during the course of its development. The larger Bombardier CS300 remains "on track" to earn type certification within the next six months, Bombardier said.

NEW MOVES TO KEEP SMO OPERATING

The Santa Monica Airport Association (SMAA) is launching a new effort to fight the city of Santa Monica's campaign to discourage flying and business operation at Santa Monica Airport (SMO). On December 4 the FAA determined, in response to a Part 16 complaint filed by pro-airport interests, that the city is obligated by grant assurances to keep the airport open until Aug. 27, 2023. *(See article on page 16.)* SMAA is embarking on a new Part 16 complaint. The first step by SMAA was to send a letter to the city, outlining the issues, as per the Part 16 process, which requires parties to try to resolve their issues before filing a formal Part 16 complaint. The issues include loans made by the city to the airport, higher landing fees that also apply to based tenants and the city's refusal to propose new lease terms for tenants.

QATAR AIRWAYS TAKES FIRST G650ER

During a ceremony at Gulfstream's Savannah, Ga. headquarters last month, Qatar Airways group CEO Akbar Al Baker took delivery of the airline's first Gulfstream, a G650ER that is part of an order for up to 30 G650ERs, G500s and G600s. Deliveries of the G500s are scheduled to begin in 2018, and all of the Qatar Airways order, which consists of firm purchases and options, will be delivered within the next five years.

NETJETS PILOTS APPROVE CONTRACT

NetJets pilot union members ratified the 2015 Tentative Agreement on December 20 with 96 percent of members participating in the referendum and 75.43 percent voting to ratify the measure. According to the union, 1,759 voted to ratify the proposal, with 573 voting to reject it. The contract provides an average pay increase of 28 percent over five years in all fleets and holds down increases on healthcare costs, according to the NJASAP pilot union. Healthcare costs and wage ratios were among the key stumbling blocks in the negotiations last year between NetJets and the pilots' union. The contract also includes signing bonuses equal to $150 per month of service, up to a $30,000 maximum.

EASA CERTIFIES ARRIUS 2R ENGINE

Turbomeca received EASA type certification for the Arrius 2R Fadec turboshaft that powers the Bell 505 Jet Ranger X, now under development. Since the first ground run in April 2014, the engine has logged more than 2,500 ground test hours. The flight-test campaign started in November 2014 with the Bell 505's first flight at Bell's Mirabel facility in Canada. In August, Turbomeca delivered the first production engine to the new Bell 505 assembly center in Lafayette, La. The 500-shp Arrius 2R uses the core of the proven Arrius 2F, and its dual-channel Fadec is designed to be more reliable and reduce pilot workload.

FRACTIONAL PILOTS AGREE TO UNIONIZE

Pilots at Flexjet and Flight Options narrowly voted in favor of representation by the International Local Brotherhood of Teamsters (IBT). Polls closed on December 15 after a three-week voting period. A little more than 51 percent of the 644 pilots who voted (330) agreed to representation. Approval is decided by a simple majority of the votes. A total of 663 pilots were eligible to vote. The National Mediation Board issued a ruling in September that recognized Flight Options and Flexjet as a single carrier.

SECOND BELL 525 JOINS FLIGHT-TEST PROGRAM

A second Bell 525 (FTV2) joined the flight-test fleet last month and the program is "ahead of plan," according to Bell Helicopter 525 program v-p Larry Thimmesch. Meanwhile, FTV1–which first flew in July–has logged 65 hours and validated the 165-knot VNE and 12,000-foot ceiling; it has also begun hover performance testing in and out of ground effect and initial autorotation testing. Bell says the 525 remains on track for certification next year.

700th R66 ROLLS OFF PRODUCTION LINE

Robinson's 700th R66 rolled off the production line on December 18, five years after the five-place turbine helicopter received FAA certification. S/N 700 is an R66 Turbine Marine equipped with pop-out floats. At press time it was scheduled to be delivered to Robinson dealer Air Technology Belgium. This will be the first Turbine Marine delivered to Europe since the EASA approved the float option in October.

FAA unveils small-UAS registry

by Kerry Lynch

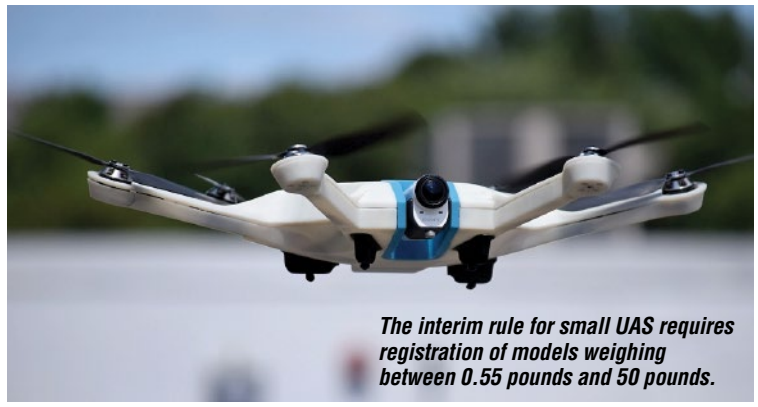
The U.S. FAA rolled out a web-based aircraft registration process for small unmanned aircraft systems (UAS) that weigh between 0.55 pounds and 55 pounds. An interim final rule took effect December 21, in time for a holiday season that some predicted would see 700,000 small drones purchased.

The rule provides for a simple registration process as well as a means for marketing small unmanned aircraft that the agency said is more appropriate for those aircraft.

The weight threshold includes payloads such as on-board cameras. Existing small UAS owners must register their aircraft by February 19. Owners of affected small UAS that are purchased after December 21 must register the aircraft before first flight. Registrants must be at least 13 and can use either a paper process or go online.

The registry will require a name, home address and email. Once the process is completed, a certificate of aircraft registration is generated providing a unique identification number that must be marked on the aircraft in a readily accessible location. Owners may use the same identification number for all UAS in their possession. Registration is valid for three years. The FAA will waive the $5 registration fee until January 20.

"We expect hundreds of thousands of model unmanned aircraft will be purchased this holiday season," said FAA Administrator Michael Huerta. "Registration gives us the opportunity to educate these new airspace users before they fly so they know the airspace rules and understand they are accountable to the public for flying responsibly."



The interim rule for small UAS requires registration of models weighing between 0.55 pounds and 50 pounds.

The system initially is for recreational use of the aircraft, but the FAA is working on enhancements of the registration system for other uses, expected to be ready in the spring.

The rule received mixed reaction from the model aircraft community. Dave Mathewson, executive director of the Academy of Model Aeronautics (AMA), said the association "is disappointed with the new rule for UAS registration," adding that the registration process is "an unnecessary burden for our 185,000 members who have been operating safely for decades."

But Brian Wynne, president and CEO of the Association for Unmanned Vehicle Systems International, said his association "is pleased that the FAA has moved forward with a final registration rule that will lead to increased accountability across the entire aviation community."

Wynne also reiterated his call for the FAA to complete its work on the rule governing small UAS. "While the creation of a registration system is an important step to enhance safety, the FAA must continue its work to integrate UAS into the national airspace, starting by finalizing the small UAS rule," he said." ❑

Pilots Bill of Rights 2 wins Senate approval

The Pilots Bill of Rights 2 took another step forward on December 15 with passage by the full Senate. The Senate approved the bill by unanimous consent less than a week after the Senate Commerce Committee approved a compromise version of the bill, S.571, which addresses concerns raised in November during initial consideration of the measure. The bill, a follow-on to the original Pilots Bill of Rights, would ease certain current third-class medical requirements and strengthen pilot protections during enforcement cases.

The Commerce Committee began consideration of the legislation in November but had to delay a vote as Sen. Bill Nelson (D-Fla.) raised concerns regarding the lack of a medical checklist during examinations by private physicians as well as an expansion of certain liability protections to contract aviation medical examiners. The version approved last month eliminated the expansion of the liability protections and included use of a medical checklist when affected pilots are examined by their personal physician every four years.

Senate Commerce Committee chairman John Thune (R-S.D.) praised the collaboration that resulted in the compromise. "It's a good product and it's important to a very large constituency," Thune said.

But the bill still had its detractors. Sen. Brian Schatz (D-Hawaii), told the committee, "My fundamental disagreement is we are crashing a system, replacing it with an untested framework, making it easier for people with dangerous medical conditions to fly…without any real oversight. If anything, there should be more vetting."

Sen. Joe Manchin (D-W.Va.), who offered the compromise version of the bill, disagreed, noting that sport pilots have been using driver's licenses and have been exempt from third-class medical requirements without any demonstrated problems.

The Senate passed the bill as the number of co-sponsors had grown to 70. The legislation still must receive consideration by the House, where the number of co-sponsors has reached 152.

"This is an enormous step toward getting long-awaited third-class medical reforms," said AOPA president Mark Baker. "These reforms are vital to the future of general aviation."

"With this bill, pilots are assured every opportunity to protect their airman certificate," added Brian Koester, NBAA's manager of operations. NBAA pointed to provisions calling for the FAA to provide timely notification of the start of an enforcement investigation and to hand over enforcement investigative reports when serving emergency orders. *–K.L.*

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NEWS BRIEFS Compiled by Chad Trautvetter

Bizav Groups Oppose Privatized ATC

Business aviation groups are stepping up their opposition to a proposal to create a user-funded independent organization to run the U.S. air traffic control system. House Transportation and Infrastructure Committee chairman Bill Shuster (R-Pa.) intends to make such a proposal the centerpiece of his comprehensive FAA reauthorization bill, which is expected to be released early this year. Airlines for America, which strongly endorses the concept, rolled out the chief executives of six U.S. airlines last month to argue their case for an independent ATC organization. In response, NBAA president and CEO Ed Bolen said, "The general aviation community has once again been served with a fresh reminder of the very real threat to the industry from a proposal from the airline lobby...the airlines are readying for the coming battle over ATC privatization funded by user fees, and we must do likewise."

Gulfstream To Trim Workforce

Gulfstream Aerospace is reducing its workforce by about 3 percent and its contractor workforce by 600 people. The Savannah, Ga. manufacturer, which had expanded its employee and contractor workforce to more than 16,500 people, said it is "streamlining our business to position Gulfstream for continued success." The employee layoffs will involve indirect support staff throughout the business. With the contractors, the company added, "We typically manage fluctuating workforce requirements with contract labor to maintain maximum flexibility." Gulfstream is making the adjustments despite its current strong financial footing, with the most recent quarter marking the highest-ever quarterly revenue and the fifth consecutive quarterly profit exceeding $400 million.

U.S. Files WTO Dispute over China's VAT

The office of the U.S. Trade Representative (USTR) launched dispute settlement proceedings at the World Trade Organization over China's exemption of value added tax (VAT) on domestically made commercial jets weighing less than 25 metric tons. The U.S. claims that China's 17-percent VAT on imported aircraft in that weight category constitutes a breach of WTO rules against taxation. The complaint also extends to general aviation aircraft. "China's discriminatory, unfair tax policy is harmful to American workers and American businesses of all sizes in the critical aviation industry, from parts suppliers to manufacturers of small and medium-sized aircraft," U.S. Trade Representative Michael Froman said in a statement. "We're also especially concerned that China attempted to hide this discriminatory tax policy."

First Phenom 100E Arrives in China

On December 14 Embraer Executive Jets announced the delivery of the first Phenom 100E in China. The light jet will be operated by Wanfeng Aviation, a subsidiary of the Wanfeng Auto Holding Group, for business passenger travel. Wanfeng Auto has businesses in automotive parts, machinery, financial investments, alternative energy and materials. More than 320 Phenom 100/100Es are currently in operation in 26 countries.

PlaneSense Food Drive a Success

New Hampshire-based fractional aircraft provider PlaneSense flew one of its Pilatus PC-12s filled with donated food to Manchester Boston Regional Airport on December 9 for the New Hampshire Food Bank. The December 2014 contribution totaled 800 pounds; the latest effort amassed more than 7,000 pounds of food, exceeding the turboprop-single's cargo capacity and requiring the remainder to be delivered by truck.

Flexjet's Aerion AS2 supersonic business jets will be deployed to link major city pairs–likely coastal cities that would allow nearly the entire flight to be flown overwater at the aircraft's top speed of Mach 1.5. Customers using the AS2 would then need to transfer to a subsonic Flexjet aircraft to complete the rest of their trip, employing a hub-and-spoke system.

Flexjet outlines plans to integrate Aerion AS2s into fractional fleet

by Chad Trautvetter

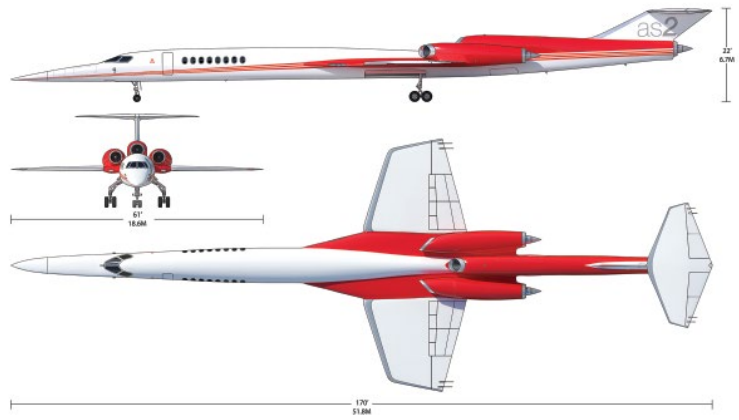
Like its Gulfstream G650s that will enter service this year, Flexjet's supersonic Aerion AS2s–slated for delivery starting in 2023–will be part of the fractional provider's Global Access program, Flexjet chairman and parent company Directional Aviation Capital principal Kenn Ricci told **AIN** last month. This means that Flexjet will not be selling shares in either of these long-range aircraft.

Instead, existing Flexjet share owners will pay an extra monthly fee for access to the G650 and AS2, in addition to hourly occupied charges. The company said these hourly charges will be "dynamic," with members paying lower rates for the hours spent in long-range cruise.

According to Ricci, the AS2 will fly only international city pairs–likely coastal cities that would allow nearly the entire flight to be flown overwater at the aircraft's top speed of Mach 1.5. Another reason is the jet's 170-foot length, which will require specially built hangars, and its need for runways longer than those used by traditional business aircraft. Customers riding in the AS2 would then need to transfer to a subsonic Flexjet aircraft to complete the trip to their final destinatiuon, essentially a hub-and-spoke system.

The company will therefore need to have aircraft based outside its core U.S. market. On this front, Ricci said Flexjet plans to expand into the European market this year, with operations bases likely added in other regions of the world later.

A Flexjet spokesman told **AIN**, "Over the last year, Flexjet has been running and fine tuning a version of the Global Access program with its Global Express fleet. So far, the program has been well received by intercontinental travelers who appreciate the flexibility, access and economic efficiencies it provides." ❑



Flexjet is planning for its 2023 AS2 deliveries, anticipating the need for construction of larger hangars and bases outside the U.S.

CHINESE FIRM TO TAKE STAKE IN LUXAVIATION

China Minsheng Investment (CMI) is preparing to take an equity stake in European business aviation services group Luxaviation, a company spokesman told **AIN**. No further details were available. The Luxembourg-based group, which has been calling itself Luxaviation-CMI for several months, acquired ExecuJet Aviation last year and now operates more than 250 aircraft.

In April, Luxaviation announced a partnership with CMI subsidiary Minsheng Aviation. At the time, the company said that the partnership "will allow Luxaviation Group to develop its offer for the fast-growing Asian business jet market." Minsheng Aviation was described as having "a significant fleet of jets managed and financed in China and Hong Kong and aircraft financing capacity."

In September, CMI formed a new subsidiary, CM International Financial Leasing (CMIFL), to acquire 100 Airbus Helicopters H125s and H130s over five years. The company has a capital base of approximately $1 billion.

In December 2014, CMI paid $194 million to buy a 61.25-percent stake in Chinese operator Minsheng International Jet from Minsheng Financial Leasing, which is part of the China Minsheng Bank. Minsheng Financial Leasing formed Minsheng International Jet in April 2013, after buying Citic General Aviation and acquiring a Chinese AOC in the process. At the time, it predicted that the operator would have 400 aircraft within five years. The slowdown in the Chinese economy, along with stock market volatility and a government campaign against alleged corruption, has slowed business aviation growth in the country. *–T.D.*

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Zetta Jet Signs for up to Five Globals

Los Angeles-based air charter firm Zetta Jet has signed a deal with Bombardier Business Aircraft for up to five Global 6000s worth a potential $318 million at list prices. The agreement, announced December 15, comprises a firm order for one Global 6000 and options for four more of the ultra-long-range jets. The airplane will operate from Zetta Jet's Asian hub in Singapore and will join its fleet of four Globals, one of which is a new Global 5000. Zetta Jet, which started operations in August, is an FAA Part 135 charter operator with a scheduling and operations center in Los Angeles, in addition to a network of sales and support offices in New York; London; Harbin, China; and Singapore. Notably, the Part 135 operator has been authorized by the FAA to conduct polar flights, which can shave 1.5 hours off a flight between Los Angeles and Moscow.

Gulfstream G650 Fleet Nears 150

Since entering service three years ago last month, Gulfstream Aerospace's flagship G650 fleet is approaching 150 aircraft. Some 145 of the ultra-long-range business jets—105 G650s and 40 G650ERs—are currently flying, according to the Savannah, Ga.-based aircraft manufacturer. To date, the G650 fleet has logged more than 78,000 hours and 29,000 cycles, a company spokeswoman told **AIN**. Overall, the twinjet's NBAA dispatch reliability rate is 99.7 percent, she added.

Morgan Freeman Unhurt in Overrun

Actor Morgan Freeman's SyberJet SJ30 ran off the runway at Mississippi's Tunica Municipal Airport at about 6:15 p.m. on December 5 "after diverting following a reported possible blown tire and hydraulic problem," according to a preliminary FAA incident report. The twinjet, N30GZ, suffered "minimal damage" according to Tunica Municipal Airport officials, while Freeman and his pilot, Jimmy Hobson, were uninjured in the incident. The flight's intended destination was Sugar Land Regional Airport in Houston. Reports indicate that one of the SJ30's tires blew shortly after takeoff from Fletcher Field in Clarksdale, Miss., at 3:04 p.m. According to FlightAware, the aircraft then circled the area for almost three hours while Hobson apparently attempted to troubleshoot the issue.

Bizav Traffic Slides Again in Europe

Business aviation traffic in Europe slid 2.5 percent in November, erasing the slight gains in activity during the early summer, according to the latest WingX Business Aviation Monitor. Through the first 11 months of last year, business aviation activity is down 0.8 percent from the same period in 2014, equating to 5,700 fewer flights, WingX reported. "The renewed collapse of the business jet market in Russia, down by a third this month, is a factor," said WingX Advance managing director Richard Koe. "Becoming more significant is Italy's decline, [where] the charter market is particularly weak," Koe added. Flight activity was down 7 percent in Italy in November, with charter flights down by 12 percent overall there. Along with Italy, flights in November were down in the other busiest markets in Europe: France, Germany and the UK.

Daher Delivers 100th TBM 900

Daher delivered the 100th TBM 900 last month, just 20 months after the updated turboprop single was unveiled. The milestone TBM 900 was handed over to Dale Schneider, a North Carolina businessman and 3,000-hour airplane and helicopter pilot. It replaces a TBM 700C2, which Schneider purchased pre-owned in 2006 and has since flown some 1,000 hours.

PHOTO COURTESY OF UPS

UPS expects to 'de-install' ADS-B IN cockpit displays of traffic information on its 757s and 767s by the spring. The company remains an early adopter of ADS-B OUT.

UPS pulls the plug on ADS-B IN for its fleet

by Bill Carey

Fifteen years after it helped to introduce the technology, UPS is removing traffic information displays from its Boeing 757 and 767 flight decks because the equipment is obsolete and there is no Federal Aviation Administration mandate to use it, the cargo carrier said last month. It expects to remove the automatic dependent surveillance-broadcast (ADS-B) IN capability by next spring.

Responding to an **AIN** inquiry, the carrier said ADS-B IN avionics developed by its former UPS Aviation Technologies subsidiary are no longer supported by Garmin International, which acquired the subsidiary in 2003. That reason, and the lack of an FAA mandate to equip aircraft for ADS-B IN capability, led UPS to remove the equipment, a decision reportedly announced in October in an internal company memo.

While it is removing avionics that support ADS-B IN–the capability to display nearby air traffic targets in the cockpit–UPS said it is committed to equipping for ADS-B OUT, the capability of an aircraft to regularly broadcast its GPS-derived position to the ground for use by controllers in separating aircraft. The FAA has mandated that all operators equip for ADS-B OUT by 2020, but it deferred requiring ADS-B IN.

"UPS remains an early adopter of ADS-B OUT," the carrier said. "Our 747, MD-11, 767 and A300 fleets already have ADS-B OUT, and we are installing it on our 757 fleet as they cycle through C checks. UPS will be equipped well in advance of the FAA's 2020 mandate for ADS-B OUT."

Technology Trials

UPS, FedEx and the former Airborne Express (now DHL) started evaluating ADS-B in 1999 under the FAA's Safe Flight 21 program. In October 2000, UPS hosted an operational evaluation at its Louisville, Ky. hub, using several Boeing 727s. The trial focused on using ADS-B with a cockpit display of traffic information (CDTI) for approach spacing, departure spacing and airport surface operations.

UPS's Aviation Technologies subsidiary based in Salem, Ore., provided an ADS-B system for the evaluation that included a CDTI, display processing unit and datalink connection. In August 2003, Garmin acquired the subsidiary for $38 million and renamed it Garmin AT. "The company is known for its leadership in the development of ADS-B technology and has participated in the development of innovative equipment to enhance flight safety as part of the Federal Aviation Administration Safe Flight 21 and Alaskan Capstone projects," Garmin said at the time.

Despite disconnecting ADS-B IN, UPS said that it "remains an advocate for ADS-B" and the FAA's broader NextGen program to modernize the nation's ATC system. As evidence of its commitment, the carrier cited its participation in the FAA's Data Comm program to implement text-based communications between pilots and controllers. UPS started testing that capability in 2013 at Newark Liberty International Airport. ❑

Aerospace heading for record trade surplus, but…

by Kerry Lynch

U.S. aerospace manufacturers closed the books on last year headed for a record trade surplus, but the industry is showing early signs of a slowdown in orders and backlogs, according to the Aerospace Industries Association. Presenting the association's annual Year-end Review on December 15, AIA chief David Melcher reported that the trade balance has grown by nearly $19 billion over the past five years to $62 billion and "is on a path this year to set a record surplus level."

Through the first three quarters of the year, the aerospace manufacturing sector exported $92 billion in goods, which is up 5.8 percent from the same period in 2014. Of that, $81.3 billion involved civil aircraft, engines, parts and space systems. Total aerospace shipments through the first nine months also were at a record $230 billion. This was up 9 percent from the first nine months of 2014 and included $187 billion in aircraft and parts manufacturing. Aerospace backlogs also reached a record $731.7 billion, a 6.8-percent climb from 2014.

But new orders were down 32 percent to $210.3 billion, led by a 40-percent drop in nondefense aircraft and parts. The rate of backlog expansion also was down and the workforce continued its downward trend by 1 percent.

Government Support Needed

The aerospace trade balance cannot be taken for granted, Melcher warned. "The government's support for trade promotion is crucial," he said, calling for promotion of a level playing field in the global marketplace and passage of the Trans-Pacific Partnership trade agreement.

He praised the passage of a measure to renew the Export-Import Bank charter, but reiterated, "Our work is still not done. We're encouraging the President and Congress to ensure the Bank's board has a working quorum, so that loans over $10 million dollars can be approved."

The industry also needs to continue to work with the FAA to improve certification processes and ensure continued implementation of NextGen, he said. But when asked about proposals to separate out the ATC organization, Melcher did not take a position. Instead he said he found it interesting that the two key arguments from Congress for the change center on lack of stability in the authorization and budget cycles, both of which are controlled by Congress.

As for moving NextGen forward, he said, "the single biggest thing that has to happen…is for operators to equip." Melcher, who joined the AIA after serving as president and CEO of ADS-B contractor Exelis, emphasized that the infrastructure was put in place on time and on budget. ❑

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NEWS BRIEFS Compiled by Chad Trautvetter

Embraer Forecast: 9,100 New Bizjets

Embraer Executive Jets' latest 10-year demand forecast for business jets predicts sales of 9,100 aircraft worldwide worth $259 billion. This represents an annual growth rate of 3 percent, as well as a gain in deliveries compared with the previous decade. The North American market drives the demand, with 4,850 units worth $130 billion, followed by Europe and Africa, with 2,100 jets worth $64 billion; the Middle East and Asia-Pacific, with 1,500 aircraft worth $54 billion; and Latin America, with 650 airplanes valued at $11 billion. Large jets will lead the market both in terms of number of units and value. Midsize jets are expected to regain some traction, while the light jet market will continue to struggle.

Mallya's ACJ319 Up for Auction

A court in Mumbai, India, has ordered that an impounded Airbus ACJ319 owned by former Kingfisher Airlines founder Vijay Mallya must be sold before March 1. The jet was seized three years ago by India's tax authority after Kingfisher failed to remit $28 million in service taxes collected from passengers. The ACJ, manufactured in 2006, is on a finance lease from CJ Leasing of the Cayman Islands. The airplane, registered as VT-VJM, is parked at Mumbai Chhatrapati Shivaji International Airport.

Wichita OKs Bonds for Cessna Aircraft

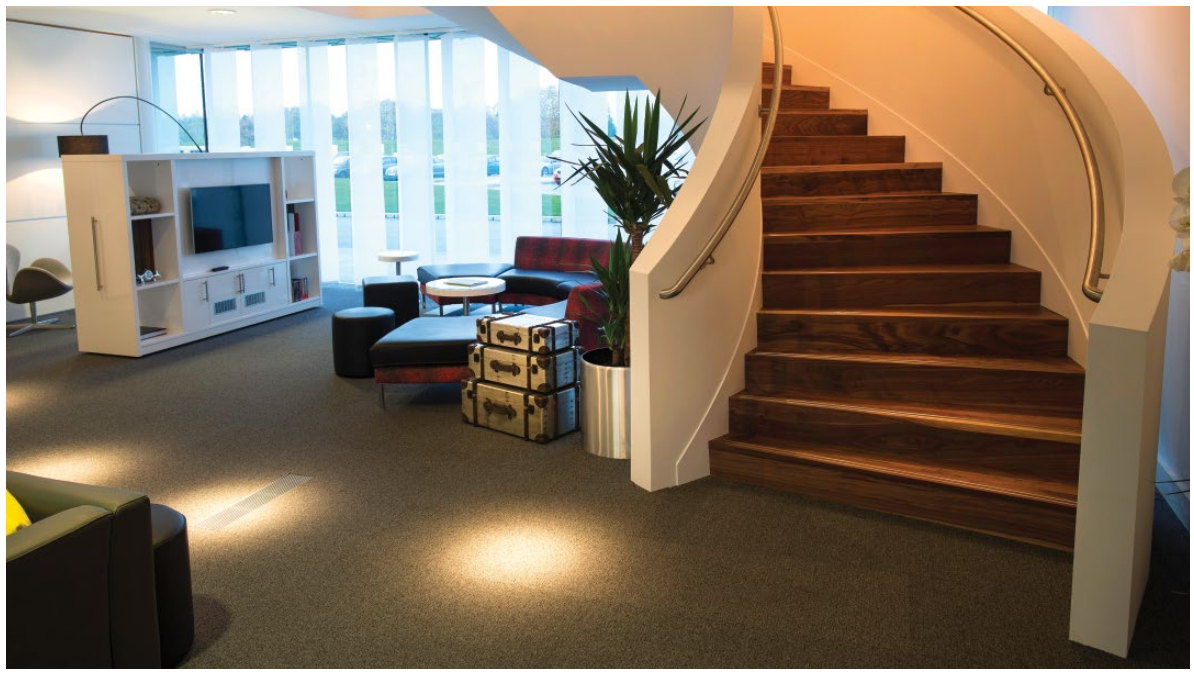
Early last month the Wichita City Council approved bond requests from Textron Aviation's Cessna Aircraft for up to $50 million in industrial revenue bonds to finance $15 million in aircraft manufacturing and flight-testing facility improvements and $33 million in tooling the company invested in last year. The remainder of the request is expected to cover the cost of the bonds. The request is part of a five-year letter of intent (LOI) that Cessna reached with the city council in August 2013 covering the issuance of $513.6 million in bonds.

NetJets' Profits Take Hit in Q3

While its aircraft share sales were up last year, NetJets' earnings suffered in the third quarter as the company continued to streamline its fleet with cancellations of some older orders and realignment with new models. In the quarter, NetJets reported a 37-percent drop in earnings from "increased nonfuel flight operation costs and increased general and administrative expenses, including fees to cancel certain aircraft purchases," parent company Berkshire Hathaway reported. The company did not specify which aircraft cancellations eroded earnings in the quarter, but in July Dassault reported the cancellation of a NetJets order for 20 Falcon 2000s. The results erased earlier gains in NetJets' earnings last year, with profits in the first nine months down 7 percent year-over-year even as revenue increased 5 percent.

Pilot Mental Health Gains Attention

To strengthen the relationship between aviation medical examiners and pilots, the European Society of Aerospace Medicine, European Association for Aviation Psychology and European Cockpit Association unveiled a joint approach to medical and mental fitness assessments of pilots. It endorses a key set of guidelines developed by the Aerospace Medical Association, taking into account the growing relevance of psychosocial stressors, mental health aspects and the ever-changing working environment. The three organizations emphasized that safe pilot performance during an entire career should be the "common aim" of professional pilots, aeromedical and aviation psychological specialists, aviation managers and authorities. The statement particularly addresses pilot mental health, a topic that the aviation community has previously avoided.



TAG Aviation spent approximately $1.5 million making over its Farnborough FBO terminal to create a more comfortable facility for crews and passengers. Amenities for the crews include a gym and a private lounge overlooking the ramp. Although many passengers never come inside, the company also upgraded its passenger lounge at the London-area airport.

TAG Farnborough refresh continues with new lounges

by Ian Sheppard

TAG Farnborough Airport is continuing the improvement project begun in October, when it moved its headquarters offices out of the distinctive terminal building. As part of a £1 million ($1.5 million) refit, the company has established new "designer" lounges and opened a "fast track" entrance for customers to the airfield. It has also built a gym for crew and has a new snooze room. The improved terminal is "one million pounds well spent," according to TAG Farnborough Airport CEO Brandon O'Reilly.

The contemporary design of the new lounge area gives an impression of space and a place where relaxation is a priority, for both passengers and crew, who now have a lounge overlooking the apron.

Underlying the move was the company's view that "the terminal building should be about our customers," said O'Reilly. With that goal in mind, in 2007 the company purchased an office suite known as Meadowbank and moved the TAG management team to that site.

Also driving the relocation was customers' continuing move toward larger aircraft, often with more passengers on board. "We wanted to create better facilities [and] we've discovered that there is emerging demand for higher-volume business aviation flights, as well as football teams, entertainers and their entourages."

O'Reilly said he was expecting movements for last year to be up 2 percent compared with 2014 and "between 5 and 8 percent up in the larger aircraft, such as BBJs." Thus movements stand at about 25,000 a year, "but we can go to 50,000, so are only at half capacity." Added O"Reilly, "We have everything we need now to be able to support our customers [up to the consented capacity limit]." Farnborough Airport remains the only "bespoke" business aviation airport in the UK, designed specifically for VIPs and business travelers.

O'Reilly reflected that although the lounge areas are available, many passengers are too busy to stop and simply head straight to their aircraft or to a car that meets their aircraft, before heading to their helicopters or driving to the nearby M3 highway.

"Immigration officers come on board to stamp your passport so you can get straight in your car and onto the M3, or into your helicopter," he said. London has 11 airports in and around it that support business aviation "but all other airfields are hybrids," meaning they have either commercial operations or flying schools.

The company has several other facilities near the airport, added O'Reilly. "The Swan, an old coaching inn, became available 18 months ago so we bought the freehold of the pub. We have just finished a significant refurbishing." TAG already owns the Aviator 169-room hotel by the airfield. The Swan is "a standalone business overseen by The Aviator. It's a nice warm English gastro pub." ❑

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NEWS BRIEFS Compiled by Chad Trautvetter

Study: UAVs a Threat to Manned Aircraft

Toy drones pose a "significant threat to manned rotorcraft in all phases of flight," according to a study released by aerospace and defense firm Aero Kinetics. The study, "The Real Consequences of Flying Toy Drones in the National Airspace System," examined what could happen in the event of a collision between a toy drone and manned aircraft, including the potential for damage and death. It compared a toy drone strike with historical data on bird strikes, which cause $951 million damage per year to manned aircraft, as well as loss of human life. "The impact of a toy drone…with a manned aircraft would be even more catastrophic," the report notes.

Beijing Red Cross Adds Medevac Falcon

The Beijing Red Cross Emergency Medical Center took delivery of a Dassault Falcon 2000LX specially equipped for medical evacuation flights. The cabin conversion work, conducted by Dassault Aircraft Services in Wilmington, Del., includes an electrically powered patient loading system and a full medical suite with a stretcher, a three-bottle oxygen supply and health monitoring and analysis equipment. The aircraft also can accommodate special devices such as defibrillators, electrocardiographs, echographs, a blood bank and an extracorporeal membrane oxygenation system.

ICAO Warns about New Taxes

As the United Nations Conference on Climate Change (COP 21) got under way last month in Paris, the International Civil Aviation Organization's (ICAO) governing council warned that the international air transport industry could be targeted for disproportionate fees under currently proposed legislation. "There have been a number of calls for global air transport revenue to be taxed by states for use in non-aviation-related climate change mitigation programs," said ICAO council president Dr. Olumuyiwa Aliu. "This is an unfair approach and one that is ultimately counterproductive given the historic and exemplary environmental performance of [the aviation] sector and the significant socio-economic benefits it brings." ICAO has committed to air traffic management improvements to reduce aircraft fuel burn; CO_2 emission standards for new aircraft this year; development of alternative fuels; and a global, market-based plan for international aviation from 2020, to be finalized this year.

Sennheiser Trims Headset Production

Sennheiser will exit the pilot headset business at the end of next month, shifting its focus to core businesses, the company said. "Our decision to leave the pilots' headset sector was not taken lightly, especially as we have played a key role in the development of audio transmission in the cockpit," said COO Peter Claussen. The company will continue to provide headsets for the ATC sector. The ATC team will be folded into the joint venture Sennheiser Communications this month. Sennheiser also said it would fulfill all obligations for aviation headset servicing and spare parts.

Satellite Joins Global Xpress Network

Last month, Satcom Direct (SD) validated its services on the Inmarsat-5 F-2 satellite, the second Ka-band satellite in the new Global Xpress network. SD is a service provider for Jet Connex, the business aviation high-speed connectivity service operating on the Global Xpress network, which offers speeds fast enough for streaming video and voice-over-IP telephone calls. SD is offering tiered pricing plans at various data speeds, with Jet Connex-guaranteed minimum data rates for each tier, according to the company.

Industry groups hail action on Capitol Hill

by Bill Carey and Kerry Lynch

The U.S. aerospace industry hailed the December 3 passage by Congress of legislation that renews the operating authority of the Export-Import Bank more than five months after that authority expired. The dispute over preserving the export credit agency pitted aerospace and other manufacturers against arch-conservative lawmakers who accused the institution of cronyism and skewing free-market competition in favor of large companies.

Legislation providing for a four-year reauthorization of the Ex-Im Bank is contained in a $305 billion highway and mass-transit spending bill the House and Senate each passed by wide margins and sent to President Obama for his signature. In addition to Ex-Im reauthorization, the five-year Fast, or Fixing America's Surface Transportation, Act also called for a study on the diversion of taxes on non-commercial jet fuel to the Highway Trust Fund.

The Senate included the Ex-Im Bank provision in the Fast Act in July. The House retained the provision this fall when it began consideration of the bill despite the staunch opposition of certain House leaders.

The Ex-Im Bank provides loan guarantees and other financing support to foreign buyers of U.S. products, among them business aircraft and airliners. Its operating authority expired in July when Congress broke for summer recess without voting to reauthorize the agency. However, the bank maintained responsibility for its outstanding loan agreements and remained funded during the interim period. There were no layoffs.

Bizav, Airlines Agree on Ex-Im

"The lapse in the Ex-Im Bank's authority should never have occurred, and the Bank's closure has taken a serious toll on both small and large general aviation manufacturers who have seen deals disappear or delayed during these last five months," Pete Bunce, president and CEO of the General Aviation Manufacturers Association, said. "The overwhelming bipartisan majorities in both the U.S. House of Representatives and the U.S. Senate who voted to renew the Bank show their recognition that re-establishing a level playing field in credit agency financing is critical to ensuring fair competition between manufacturers in the international marketplace."

"By reopening the Export-Import Bank, Congress has taken strong action enabling American exporters and the skilled workers they employ to compete successfully in tough global markets," Boeing president and CEO Dennis Muilenburg added. "With these votes, Congress did the right thing for workers at companies large and small across the nation, including the 1.5 million workers at nearly 15,000 U.S. companies that help Boeing design, make and support America's aerospace exports."

The Aerospace Industries Association (AIA), which represents U.S. aerospace and defense contractors, said it was "relieved and delighted" by the congressional action to reauthorize the bank, which sends "a clear signal that we are serious about competing in the global marketplace and will take the necessary steps to ensure American taxpayers have a level playing field."

But "one last item remains," the AIA added. The bank's governing board does not currently have the required number of directors to approve transactions greater than $10 million, and filling those positions will require further cooperation by the Senate and the White House to nominate new members, the association said.

Not all entities welcomed the bank's revival. The reauthorization "is a knife in the back of [the] conservative grassroots," said FreedomWorks, a conservative advocacy organization. "Supporters of the Export-Import Bank acted like the sky was falling when Congress didn't renew its charter this summer," it said. "Obviously, these Chicken Littles were proved wrong. The sky didn't fall, the economy didn't crash and taxpayers were better off without having to bear the burden of risky loans doled out to politically connected corporations and Beltway insiders."

Fuel Tax Changes

As for the revenue diversion provision, House and Senate negotiators agreed to include a measure authored by Rep. Mike Pompeo (R-Kan.) that would require a Government Accountability Office study on the so-called fuel-fraud law.

The fuel-fraud law, enacted as part of the 2005 highway bill, was designed to discourage highway diesel fuel users from purchasing aviation jet fuel to avoid paying the higher taxes placed on highway diesel fuel. Under the fuel-fraud measure, non-commercial jet fuel is taxed at the highway diesel fuel rate and then deposited into the Highway Trust Fund until approved aviation vendors demonstrate that the fuel was used for aviation purposes.

Aviation leaders have pushed for the repeal of the measure, but that has proved politically difficult since lawmakers are hesitant to take any action to reduce revenue from the troubled Highway Trust Fund. The study, however, puts the government in a better position to assess the ramifications the law has had on aviation.

"[The National Air Transportation Association] has long questioned the need for the 2005 diversion provision and views it as a bureaucratic roadblock draining the Airport and Airway Trust Fund of revenue needed for airport improvements and the deployment of a more modern ATC system," said NATA president and CEO Tom Hendricks. "We are confident that an investigation by the GAO, the nonpartisan investigative arm of Congress, will bolster the case for the provision's ultimate repeal." ❑

WALL STREET IMPROVES OUTLOOK ON TEXTRON

Textron's successful integration of its Beechcraft acquisition and new lineup of business jets is improving Wall Street's view of the company. Ratings agency Moody's Investors Service last month changed its rating outlook for Textron and Textron Financial to "Positive" from "Stable."

"With stability in core business conditions, sound investment strategies and balanced capital allocation policies, a rating upgrade is possible," said Russell Solomon, senior v-p and Moody's lead analyst on Textron. Moody's pointed to a "successful execution" of the Beechcraft acquisition and said the company is making tangible progress in cost savings as it combines the unit with Cessna Aircraft.

The agency added that it believes "Textron is well positioned to benefit from any upside in the business jet market as it expands its product offering further upmarket with its recently introduced midsize Cessna Citation Latitude and forthcoming new super-midsize Longitude and large-cabin Hemisphere." *–K.L.*

Santa Monica Airport gets reprieve

by Matt Thurber

In a December 4 decision on a Part 16 complaint filed by pro-airport interests, the FAA has determined that the city of Santa Monica, Calif., is obligated by grant assurances until Aug. 27, 2023. Essentially, this means that the city must comply with statutory and regulatory obligations in its running of Santa Monica Airport (SMO) and keep the airport open until that date, according to visiting professor at UCLA and local pilot Lon Sobel.

"Those obligations have an impact on things like landing fees and lease lengths," he explained. "And it's likely that the city's landing-fee hikes and short-term rentals violate those obligations. The Part 16 procedure that was used to get [the December 4] ruling is a procedure that can be used to attack landing fees, short-term rentals and other things the city has done, or may attempt to do in the future, to make the airport unworkable."

MATT THURBER

The FAA's decision on the Part 16 complaint leaves the door open for SMO tenants to challenge what they see as unfair fees and rules that limit the utility of the airport.

The Part 16 complaint was filed July 2, 2014, by NBAA, AOPA, airport businesses, tenant and actor Harrison Ford, airport user Paramount Citrus and other parties seeking a clear decision on when the city's grant obligations expire. The city claimed an expiration date of June 29, 2014, and since then has raised landing fees significantly, applied these fees to all based tenants and shortened tenant rental terms, while moving forward with attempts to close the airport partially or fully. The city had 30 days to appeal the FAA's determination and had not done so by the time this issue went to press.

"Santa Monica Airport is a crucial part of Southern California's transportation infrastructure and is responsible for 1,500 jobs and 175 businesses, and contributes $250 million to the economy," said AOPA president Mark Baker. "Today's ruling on what was clearly a frivolous claim is good news for Santa Monica's economy and the long term future of the airport."

Wide-ranging Implications

NBAA COO Steve Brown said, "America's airports are part of a federal transportation system, and this determination highlights the FAA's recognition of the overall importance of grant commitments and demonstrates to other municipalities that recently have attempted to impose illegal restrictions…the significance of the commitment that airport owners and operators make when accepting federal funds.

"We hope that the city will end its short-sighted efforts to restrict operations at SMO, especially now that they have

Continues on page 18 ▶

TORQUED | Full-throttle opinion from former NTSB member John Goglia

Industry must act now or face shortage of pilots and mechanics

I don't know how much more dire the predictions about pilot and mechanic shortages need to get before action is taken. Reading Boeing's annual pilot and maintenance technician forecasts tells me the alarm bells are ringing, but no one seems to be listening. And Boeing's 2015 forecasts once again predict an unprecedented demand for personnel to fly and maintain the tens of thousands of airplanes the company expects will be placed into commercial service over the next 20 years. According to its predictions, the aviation industry will have to provide "more than one million new airline pilots and maintenance technicians between now and 2034."

A staggering number of new aviation personnel is needed in the not-too-distant future. Especially when you consider that, at least in the U.S., we are not seeing the growth needed in the numbers of young people going into aviation as careers. For mechanics, there are many reasons. The most common one I see is that aviation mechanics earn significantly less than, say, automobile mechanics. But that is changing as the number of qualified mechanics shrinks rapidly. For pilots, the issues I hear most frequently are the high cost of college and flight training and the low wages for entry-level pilots, particularly at commuter airlines.

Keeping the Pipeline Flowing

As an industry, we need to encourage–maybe demand–significant changes in higher education, or else we are going to find ourselves suffering the consequences of severe shortages of skilled labor. One change requires no upfront costs; it is really more a change in expectations. In the past, people who wanted careers as pilots learned to fly first got jobs and, if they went on to college, earned their degree while working.

Somehow that all changed and the pressure on pilots was to learn to fly and go to college at the same time. This means that would-be pilots are saddled not only with high college costs but also the high costs of flight training. This is an expensive proposition for many young people and certainly deters many I have spoken to over the years. Of course, it's not just the high cost of college and flying lessons, but also the pay scale. For pilots right out of school the pay at some commuter airlines is frequently not much more than for working at McDonald's. In fact, it might be significantly less than the $15 per hour recently awarded to some fast-food workers.

Others are making the same point about changing the typical path of high school to college to work. In "Alternative Paths to College Education: First Learn a Job," a writer at *Forbes* makes the case that with the high cost of education and the difficulty of finding jobs that pay enough to cover high student debt, prospective college students should consider an alternative path, such as getting job skills first and then rounding out their education with a college degree. His comments are applicable to the aviation field. Creating a pipeline of pilots who earn college degrees as they work might be a better alternative to facing a severe shortage of pilots in the future.

The other area that needs immediate attention is the shortage of mechanics. Returning to the days of vocational schools for students interested in a skilled profession–such as aviation maintenance–is critical. An article by another *Forbes* writer makes the case that encouraging college for all high-school students has hurt students and the economy by creating a skills shortage in challenging and well paying jobs. While the author's focus is on manufacturing jobs, I would argue that the same is true for many careers in aviation, including maintenance, where vocational schools begun at the high-school level and continuing with apprenticeships or two-year community college programs would benefit both the student and the aviation industry.

We need to accept that the aviation industry is not as attractive a career choice to young people as it once was. Salaries and working conditions have not kept pace with those in other industries. Attracting students in high school and providing them an affordable career path will be critical to addressing the projected shortfalls. ■

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.

▶ Continued from page 16

been declared impermissible," Brown added.

"This is a big step forward," said SMO tenant Skip Short, executive producer of aerial filming company Aero Film. Short worries that the city of Santa Monica remains determined to close the airport and make it uncomfortable for tenants to stay there and that the city will begin filing lawsuits. "They are definitely going to try to make it as difficult as they can, but I think we have gained a lot of time with the FAA's decision," he told **AIN**.

The city has been arguing that it isn't bound by a post-World War II agreement to keep the airport open in perpetuity and also that if this is binding, the agreement doesn't apply to a portion of the airport property that includes 2,000 feet of the 4,973-foot runway. In any case, the December 4 determination forces the city to keep the airport open until Aug. 27, 2023.

However, the decision also could rein in some of the punitive measures that the city has taken in an effort to discourage operations at the airport, such as higher landing fees and application of those fees to based tenants, raising of lease rates and limiting of leases to month-to-month and a recent attempt to limit jet emissions at the airport. "The [grant assurance] regulations control the manner in which airports that are subject to those regulations determine the amount of landing fees, what they charge for fuel and things that airport owners do," Sobel explained. "That's why this decision is the foundation for airport users to demand that the airport do things or undo things that have happened."

MATT THURBER

The city has sought to reduce the utility of the airport by restricting jet operations.

The attempt to cap emissions at SMO is also not legal, according to Sobel. "Can the city enact emission control regulations to eliminate jets? The answer is: the city cannot use emissions controls to interfere with the operation of an airport. That's solely the purview of the FAA."

More Legal Battles Ahead

Overall, Sobel sees the Part 16 determination as a victory, even though it is likely to lead to further legal battles. Sobel worries that California legislators could seek a law in Congress to close the airport.

Rymann Winter, president of SMO flight school Proteus Air Services, is more positive about the Part 16 determination. "The decision by the FAA in favor of airport businesses is a big win for all of us in aviation," he told **AIN**, "not just for those based at SMO. This airport is the canary in the coal mine for hundreds of airports in the U.S. that are facing similar pressure from people who bought cheap houses next to an airport and then have the temerity to complain about aircraft noise."

Winter noted that in the Part 16 complaint, the city claimed that it switched to short-term leases because of the lack of surety about whether the airport would remain operating. "My hope, now that we have a decision by the FAA that the airport will remain in operation until at least 2023, is that the city will be compelled to offer long-term leases. It does make it a little easier to believe we will be here until at least 2023, but day to day we still face the issue of operating at an airport run by a city that is hell-bent on shutting it down." ❑

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News Makers 2015

A look in the rearview mirror that was 2015 shows what is shaping the future of business aviation and where it might be headed.

The year in Washington: much noise but little achieved

by Kerry Lynch

The year 2015 began with promise of a busy one in Washington with U.S. FAA reauthorization coming to the forefront, new resolve to address tax policy and lawmakers ready to move quickly on funding bills. Also, a Part 23 rewrite was widely anticipated in the year and hope remained for resolution on the aircraft management fee tax assessments.

But as 2015 came to its conclusion, the year ended like many before it, with the U.S. Congress scrambling to finish work on federal funding and hammer out an agreement on tax policy. FAA reauthorization was already in stopgap mode. Personnel turnover at the Internal Revenue Service pushed back resolution of the management fee issue, and while progress on Part 23 was being made behind the scenes, the FAA failed to produce a notice of proposed rulemaking by the middle of December.

With the FAA's authorization originally set to expire on September 30, lawmakers got out of the gate early on the issue with the first hearing held in January last year. That hearing showed consensus: the focus was on delays with the FAA's certification projects and inconsistency in the way it interprets regulations. But reauthorization debate quickly heated up with talks turning to the air traffic control organization. This resurrected a decades-old debate over ATC privatization-corporatization-nonprofitization and user fees. It also once again pitted the business and general aviation community against the airlines.

While the Senate remained largely quiet about the debate, the intentions of Rep. Bill Shuster (R-Pa.), the chairman of the House Transportation and Infrastructure Committee, became clear during a June speech before the Aero Club of Washington, where he outlined his vision for authorization. The centerpiece was an independent, not-for-profit organization, funded by user fees, to run ATC. But Shuster's own committee lacked agreement on the issue, along with lawmakers outside the committee and the industry. Also, debate about a sweeping highway bill began to consume the attention of the committee.

While no one had an appetite for a repeat of the 23 extensions of the FAA's authority that occurred during the last reauthorization cycle, a comprehensive FAA bill was not ready as the September 30 deadline loomed. Shortly before the FAA's authority expired, Congress was forced to adopt its first extension, pushing consideration and the debate about ATC and user fees into early 2016.

This is giving the opposing parties time to fortify their front lines on ATC organization. As the year closed, Airlines for America rolled out its chief board members to outline a case for independent ATC. NBAA president and CEO Ed Bolen responded with this message to members: "the airlines are readying for the coming battle over ATC privatization funded by user fees, and we must do likewise. The business aviation community must once again band together in active opposition."

Many hold out hope that the reauthorization will be finalized before the end of March, when the first extension is set to expire. Even though the ATC provision is controversial, the bill is a possible vehicle for a laundry list of aviation measures that have strong industry backing. These include the Pilot's Bill of Rights, certification efficiencies and the consistency of regulatory interpretation, and possibly a permanent fix to the IRS tax treatment of aircraft management fees.

As with reauthorization, Congress was unable to finalize appropriations bills that fund most government agencies, including the FAA, before the fiscal year ended on October 1. This led to another stopgap measure to keep the government running until December 11. Stopgap measures keep funding flat for agencies and can prevent the start of certain new projects, which can present a problem for efforts such as NextGen.

Some Progress Made

On the positive side, lawmakers were able to reach agreement on a multi-year budget that establishes funding thresholds for each agency. Theoretically this should make the appropriations process smoother since there is an overarching agreement on funding levels. But highly controversial issues (such as Planned Parenthood funding or healthcare) tend to pop up to stall progress on appropriations bills and very well could keep government appropriations mired in partisan politics in the future.

Also on the plate in December were a bevy of tax incentives that appeared on a seemingly endless cycle of one- or two-year renewals. Industry has been following three of those incentives in particular: the research and development tax credit, bonus depreciation and Section 179 expensing. Talks of making those three incentives permanent appeared encouraging, but lawmakers were engaged in a major horse-trade that appeared tenuous in early December. This could extend the existing renewal cycle, and tax talk could emerge again this year.

Congress did complete work on a couple of major issues, among them renewing the U.S. Export-Import Bank, which had appeared to be on life support. And the National Air Transportation Association was able to draw attention to the diversion of noncommercial jet fuel taxes to the highway trust fund, with Congress backing a study of the issue.

The ADS-B equipage deadline (midnight Dec. 31, 2019) and small unmanned aircraft systems (sUAS) also became hot topics last year that will continue into the New Year. The rate of ADS-B equipage sped up, particularly in the business aviation community, and a working group formed in late 2014, Equip 2020, submitted a report on the stumbling blocks to equipage. The group spawned further discussion on a key concern of the business aviation community, privacy, and the FAA is reviewing possible solutions. The agency has made clear it has no intention of moving the 2020 equipage deadline.

Small UAS drew intense media attention on sightings and so-called "near misses." Calls escalated for the FAA to release rules to govern sUAS. The FAA issued the much anticipated notice of proposed rulemaking on regulation of sUAS in February and the comment period ended in April. A final rule is anticipated this year. The FAA also established a task force to develop recommendations on a registry for small UAS. That task force delivered its recommendations for the registry in November, and late last year the FAA said it was working quickly to move on those recommendations.

Beyond the FAA, the Environmental Protection Agency issued an advance notice that sets the stage for regulation of aircraft greenhouse-gas emissions. This notice was predicated on the outcome of the International Civil Aviation Organization effort to establish a CO_2 standard. That standard, expected next month, will kick off debate on how to regulate the standard and what market measures will be used.

All of this points to a busy year for industry advocates, even if 2016 turns out to be another year of politics inaction rather than in action. ❑

Time Line

AIN's editors take a look back at the events that shaped business aviation in the past year. Among the highlights: manufacturers completed or made significant progress on their in-development programs as the industry embraced changes in technology and sought legislation that keeps pace with its changing reality.

DECEMBER 2014

9

Avanti Evo Achieves EASA Certification

Piaggio Aerospace received initial European approval for the Avanti Evo twin turboprop, with certification from the FAA and Indian authorities to follow. The first two aircraft are being delivered to separate Indian customers, the third aircraft is for a U.S. customer, and the fourth for a buyer in Europe. Italy-based Piaggio has orders for 16 Evos so far. The company is owned by Abu Dhabi's Mubadala Aerospace.

DAVID McINTOSH

JANUARY 2015

13

MATT THURBER

Nextant G90XT Makes Maiden Flight

Nextant Aerospace flew the re-engined G90XT for the first time on January 13. The G90XT, a Beechcraft King Air C90A equipped with GE H75-100 turboprop engines and Garmin G1000 avionics, is Nextant's second remanufactured aircraft program.

28

NetJets Prevails in Lawsuit against IRS

Part of a 2011 lawsuit that NetJets filed against the U.S. government has been resolved in the fractional-share company's favor. NetJets filed the lawsuit seeking "refund and abatement of excise taxes, interest and penalties totaling $642,706,119.89, which the Internal Revenue Service has illegally assessed against them under section 4261 of the Internal Revenue Code," according to the document.

Component improvements drive aircraft efficiency gains

by Matt Thurber

Breakthroughs in aircraft design are few and far between; what we are seeing now are incremental improvements that nevertheless aim for ever greater efficiency and performance. Many of these improvements are under the skin of modern aircraft, such as new avionics, improved systems and, most important, the engines that make flying possible.

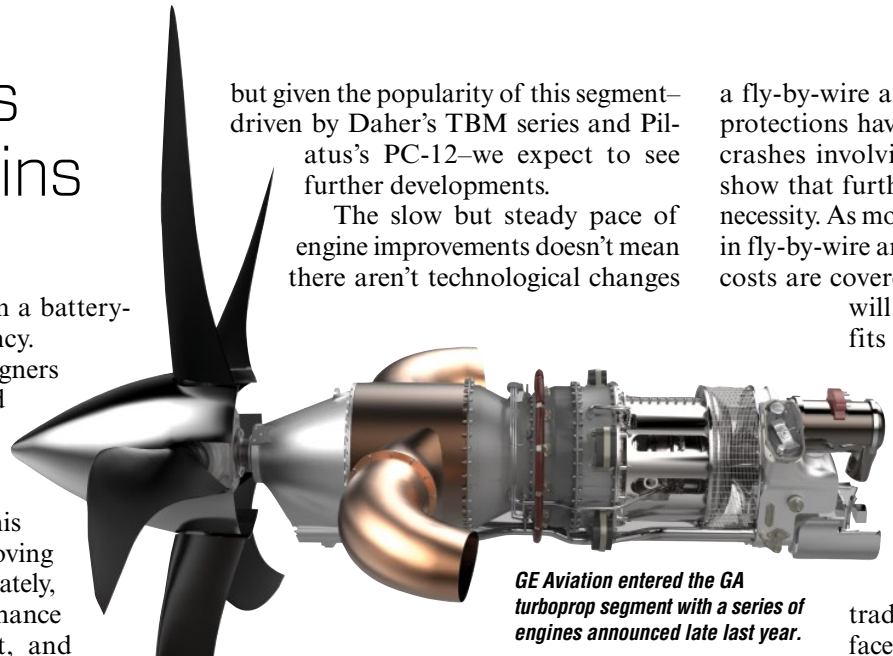
While there have been major breakthroughs in electric motor design, it's unlikely that electric-powered aircraft will be carrying significant loads–more than a handful of passengers–anytime soon. Battery technology, while gaining ground, just isn't up to the task and might never match the energy density of carbon-based fuels.

That said, we do expect to see widespread adoption of lithium-ion for mainship battery applications. Manufacturers such as True Blue Power know how to make these batteries with safe lithium-ion technology and, compared with nicad versions, these batteries are far more reliable, last longer, deliver more power for low-temperature starts and operate much longer in a battery-only electrical emergency.

Turbine engine designers have steadily improved efficiency by an average of about one percent per year during recent decades, and this points to reliably improving performance. Unfortunately, turbine engine performance comes at a high cost, and although there are some promising small engines in the works, there is little opportunity to dramatically lower the cost of turbine engines and spark a resurgence in general aviation powered by turbines replacing pistons.

Nevertheless, GE Aviation's entry into the 850- to 1,650-shp market offers some long-awaited competition, and this will surely stimulate new turboprop designs powered by both GE's new engine and Pratt & Whitney Canada's PT6. The first to emerge will be Textron Aviation's GE-powered single-engine turboprop, but given the popularity of this segment–driven by Daher's TBM series and Pilatus's PC-12–we expect to see further developments.

The slow but steady pace of engine improvements doesn't mean there aren't technological changes that could speed up engine development. Ceramic matrix composites are headed toward production engine programs. And engine manufacturers are pouring many millions of dollars into 3-D printing of complex components, which should ultimately lower costs and accelerate prototype development.



GE Aviation entered the GA turboprop segment with a series of engines announced late last year.

Aerion believes its supersonic business jet could enter service by 2023, and a 20-aircraft order from Flexjet shows the industry's appetite for speed.

Fly-by-Wire Technology

The trend on the business jet side is toward increasing complexity that makes pilots' jobs easier. Most clean-sheet new business jet designs have fly-by-wire flight control systems, witness Embraer's Legacy 450/500, Gulfstream's G500/G600 and Bombardier's Global 7000/8000. For those who say that fly-by-wire is suited only to larger aircraft, the Bell 525, although a relatively heavy helicopter, shows that modern flight controls make sense in smaller packages.

Thales, which is developing the fly-by-wire rudder control system for Textron Aviation's Longitude, doesn't see any reason why fly-by-wire won't be beneficial for smaller business jets, too. While the weight savings aren't as significant as for larger aircraft, they are a factor. But more important are the safety benefits of fly-by-wire. Flight envelope protections built into fly-by-wire systems can help get pilots out of trouble and could eventually eliminate the need for some upset recovery training, although pilots will always need training in the fundamentals of flying, especially how to recover a fly-by-wire aircraft in a mode where protections have been removed. Recent crashes involving fly-by-wire airliners show that further training is an urgent necessity. As more OEMs gain experience in fly-by-wire and as initial development costs are covered by new aircraft, they will gradually see the benefits of moving the technology into smaller aircraft.

Another benefit of fly-by-wire is that it enables designers to extract even more performance from future airframes. One way to do this is by eliminating traditional flight control surfaces and replacing them with flexible portions of wings and horizontal and vertical stabilizers. Winglet manufacturer Aviation Partners has teamed with FlexSys in a joint venture to market the FlexFoil variable-geometry flight control surface technology. FlexSys has been testing it on a GIII, in which the flaps were replaced with FlexFoil seamless continuous surface units that can morph from -9 degrees to 40 degrees. The surfaces could eventually be used for mission-adaptive profiling, where operators can adapt the control surfaces for the shape best suited to the phase of flight.

For the near future, the pinnacle of aerodynamic design will likely be a supersonic business jet, and the Aerion-Airbus team has steadily built engineering and financial capabilities that could lead to the first Aerion AS2 entering service in 2023. Fractional-share operator Flexjet is slated to become one of the first operators to place the AS2 into service, having signed a firm order for 20 of the SSBJs.

One development that seems fully established is flat-floor cabins for mid-size and larger business jets. And while ultra-long-range jets have commanded significant market share, Textron Aviation's recently announced Citation Hemisphere is going to test the market with relatively long range (4,500 nm) and a 102-inch-wide cabin (the same width as the Falcon 5X, but less range than the 5X's 5,200 nm). Time will tell how this new market niche develops. ❑

FEBRUARY 2015

6

Dassault Falcon 8X Starts Flight-test Campaign

Dassault's new flagship, the 6,450-nm Falcon 8X, made its maiden flight. With test pilots Eric Gérard and Hervé Laverne at the controls, Falcon 8X S/N 01 took off at 2 p.m. local time from Bordeaux Mérignac airport and landed at 3:45 p.m. The maiden sortie took place seven weeks after the rollout ceremony.

15

FAA Unveils Long-awaited Small-drone Draft Regulation

The FAA unveiled its highly anticipated proposed regulation for the commercial use of small drones weighing less than 55 pounds, nearly four years later than expected. The agency's release of the rule coincided with the release of a Presidential memorandum setting privacy guidelines for federal agencies that use unmanned aircraft systems (UAS).

18

PW800 Engines for G500/G600 Get Transport Canada Nod

Pratt & Whitney Canada's PW814GA and PW815GA—which will power the Gulfstream G500 and G600, respectively—received type certification from Transport Canada. During testing, the PW800 engines logged more than 3,300 hours, including more than 350 flight hours on P&WC's Boeing 747SP flying testbed.

MARCH 2015

CONTINUES ON NEXT PAGE

18

GE Honda Wins FAA Production Certificate for HF120 Engine

GE Honda Aero Engines' plant in Burlington, N.C., received an FAA production certificate for the HF120 engine that will power the HondaJet and other light business jets. The company obtained FAA approval for the engine in December 2013.

27

HondaJet Receives Provisional FAA Certification

Honda Aircraft announced that it received provisional certification for the HA-420 HondaJet from the FAA. Full certification is expected "in the next few months," according to the company, "following the completion of final testing and approval by the FAA." The FAA awarded full certification on December 9. Provisional certification allows an aircraft manufacturer to keep production moving, with final-phase manufacturing continuing on customer aircraft so they can be delivered on schedule.

News Makers 2015

NextGen capabilities available now

by Matt Thurber

Without a doubt, the most startling advances in aviation continue to be in the realm of avionics: they are having a significant effect on flight operations and ultimately–witness the accelerating move to NextGen–on ATC. Some aircraft owners and operators view the upgrade mandates (such as ADS-B OUT) to meet NextGen's equipage requirements as an unnecessary burden, but that shouldn't be the way we characterize it, according to Ric Peri, vice president of government and industry affairs at the Aircraft Electronics Association.

ADS-B, he suggested, "is nothing more than modernization. The industry modernized aviation 25 years ago with the introduction of GPS, and the FAA is now modernizing its air traffic system to take advantage of it." In other words, the ATC infrastructure is finally going to realize the benefits that GPS promised, from pinpoint radar-less surveillance to opening precision GPS approaches into many more airports. In fact, the number of Waas LPV approaches in the U.S. reached 3,951 at 1,746 airports in November, and 1,002 of these airports have no ILS. Precision GPS procedures are available in other regions, among them Canada and Europe.

Many aircraft being upgraded to ADS-B are taking advantage of the requirement for a precise GPS source to add LPV capability at the same time, so both the ATC system and the aircraft owner realize NextGen's benefits.

Avionics Makers Ready for Change

With NextGen, there are other factors that dovetail nicely with avionics developments, for example performance-based navigation (PBN) required navigation performance (RNP) approaches. These often look like the designs of a twisted mind because of the way they curve around obstacles, but airlines have been flying them for years, and pilots of properly equipped business and light aircraft can also take advantage of this capability.

One company that saw this coming is Sandel Avionics. The company's new Avilon integrated flight deck for King Airs displays path-based guidance in both the vertical and lateral axes on dedicated screens. The upgrade, priced at $175,000 installed, is a single preassembled unit that plugs into the airplane's existing electrical connectors, greatly simplifying installation.

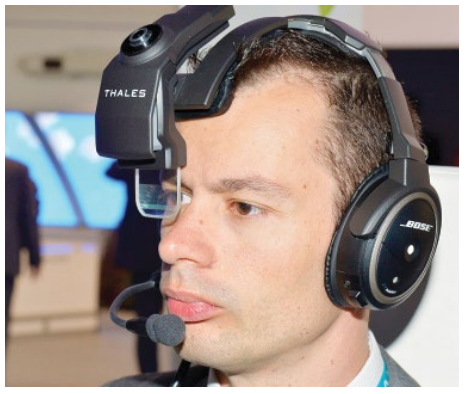
Honeywell is targeting future fliers with its DynaCharts software upgrade for Epic and Apex avionics suites. DynaCharts takes information from charts and uses it to populate cockpit displays, instead of placing the chart itself onto the display. This relieves the pilot of having to look at a chart then mentally cross-reference that information with what is showing on the displays.

To fly RNP approaches efficiently, autothrottles are essential, and avionics manufacturer Innovative Solutions & Support has developed a clutch-less and servo-less autothrottle system for Pratt & Whitney Canada PT6s, a segment of the market that hasn't seen this kind of technology. IS&S's autothrottle can be adapted to any PT6-powered airplane, although it will also require installation of IS&S's integrated standby display, which runs the thrust computer software to make the autothrottle work.

Avionics makers are working hard to help pilots land in the worst weather, and their efforts include improvements to infrared sensor-based enhanced flight vision systems. Honeywell is testing a combined vision system that marries infrared imagery with synthetic vision and presents it all on one primary flight display. And Rockwell Collins is bringing head-up displays (HUD) into smaller aircraft with its HGS-3500 compact HUD. The first installation is on Embraer's Legacy 450/500.

For aircraft where even a compact HUD might not fit, Thales has developed its TopMax head-mounted HUD, which consists of a monocular display that the pilot attaches to a headset. Costing about half the amount of a traditional HUD, TopMax lets a pilot view flight information while looking through the display. Unlike with a more conventional display, the pilot can look in any direction and see pertinent information such as a terrain display when looking down, or traffic when looking to the side.

Infrared sensors are the current technology used for EFVS, but engineers are exploring other technologies that could help pilots "see" even better through low clouds during the final 100 feet before landing. Currently EFVS allows pilots to fly to 100 feet agl, but then they must be able to see the runway visually. Infrared sensors can't cut through all types of thick fog. One possible solution envisions coded signals from LED approach lights received in the cockpit and translated into a visual display on the HUD or PFD. Someday soon, pilots might be able to hand-fly safely to touchdown in true zero-zero conditions. ❑



Above, IS&S is offering an autothrottle system to bring RNP approaches to PT6-powered aircraft. Honeywell's DynaCharts, below, populates displays with information from charts to ease workload. TopMax, right, brings HUD capability to smaller aircraft.

Avilon combines touchscreens with a minimal number of knobs and switches. Visual displays depict the state of the airplane on "tiles" that add up to a richly informative "main primary" display in front of each pilot. Each main primary is split into four of these tiles, essentially mini-displays adding up to a larger 12-inch display.

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APRIL 2015

23

Piaggio Begins Avanti Evo Deliveries

Piaggio Aerospace handed over the first Avanti Evo to a Greek customer for use in charter operations. Announced during last year's European Business Aviation Convention and Exhibition, the Evo is the third generation of the Avanti twin pusher-turboprop aircraft, with winglets, redesigned nacelles, a reshaped front wing, new Hartzell five-blade scimitar propellers and a number of system upgrades.

30

FAA Declares New En Route Automation System Operational

The Federal Aviation Administration finished installing a computer automation system that substantially improves the efficiency and capacity of its high-altitude, en route ATC centers. Thirteen years in development, the $2.48 billion en route automation modernization (Eram) system now operates at the 20 air route traffic control centers in the U.S.

MAY 2015

18

Gulfstream G500 Logs Maiden Flight

Seven months after rollout at Gulfstream's headquarters in Savannah, Ga., the fly-by-wire G500 took off for its first flight at 10:39 a.m. from Savannah-Hilton Head International Airport and piloted by experimental test pilots Scott Martin and Kevin Claffy, along with flight-test engineer Bill Osborne.

JUNE 2015

1

NetJets Brings Back Two Execs as Hansell Steps Down

The management shakeup at NetJets continued, with the sudden departure of NetJets chairman and CEO Jordan Hansell and the return of two senior executives to take the helm of the company. NetJets announced that Hansell left his posts as chairman and CEO after leading the company since 2011.

2

Dassault Rolls Out First Falcon 5X; Slated To Fly Summer 2015

Dassault unveiled the first prototype of the 5,200-nm Falcon 5X twinjet at its factory in Bordeaux, southwest France, and planned to fly the aircraft in the summer of 2015. Delays with the Snecma Silvercrest engine disrupted that schedule.

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News Makers 2015

In air transport, 2016 shaping up as year of the narrowbody

by Gregory Polek

Bombardier completed flight tests of its CSeries in November. It received Transport Canada certification on December 18.

All the activity in the narrowbody segment planned for 2016 stands to make it one of the busiest years in recent memory for airliner makers, while airlines around the world look to reap all the expected economic benefits the new engine and airframe technology promises. With November's certification of the Pratt & Whitney PW1100G-powered Airbus A320neo and last month's Transport Canada approval of the Bombardier CSeries, the Pratt geared turbofan, for example, gets its first chance to prove its double-digit fuel improvement claims in revenue service. Meanwhile, as Bombardier and Airbus execute first delivery of their single-aisle jets, Boeing and China's Comac continue preparations for first flight of the 737 Max 8 and C919, respectively. Finally, by the middle of the year Airbus expects to deliver the first CFM Leap-1A-powered A320neo, while Embraer prepares for first flight of the new E190 E2, the Pratt & Whitney PW1900G-powered derivative of the E190 scheduled for certification in the first half of 2018.

While the culmination of several long campaigns this year certainly looks like progress, the path to reaching this point didn't track as straight as some had hoped, and last year in many ways marked a defining moment for troubled programs such as the CSeries. Finally completing all its certification testing after more than two years of delays, the CSeries didn't reach the proverbial finish line before receiving a much needed financial boost late last year from the provincial government in Quebec, which promised to inject $1 billion in capital in return for a 49.5-percent stake in the project.

The new investment by the Quebec government came three weeks after Bombardier and Airbus each confirmed that they had explored "certain business opportunities" together and that talks had ended following reports that Bombardier offered a majority stake in the CSeries to the European airframer.

Another troubled program that has seen its fortunes turn over the past year–the Mitsubishi MRJ–flew for the first time in November, marking the start of a flight-test program expected to see the 90-seat Japanese jet ply U.S. skies this year as a major part of its certification effort. Plans call for the first of four MRJ90 prototypes to arrive in the U.S. in the second quarter to begin a flight-test campaign at Grant County International Airport at Moses Lake, Wash., to take advantage of its long runways and lack of regular scheduled airline service. Other testing sites in the U.S. include Gunnison-Crested Butte Regional Airport in Colorado, where the company plans to conduct high-altitude takeoff and landing tests. Meanwhile, it has chosen Roswell International Air Center in New Mexico for special runway tests and McKinley Climatic Laboratory in Florida for extreme environment testing. It also plans to employ 150 engineers at a new engineering center in Seattle to support all the testing activity in the U.S.

While regional jets and narrowbodies attract much of the attention this year in terms of service entry and flight-testing, widebody developments also continue to speed along as well. After a successful entry into service of the 787-9 last year, Boeing's 787-10–the straightforward stretch of the -9 the company bills as the most fuel-efficient airplane in the world–stands ready for 100-percent design release this year, in time for entry into service in 2018. On the other side of the Atlantic, work continues apace on the stretched version of the Airbus A350-900 called the A350-1000. On November 5 the Rolls-Royce Trent XWB-97 engine under development for the big jet made its first flight on the European airframer's A380 flying test bed, marking the start of a nine-month test program leading to first flight of the A350-1000 by mid-year.

To virtually all the world's airliner manufacturers, goals for 2016 center on plan execution rather than new product launches. One exception could come from Airbus in the form of what has become known as the A380neo. If Emirates Airline had its way, Airbus would launch a re-engined A380 this year, but Toulouse would need a commitment from more than just one customer to risk such a potentially massive investment on a program that hasn't yet proved itself worthy of the costs it has already incurred. Most recent indications from Airbus executives point to a possible service entry not until after 2022, in which case a launch this year would seem unlikely.

Whether or not Airbus launches the A380neo, 2016 will bring with it plenty of opportunity for airframers to prove their mettle, whether that means executing successful entries into service or reaching program milestones on time. It should also give observers the chance to second-guess if things don't go as planned. In any case, through the successes and setbacks, it looks sure to keep everyone involved busy making aviation history. ❑

The Airbus A380 holds the most promise for an announcement in 2016: a re-engined version if the airframer can secure enough interest.

JUNE 2015

3

Airbus Helicopters H160 Enters Flight-test

The Airbus Helicopters H160 medium twin made its first flight at Marignane Airport, where the manufacturer has its headquarters.

5

Citation Latitude Completes FAA Certification

Cessna earned FAA type certification for the Citation Latitude, clearing the way for deliveries to begin in the third quarter. Among the first customers is fractional ownership provider NetJets, which has ordered up to 150 of the aircraft.

JULY 2015

1

Bell's 525 Relentless Logs First Flight

After 21 hours of ground testing, Bell Helicopter flew the 525 Relentless super-medium twin for the first time from its assembly plant in Amarillo, Texas. Despite wind gusting to 20 knots, the 525 taxied, hovered and flew maneuvers to assess low-speed controllability with Bell senior test pilots Troy Caudill and Jeff Greenwood at the controls. Caudill said the helicopter performed "extremely well. It flies better than it does in the simulator."

15

AgustaWestland AW169 Gets Nod from EASA

AgustaWestland received EASA certification for the AW169 medium twin. The 10,140-pound/4.6-metric ton AW169 is powered by a pair of Pratt & Whitney Canada PW210A Fadec-controlled turboshaftss (1,000 shp each) and has Rockwell Collins glass-panel touchscreen avionics.

20

Lockheed Martin Buying Sikorsky for $9B in Cash

Lockheed Martin's decision to buy Sikorsky Aircraft from United Technologies (UTC) for $9 billion lifted a cloud of uncertainty that has hung over the Connecticut-based helicopter maker since UTC announced its desire to shed the enterprise earlier in 2015.

CONTINUES ON PAGE 26

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News Makers 2015

Economic forecast points to further doubt and confusion

by Charles Alcock

The last time I was able to kid myself I had a clue about what was happening to the global economy was somewhere around early September 2008, before the financial meltdown of the sub-prime mortgage crisis plunged us all into an almost unprecedented spiral of uncertainty. More than seven years later, I take consolation from the fact that hardly any credible economists today would pretend to have any degree of certainty as to how things will unfold in 2016. But what is clear is that the aviation industry is facing another year of doubt about what will come to pass in just about all the key markets it serves, with much of this uncertainty being driven by factors such as the immeasurable impact of political instability and terrorist violence.

The latest Economic Outlook from the Organization for Economic Cooperation and Development (OECD) could not make this plainer. "A further sharp slowdown in emerging market economies is weighing on global activity and trade," commented OECD secretary general Angel Gurría when the forecast was published on November 9. "At the same time, subdued investment and productivity growth is checking the momentum of the recovery in the advanced economies."

Translation: All those emerging markets you were counting on to plug gaps in demand from flattening mature markets, well I wouldn't hold out much hope of those if I were you. And I wouldn't go getting your hopes up about what you can expect from the mature markets either.

When the number-crunching stops for 2015, the OECD expects the global economy to have grown by less than 3 percent. "This is the weakest growth since 2009 and well below the long-run average," reported Gurría. "This largely reflects further weakness in emerging market economies, with recessions in Brazil and Russia and the slowdown in China hitting activity in key trading partners."

So the message from the OECD is that it's not just a case of accepting that individual national economies are seeing slowing growth or recession but that the high degree of interconnectivity between markets means that these trends are now denting overall global trade and feeding through into weakening levels of investment in infrastructure and equipment (such as aircraft). "Global trade, which was already growing slowly over the past few years, appears to have stagnated and even declined since late 2014, with the weakness centering increasingly on emerging markets, particularly China," said the OECD. "This is deeply concerning as robust trade and global growth go hand in hand. In 2015 global trade is expected to grow by a disappointing two percent."

In the 34 OECD member states (including most European countries, the U.S. and Australia), business investment in 2015 and through the end of 2016 is expected to rise by 3.3 percent, a rate that the Paris-based organization described as "anemic." At the same time, it described the availability of credit in many advanced countries as "subpar."

The OECD members do not include any of the emerging markets that the group's economists now say are a big cause for concern going into 2016. These emerging markets have been hit by factors such as lower commodity prices and weak export demand. Rising corporate debt levels in these emerging economies are now a further cause for concern because, according to the OECD, "volatile international capital flows could make serving that debt much more difficult."

The slowdown in annual growth of China's gross domestic product to an anticipated 6.5 percent in 2016 (from 6.8 percent in 2015) and 6.2 percent in 2017 is already adversely impacting the economies of key trading partners, including Russia, Brazil, Malaysia, the Philippines, South Korea, Mexico, Indonesia, Chile and South Africa. The haziness of the outlook for China is compounded by the serious lack of transparency over economic data on the part of the Chinese government.

In the case of Russia, there is clearly a political dimension to the uncertainty in that at least a part of its dipping GDP growth can be attributed to economic sanctions imposed on it by Western countries in response to the military conflict in eastern Ukraine. The OECD sees Russian GDP growth down by 4 percent in 2015, and a further 0.4 percent in 2016 before, hopefully, rebounding upwards by 1.7 percent in 2017.

Terrorism Concerns

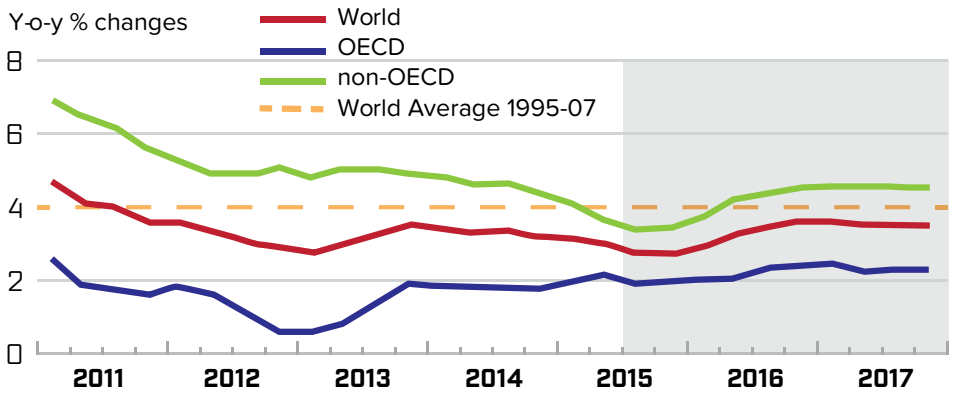
Where politics really starts to make it harder for economic forecasters to feel confident in their projections is in the possible fallout from the rising tide of terrorism. Related factors such as the barely controllable exodus of refugees from Syria could further dent prospects in Europe's economies.

Further cause for concern of economic destabilization comes from the continuing major military conflicts in Syria, parts of Iraq and Yemen, and the fact that countries such as Egypt, Libya and Algeria are clearly struggling to contain terrorist activity. The more prosperous states of the Arabian Gulf are eager to convey the impression that they are immune to these surrounding threats and for the sake of global trade we have to hope that this belief is well founded.

In making our assessments of business prospects **AIN** relies on professional forecasters as much as anyone else. But we also are blessed with the opportunity to connect directly with the industry on the international airshow circuit and this provides a vital chance to gauge mood (albeit somewhat subjectively).

Our recent travels to the Dubai Airshow and the NBAA Convention in Las Vegas provided a telling contrast as to how executives see prospects for the coming year. The mood in Dubai was subdued, with little evidence of rising sales in the Middle East. In Las Vegas, where the glass always *appears* half full, there was strong sales activity and optimism-fueled news of new partnerships and products.

The fortunes of business aviation in particular are usually inexorably tied up with those of world stock markets, which have had another roller-coaster year. This is probably reflected in recent specific forecasts issued by companies such as Honeywell, projecting a mixed picture of anticipated demand. ❑



REAL GDP
(Annual percentage changes)

	2014	2015	2016	2017
World[1]	3.3	2.9	3.3	3.6
United States	2.4	2.4	2.5	2.4
Euro area	0.9	1.5	1.8	1.9
Japan	-0.1	0.6	1.0	0.5
China	7.3	6.8	6.5	6.2
India[2]	7.3	7.2	7.3	7.4
Brazil	0.2	-3.1	-1.2	1.8

1. Moving nominal GDP weights using purchasing power parities.
2. Fiscal years starting in April.
Source: OECD November 2015 Economic Outlook database

JULY 2015 **AUGUST 2015** **SEPTEMBER 2015**

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30 11 31 23 27

Bombardier Global 7000 Faces Two-Year Delay

Citing complexities of developing its Global 7000/8000 program, Bombardier pushed back entry into service of the first model, the 7000, by two years. At the same time, the Canadian OEM announced plans for a 30-percent cut in production of the existing Globals.

Embraer Legacy 450 Wins Brazilian Approval

Embraer received type certification for the "mid-light" Legacy 450 from Brazil's civil aviation agency, Agência Nacional de Aviação Civil (ANAC), during a ceremony at the LABACE show. The company also announced that the twinjet has exceeded many of its guaranteed performance specifications.

DAVID McINTOSH

DAVID McINTOSH

Embraer Legacy 450 Gets FAA Nod

Embraer Executive Jets announced that the Legacy 450 received FAA approval, just 20 days after the midsize twinjet was certified by Brazil's ANAC. The first Legacy 450 was scheduled to be delivered in the fourth quarter.

Signature To Acquire Landmark in Blockbuster Deal

In what would be the largest acquisition in the history of the general aviation service industry, not to mention a substantial wager on the continuing resurgence of business aviation, Signature Flight Support parent company BBA Aviation announced plans to purchase Landmark Aviation from investment fund manager The Carlyle Group for $2.065 billion.

$115 Million Capital Injection Boosts Wheels Up

A group of financial institutions led by T. Rowe Price announced a $115 million capital injection for private flight membership program Wheels Up. The investment is backed by Fidelity Management and Research Company and NEA, and, according to Wheels Up, values the two-year-old company at $500 million.

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News Makers 2015

A year of progress for helicopter technology

by Thierry Dubois

Last year was a noteworthy one for rotorcraft, with confirmation of some trends and the unexpected emergence of some others. Despite a softening commercial market, attributable largely to the dwindling price of oil, airframers do not appear to have scaled back their investment in technology.

Airbus Helicopters unveiled the H160 medium twin (until then codenamed X4), a clean-sheet design in the 12,000- to 13,000-pound-mtow category (typically 12 seats). As expected, it will succeed the AS365 Dauphin/EC155 series.

However, contradicting what then-CEO Lutz Bertling suggested in 2011 when he revealed the existence of the program, the H160 has a relatively conventional cockpit. The controls are not fly-by-wire and the man-machine interface lacks the windshield-size head-up display Bertling envisioned. Airbus will therefore not be the first helicopter manufacturer to offer a civil fly-by-wire rotorcraft. Bell Helicopter is poised to cross that finish line first with the 525 Relentless, which made its first flight in July. A second test aircraft was set to join the fleet late last year. It is safe to say this turn of events has left some Airbus engineers disappointed. Innovations on the H160 include swept-tip main rotor blades for quieter operation.

The H160 made its first flight on June 13 and Airbus plans to begin taking orders this year, so we will soon see how the H160 fares against its main target, the AgustaWestland AW139.

Airbus Helicopters also unveiled the first artist rendering of the long-awaited X6, a new helicopter in the heavy category. The X6 will eventually replace the H225 Super Puma and will have fly-by-wire controls.

Those disappointed engineers at Airbus might have drawn some comfort in July when their company unveiled the Bluecopter, a demonstrator based on the H135. One notable feature is a power management system that could shut down one engine in the cruise phase and use the other one at a higher (and thus more fuel-efficient) output. Such smarter use of engine power, including some level of hybridization with an electric motor, has been talked about for four years or so. Actual progress, however, has been erratic and the outlook for what to expect in the next couple of years is murky.


Airbus X6


Airbus Bluecopter


Sikorsky Raider

Lockheed Martin completed its $9 billion acquisition of Sikorsky Aircraft, a purchase the U.S. defense contractor announced in July. Lockheed Martin will maintain the Sikorsky brand, as well as the military and civil product lines, the latter including the S-76D medium and S-92A heavy twins. UTC disposed of its helicopter business because it saw a lagging profit margin and lackluster growth projections, which some industry observers (Lockheed Martin among them, apparently) deemed short-sighted.

Sikorsky logged a major technology advancement in May when the S-97 Raider semi-compound helicopter made its first flight. 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 with a conventional rotorcraft. Sikorsky is looking mainly at military applications but civil use is in the cards. Sikorsky intends to dispatch the Raider on a demonstration tour this year.

AgustaWestland suffered a setback on the AW609 civil tiltrotor program after the fatal crash of prototype two on October 30. The aircraft crashed in Italy outside Santhia in Vercelli province, killing company test pilots Pietro Venanzi and Herb Moran. The aircraft was scheduled to perform high-speed testing at the time of the crash. Two more test aircraft are under construction and the bulk of the flight-test work is being moved to AgustaWestland's Philadelphia campus in the U.S. Before the accident, AgustaWestland had hoped to have the AW609 certified by late next year and begin customer deliveries in 2018. The company has not released a revised schedule, but it has reaffirmed its commitment to the program.

Marenco Swisshelicopter, an outsider with ambition, made little progress last year. The company has had to redesign the main rotor head of its SKYe SH09 light single, which was already in flight-test. The Honeywell-powered SH09 is positioned at the higher end of the single-engine helicopter segment. An EASA rotorcraft expert told **AIN** he finds the project daring and exciting. We, in turn, hope Airbus Helicopters will not try to kill the SH09 in the nest by offering unbeatable discounts on the H125.

Describing Russian Helicopters as an outsider would be unfair but, even if it is a real competitor for Western airframers, it cannot be characterized as a major player either. Last year several civil programs remained stuck at various stages of development. The exception was certification of the Ka-226T. Communications are close to non-existent.

China's Avicopter has made even slower progress, notably with the AC352 medium twin, the H175's counterpart in a 50-50 program with Airbus Helicopters. ❑


Sikorsky S-92

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29

Flexjet Takes Delivery of First Embraer Legacy 500

Dallas-based fractional provider Flexjet took delivery of its first Embraer Legacy 500 at the aircraft manufacturer's headquarters in São José dos Campos, Brazil. This was one of five Legacy 500s Flexjet was slated to accept by year-end, in addition to an unspecified number of Legacy 450s that will start to enter its fleet in June.

15

UK Conducts First Large Drone Flight in Unrestricted Airspace

NATS, the air navigation service provider of the UK, and manufacturer Thales said they conducted the first flight of an unmanned aircraft system (UAS) in non-segregated, controlled airspace over Wales in late September, a UK first. Participants expected the trial, involving the 1,050-pound Thales Watchkeeper, to help establish the operational and regulatory conditions for future unmanned aircraft flights in unrestricted airspace.

15

Garrison Leaves Bell Helicopter

Bell Helicopter CEO John Garrison resigned after six years at the helm of the Fort Worth, Texas-based Textron subsidiary. Garrison left to take the reins at Terex, a $7.3 billion manufacturer of heavy equipment based in Westport, Conn., effective November 2.

19

U.S. Transportation Department Plans National Drone Registry

Seeking to create "a culture of accountability and responsibility" among people who fly drones for recreation, the U.S. Department of Transportation (DOT) plans to establish a national registry to track drone ownership. The department appointed a task force to develop the registration process, with instructions to deliver its recommendations by November 20. The registry was unveiled on December 14 with rules to take effect on December 21.

29

Learjet 85 Axed; Bombardier Bizjet Deliveries Flat

Bombardier ended months of speculation about the fate of the Learjet 85 when it confirmed on October 29 that it has formally cancelled the program. The decision comes a year-and-a-half after the all-composite midsize business jet first flew, in April 2014. When the company "paused" the program in January, the sole flight-test Learjet 85 had logged more than 70 flights.

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News Makers 2015

Landmark change ahead in the FBO landscape

by Curt Epstein

With September's announcement that Signature Flight Support parent company BBA Aviation is buying Landmark Aviation from the Carlyle Group, the FBO landscape will change somewhat this year. The $2.065 billion deal, when and if consummated, will give Signature–which already has the world's largest FBO network–nearly 200 locations worldwide. Some observers have pointed out that the deal won't change the number of bases controlled by service provider chains (approximately 10 percent in the U.S., mainly at top-tier airports). What will change is the name on a number of facilities, and there is no denying that for those customers who maintain brand loyalty (not a very large percentage, according to responses from our annual FBO survey) Signature has greatly enhanced its coverage and in-network referral capability, both domestically and abroad.

There is overlap between Signature and Landmark at 12 airports, and it remains to be seen how regulators will address this. Given the recent penchant for FBO chains to double-up locations at some airports, the deal will take some massaging at locations such as Westchester County Airport, where four of the five FBOs are currently operated by either Signature or Landmark, or at Teterboro Airport, where Signature already has two of the six facilities operating there. Landmark was one of two FBOs at Scottsdale when it acquired its competitor as part of its Ross Aviation purchase, a blockbuster deal at the time that involved 19 FBOs. Landmark was forced to shed that location and subsequently sold it to Signature. Now Signature will likely find itself in the exact same situation at the exact same airport.

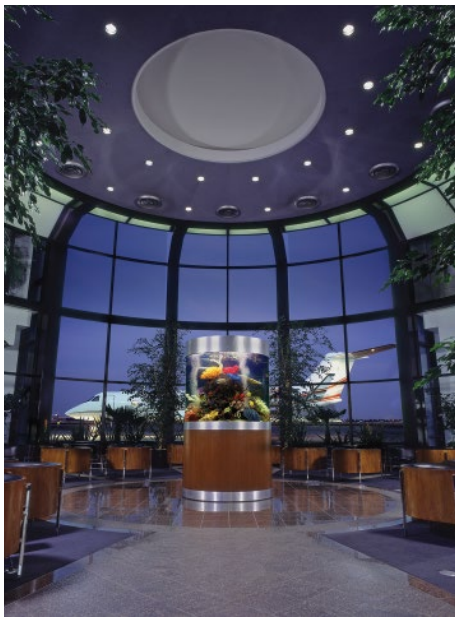
Consolidation Trend?

For BBA Aviation, the purchase represents a hefty bet on the future of the industry, and with a resurgent U.S. business aviation industry it could prove to be a shrewd one. As the metrics for bizav flight operations in the U.S., the industry's largest market, continue to improve, they could turn up the heat on the FBO consolidation pot. The usual factors remain at play: owners who have been looking to exit the market, for reasons such as age, lack of family succession or simply fear of another downturn, could see their asking prices met under a wave of optimism. With Landmark presumably out of the way, Signature will have lost a major rival in its bidding, but one might assume that the BBA Aviation subsidiary could pause to digest its enormous acquisition before plunging back into the consolidation fray. This could present an opportunity for Atlantic Aviation, Million Air and Jet Aviation as well as smaller regional chains such as Tac Air.

When the price of a barrel of crude oil fell by more than half in late 2014, few believed those prices would or could be sustained for more than a few months, but at the beginning of last month they were still hovering around $40 per barrel. That has lowered pump fuel prices while driving U.S. flight-department activity. Despite the rising pressure from contract fuel and more efficient aircraft, given the relatively stable profit margins in the system, many North American FBOs saw their highest fuel flowage and most profitable year (at least since the economic downturn) last year. Enthusiasm about this trend continuing is sure to be evident at NBAA's Schedulers and Dispatchers Conference in Tampa.

When the $2 billion deal closes, Landmark's 68 FBOs will join the Signature stable, bringing the BBA subsidiary's FBO total to nearly 200.

Another point of curiosity will be the fate of AirFlite, a favorite of **AIN**'s readers for nearly a quarter century. Owned by Toyota, the FBO at Los Angeles-area Long Beach Daugherty Field houses the automaker's North American flight operations department as its major tenant, which is in the process of relocating from Southern California to Plano, Texas, where the Nagoya, Japan-based company is establishing its new North American headquarters. While AirFlite has racked up an enviable record over the course of its existence, keeping its same name and ownership while many of its contemporaries have been sold off or rebranded, and earning top survey scores when other facilities are being replaced, it is uncertain whether the auto manufacturing giant will continue to maintain its investment in the FBO, which was once seen as the cornerstone of an aviation service provider network that Toyota intended to build.



AirFlite is a perennial favorite in Southern California, but its future ownership may be cloudy.

In 2014, when the establishment of the Texas campus was announced, Toyota noted the move would not affect AirFlite at that time, but with its sterling reputation and immaculate facility, the FBO would certainly be considered a plum for any of its competitors. Given Gulfstream's expanding West Coast service center located just across the field, many believe it would be an excellent opportunity for the airframer's sister company Jet Aviation to add its first location on the Left Coast. ❑

The acquisition of Landmark will give Signature more than just the company's FBOs in the U.S. and Europe; the deal also includes the MRO business and the company's aircraft charter and management division, BBA's first involvement in that segment.

NOVEMBER 2015

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9

DAVID McINTOSH

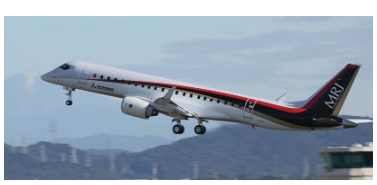
Transport Canada Gives Nod to Challenger 650

Bombardier Business Aircraft's large-cabin Challenger 650 received Transport Canada certification. Customer deliveries were scheduled to start by year-end, about six months later than originally planned when the latest version of the 600-series Challenger was launched at the 2014 NBAA Convention.

11

Mitsubishi Regional Jet Makes First Flight

The Mitsubishi Regional Jet (MRJ) made its long-awaited first flight, taking off from the Japanese manufacturer's Nagoya Airport base at around 9.30 a.m. local time. According to a statement from Mitsubishi Aircraft and parent company Mitsubishi Heavy Industries, the new narrowbody conducted a 90-minute flight off Japan's Pacific Coast during which it "confirmed its basic characteristics and functionality in ascent, descent and turning."



12

EJM Wins Court Case over IRS FET Levies

A U.S. District Court Executive Jet Management not liable for $9.7 million in federal excise taxes the IRS had assessed for aircraft management services the company provided for aircraft used in charter operations. On November 12 the U.S. District Court for the Southern District of Ohio found that "the government failed to provide EJM with precise and not speculative notice of EJM's potential tax collection obligation."

16

GE Aviation Takes On a Titan with New Turboprop Engine

GE Aviation takes on Pratt & Whitney Canada's venerable PT6 with the launch of an 850- to 1,650-shp line of turboprops and the first key win under its belt. GE Aviation formally launched the first variant of the still unnamed series, a 1,300-shp engine that will power Textron Aviation's new single-engine turboprop.

16

Textron Fast-Tracks New Longitude and Hemisphere

Textron Aviation CEO Scott Ernest said the company is spending more than $200 million annually on new product development, including the new super-medium Longitude and just-announced, large-cabin $35 million Hemisphere. He said Textron Aviation has the industry's fastest product development cycle, noting that in the last three years it had designed and certified eight new products.

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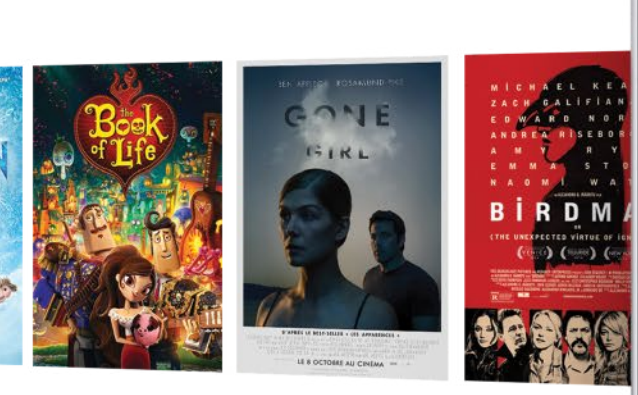

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News Makers 2015

Movers and shakers

by Kerry Lynch

Last year was a year of transition for the leadership at a number of airplane and helicopter manufacturers. Both Bombardier and Gulfstream experienced turnover at the highest ranks, as did Airbus Helicopters, Bell and Sikorsky.

The transition at Bombardier began in 2014 and stepped up in 2015 when the Canadian company brought in former United Technologies executive **Alain Bellemare** to succeed **Pierre Beaudoin** as president and CEO. Beaudoin, meanwhile, became chairman.

After the appointment of Bellemare, several more leadership posts were changed as the financially struggling manufacturer moved to restructure its operations. Pratt & Whitney executive **Jim Vounassis** was named vice president of operations strategy to streamline operations.

At Bombardier Business Aircraft, former Spirit AeroSystems executive v-p and general manager **David Coleal** took over the reins from **Eric Martel**. For Coleal, the move was a return to a familiar product; in 2008 he joined Bombardier to become president and general manager for Learjet.

Bombardier returned to UTC for a third time to replace Pierre Alary as CFO. **John Di Bert**, most recently vice president of customer service at UTC's Pratt & Whitney Canada, took over the position in August.

At Gulfstream, the changes came as long-time employee and former president **Larry Flynn** retired. Staying true to its focus on product support, Gulfstream parent General Dynamics named **Mark Burns** to succeed Flynn as president at the Savannah, Ga.-based manufacturer. Both Flynn and Burns had held the title of president of product support before taking the helm of Gulfstream.

Boeing Business Jets also received a new chief after **Steve Taylor** moved on to become chief pilot of Boeing Flight Services. **David Longridge**, who was one of the early members of the BBJ team, returned to run the division after serving as a sales director for Boeing.

Supersonic business jet developer Aerion also expanded its executive team with some notable industry executives, including former Nextant Aerospace president and CEO **Sean McGeough**, who became regional vice president for the Northeast U.S., and former Embraer Executive Jets chief **Ernie Edwards**, who came on board as chief commercial officer.

Leadership changed in the helicopter manufacturing markets, too, most recently with the announcement that Bell Helicopter Textron chief **John Garrison** was resigning after leading the Fort Worth, Texas-based subsidiary for six years. Garrison had taken a position to lead heavy equipment manufacturer Terex. **Mitch Snyder**, who had been executive v-p for military business, succeeded Garrison as president and CEO.

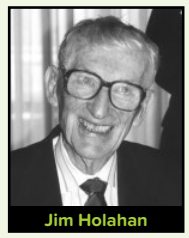
In April, shortly after after announcing plans to dispose of Sikorsky, United Technologies (UTC) appointed **Robert "Bob" Leduc** as president of the helicopter manufacturer. He succeeded **Mick Mauer**, who was promoted to senior v-p of strategic projects at UTC.

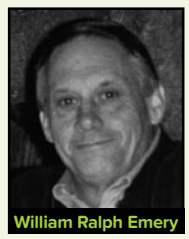
Also, Airbus Group tapped Airbus senior v-p of marketing **Chris Emerson** to lead Airbus Helicopters Inc., the Grand Prairie, Texas-based subsidiary of Airbus Helicopters. He succeeded **Marc Pagnini**, who became head of special projects for Airbus Group.

In the business and general aviation services end, industry veteran **Christof Spath** became CEO of TAG Aviation Europe, former ExcelAire president **David Rimmer** became president of JFI Jets, corporate pilot **Greg Brinkman** succeeded Rimmer at ExcelAire, former COO of Comlux America **Scott Meyer** became CEO, and **Barry Knuttila** was promoted to CEO of King Schools. ❑

In Memoriam

Gulfstream contract pilot and outspoken industry advocate **Jeff Beck** passed away January 6 in Houston, where he was undergoing treatment for leukemia. Beck, 66, had more than 22,000 hours total time and had served as a captain for numerous operators, including Eagle Jet Charter, Martin Aviation, Casper Air Services and Air Bahia Airlines. For the past two decades he served as a contract pilot, a career path he had championed, helping mentor numerous other contract pilots.


Jim Holahan


William Ralph Emery


Carolyn Williamson

Otto Pobanz died June 12 at the age of 93. Pobanz left a legacy for serving as a long-time corporate pilot, safety expert and acoustic specialist. He had a 30-year career with Federated Department Stores and became active in numerous safety issues, serving on government/industry panels addressing proper management of NiCad batteries and the development of cockpit resource management. He helped initiate development of Learjet 24/25 thrust reversers and led a team of engineering and product manufacturers to reduce interior noise levels while exceeding flammability and toxicity standards. He served on the NBAA board of directors from 1972 to 1983.

Jim Holahan, founding editor of this magazine, died on July 4 at the age of 94 (a tribute to Jim published at the time can be found at www.ainonline.com/aviation-news/business-aviation/2015-07-06/ain-founding-editor-james-holahan-dies-aged-94). Holahan, who founded the company in 1972 with managing director Wilson Leach, had retired from the editor's chair here in 1998.

William Ralph Emery died August 7 at the age of 73. Emery began working at his father's company, Executive Aircraft Service. In 1977 he teamed with his brother Richard to help found K-C Aviation, which expanded into completions programs, including the Canadair Challenger, McDonnell Douglas DC-9 and Gulfstream IV. K-C Aviation ultimately was acquired by Gulfstream. He later founded corporate aircraft interior and refurbishment specialist Aviation Concepts.

Carolyn Williamson, the long-time executive director of the University Aviation Association (UAA) and founding board member of Women In Aviation International, died August 9 following a battle with cancer. She was 61. Williamson spent 22 years with the UAA.

Eugene "Gene" Condreras–who spent nearly 40 years serving with his family business, the Panorama Flight Service FBO at Westchester County Airport in White Plains, N.Y.–died on August 23. He was 56. Condreras grew up around the business his grandfather founded in 1958 and joined with his brothers, Ken Healy and Ed Condreras, in the early 1980s. In 1992 he became president. He steered the business until he retired, selling the long-time mom-and-pop facility to Landmark Aviation in 2013.

Midcoast Aviation founder **John Tucker** died August 30 in Vero Beach, Fla., at the age of 82. Tucker became indoctrinated in aviation services and modifications working at Remmert-Werner at Lambert-St. Louis Municipal Airport. In 1971 he founded Midcoast Aviation and Airport Terminal Services, where he remained for the next 20 years.

Donald Holbert, chairman of Central Flying Service, died September 27 in Little Rock. He was 75. Holbert began working at Central Flying Service, the company his father founded, at the age of 15 as a line service tech fueling aircraft. He stepped in as chairman in 1981.

Dick Taylor, the long-time Boeing employee who is known as the "father of extended operations" (Etops), also passed away October 4. Taylor held several senior executive positions during his 45-year career at Boeing and served as a test pilot on numerous aircraft, among them the B-47 Stratojet and KB-29. He paved the way for two-pilot cockpits in the 737, 757 and 767 and played an instrumental role in demonstrating the reliability of long-range travel in twin-engine airplanes, leading to Etops.

Mayo Aviation founder **Gwendolyn Lee Olson Mayo** died November 20. Born in 1932 in Minneapolis, Mayo earned a Ph.D. in organic chemistry from the University of Minnesota and served as a research chemist for the University of Colorado before launching Mayo Aviation in 1978. ■

NOVEMBER 2015

END

16

Nextant Completes Certification of G90XT Turboprop

Nextant Aerospace has received FAA certification approval for the G90XT, a reengined remanufacture of the C90-series Beechcraft King Air.

17

P&WC Unveils PT6-140A Turboprop

Pratt & Whitney Canada introduced the PT6A-140A, with an 867-shp gearbox and 1,100 shp thermodynamic. The new engine is tailored to the needs of operators flying utility aircraft in hot/high conditions.

"It's been developed to meet the needs of customers who currently own PT6A-powered aircraft, but want an extra boost in performance," said the company. The new engine will be able to deliver 867 shp to 106 deg F at sea level.

17


BARRY AMBROSE

Flexjet Boosts Supersonic Bizjet Plan with Aerion AS2 Order

Fractional-share provider Flexjet signed a firm order at NBAA 2015 for 20 Aerion AS2 supersonic business jets for delivery beginning in 2023. The deal, worth $2.4 billion (2015 $) at list prices, is backed by a nonrefundable deposit.

18

Eclipse 550 Wins European Certification

One Aviation received EASA certification for its Eclipse 550, clearing the way for sales of the light twinjet in the European Union and its use for air-taxi service there. The company has deposits from half a dozen European customers.

19

Embraer Executive Jets Taps MGM Jackpot with $200M Order

AT NBAA15 in Las Vegas, Embraer came up a winner in new aircraft sales casino, inking a deal worth more than $200 million for letters of intent covering three Lineage 1000E large cabin and three midsize Legacy 500s. The prospective buyer is MGM Resorts International, which plans to use the aircraft to fly its customers.

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PHOTOS: CURT EPSTEIN

A smoke-filled cabin adds a sense of urgency to the exercise: The situation is about to get much worse…

Have simulator, will travel

by Curt Epstein

You are sitting in the comforts of the spacious business jet cabin when all of a sudden there's a bang and a vibration and a wisp of smoke wafts up from the floor. The pilot comes on the cabin intercom and announces that the aircraft has lost an engine, while the flight attendant begins preparing for an emergency landing. As smoke begins to billow into the cabin, you brace for the worst…

That type of event is played out on most days of the year among Aircare International's fleet of full-motion emergency simulators around the U.S. In November, the company brought its newest device to Las Vegas to demonstrate its capabilities at the NBAA Convention. The trailer-mounted Facts VIII simulator is based in Long Beach, Calif., and can travel directly to customer hangars, to bring in-flight emergencies to life in realistic scenarios intended to expose trainees to calamities such as land and water evacuations, rapid decompression and cabin smoke. (Facts VII and Facts VI are fixed at AirCare's training facilities in Dallas and Morristown, N.J., respectively). "We create a training environment as close as we can to the environment in an emergency," said Brian Hayvaz, vice president of Aircare Facts training. "We want to teach and train the crewmembers to overcome the stressful situation around them and focus on getting the job done."

The full-motion device is also the company's most advanced version, using a combination of hydraulic rams and airbags to achieve the illusion of aircraft movement, either smooth or jarring. It is controlled by an operator in a small compartment just aft of the "mockpit" a generic cockpit with functioning communication equipment so the pilots can speak to the cabin. The operator can control motion, lighting, cue sound effects, and decide when and where to start the theatrical smoke. "We can turn on the smoke in different areas," noted Martin Hamilton, the company's vice president of business development and marketing, noting the operator can also regulate how much to produce.

Among the simulator's trick props is a laptop computer that starts to smoke without warning, providing cabin attendants practice on how to deal with thermal runaway of a lithium-ion battery. All emergency equipment found on a real business aircraft such as fire extinguishers, fire containment bags, oxygen masks, first-aid kits, flashlights and automatic emergency defibrillator are on board, along with a life raft. "We attempt

to eliminate pretending during drills," said Hayvaz. "If the scenario is a smoke-filled cabin, we want the crew to find that extinguisher in the dark, remove it from its holder and pull the pin and squeeze the handle. Doing teaches much more than pretending."

Demonstration Hits Home

In the Las Vegas demonstration, after the flight attendant successfully dealt with the rogue laptop computer, the engine-out scenario began. The level of smoke pumped into the cabin soon reduced visibility to near zero, as the cabin lights flickered. The flight attendant quickly moved passengers to rear-facing seats, as the pilot gave updates on the imminent landing, adding that the aircraft had also suffered a hydraulic failure. As the motion became more frenzied, the flight attendant, barely visible through the haze, groped her way from seat to seat making sure passengers were belted in and instructing them how to brace properly for impact. Over the intercom, the pilot counted down to impact, and when it came it was as violent as one might expect from an aircraft skidding across a runway.

Amidst the grinding noises the device finally bounced and shuddered to a stop, after which the flight attendant opened the emergency window exit (one of the advancements of the Facts VIII is changeable window plugs to match different types of business jets) and began helping the passengers depart the smoky interior, repeating the rendezvous point to each as they clambered out onto the stub wing, blinking in the bright sunshine. For all involved, it was as close to a real aircraft emergency as they ever care to be.

Five minutes later, after the faux smoke was vented out, the simulator was ready to go again. "Typically in a classroom setting, they'll go through a drill, they'll all get out of the aircraft and go to a meeting place," Hamilton told **AIN**. "Then we'll come back to the main entrance and debrief on what went well, what didn't we do well, before we get on and do it again."

A smoking laptop is just one of the faux hazards that participants might face during Aircare simulator training.

Other exercises involve water ditchings, with appropriate sound effects and a gentle rocking sensation when the simulated airplane comes to a halt. The Aircare staff can also provide training for emergency medical emergencies. "The training is not necessarily something that [an operator has] to do. There are always ways to cut corners on training, but we find some of the most safety-conscious flight departments want to do this and they want us to push them to get better. We're really proud of that," said Hamilton, adding that the program is in greater demand now as more companies tackle the requirements of IS-BAO Stage 3. ❑

News Note

The Los Angeles Police Department's Air Support Unit has selected FlightSafety International to provide Airbus Helicopters AS350B3 level-D simulator training at its new Denver learning center beginning in 2017. The Denver center will be equipped with level-D simulators for the Bell 407GXP and Airbus AS350B3, H130 and H135. ■

Continued from page 1

did not know what the future held for our project. However, when we showed the test HondaJet to aviation enthusiasts at AirVenture, the response was overwhelming. It was more than I could ever have imagined. In a sense, this was a true beginning for Honda's aviation adventure."

In 2006, when Honda announced plans to bring the HondaJet to market and establish company headquarters in Greensboro, he said, "We had a very small team, less than 50 people at that time. Honda took on board the challenge of designing and certifying a clean-sheet aircraft with new technologies, with a new engine, with a new avionics system and by a new company. It was an unprecedented challenge. To be honest, sometimes it seems nearly impossible for a new manufacturer to certify a clean-sheet design. However, today, we have nearly 1,700 associates working on the program from all over the world. Our associates helped share the same challenges and devoted themselves both day and night to overcome obstacles during a difficult time, and we share our success together.

"Unimaginable Experience"

"In my lifetime," Fujino told the audience, "I have participated in four airplane project as an aircraft designer. I now realize that only by experiencing certification of a clean-sheet aircraft design we can truly appreciate the complexity of the technologies. It is an unimaginable experience. Not many people have the opportunity to experience this in their life. This moment we are sharing together today is a peak experience in our lives. If I may use a Japanese expression, it is a crystal of our sweat and tears. I'm truly grateful for our associates' passion and perseverance to achieve our goal. Again, thank you very much for coming tonight and please enjoy tonight together."

FAA Administrator Huerta praised all involved in the program. "Aviation globally and in America has always been defined by two things," he said. "It's always been about collaboration and it's always been about how we harness innovation. And tonight we celebrate both of those things. We're celebrating the issuance by the FAA of the type certificate for the HondaJet, but as we all know, the journey began long before that.

"It was in 1997 that Mr. Fujino first sketched what would become the HondaJet, an airplane with engines mounted on pylons high above the wing. He wondered if anyone would ever accept that. It looked a little funny, but it was dramatic in terms of what it achieved in the use of aerodynamics to deliver a more efficient and a quieter light business jet.

"Now, turning that into a reality has taken 18 years, more than 3,000 flight hours and nearly 1,700 associates here at Honda Aircraft and throughout the world. Certification is the culmination of that hard work and that dedication, and the FAA is proud to be a partner with you in achieving this important milestone today."

Kenny G Takes the Stage

After Huerta's talk, musician Kenny G performed "Silhouette," one of his most recognized songs, and walked off the stage to shake Fujino's hand. Kenny G's long time co-collaborator and musical director Robert Damper was on keyboards, and the two serenaded the hushed audience inside the big hangar.

Afterwards, Huerta handed over the ceremonial type certificate, and Fujino joked, "This is one of the most expensive [pieces of] paper! Thank you so much," he concluded. "I highly appreciate my team members' work and also all the associates and associates' families. I really appreciate this moment." ❑

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Singapore Airshow Preview:

All eyes turn to Asia-Pacific region

by Charles Alcock and Ian Sheppard

The first major international aerospace and defense event of the New Year will be held next month (February 16 to 21) when the biennial Singapore Airshow is staged at the Changi Exhibition Centre. As of the end of last year, more than 1,000 companies from some 50 countries had confirmed their attendance, according to organizer Experia Events.

"This constitutes 90 percent of exhibition space being taken up before the show, 75 percent of which are returning exhibitors and industry heavyweights, such as Airbus, Bell Helicopter, Boeing, Bombardier, Embraer, Israel Aerospace Industries (IAI), Pratt & Whitney, Rolls-Royce, ST Engineering, Thales and UTC Aerospace Systems."

DAVID McINTOSH

The static display hosted 90 aircraft in 2014; a similar number is expected this year.

The organizers are claiming this continued success despite last year's worldwide commodities slump, which has hit developing nations (in particular the BRICS economies) hard. Chinese equity markets collapsed last summer in response to emerging data indicating significant stalling in China's economic growth. Singapore is closely linked with China industrially. It is not yet entirely clear how the fallout from these difficulties has hit various Asia-Pacific economies, but in the commercial aviation segment there is little sign of a slow-down.

In round numbers, the 2014 Singapore show attracted 45,000 trade visitors and 100,000 public visitors, as well as 1,000 exhibiting companies. There were also 90 aircraft on the static display. Organizers expect numbers for this year's static and flying display to be similar to those from the 2014 show.

Education Opportunities

Three new exhibition zones have been devised for the 2016 Singapore Airshow: training and simulation, aerospace emerging technologies and business aviation. The agenda also includes three special business forum events focusing on training and simulation, aerospace emerging technologies and the wider Asian business environment.

Among several specialist conferences being held in conjunction with this year's show will be the Singapore Airshow Aviation Leadership Summit, the Asia-Pacific Security Conference and the A*Star Aerospace Leadership Forum. Also planned is an Education Day that will promote careers in aerospace. ❑

Count on **AIN** *for full coverage of the 2016 Singapore Airshow. Our team will publish three of our award-winning daily* ***Singapore Airshow News*** *editions at the show on February 16, 17 and 18. We will also have comprehensive real-time reporting of all the top news at* **AINonline.com** *and in our daily e-newsletters.*

If you are an exhibiting company that wants to share news or propose pre-show interviews and briefings, please contact Ian Sheppard (isheppard@ainonline) or Charles Alcock (calcock@ainonline.com). ■

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In The Works: Crystal Ball Edition by Matt Thurber

Last year was another one of entrenchment in new aircraft development, but there were encouraging signs in some segments. The cancellation of the Learjet 85 program means that, once again, there is no all-composite Part 25 business jet in development. Perhaps another company will someday deem that void to be worth filling…

…Of course there is an all-composite business jet on track for certification in the first half of this year, the Cirrus Vision SF50.

Development of the Flaris LAR 1 composite single-engine jet is proceeding, with selection of the Williams International FJ33-5A turbofan announced at last year's Paris Air Show.

Another composite program, Epic Aircraft's E1000 single-engine turboprop, is also aiming for type certification later this year. Since last year's formation of One Aircraft, the Kestrel K350 composite single-engine turboprop program is under the same umbrella as the Eclipse 550 very light jet.

Other than the Epic and Kestrel programs and the soon-to-be certified Mahindra Airvan 10, there has been little activity in the single-engine turboprop arena, but that is about to change. Textron Aviation is forging ahead with plans to build a single-engine high-performance turboprop. This will be powered by a 1,300-shp variant of GE Aviation's new turboprop engine.

In the business jet market, other than Textron Aviation's Cessna brand, new developments are few. On December 9 Honda Aircraft celebrated receipt of the type certificate for the HA-420 HondaJet.

Gulfstream's G500/G600 programs are well under way. The G500 should be certified next year, followed by the G600 in 2018.

Dassault's Falcon 8X flight-test program has fully opened the flight envelope in preparation for certification and entry into service in the second half. Meanwhile, first flight of the Falcon 5X has been delayed until early this year, Dassault citing development delays with the Snecma Silvercrest engines.

Financial challenges prompted Bombardier to push out development of the Global 7000 by about two years, with deliveries now planned to begin in the second half of 2018. The company is not currently discussing the timeline for the longer-range shorter Global 8000. Bombardier's latest model, the Challenger 650, was certified in November.

At NBAA 2015, Textron Aviation unveiled the final configuration of the Longitude, which will now be powered by Honeywell's HTF7000. The company also announced the large-cabin Hemisphere. The Latitude, Longitude and Hemisphere now constitute a new series. ❑

Correction: The empty weight of the Cirrus Vision SF50 single-engine jet is 3,572 pounds. **AIN** incorrectly wrote 3,752 in the December issue (page 60). ■

AIN's 2016 FORECAST

An Unbiased Guesstimate of the Probabilities of Success of Current Business Jet, SSBJ and Turboprop Business/Utility Airplane Programs

Company	Airplane	Milestones: First Flight	Certification & production	Long-term prospects[1]
Aerion	AS2	●↑	●	●
Bombardier	Global 7000	●●	●●	●●
	Global 8000	●↓	●↓	●↓
Cessna	Citation Hemisphere	●●	●●	●●
	Citation Longitude	●●	●●	●●
Caiga	Primus 150	●	●	●
Cirrus Aircraft	Vision SF50	7/08	●●↑	●
Dassault	Falcon 5X	●●	●●	●●
	Falcon 8X	2/15	●●	●●
Diamond	D-Jet	4/04	●●	●●
Dornier Seawings	Seastar	8/84	●●	●●
Epic Aircraft	E1000	N/A	●●↑	●●↑
Evektor	EV-55	6/11	●↑	●↑
Flaris	LAR-01	●	●	●
Gulfstream	G500	5/15	●●	●●
	G600	●●	●●	●●
HyperMach Aerospace	SonicStar	●●	●●	●●
Mahindra	Airvan 10	●●	●●	●●
	Airvan 18	●↓	●↓	●↓
One Aviation	Kestrel K350	●●↑	●●↑	●●↑
Pilatus Aircraft	PC-24	●●	●●	●●
Privateer Industries	Privateer	●●	●●	●●
Supersonic Aerospace	QSST	●●	●●	●●
Textron Aviation	Single-engine Turboprop	●●	●●	●●

●● = Less than 25-percent chance of success;
● = 50-percent or less chance of success;
● = Even, or too soon to tell;
● = greater than 50-percent chance of success;
●● = greater than 75-percent chance of success;
↑ = rating upgraded from last year;
↓ = rating downgraded from last year.

1. Long-term prospects of at least 100 aircraft being produced and the airplane model still in production, or the design sold and still in production, in 10 years.

Monacair adds Monaco-Nice route

by Thierry Dubois

Monaco-based helicopter operator Monacair will offer scheduled flights between Nice Airport and Monaco's heliport beginning January 1. The company, which won a 10-year tender against incumbent operator Heli Air Monaco earlier this year, will strive to return traffic to its 2007-2008 level. It has ordered six Airbus Helicopters H130s.

Annual passenger traffic for the Monegasque operator (the other operator on the route is a French one, according to a bilateral agreement) has dwindled to between 50,000 and 60,000 from about 100,000, according to Monacair CEO Gilbert Schweitzer. He is preparing "innovations," such as optional services, to drive the number up again. Schweitzer expects the Nice-Monaco service to boost Monacair's revenue by 35 percent. Monacair will also endeavor to drive down the connection time at Nice Airport.

Convenient Flights

The goal is for passengers to be at its boarding gate in Nice 20 minutes after arrival at the Monaco heliport. Flight time is seven minutes. Security checks will take place in the helicopter area in Nice.

Airfare for a one-way flight will be €160 (approximately $180) or €280 ($310) for the round trip. Monacair plans to streamline the booking process. Tickets and an electronic boarding pass will be available through Internet booking.

Schweitzer suggested that the planned order for six new helicopters was a factor in Monacair's successful bid on the route: "These aircraft are quiet and air-conditioned." The purchase is valued at €17 million ($19 million) and deliveries will run from next month to May. The H130 can accommodate six passengers, in addition to the pilot.

Flights will run on a schedule of "practically one flight every 30 minutes," Schweitzer said. Monacair might operate 80 to 100 flights per day in summer. Sometimes, heavy rain or strong easterly wind causes flights to be cancelled but "this is very rare," Schweitzer added. Night flights (around 10 percent of the total) will be performed with twin-engine helicopters–an EC145 and an AgustaWestland A109SP–to comply with limitations on single-engine operations. The H130s may be used for other operations such as flights to sea or ski resorts.

Specializing in private helicopter management, Monacair so far has managed a fleet of 20 helicopters composed of mostly Airbus and AgustaWestland light singles and twins, including Airbus's Dauphin. In the middle of next year Monacair will receive an H175 and an AW169, both to be offered for private flights. ❑

DAVID MCINTOSH

Airbus Helicopters H130

King Air seizure

▶ *Continued from page 1*

of the Twelve-Five protocols. Hensley also questioned how he was to determine whether the passengers were illegal aliens. When the trip involves a charter picking up a passenger in the U.S. and dropping off in the U.S, he said, "there are no rules to require that."

Hensley noted that the booking was paid for in cash and that he receives about a half-dozen such cash trips in a given year, some with regular customers traveling to places such as Las Vegas.

After hours of interrogation, the agent told Hensley he was free to go, and no charges were filed. However, the agent informed Hensley that he was seizing the airplane. While it wasn't clear to Hensley under what authority the CBP was seizing his airplane, he bought an airline ticket and flew home to Oklahoma. "I never once thought I'd have to go home on the airlines."

The CBP, meanwhile, released a statement saying the inspecting agents determined that all seven passengers on the airplane were in the U.S. illegally and that the pilot was released "pending further investigation." The agency confirmed it had seized the airplane. "This is another example of the excellent work being done by the agents of the McAllen Air and Marine Branch to prevent the smuggling of people and drugs from the Rio Grande Valley into the interior of the U.S.," said director of air operations William Durham.

Covered by Insurance

After returning home, Hensley contacted his insurance company and attorneys. He found his insurance company helpful and received good news: he was covered for events like this. Hensley also found an attorney who had experience with such government seizures, and he learned something about seizures: "The lawyer told me that [CPB believed] if I was upside down on the airplane [financing], or if I was doing something illegal, I would just walk away from it."

But neither was true in his case, Hensley stressed. He had operated the King Air on behalf of its owner for a number of years before buying it outright three years ago. He had since invested $400,000 to re-engine the aircraft, and it was not an asset he was willing to walk away from and permit the government to keep.

His attorney worked with the U.S. attorney's office in Houston on the release of the aircraft, and on November 6 the U.S. attorney's office was set to remit the aircraft back to American Jet Charter. But just as that was to happen, Hensley learned that the CBP refused to release the aircraft until he signed a hold-harmless agreement and agreed to cover the expenses of the seizure.

On the advice of his attorney, Hensley refused. After more discussions with the U.S. attorney's office, the CBP relented and on November 17 it released his airplane.

Questions for Working Group

With his airplane now back in Oklahoma, Hensley is left to ponder the seizure. He believes the CBP "overstepped its authority."

Hensley has contacted some of the associations on the issue, including the National Air Transportation Association. The event raises several questions that are worthy of consideration by the recently formed CBP/industry working group, said Bill Deere, NATA senior v-p for government and external affairs. Among them, he said, are: "What are the regulations under which the agency inserts itself into domestic aircraft operations? Are they consistent with the underlying law? Most important, what can each side do to raise understanding and reduce the likelihood of situations like this occurring again?"

According to the American Immigration Council, CBP agents can search for noncitizens on any "railway car, aircraft, conveyance or vehicle" that is "within a reasonable distance from any external boundary of the U.S." Reasonable is described as within 100 nm of an external boundary. Located at the southern tip of the Rio Grande Valley, McAllen is a border town with Mexico.

But less clear are the regulations about aircraft seizure in cases where the pilot is not responsible for determining the immigration status of passengers–such as trips that begin and end in the U.S.

Pilot responsibilities were at the center of a case dubbed "Air Cocaine," in which two French pilots were held liable for drugs found aboard their aircraft. The charter pilots maintained they were unaware that the packages aboard their aircraft contained drugs and that they were not responsible for checking them. The International Federation of Airline Pilots' Associations backed that contention. A Dominican Republic tribunal did not take that position, ruling, instead, that the flight was a private one and the pilots were responsible for the cargo.

In 2013, after receiving more than 40 reports of the CBP detaining and searching general aviation aircraft flying within the U.S., the Aircraft Owners and Pilots Association enlisted the help of Congress. That led to a meeting between AOPA president Mark Baker and recently appointed CBP commissioner Gil Kerlikowske. The CBP said it planned to be more judicious in such events. ❑

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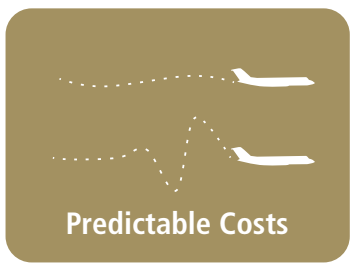

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Honeywell demonstrates aircraft 'mind control'

by Curt Epstein

Last month's long-anticipated release of the most recent chapter in the *Star Wars* saga captivated audiences with scenes of futuristic spacecraft skirmishing in a sub-orbital dogfight, their pilots' hands firmly on the controls, as they have been since the very first aerial combat. Yet researchers at Honeywell are working on something even diehard science fiction fans would find astonishing: an aircraft control system that responds to mental commands.

At the recent NBAA Convention in Las Vegas, guests at the company's annual Aviation Forecast dinner were able to gaze into the engine and avionics manufacturer's "crystal ball" and see technologies that it believes are on the horizon, among them trans-cranial neural sensing and characterization, which receives and analyzes faint signals from parts of the brain near the skull, using a specialized headset.

The company initially developed the technology in conjunction with one of the U.S. intelligence agencies in the early 2000s to enhance analysts' ability to sort through reams of satellite images looking for specific "targets of interest." The human mind can recognize images faster than it can process them; the sensors were able to determine a match on images that flashed at speeds of up to 15 per second. According to Bob Witwer, Honeywell Aerospace's vice president of advanced technology, use of the system raised the analysts' throughput as much as ten-fold.

Human Machine Interface

With that experience in mind, researchers began to look for other applications such as the ways humans interact with machines. "One of the things that we're really focused on at Honeywell Aerospace, and certainly with my team, is recognizing that we've got more human-machine interface modalities available to us than we've ever had before," Witwer told **AIN**. "People expect to be able to interact with a computer in some cases by touching or by using their voice, so neural technology from that point of view is just another potential modality for interacting with machines."

The Arizona-based company has applied that technology to aircraft controls for more than a decade, with tests first on a Boeing 737 flight simulator and then this summer in actual flight-testing on one of its modified King Airs. The research has been successful, with the company conducting 10 flights thus far. In each case, the pilot was trained to associate patterns of lights flashing on a control panel grid with the desired movement of the airplane. When his brain recognizes the flash of the lights across the top of the grid, for example matching his intention of making the aircraft climb, the neural-sensing headset reads that faint recognition signal and translates it to the aircraft controls.

Given this is just a demonstration of the neural sensing capability, the Honeywell advanced technology staff is still feeling its way regarding the best means of interaction. "I don't know that this would be the specific implementation that we would use," explained Witwer. "In fact, it wouldn't be my preference because having lights flash in a cockpit is not something pilots normally like to see."

Supplemental Capabilities

Another set of experiments set to begin this spring will attempt to sample impulses from another brain structure, the supplementary motor cortex, where the mind plans movement. "What if I imagine that I'm going to move my left elbow up, and if I move my left elbow up that means I want the airplane to bank to the right?" Witwer said. "You don't have to move anything; you just imagine the movement. We start that in the supplementary motor cortex and then we can control the airplane."

Witwer stresses that these modalities are not necessarily the direction Honeywell is moving in terms of primary human-machine interfaces. Rather, they could have application in a supplementary or even emergency capacity, where the instantaneous recognition of an abnormality and response could help avert further danger.

"Even though it sounds really cool, like science fiction, the truth is from our point of view, most of the stuff that we are doing in our industry today was science fiction at some point in the not-so-distant past," said Witwer, noting that such now commonplace advances as GPS, cellphones and personal tablet computers did not exist when he joined the industry in 1980. ❑

TRANSPORT CANADA APPROVES LATITUDE DL150 TSO

Latitude Technologies received Transport Canada C159b "Next Generation Satellite Systems (NGSS) equipment" technical standard order (TSO) approval for its DL150 satellite data unit (SDU). The DL150 combines many capabilities, including datalink communications for Fans 1/A+ installations, air traffic services notification and Acars and CPDLC messaging as well as Arinc 741 and 618 protocols.

Equipped with an Iridium satcom transceiver, "The DL150 also supports optional autonomous flight-tracking, three-axis acceleration monitoring, Arinc 429 messages and has discrete inputs and outputs for optional event reporting," according to Latitude. "The DL150 is also qualified for Arinc GlobalLink and Sita Aircom networks. DL150 qualification includes RTCA DO-262B, DO-178C DAL D and DO-160G."

At the NBAA Convention in November, Latitude announced that Duncan Aviation is creating the first supplemental type certificate (STC) for the DL150, which will be added to Duncan's Challenger 601 Fans 1/A+ STC program. "Our DL150 Fans datalink SDU is the first product to have gained Rev b., notable for its more complex MOPS [Minimum Operational Performance Standards] testing than was required with prior versions," said Latitude president Mark Insley.

"It is wonderful to acknowledge the close cooperation between the FAA and [Transport Canada] that occurred prior to the design approval being issued by Canada. Our DL150 is one of the first TSO applications to be part of the international treaty synchronization between civilian aviation regulatory agencies FAA and [Transport Canada], including EASA, to harmonize and therefore recognize each country's TSOs." *–M.T.*

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NextGen Upgrade Pace and STC Approvals

by Matt Thurber

The most restrictive ADS-B OUT mandate in the world takes effect in U.S. airspace after midnight on Dec. 31, 2019, and installation centers, STC developers and equipment manufacturers are scrambling to help aircraft owners and operators meet the deadline. The mandate means that any aircraft inadequately equipped to be flown in U.S. airspace where a transponder is required will be grounded on Jan. 1, 2020.

The mandate for ADS-B OUT (automatic dependent surveillance-broadcast) is part of the FAA's NextGen transformation of the National Airspace System and also global ADS-B implementation. ADS-B OUT takes onboard and highly accurate GPS information and transmits it to ground-based monitoring stations and other aircraft to provide a far more accurate display of aircraft location to both air traffic controllers and other aircraft equipped to receive traffic information via ADS-B IN technology.

Other NextGen capabilities that will affect business aviation operators include future air navigation system (Fans), for automatic provision of position information and text-type messaging with ATC during oceanic operations; controller-pilot datalink communications (CPDLC or Link 2000+ in Europe), the messaging capability alone, which is already being implemented at some U.S. airports for pre-departure clearances but isn't mandatory except for European airspace above FL285 after February 2020; performance-based navigation (PBN) required navigation performance (RNP) approaches, currently available but mostly being flown by airlines; and Tcas II Change 7.1 software, required in Europe beginning Dec. 1, 2015, but available to any operator. *(See chart for upcoming mandates details, right.)*

For business aircraft operators, there are a few ways to approach the upcoming NextGen mandates. In many cases, upgrading to the latest version of Fans (Fans 1/A+) makes ADS-B OUT compliance much easier. This is because ADS-B requires an accurate position source (generally equivalent to SBAS or Waas GPS), and once that is installed as part of a Fans upgrade and coupled to an ADS-B-OUT-compliant transponder and required indicators, the ADS-B requirement is met.

An important consideration for ADS-B compliance is that owners/operators should plan on meeting the latest RTCA standard. Some early ADS-B upgrades were to the DO-260A standard, but DO-260B is now applicable, and any DO-260A systems must be upgraded to the -B configuration. While some regions of the world still accept DO-260A, the U.S. and Europe mandates require DO-260B. Generally, the current Australian and other Asia-Pacific ADS-B OUT requirements start above FL290. Canada's Hudson Bay region inclusive of FL350-FL400 offers direct routing for ADS-B-equipped aircraft; while not mandatory, it is an example of preferential treatment for better equipment.

For ADS-B, this article focuses primarily on the needs of business aircraft, which fly above the 18,000-foot threshold in the U.S. that separates two ADS-B OUT standards. Above 18,000 feet, aircraft are required to have ADS-B OUT broadcasting on 1090 MHz (also known as 1090ES or extended squitter). Below 18,000 feet, aircraft can be equipped with 978 MHz ADS-B OUT systems (also known as 978 UAT or Universal Access Transceiver). This two-frequency ADS-B OUT setup is applicable only in the U.S. All other countries will use 1090ES exclusively.

Another wrinkle in this potentially confusing situation is that in the U.S., the FAA has created a system for aircraft equipped with ADS-B IN receivers to view traffic and weather data on compatible cockpit displays, EFBs or mobile devices. ADS-B IN features include traffic information services-broadcast (TIS-B) and flight information services-broadcast (FIS-B). These free services are delivered via 978UAT and only in the U.S., but reception is available within line-of-sight range of ADS-B ground stations and works to fairly high altitudes. Many business aircraft operators take advantage of ADS-B IN using inexpensive receivers that connect wirelessly to mobile devices. Avionics manufacturers are also offering permanently installed ADS-B IN receivers connected to cockpit displays. Garmin, Honeywell and Rockwell Collins, for example, have developed airborne and ground-based traffic displays using ADS-B IN. Like Rockwell Collins and Honeywell, ACSS, the Thales/L-3 Aviation joint venture, has developed software that extends ADS-B IN capabilities even further, with applications such as merging and spacing, in-trail procedures and more.

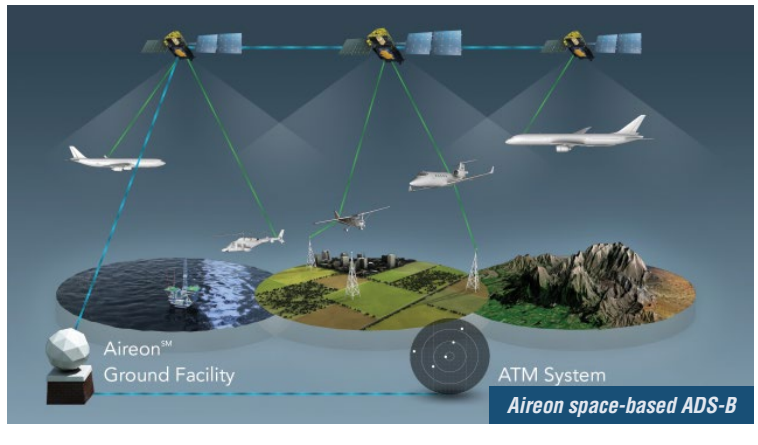
In the U.S. where ADS-B OUT surveillance is being implemented, the system works via ground stations that receive the 1090ES or 978UAT broadcast from equipped aircraft, then forwards the data to air traffic controllers, or bounces it back into the ether for other aircraft to receive via ADS-B IN. ADS-B IN-equipped aircraft can also receive ADS-B OUT signals directly from other aircraft, either 978UAT or 1090ES only (single-band) or both (dual-band).

ADS-B suffers from zero coverage over oceanic and remote areas, that is, until a company called Aireon (not to be confused with supersonic bizjet developer Aerion) started installing ADS-B receivers on low-Earth-orbit Iridium satellites. With the correct antenna installed on top of the aircraft and a 1090ES transponder with a minimum output of 125 watts, now ADS-B reception can be available anywhere in the world.

Aftermarket Upgrades - Avionics Manufacturers

Avionics manufacturers are busy not only making equipment for NextGen mandates but also working closely with OEMs and aftermarket service providers to develop and certify upgrades to meet the mandates.

NextGen Mandates	Retrofit deadline	New-aircraft deadline
ADS-B OUT U.S.	Jan. 1, 2020	Jan. 1, 2020
ADS-B OUT EASA (12,500+-pound mtow or true airspeed 250kt+)	June 8, 2020	June 8, 2016
ADS-B OUT Australia, Hong Kong, Singapore, Vietnam above FL290	In effect (Australia Feb. 4, 2016 for certain airspace; Feb. 2, 2017, all IFR ops)	In effect
Fans (all North Atlantic Organized Track System FL350-FL390)	In effect	In effect
Fans (all North Atlantic Tracks MNPS airspace FL350-FL390 inclusive)	Dec. 7, 2017	Dec. 7, 2017
Fans (all North Atlantic airspace FL290 and above)	Jan. 30, 2020	Jan. 30, 2020
Link 2000+ (CPDLC) (EASA, above FL285)	Feb. 5, 2020	Feb. 5, 2020
Tcas II Change 7.1 (EASA)	In effect	In effect



Aireon space-based ADS-B

Aspen Avionics

Aspen's Evolution cockpit displays can be integrated with the L-3 Lynx NGT-9000 dual-band transceiver/transponder. Aspen also offers the ATX100/100G (978UAT OUT and IN, with or without GPS position source) and ATX200/200G (978UAT OUT, 1090ES and 978UAT IN, with or without GPS position source).

Avidyne

Avidyne's ADS-B solutions are designed primarily for customers with Avidyne displays installed. Equipment includes the AXP340 panel-mounted and AXP322 remote-mounted mode-S transponders for 1090ES ADS-B OUT. For the position source, Avidyne's IFD440/540 navigators can be interfaced with those transponders for full ADS-B OUT. ADS-B IN is also available, using the Avidyne MLX200/210 receiver.

FreeFlight Systems

"Our focus is to be able to provide solutions to a wide variety [of operators]," said Pete Ring, director of sales and marketing at FreeFlight Systems. The company's ADS-B products offer some of the lowest-cost ADS-B OUT-compliant systems for light aircraft owners, and a variety of ADS-B IN and ADS-B OUT products for any jet up to a Boeing 747.

"We are quite excited about the turboprop and lighter business jet market," said Tim Taylor, CEO. "We see some gaps in the landscape for easy-to-install, integrated and affordable but flexible 1090ES ADS-B OUT with the added benefits of ADS-B IN."

FreeFlight is hearing from customers with older aircraft who can't afford some of the more costly service bulletins or STCs from OEMs or other available options. The owner of a Premier, he said, was preparing to get rid of it. The hull value of the airplane just isn't that high, and the cost of the ADS-B equipage–$250,000–was a significant portion of the hull value. "He couldn't make the math work," Taylor said.

But FreeFlight was able to offer this owner a fix that will be available under an STC by a FreeFlight dealer, at a significantly lower cost. The kit includes a FreeFlight standalone position source coupled to the existing transponder, which needed to be upgraded, and installation of a new antenna. The equipment cost is about $14,000, plus 40 hours of labor and the transponder upgrade.

For light aircraft owners, the lowest-cost ADS-B OUT from FreeFlight includes the Rangr Lite with built-in GPS source at $1,995. Add a typical installation time of 12 to 20 hours, and an owner can be mandate legal for about $3,200. But most buyers appreciate the benefits of ADS-B IN, and for another $1,000 can add that capability, for display on a mobile device.

Garmin

Many Garmin avionics owners are facing a simple software and possibly hardware upgrade for G1000 glass cockpit ADS-B OUT upgrades. But for aircraft without a reasonably priced solution, especially older business jets, Garmin offers a relatively simple upgrade. Buyers can opt for a Garmin 1090ES transponder if theirs isn't upgradeable, but once the transponder meets the mandate requirements, simply adding a Garmin GDL 88, with its included Waas GPS, provides a relatively simple ADS-B OUT and IN upgrade. The GDL 88 can deliver ADS-B IN information to compatible cockpit displays or to mobile devices. Garmin is working with dealers that are obtaining STCs for this package, and many are in process, including Part 25 business jets and Part 23 turboprops and jets under an approved model list (AML) STC. "That [package] minimizes downtime and cost to operate and achieves immediate benefits," said senior business development manager Bill Stone.

Garmin also offers Fans and Link 2000+/CPDLC, but these are part of G5000 integrated cockpits and generally are options for new business jet purchases.

Garmin's ADS-B IN package includes the TerminalTraffic feature, which displays position of ADS-B-equipped ground vehicles and aircraft on the airport environment as shown on Garmin SafeTaxi airport diagrams. Aircraft and ground vehicles are shown in colors and shapes distinct from those used for airborne traffic, and audible alerts are provided to prevent traffic conflicts. TerminalTraffic is available via GDL88/84 ADS-B datalinks or GDL 39/39R/39D portable ADS-B receivers paired to compatible Garmin displays or mobile devices.


Honeywell

Honeywell

Honeywell's Epic flight decks are already providing ADS-B IN services on Gulfstream G650s, through Honeywell's SmartTraffic CAS 100 traffic computer. The advantage of ADS-B IN here is that while Tcas traffic is shown on the Epic displays, this traffic doesn't have the same high position accuracy as ADS-B IN. So where ADS-B IN data is available for the same target identified on Tcas, Honeywell uses the more accurate ADS-B IN data to show pilots the position and trend vector of that traffic. Pilots can also click on the traffic target to get more information, similar to what controllers would see on their scopes. "All Epic cockpits will have this," said Tom Dooling, Honeywell senior manager of technical sales for business and general aviation.

Honeywell has also demonstrated other ADS-B IN capabilities, such as in-trail procedures, but until more large aircraft are ADS-B IN equipped and can take advantage of this capability, there won't be an urgent push for this technology. Display of ground vehicles on airport charts is also coming, but this, too, depends on technology adoptions, specifically the addition of ADS-B OUT to airport cars, trucks, tugs and so on.

Honeywell is working closely with OEMs and repair stations to help provide ADS-B OUT upgrades, and many are now available for Epic and Primus II cockpits. There was some delay because Honeywell started on the road to DO-260A compliance, and had to catch up when the FAA switched to DO-260B. This also affected BendixKing MST-67 transponders, but Honeywell expects to obtain TSO approval of the DO-260B upgraded MST-67 in this year's second half, according to Dooling.

A variety of options are available to bring Primus II cockpits to ADS-B OUT standards. Cockpit indicators are required for ADS-B OUT, and these can be accommodated by either updating the RM-855 radio management unit or replacing the old RM-850 with a new RM-855.

For Falcons with EASy II or upgrading to that configuration, ADS-B OUT, CPDLC, Sbas/Waas LPV and Fans are available options. The upgrade is offered via Falcon service bulletins.

Gulfstream's PlaneView upgrade for the G450/G550 offers optional Fans and Waas LPV, among other capabilities. For the GIV/GIV-SP, GV, G300 and G400, the PlaneDeck upgrade replaces cathode-ray tube (CRT) displays with LCDs. This is similar to the Primus Elite upgrade offered for the Falcon 900C/EX, Global Express/XRS and Primus 2000-equipped Global 5000, and it makes possible the addition of Waas LPV, ADS-B OUT and Fans.

Older jets with Primus 1000 and 2000 cockpits can be upgraded with LCDs with the Primus Epic CDS/R system, which includes Waas LPV and ADS-B OUT. The CDS/R upgrade eliminates the expense and hassle of trying to maintain older CRTs.

L-3 Aviation Products/ACSS

Aviation Communication and Surveillance Systems (ACSS), the L-3 and Thales joint venture, is urging operators to complete the Tcas II version 7.1 upgrade, which became due in Europe this past December 1. ACSS products include the Tcas II, Tcas 3000 /SP, T2cas and T3cas. "The Change 7.1 upgrade delivers important enhancements to Tcas, including reversal logic, new aural alerting for adjust vertical speed and level-off resolution advisories. A lot of operators should want this upgrade even if they don't fly to Europe," explained Shane LaPlante, vice president of aftermarket sales for ACSS and L-3 Aviation Products.

L-3 Aviation Products already serves the Part 25 market with the NXT-600 and NXT-800 ADS-B OUT transponders, but one repair station–Contact Aviation–has certified a dual installation of the new Lynx NGT-9000 transponder/ADS-B OUT/IN Multilink Surveillance System for Part 25 aircraft.

Last year, L-3 introduced the Lynx series, which includes the $6,800 NGT-9000 (starting price; the top-of-the line NGT-9000D+ with active traffic and antenna diversity is $11,933) as well as the remote-mounted NGT-1000, -2000 and -2500 for smaller aircraft. The -1000 through -2500 are 978UAT systems, while the NGT-9000 is 1090ES OUT and dual-band 1090ES and 978UAT IN. The NGT-1000 offers one of the lowest-priced 978UAT ADS-B solutions, and is priced below $2,000, with no ADS-B IN features. The NGT-2000 adds Wi-Fi capability for display of ADS-B IN on mobile devices. And the NGT-2500 includes an Arinc 429 and RS-232 interface to cockpit displays, so weather and traffic can be shown on compatible panel displays as well as via Wi-Fi on mobile devices.

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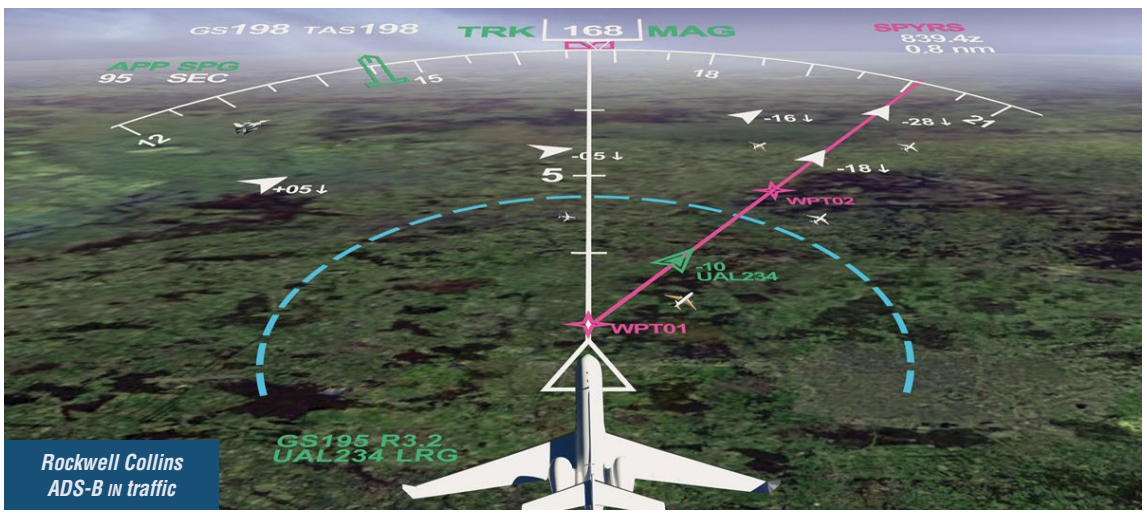


Rockwell Collins ADS-B IN traffic

Rockwell Collins

The DO-260B-compliant Rockwell Collins TDR-94D transponder that is installed in many business jets and turboprops is "widely available," according to Adam Evanschwartz, director of business and regional systems marketing. "We are delivering them routinely and in increasing volumes. For example, we have had multiple bulk orders from installers this quarter and are delivering on those so that they can fulfill the accelerating demand. One of our dealers recently purchased an inventory of 20 TDR-94Ds and reports that they took orders for eight installations immediately."

The number of NextGen upgrades is on the rise, he added. "We're seeing wide adoption of our recently certified Fans 1/A retrofit, we are still in a cycle of Tcas II upgrades for the European Change 7.1 compliance deadline, and ADS-B activity is by all accounts accelerating. One Rockwell Collins authorized dealer reports that its volume of ADS-B quote requests from operators has increased more than 50 percent in the past six months. Fans activity is also picking up in line with the North Atlantic enforcement."

Rockwell Collins has all of the equipment available for NextGen upgrades for its products. And, said Evanschwartz, "There is a large and growing portfolio of STCs and OEM service bulletins available that enable aircraft applications." However, as mandate deadlines approach, he expects equipment and installation costs to increase. "This demand versus supply effect on price has occurred in virtually every historical airspace modernization program [RVSM, Tcas, ELS/EHS and so on]."

Trig Avionics

Trig Avionics manufactures the TT22 and TT31 1090ES transponders, which easily integrate with position sources such as Garmin's GNS and GTN series navigators to meet the ADS-B OUT mandate. Trig also manufactures its own Waas GPS, the TN70, which meets ADS-B OUT standards. The $2,925 TT31 is approved in 650 aircraft types, and the TT22 in 576 types. An advantage offered by the TT31 is that it installs in a BendixKing KT76A or KT78A transponder tray, with no wiring changes and using the existing antenna.

Universal Avionics

As the time to meet NextGen mandates gets closer, industry experts worry that service centers will run out of capacity to handle the influx of work. To help persuade owners and operators, Universal Avionics is offering discounts on ADS-B programs. These range from $13,000 to $19,000 off for single-FMS and transponder systems to $26,000 to $38,000 discounts on dual-FMS and transponder packages, according to Carey Miller, manager of business development U.S. for Universal Avionics. "We're finally starting to see an uptick with these," he said. "[Discounts] are good through the middle of this year. We're pricing our solutions aggressively now to give benefit to early adopters."

For operators considering a Fans upgrade, updating a Universal FMS or equipping with one makes ADS-B OUT upgrading a simple process, because the FMS provides the compliant position source. Universal has also worked closely with Rockwell Collins to package the TDR-94D transponder with the Universal FMS. The modern FMS also enables Waas LPV and PBN RNP approach capability. "There will be a lot of benefits there," he said.

In March this year, Universal Avionics will release its CPDLC/Link 2000+ upgrade, which uses the Universal Waas FMS and UniLink communications management unit, the same setup as for Fans. Those aircraft already upgraded with Universal Fans will be able make a simple upgrade to CPDLC/Link 2000+. And this will benefit operators that want to take advantage of DataComm in the U.S., which is already available at some airports for pre-departure clearances (but is not mandatory).

Aftermarket Upgrades - Service Centers

Much of the work to modify all the aircraft that need to become NextGen compliant will be done by avionics shops and maintenance centers, as well as OEM factory service centers. The big push is for ADS-B OUT compliance for U.S.-based aircraft, and the mandate applies basically to any aircraft that will fly in airspace where a transponder is required on Jan. 1, 2020.

About 165,000 of the 200,000 aircraft in the general aviation fleet are currently transponder equipped, according to Jens Hennig, vice president of operations at the General Aviation Manufacturers Association. The current rate of ADS-B installations has reached 1,000 per month, with 48 months to go until the deadline. "The rate is slowly increasing," he said, from what was not too recently 400 to 500 per month. The current projection from the FAA is that 120,000 aircraft will be compliant by 2020.

There are about 18,684 business jets and turboprops in the U.S., according to Universal Avionics business development manager Carey Miller. He looked at the rate of RVSM installations to try to calculate the likelihood that the industry can upgrade all those airplanes to ADS-B IN time for the 2020 mandate. RVSM installations, roughly the same complexity as ADS-B, averaged about 180 per month. By that measure, business aircraft ADS-B installations should have started in April 2011. This means that not all of those airplanes will make the deadline. "There is a big tidal wave of these aircraft coming," he said.

There might be owners who will decide that they don't plan to keep their aircraft past the 2020 deadline, but not complying with the ADS-B mandate could make the aircraft harder to sell. "Lack of NextGen technology has no choice but to affect the value of the airplane," said AEA vice president of government and industry affairs Ric Peri.

All the industry experts agree that the FAA is not going to extend the 2020 deadline for general aviation aircraft. Unlike previous FAA programs where the agency lacked the infrastructure to support a new technology and ended up extending deadlines, Peri pointed out, for ADS-B "the ground infrastructure is in place, ATC has transitioned [to the new technology] and we're on schedule to meet the deadline. The FAA is doing everything it can to minimize the impact of certification and installation."

One important message for any aircraft owner or operator is that even if they haven't selected a particular ADS-B solution or one isn't available yet, they should schedule a slot at the avionics shop or service center right away. "Talk to your shop and get it scheduled," Peri said. "You don't want to put it off until 2019 and not have a slot to get the work done."

Chicago Jet

Chicago Jet has pioneered Fans STCs for business jets and holds approvals for the Falcon 50/50EX and 900B/C/EX, GIV/GIV-SP and G300, G100/150 and Astra. The company has already done installations on and is waiting for FAA approval for the Falcon 2000/2000EX, GII/GIII and GV and Challenger 600 and 601. The company's Fans upgrades use Iridium satcom systems.

For standalone ADS-B upgrades, Chicago Jet is using STCs developed by Dan Buzz & Associates, using Garmin transponders and datalink units with built-in GPS sensors or the Universal Avionics Sbas FMS.

Chicago Jet is also working with Banyan Air Service to get Chicago Jet STCs approved for Latin American operators. "That's going to benefit Banyan and service their customer base they already have established," said Chicago Jet director of operations Mike Mitera.

Prices for Fans upgrades start at about $100,000 if the aircraft is already satcom equipped, and if satcom needs to be added the cost can climb to about $425,000. Each airplane's avionics status has to be evaluated to see what needs to be done. "There is no such thing as Fans in a box, take it home and plug it onto the airplane," said Mitera.

Chicago Jet is also developing an upgrade to modify the Falcon 50 and 900 with the Universal Avionics InSight integrated cockpit, with Safe Flight autothrottles. This will include Fans, ADS-B and PBN RNP approach capability.

Clay Lacy Aviation

Clay Lacy Aviation's avionics shop has certified a Fans package for the GIV/GIV-SP and is developing a Fans STC for the GV. The company has developed a Fans STC for the Challenger 601-3A/3R. The STCs add a third FMS, a Universal Avionics Sbas unit, which also can act as the position source for ADS-B OUT. Also included is Universal's UL-801 communications management unit and CVR-120A cockpit voice recorder for storing Fans messages. For customers asking about standalone ADS-B OUT, director of avionics Jim Lauer recommends the Fans STC as it is easy to include ADS-B OUT when upgrading to Fans, and these airplanes typically fly to Europe, so Fans will be required in the not-too-distant future.

Basic cost of Fans for the Gulfstreams is about $216,000, "in a well qualified aircraft," said Lauer. Adding ADS-B OUT can range from $20,000 to $40,000, depending on the dash numbers of the transponders and what is needed to bring them up to the ADS-B standard.

Clay Lacy is sharing its STCs with other qualified Universal Avionics dealers. While many of these shops are quoting upgrades to their customers, he said, "People aren't rushing to the door now because they don't feel the pressure."

CMD Flight Solutions

CMD has developed an AML STC that covers more than 5,000 aircraft, business jets among them. The approval is for aircraft equipped with Rockwell Collins TDR-94D transponders and either the Universal Avionics Sbas FMS or Collins GPS-4000. Many installers are using the CMD STCs.

Comlux

Comlux has developed a Fans STC for the Challenger 601 and installs the CMD ADS-B STC for the 601. For the Challenger 604, Comlux is installing the Rockwell Collins Fans STC and CMD ADS-B STC. Comlux is using Bombardier service bulletins to install Fans and ADS-B IN the Challenger 605.

For all Learjets, Comlux installs the CMD ADS-B STC.

In the Boeing 737, Comlux can install Boeing service bulletins for Fans and ADS-B compliance.

Contact Aviation

Contact Aviation has developed a solution to add ADS-B OUT to legacy Part 25 jets, as long as they aren't equipped with Tcas II. The package includes two L-3 Lynx NGT-9000 transponder/ADS-B OUT/IN transceivers. This package can be far less expensive than upgrading an existing transponder and adding a compliant Waas/Sbas GPS position source. Cost of the Contact package is about $50,000 to $60,000.

The company has long experience with ADS-B, having done its first STC in 2011 for a Part 25 jet, according to managing director John Shirk. It turns out that the Lynx NGT-9000 meets all Part 25 certification requirements, so Contact Aviation consulted with the FAA to use basically the same approval criteria from Part 23 jet AML STCs for the NGT-9000 to develop a follow-on STC process to install the units in Part 25 jets.

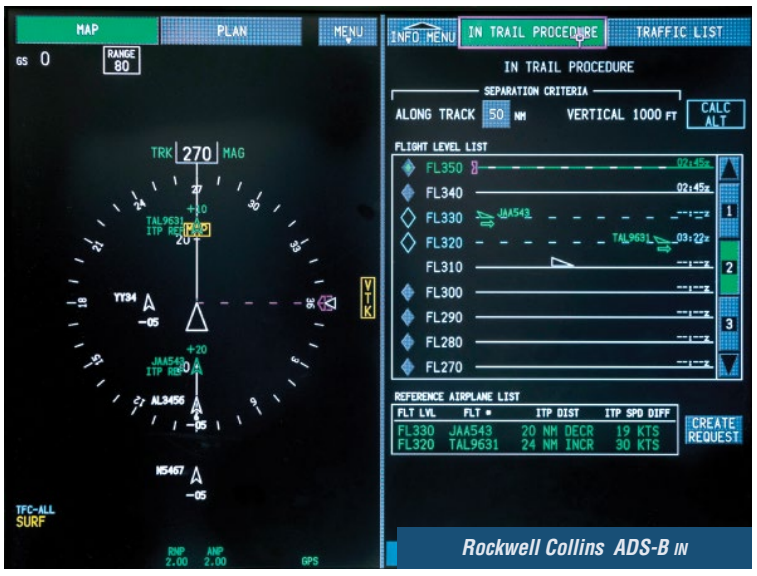
"I think there is a tremendous amount of opportunity," Shirk said. By upgrading to ADS-B with the dual NGT-9000, owners of legacy jets worth less than $1 million can preserve the value of their airplanes at a reasonable cost.

For jets with Tcas II, a Universal Avionics FMS upgrade is the way to go, according to Shirk. A single FMS upgrade would cost about $150,000 and dual FMS $200,000, plus about $50,000 for ADS-B OUT/IN using the Rockwell Collins TDR-94D transponders.

Contact Aviation is also offering PBN RNP upgrades, using Garmin GTN 650/750 navigators for Part 23 and Universal FMSs for Part 25 airplanes.

Duncan Aviation

According to Duncan Aviation regional avionics sales manager Mark Francetic, about 60 to 70 percent of the business airplanes that will need ADS-B upgrades already have an available solution. Duncan Aviation has certified many of its own, and the minimum threshold for developing an STC is 10 airplanes that need the upgrade, he said. Duncan also shares its



Rockwell Collins ADS-B IN

STCs with other qualified dealers. "It's in your best interest to do that," he said.

Duncan Aviation is seeing ADS-B installations for its customers coming in waves, with early adopters making the upgrade and others still waiting. Some aircraft owners are still confused about what can be done to bring their aircraft up to the DO-260B standard. "Several operators have brought a brochure at the events I do that says they can get an installation for $2,000," Francetic said. "It's not meant for Part 25. There's misinformation in the industry. These people are in the generation that will wait for the last minute and then probably are speaking loudest, saying 'We didn't have time.'"

Francetic is already seeing operators scheduling ADS-B installations out to 2018. "Customers want assurances that they'll have the slot," he said. "Not only at Duncan, but also West Star, StandardAero and so on. We just won't have the capacity, and neither will anybody else. We encourage operators to get an early slot. Typically when we run into capacity issues, the price will be higher. Operators say the longer we wait, the lower the price will go. American people are procrastinators, and if they do that, they get less choice. If we have to work shifts triple time, that doesn't come cheap. Have a plan for your airplane, and schedule it with your next inspection because it will be easier and cheaper to put in."

Among many Duncan NextGen projects are ADS-B OUT STCs for the Citation 560/560XL and Hawker 800A/800XL equipped with Honeywell Primus avionics, and these will be available in the first quarter this year. Honeywell and Duncan are working together on the STCs.

Duncan Aviation also announced the industry's first Fans/CPDLC STC for the Challenger 601 with an upgraded Honeywell NZ-2000 FMS.

FlightStar

FlightStar is expecting STC approval of its Learjet 40/45 ADS-B OUT STC in the first quarter this year, according to avionics sales manager Greg Vail. The FlightStar upgrade will cost approximately $65,000, depending on what equipment needs replacing. The FlightStar upgrade includes a single Universal Avionics UNS-1Ew, which adds Waas LPV capability. Another option will be an STC using a standalone Honeywell Waas GPS or single or dual Waas FMSs. FlightStar is looking into other NextGen STCs for the Learjet 40/45, but hasn't identified them yet.

Jet Aviation

Jet Aviation St. Louis has received approval for a Fans/CPDLC STC for the Challenger 604. "We can complete the fully integrated Fans 1/A upgrade with minimal downtime and cost, all during a scheduled or unscheduled maintenance event," said Blake Hogge, senior manager for avionics sales at Jet Aviation St. Louis.

Jet Aviation Basel holds an EASA STC for the Tcas II version 7.1 upgrade.

JetTech

JetTech was issued an STC amendment to add ADS-B capability to 500-series Citations that have been modified by JetTech with Garmin GTN 650 and 750 navigators. JetTech can install the GTN 650/750 in Citation 500s Serial Number 1 through 274 that are fitted with Bendix FGS-70 autopilots. The JetTech STC covers more than 2,000 Citation 500s, 501s, 550s, 551s, S550s and 560s, according to the company.

The ADS-B portion of the STC uses Garmin's GDL 88 dual-link transceiver, which includes ADS-B IN, plus Garmin's GTX 33ES transponder.

KaiserAir

KaiserAir has been issued an STC for Fans with a third Universal Avionics FMS on the GIV/GIV-SP and GV, plus Universal's UL-801 communications management unit and CVR-120A cockpit voice recorder, which is required to store Fans messages. "The STC also incorporates an option to upgrade the existing Collins TDR-94D transponders to the DO-260B-compliant -501 version of the TDR-94D," according to KaiserAir, which facilitates adding ADS-B OUT.

The company's next Fans/ADS-B OUT projects will be the Boeing 737-700 (BBJ) and 737-500.

Peregrine

Peregrine received approval to expand the list of aircraft covered under its STC for the Tcas II version 7.1 upgrade. The STC, obtained in August, originally covered an update of the BendixKing CAS 67 transponder to support Change 7.1 on the Learjet 31A, Citation 650, Hawker 800A, GIV and Challenger 601-3A/3R. This expansion now covers the CAS 67 on other legacy Gulfstreams, Falcons, Hawkers, Challengers and Learjets.

Pentastar Aviation

Pentastar Aviation is offering an ADS-B OUT upgrade for the GIV equipped with Rockwell Collins avionics. The upgrade costs less than $100,000 and includes installation of a Rockwell Collins GPS-4000A position source and upgrading of the existing transponder per a Rockwell Collins service bulletin. No changes are made to the flight management system.

Spirit Aeronautics

A new STC is available from Spirit Aeronautics for Fans 1/A and CPDLC in the Challenger 604 equipped with Rockwell Collins Pro Line 4 avionics. The STC uses the existing FMSs and control display units and includes a new Rockwell Collins CMU-1000 communications management unit and L-3 FA2100 cockpit voice recorder.

StandardAero

StandardAero facilities are installing ADS-B OUT upgrades using the CMD Flight Solutions STCs or OEM service bulletins for most business jets equipped with Rockwell Collins transponders, except for the Challenger 601 and Honeywell-equipped Hawker 800XP.

StandardAero also plans to be able to offer Fans installations on "most, if not all the large-cabin aircraft that we work on" by the second quarter this year. Midsize jet Fans packages will also be available, although the company isn't planning to offer them for the Hawker 800XP or Learjet 60. The Fans approvals will be from OEM service bulletins or OEM or other companies' STCs.

A StandardAero STC for installation of the Rockwell Collins TSS-4100 should be available in this year's first quarter. The TSS 4100 combines Tcas II and mode-S transponder into a single LRU.

TAG Aviation

TAG Aviation has developed an STC for installation of the Rockwell Collins TTR-4100 Tcas II system on the Falcon 2000/2000EX, with Falcon 900 and 50 approvals to follow shortly. The TTR-4100 enables future ADS-B IN applications and includes Tcas II version 7.1 software. ❑

Visit www.ainonline.com/cockpitavionics2016 to read an expanded edition of this report with a bonus section on the OEMs' progress in meeting operators' needs for NextGen equipage of legacy aircraft.

NEWS UPDATE

Air Med Operators Commit to Crash-resistant Fuel Systems

The Air Medical Operators Association has committed to ordering all new, and retrofitting all existing, helicopters with crash-resistant fuel systems (CRFS) in partnership with Bell and Airbus Helicopters. Helicopters certified under FAR Part 27 require CFRS unless the helicopter is a derivative of a design that was "grandfathered" before adoption of the regulations in the late 1980s.

Bond Launches Service for Sick Pax

The UK CAA is allowing sick or injured passengers to be flown back to shore by helicopter. Bond Offshore Helicopters has thus launched a new service for them, including those who can't wear a lifejacket or survival suit. Previously, people who were too ill to fly either had to wait offshore until they were better or their condition deteriorated enough to warrant an airlift from the UK's Search and Rescue service, or they had to be transferred by boat.

Airbus H225 Gets Russian Nod

The Airbus Helicopters H225 heavy twin has been approved by the Interstate Aviation Committee, Russia's certification authority. It is the first time a foreign heavy helicopter has been certified in the country, the company said. The approval opens the market for the 19-seater in other countries, such as Azerbaijan, Armenia, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, Turkmenistan and Uzbekistan. For the cold weather found in several of these, Airbus is highlighting the H225's proven de-icing system.

FAA OKs Maxcraft Garmin STC

Maxcraft Avionics has received FAA validation of its Transport Canada STC for installation of Garmin GNS/GTN navigators in the Sikorsky S-76A/C, expanding the package to include GNS Waas and GTN navigators as well as all models of Honeywell EDZ-705/706 EFIS, and SPZ-7000 or SPZ-7600 DDAFCS systems.

EMS Operator Takes FTD

Frasca International has delivered a Bell 206L Level 7 flight training device to Air Evac Lifeteam. The Level 7 FTD includes Garmin G500H, Genesys Aerosystems HeliSAS, HTaws, Garmin GTN650, Frasca's high-fidelity NVG simulation and TruCue, Frasca's newly developed simulator cueing and vibration system that provides vestibular feedback to the pilots. TruCue consists of a motion base with six degrees of freedom, modified for helicopter simulation, and uses technology from Frasca's Level D simulators.

Airbus Builds Factory in Romania

Airbus Helicopters is building a final assembly line for the H215 (the new name of the AS332 C1e/L1e) heavy twin in Brasov, Romania. The 100,000-sq-ft factory will eventually employ 300 people to assemble 15 aircraft per year. The first H215 is planned to roll out in 2017.

"In Brasov, we think we will reduce costs that we did not manage to reduce in Marignane," a spokesman told **AIN**. Lower labor costs will combine with a new industrial model under which customers can choose from either a short or long fuselage and add optional equipment as desired.–*T.D., M.H.*

The aim of the EvoLux charter portal is to simplify bookings, allowing customers to book an entire helicopter or share one they have booked with other clients, says CEO Ray Leavitt.

EvoLux charter portal eyes growth, seeks funding

by Mark Huber

The online helicopter booking portal EvoLux now has 200 helicopters enrolled in the system in eight major metropolitan areas, among them New York, Chicago, Los Angeles and Miami, and now founder Ray Leavitt says he is readying the company for the "next level" as he seeks an investment seed round of $5 to $10 million.

Sikorsky Innovations selected EvoLux as the winner of its second "Entrepreneurial Challenge Competition" in 2013. Leavitt wants to make it easier to book a helicopter seat via two computerized platforms that let customers either book the entire helicopter through SkyLimo or open up a helicopter they have booked to friends or the general public to cut costs through SkyShare. Leavitt said EvoLux differs from its better known competitor Blade in that it allows operators more flexibility to accept, deny or shift a flight or substitute equipment as they see fit in a way that "keeps it non-scheduled and Part 135."

Leavitt thinks his system will be a boon, particularly to small helicopter charter operators who he says spend an inordinate amount of time preparing charter bids. "Our system calculates where the aircraft is located, what the reposition would be, the flight time, the wait time, the reposition of the aircraft back and any other fees that go into it. You can go onto our site and pretty much have a search from anywhere to anywhere and have a price quoted with all that included in less than three seconds. That right there is an efficiency that doesn't exist in the current marketplace for helicopters," Leavitt said.

Expanding the Market

Leavitt's goal is to use EvoLux to get more helicopter riders–and more helicopters–in the air, thus bringing down the cost for both. "My research shows that there are 781 helicopters available for charter in the U.S. That isn't very many when you consider that in São Paulo, Brazil, alone there are 450. On average a helicopter in the U.S. fleet flies just 0.81 hours per day, but they have the potential to do six to eight hours per day. You can open up that market to a huge population if you had something to make helicopter travel more affordable." Leavitt thinks EvoLux does just that. "These operators can get to the point where they not only fill their existing helicopters but they can buy new ones because there is now more civilian demand for it."

Leavitt worked as a consultant to DayJet and as a charter broker before starting EvoLux, rolling out a prototype system in 2009 regionally in south Florida, where he developed a VIP clientele and began doing high-end events such as professional golf tournaments.

The future opening of air travel to Cuba from Miami also holds promise for twin-engine operations, Leavitt noted.

In Los Angeles, where EvoLux has 24 helicopters enrolled, the company is watching the debate over the fate of the moribund heliport at Los Angeles International Airport and sees Los Angeles overall as a market with lots of potential. "We think southern California is one of those markets that will organically 'get it' and just start using this. It's three-hour traffic jams everywhere you go, and it is so spread out. If we can activate the LAX heliport and then bundle $200-per-seat flights to it with first-class scheduled service on American Airlines, I think you could really kick off the L.A. market," Leavitt said.

In November, EvoLux announced that it would begin operation from Chicago's new Vertiport with partners Helimotion, Image Air and Indiana Helicopters. Leavitt noted that EvoLux also is looking hard at the Phoenix and Colorado ski resort markets. EvoLux vets its carrier partners but does not require Argus or Wyvern ratings. "We use only qualified operators," Leavitt said. "We check a carrier's certificate and liability insurance and we have declined to invite certain operators onto the platform."

"We want to attract resorts and destinations that are off the beaten path that normally would take a customer forever to get there," Leavitt said. "The resorts will want to promote us to their customers." ❑

EASA ROTORCRAFT SYMPOSIUM

CAAC OFFICIAL GIVES UPDATE ON FAST-GROWING CHINESE INDUSTRY

In a rare presentation by a Chinese official, Zhang Yu, a representative of the Civil Aviation Administration of China (CAAC), gave a status report on the helicopter operator industry in the country. In 2014 (the last year for which data is available) there were 538 civil helicopters flying in China, up from 385 the year before. The number of operators has also risen, to 82 from 55.

The top five CCAR-135 operators are Citic Oceanic Helicopter, China Southern Zhuhai Helicopter, East General Aviation, China Flying Dragon General Aviation and Capital Helicopter. Zhang also mentioned China Rescue's four fleets. The state operator has asked the CAAC to provide civil rules to enhance the safety of its operations. "We don't certify them but we do give them guidance," he said.

The leading player in the training sector appears to be the Civil Aviation Flight University of China. Zhang noted that Airbus Helicopters holds special authorization for training thanks to its partnerships with local airframers.

There were 1,519 professional pilots (holders of a private, commercial or ATP certificate) as of 2014. This represented a 22-percent increase over 2013 and more than double the 2010 pilot population. Training those pilots remains a challenge, said Zhang.

He also gave some safety statistics. Seven accidents happened in 2013, one in 2014 and six between January and September last year. Of these, two involved powerline strikes, one from weather and one from a combination of weather and terrain. Two accidents are still being investigated.

Looking ahead, Zhang said CAAC's management style will be "system-based" in the future, not "regulation-based," as it is today. –*T.D.*

EASA ROTORCRAFT SYMPOSIUM

The European Aviation Safety Agency's ninth rotorcraft symposium gathered more than 200 attendees in Cologne, Germany, early last month and proved, once again, to be a valuable place for constructive exchange–sometimes in hot debate–between the industry and the authorities. In addition to outlining their views of how safety should progress with new standards, the EASA also announced an effort to coordinate more effectively with other authorities (in the U.S., Canada, Brazil and eventually China). Meanwhile, airframers and operators provided insights about how they make the most of new technologies to improve safety at lower cost. They suggested ways to coordinate work necessary for compliance with new rules and proposed fresh approaches to dealing with emergencies such as engine failure. ***Thierry Dubois reports from Cologne.***

Airbus strives to tailor service life to actual use

Airbus Helicopters wants to offer "customized" service life limits for parts by comparing customer data on the time the helicopter spends in each flight phase with the loads measured, during flight-testing, in the same phase. The effort could extend components' service life, reduce costs and help safety, said the company.

A component is often designed to repeatedly withstand flight phases that owners never fly. For instance, "the typical offshore spectrum is much less severe than our certification reference spectrum," said Emmanuel Laillet, an Airbus Helicopters specialist in rotor stress. Airbus wants to use sensors that are already on board (part of the health and usage monitoring system, Hums) to measure climb rate, loads and so on, to align maintenance with actual, rather than theoretical, usage.

The company expects the resulting lighter maintenance to reduce the cost of operation. Such usage analysis may prompt the customer to change a mission profile if this alleviates component fatigue, Laillet suggested.

The project stands to provide the most dramatic benefits for offshore operations, which are relatively "soft" for dynamic systems. An H225 engaged in such efforts spends 58 percent of its time aloft in level flight and 29 percent taxiing, according to an Airbus analysis. The rotating swashplate's service life could therefore be extended twofold over the service life that was defined by certification testing. Conversely, the maintenance department could factor in severe usage, which would be a safety benefit.

Airbus has thus introduced the concept of "remaining useful life." To benefit from it, an operator will have to upload its data regularly, a process that could be automated, said Sophie Hasbroucq, Airbus Helicopters' head of Hums.

How the service life could be revised has not been precisely defined yet. "If we replace a scheduled task with an unscheduled job, we will miss the target," Hasbroucq noted. Airbus Helicopters is proposing that the EASA adapt the existing Part M regulation. ❑

AgustaWestland pitches new decision technique

The EASA and AgustaWestland are discussing a new approach to the height-velocity (H-V) diagram and exploring the notion of replacing it with "safe reject" indications.

The two advocate the idea of "fly away" to make the most of the helicopter's performance rather than depending on a diagram that shows operators what not to do, itself no guarantee of safety.

Bernardino Paggi, an AgustaWestland expert in flight-test methodologies, identified a common misconception that "If I fly outside the H-V area, I am always safe."

A rejected takeoff from the takeoff corridor *(see diagram)* might encounter an obstacle, since H-V envelopes are demonstrated on only one type of surface (usually a runway) and cannot be applied to all the surfaces from which a helicopter can operate.

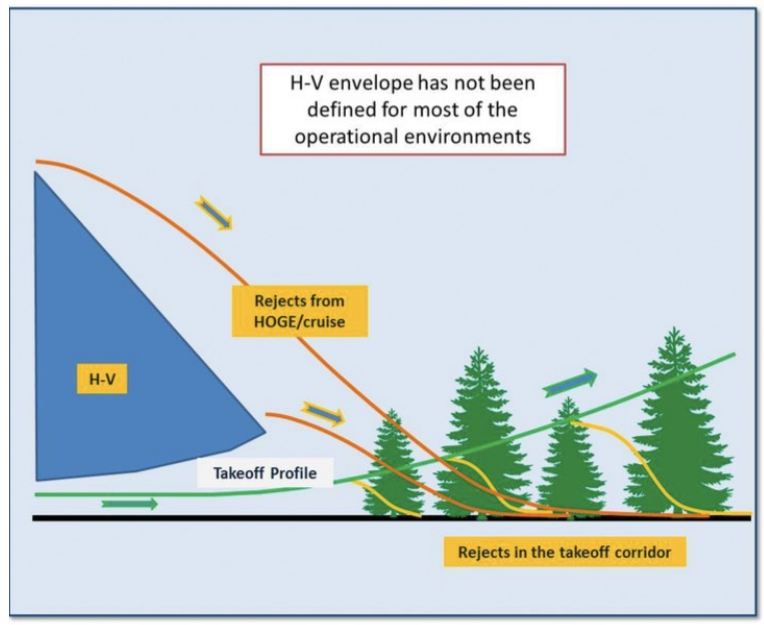
Limited Applicability

To guarantee actual one-engine inoperative (OEI) capability, AgustaWestland proposes the regulation clearly require a statement of applicability, such as, "this performance can be achieved only over such a surface." Paggi also suggested that the concept of VTOSS (takeoff safety speed) should replace climb-out speed.

"Safe vertical rejects and hover-out-of-ground-effect fly-away performance provide a safer and operation-oriented envelope, rather than the existing 'no-fly zone,'" Paggi added. The notion of a safe vertical reject is new to the lexicon of a regulatory expert. "The helicopter manufacturers are managing to make steeper and steeper landing angles, as they have done on the Airbus H175 and the AW189, but the difficulty is to see beneath the aircraft," noted Jean-Marc Sacazes, deputy head of the EASA's rotorcraft department.

He made it clear that while the agency regards AgustaWestland's approach positively, a consensus has to be found with other airframers and authorities.

The basic regulation (CS, in EASA's nomenclature) would have to be changed slightly. As a result, a momentary foray into what has thus far been called the "no-fly zone" of the H-V diagram might be allowed, provided the risk has been fully assessed. ❑



The current height-velocity diagram is not an effective means of ensuring safety, maintains Airbus, which is pitching a change in thinking: to a safe reject approach.

BELL HAS CHEST OF GROUND TOOLS FOR 525 TEST PROGRAM

Bell Helicopter provided insight on the tools it is using to develop the fly-by-wire control system for the 525 Relentless. In addition to the flying prototypes, the company is incorporating ground-based test tools–a test bench, an integration lab and a "cockpit rig and simulation host"–to shorten the development cycle and make the flight-test program safer, according to engineer Stephanie Hoelscher.

The flight controls test bench gathers the onboard computers and associated hydraulics and trim actuators. All of the flight-controls software is tested on the bench.

The cockpit rig and simulation host looks like a non-motion open cockpit with a 180-degree visual. It is fitted with production-representative sticks, trim actuators and switches, as well as the 525's Garmin G500H avionics. It uses an aerodynamic model and an engine/Fadec model. It can simulate an autorotation and adverse flight conditions, Hoelscher said. Failures can be "injected."

The Relentless Advanced System Integration Lab (Rasil), perhaps the most important tool, integrates the vehicle management system. It comprises the flight controls, avionics and electrical system, and allows for the testing of real hardware. The Rasil helps with rehearsing flight-test cards, Hoelscher added.

It has been instrumental in the early development phase, thanks notably to its level of automation. Bell's engineers believe that with Rasil testing, systems are more mature when the flight-test phase begins.

Bell has been satisfied with the correlation between Rasil and flight-test results. For example, "in a hover turn, nearly the same pedal displacement is required to match the flight-test heading," Hoelscher said.

With these results under its belt, Bell now plans to extend failure testing to Rasil. "Excellent correlation between aircraft data and Rasil simulation models supports verification of system redundancy away from the aircraft," Hoelscher emphasized, pointing out that the testing will allow Bell to avoid injecting hazardous faults on the real helicopter. Bell plans to use the device over the software's entire life cycle.

As of early December, the Relentless flight evaluation program had logged 80 hours. ■

► *(continued from preceding page)*

A consulting firm will document the different practices at operators in the UK, Norway, the Netherlands and Denmark.

EASA seeks cooperation on offshore safety efforts

The EASA has tasked risk-management specialist DNV-GL with reviewing current practices in offshore helicopter operations and eventually issuing recommendations to improve those operations. The project is scheduled for completion in this year's third quarter.

"The EASA has difficulty understanding differences between operators in the same country and between different countries; these differences probably come from cultural issues," said principal consultant John Spouge. To address that concern, DNV-GL will document the different practices and evaluate their benefits and limits, focusing on EASA member states in the North Sea. The countries under scrutiny are thus the UK, Norway, the Netherlands and Denmark.

The EASA has given DNV-GL a list of 135 "relevant subjects" to cover. The research will examine how stakeholders interact with each other and how design assumptions and actual operation vary. The firm will also study how safety practices vary among different offshore operations–"different" meaning the distances offshore, the types of helicopter and the types of operating region.

Ditching Survivability

Meanwhile, the EASA is forging ahead on its notice of proposed amendment (NPA) to improve occupant survivability in a helicopter ditching (when the crew still has some level of control) or water impact. "People should not drown in a helicopter cabin," EASA cabin safety expert Peter Chittenden said. As capsize is inevitable, the authority is working on stretching the time the aircraft stays upright and mitigating capsize.

Also involved in the rulemaking effort are three OEMs, two operators, two other authorities (CAA UK and FAA) and two oil trade associations.

The NPA will call for realistic testing of a scale model in a wave tank. "Realistic testing [meaning irregular waves] has been performed for ships for years," Chittenden noted. The scale model will have to stay upright for about five minutes.

Providing an air pocket in the cabin will become mandatory. "In capsize mitigation, an air pocket is considered superior to category-A emergency breathing systems (EBS)." On the airframe, flotation devices might include foam-filled engine cowlings, passive means that do not need inflating.

The NPA was to be issued for public comment late last year or early this year. The new CS27 and CS29 certification rules will be applicable only to new designs. However, Chittenden suggested the NPA might also make its way into CS26, meaning certain airworthiness requirements will be applicable to aircraft already in service. ❑

AUTHORITIES LAUNCH HARMONIZATION EFFORT

In a move the industry had been eagerly awaiting, four civil aviation authorities have agreed to jointly manage some (not all, OEMs may complain) certification issues. Last September, the directors of Europe's EASA, the U.S. FAA, Brazil's ANAC and Canada's TCCA signed a charter creating the "certification management team" (CMT). A group called Certification Authorities for Rotorcraft Products (CARP) is part of the CMT.

The team's mission is to create "a better efficiency" in the existing processes for certification, manufacturing, export and continued airworthiness. The operational-level CARP group intends to "reduce duplication of efforts by maximizing the reliance on each other's decisions," said Juri Pauletti, an EASA rotorcraft project certification manager.

Another objective is to identify opportunities to harmonize regulation and policy. The CARP will identify those differences among national authorities that might lead to conflicts during the certification and validation processes. "It is good to know from the beginning if the authorities have different interpretations of a rule and what applicants should do," Pauletti emphasized.

Finally, it will provide early awareness of emerging safety concerns, Pauletti said.

The CARP group will meet regularly, and it might make recommendations to the CMT. In the CARP's scope are certification rules (existing and proposed) and continued operational safety.

The CMT also sees itself as an interface with the industry. Therefore, the CARP might invite the helicopter industry to discuss specific items and request industry support in achieving specific objectives. It will welcome coordinated proposals from the industry.

What about expanding the CMT to other authorities? "That's the goal," said Massimo Mazzoletti, head of the EASA rotorcraft department. ■

Common ops manuals cut costs for Swiss firms

Confronted with spiraling costs to meet the requirement to develop manuals, about two thirds of Switzerland's 34 helicopter operators have united to create a common basis for such material. They have received financial support from the Swiss civil aviation authority (FOCA), and the EASA has raised no objection. The next project is to adopt the same approach for developing standard operating procedures (SOPs).

The nation's helicopter industry logs 54,000 flight hours annually, and most of those are for complex aerial work and search and rescue, according to Patrick Fauchère, Air Glaciers' flight operations manager. Many operators are small companies, and the amount of work involved in developing a manual is proportionally high. Over the next several years each is to issue several manuals: for non-commercial operations, specialized operations (SPO, the EASA's nomenclature for aerial work) and so on.

Some 20 operators now have identical operating manuals, based on a 'generic' publication received via the Swiss Helicopter Association.

This may translate into a 200-percent increase in annual training costs, at €30,000 ($33,000), for the average company (five pilots and five staff), Fauchère noted. The creation of "generic" manuals can reduce that number slightly, to 150 percent. The Swiss Helicopter Association outsourced the job to a company called Next-Generation Flight Training (NGFT).

As a result, 20-plus AOC holders now have identical operating manuals, based on "generic" manuals developed by NGFT. The operators thus comply with EASA rules regarding commercial air transport (Part CAT) and operations requiring specific approvals (Part SPA). They also have identical training content, thanks to a central learning management system. A common platform stores pilot and staff data.

As a follow-on project, an SOP working group is now developing standardized SPO manuals. This includes 25 SOPs in four languages. Common elements have been defined for aerial work operations. The working group will "ensure harmonization regarding crew requirements and training." It will provide training material to all operators.

Eight SOPs–such as for logging and avalanche mining–have been completed already. They are now to be submitted to the association's members and the FOCA. The latter is expected to sign off on 25 SOPs by April this year. Training material will be available in the summer, for implementation during the summer and the fall.

The Swiss Helicopter Association is open to collaboration with other countries. "Once signed off by the FOCA, these documents will be made available to all interested parties," Fauchère said.

A cooperative approach is the way to go, Dominique Orbec, president of the French lobbying association of the helicopter industry (UFH), told **AIN**, a view perhaps not shared by the union membership. French operators so far have shown lukewarm interest in such an approach, citing concern about sharing commercially sensitive information. However, in Orbec's view, such information can be kept out of a generic manual or SOP.

Orbec believes the French DGAC is favorable to this kind of approach. He believes, however, that while it is suitable for aerial work it is not a good fit for airline-type offshore operations. ❑

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NEWS UPDATE

FAA's Oversight of Regionals Under Inspector General Scrutiny

The U.S. Department of Transportation's Office of Inspector General (IG) plans to begin an audit into the oversight of regional airlines by the FAA, the IG's office announced on December 3. The IG said that the objectives of the audit, scheduled to start this month, center on evaluating the FAA's processes for identifying periods of transition and growth at regional carriers, and for adjusting oversight in response to changes in those carriers' operations.

The audit mandate came at the request of ranking members of the U.S. House Transportation and Infrastructure Committee. The congressmen also requested that the IG consider issues relating to regional airline pilot pay, and it has pledged to tackle that subject in a separate report. They questioned whether current levels of FAA oversight take account of both rapid growth among some regional carriers and financial distress on the part of others.

Air New Zealand Boeing 777 Makes First 330-Minute ETOPS Flight

Air New Zealand completed the first flight approved for 330-minute extended twin-engine operations (Etops), flying a 777-200ER powered by Rolls-Royce Trent 800 engines. The flight departed from Auckland, New Zealand, on December 1 and landed in the Argentinian capital Buenos Aires about 12 hours later.

The 330-minute Etops authorization allows Air New Zealand to fly its Rolls-Royce-powered 777-200ERs up to 5.5 hours from diversion airports, allowing for more direct flights, reduced fuel burn and lower emissions. The first flight marked the completion of configuration and operational requirements set by the U.S. Federal Aviation Administration and the New Zealand Civil Aviation Authority.

Boeing announced in December 2011 that it had received type-design approval from the FAA for up to 330-minute Etops for the 777, initially those powered by General Electric GE90s. The manufacturer won FAA approval for 330-minute Etops on the 787 Dreamliner in 2014.

Chinese ATC To Adopt English-only Policy

China will mandate that its air traffic controllers use only English when communicating with pilots of any airline starting in 2017, according to the Civil Aviation Administration of China (CAAC).

Zhao Yun, an official at the CAAC in Beijing, said the move will improve situational awareness for foreign pilots. Currently, controllers at all airports in China use English to communicate with pilots of foreign airlines and Mandarin with those flying for Chinese carriers.

Early this year pilots from three Southeast Asian airlines had expressed concern about the lack of a common language among all pilots tuned to the frequency to communicate with ATC at Beijing Capital International Airport (BCIA). "We took the feedback from the pilots of the three airlines seriously to make the decision for a common language to be used," Zhao said.

The PW1100G-powered A320neo flew for the first time in September 2014.

Airbus A320neo gains joint EASA-FAA approval

by Gregory Polek

The Pratt & Whitney PW1100G-powered A320neo received joint type certification from the European Aviation Safety Agency (EASA) and the Federal Aviation Administration (FAA) on November 24, clearing the way for first delivery by the end of last year.

EASA certification director Trevor Woods signed the European certificate and FAA Transport Airplane Directorate manager Jeffrey Duven signed the approval on behalf of the U.S. authorities. They presented the type certificates to Airbus executive vice president of engineering Charles Champion and Airbus A320neo chief engineer Pierre-Henri Brousse.

"This double seal of approval represents a great achievement for Airbus," said Airbus president and CEO Fabrice Brégier. "It recognizes the hard work performed by all the teams at Airbus and Pratt & Whitney. It demonstrates the A320neo is meeting all requirements."

The three A320neo flight-test aircraft powered by Pratt & Whitney engines accumulated more than 1,070 flight hours during some 350 flights. Some 300 hours involved the same aircraft in an airline-like environment to ensure operational maturity at entry into service, said Airbus.

Two other A320neos–powered by CFM Leap-1A turbofans–continue to fly test missions ahead of expected certification of that variant by the middle of this year. Certification plans call for the A321neo and A319neo in both engine variants to follow.

Airbus managed to meet its target for certification of the Pratt-powered A320neo by the end of last year despite encountering at least two engine-related problems during the past year. In early October it confirmed that one of the test engines in A320neo MSN6101 suffered "minor damage" following hot-weather trials in Al Ain in the United Arab Emirates, forcing Airbus to ground the airplane for several weeks.

News of that incident came some two months after MSN6101 returned to the air following discovery of a manufacturing defect in a 10-inch-diameter retaining ring in the powerplant's combustor section. A resulting three-month "pause" in flying forced the manufacturer to revise testing dates and modify the A320neo flight-test program to accommodate the changes. For example, an A320neo powered with Leap-1As had to undertake additional work previously earmarked for the GTF-powered A320neos and unrelated to engine systems.

Airbus has drawn orders for more than 4,300 A320neo-series narrow-bodies from some 75 customers since the manufacturer launched the program in 2010. ❑

BOMBARDIER EYES CSERIES MARKET ENTRY AS IT SEEKS CASH

Bombardier continues to talk to Canadian government officials about possible investment of another $1 billion as the CSeries moves from development to entry-into-service. The program received a boost with the recent $1 billion commitment from the Government of Quebec, which strengthened the company's near-term liquidity. The company has since asked government officials in Ottawa to consider a request for further investment with some urgency, the Canadian newspaper *The Globe and Mail* reported early last month.

Bombardier Commercial Aircraft president Fred Cromer acknowledged talks that Bombardier would need another $1 billion as it ramps up the CSeries, but said the company is taking steps to minimize risk.

At a recent Investors Day, Cromer outlined plans to work with suppliers and to focus on lowering production costs and ensuring a smooth entry-into-service for the CSeries. With flight-testing complete, he said the program is at the "door step" of certification and that the company has been working toward service entry with launch customer Swiss International Airlines this year. Transport Canada certified the aircraft on December 18.

"Entry into service is crucial. We need to be flawless," Cromer said, adding, "We have robust plans in place to ensure that our best sales people will be the operators of this airplane."

Recent function and reliability proving runs have given confidence in those plans, he said, noting that during the 150 hours conducted so far to mimic the airline environment, the aircraft achieved a dispatch rate of 100 percent. "The first block proved to us that reliability out of the box is putting us on a path to be successful," he said.

Bombardier is pressing ahead with plans to ramp up production of the CSeries airliner even as the company seeks to find another $1 billion in capital to fund the next phase of the delayed program.

The company is planning a gradual ramp up that would deliver between 250 and 300 aircraft over the next five years. For this year, deliveries are estimated at 15 to 20, nearly doubling to 30 to 35 next year and eventually reaching 90 to 120 by 2020. Cromer called the plan manageable, noting the program has firm orders for 242 aircraft. Including letters of interest and options, that number grows to more than 600, he added.

While Cromer stressed that the company is not satisfied with the orders, he also said it is conducting negotiations for large fleet orders since "we don't have a tremendous number of positions [available] in the near term." *–K.L.*

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Boeing rolls out first 737 Max

by Pete Combs

Nineteen years to the day since the last rollout of a new design from its factory in Renton, Wash., Boeing introduced the 737 Max 8, a new take on what has become the manufacturer's most ubiquitous airframe and a redemption of sorts after the rocky unveiling of the 787 Dreamliner in 2007.

The 737 Max is the latest iteration of an aircraft first introduced in 1966. The differences between the first Boeing 737 and the first 737 Max, however, are stark. Boeing 737 Max vice president and general manager Keith Leverkuhn pointed to aircraft 1A002, the second Max still on the assembly line in Renton, noting that virtually all the components below the wing differ from those on the current models still in production a few feet away.

The first 737 Max 8 rolls out of a paint hangar in Renton, Wash.

Along with major avionics upgrades, the Max features new powerplants built by CFM, the joint venture between General Electric and France's Snecma. Leverkuhn said the new engines, together with design changes, will deliver 14 percent better fuel efficiency per passenger than current technology. At least one customer, Ryanair, said Boeing has promised it an improvement of no less than 16 percent per seat.

But whether or not the 737 Max can counter the surge in orders currently enjoyed by Boeing's chief rival, Airbus, remains an open question. As of last month, the European consortium projected it would hold some 60 percent of the total volume of orders for new narrowbodies by the end of last year. Leverkuhn insisted Boeing will soon reach parity again.

"Don't forget that the Airbus A320neo launched 18 months ahead of the Max," he told reporters gathered on the floor of the company's Renton assembly building for the December 8 rollout. "They gained orders early. But by the time we launched, we're comfortable with the way the market is settling… It's about 50-50."

The rollout was a deliberately lower-key event than the fanfare that surrounded the 787's debut eight years ago. Then, video feeds carried the ceremony to 40 countries, a live band performed and former *NBC Nightly News* anchor Tom Brokaw served as master of ceremonies. But the airplane on display lacked some major systems, and temporary fasteners held together several parts. After several delays attributed to parts shortages, supply-chain interruptions, software glitches and incomplete or inaccurate supplier documentation, the airplane flew for the first time in December 2009, some two-and-a-half years after the rollout.

Leverkuhn made it clear Boeing has changed its approach since then. "We're depending on something we call 'right at first flight,'" he said. "That's the idea of making sure that the systems are put together in a way that we know not only how they'll function, but also just how reliable they're going to be."

Leverkuhn said the Max remains on schedule to fly early this year, and he predicts certification of the new engines "within weeks" after that. He promised the Max will undergo rigorous, "first-of-its-kind" testing that will closely simulate the way airlines use the aircraft, ensuring its readiness for first delivery in 2017.

"A new airplane is like a comet sighting," Leverkuhn said. "It's rare and it's a big deal. This is an exciting day." ❑

Toronto City decision a setback for CSeries

by Ian Goold

Potential Bombardier CSeries operations from Toronto City Airport remain in limbo after Porter Airlines failed to persuade authorities to support plans to fly the 120-seat jetliner from the airport's island location in Lake Ontario. The proposal, involving an extended runway, required the Canadian Ministry of Transport, the Toronto Port Authority (recently re-styled as PortsToronto) and the City of Toronto to amend the airport operating agreement, which bans jet operations.

PortsToronto, which manages the airport, followed the new Liberal national government's confirmation of pre-election commitments not to permit jet operations there by saying last month it would not proceed with "public engagement-related activities" on the matter. Rather, it will "complete technical work" and "focus on… current operations to benefit our passenger base, fulfill the airport's potential and serve Toronto's economic interests."

Porter told **AIN** it is considering the implications of the decision. "We will continue assessing the situation and do not have any additional statement," it said. The airline placed a conditional purchase agreement covering acquisition of 12 CS100s and options on a further 18 and operates Bombardier Q400 turboprops from Toronto City.

A Porter order always hinged on the airport receiving runway-extension approval, but the operator apparently has not discounted alternative CSeries applications completely. Canada's *Financial Post* business magazine reported last month that the airline has also considered CSeries operations from bases in western Canada.

If confirmed, the Porter deal would boost firm CSeries orders by 5 percent, to more than 250 aircraft, but if lost the pain will no doubt be felt more broadly, with 14 CSeries suppliers based in Ontario.

The possible loss of the Porter order comes as Bombardier prepares to celebrate formal airworthiness approval for the aircraft. As of last month, executives said the design remained "on track" to receive Canadian type certification by the end of 2015.

Meanwhile, CSeries function and reliability testing will continue early this year in northern Europe. "We conducted recent customer demonstrations to much enthusiasm in Stockholm and Riga," said Europe, Russia and CIS sales vice president Ryan DeBrusk. "We're seeing a positive impact and tone in the market as a result [of meeting promised performance commitments and] yes, we do see this translating into sales in the very near future," accompanied by "much more news on the program side." ❑

FAULTY RUDDER CONTROL, PILOTS' RESPONSE LED TO AIRASIA CRASH

Faulty rudder-control components and the pilots' response to the problem contributed to the crash of AirAsia Indonesia Flight QZ8501 in December 2014, the accident investigation has concluded. The Airbus A320 crashed in the Java Sea after departing from Surabaya, Indonesia, on a flight to Singapore, with the loss of 162 passengers and crew.

In a report released on December 1, the Indonesia National Transportation Safety Committee traced the sequence of events that led to the accident to a cracked solder joint that "resulted in loss of electrical continuity" and the failure of rudder travel limiter units (RTLUs) that restrict the rudder deflection angle of the vertical stabilizer. The aircraft's maintenance records showed that there had been 23 RTLU problems over the course of 2014.

Once the aircraft reached cruising altitude, there were four master caution alerts associated with the RTLUs over 14.5 minutes, the flight-data recorder (FDR) indicated. After the fourth alert, pilot actions triggered two more master cautions reporting faults with the flight augmentation computer that manages rudder control functions. The FDR indicated that the circuit breaker to the computer was reset, resulting in an electrical interruption. After the sixth master caution, the autopilot and auto-thrust disengaged, and the flight-control logic of the aircraft's fly-by-wire system reverted from normal to alternate operation.

"Subsequent flight crew action leading to inability to control the aircraft in the Alternate Law resulted in the aircraft departing from the normal flight envelope and entering a prolonged stall condition that was beyond the capability of the flight crew to recover," the report states.

Among safety recommendations, the committee called on Airbus to develop a means for pilots "to effectively manage multiple and repetitive master caution alarms to reduce distraction."

The accident A320 had logged 23,039 hours and 13,610 cycles since it was built in 2008. –*B.C.*

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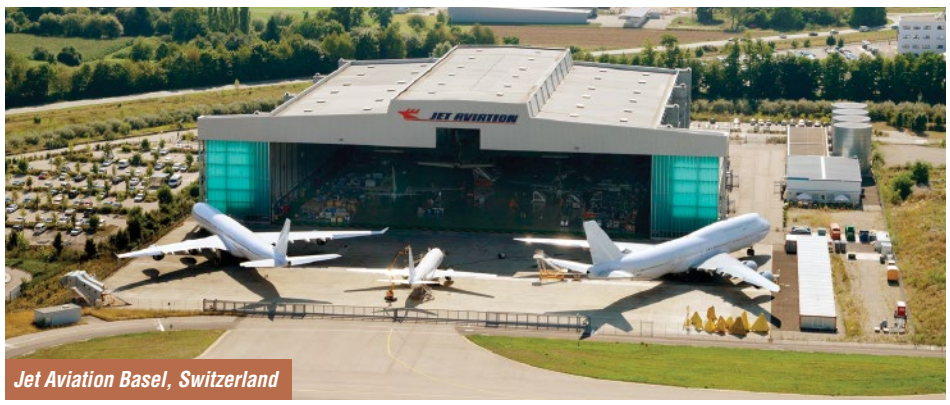
Maintenance News



Jet Aviation Basel, Switzerland

JET AVIATION BASEL DELIVERS HEAD-OF-STATE ACJ320

Jet Aviation Basel recently outfitted and delivered an Airbus ACJ320 for an undisclosed head of state in Europe. The configuration, which was certified under EASA STC for private use, includes a bedroom, bathroom, lounge, office area and a large executive staff area and is designed to accommodate 57 passengers and five crewmembers.

"I am delighted with how this beautifully finished VIP cabin interior came to life," said Marius Tokarski, project manager. "The interior was fully designed, engineered, produced and completed by our specialized team of engineers and craftsmen here in Basel, and the aircraft was delivered significantly ahead of schedule."

BOMBARDIER WICHITA CENTER TO SERVICE R-R BR710s

Bombardier Business Aircraft's Wichita Service Center has been named an authorized service center for the Rolls-Royce BR710 turbofan. The designation allows Bombardier to perform maintenance on BR710s installed on the Global Express/XRS/5000/6000. It also means all of Bombardier Business Aircraft Service Centers are now Rolls-Royce authorized and can provide direct access to Rolls-Royce technical service representatives, as well as Rolls-Royce's myaeroengine.com portal for support and technical troubleshooting.

The MRO is equipped to perform scheduled and unscheduled maintenance, as well as interior modifications and avionics installations and to provide AOG support for Learjets, Challengers and Globals. It holds certifications from the FAA, Transport Canada and EASA, as well as authorities in Bermuda, Mexico and Venezuela.

GULFSTREAM PARTS CENTER OPENS IN DUBAI

Gulfstream Aerospace recently opened a regional parts distribution center near Dubai Al Maktoum International Airport. The facility, located in Dubai South (formerly Dubai World Central), houses high-usage items and provides rapid-response support to Gulfstream's factory-authorized service center and customers throughout the Middle East, India and Africa.

The facility was expected to hold approximately $10 million in parts and materials inventory by the end of last year. Inventory there will complement what is housed at sister company Jet Aviation's warehouse at Dubai International, Gulfstream said.

Gulfstream's customer resources in the region help support a fleet of some 180 aircraft in the Middle East, India and Africa. These resources include Jet Aviation's service center at Dubai International Airport and FBO at Al Maktoum, along with Jet Aviation FBOs in Jeddah, Medina and Riyadh, Saudi Arabia.

HONEYWELL INTROS MX PLAN FOR G200s, CHALLENGERS

Honeywell Aerospace launched a new mechanical protection plan (MPP) for the G200 and Challenger 604/605. With the new plans, Gulfstream and Bombardier operators will have coverage for components on their environmental and cabin control systems, reducing maintenance time and costs.

Under the terms of the MPPs operators can get parts shipped to any Honeywell AOG supplier within four to 24 hours, making maintenance costs predictable. Operators also have an option to enroll in individual predicted and planned maintenance rather than full tip-to-tail coverage, ensuring that they are paying only for the maintenance coverage they need.

Enrollment for the G200 and Challenger 604/605 MPPs will begin this month. The program is also available for the Gulfstream G350/G400/G450/G500/G550 and Pilatus PC-12. The MPP builds on established Honeywell maintenance programs such as the maintenance service plan for engine and APU maintenance and the Honeywell avionics protection plan.

STANDARDAERO EXPANDS ENGINE OFFERINGS

StandardAero has signed an agreement to become an authorized engine line maintenance service provider to operators of aircraft with AE3007A or BR710A2-10 engines enrolled in the Rolls-Royce CorporateCare maintenance program. The five-year deal covers borescoping, engine removal and replacement, troubleshooting and warranty maintenance.

Initially, the BR710 service will be offered at StandardAero's facility at Van Nuys Airport, while the AE3007 service will be available at Van Nuys, Houston and Augusta. The agreement applies to operators of the Legacy 600/650 and Global 5000/6000.

ERICKSON OK'D FOR BELL MX

Bell Helicopter has named Portland, Ore.-based Erickson a certified maintenance center. The agreement officially adds Erickson to Bell Helicopter's customer support network and authorizes Erickson to perform aircraft refurbishment and maintenance, repair and overhaul (MRO) of Bell 214Bs and Bell 214STs at all Erickson locations.

CONSTANT AND ROLLS-ROYCE RENEW SERVICE ACCORD

MRO operator Constant Aviation renewed its agreement with Rolls-Royce to remain an authorized service center for the AE3007 at all three of its locations–Cleveland, Ohio; Birmingham, Ala.; and Las Vegas. The designation allows Constant to offer Legacy 600/650 operators enrolled in Rolls-Royce's CorporateCare program on-site parts and warranty claims processing.

"This relationship is important to our business as we touch more Legacy 600s than any other service center. We recently completed our 32nd 96-month inspection, with our 10th 144-month inspection currently in work," said Constant's Legacy 600/650 program manager, Jim Rady.

AMAC TO PERFORM HEAVY MX ON HEAD-OF-STATE BBJ

Amac Aerospace Switzerland signed a contract to perform heavy base maintenance on a head-of-state 737-700. When the aircraft is in for such work, the company will perform various cockpit updates and cabin modifications and install auxiliary center tanks. As part of the process, the cabin will be removed to perform structural inspections. The aircraft will enter the shop in the first quarter.

The MRO also reported the on-time, on-budget return to service of a head-of-state GIV after an intensive maintenance check. The company has also performed an on-site intervention on a GV in Africa and installed a satcom system on an A340.

MOBILE APP SIMPLIFIES SQUAWK SUBMISSIONS

The newly released The Squawk App for iOS devices is designed for pilots who are dissatisfied with writing down hours and squawks and submitting them after the fact. The app, which will also be available for Android devices next month, provides an easy-to-use structured data entry form that allows issues to be written up as they happen to facilitate operations and repair.

Data can also be input into an organization's safety management system (SMS). The pilot chooses the aircraft he is flying then answers three standard questions associated with a squawk: where/when did it happen, what happened and what troubleshooting steps were taken. After the squawk is submitted, the pilot can check the status on the home screen and confirm the squawk was sent to the server and, if not, resubmit it.

The pilot receives an email as further confirmation that the data went to the server. The email also goes to recipients assigned during setup, typically the maintenance and operations team.

FLYING COLOURS NAMED SERVICE FACILITY FOR GLOBALS

The Peterborough, Ontario, headquarters of MRO and completions specialist Flying Colours announced Bombardier Business Aircraft has awarded the MRO heavy authorized service facility (ASF) status to work on the Global 5000 and 6000. Bombardier has also renewed its existing ASF status for a further five years at both its Canadian and U.S. facilities.

"The addition of Globals to our existing Bombardier ASF status illustrates the confidence the manufacturer has in us and enables us to work with an even greater number of owners and operators," said Eric Gillespie, v-p of Flying Colours. The existing Peterborough ASF agreement covers heavy work on the Challenger 605 and Challenger 850. ❑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Touching Bases by Curt Epstein

FBO and Airport News

World-Way Aviation's Sorocaba FBO is set to open its doors next month.

BRAZIL'S LARGEST FBO SET TO OPEN

World-Way Aviation will debut its new FBO at Brazil's Sorocaba Airport next month. The $15 million facility, one of six service providers at the airport, offers a hangar with a clear span of 252 feet and nearly 100,000 sq ft of space (enough room for nine Embraer Lineage 1000s), and 1.5 acres of ramp area. The 30,000-sq-ft terminal provides a dedicated VIP lounge, conference room, crew lounge, flight-planning room, crew rest suites, fitness center, observation balcony and concierge service. It will be the largest service provider facility in the country, as well as Brazil's only member of the Air Elite network.

Located 60 miles from downtown São Paulo, the dedicated business aviation airport is open 24 hours with no slot restrictions, and is the world's only airport to host service centers owned by Dassault, Embraer, Gulfstream and Pratt & Whitney Canada.

JETEX LAUNCHES FBO PARTNERSHIP AT TOKYO AIRPORTS

Jetex Flight Support started a licensing agreement with Japan's Air Contrail to provide ground handling services at Tokyo Narita and Haneda International Airports. Under the agreement, Air Contrail will rebrand its existing aircraft handling centers under the Jetex name. The full range of Jetex services will be available at both airports, marking the Dubai-based group's entry into the Japanese business aviation market. The company's facilities include an executive lounge, as well as customs and immigration, fueling and ground handling support, and concierge and security services. Its staff members speak Japanese, English, Korean and Chinese.

AIR BP, SIGNATURE SWING U.S. STERLING DEAL

Air BP has announced an agreement with Signature Flight Support that will see the petroleum company's Sterling Card accepted at all 63 of Signature's U.S. FBOs. The announcement represents a milestone for Air BP, as this is the first time the Sterling Card will be accepted in the U.S. While Air BP has not had any branded locations since 2012, it remained a major bulk fuel supplier for Signature, as well as numerous corporate flight departments with their own fueling facilities.

Outside the U.S., however, the company operates an extensive fuel network. "We do have a portfolio of some American customers that hold our Sterling Card, and when they fly internationally they use this card to obtain fuel at any of our Air BP locations abroad," said Julio Casas, director of Air BP's North American general aviation business.

Another development in the program will enable customers for the first time to use the Sterling Card to pay for FBO services such as ramp fees, lavatory and water service, de-icing and merchandise in addition to fuel at Signature's U.S. locations.

EXECUJET SET FOR EXPANSION IN DUBAI AND JEDDAH

ExecuJet Middle East is expanding its presence in Dubai. The company, which is part of the Switzerland-based ExecuJet Aviation group, also announced plans to broaden operations in Saudi Arabia with a new FBO in Jeddah. ExecuJet's main base is at Dubai International Airport, and for the past two years the company has also operated a temporary base at Dubai World Central, or Dubai South as the massive new airport has been renamed. It has now secured land for a permanent facility and hopes to start construction soon with a view to opening during the first quarter of next year. The company's planned FBO in Jeddah will be established with its existing Saudi partner, NAS. Last month, their joint operation in the capital Riyadh relocated to the royal terminal of King Khalid International Airport from the general aviation terminal.

CUSTOMS ADDED AT OMAHA'S EPPLEY AIRFIELD

A 2,000-sq-ft purpose-built U.S. Customs and Border Protection facility has opened at Eppley Airfield in Omaha, Neb. Attached directly to the Tac Air FBO, the new facility, established in conjunction with the Omaha Airport Authority, will provide a smooth experience for all general aviation aircraft arriving at OMA from outside the U.S., according to Matt Davis, Tac Air's director of business development.

The company is also investing $11 million in a redevelopment project at Bill and Hillary Clinton National Airport in Little Rock, Ark., which will see the construction of an executive terminal, and it is adding hangar space at its locations in Texarkana, Ark., and Hartford, Conn.

CLAY LACY AVIATION EXTENDS APRON AT VAN NUYS AIRPORT

As the first phase of a $10 million development plan, Clay Lacy Aviation has opened 2.5 acres more ramp space at its Van Nuys (Calif.) Airport FBO, expanding the space available for overnight parking and aircraft positioning and reducing the need for towing. The upgrade project, which will encompass six acres, is aimed at creating the Los Angeles area's best and most secure private aviation complex.

According to the company, the physical orientation of planned buildings, combined with refurbishment of existing facilities, will all be directed toward that goal. Work on the project began in February and by the time it concludes next summer it will have added another acre of apron, a 63,000-sq-ft hangar for ultra-long-range business jets, 21,000-sq-ft of office space and an indoor glass-enclosed event space showing Clay Lacy's Learjet 23, the first business jet to land at Van Nuys Airport in 1964.

Clay Lacy has also become the latest FBO operator to join the World Fuel Services-sponsored Air Elite network.

AVFLIGHT ADDS IN COLORADO

Avflight has bolstered its FBO network with last month's addition of ski-country gateway Gunnison Valley Aviation, the lone service provider at Colorado's Gunnison-Crested Butte Regional Airport. Though the purchase comes at the height of the location's peak season, the Avfuel-affiliated company noted the "transition to Avflight will appear seamless to customers arriving for the ski season, and smooth for existing staff even during this high-traffic time of year."

The location includes a 4,100-sq-ft terminal with pilots' lounge, conference room, crew car, flight-planning room and Wi-Fi. The 56,000 sq ft of hangarage can accommodate aircraft up to a Global 6000.


Colorado's Gunnison Valley Aviation recently joined the Avfuel network.

CUTTER CONSOLIDATES AT DEER VALLEY

Cutter Aviation has purchased the Atlantic Aviation FBO at Arizona's Deer Valley Airport, consolidating its position at the Phoenix-area gateway, where it is now the lone full-service provider. The move doubles Cutter's leasehold on the airport, to nearly 20 acres, and boosts its hangar space to approximately 50,000 sq ft, giving it the space to accommodate the latest big business jets. The location also gained an additional 30,000-gallon fuel farm and 12,000 sq ft of office space currently occupied by one of the two large flight schools on the field.

Cutter will continue to operate both locations at the airport and intends to integrate the former Atlantic employees into its operation. The company will relocate its customer facilities and CSR staff to the newly acquired

Continues on page 62 ▶

CHARTER NEWS NOTES

- Angolan aviation authority **INCVI awarded an air operator certificate to Bestfly**, allowing the company to fly third-party charters from the country with its managed fleet of seven Angolan-registered aircraft.
- **Avjet launched a website to promote the BBJ** it offers for charter. The company recently added two more GIV-SPs and a G650 to its charter certificate. The jets are based at Avjet's headquarters in Burbank, Calif.
- Portland, Maine-based **Mac Air Group is launching QJet shares**, a program offering shared ownership of one of six Hawker 1000s. Only six shares per airplane will be sold (100 hours per year), and the hourly flying rate will be $2,850.
- Munich, Germany-based **MHS Aviation's fleet will grow to 19 aircraft** in the first quarter with the addition of a CJ2+ and Challenger 300.
- **N-Jet** of Wheeling, Ill., **has added a 2005 CJ3 to its fleet**.
- Toronto-based **Charter Air Transportation Services bought a Premier IA**, bringing its fleet to three Premiers, a King Air C90GTx and a G150. ■

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2,500-sq-ft terminal to open more tenant space. As part of the approval process with the airport authority, Cutter has committed to building a new multimillion-dollar FBO at DVT. It expects to break ground on the facility within the next year, as it negotiates a lease extension.

ATLANTIC ON LINE AT SALT LAKE CITY

Atlantic Aviation began operations last month at Salt Lake City International Airport (SLC), where it was selected as the winner of the request-for-proposal process for a second FBO.

"We are pleased to enter the Salt Lake City market," said Lou Pepper, Atlantic's CEO. "Salt Lake is a dynamic and growing city and a great complement to the Atlantic network." Since 2011, SLC has been served by one FBO when the two existing locations there were consolidated.

With its recent acquisition of Atlantic Aviation at DVT, Cutter Aviation is now the lone service provider at Deer Valley Airport. It will operate both facilities on the field.

Current service provider Tac Air acquired the business the following year.

Under the terms of the agreement, Atlantic's leasehold will have more than 17 acres of space housing four hangars totaling 31,600 sq ft. The company is operating temporarily out of the 4,000-sq-ft former Keystone Aviation terminal building, as it plans to break ground in this year's second quarter on a $25.5 million FBO complex that will have a 12,500-sq-ft terminal, an additional 30,000-sq-ft hangar capable of sheltering the latest business jets and a new fuel farm.

IRELAND GETS NEW FBO

Weston Aviation opened its fifth FBO, and its first outside the UK, last month at Ireland's Cork Airport. The Business Aviation Centre, the first dedicated FBO at the airport, has a 10,000-sq-ft hangar that can accommodate business jets up to super-midsize and direct private ramp access. The location offers a passenger lounge, crew lounge, customs pre-clearance, complimentary Wi-Fi, concierge service, rental cars and aircraft and helicopter charter.

LONDON-AREA FBO UPGRADED

London Biggin Hill Airport has put the finishing touches on a two-month-long interior renovation project on its FBO, Biggin Hill Airport Executive Handling, one of three service providers at the capital-area international business aviation gateway.

Among the improvements were the installation of modern furnishings and lighting to transform the facility, which now offers a number of discrete passenger areas and a dedicated pilots' lounge. In addition, the location adopted the FBO One aircraft handling system to help streamline its customer service. ❑

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PRELIMINARY REPORTS

CONQUEST CRASHED WHILE MANEUVERING FOR IFR APPROACH

Cessna 441, near Climax, Ga., Nov. 9, 2015–The turboprop twin collided with terrain while maneuvering near the Florida-Georgia border in daytime IMC. The aircraft had departed from Lakeland Linder Regional Airport (LAL), Lakeland, Fla., on an IFR flight plan for Cairo-Grady County Airport (70J) in Cairo, Ga.

Sixty-two miles from 70J, the pilot told ATC he was trying to "get to" VFR conditions, and if unable he would request the Rnav Runway 31 approach to the airport. Two airports in the vicinity of 70J reported IFR conditions at the time.

While flying at 3,300 feet msl 36 miles from 70J, the pilot reported the destination in sight and cancelled the IFR flight plan. Over the next 13 minutes, the radar track indicated erratic left, right and overlapping 360-degree turns, taking the aircraft farther west from its destination, with altitudes varying from 4,000 feet to 900 feet.

The pilot then re-established contact with Approach and requested the Rnav Runway 31 approach to 70J because he had lost visual contact with the airport.

The controller provided heading and altitude assignments to vector the airplane to OCAPE, the initial approach fix (IAF) for the Rnav Runway 31 approach. The aircraft failed to maintain its heading and altitude assignments, and after providing corrections ATC instructed the pilot to proceed direct OCAPE. The pilot indicated difficulty with identifying OCAPE and requested the correct spelling so that he could "load it." The pilot later acknowledged the clearance in his last transmission to ATC.

Radar tracks indicate the Conquest II climbed and descended in the vicinity of OCAPE, in a descending right turn at 2,500 feet and 180 knots, before ATC lost contact with the airplane. The commercial pilot/owner and the passenger were killed in the crash and post-impact fire.

NINE LOST IN HAWKER 700 LANDING ACCIDENT

British Aerospace Hawker HS125-700A, Akron, Ohio, Nov. 10, 2015–The aircraft departed controlled flight while on approach to land at Akron Fulton International Airport (AKR) in daytime IMC and was destroyed when it hit an apartment building and caught fire.

Operated as Execuflight 1526 as a Part 135 charter flight, the aircraft had departed from Dayton-Wright Brothers Airport (MGY), Dayton, Ohio, at 2:13 p.m. on an IFR flight plan destined for AKR. According to the FAA, the Akron-Canton terminal radar approach control facility provided the Hawker with radar vectors for the localizer Runway 25 approach procedure at AKR.

A flight instructor on board a Piper PA-28 performing flight training at AKR before the crash told investigators he "broke out at minimums" while on the localizer Runway 25 approach and landed on Runway 25. The PA-28 pilot reported he then heard one of the accident pilots state "Hawker jet on a 10-mile final localizer 25" over Unicom, and that he replied on frequency, "We broke out right at minimums." A pilot on the Hawker acknowledged receiving the information.

At 2:52 p.m., a motion-activated security camera located 900 feet southeast of the accident site captured the airplane descending in a left-wing-down attitude about 1.8 nm from the approach end of Runway 25 at AKR. An explosion and post-impact fire were then observed on the video just after the airplane flew out of the security camera's view. The pilot, copilot and all seven passengers died; no injuries involving people on the ground were reported.

Investigators accounted for the airframe, engines, primary flight controls and landing gear. The aircraft's Fairchild GA-100 cockpit voice recorder was recovered and sent to the NTSB Vehicle Recorders Laboratory for examination.

Surface weather observations at AKR immediately before the accident reported wind from 240 degrees at seven knots; visibility 1.75 statute miles in mist; ceiling broken at 600 feet agl and overcast at 900 feet agl 9 degrees.

MULTIPLE LANDING ATTEMPTS BEFORE AS350 CRASH AT CRQ

Airbus Helicopters AS350B3E, Carlsbad, Calif., Nov. 18, 2015–The recently purchased turbine-powered helicopter departed controlled flight during a landing attempt to a mobile helipad at McClellan-Palomar Airport (CRQ) in Carlsbad. The private pilot and passenger (also a certified private pilot) were killed.

The helicopter had departed from the platform earlier in the day. After departure, the FBO line crew moved the helipad from the east end to the west end of the ramp. Upon returning to CRQ approximately two hours later, the helicopter approached the helipad from the east, and into the sun, and initially landed short of the helipad with the center of its landing skids contacting the pad's front edge. Witnesses said this impact caused the helicopter to pitch back and its tail skid to contact the ground.

The helicopter then began a series of back-and-forth oscillations, and the helipad broke free from the rear left chock and rotated to the right. The helicopter spun with the helipad for a quarter turn, then rapidly climbed and rotated 270 degrees to the right. The helipad came to rest to the north, having revolved 180 degrees, and about 50 seconds later the helicopter landed on the ramp east of the helipad.

After line crews re-secured the helipad, the helicopter approached the pad from the west, and over the next four-and-a-half minutes the pilot attempted to land three times, each time coming within five and 20 feet of the platform.

Video footage of the final landing attempt, captured by a witness who had watched the prior three attempts, showed the helicopter rocked back twice against its tail skid after landing short of the pad. The helicopter then pitched forward, out of view from behind the hangar, with security camera video showing the helicopter spun left 180 degrees and pitched up 45 degrees. The tail rotor and vertical stabilizer struck the ground and separated from the airframe.

The helicopter bounced and rotated another full turn before landing hard on its left side, the main rotor blades and cabin continuing to spin along the ground for more than five minutes before the helicopter rolled onto its side and shed its main rotor blades following separation of the tail boom and horizontal stabilizer.

Investigators stated that the pilot, who had previously owned a Bell 407, purchased the AStar on Oct. 29, 2015. Since September 20, he had flown it for 8.8 hours on demonstration and familiarization flights with a certified flight instructor. The final flight was the first the pilot had flown in the AStar without a professional pilot aboard. ❑

FINAL REPORTS

NTSB: ERRONEOUS PFD DATA CONTRIBUTED TO LANCAIR FATAL

Lancair IV, near Duluth, Minn., June 7, 2014–The NTSB concluded that the pilot likely lost control of the aircraft because of spatial disorientation induced by erroneous guidance information from the flight instruments, the source of which the investigators were unable to determine. The Board also noted the pilot might have been impaired, a conclusion it reached from the presence of a sedating antihistamine in his blood, and that the aircraft was 509 pounds over max takeoff weight at the time of the crash.

The aircraft, powered by a Walter turboprop, crashed into Lake Superior after departing from Duluth International Airport (DLH), Duluth, Minn., killing the sole-occupant pilot. Marginal daytime VFR conditions prevailed at the time of the accident, and the pilot had filed an IFR flight plan to Goose Bay (YYR), Newfoundland, Canada.

The aircraft was cleared to depart from Runway 9 at DLH and climb to 6,000 feet on a heading of 060 degrees. At 11:17 a.m., the pilot contacted departure control, which instructed the pilot to turn left and fly direct to Thunder Bay (YQT) and climb and maintain 12,000 feet. The pilot did not acknowledge this instruction but responded to ATC 35 seconds later after being instructed to fly heading 030.

At 11:18 a.m. ATC instructed the aircraft to fly direct to YQT, and the pilot acknowledged the transmission. There were no further recorded radio transmissions from the pilot. The airplane continued on a northeasterly heading until 11:19, when it started to turn right to a southeasterly heading. The last radar return at 11:20 showed the airplane heading south at 2,400 feet at 201 knots.

The day before the accident flight, the pilot flew the airplane from Bend, Ore., to DLH following repairs to the autopilot. An auto-trim reverse sensing error was found to have caused the system to trim the nose up or down opposite from what was required to maintain level flight. A repair facility reinstalled the sensor correctly.

The aircraft was equipped with two synthetic vision integrated display units (IDUs) used for primary flight display (PFD) and multifunction display (MFD). A comparison of the radar track data with the flight data recovered from those displays revealed discrepancies between the two sources regarding airspeed, bank angle, heading, wind speed and wind direction, in which the flight data indicated periods of straight and level flight when the radar track data indicated the airplane was banking and changing heading.

DIFFUSER CRACKS LED TO CJ2+ UNCONTAINED ENGINE FAILURE

Cessna Citation CJ2+, Stuttgart, Germany, March 1, 2010–The German accident investigation authority determined that cracking in the diffuser assembly led to uncontained failure of one of the CJ2+'s two Williams FJ44-3A-24 turbofans, forcing an emergency landing at Stuttgart Airport (EDDS).

The incident occurred shortly after takeoff from EDDS. "Simultaneously with the retraction of the flaps from 15 degrees to 0 degrees the pilot noticed unusual vibrations and a strong left yawing moment," the report stated. "Immediately afterwards he heard the acoustic warning Left Engine Fire ... [and] the inter-turbine temperature (ITT) was far in the red area."

The pilot shut down the affected engine and pushed the engine fire switch, which turned off the fire warning. The aircraft returned to Stuttgart and made an uneventful landing. Subsequent inspection revealed apparent engine damage, and that the aft outer cowling of the left engine had been "destroyed."

Investigators later learned that the smell of smoke in the cabin had been reported on two previous flights, "eliminated by selecting the air source switch to the right engine." Crews also reported that indicated turbine temperatures in the left engine had been 20 to 30 degrees C higher than those on the right for the past six months.

At the time of the incident, Williams International had noted 17 cases of diffuser cracks with the FJ44-3A, although no reported cases in the -24 variant. In April 2010 the manufacturer issued an advisory for operators to be aware of the signs of potential damage in the diffuser assembly; as of January 2015, Williams noted that "almost all" FJ44-3A-24s in service had been refitted with a reinforced diffuser developed for the FJ44-4 series. ■

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.

Compliance Countdown by Gordon Gilbert

Within 6 Months

▶ **Jan. 14, 2016** NEW

Class A Airspace ACAS Reporting Revised

The NTSB will revise its current rule to require notification for all ACAS advisories within Class A airspace. The new rule applies only "when an aircraft is being operated on an IFR flight plan and the advisory is necessary to avert a substantial risk of collision between two or more aircraft." Pending comments, the rule will be effective Feb. 16, 2016.

▶ **Feb. 1, 2016** EXTENDED

Aviation Maintenance Technical Schools Proposal

The FAA extended the public comment period from Dec. 31, 2015, to February 1 on its notice of proposed changes to the regulations governing the curriculum and operations of FAA-certified aviation maintenance technician schools. These amendments would "modernize and reorganize the required curriculum subjects in the appendices of the current regulations," the agency said. "They would also remove the course content items currently located in the appendices and require that they be placed in each school's operations specifications so they could more easily be amended when necessary." Existing curriculums are "outdated, do not meet current industry needs, and can be changed only through notice and comment rulemaking," says the agency.

▶ **Feb. 5, 2016** NEW

EASA Airworthiness Rule Changes Proposed

The European Aviation Safety Agency is proposing changes to airworthiness certification rules that it says provide "clearer requirements/guidance on those aspects creating interpretation/standardization problems; removes those requirements that do not bring any safety benefits; facilitates the transfer of aircraft between member states; and reinforces the oversight role of the national aviation authorities."

▶ **Feb. 14, 2016** NEW

OSHA Updated Safety and Health Program Management

The draft of updated guidelines for OSHA's Safety and Health Program Management has been published for public comment. The guidelines, a voluntary compliance program, were first published in 1989 and are being updated to reflect modern technology and practices. Comments are due by Feb. 14, 2016.

▶ **Apr. 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.

▶ **March 4, 2016**

Contract Maintenance Requirements

Certain Part 135 on-demand operators have until March 4, 2016, to comply with new requirements. Under the new rules, Part 135 on-demand operations flying aircraft with 10 or more seats (excluding pilot seats) are required to develop FAA-acceptable policies, procedures, methods and instructions when using contract maintenance. It also requires these operators to provide a list to the FAA of all people with whom they contract their maintenance.

▶ **May 4, 2016**

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 potentially leading to accidents, are based on ICAO standards and recommended practices, as well as procedures being developed by the EASA in consultation with leading industry experts.

▶ **June 8, 2016**

European ADS-B OUT Mandate

The 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.

Within 12 Months

▶ **Aug. 25, 2016**

European Safety Standards for Private Operators

Europe's new rules for so-called "non-commercial operations with complex motor-powered aircraft" will affect all private operations with large business turbine airplanes and helicopters. Between now and Aug. 25, 2016, which is the final deadline for implementation, owners must develop safety management systems and take other required steps to bring their aircraft and operations to a level of compliance that is "up to the safety standards of commercial operators."

Beyond 12 Months

▶ **Feb. 2, 2017** NEW

Australian ADS-B Mandate

The Civil Aviation Safety Authority of Australia is implementing new regulations and aircraft equipment mandates to align the nation's operations with global standards set by ICAO. The new rules contain a number of equipment mandates that culminate on Feb. 2, 2017. After that date IFR-rated pilots and aircraft must comply with ADS-B equipment and operational requirements to fly in Australia.

▶ **Nov. 8, 2018**

ICAO Adopts 15-min. Position Reporting

The International Civil Aviation Organization Council adopted a tracking standard for certain international flights that requires crews to report their aircraft's position at least every 15 minutes. It will become effective in March 2016 and applicable Nov. 8, 2018. The new requirement will be formalized as Amendment 39 to Annex 6–*Operation of Aircraft*, Part I. The new standard is the outcome of recommendations stemming from the disappearance of Malaysia Airlines Flight MH370 while en route from Kuala Lumpur to Beijing, China, on March 8, 2014. The search for that aircraft continues. ❑

Completion & Refurbishment

by James Wynbrandt

Lufthansa Technik Hands Over Head-of-state 747

After more than two years of work, Lufthansa Technik has delivered the first of three head-of-state 747-8 conversions the company is performing simultaneously for an undisclosed customer at its Hamburg headquarters. Each 4,700-sq-ft cabin is individually designed and equipped with custom hand-made parts incorporating more than 300 different finishing materials. The first completion includes a large conference room, lounge, bedroom and several bathrooms with showers. An integrated and complex cabin management and onboard entertainment system delivers broadband Internet, GSM, WLAN, Live TV and satcom.

Lufthansa Technik is also performing completions on two Royal Jet BBJs at the Hamburg facilities, with redelivery slated for the third and fourth quarters. New York's Edese Doret designed the 34-passenger interiors, each providing private master bedroom and bathroom, large lounge area and business and economy class areas. Abu Dhabi-based Royal Jet operates six BBJs.

MNG Jet Refurbs Challenger 604

A 17-year-old Challenger 604 looks brand new after Istanbul's MNG Jet refurbished the aircraft with new carpet, new seat leather, sidewall and ceiling leather, complete wood veneer change, metal plating and new seat belts, as well as USB data loader modification and EFB installation on the flight deck. The lavatory and galley were also refurbished. The work was completed in 12 weeks during a scheduled 96-month inspection and landing-gear overhaul. MNG Jet is now preparing for its first Global Express refurbishment when the jet comes in for an 8C check in the first quarter.

MNG recently refurbished a Challenger 604 during the aircraft's 96-month inspection.

Lufthansa Technik, Mercedes-Benz Unveil Plans for VIP Cabin

Six months after announcing their collaboration at EBACE 2015 in Geneva, Mercedes-Benz and LT unveiled their VIP cabin design floor plan. A helix structure creating a dynamic spiral layout is the central design concept, producing independent spatial zones without the typical configuration of seat and wall elements. The refined design has added cabin sections around the already presented mid-cabin lounge area. The forward area features a foyer, galley, a private room and lavatory. The aft cabin combines a separate entertainment zone with an en suite private area featuring an open design bathroom and bedroom conceived around a freestanding shower with transparent sidewalls and a king size bed framed by an upholstered concave head wall. The 16-passenger interior can be incorporated into any single-aisle airliner undergoing conversion.

BizJet International Delivers BBJ to Chinese Customer

BizJet International, Lufthansa Technik's U.S.-based single-aisle completion specialist, delivered a newly completed BBJ to China's Jing Cheng Group (JCG) with a formal signing of the certificate of final acceptance and the interior acceptance certificate at a ceremony at the company's Tulsa, Okla. facility. Representatives of the Civil Aviation Authority of China presented JCG with the jet's standard airworthiness certificate, certificate of registration and radio license at the ceremony. Designed to transport company associates, the 29-passenger interior has two VIP sections and a business class section in the center. This is BizJet's ninth executive interior completion for an East Asian customer.

The adjustable bed in the VIP section of this BBJ, completed by BizJet, allows the passenger to maintain a level pitch regardless of the aircraft's attitude.

Global Express Gets Cabin Refresh at OHS Aviation Services

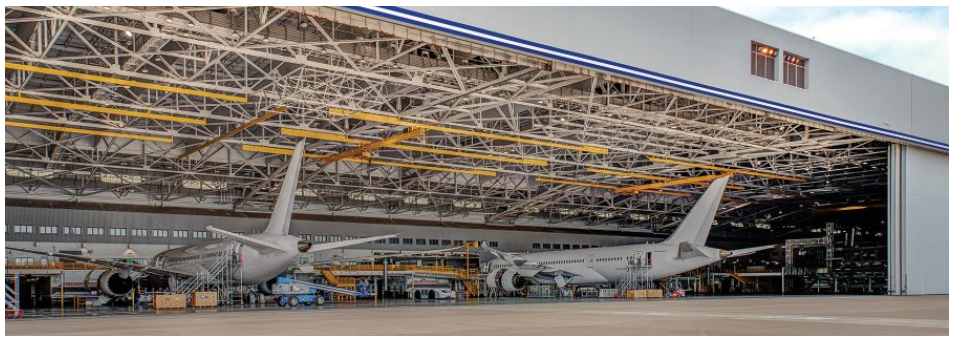
OHS Aviation Services has refurbished the interior of a Global Express in less than eight weeks, the 15th cabin makeover the Berlin-based company has performed on the model. The cabin design by Tim Callies for ArcosJet Design used a palette of dark chocolate brown, light cream and nuances of green, and included new seat design, seat belts, carpet, counter tops, sidewall and ceiling coverings, divan re-covering, wood veneer rework, and individualized accessories such as monogrammed towels and pillows, with fabrics from Dedar and Hermés.

Duncan Installs Stone Floor in Falcon 2000

Duncan Aviation entered the stone age as the Lincoln, Neb.-based MRO completed installation of the first F/List stone floor in a Falcon 2000. The 2.5-mm-thick granite (marble is also available) sits on a lightweight panel substructure, adding little weight over standard flooring, according to the Austrian company. The stone meets all applicable certification requirements. It is available in various colors and can be enhanced with customized tiling concepts, mosaics, borders, logos and other design options.

Gulfstream Chooses MSB Design Table

MSB Design's Hi-Lo conference tables are now available as a line-fit option on the G500/G600, the aircraft for which the latest manual versions of the table were designed. The new table features a slimmed pedestal and carpet pinch beauty ring. The Montreal company also offers an electric pedestal version that can be operated by Bluetooth, changing between dining and coffee table modes; and an optional oval shroud converting the standard round or square shape into an elegant oval. The table can support 600 pounds of load and survive 1,400 pounds in the deployed position. ■



GDC Technics has made major investments in new cabin interiors technology for its facilities in Fort Worth (pictured here) and San Antonio in Texas. The company also has engineering support from its subsidiary in Munich, Germany.

GDC's new cabin interior tech raises the bar for completions

by Charles Alcock

Completions specialist GDC Technics has rolled out an array of new technology developed in-house to provide more advanced options for outfitting and modifying private and business aircraft.

After investing approximately $30 million in five areas of technology, the Texas-based group is now applying its new capabilities to an "Engineering the Impossible" strategy unveiled in November.

"We're trying to challenge the conventional wisdom in designing VIP cabins," said GDC general partner Mohammed Alzeer. "We deliver airplanes that look as good on the inside as they look on the outside, and this means there have to be the latest and greatest technologies adding value for customers."

By adopting new fabrication techniques and advanced materials, GDC says it is producing cabin interiors that are some 20 percent lighter than those specified by the airframers themselves. "That can mean additional payload, fuel savings and more range for our customers," said Alzeer.

Big Weight Reductions

For a private Boeing 787, for example, GDC believes it could reduce the overall weight of a cabin interior to around 40,000 pounds from just over 50,000 pounds thus far. Among the techniques used are eliminating heavier metal pins and glues in favor of mortise and tenon joints, and also the adoption of carbon-fiber panels with about two-thirds the weight of earlier Nomex materials.

GDC is using 3-D printing techniques to make lightweight cabin and in-flight entertainment components, such as precision tuned speaker housings. Having invested in advanced 3-D printing machinery, the company is using it to miniaturize certain items in pursuit of further weight savings.

Another aspect to GDC's innovation is the introduction of its Synchronicity 3-D engineering software, which allows engineers in the group's various locations to work more collaboratively to reduce development times for projects, using the latest Catia v6 design software. "We have linked engineering to program management to more efficiently map out every aspect from design to implementation," explained Alzeer. "We have to be completely synchronized for STCs."

At the same time, 3-D virtual reality interfaces are allowing GDC's designers to show clients exactly, to scale, how their preferences for cabin interiors will look in practice. This can accelerate the process for adjusting designs and ensure that the end product more closely matches what the customer wants.

The use of Catia v6 3D has helped GDC to reduce the margins it allows in developing cabin structures, resulting in less waste of materials. "The use of these systems means that engineers and technicians in our various facilities can collaborate more quickly and effectively, minimizing the need for fit checks on the aircraft. This is helping us to beat our own schedules," said Alzeer.

"We're trying to eliminate the gaps [between client expectations and what can be delivered]," explained Alzeer. "This allows us to take the wishes of the aircraft owner and have the designer transform it into a 1:1 scaled three-dimensional image showing exactly how the cabin would look when finished. At that point it's easier to refine the finished product so that it completely matches what the owner dreamed of."

GDC's efforts to apply higher technology to completion projects also benefit from the contribution of its new GDC Engineering subsidiary in Munich, Germany. The aircraft engineering specialist has been directly involved in design work on cabins for the 787 and A350.

GDC, which has facilities in San Antonio and Fort Worth, is introducing new materials such as high-definition film and hydrographic coatings that are a more environmentally friendly and less flammable alternative to wood veneers. These materials are more easily repairable and can be more readily reproduced to allow designs to be easily changed. ❑

People in Aviation Compiled by Kerry Lynch

Nexus appointed **Omar Halawani** president and CEO. Halawani previously spent five years as president and CEO of Masarat Aviation Consulting and before that held roles with Maz Aviation Consultants, Flynas and NetJets Middle East. He succeeds **Abdullah Al-Sayed**, who became chairman of the Saudi Arabia-based flight operations services company.

Denis Jubinville was named president of newly launched aircraft acquisitions and sales company *The Dow Group*.

Loic Nicolas has founded *Aero Market & Business Development*, a Paris-based consultancy that will provide business aviation market analysis for prospective aircraft models. Nicolas brings more than 25 years of business aviation experience to his new role, having served as general manager-business aviation market for Snecma (Safran Group), director of business development and strategy for Hispano Suiza, director of marketing and sales-aircraft engines and equipment for Honeywell Aerospace and director of marketing and sales for Thomson-Auxilec (now Thales Group).

Brant Dahlfors is teaming with **Mark Bloomer** of the business jet transaction consultancy Bloomer deVere Group Avia to create *Bloomer deVere Dahlfors*.

Jeffrey Gilley, *NBAA*'s longtime director of airports and ground infrastructure, retired. Gilley, who joined the association in 1999, has been the association's expert on airport access and advocacy issues, serving as staff liaison to the NBAA Access Committee and handling high-profile access issues in Burbank, Santa Monica, Naples and Teterboro, among many others.

Steve Foley joined *Solairus Aviation* as executive v-p.

Dustin Cordier joined *jetAviva* as v-p of sales. Cordier has served as an executive for both Cessna and Embraer Executive Jets.

Acropolis Aviation appointed **Kuky Salazar** v-p for the U.S. and Latin America. Salazar has more than two decades of business aviation experience, holding executive positions at Private Aviation Solutions, Presidential Aviation and NetJets/Executive Jet Aviation.

Wyvern appointed **John Meehan** vice president of global sales and promoted **Tony Ciaravino** to East Coast regional director of sales.

Executive AirShare named **Matt Druten** CFO and promoted **Kyle McCracken** to director of scheduling and **Lori Harlow** to v-p of accounting and controller.

Stellar Labs named **Fred Powell** v-p of operator systems and

Final Flight

Mayo Aviation founder **Gwendolyn Lee Olson Mayo** died November 20. Born in 1932 in Minneapolis, Mayo earned a Ph.D. in organic chemistry from the University of Minnesota and had served as a research chemist for the University of Colorado before launching Mayo Aviation in 1978.

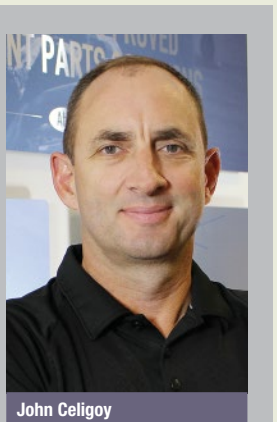
Under her leadership, Mayo Aviation grew into an established charter and management business that operates aircraft from turboprops to heavy jets and also has a certified repair station. Based at Centennial Airport in Denver, Mayo also has had a 36-year partnership with Flight for Life Colorado.

Mayo was the first woman chair of the National Air Transportation Association and won that organization's William A. (Bill) Ong Memorial Award in 1978. She was inducted into the Colorado Aviation Hall of Fame and was recognized with NBAA's Silk Scarf Award. ■


Denis Jubinville


Steve Foley


Kuky Salazar


John Celigoy

Wendy Burton director of operator relations and integration.

Able Aerospace Services appointed **John Celigoy** v-p of business generation.

Parker Aerospace promoted members of its leadership team. **Guy Martin**, who had been with Parker since 1983 and most recently was vice president and general manager of the fluid systems division, was appointed vice president of operations for airframes and actuation. Succeeding Martin at the helm of the fluid systems division is **Manuel Bajaksouzian**, who has served with the company since 1984 and most recently was vice president and general manager of Parker Aerospace's gas turbine fuel systems division. **David Overholt**, who had been general manager Parker's Advanced Atomization Technologies joint venture with GE Aviation, becomes vice president and general manager of the gas turbine fuel systems division. Succeeding Overholt is **Steve O'Connor**, who has served with Parker since 1983 and most recently was a regional business unit manager for Parker Aerospace's fluid systems division. Also, **Austin Major** has been named vice president of Parker Aerospace's customer support operations.

C&L named **Calvin Tuitt** senior v-p, MRO.

Scott Latino joined **English Field Aviation** as avionics manager. Field has 30 years of experience as an avionics technician and has owned and operated his own repair station for 10 years.

FlightSafety International appointed **Andy Parrish** as manager of its learning center in San Antonio, Texas. He succeeds **Gil Viera**, who became a program manager at FlightSafety's Orlando center.

FreeFlight Systems named **Ashley Kelly** inside sales manager and **Kyle Williams** regional sales manager. Kelly rejoins the company with eight years of experience in the avionics industry.

Dumont Aviation promoted **Michael Wallace** to director of maintenance of Dumont Aviation BMI in Bloomington, Ill. Wallace, who joined Dumont Aviation in 2011, previously spent 10 years with Avcraft Technical Services.

Kevin Gettemeier joined *AV8MRO* as the company's technical sales representative. Gettemeier has 40 years of experience in flying, aircraft maintenance, operations and business development.

Nikolaus Ludwig has joined the instructor staff of *Global Jet Services*.

Guardian Jet named **Richard Smith** and **Earl Kessler** regional sales leaders. Smith, who is vice president of sales for the South Central U.S., previously was vice president at Business Aircraft Leasing. Kessler, who serves as sales director, previously spent 20 years as a partner in Resource Management & Development, a Reno-based real estate and development firm.

Meridian appointed **MaKayla Hambek** as an aviation sales executive at Meridian Air Charter. Hambek previously served with Castle & Cooke Aviation and before that was with Baymark Aviation at Van Nuys Airport.

Gregory Laabs was named director of MRO services for *Banyan Air Service*. ❑

Awards & Honors

The Wichita Aero Club will present the fifth Wichita Aero Club Trophy to volunteers and members of **Doc's Friends**, the organization restoring a Wichita-built B-29 to flying condition. The trophy was established to honor a living person, group or existing organization with a strong relationship to the greater Wichita area that has distinguished itself in the field of aviation or aerospace. The trophy will be presented January 23 at the Aero Club's annual Trophy Gala. ■

AIN Calendar

See www.ainonline.com for a comprehensive long-range aviation events calendar.

JANUARY

ERAU WEBINAR: CHALLENGES FOR THE AIRCRAFT MRO INDUSTRY…Jan. 14, Embry-Riddle Aeronautical University, Daytona Beach, FL. Info: http://worldwide.erau.edu/webinars.

▲ **SCHEDULERS AND DISPATCHERS CONFERENCE**…Jan. 19-22, Tampa Convention Center, FL. Info: (202) 783-9000; www.nbaa.org.

BAHRAIN INTERNATIONAL AIRSHOW… Jan. 21-23, Sakhir Airbase, Bahrain. Info: www.bahraininternationalairshow.com.

FEBRUARY

BUSINESS AIRCRAFT FINANCE, REGISTRATION AND LEGAL CONFERENCE…Feb. 10-12, Boca Raton, FL. Info: (202) 783-9000; www.nbaa.org.

AIRCRAFT FINANCING AND LEASING IN ASIA… Feb. 14, Sheraton Towers, Singapore Hotel, Singapore. Info: +44 20 8123 7072; www.aeropodium.com.

◆ **SINGAPORE AIRSHOW…**Feb. 16-21, Changi Exhibition Center, Singapore. Info: +65 6542 8660; www.singaporeairshow.com.

LEADERSHIP CONFERENCE…Feb. 22-24, San Antonio, TX. Info: (202) 783-9000; www.nbaa.org.

MARCH

◆ **HELI-EXPO**…March 1-3, Louisville, KY. Info: (703) 683-4646; www.rotor.org.

AIR CHARTER SAFETY SYMPOSIUM… March 8-9, NTSB Training Center, Dulles, VA. Info: (888) 723-3135; www.acsf.aero.

ABU DHABI AIR EXPO…March 8-10, Al Bateen Executive Airport, Abu Dhabi, United Arab Emirates. Info: +971 (0) 2 419 2714; www.abudhabiairexpo.com.

WORLD ATM CONGRESS… March 8-10, IFEMA, Madrid, Spain. Info: (703) 299-2430; www.worldatmcongress.org.

EUROPEAN CORPORATE AVIATION SAFETY SUMMIT…March 9, 20 Primrose St., London, England. Info: www.aeropodium.com.

WOMEN IN AVIATION INTERNATIONAL CONFERENCE...March 10-12, Gaylord Opryland Resort and Conference Center, Nashville, TN. Info: (937) 839-4647; www.wai.org.

SINGAPORE AVIATION SAFETY SEMINARS … March 14-18, Singapore Aviation Academy, Singapore. Info: www.flightsafety.org.

AIN NEXTGEN WORKSHOP…March 15, Embry-Riddle Aeronautical University, Daytona Beach, FL. Info: (203) 798-2400.

INTERNATIONAL OPERATORS CONFERENCE… March 21-24, San Diego, CA. Info: (202) 783-9000; www.nbaa.org.

WORLD AVIATION SAFETY SUMMIT…March 23-24, Dubai, United Arab Emirates. Info: aviationsafety.ae.

APRIL

AIRCRAFT INTERIORS EXPO…April 5-7, Hamburg Messe, Germany. +44 03 840 5686; www.aircraftinteriorsexpo.com.

▲ **SUN 'N' FUN**...April 5-10, Lakeland Regional Airport, Lakeland, FL. Info: (863) 644-2431; www.sun-n-fun.org.

◆ **ASIAN BUSINESS AVIATION CONFERENCE & EXHIBITION…**April 12-14, Shanghai, China. Info: (202) 783-9000; www.abace.aero.

RACCA 2016…April 26-28, Hilton Scottsdale Resort, Scottsdale, AZ. Info: (508)747-1430; www.raccaonline.org.

AIRCRAFT ELECTRONICS ASSOCIATION ANNUAL CONVENTION...April 27-30, Orlando, FL. Info: (816) 347-8400; www.aea.net.

MAY

AVUSI XPONENTIAL…May 2-5, Ernest N. Morial Convention Center, New Orleans, LA. Info: www.xponential.org.

MAINTENANCE MANAGEMENT CONFERENCE… May 3-5, Kansas City, MO. Info: (202) 783-9000; www.nbaa.org.

BUSINESS AVIATION SAFETY SUMMIT… May 5-6, Austin, TX. Info: www.flightsafety.org.

NBAA BUSINESS AVIATION TAXES SEMINAR… May 6, Washington, D.C. Info: www.nbaa.org.

REGIONAL AIRLINE ASSOCIATION CONVENTION…May 9-12, Charlotte, NC. Info: www.raa.org.

AHS ANNUAL FORUM AND TECHNOLOGY DISPLAY…May 17-19, Palm Beach County Convention Center, West Palm Beach, FL. Info: vtol.org.

AIR TRAFFIC CONTROL TECHNICAL SYMPOSIUM…May 17-19, Resorts Hotel and Casino, Atlantic City, NJ. Info: (703) 299-2430; www.atca.org.

◆ **EUROPEAN BUSINESS AVIATION CONVENTION & EXHIBITION**…May 19-21, Palexpo, Geneva, Switzerland. Info: www.ebace.aero

JUNE

FLIGHT ATTENDANTS/TECHNICIANS CONFERENCE…June 21-23, Delray Beach, FL. Info: (202) 783-9000; www.nbaa.org.

JULY

◆ **FARNBOROUGH INTERNATIONAL AIRSHOW**…July 11-16, Farnborough Airport, United Kingdom. Info: +44 (0) 1252 532 8000; www.farnboroughinternational.org.

EAA AIRVENTURE…July 25-31, Wittman Regional Airport, Oshkosh, WI. Info: www.eaa.org.

AUGUST

◆ **LATIN AMERICAN BUSINESS AVIATION CONFERENCE & EXHIBITION**… August 23-25, São Paulo, Brazil. Info: www.abag.org.br.

NOVEMBER

◆ **NBAA BUSINESS AVIATION CONVENTION & EXHIBITION**…November 1-3, Orange County Convention Center, Orlando, FL. Info: (202) 783-9000; www.nbaa.org.

◆ Indicates events at which **AIN** will publish on-site issues or distribute special reports.

▲ Indicates events for which **AIN** will provide special online coverage or e-newsletter.

● Indicates events at which **AIN** will broadcast AINtv.com.

THE FUTURE OF FLIGHT AWAITS

The future of the aerospace industry beckons at Singapore Airshow 2016. Don't miss this incredible opportunity to gather ground breaking intel, network and exchange ideas with the who's who in the global aviation industry alongside the region's top government and defence delegations. Register your attendance today!

AIRSHOW HIGHLIGHTS

- 2016 Feature Country: France
- Aerospace Emerging Technologies Zone
- Training and Simulation Zone
- Singapore Airshow Aviation Leadership Summit 2016
- Business Forums
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