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NIGEL MOLL

PILOT REPORT: QUEST KODIAK

AIN editor Nigel Moll puts the float-equipped turboprop through its paces on the Finger Lakes in Central New York. The amphib is in its element charging through chop on the water or in the air. **Page 36**

Circling approach at TEB: more leeway than you think

by Sean Broderick

Against the backdrop of the May 15 fatal Learjet 35 accident there, Teterboro Airport (TEB) stakeholders used a recent users' group meeting to discuss circling approaches, specifically best practices and the challenges that both pilots and ATC face. The consensus: the most promise for mitigating risk lies in ensuring that pilots have a better understanding of what they are expected to do and what they're allowed to do.

The July 19 meeting attracted 40 operators, airport officials, corporate representatives and New York-area controllers. The discussion focused on the Runway 1 approach, which is flown by setting up for an ILS approach to Runway 6, turning right after the TORBY intersection, and circling around for a visual approach to Runway 1.

The approach, which necessitates a late line-up on Runway 1 to accommodate Newark International Airport (EWR) traffic to the south, is used only in VFR conditions when wind or other issues make Runway 6 unavailable, controllers said. The maneuver to Runway 1 can lead aircraft over the 82,000-seat outdoor stadium and 19,000-seat indoor arena of the Meadowlands Sports Complex in East Rutherford, N.J., about a mile south of TEB. There is also a cluster of 675-foot-tall radio towers next to the sports complex.

Controllers from TEB tower and New York Tracon highlighted a few misconceptions about the approach. They underscored that a TFR in force during sporting events that covers airspace in a 3-nm radius from the stadium up to 3,000 feet agl does not apply to TEB traffic in contact with ATC.

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U.S. lawmakers seek to boost FAA funding

by Kerry Lynch

The U.S. House and Senate Appropriations Committees agreed to scale up the FAA's budget in Fiscal Year 2018, but neither set aside funds to facilitate the proposal to create an independent air traffic control organization. In fact, the Senate version of the Fiscal Year 2018 Transportation, Housing and Urban Development and related agencies bill would outright ban such a transition.

The Senate committee in late July approved the Fiscal Year 2018 Transportation, Housing and Urban Development and related agencies bill, calling for a $16.97 billion budget for the FAA. This funding would mark an increase of more than $500 million over this year's levels and an $800 million boost over the White House request. The bill would also provide $300 million more than the House version.

Earlier in July the House Appropriations Committee approved a $16.6 billion budget for the FAA in Fiscal Year 2018.

In addition, the Senate bill would prohibit the use of funding "to plan, design or implement the privatization of the air traffic organization functions." In report language accompanying the bill, the committee rejected the proposal to create an

Continues on page 60 ▶

JOINING THE CLUB

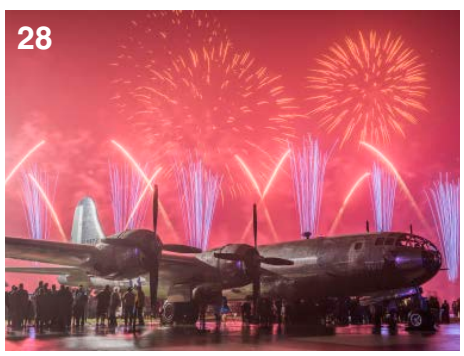
MEMBERSHIP: THE NEW ACCESS PARADIGM

In not even five years since their inception, membership programs have created a new class of business aviation access while changing charter industry practices and perceptions of customer habits. **AIN** provides an overview of the companies at the forefront of defining the paradigm. **Page 20**

Inside this issue

COCKPIT AVIONICS: PART 2

New rules allowing the use of enhanced flight vision systems below 100 feet on an instrument approach are unleashing wider adoption of more informative and intuitive head-up displays for business aviation. We examine who is leading the way, and what their efforts mean for business aviation operations. **Page 48**



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As we go to press

BIZJET SHIPMENTS UP, TURBOPROPS DOWN

The General Aviation Manufacturers Association reported shipment of 561 airplanes in the second quarter, compared with 547 in the same period a year ago. Billings for airplanes in the quarter inched down to $5.311 billion, from $5.376 billion a year earlier. For the first half as a whole, deliveries were up 2.7 percent to 995 airplanes, and billings softened 3.4 percent to $9 billion. Despite five fewer shipments in the second quarter, business jet shipments in the first half rose 1 percent, to 295. Deliveries of pressurized turboprops fell 9.6 percent year-over-year in the first half, to 104 aircraft. Notably, King Air deliveries plummeted 58.1 percent in the first six months, to 31. But turboprop deliveries at Piper soared 137 percent in the first half as it ramped up M600 production, delivering 15 of the new turboprop singles during this period.

TESTBED UNVEILED FOR ECLIPSE 700 WING

Albuquerque, N.M.-based One Aviation unveiled the first of three planned prototype aircraft on August 16, each testing components for the Eclipse 700 (aka "Project Canada") variant of the Eclipse 500. The first aircraft, built from an experimental Eclipse 500, sports an aerodynamically conforming version of the new aircraft's larger wing. One Aviation CEO Alan Klapmeier said the decision to fly the new wing on an existing airframe represents "the lowest-risk approach, at the lowest cost and the best schedule to learn most about the new wing." The company plans a similar approach on subsequent aircraft outfitted with the Eclipse 700's Williams FJ33-5A turbofans and Garmin G3000-based avionics.

TWEENS NEGOTIATE HANGAR DEAL AT SNA

A middle school field trip to ACI Jet at John Wayne Airport (SNA) in Orange County, Calif., led to an agreement—inked entirely between two tweens who met at the event—to base a Falcon 900 at the FBO. Sixth graders Gavin and Jake [Ed. note: last names were withheld by ACI Jet since they are minors] drafted the hangar agreement soon after recognizing an aviation connection during the field trip. Jake is the son of an ACI Jet manager and Gavin the grandson of John Dahlberg, owner of the Falcon 900. "Gavin and Jake were granted the authority by their respective parents and grandparents to make the deal happen," said ACI Jet president William Borgsmiller.

JET AVIATION TO CLOSE CPS COMPLETIONS BIZ

Jet Aviation plans to shut down its St. Louis completions and maintenance center, in preparation for the transition to a maintenance operation to be operated by sister company Gulfstream Aerospace. According to Jet Aviation, it has notified the employees at the St. Louis Downtown/Cahokia Airport (CPS) facility of pending staff reductions, which are expected to affect some 330 workers—half of the location's workforce. The layoffs will be implemented in several phases through next year's first quarter. Jet Aviation will continue to operate the FBO.

HONDAJET, PHENOM 300 SPAR FOR SALES TITLE

If midyear results are any indication, the HA-420 HondaJet could be the most delivered light jet this year. If it pulls off the feat, the HondaJet would assume the title from the Embraer Phenom 300, which has been the best seller in this category for four years running. According to the latest statistics from GAMA, Honda Aircraft delivered 24 HondaJets in the first half, while Embraer shipped 20 Phenom 300s. However, JetNet iQ's forecast is calling for shipment of 60 Phenom 300s and 42 HondaJets this year. "Embraer tends to have a strong fourth quarter; it delivered 25 Phenom 300s in the fourth quarter last year," said JetNet iQ managing director Rollie Vincent.

GLOBAL 7000 TESTS CONTINUE AFTER FLAMEOUT ON FTV2

Bombardier said there is "no impact" to the Global 7000 program schedule as a result of an in-flight flameout of the right GE Passport engine on flight-test vehicle 2 (FTV2, registry C-GBLB) on August 15. According to a Transportation Safety Board of Canada preliminary report, FTV2 "experienced an in-flight flameout of the right engine following high vibration and high inter-turbine temperature readings." The flight crew declared an emergency and landed at Wichita Dwight D. Eisenhower National Airport. The incident happened as FTV2 was being operated by the company's Wichita-based flight-test group while flying over Kansas at FL410. A Bombardier spokesman told **AIN** that the three in-service flight-test vehicles have been cleared to continue all test points and that the Global 7000 will still enter service in the second half of next year.

BACA SEEKS REVIEW OF COST-SHARING REGS

Worried about the potential use of flight cost-sharing apps as a platform for illegal air charter, the Baltic Air Charter Association (BACA) is seeking an "urgent review" of regulations that currently permit such cost-sharing. The association wants global regulatory authorities to work together with the industry to develop standards that "maximize safety and security on all cost-sharing flights."

Legal battles rage on over SMO decision

by Kerry Lynch

The Santa Monica city council in California has agreed to a $3.5 million "guaranteed maximum price" contract to Aecom to shorten the runway at Santa Monica Airport (SMO) to 3,500 feet from 4,973 feet. The August 8 approval of the contract is in line with the city's timeline to begin work on shortening the runway next month and complete the project by December 7, when new FAA charts are ready for release.

A January 28 settlement between the FAA and the city cleared the way for not only trimming the runway but also closing the airport forever on the last day of 2028. The city anticipates the shorter runway will reduce jet traffic by 45 percent and says, "Regaining local control of land use at SMO and reducing the health and safety impacts on adjacent residents is one of the city council's strategic goals."

NBAA and five other aviation stakeholders filed a lawsuit with the U.S. Court of Appeals, District of Columbia Circuit, in February challenging the agreement between the FAA and the city. But NBAA director of airports and ground infrastructure Alex Gertsen does not expect the court process to conclude for another year—well after the city's timeline for shortening the runway. In May the court denied the association's request for an injunction against shortening the runway. NBAA appealed to the city to allow the process to work its way through the courts before taking action on the runway, but the city moved ahead, dismissing NBAA's arguments.

Initial plans for shortening the runway, however, will not destroy any runway pavement, instead involving repainting, moving navaids, removing taxiways and installing new taxiways to accommodate the shorter runway.

The city council had already awarded a design contract to Aecom to define the runway-shortening project at Santa Monica. Final design completion was anticipated last month, with site preparation beginning in September. According to Nelson Hernandez, a senior advisor to the city manager on airport affairs, the airport will be frequently closed from 9 p.m. to 7 a.m. to accommodate the work. In addition, the city anticipates a seven- to 14-day "hard closure" period.

The runway at Santa Monica Airport will be shortened to 3,500 feet from 4,973 feet, which is expected to reduce the amount of jet traffic at the airport by half.

While the initial plan would keep pavement intact, the city noted that "staff has begun the process of developing options for removal of excess runway pavement (as the result of the runway shortening)," and anticipates presenting those proposals to the city council late this month. Gertsen said that removal of runway pavement could be a much costlier endeavor, with environmental ramifications.

But as the city moves forward with the runway project, so too does the aviation groups' lawsuit. On August 16 NBAA and five other stakeholders filed a brief to the courts, saying the settlement agreement must be vacated.

The groups charge that in signing the settlement agreement, the FAA disregarded the statutory requirements for a study under the Airport Noise and Capacity Act (ANCA); ignored the requirement to show that releasing SMO from its obligations would benefit aviation; neglected to document requirements rooted in the National Environmental Policy Act (NEPA); failed to provide the mandatory opportunity for public notice and comment; and did not follow other legal requirements.

"The agreement, whether reasonable or unreasonable, circumvented statutory and regulatory protections that Congress, and the FAA itself, long ago emplaced to ensure that the national interest in aviation and airports could not be disregarded

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JetAviva rises in the pre-owned game

by Curt Epstein

Aircraft brokerage jetAviva's two latest company acquisitions have propelled it, in little more than a year, to become one of the largest pre-owned aircraft sales organizations in the U.S., if not the largest. The company announced in July that it had purchased Texas-based Citationjet specialist Jet Quest. JetAviva purchased Kansas Aircraft in May last year and subsequently relocated its main office to Kansas City.

According to jetAviva CEO Cyrus Sigari, the latest deal "gives us, I believe, the largest sales force in the world in terms of pre-owned sales organization, certainly the largest for Citations and Embraers." He added that while his company has conducted large-cabin transactions, its sweet spot lies in the light to midsize categories. "In fact, our pre-owned Citation sales team is larger than Cessna's and we've got product specialists in every type of airplane."

The light jet segment, it seems, has done a 180 in just a few years. "Light jets are very active right now," Sigari told **AIN**. "We had the busiest month we've ever had in July." Currently, the company is on a pace to conduct 140 jet and turboprop transactions this year.

Among the hottest aircraft, according to Sigari, is the Phenom 300, which he praised for its extraordinary value. Some 400 Phenom 300s have been built, and 13 are currently for sale, he explained.

He believes aircraft such as the Cessna CJs, the Mustang and the Phenom 100 are also seeing more activity as prices have come down.

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NEWS BRIEFS Compiled by Chad Trautvetter

ADS-B OUT Could Eliminate RVSM Application Process

The FAA has issued a notice of proposed rulemaking (NPRM) that would eliminate the requirement for operators to apply for an RVSM authorization when their aircraft are equipped with qualified ADS–B OUT systems. "Continual monitoring enabled by ADS–B OUT provides more height-keeping performance data for individual aircraft and enables the FAA to identify poor altimetry system error performance sooner, allowing quicker mitigation of any risk posed by poor-performing aircraft," the FAA said. Additionally, operators of ADS–B OUT-equipped aircraft would be able to begin RVSM operations immediately. Comments are due by September 6.

Retrofits Driving Gains in Avionics Sales

Business and general aviation avionics sales inched up 2.7 percent overall in the first half of this year to $1.145 billion, according to the latest Aircraft Electronics Association (AEA) Avionics Market Report. But the improvement comes from gains in the retrofit market, which offset a decline in forward-fit applications. The industry recorded $1.115 billion in sales during the same period last year, AEA said. In the first half this year, the retrofit market accounted for 56.2 percent of avionics sales, with forward-fit applications amounting to 43.8 percent. In the second quarter of this year, avionics sales improved 5.4 percent year-over-year globally, to $579 billion.

Flight Proves Global Xpress Coverage

Inmarsat recently completed an around-the-world test flight of Global Xpress, the company's satellite-based Ka-band, high-speed broadband network. The exercise, conducted on a Gulfstream IV, covered 25,000 miles and demonstrated that Global Xpress can deliver "seamless, worldwide coverage across multiple spot beams and satellites." During the flight, Global Xpress supported voice, data and streaming applications, high-speed internet access and file transfer, VPN and phone calls.

U.S. Bizav Flying Up in July

This past July marked the busiest July for business aircraft flying since 2009, but the 1.4-percent year-over-year gain was driven solely by charter and fractional activity, according to Argus data. Notably, there was a 9-percent drop in overall activity during the July 4th holiday week, it said. July's results were propelled by a 6.7-percent year-over-year improvement in Part 135 activity, followed by a 1.3-percent rise in fractional flying. Part 91 activity contracted by 2.1 percent. Large-cabin jets and turboprops posted the largest year-over-year gains, rising 4.1 percent and 2.3 percent, respectively. Meanwhile, midsize jet flying rose 1.7 percent from last July and light jets declined 1.4 percent.

Universal InSight STC'd, TSO'd

The FAA has granted technical standard order authorization for the Universal Avionics InSight Display System avionics suite and an STC for installation in the Cessna Citation VII. Universal is providing the STC at no cost to its authorized dealer and integrator network for installations that they perform, according to a company spokeswoman. The InSight suite is available in a variety of configurations, such as three or four of Universal's 10.4-inch EFI-1040 displays and simple integration with the company's SBAS-FMS and UniLink UL-800/801 communications management unit for upgrades to NextGen capabilities such as PBN, CPDLC, Fans 1/A+, Data Comm and ATN B1.

Progress continues on Cessna Denali t-prop

by Mark Huber

In the year since Textron Aviation unveiled the $4.8 million Cessna Denali turboprop single at EAA AirVenture 2016, both Textron and engine maker GE Aviation have made steady progress toward a projected first flight in next year's fourth quarter. Brad Thress, Textron Aviation senior vice president of engineering, and Brad Mottier, vice president and general manager BGA, GE Aviation, gave an update to **AIN** on the program's progress on the eve of this year's AirVenture.

Thress reported that 4,000 of the aircraft's 7,500 airframe and systems detail parts have been released into the factory. About 10,000 parts have been manufactured, counting multiples of certain part numbers. "Some of the larger components are coming to fruition, which is always nice to see. We've got the cabin door complete and the large cargo door completed, and those are going in a door test article. Just a couple of days ago we had our first fuselage skin come out of the metal bond shop, so the fuselage skin runs back from the cockpit to where the empennage starts. It's a really large assembly so it's exciting for our folks to see that. So a lot of good progress on the airframe design," Thress said.

"We're generating actual airplane parts and that's fun. You have that time early in a program where you are doing a lot of stuff on [engineering drawing software] Catia and on paper but you are not seeing parts flow out, so this is an exciting time for us as we are starting to see large assemblies come out of the factory and move into full-scale test articles."

Propeller and Avionics Work

Textron is continuing its human factors work on the aircraft, hosting customers to solicit feedback and employing advanced modeling and simulation tools, Thress noted. "We have a human factors lab where we use virtual reality to take customers through the cockpit and make sure we get their feedback on where things are located. We use flight control iron birds and pilot iron birds as well."

Textron's McCauley division has made substantial progress developing the Denali's 105-inch-diameter all-composite propeller, which features scimitar-shaped blades, Thress reported. Among the completed tests are full-rpm runs for extended hours and centrifugal loading of the hub, including an out-of-balance condition that simulates blade loss. "The hub has done well. We've also done blade fatigue testing. Every time a blade goes around it experiences a load cycle. As part of our development testing we do 100 million load cycles, and we've completed that testing on the blade."

Thress said the blade has also been tested to maximum static load and that propeller development testing is nearly ready to give way to certification testing.

Cessna is making progress on assembling large sections of the Denali, such as the cargo door, and aft cabin lower quarter panel, above.

The Garmin G3000 avionics system for the Denali is not expected to ship until next year's second quarter, but Thress does not foresee any significant integration issues given Textron's experience with it on the Cessna M2 and Citation CJ3+. "It's a pretty integrated system. You do a lot of neat things through the Garmin touch controller," he said. He also said that Cessna is developing and will be manufacturing its own proprietary cabin seats for the Denali. The aircraft will be available with a standard modular aft lav that can be removed for more cargo space or an optional permanent lav that can be serviced externally.

GE's Mottier said the Denali's ATP (advanced turboprop) engine is on schedule for first engine test run by year-end. "All of the initial design work is complete.

The detailed parts have been released, and the ATP team has printed all the additive parts. We've taken 855 individual parts and through an additive design and manufacturing process we have reduced that number to 12 and those parts are complete. We also started writing the first engine assembly and disassembly procedures," he said. The ATP software and fuel controls have been tested on a GE H80 engine at the company's facility in Prague.

Simplified Engine Ops

Both Mottier and Thress highlighted features of the ATP engine. "The Fadec not only provides much simpler operation of the engine controls but—because it automatically optimizes the propeller and the engine together as a system—it also provides more power at altitude while burning less fuel than engines that are in the marketplace today," Mottier said. "The Fadec also has a digital twin feature for data analytics." The feature is already on board the company's airliner engines, using data from every flight and running a computer simulation to know how each individual engine serial number is performing. The result, he said, is lower ownership cost and extended service periods.

"The ability to go to a detent and let a computer do its thing is really revolutionary in this class of airplane," said Thress. "That's really enabled by the efficiency of the engine. Lower fuel burns and lower direct operating costs." ❑

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NEWS BRIEFS Compiled by Chad Trautvetter

SmartSky Delays Service Launch

SmartSky Networks, which is developing an air-to-ground airborne connectivity network in the U.S., has delayed launching the 4G LTE service until the middle of next year. SmartSky has flight-tested its beamforming technology, which it claims "will provide 10 times the typical speed and capacity of the current industry standard ATG network." SmartSky has established data centers in Virginia and California, secured commitments "for high-bandwidth backhaul resources" and installed systems that will allow data and voice to be converged on a 4G LTE network. Once local permits are issued, the final ground infrastructure—230 to 250 base stations—will be installed and commissioned.

FAA Resolves Part 135 Compliance Issues for PC-12

The National Air Transportation Association (NATA) and Pilatus Aircraft have resolved a compliance issue with the FAA that was preventing air charter operators from adding "legacy" Pilatus PC-12s—defined as S/Ns 101 to 888—to their Part 135 certificates. The issue arose when individual FSDOs had differing interpretations of FAR 135.163(f), which outlines electrical power requirements for single-engine aircraft carrying passengers under IFR. After working with Pilatus and NATA, the FAA has "standardized" an interpretation of the rule and operator guidelines for a GEN 1 failure via Information for Operators (InFO) 17011.

Court Nullifies HTO Noise Restrictions

The U.S. District Court for the Eastern District of New York issued a permanent injunction last month that strikes down noise and access restrictions at New York's East Hampton Airport (HTO). The move concludes what NBAA, one of the plaintiffs in the lawsuit, called a "precedent-setting case for public-use airports nationwide." Litigation was triggered in April 2015, when the town of East Hampton adopted a year-round general curfew at the Long Island airport from 11 p.m. to 7 a.m. daily; a year-round extended curfew for "noisy" aircraft from 8 p.m. to 9 a.m. daily; and a summertime one-trip-per-week limit for aircraft the town deems "noisy."

Euro Bizav Flying on Upward Trajectory

Business aviation flying in July in Europe climbed 2.5 percent year-over-year, to 87,826 departures, and the year-to-date trend is up 3 percent, a gain of 13,950 flights from 2016, according to WingX Advance. "July is the peak month so far this year…and is also only 1 percent down from pre-crisis July 2008," the business aviation data firm said. Following the trend so far this summer in Europe, the strongest expansion in July flight activity was in the Mediterranean, with business aviation flying rising 7 percent year-over-year in Spain and double-digit growth in flights from Turkey and Greece. Germany and the UK also saw gains of 5 percent and 2 percent, respectively. Business aviation activity dipped in France, Benelux and Switzerland.

NBAA-CAN Fundraiser Gets New Look

The NBAA Business Aviation Convention & Exhibition, to be held October 10 to 12 in Las Vegas, continues the tradition of hosting a fundraising event to benefit the Corporate Angel Network (CAN), but the event will have a new format this year. The Fund an Angel Cocktail Reception will feature auctions, cocktails and hors d'oeuvres and networking with industry leaders and colleagues. It will take place on October 11 at the Wynn Las Vegas from 6 to 8 p.m. Funds from the event will help CAN continue its work of arranging flights for cancer patients to and from treatment.

(At front: left to right) HondaJet Southeast sales manager Bob Van Riper, pilot Julian MacQueen, wife Kim MacQueen, Honda Aircraft v-p Doug Danuser, Honda Aircraft director of sales for Latin America Ryan Ramos and the Honda Aircraft team celebrate delivery day for the aircraft used during the world flight at Honda Aircraft's Greensboro factory.

2017's summer of *big* tours

by Samantha Cartaino

The summer of 2017 can officially be referred to as the summer of long-distance tours. At press time, Bell Helicopter's 429 and the HondaJet were both circumnavigating the globe. Over the course of a six-week trip in May and June the M600 flew directly across the Atlantic for the first time. The HondaJet's 80-day tour marked the first time that the aircraft has embarked on such a journey. The Bell 429, built near Montreal and outfitted with Honeywell's connectivity services, was flying around the globe to celebrate Canada's 150th birthday and showcase Honeywell's connectivity.

M600 European Tour

Drew McEwen led the six-week M600 European tour along with Thomas Nielsen, Piper's regional sales manager for Europe, the Middle East and Africa. The trip started in Geneva on May 24 almost immediately after the aircraft was validated by the EASA and ended in Italy on June 30. McEwen, who serves as Piper's v-p of international and direct sales, flew the airplane to France, Germany, Russia and Poland. Ultimately, the aircraft flew 7,000 miles in Europe and burned approximately 38,000 pounds of fuel in the process.

"I'm glad I had someone who's flown in Europe a lot," McEwen told **AIN**. "It's amazing how you have to plan your trip well in advance and go through a handling agent who gives you your routing. The routing has multiple waypoints; some legs had 15 waypoints. In the U.S. we typically have two to three waypoints or we just go direct."

One of the most significant milestones of the trip was the M600's crossing of the Atlantic. According to McEwen, Piper's M-Class aircraft generally take a northern route to land-hop to Europe. The M600 left from St. John's, Newfoundland, and landed at Lajes Airport in Portugal four hours 38 minutes later after flying the 1,271 nm at FL280 and averaging 42 gph for a fuel burn of 1,290 pounds. The tailwind was less than 20 knots.

The M600 saw a lot of interest in eastern Europe, according to McEwen. After completing several demo flights, two aircraft were sold in the Czech Republic while one was sold in Poland, one in Germany and another in Russia. Russian Piper dealer SimAvia marked the M600's presence in Russia with a celebration and unveiling at the Kuban Airshow in Krasnodar on June 17 and 18.

Piper's M600 completed a six-week tour of Europe shortly after EBACE. Thomas Nielsen, regional sales manager for Europe, the Middle East and Africa, shown, conducted the flights with Drew McEwen, v-p of international and direct sales.

Around the World in 80 Stays with the HondaJet

Julian MacQueen; his wife, Kim; and Travis Holland of Holland Aero embarked on the HondaJet worldwide tour from AirVenture at the end of July. Dubbed "Around the World in 80 Stays," the tour has been planned to take in 80 locations around the world, among them Colombia, Ireland, Portugal, Turkey, Vietnam, India, Thailand, Australia, Japan and Russia. MacQueen owns Innisfree Hotels, and the tour aims to link traveling and the hotel industry while showcasing the aircraft.

"This is just one of those moments where I thought, 'When will I ever get the opportunity to be the first to fly an airplane as cool as the HondaJet single-pilot around the world?'" MacQueen previously told **AIN**. "This trip combines a bunch of passions of mine: flying, hotels, design, culture. I'm at the age where if I don't do it now, I may not be able to do it in the future. I thought I'd grab it while I could."

This trip marks the first time a HondaJet has circumnavigated the globe. Before taking off, MacQueen estimated that the aircraft would use 60,000 pounds of fuel and fly 29,000 nm, which is approximately 68 flying hours. At press time, post-trip numbers were not available as the airplane was still making the rounds. Honda Aircraft worked with the MacQueens to display the

Continues on page 34 ▶

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NEWS BRIEFS Compiled by Chad Trautvetter

Bombardier Bizjet Shipments Down

Business jet deliveries at Bombardier Aerospace fell 6 percent in the second quarter on lower Learjet and Challenger volume, partially offset by more Global shipments. During the quarter, the company delivered 36 business jets (three Learjet 70/75s, 12 Challenger 350s, six Challenger 650s and 15 Global 5000/6000s) versus 42 a year ago (five Learjets, 16 Challenger 350s, seven Challenger 650s and 14 Globals). The business jet division recorded revenue of $1.386 billion in the second quarter, down $87 million from a year ago. However, before-tax earnings in the period climbed by $2 million, to $148 million, thanks to the Global deliveries. Backlog at Bombardier Business Aircraft stood at $14.7 billion as of June 30, $700 million lower than at the end of last year.

G1000NXi Offered as TBM Retrofit

Daher is offering G1000NXi upgrade kits for retrofit in TBM 850s, 900s and modernized 700s that have Garmin G1000 avionics. Available through Daher TBM authorized distributors, the upgrade involves changing out the two primary flight displays, the multifunction display and the control keypad, along with new software and database installations. The upgrade will manage more data and display visual charts and accelerate system boot-up and software loading. The kit is being offered at an introductory price of $59,995 through year-end.

Legacy Deliveries Boost Embraer

While Embraer delivered fewer business jets in the second quarter this year than in the same period last year, more shipments of larger business jets and a surge in airliner deliveries drove a 29.5-percent jump in revenue during the quarter, to $1.77 billion from $1.366 billion in the second quarter of last year. Business jet deliveries slid to 24 from 26 in last year's second quarter, but the mix shifted: eight large-jet deliveries rather than three in the second quarter last year.

HAI: Include Helos in ADS-B Rebate

The Helicopter Association International (HAI) has asked the FAA to add single-engine piston helicopters to the ADS-B rebate program, which at press time still had more than 12,000 rebates available before the application period expires on September 18. The program offers $500 rebates to 20,000 owners who install ADS-B equipment in their light piston-powered airplanes. ADS-B OUT avionics will be required for all aircraft flying in controlled U.S. airspace as of Jan. 1, 2020. "Since 65 percent of these grants remain available, we see no reason that the FAA should not offer the same opportunity to owners of small helicopters," said HAI president and CEO Matthew Zuccaro.

U.S. Mandates GIV Gust Lock Retrofits

U.S. owners and operators of Gulfstream IVs, IV-SPs, G300s and G400s have less than three years to comply with FAA AD 2017-13-11, which requires modification of the gust lock system and a revision of the maintenance or inspection program to incorporate functional tests. The action stems from an NTSB recommendation related to the GIV-SP that crashed on takeoff from Bedford-Hanscom Field in Massachusetts in May 2014, killing all seven on board. The GIV has a mechanical interlock between the gust lock handle and the thrust levers that restricts the movement of the thrust levers when the gust lock handle is in the on position. This mechanism was intended to limit thrust lever movement to no more than 6 degrees during operation with the gust lock on. However, post-accident testing on nine GIVs found that, with the gust lock handle in the on position, forward thrust lever movement was three to four times greater than that limit.

Piper M600s returning to service

by Mark Huber

As of early last month, 21 of the 39 Piper M600 turboprops in service were flying again after the company temporarily grounded the fleet in late July for what company CEO Simon Caldecott called "a potential non-conformance in a vendor-sourced wing component" in a section of the aft wing spar that was found to be "below the required design measurements in one area." Caldecott said the company became aware of the problem during a "standard quality process." He believes the problem was confined to "one rogue part" but grounded the fleet "out of an abundance of caution."

Piper issued a mandatory service bulletin (SB1317) requiring that all M600s undergo an inspection of the aft wing spar, a one-day process, before returning to flight. The mandatory service bulletin defines the inspection process, which requires draining the fuel tanks and measuring the spar in both wings in a certain area to confirm it meets the design criteria. "We expect the aircraft will be back in the air shortly," he said.

The Piper M600 was temporarily grounded in late July. Most of the fleet had returned to service as of early last month.

A Piper spokeswoman told **AIN** that all of the 21 inspected aircraft either met or surpassed the required tolerances and will be immediately returned to service upon receipt of a release letter from Piper. The same procedure will be followed for the remaining aircraft currently undergoing inspection.

Piper is covering the inspection cost and assisting owners with alternative transportation costs during the inspections and working with dealers to ensure inspections are completed as soon as possible. Should any anomalies be discovered, Piper said it would work with any affected customer to correct the condition and return the aircraft to service. The company is extending by two years the manufacturer's warranty on all wing structure components on aircraft affected by SB1317, taking the coverage to seven years. ❑

TSAGI PLANS SUPERSONIC BUSINESS JET THAT COMPLIES WITH ICAO CHAPTER 14

At the MAKS'2017 International Aerospace Salon in Moscow in July, the Zhukovsky Central AeroHydrodynamic Institute (TsAGI) exhibited a scale model of a Supersonic Business Jet/Supersonic Commercial Jet (SSBJ/SSCJ). According to TsAGI, the airplane is intended to comply with ICAO Chapter 14 noise levels and produce a sonic boom with intensity less than 72 dBA or 78 dB SPL (sound pressure level). The company believes the latter figures will make supersonic flight possible over land.

The effort is part of long-term scientific research to produce "a two-regime" aerodynamic layout that would be efficient at both high-subsonic (Mach 0.90) and supersonic (Mach 1.5 to 2.0) speeds, which TsAGI asserts is the key to success for a civil supersonic jet. The model exhibited at MAKS'2017 is intended to cruise at up to 1,133 knots and provide range of 4,000 to 4,640 nm, while ensuring that landing speed does not exceed 162 knots.

At the MAKS show TsAGI also released images of a slightly different-shaped model being tested in the T-102 wind tunnel. TsAGI is conducting the SSBJ/SSCJ studies jointly with the Aviadvigatel and NPO Saturn Lyulka engine design houses. The Central Institute for Aviation Motors is also involved in the research into "advanced highly parametric dual-flow turbojet engines with regulated mixer and three-flow variable cycle engines" for propulsion. —*V.K.*

VLADIMIR KARNOZOV

The Zhukovsky Central AeroHydrodynamic Institute (TsAGI) is working on a supersonic business/commercial jet intended to provide both high-subsonic and supersonic speeds, while still meeting strict ICAO Chapter 14 noise limits.

FAA & EASA OK FJ44 for Pilatus PC-24

by Chad Trautvetter

The Williams International FJ44-4A-QPM turbofan, which powers the new Pilatus PC-24 twinjet, has received type and production certification from both the FAA and EASA. Deliveries of production engines to Pilatus have begun, and the Swiss airframer expects the PC-24 to receive certification by year-end.The PC-24's engines are each rated at 3,435 pounds of normal takeoff thrust at ISA+8, and 5 percent more thrust is available, if needed, through a new automatic thrust reserve feature, Williams noted.

Other new features of the FJ44-4A-QPM: an anti-ice and noise-suppressing inlet; integral pre-cooler to condition engine bleed air and reduce drag losses; and passive thrust-vectoring exhaust nozzle. The PC-24 will be the first FJ44 application to take advantage of Williams's quiet power mode, which allows the engine to provide "quiet, efficient ground power," eliminating the need for a traditional APU. In addition, the -4A-QPM is the first FJ44 to be certified with Williams's "latest and most advanced" Fadec, which will be incorporated into all FJ33/FJ44 models. Engine TBO is 5,000 hours, with an on-pylon hot-section inspection at 2,500 hours.❑

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NEWS BRIEFS Compiled by Chad Trautvetter

Falcon Sales Boost Dassault in First Half

Stronger new and pre-owned Falcon business helped propel a 23.5-percent jump in Dassault Aviation's first-half results, to €2.05 billion ($2.40 billion) from €1.66 billion ($1.94 billion U.S.) in the same period last year. Operating income was stable at €123 million ($144 million), while net profit rose 7.5 percent. Deliveries of Falcons were up, to 17 from 15 year-over-year, and the pre-owned aircraft business was even better, the company reported. Net Falcon order intake was also positive, with 14 aircraft sold in the first half, three more than in the same period last year. New and pre-owned combined, the order intake for Falcons amounted to €1.029 billion ($1.20 billion) in the first half versus €778 million ($909 million) last year.

JSSI: Activity Up 8.5 percent in Q2

The business aviation industry continued its rebound in the second quarter, with overall flight hours rising 5.2 percent since the first quarter and 8.5 percent year-over-year, according to statistics from maintenance support provider JSSI. Construction and power/energy operators recorded the largest gains in usage, up 15.6 percent and 12.6 percent, respectively, from the first quarter. Most welcome was an 18.2-percent rise in overall activity in Europe since the first quarter. "Flight hours are at their highest levels since the early days of 2008," said JSSI president and CEO Neil Book.

FAA Dismisses Signature SNA Complaint

Signature Flight Support expressed disappointment in the FAA's decision to dismiss its Part 16 complaint over the ending of its leasehold at John Wayne Airport (SNA) in Santa Ana, Calif., but vowed to continue pursuing all legal options to restore its presence on the airport. Signature filed the complaint to the FAA earlier this year, alleging that the Orange County Board of Supervisors had violated Grant Assurance 22 regarding economic nondiscrimination. It argued that the county had discriminated against Signature by awarding a lease that it had held for two decades at SNA to ACI Jet. Signature said the process used was discriminatory and that the county failed to negotiate renewal in good faith. But in a late-July determination, the FAA disagreed that the county had violated its grant assurances.

Remote Tower To Be Tested in Colorado

The FAA has tapped Canada-based Searidge Technologies to install, test and certify a remote tower at Northern Colorado Regional Airport (FNL). FNL was chosen as the test facility in part because of its traffic volume and the wide mix of aircraft types operating at the airport. This project will be the first in the world to integrate video and track-based surveillance (radar) to provide a comprehensive view of the airport surface and Class D airspace to air traffic controllers working in a remote facility. Remote tower equipment will be installed at FNL this fall, with passive testing slated to start next summer and active testing to begin next fall and conclude in spring 2019.

FAA Suggests Committed-to-stop Point for Landings

The FAA is recommending that crews of turbine-powered aircraft establish a point during landing where a go-around or rejected landing procedure will not be initiated, where the only option would be to bring the aircraft to a stop. "Operators who establish committed-to-stop points would eliminate ambiguity for pilots making decisions during time-critical events," the FAA said. The agency recommends that operators establish SOPs for flight crews to determine a point after touchdown at which a go-around will not be initiated.

Service expansion part of DAS 'culture change'

by Kerry Lynch

Dassault Aircraft Services (DAS) is eying expansion of the services and capabilities offered throughout its network as part of a wholesale review the company is undertaking to enhance customer relations, build on quality and extend capacity.

Mark Ozenick, DAS president

Dassault brought in turnaround and startup specialist Mark Ozenick earlier this year to lead the service network in North, South and Central America. Ozenick, who was the founding president and CEO of Heli-Flite Shares and has been involved in a handful of turnarounds, emphasized, "DAS is not broken." But Ozenick also said the entire network is undergoing a cultural change.

DAS, the customer service network for Dassault Falcon, has company-owned service centers in Wilmington, Del.; Reno, Nev.; and Little Rock, Ark. in North America, along with Sorocabo center in South America. They accompany Dassault's centers in Bordeaux-Merignac and Paris Le Bourget in France, as well as a network of satellite service centers, spares depots, a mobile repair unit (MRU) and authorized service centers.

Ozenick and the Falcon team are working on a multi-pronged initiative to improve the customer experience, responsiveness and customer ownership—making it "better, cheaper, faster," he said—adding that the hope is to become more competitive than the top-tier independent service companies.

This means an evolving culture to ensure that the focus remains on the customer's needs and that the customer is heard. In the past this wasn't consistent across all locations, he said. "We're selling relationships," he said.

Improving Service Access

Along with strengthening the customer relationship, DAS is working to provide a more seamless experience so customers can get services at the most convenient center, Ozenick said. DAS technicians from one location may be sent to another, if required, to support a given project, even if the aircraft is not at one of the major centers.

To make it easier for the customer, the Dallas-based DAS MRU, which supports aircraft throughout the U.S., is working toward bringing not only unscheduled maintenance but regularly scheduled 1A maintenance to the customer's aircraft. The company also is targeting reduction of downtime and continuous improvement with a goal of bringing "quality escapes to zero," he said.

DAS has bolstered spares inventory to $825 million at 15 distribution centers to ensure it has parts coverage throughout the

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New Dassault Unit Packages Pre-Owned Falcon Services

Seeing a jump in pre-owned Falcon transactions, Dassault Aircraft Services (DAS) has created a new organization—Falcon Pre-Purchase Services—that packages services to help customers transition into the Falcon series.

The intent of the organization is to provide potential customers of pre-owned Falcons an experience on par with that for customers of new aircraft, said Michelle Averso, director of the organization. These services range from detailed aircraft evaluations to a complete walkthrough of requisite updates to meet upcoming NextGen requirements such as ADS-B OUT and FANS-1/A to coordination of any other updates or modifications that the customer might seek.

Among the services offered are physical evaluation records research, systems operational checks and other evaluations that draw on Dassault's experience in engineering, production and aftermarket support. The modifications and other upgrades could vary from paint or interior refreshes to installation of new avionics or cabin management systems.

DAS, the Falcon support network, also will coordinate on proprietary modifications and updates that are designed to keep the existing in-service fleet at the level of new production aircraft. DAS is cross training a dedicated staff on these services to bring expertise to the buyer. The advantage of going through DAS, said general manager Gary Schiff, is that the specialists have access to all the original drawings, engineering and STCs, thus lowering the cost and time of any requisite and many desired updates. He added that with Dassault as the parent company, they can "smooth the process" of imports and bringing foreign-registered aircraft up to U.S. standards.

The changes are preparing DAS for an anticipated uptick in pre-owned activity, said Mark Ozenick, president of DAS. Dassault officials recently noted they have seen more activity in the first half of this year than they did throughout last year. As the number of Falcon transactions picks up, so too has the need for these services, Averso said, noting that at one point the company had three evaluations under way simultaneously at the Little Rock facility. "There's been a lot of activity since the beginning of the year," she said.

While the used market has heated up in recent months, the overall demand for such services has evolved since the market downturn. Working with brokers, DAS has seen its share of pre-purchase Falcon services grow from 10 percent in 2011 to 75 percent. Ozenick said the goal is to capture all that business, noting that the services build brand loyalty, trust and relationships for future work. "It's a great introduction to the Falcon brand." —*K.L.*

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SMO battles

▶ Continued from page 4

in favor of a parochial agenda," the brief said.

The brief notes that 45 years ago, the FAA had called SMO a vital resource that it would preserve, quoting the agency as saying it "has no intention of consenting to the use of this property for other than airport purposes and will insist on the City of Santa Monica complying with its contractual obligations."

The brief further outlines the group's belief "that this position remains the correct one and that the FAA erred in discarding decades of firmly established policy against the closure of viable airports to effect a settlement with the city. But the petition in this case does not depend on the wisdom or consistency of the FAA's decision. What occurred was wrong as a matter of law."

NBAA president and CEO Ed Bolen said the agreement allows "'local control' driven by a vocal minority, with complete disregard for system-wide impacts."

During EAA AirVenture in Oshkosh, Wis., FAA Administrator Michael Huerta defended the agreement, saying, "Decisions of land use and facilities under our Constitution are reserved for local governments…[the FAA's] arrangement with them is effectively contractual in consideration of receiving grants." The localities must agree to performance standards, he said, but "the reality is that it is a local decision."

He said that the battle is with the community, not the FAA. "Rather than litigating this thing and possibly losing and facing overnight closure…we have bought a certainty for a number of years to work on that challenge with the local community." ❑

JetAviva expands

▶ Continued from page 4

"You can buy a nice Mustang for $1.5 million now," said Sigari, adding that his company has sold 13 of the entry-level twinjets so far this year. "In our best year we sold 22, and we're well on our way to break that record."

"Midsize is pretty challenged," Sigari noted, with a plethora of aircraft chasing a limited number of buyers. "There are a lot of competitors in that space on both the new and pre-owned sides, so I think we're going to continue to see pricing pressure in those segments."

In a segment that includes the Cessna Sovereign, Latitude and soon the Longitude, the Embraer Legacy 500 and 450, the Gulfstream G280, the Bombardier Challenger 350 and the Dassault 2000, buyers have many choices, not counting the pre-owned, which has been active of late. In February, 41 Challenger 300s were listed for sale; by the beginning of last month that number had declined to 27.

From Sigari's perspective the market has done an about-face from just several years ago, when the large-cabin jets were propping up the business aircraft market. "As you get bigger, it's getting a little bit more challenging; as you go smaller, everybody is getting more secure."

Following this latest acquisition, the company plans to expand its presence in the high-end turboprop segment, where it sees great stability. "PC-12 prices are going up, and owners of them just don't want to sell them," explained Sigari. Indeed, only 4 percent of the single-engine Swiss aircraft produced since 1996 (PC-12/45/47 and NG models) are available.

Looking ahead, Sigari said that while he believes the industry sentiment is positive from a consumer perspective, he remains cautiously bullish in terms of managing risk, in view of the current domestic political instability and the potential for geopolitical risks in North Korea, Russia and the Middle East. ❑

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Caravan and King Air get Blackhawk refresh

by Mark Huber

Blackhawk Modifications has completed flight-testing the XP67A engine upgrade program for the King Air 350 and is beginning a program to revitalize aging Cessna Caravans in partnership with Metal Innovations, the company announced at AirVenture in late July.

The Caravan Reset Program will address aging aircraft issues for Caravans with 20,000 hours' total time and at 5,000-hour intervals thereafter. It is coupled with a Blackhawk engine upgrade. "Typical maintenance schedules for the Caravan are frequent and costly. Cessna maintenance inspection requirements significantly increase at 20,000 hours total time, then again every 5,000 thereafter. These intensive inspections…can cost an operator hundreds of thousands of dollars in maintenance and lost revenue from aircraft downtime," Blackhawk explained.

Flight-testing is complete for Blackhawk's XP67A engine upgrade program for the King Air 350, and the company launched a program to address aging issues on the Cessna Caravan.

The Reset program provides a pending FAA-approved Metal Innovations Cessna 208 Special Instruction Document (SID) Reset STC along with the new 867-shp Blackhawk XP140 engine, the same PT6A-140 installed on the production Caravan EX. The engine upgrade delivers 28 percent more horsepower for takeoff, climb and cruise, while retaining the existing cowling, engine mount and exhaust system. The upgrade comes with a 325-amp starter-generator that lowers start temperatures by 100 degrees F, a new Hartzell 106-inch propeller and Hawkeye DigiLog Engine gauges.

FAA approval was imminent as of early last month. Foreign certification efforts will begin immediately after approval.

King Air 350 Mod

Blackhawk CEO Jim Allmon said the upgrade makes the XP67A-equipped turboprop "the fastest King Air on the planet." Blackhawk said that at FL280, ISA+20 degrees C, max cruise, 13,000 pounds, the XP67A upgrade delivers 332 ktas versus 292 ktas for a stock King Air 350. Under the same conditions, the XP67A climbs from sea level to FL350 in 18 minutes, versus 45 minutes for the stock King Air 350.

The XP67A upgrade installs two factory-new Pratt & Whitney Canada (P&WC) PT6A-67As and new five-blade composite MT propellers and spinners. Training, support and a five-year or 2,500-hour new-engine warranty are also provided by P&WC.

Allmon announced that the company is equipping a King Air 350ER with the XP67A engine upgrade and is planning for certification this year at 16,500 pounds mtow. The final phase of the project will be to equip and certify a King Air 300 with the XP67A engine upgrade starting early next year. ❑

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Knowing when to intervene in aviation

Three recent incidents got me thinking about how we—as bystanders, coworkers or participants—react to developing situations in aviation. The incidents I am referring to are the Air Canada flight that came close to landing on a taxiway in San Francisco with other jetliners awaiting takeoff; the United Airlines flight where a ticketed toddler—over the age of two—was forced to fly as a lap child; and the death of a tourist in Saint Martin from jet blast. Each of these incidents involved different groups of people who could have intervened or perhaps acted more forcefully as the events unfolded. Maybe talking about alternative ways these events could have played out will make a difference if we are faced with similar situations in the future.

In the incident in Saint Martin, a 57-year-old woman visiting the island from New Zealand was at a popular tourist beach located just outside the Princess Juliana International Airport fence. She reportedly had been hanging on to the airport fence when the jet blast from a departing airliner sent her reeling backwards into a concrete walk. The fence was marked with danger signs warning that jet blast could cause "extreme bodily harm and/or death." Family members with her later expressed remorse for the risk they took in not heeding the warnings.

The incident raised for me the question of whether any bystanders warned the woman of the dangers of clinging to the airport fence. And whether they should have.

Raising a Question

In the incident involving a United Airlines passenger travelling with her ticketed 27-month-old toddler, the airline gave the child's seat (for which the parent had purchased a ticket) to another passenger because of an apparent ticketing snafu. FAA regulations require all children who have reached their second birthday to have a seat of their own. Although the mother tried to explain that her son had a ticket for that seat, the flight attendant nonetheless insisted he fly as a lap child.

Photos widely distributed in the media show a rather large child sprawled across his mother in the seat. I wonder about the rest of the cabin crew. No one else walked down the aisle and wondered why such a large child was travelling as a lap child?

This is such a basic requirement—a separate seat with a separate seat belt properly secured—that it seems to me that a properly trained crew would have asked the mother if the child was over the age of two and not allowed him to travel unrestrained.

The last incident is probably the most difficult: when does an aviation professional question the actions of another aviation professional, particularly when they have different fields of expertise? The incident I'm referring to was the disaster that was narrowly averted right before midnight on July 7 at San Francisco International Airport when an Air Canada A320 carrying 140 people almost landed on a parallel taxiway with four jumbo jets awaiting takeoff.

Audio of the exchange between the Air Canada crew and air traffic control shows the pilot asking ATC to confirm the runway because "we see some lights on the runway." The controller confirms the runway and adds "there's no one… but you." Almost immediately after, an unidentified voice can be heard questioning "Where's this guy going? He's on the taxiway." ATC then issues the Air Canada flight a go-around instruction.

Both the NTSB and the Canadian TSB are investigating the incident. A preliminary TSB statement shows that the Air Canada aircraft had overflown the taxiway for a quarter of a mile before ATC instructed it to go around. The TSB estimated that the Air Canada flight overflew two aircraft by 100 feet, one by 200 feet and one by 300 feet. The closest lateral distance was estimated to be 29 feet.

There's no question that disaster was averted by minutes if not seconds. But should the situation have gotten this close? Should the controller have done more to ascertain that the Air Canada flight was correctly lined up for the runway or instructed a go-around when the pilot first indicated seeing lights on the "runway"? It's tough to question another person's professionalism, but sometimes perhaps we need to do just that. ■

John Goglia is a former member of the NTSB and currently a safety consultant. He welcomes your e-mails at gogliaj@yahoo.com.

The opinions expressed in this column are those of the author and not necessarily endorsed by **AIN**.

UBS: pilotless airplanes represent $35B opportunity

by Kerry Lynch

A move toward pilotless airplanes represents a $35 billion global opportunity, $3 billion of it generated by savings in the business aviation sector, and could technically be ready for commercial operations by 2025, a new report from Swiss analyst UBS asserts. The report—"Flying solo: how far are we down the path toward pilotless airplanes?"—delves into the cost savings and other benefits, technical feasibility and challenges facing the use of pilotless airplanes.

Industry is well en route to an automated airplane, the report states, noting, "In the not-too-distant future, we would expect to see a situation where flights are pilotless or the number of pilots shrinks to one, with a remote pilot on the ground and highly secure ground-to-air communications."

Remote-control drones exist today and this technology can be adapted for use in helicopters, general aviation, smaller business jets and eventually airliners.

Service Entry

"A number of manufacturers are already involved in making pilotless airplanes a reality," the report says, pointing to initiatives under way at Boeing and Airbus, as well as preparations Embraer has been making in anticipation of the possibility of a single-pilot operation by as early as 2020. NASA is exploring single-pilot concepts under which one pilot remaining in the cockpit works in tandem with a ground operator.

The report also found considerable activity in efforts on the "sky taxi" front, citing a half-dozen examples, among them Uber's work with Bell Helicopter, Aurora, Mooney, Embraer and Pipistrel to make flying taxis. Uber is in negotiations with Dubai and Dallas-Fort Worth to begin demonstrations in 2020.

"Technically speaking, remotely controlled airplanes carrying passengers and cargo could appear by 2025," the report says.

As for benefits, the report cites the potential of saving $35 billion in annual pilot, training, fuel and insurance costs. In the business jet sector, the report estimates two-thirds are flown by a crew of two professional pilots. When average salaries are factored in, pilotless airplanes could produce up to $2 billion in annual savings in pilot costs, the report speculates. In addition, optimized flight paths that could come with the technologies could produce another $1 billion in fuel savings.

Similarly, in the civil helicopter industry, up to $2.1 billion could be saved "if pilots were removed totally." While the report looks at the possibility of pilotless operations, UBS sees the transition to single-pilot operations first. In addition, the report cites safety benefits and suggests that improved safety could result in "hundreds of millions" of dollars in insurance premium savings.

But the report sees several obstacles, particularly public perception. More than half (54 percent) of 8,000 people surveyed said they would be unlikely to fly aboard a pilotless airplane. Only 17 percent of those surveyed said they would take such a flight. But it also says this is generational. Thirty percent of younger respondents (aged 18 to 34) indicated they would be willing to fly aboard a pilotless airplane. ❑

JOINING THE CLUB

MEMBERSHIP: THE NEW ACCESS PARADIGM

by James Wynbrandt

In not even five years since their inception, membership programs have created a new class of business aviation access while changing charter industry practices and perceptions of customer habits (for example, travelers' willingness to share the cabin of a business jet with strangers). These programs often have little in common besides providing access to a closed fleet, and range from relatively low-cost subscription access "private" airlines to traditional operators of ultra-long-range jet fleets. The companies highlighted here are at the forefront of defining and expanding these new access paradigms.

Surf Air

Commencing scheduled service in 2013 with a fleet of PC-12/12NGs, California's Surf Air was the first subscription membership "private airline" and the model for subsequent monthly, fee-based, "all-you-can-fly" providers. In June Surf Air purchased Rise, its Texas-based clone, and concurrently launched service at subsidiary Surf Air Europe, the two moves seen as validating the subscription access concept. With 850 users from Rise added to its rolls, Surf Air now has 3,850 members.

The Rise acquisition is intended to fuel rapid expansion of Surf Air's dozen legacy routes and a doubling of flights on former Rise routes, a company spokesperson said. Coming soon are Monday-through-Friday flights linking California and Texas. An in-development premium program will add weekend service to Cabo San Lucas, Mexico; Aspen, Colo.; and Sun Valley, Idaho. More immediately Bentonville, Ark. (home of Walmart); Midland, Texas; and Oklahoma City are joining the Texas route network.

Surf Air

Additional membership programs providing various levels of access to the network will be created. Eventually the Rise fleet of King Air 350s will be replaced by a dozen PC-12/12NGs. Surf Air currently has firm orders for three PC-12NGs and options for 50 more.

Basic membership ($1,950 per month) provides access to the basic route network, two reservations at a time. Preferred ($2,450 per month) provides access to the preferred network, four reservations at a time. Premium ($2,950 per month) provides up to six reservations at a time on the premium network, which will include yet-to-be-launched routes.

Planned expansion notwithstanding, flights and flight hours on Surf Air's legacy routes declined almost 25 percent year over year from July last year through this past June, according to Argus International. Surf Air told **AIN** it reduced flying in October last year "by about 25 percent," and that "like any young company, we had grown quickly and experimented with a few different strategies to see what profitably builds the membership." The cutback, or "rationalization," was in response to recognition "that our members wanted schedule depth in a few key markets [rather than] schedule breadth across more markets," the company said.

Surf Air has since reallocated seat capacity to focus on the Los Angeles to San Francisco markets during the week, while catering to leisure travelers on weekends with flights to Napa, Monterrey, Truckee and Palm Springs, and adding service to Las Vegas from Hawthorne, San Carlos and Santa Barbara. Since last October the schedule has grown in core markets and restored about 600 monthly hours of flying, according to the company, and in mid-August it introduced San Diego to the Bay service via Montgomery Field.

CEO Jeff Potter, former CEO of Frontier Airlines, left Surf Air at the end of May in what he says was a planned move, after engineering transfer of operational control of Surf Air's fleet to Encompass Aviation. Potter told **AIN**, "I remain Surf Air's number-one fan." Chairman Sudhin Shahani has taken on the role of CEO. Rise founder and CEO Nick Kennedy is now Surf Air's president of the Texas and Southeast region.

Meanwhile, Surf Air Europe has taken possession of its first Phenom 300 (operated by UK-based FlairJet) and is flying between London Luton Airport and Ibiza, Spain; and Cannes. Plans call for inaugurating service to Zurich, Munich, Geneva and Milan from London, and adding four Phenom 300s to the fleet by year-end. Several membership plans are available, priced relative to the extent of the service network they access, ranging from monthly Select subscriptions at £1,750 (about $2,285), Prime at £3,150 (about $4,110), and £3,650 (about $4,765). In a nod to the shared charter flights appearing to gain traction in the U.S., the European branch offers an Anywhere membership, which allows crowd sourcing of ad hoc charter flights for round trips,

starting at £2,600 per person. A potential customer sets the time and deposits the funds, and Surf Air Europe markets the flight. Once six passengers have committed, the flight is scheduled; if fewer sign on, the initiating customer can pay the difference or cancel the flight.

Wheels Up

Founded in 2013, Wheels Up has experienced rapid growth, owning 63 King Air 350i twin turboprops and 15 refurbished Citation XLS/XLS-plus light jets (operated by UK-based Gama Aviation), providing access to members who pay a one-time initiation fee and annual dues in following years. Fixed hourly costs for the King Air 350i are $4,295 and $7,495 per hour for the Citation XLS.

In this year's first half Wheels Up saw 75-percent year-over-year growth, founder and CEO Kenny Dichter said, and "will exit 2017 with 4,000 active Wheels Up members" and "$300 million-plus in revenue." The company, founded in 2013, will turn Ebitda positive by year-end, and in June received a $90 million forward credit facility from private equity firm KKR for purchase of 17 more King Air 350is, Dichter said.

Seeing a powerful, user-friendly digital platform as critical to growth, Dichter aims to keep Wheels Up "at the leading edge of technology" as it "endeavors to be the world's best social and aviation company." Shared shuttle flights are one means of strengthening that social component of membership. Routes include New York-South Florida; New York-Nantucket; Boston-Nantucket; and in the winter, San Francisco-Truckee, Calif. During football season, Saturday shuttles to college games are popular, as were shuttles between California and Reno during the Burning Man festival, Dichter said.

Meanwhile, Wheels Down, the on-the-ground events program, is key to driving more socialization and asset utilization. Wheels Down's "tent pole events" are the Super Bowl, Masters Golf Tournament and Art Basel, during which the company hosts parties, meetings with celebrities and other insider opportunities for members, further driving fleet utilization and creating a sense of community. Wheels Up offers free empty legs. One indication of the intent to mainstream its offering: Wheels Up memberships are sold in Costco, and during "key time periods" at other warehouse stores.

Corporate sales are the next growth frontier. Wheels Up has 200 corporate accounts and is "committed to a big push" to "double that over the next 18 to 24 months," Dichter said. Current accounts use Wheels Up primarily to supplement corporate flight departments, secondarily as an alternative to airlines, or lastly among small to medium-sized businesses for all corporate lift.

Expansion into Europe, initially targeted to launch this year, is on hold. The company is "focused on the U.S. and North America" and "waiting to see how Brexit" affects business aviation on the Continent. Executive v-p and founding partner John Colucci is based in Europe, and with fleet operator Gama Aviation headquartered in Farnborough, UK, whenever conditions warrant "we have a plug and play" offering ready to go, Dichter said.

Individual memberships carry a $17,500 initiation fee for the first year and $8,500 per year thereafter. Corporate memberships cost $29,500 for the first year and $14,500 per year thereafter. The entry-level "8760" program costs a flat $6,950 per year.


XOJet

XOJet

XOJet introduced a new charter model in 2009, offering low (then starting around $20,000), one-way transcontinental rates aboard its owned and operated fleet of Citation Xs and Challenger 300s. In the years since, XOJet has de-emphasized ad hoc charter in favor of membership programs, and is now going all in on the new paradigm: "We're changing to a subscription model," said XOJet CEO Brad Stewart. "That's worth carefully explaining." To whit: The platform XOJet developed and provides exclusively for program members "costs money, so we say to the client, 'If you're a member, we need you to pay for the platform,'" Stewart said. Most customers have accepted the change without complaint. "People are more and more comfortable with subscription models: Pandora, NetJets and Flexjet have been subscription models for decades; second homes have HOA dues. They get it," Stewart said.

The deposit-based membership programs—now Elite, Preferred and Select Access—have been modified and are bundled under an Access Solutions umbrella. The top-tier Elite Access membership, representing a $200,000 refundable deposit, gets the biggest upgrade: guaranteed hourly rates, previously available only for super-midsize jets ($8,500 per hour), have been extended to light ($5,500) and midsize ($6,750) categories, in place of the demand-based pricing previously applied. Monthly fee is $1,000, $1,500 or $2,000, for access to one, two or three categories of jets at guaranteed pricing. Initiation fee is $3,000.

For a $100,000 deposit, Preferred Access, which Stewart described as a "combination of ease of use and loyalty program," provides a 4-percent discount for fleet aircraft use. Initiation is $3,000 and monthly fee is $500.

Select Access, a new $50,000 entry-level program for fliers needing 15 to 25 hours per year, provides a 2-percent discount for fleet aircraft use. Monthly fee is $250.

Overall, Access Solutions saw 30-percent year-over-year growth in program sales in this year's first half. Most new customers are coming from former fractional owners, other card programs and "regionalized mom-and-pop service platforms," Stewart said.

While emphasizing memberships, XOJet's ad hoc charter and charter brokerage businesses are also growing, and the California-based company has a concept for a "fourth component": a ride-sharing offering that "can extend the addressable market for our products down market a little, in an effort to be more inclusive," Stewart said. Such an offering would be developed in conjunction with JetSmarter, XOJet's exclusive digital marketing partner, which has the technology chops to create the app. All online booking of XOJet ad hoc charter is done via the JetSmarter app, while XOJet sells all its empty legs to JetSmarter, which offers them along with other empty legs it purchases to JetSmarter members.

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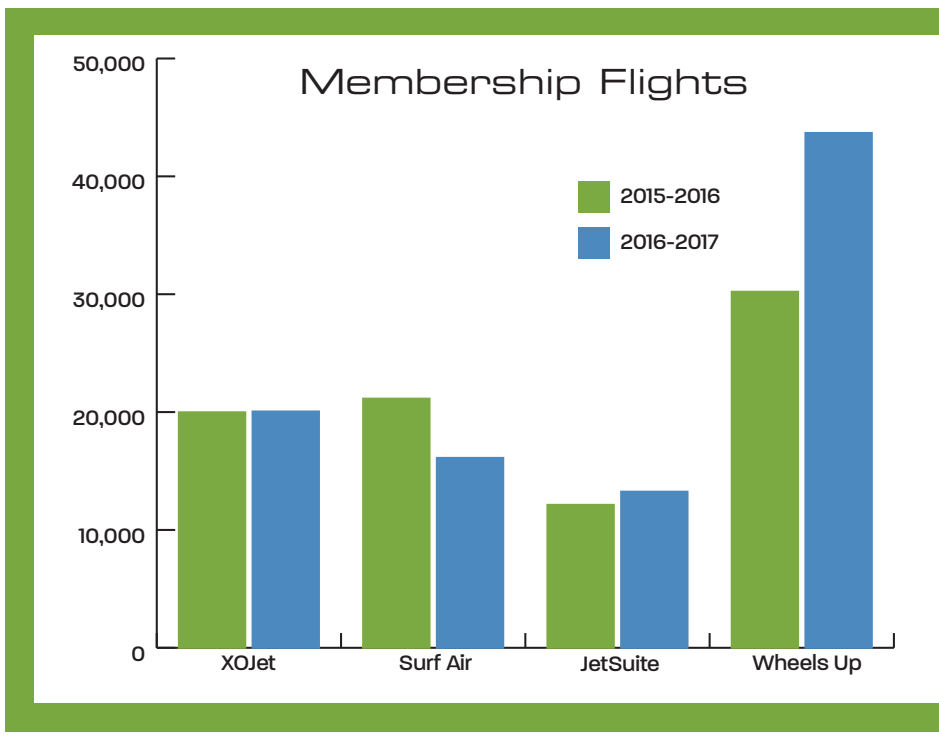

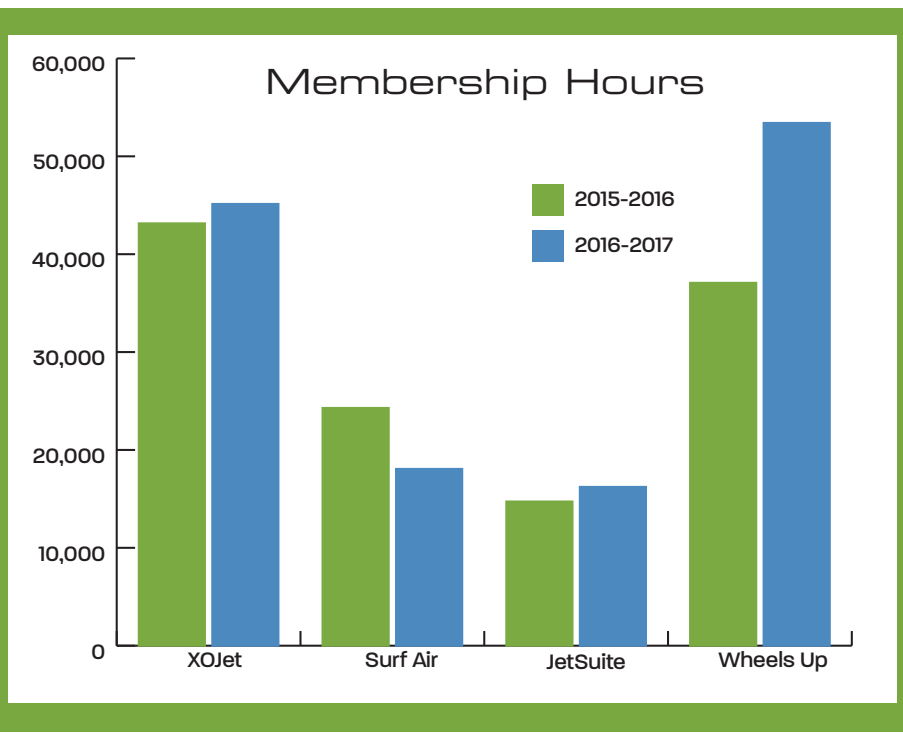

Source: Argus

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JetSmarter

JetSuite

California's JetSuite owns and operates a fleet of Phenom 100s and Citation CJ3s, offering both ad hoc charter and SuiteKey memberships, the latter providing reduced hourly flight rates on deposits of $50,000; $100,000; $200,000; or $400,000. Serving SuiteKey members "is the single largest part of our business," said Cameron Gowans, v-p of sales and marketing, accounting for "in excess of 80 percent" of flight activity. Growing SuiteKey sales and member demand for lift led JetSuite in May to offer an aircraft management program aimed at adding inventory—specifically Phenom 100s and 300s and Legacy 600s and 650s—to the fleet. "We need to add more supply to meet growing demand," Gowans said. In homage to the bright swaths of paint bisecting the airframes of its fleet, the three-tiered management offerings are named RedStripe, GreyStripe and WhiteStripe.

WhiteStripe is a traditional charter management arrangement, with JetSuite assuming operational control and using the aircraft for revenue service when the owner makes it available. RedStripe, aimed at owners who want to outsource all fixed operations and management costs, makes the airplane available to them as scheduled for planned trips, while giving JetSuite primary access for revenue service. JetSuite pays crew salaries, training, insurance, maintenance and all other operational costs.

GreyStripe is tailored to owner/operators and small corporate flight departments seeking revenue for aircraft when dormant. JetSuite handles maintenance and compliance with Part 135 requirements and operates the aircraft when available with its own crews, returning it to the owner at the end of the time block, who continues to operate and crew the aircraft. All management clients have access to JetSuite's fleet.

JetSuite signed its first management contract, a RedStripe agreement for a Legacy 600, and was about to add it to the charter certificate as this issue went to press, the first large-cabin jet in the fleet. Meanwhile, the CJ3s are undergoing cabin refreshments, as the Phenom 100s did last year.

JetSuite has a charter shuttle airline, JetSuiteX, connecting California, Montana and Nevada with executive configured ERJ135s, but there is no membership requirement or program for the service; SuiteKey members get a 10-percent discount on JetSuiteX tickets.

JetSmarter

JetSmarter is a charter brokerage/technology company providing discount rates to members who pay an initiation fee and annual dues for access to services, and has gained wide attention with the shared shuttles it also offers on 50 popular routes in the U.S., Europe and the Middle East.

Though per-seat shared flights (distinct from "airline" shuttles à la Surf Air and JetSuiteX) have been marketed (and long derided by industry traditionalists as unwanted by charter customers) for some years, Florida-based JetSmarter has popularized the access option, boosting its profile and membership ranks in the process. All three JetSmarter memberships—Sophisticated ($50,000 per year), Smart ($15,000 per year) and Simple ($5,000 per year)—provide access to shuttle flights as well as ad hoc charter, though the number of shuttle seats members can reserve (six, two and one respectively) vary accordingly. A limited number of the shuttle flight seats are free to Smart members; if all are spoken for, members can start another shuttle flight on that route and pay a per-seat rate—for example, $2,900 on a light jet from New York to South Florida—that's guaranteed to make the trip even if no other passengers sign on.

But shuttles ply only the most popular routes. To expand the shared charter offering, in July JetSmarter introduced SharedCharter, which enables a member to create a charter flight for any route and have JetSmarter market unused seats, earning flight credits for seats sold for up to 100 percent of the charter cost. (Simple members pay a surcharge for using the service.) Members who buy a seat on the flight can save up to 90 percent on charter costs, according to JetSmarter.

As noted, JetSmarter also buys empty-leg inventory from charter operators—from XOJet, for example—offering them gratis to members. Relatively few take advantage of empty legs, but CEO Sergey Petrossov said members often check on the availability and flights, underscoring the interest members have in the benefit.

JetSmarter has invested heavily in the digital platform that enables its shuttle flight scheduling, CharterSharing and other offerings, and tracks all customer interactions for big data application.

Part 380 Charter

Part 135 rules preclude on-demand charter operators from offering single seats or scheduled flights. But shuttle flights like those organized by Wheels Up and JetSmarter, and charter airlines like Surf Air and JetSuiteX, operate under Part 380 rules. A Part 380 public charter operator is allowed to sell single seats aboard aircraft with up to 30 passenger seats by DOT approval but cannot schedule flights for more than a one-year period. ■

JetSuite

A Membership Pioneer Bids Aviation Adieu

As Surf Air announced its acquisition of Rise, the conquering company's co-founder, former CEO and inventor of the all-you-can-fly subscription model, Wade Eyerly, quietly exited the aviation industry. After leaving Surf Air in 2014, Eyerly and partners founded Beacon, aiming to replicate the Surf Air model in the New York-Boston corridor, sans Surf Air's ownership and operational responsibilities. The venture failed, Eyerly said, because of poor execution of plans for which he takes full responsibility but declines to identify.

Eyerly was then hired under a one-year contract as managing director of new ventures at Wheels Up, a company he calls "incredibly good." His new endeavor, which he said he's been thinking about for some time, involves providing insurance for college loans, to protect against the financial calamity caused by inability to repay a student loan. Looking ahead at the membership market, Eyerly said, "I think you'll continue to see the model explored and extended," ticking off countries around the world he's had inquiries from about starting a similar service. "You're going to see interest as more and more innovative models come up." ■

VistaJet

Malta-based VistaJet owns and operates a fleet of Globals and Challengers for both membership and ad hoc charter programs, with sales of the former up 57 percent year over year for this year's first half, the company reported. VistaJet's flagship offering, Program, a three-year membership, provided a record 63 percent of the company's revenue in the second quarter, up from 55 percent in the previous three months. Aimed at users flying at least 50 hours, Program provides guaranteed availability and hourly rates. The average program member flies 100 hours per year, said Chris Moore, chief commercial officer.


VistaJet

MARK WAGNER

Members make yearly or quarterly deposits. One hundred hours per year on a Challenger 350 costs $12,000 per hour, or $1.2 million. Access to the Globals is more customized, driven by factors such as call-out time, the amount of flying per day and the length of typical routes. For those seeking long legs and providing seven days' notice, prices for Globals typically range from $18,500 to $19,000 per hour for a 100-hour membership, or $1.85 to $1.9 million per year.

The company sold 6,000 new hours through the first half of this year, compared with 10,000 new hours in all of last year. VistaJet also reported a 91-percent customer retention rate, and renewal hours more than tripled in the first half of the year. The company believes its recent abolition of positioning fees is further fueling demand.

VistaJet is scheduled to take delivery of one more Global 6000 this month, taking the fleet to 73 jets. "Then we're finished with the investment cycle," said Moore. The company has no orders for the forthcoming Global 7000, nor interest at the moment, he added. Meanwhile, a shift in the VistaJet pitch is under way. "Our first ten years were focused on wealthy individuals," said Moore. "In the last two to three years our focus changed on what we can do for corporations." One selling point: "You know exactly what it's going to cost you" to use the jet, unlike fractional or whole ownership. "Unless you absolutely have to [access a jet] with a couple of hours' notice, ownership of an aircraft is getting to the point of being redundant," Moore said. "There wasn't a global offering in the past that gave access to a fleet like this. The hours we sold demonstrate the trend toward shared ownership."

Moore also noted, "Corporations take longer to sell to but are generally a lot more loyal" than private customers, and their typical use of aircraft is complementary to the schedules of wealthy individual members. ❑

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TEB approach

▶ *Continued from page 1*

"If you feel like you must, you can go over the stadium" on approach, one veteran TEB controller said, noting that a tighter turn to stay inside the stadium can be a risky maneuver. "It's the same for departure. [Law enforcement] and stadium security call us up, and we let them know these things will happen."

Controllers also emphasized that the ILS 6, Circle to 1 approach is not a circling approach by regulatory standards, which include published altitude minimums—760 feet for Category A, B and C aircraft and 820 feet for Category D—that must be flown. The governing altitude restriction that applies to the TEB approach is the 1,500-foot maximum related to EWR traffic.

"We never use" the circling minimums criteria on the Runway 1 approach, an approach controller said. "It's meaningless to us. We only use VFR as far as circling…A 1,500-foot [ceiling] and visibility of three miles is when we start considering" the ILS 6, Circle to 1 procedure.

Once the turn is initiated, "You're visual from that point on, eyes out the window, turning the airplane to the airport as soon as you can."

The "circle to 1" phrase, in use for years, "is a succinct way of communicating you're not landing on Runway 6," the controller explained. "There hasn't been another way to easily describe what we're asking you to do. It's a visual approach to Runway 1. If pilots are interpreting it as a requirement to circle at minimums, then that's wrong."

ATC reps said that changing the phraseology—which most pilots in the room supported—is "something we can discuss from an [FAA] Air Traffic perspective." Among the suggested wording: "ILS 6, expect Runway 1" or "ILS 6, land Runway 1."

Pilots shared various techniques for using avionics to assist on the approach, such as programming the FMS to enter raw data for the Runway 1 approach. But variations in company standard operating procedures led the group to conclude that there is no single solution.

A FlightSafety instructor recommended an old-school approach: "The airplane you fly has a bearing pointer," he said. "If you put that bearing pointer on the Teterboro VOR or the airport reference pointer for Teterboro, then turn right and turn left and join the 010 to that reference point on the pointer and look out the window, you will see Runway 1."

The consensus takeaways: pilots flying to TEB should brief early and thoroughly, establishing clear courses of action for each pilot and setting up any avionics assistance to avoid having to put heads down at a critical time. When given the ILS 6, Circle to 1 approach, the initial turn should start as soon as permissible—controllers emphasized this point as "after" TORBY and not "at" TORBY—and go just outside the sports complex and towers to provide the greatest opportunity to stabilize the aircraft on final. Waiting too long after TORBY to start the maneuver to Runway 1 risks too steep a turn, and should—like any unstable approach—result in a go-around. ❑

TEB ILS 6, Circle To 1 Tips

- Initiate turn ASAP after TORBY.
- Maneuver just outside of stadium and arena to roll out ~1.6 nm from touchdown at 500 feet for stable approach.
- Overflying stadium permitted when necessary for operational or safety-of-flight purposes.
- Fly visual approach as high as 1,300 feet, not at circling minimums.
- Avoid late/steep turns when maneuvering to Runway 1. If approach is unstable, go around.

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WHEELS UP

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Deer Jet's Boeing 787-based "Dream Jet" features dedicated passenger zones, including a master suite, a living room/dining area and berthable business-class seating for 18.

Deer Jet's 787-8 'Dream Jet' serves luxury travel market

by Guillaume Lecompte-Boinet

Chinese business jet operator Deer Jet unveiled its luxury Boeing 787-8 to the European press just after the Paris Air Show in June. The aircraft left Boeing's factory in 2014 and underwent more than two-and-a-half years of design and completions work before becoming operational in September last year. Registered in Guernsey, the "Dream Jet," as Deer Jet has dubbed the aircraft (referencing the airliner-based 787's Dreamliner name), is operated through subsidiary Hong Kong Jet on behalf of parent company HNA Group. HNA also owns an airline and a chain of hotels and reports assets of $145 billion, $90 billion in annual revenue and 410,000 employees worldwide.

The Paris appearance marked the finale of the 787's eight-leg "Dreams Encounter the World" tour, which took it to Hong Kong, Shanghai, London, Dublin, Doha, Seattle and Marrakech before touchdown at Paris Le Bourget Airport. "At each stage of the tour, we adapted the cabin décor to combine the best of its Eastern heritage with the culture of the place we visited," said Frank Fang, Deer Jet v-p.

To celebrate the arrival in Paris with flair, Deer Jet appointed the Boeing's interior with locally designed jewelry and crystal brands such as Puiforcat and Saint-Louis. The Dream Jet's interior was the work of French designer Jacques Pierrejean, whose résumé includes design work for Emirates, Asiana and Singapore Airlines.

Cabin Comforts

Configured to accommodate up to 30 passengers, the Dream Jet spares no expense in luxury appointments. The entryway has a small crew rest area on the right. The aircraft is normally crewed by four pilots for long missions of up to 18.5 hours and 8,100 nm. Turning left from the main entry door leads to an upholstered corridor to the cockpit. The flight deck is, indeed, the only area on the airplane that looks like that of an airline 787.

Aft in the main passenger cabin, everything is designed for comfort and luxury. The master passenger suite consists of a room with a king-size bed, upholstered walls on one side and shaded exterior windows on the other. The color pallette is soft, with rather creamy colors—white and beige with some deep brown accents, reminiscent of teak wood. The suite has a bathroom with a double sink and a spacious shower. Most important, occupants of this space are promised ambient noise not exceeding 46 decibels (defined by one industrial noise authority as halfway between a library and home in a quiet suburb).

Moving aft past a storage area leads to a large living room and dining area spanning the full 19-foot (5.75-meter) width of the cabin. This main cabin zone constitutes a third of the overall passenger cabin area. A wide divan faces a large-screen video display. There are also eight leather passenger seats. Two more divans face a pair of small tables that extend to become dining tables. With the berthable seating, this area accommodates six passengers for sleeping.

Farther aft is a higher-density cabin zone with 18 business-class leather seats, each berthable to a "full flat" bed. Beyond that is the kitchen area with seating for the service staff.

The target clientele for Deer Jet's Dream Jet: *Fortune* 500 companies, Russian oligarchs, Chinese or American billionaires, or even the royal families of the Middle East. Chartering the Dream Jet costs $70,800 per hour. "Our target market is an international clientele, those who enjoy luxury and want to travel under exceptional conditions," said Fang.

Deer Jet operates 90 business jets, 30 of them wholly owned, and serves 300 customers a year, half of whom are Chinese. The ambition of the Beijing-based company is clear: "We are leaders in our specialty in Asia, and now we want to become a world leader. This aircraft will help us," said Fang.

To that end, Deer Jet ordered a second 787 last year. It is expected to enter service by early next year. Deer Jet owns eight FBOs in China, employing 1,000 people. To strengthen its international presence, Deer Jet acquired two companies last year: UAS International Trip Support, a Dubai-based flight support provider; and Hong Kong-based charter provider Asia Jet. ❑

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TEXTRON AVIATION

AirVenture 2017

by Mark Huber

ROB OLEWINSKI

B-29 Doc

GA's big show gets bigger

The Experimental Aircraft Association's (EAA) annual AirVenture conclave is perhaps the best biological barometer of the state of general aviation, and this year's gathering signaled that things are definitely looking up. Attendance was up 5 percent over last year, to nearly 590,000 for the week.

EAA ran out of parking space for cars and airplanes, it ran out of camping space, it opened new parking lots, enlarged both aircraft and ground vehicle camping, expanding Camp Scholler by 10 acres. Attendance at the Camp was an estimated 40,000, up 11 percent on last year. Wittman Field recorded 17,223 aircraft operations between July 21 and 30; more than 10,000 aircraft arrived there and at nearby airports during the week. The number of showplanes was 2,991, up by 5 percent on last year, and there were 881 commercial exhibitors.

EAA chairman Jack Pelton attributed the attendance to more general aviation flying as well as EAA's focus on planning an event packed with diverse content that appeals to a variety of constituent groups across multiple interests. "We've spent the last three years [showcasing] WWII and warbird aviation, homebuilt aviation, vintage aviation, celebrations and history—to have enough of that content in the event to keep people interested," he said.

That is an understatement.

Bombs Away!

This year's AirVenture featured the only two flyable WWII Boeing B-29 bombers on display and flying over the delighted crowds in formation. It was part of the 75th commemoration of the 8th Air Force. By way of celebration, during the show AirVenture hosted the Superfortresses as well as a B-1B, B-2, B-52, B-24, A-26, several B-17s and 13 B-25s that reenacted Doolittle's Raid on Tokyo, complete with open bomb bays, pyrotechnics and the last surviving raider, 101-year-old Richard "Dick" Cole, who flew as Gen. Jimmy Doolittle's copilot on the raid. The B-25s lined up in formation before beginning their takeoff roll on Runway 18, a low-flying Japanese flag planted near the end of the pavement. A few of the pilots mimicked the short-field takeoff techniques that were needed to launch from the aircraft carrier USS *Hornet* on April 18, 1942. Once airborne, the B-25s converged on show center from multiple directions at differing altitudes, simulating the Raiders' Tokyo attack, flying through smoke plumes from the fireballs below.

B-25

MARK HUBER

MATT THURBER

Honoring the Rocketmen

This year AirVenture also celebrated the 50th anniversary of the Apollo space program with a two-hour evening program

reunion and discussion panel of surviving lunar astronauts and NASA officials, among them legendary flight director Gene Kranz and astronauts Walt Cunningham (Apollo 7), Frank Borman (Apollo 8), Jim Lovell (Apollo 8 & 13), Buzz Aldrin (Apollo 11—the second man on the moon), Fred Haise (Apollo 13), Al Worden (Apollo 15) and Joe Engle (Apollo 17). Cunningham discussed the 1,000 changes made to the Apollo capsule in the wake of the fatal 1967 launch pad fire that stood down the program for a year. Borman and Lovell were part of a three-man crew (along with William Anders) that orbited the moon for the first time on Christmas Eve 1968, transmitting an historic live television broadcast back to Earth and taking the indelible "blue marble" photo of the Earth from lunar orbit.

Kranz reminded the audience that the Apollo program was not dissimilar from one of today's high-tech start-ups, with the average age of a NASA flight controller being 26 and an astronaut 38. Lovell, the commander of the star-crossed Apollo 13 mission that was forced to abort a lunar landing and barely made it back to Earth, challenged the audience to make the most of their lives on the planet, while Aldrin discussed possible life on Mars. He called human colonization of that planet "our destiny."

Blast Off

Aspiring astronauts had a chance to check out a full-scale mock-up of Blue Origin's New Shepard rocket crew capsule. In November 2015, New Shepard became the first rocket to ascend above the Kármán Line—62 miles above sea level, commonly considered the boundary between the Earth's atmosphere and outer space—and successfully return to Earth to make a vertical landing. The booster repeated the feat five more times the following year, demonstrating the re-use of a rocket for the first time. The six-seat crew capsule allowed visitors to recline in flight-ready seats and experience a simulated mission with real footage taken during the rocket's previous flights. Blue Origin president Rob Meyerson said, "We hope to inspire the explorers of tomorrow, the ones who will help us achieve Blue Origin's goal of millions of people living and working in space."

ROB OLEWINSKI

EAA's Ford Tri-Motor

MATT THURBER

New Shepard rocket booster

Say Hello to "Aviore"

Stan Lee, creator of such comic-book heroes as Spider-Man, the Incredible Hulk and the X-Men, has created an aviation super-hero for the EAA's Young Eagles program and to encourage education and exploration for young people in all areas of aviation and aeronautics. "I've always believed in encouraging children to read, think, imagine and do," Lee said. "Nowhere do these positive actions come to life more than in EAA's Young Eagles program. As Young Eagles celebrates its 25th anniversary, I want to donate a special gift to this wonderful program."

Blues Zoom

The U.S. Navy's precision demonstration flight demonstration team, The Blue Angels, thrilled Friday and Saturday crowds with performances. Pelton said the team won't be back for several years, in part because of the logistical problems their performances create for the neighbors on the east side of the airfield. He said that 35 houses and multiple businesses, including military vehicle maker Oshkosh Defense, must evacuate for 90 minutes each time the Blues perform.

ROB OLEWINSKI

It will be several years before the Blue Angels return to AirVenture.

Kit Standard

This year's AirVenture celebrated the 40th anniversary of the Christen Eagle aerobatic kitplane and formally recognized designer Frank Christensen. EAA chairman Pelton called the Eagle's introduction at Oshkosh in 1977 "the turning moment in the kitbuilding movement. That was a design with phenomenal instructions. You could buy it in phases and be relatively sure of a high level of completion."

Hundreds of Eagle kits were bought and assembled and the airplane became a mainstay of International Aerobatic Club (IAC) competitions and airshow performers. Christensen will be inducted into the EAA International Aerobatic Club Hall of Fame later this year.

Google This

Google co-founder Larry Page's Kitty Hawk Aviation brought its low-altitude "flying platform" to AirVenture this year. The all-electric Kitty Hawk flyer resembles a single-seat pontooned drone and is designed to be flown over water, barely out of ground effect. The current prototype has an endurance of just three minutes and can reach an altitude of 15 feet, but an improved model has the goal of reaching 25 mph for up to 20 minutes.

Not Your Father's Tesla

Oregon-based Samson Motors exhibited a pre-production prototype of the $140,000, three-wheel-drive Switchblade Flying Sports Car kit, which it claims will have a power-to-weight ratio similar to that of a 2017 Chevrolet Corvette and is constructed primarily of composites. While not completely assembled, the prototype on display at AirVenture demonstrated a patented retractable swing-wing mechanism that its developers say will shield flying surfaces while the vehicle is in ground mode. First flight for the vehicle, which will be sold primarily in kit form, is expected this fall, with deliveries to begin a year later.

According to the manufacturer, which has been working on the craft for the past nine years, the Switchblade will be powered by a 190-hp turbocharged V4, which would give it a 200 mph top speed in the air, with a better-than 1,500 fpm climb and 400 miles range with a useful load of 544 pounds. The transition from automobile to aircraft is automated and will take 45 seconds. The basic kit comes with engine, transmission, avionics, ballistic parachute and builder assist program.

Samson Switchblade

The French Connection

Daher brought a replica Morane-Saulnier Type L Parasol World War I training airplane to its EAA AirVenture display this year, after an intensive six-year construction process by a team of volunteers consisting of retired and active Daher employees. Daher launched the Parasol project to help celebrate the 100th anniversary of the company's roots in aerospace, which date back to

Continues on next page ▶

The Cub Turns 80

This year's AirVenture commemorated other historic milestones such as the 80th anniversary of the Piper Cub. The Cubs 2 Oshkosh celebration began several days before AirVenture at nearby Hartford, Wis. (KHXF) Airport, from which they departed beginning 6 a.m. July 23 for a mass arrival at Oshkosh. Within 90 minutes 50 Cubs had touched down.

Some 20,000 Piper Cubs were built between 1937 and 1947 and 5,000 of them are thought to be in flyable condition. Among the Cubs at Oshkosh this year was one piloted by fourteen-year-old Kyle Carden, who flew 800 nm in a J-3 to reach Oshkosh this year after leaving Alabama on July 19 with co-owner and certified flight instructor Philip Grice of Continental Motors. Carden currently takes care of the aircraft as he receives dual instruction toward his private pilot certificate. Continuing the tradition of this aircraft, he will choose the next teenager to become the temporary owner of the 1946 Cub once he himself becomes a professional and moves on to a bigger airplane. Grice suggested the trip to Oshkosh as a way for Carden to gain cross-country experience and practice landing at unfamiliar airfields.

EAA PHOTO/ANDREW ZABACK

▶Continued from preceding page

MATT THURBER

Morane-Saulnier Parasol replica

Morane-Saulnier's founding in 1911 and Daher's purchase of the company in 2009 as part of its acquisition of Socata from Airbus.

Some 1,800 pilots were trained in the Parasol during the First World War. Although 1,000 were built, none survived, so there were no examples to examine for the Daher project. Morane-Saulnier sold its first airplane to a U.S. customer in 1912.

"It was important to salute the U.S.," said Nicolas Chabbert, senior v-p of Daher's airplane business, explaining why the company brought the Parasol to Oshkosh. "The U.S. came to rescue us during World War I."

The volunteers who worked on the Parasol were a combination of young Daher employees and older retirees. Engineers took the 1915 Morane-Saulnier drawings and converted them into files in Catia design software, then the team used that information to make the primarily wood parts, which are covered with fabric. The Parasol has no ailerons and, like the original Wright Flyer, uses wing warping for banking. It also has an all-flying elevator and rudder. The airplane will remain at Oshkosh in the EAA Museum.

ROB OLEWINSKI

Icon Gets Its (Business) Sea Legs

Want an Icon? Got $1,000? Icon Aircraft claims to hold deposits for 1,800 light-sport A5 amphibians worth a collective $450 million, but at this year's AirVenture it was soliciting new deposits for $1,000. A little more than a year after it announced plans to slow production and realign the manufacturing flow and supply chain, Icon has resumed deliveries and is working on upgrades for the 2018 model. Icon recently handed over the first six A5s, the first deliveries since announcing the production delay in the spring of last year.

"We've had a challenging year for sure, but the A5 is now ready," said CEO Kirk Hawkins. In the past year Icon has built an airframe components facility in Mexico, opened a second flight center and trained 125 students. The company said it is now building a parts-distribution network, establishing a maintenance-training program and appointing authorized service partners.

MATT THURBER

Nearly 590,000 visitors made the trek to Wittman Field, where stunt pilot Gene Soucy, wingwalker Theresa Stokes and Showcat *were among the attractions.*

ROB OLEWINSKI

Rallying the Troops

In his opening day remarks, Pelton blasted congressional efforts to privatize the nation's ATC system and throughout the week EAA volunteers roaming the show grounds equipped with iPads enabled attendees to instantly message their members of Congress in opposition to the measure. General aviation leaders on site were unanimous in their opposition to the proposed legislation. One Aviation chairman Alan Klapmeier emphasized the need to explain the issue to those beyond the general aviation community. "It doesn't do any good if we don't talk to other people. The language that the privatization side is using is deliberately deceptive. They are trying to make it sound like it will be a competitive free-market system, but it simply won't be. Free-market capitalism requires competition. This is a system that will not have competition in it. Talk to people outside aviation and make sure they understand that this is not about a business solution; this is about a monopoly. And if you are going to have a monopoly, then you'd better be careful who you give the monopoly to." ❑

MARK HUBER

Aerospace entrepreneur George Bye stands next to a prototype of his Sun Flyer two-seat all-electric trainer.

Another Electric Company

Aviation entrepreneur George Bye brought his Sun Flyer 2 all-electric, proof-of concept trainer to AirVenture this year and announced plans to launch a four-seat model called the Sun Flyer 4. Bye said the Sun Flyer 2 is priced at $249,000 and the 4 has a launch price of $349,000. All ground testing on the Sun Flyer 2 has been completed, he said, and the company is aiming for a first flight this fall. He estimates a certification program would likely take two to three years and added that his company is attempting to certify the Sun Flyer 4 in parallel, with changes. Spartan College of Aeronautics and Technology is the lead deposit holder for both models.

The Sun Flyer 2 is a day/night VFR aircraft with a maximum 440-pound payload (same as useful load, since there is no fuel weight), 120-knot maximum cruise speed, three-hour endurance and $16 per hour direct operating costs. Bye said battery charging time between flights is 20 to 30 minutes. The Sun Flyer 4 is a day/night IFR aircraft with an 800-pound payload capable of 120-knot max cruise speed, a four-hour endurance and $18 per hour direct operating costs. ■

MARK HUBER

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MARIANO ROSALES

The Commemorative Air Force's **FIFI**, *one of the two remaining airworthy B-29s that made an appearance at this year's AirVenture.*

B-29s meet @ Oshkosh

by Matt Thurber

More than 50 years since two B-29 Superfortresses shared the same airspace, the Commemorative Air Force's *FIFI* and the recently restored *Doc* flew together over Oshkosh at this year's EAA AirVenture show. These are the only two airworthy B-29s remaining, and while *FIFI* has been flying since the 1970s, *Doc* took to the skies only last July after a 17-year restoration.

I had the opportunity to fly in *FIFI* from Kankakee, Ill., to Oshkosh, and during the flight I was seated in the bombardier's position in the nose of the big four-engine bomber. Multiple window panes flooded the compartment with light, and it felt a bit like flying in an isolated bubble, except for the overt reminders of the nature of this airplane, from the gunsight and Norden bombsight pinned in place on the right side and the indicator showing the status of the 20,000 pounds of bombs that the B-29 can carry to the exposed guts of the plumbing and flight controls on either side just in front of the two pilots.

The B-29 requires three cockpit crewmembers, consisting of two pilots and a flight engineer. *FIFI* and *Doc* are both operated with a total crew of 12, which includes ground support, ride and tour sales and in-flight positions such as the rear, left and right scanners. *FIFI* is under the care of the CAF B-29/B-24 Squadron, based at Dallas Executive Airport in Texas.

During the flight to Oshkosh, in addition to retired airline pilot Allen Benzing flying in *FIFI*'s left seat and Cessna 185 owner and airline pilot Jeff Skiles (of "Miracle on the Hudson" A320 landing fame) flying right seat, the flight engineer position just aft of the copilot was filled by *FIFI* senior crew chief Rick Garvis. The flight engineer starts the engines and operates all of the engine controls, at the command of the pilot flying. The pilot and copilot each have four throttles for engine control, mostly used during taxi, takeoff and landing. The pilot's position also has an elevator trim wheel.

The B-29's nosewheel is freecastering, and thus steering on the ground is via differential braking or power. But the expander-tube brakes are somewhat grabby, according to both Benzing and Skiles, and this can make steering with brakes a lurchy affair. Using power is generally smoother.

At some airports, such as Kankakee, taxiway lights stick up higher to accommodate winter snow drifts. The airport's taxiways are narrow enough that the B-29's outboard engines and low-slung propellers could hit the taxiway lights, so *FIFI*'s crew developed a special procedure for this kind of airport. After starting all four 18-cylinder Wright R-3350 radial engines and taxiing away from the ramp at low power to avoid blasting other aircraft and nearby buildings, Garvis and the pilots did the runup and some before-takeoff checklists, then he shut down the two outboard engines for the taxi to Greater Kankakee's 6,000-foot Runway 4. Once lined up on the runway, he restarted the two outboard engines, then the crew ran the final checklists, and it was time to take off.

On the roll, *FIFI* accelerated fairly slowly once the engines were set to takeoff power, roughly 40 inches of manifold pressure. Benzing had explained that it's sometimes necessary to use differential power to keep the nose straight on takeoff, so there may be a need to manipulate the throttles. But normally once power reaches about 30 inches, he turns the throttles over to Garvis to set maximum power.

From my seat in the nose, I could see that we tracked the runway centerline perfectly, and as we passed 100 knots the nose gradually lifted up, and then equally slowly, the rest of the airplane followed in a shallow climb. There is no need to pull the control wheel aft to rotate the nose up on takeoff, Benzing said, and the B-29 simply flies smoothly off the runway.

ROB OLEWINSKI

FIFI *and* **Doc** *fly together for the first time.*

Once aloft, we climbed just over a couple of thousand feet to stay below a scattered-to-broken cloud layer, rumbling over the emerald green Illinois and Wisconsin countryside. I was surprised at how smoothly the B-29 flies, with absolutely zero vibration from the big Wright radials. The view from the bombardier's seat, although constrained by window frames, opens up a wide-angle window on the outside world, and it's easy to see how the bombardier can look almost straight down at targets.

As the terrain grew more lumpy the further north we flew, I couldn't help contrasting the somewhat noisy wake of our 1942 B-29 as we flew over countless reminders of modern life: power-generating windmills lazily turning wind into kilowatts to power smartphones; warehouse stores and supermarkets filled to bursting with stuff that was strictly rationed during the war; cars that in the 1940s would have looked like futuristic flivvers from the pages of *Popular Science*. And meanwhile, Benzing and Skiles were picking out aerial traffic that posed no threat other than possibly trying to occupy the same space, by using a Stratus radio receiver getting signals from ground stations delivered to the ForeFlight software running on iPad tablet computers mounted just behind and to the side of each of their control wheels.

Skiles flew during most of the flight. As we neared Oshkosh, Benzing took the controls and steered *FIFI* over Warbird Island, the starting point for funneling warbirds to the airport, then towards Runway 36. We flew a high pass over the runway then broke to the right and returned for landing. Benzing explained the planning that precedes landing the B-29. Not only does it take time to think about and then request power settings from the flight engineer, but the big airplane doesn't respond quickly to control movements and power changes. It is difficult if not impossible, for example, to recover from an excessively steep approach, so Benzing brought the B-29 down final at a relatively shallow angle with plenty of power, then gradually reduced power as the B-29 crossed the end of the runway and gently descended to the pavement.

Once near the runway he touched the upwind wheel slightly ahead of the other mainwheel, both with a small squeak, then let the nose down gently a moment later for a smooth landing and straight-ahead rollout. We easily made the turnoff at taxiway P2 and trundled into the entrance to Boeing Plaza where a crowd awaited *FIFI*'s arrival.

FIFI and *Doc* graced the Boeing Plaza ramp for the night and the following morning, attracting many visitors eager to soak up the historic meeting. Both airplanes had been rescued from the U.S. Navy Proving Ground at China Lake, Calif., where they were among about 100 B-29s abused for missile target practice.

Doc made its first flight after the restoration on July 17 last year, and since then the B-29 has flown more than 30 hours. The group formed to bring *Doc* back to life—*Doc*'s Friends—is seeking a waiver from the FAA to allow passenger rides, and this will be part of the fundraising to help keep *Doc* flying and pay for building a new museum hangar and education center at Eisenhower Airport in Wichita. The goal is to open the new facility in September next year.

During the afternoon airshow on the second day of EAA AirVenture, *Doc* and then *FIFI* taxied slowly away from Boeing Plaza and took off on Runway 18, then flew circles overhead as about a dozen B-25s and warbirds galore took to the skies in the Warbirds of America show. When the exhibition was over, *FIFI* turned north for Appleton and her next summer tour stop, while *Doc* landed and taxied back to her spot at Boeing Plaza. But in spirit, the last two surviving B-29s remained bonded, wingtip to wingtip. ❑

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DAS culture change

▶ *Continued from page 12*

fleet. With "classic" Falcons comprising just over one-third of the fleet, the inventory takes the legacy aircraft into account as well. In fact, earlier this year Dassault added a Falcon Classic session to its maintenance and operations program to ensure those operators are aware of the support options that remain available for them.

Other steps designed to lower cost for Falcon customers are aimed at extending scheduled maintenance intervals. For the Falcon 7X/8X, 1A intervals were stretched to 12 months/800 hours from nine months/600 hours; and 2A went to 24 months/ 1,600 hours from 18 months/1,200 hours. In progress is an effort to extend 4A intervals to 48 months from 36, targeted for next year. Similar extensions are also under way for the Falcon 50, 900 and 2000 series from their either eight- or six-month intervals to multiples of 12-month intervals for 1A-4A maintenance.

One key reorganization was realignment of pre-purchase efforts into a newly named unit, Falcon Pre Purchase Services, led by Gary Schiff, general manager, and Michelle Averso, director.

DAS also has packaged other services efforts such as design engineering and certification engineering. DAS believes its relationship with the parent factory, as well as expansive organization designation authorizations, give it a leg up in providing expertise and equip it to coordinate on STC packages, retrofits and other modifications. The company coordinates with its international counterparts to help expedite approvals. This cuts out the middleman, Ozenick said, noting that "third parties have to go through us."

The company has introduced a Falcon Systems Solutions team that works directly with Dassault Aviation and Dassault Falcon Jet Technical Working Group to develop certified retrofits and upgrades for Falcon operators, as well as work with major avionics and other OEMs "to define the roadmap of each Falcon" with a goal to ensure each Falcon meets new mandates and is continuously improved. This is particularly important with upcoming ADS-B/Fans deadlines, he noted.

Infrastructure Investment

All of this is taking a substantial investment, Ozenick said. DAS is investing heavily in its staff, with all employees undergoing training every year. The company estimates it spends $2.5 million annually on this training, which amounts to 18,000 hours each year. Along with training, DAS is investing in new equipment and software such as Catia v5 throughout the network.

The company is evaluating expansion and other investment possibilities at facilities throughout the network, and while Ozenick said the company is not yet ready to reveal specifics about those investments, he added, "everything is on the table."

This evaluation is driven in part by growth in the used market, which is demanding more capacity and capabilities. "The used market is hot," Ozenick said. "We are changing what we do to get ready for that." It also is being driven by the overall growth of the fleet, with 2,100 Falcons in service.

A few months ago the company won back its maintenance for the NetJets Falcon 2000 fleet, which has boosted business at facilities such as the U.S. flagship center in Wilmington, as well as at the West Palm Beach, Fla. satellite line service operation located by a NetJets center. Wilmington is close to capacity, and Ozenick indicated that limitation is under study. He also expressed interest in possibilities for the West Palm Beach operation. As for the Brazilian center at Sorocaba, Falcon do Brasil, Ozenick said, "we've got some good things in mind" for growth there.

Also outside the U.S., the company recently named Skyservice Toronto a new authorized service center and is bringing two more operations on line (in New Delhi and Ostafievo in Russia); the company is not ready to reveal details. ❑

2017 tours

▶ *Continued from page 8*

aircraft to potential prospects and aviation enthusiasts along the way.

C150GO

This year marks Canada's 150th anniversary, and father-son duo Bob and Steven Dengler, along with veteran pilot Dugal MacDuff, are celebrating by flying a Bell 429 outfitted with Honeywell connectivity services around the world. Steven previously told **AIN** that he and the crew will stop in every Canadian territory as well as at specific sites that hold historical significance for Canada and the aviation industry, such as Cornwall in southwest England, where the first ever transatlantic radio signal was sent, as well as Signal Hill, in St. John's, Newfoundland, where that signal was received. By the end of the trip, the Bell 429 had stopped at 100 locations in 14 countries.

About three or four months before this trip began, the Denglers approached Honeywell Aerospace for a satellite phone to carry on their mission. Because the Honeywell team already has been working on helicopter connectivity for some time, they proposed the idea of installing a satcom system on the 429. After the Denglers agreed, Honeywell representatives had to work quickly with Transport Canada to receive a limited STC, set up a test flight and file the appropriate paperwork for installation to begin. Honeywell installed the Aspire 200 satcom system a month before the Denglers took off.

Aspire 200 is a small Inmarsat Wi-Fi system that operates on SwiftBroadband. For this trip it provided the Denglers Wi-Fi speeds up to 350 Kbps, meaning they could easily upload pictures and video to their social media accounts for people to follow along on their journey. The satcom connectivity offers weather updates, flight planning, ground logistics and maps.

Mark Goodman, product director for Honeywell Aerospace, told **AIN**, "The big challenge with helicopters when they're flying beyond city centers and can't receive ground-based connectivity is that the rotor disc rotates between the antenna and the satellite and blocks the satcom signal. We've employed some technology in the connection between the satcom system on the aircraft and the satellite that makes the connectivity really robust and error-free."

Each tour also helped the companies learn more about their clients' needs as well as their own aircraft. Following the success of the European tour, Piper worked with National Airways to bring the M600 to 11 countries in Africa from July 1 to July 20. The tour took in Nigeria, Angola, Namibia, South Africa, Malawi, Kenya, Ethiopia and Egypt. It will resume to Asia and Australasia in conjunction with the Singapore Show early next year. The HondaJet tour is helping MacQueen and his wife with their hotel business, with the trip providing a crash course in hotel culture around the world for the couple. They are studying the hotel industry and will bring back different techniques to diversify Innisfree Hotels. While Honeywell is not planning another world tour at the moment, technicians were eager to study the data from the Denglers' trip to improve and better position their products for clients' needs. ❑

Extension likely for FAA reauthorization

by Kerry Lynch

The aviation community is preparing for at least one and potentially a series of short-term extensions of the FAA's authorization after the House recessed for the August break without taking action on the comprehensive six-year reauthorization bill, which includes the controversial air traffic control reorganization proposal. House Transportation and Infrastructure chairman Bill Shuster (R-Pa.), the chief architect of the proposal to create a user-funded independent ATC organization, had hoped to bring the bill to the floor for a vote before the end of July but was unable to secure enough votes.

With just 12 legislative days left in September before the current authorization is set to expire, there is little time to get the bill through not only the House but also the Senate and come to a compromise agreement.

Unlike the House bill, the Senate bill does not include an independent ATC measure. But the Senate bill has stalled as well. While floor action has stumbled in both chambers, both sides of the ATC issue have been working feverishly through the August break to sway undecided lawmakers, to the point that one lobbyist remarked, "It's a war out there."

"There's been more dirty politics on this than I've ever seen," noted Experimental Aircraft Association chairman Jack Pelton during this year's AirVenture. Shuster and General Aviation Caucus co-chair Sam Graves (R-Mo.) have been reaching out to individual heads of general aviation (GA) companies and other organizations hoping to change minds, while GA groups have held numerous meetings on Capitol Hill hoping to shore up opposition.

At the same time, ATC reform proponents are continuing to highlight new backers. Media mogul Steve Forbes recently wrote about the "woefully dysfunctional air traffic control system" and said the solution "is to divorce ATC functions from the FAA's mission of ensuring air safety."

The opposition has dug in as well. While Graves has aligned with Shuster on the issue, fellow caucus members have resisted, among them Rep. Tom Cole (R-Okla.), who recently wrote: "The FAA has worked well for our nation for many years. If it's not broken, then don't try to fix it."

Lobbying Investigation

Meanwhile, House Democrats, who have largely been ardently opposed to the proposal, have cried foul over FAA and DOT officials weighing in on behalf of ATC reform.

Reps. Pete DeFazio (D-Ore.), the ranking Democrat on the Transportation & Infrastructure Committee, Nita Lowey (D-N.Y.), the ranking member of the House Appropriations Committee, and David Price (D-N.C.), the ranking member of the transportation appropriations subcommittee, formally asked the DOT Inspector General (IG) to investigate whether political DOT appointees "violated federal law, including the Anti-Lobbying Act."

In an August 2 letter to DOT IG Calvin Scovel, the lawmakers noted language in the Anti-Lobbying Act that prohibits use of government funds for lobbying activities but said, "It has come to our attention that at least four DOT political appointees have contacted members of Congress, nonfederal stakeholders such as aviation association representatives and airport sponsors or both to gain support for [the proposal]." They pointed to missives from the DOT officials that "with each of its major concerns addressed in the…Act, the general aviation community has no substantive basis to oppose freeing America's ATC system from an unwieldy agency and unpredictable funding."

A DOT spokesperson responded to the Democrats' allegations, saying, "The department has shared factual information in support of the president's ATC reform initiative with members of Congress and other stakeholders in response to questions and issues that have frequently come up. This has been done in compliance with the Anti-Lobbying Act."

Democrats also have appealed to the Congressional Budget Office to take a fresh look at the costs associated with the ATC proposal, saying it could push the net deficit billions beyond the initial estimate of $20 billion over the next 10 years.

As for business and general aviation leaders, they have been sending a message to their membership: "Shuster…is not giving up the effort" and the community needs to keep up the pressure on Congress. The National Air Transportation Association warned members that the congressman has told reporters the proposal "needs just a few more members of Congress to commit to supporting it before it can be scheduled for a vote in September."

NBAA president and CEO Ed Bolen has been making the rounds on the radio to voice his opposition. "This is not a situation where it is true privatization," Bolen said during a recent edition of The Lars Larson Show. "What we're talking about here is taking an ATC monopoly—it is

Continues on page 60 ▶

PILOT REPORT

Quest Kodiak

Brings solid feel and sure handling to utility role.

Text and photography by Nigel Moll

Quest Aircraft bills the Kodiak as the "next generation of STOL aircraft capable of bringing services and heavy supplies to the most remote regions on the planet," and the Idaho-based manufacturer has built 222 since the sturdy turboprop single was certified in 2007.

"Third generation" would be accurate too, in that the Cessna Caravan dates to the early 1980s. The first generation would be the Pilatus Porter (340 hp)/Turbo Porter (550 shp) and Helio Courier (295 to 400 hp). In the context of the Kodiak, the Helio seems particularly noteworthy because both it and the Kodiak were designed originally to serve missionary pilots flying on and off short, narrow strips carved out of some of the harshest terrain on the planet. Indeed, the Kodiak's 45-foot wing span (seven feet shorter than the Caravan's) was dictated by the 50-foot width of many strips carved out of jungle.

In the years since it was designed, the Kodiak has caught on with a market beyond the missionary mission but for the same reasons: short takeoff (less than 1,000 feet at max weight) and landing; an emphasis on safety not just by careful attention to aerodynamic and structural design but also in the choice of Garmin's onboard systems; versatility in a roomy cabin; and the efficiency and reliability of a single PT6 turboprop in the nose for copious power on widely available jet fuel and range of 1,000 nm with wheeled gear. For the GA market, Quest defines the Kodiak as the machine to satisfy the need for lift between a business jet—speedy but needy in the runway department—and a helicopter (land anywhere but complex and don't plan on carrying a ton of bulky stuff).

This summer Quest launched the Kodiak amphibian on a North American tour. Flown by company marketing director and lead demo pilot Mark Brown, accompanied by his fiancée, FlightSafety second-in-command and contract corporate pilot Ashley Atkinson, the airplane dropped by my home on Skaneateles Lake in Central New York. For Quest the purpose of the stop here was two-fold: demonstrate the airplane to this magazine for a pilot report and also to my good friend and neighbor Tony, who likes the look of the Kodiak as a possible replacement for not only his IO-720-powered Helio 800 amphib *(see sidebar on page 37)* but also the "family Winnebago," a PA-31-310 Navajo. The allure of one PT6 versus 20 cylinders is a powerful persuader.

During a stint in the cabin of the Kodiak while Tony was in the left seat, I could almost see cogs turning in his mind as he contemplated the possibilities opened by the smooth whistling hum up front and the big screens delivering anything he could ever wish to know about the task at hand. The contrast with his mildly updated '60s- and '80s-vintage fleet was stark.

Flying The Kodiak

Faced with scaling the big Aerocet carbon-fiber floats and their struts to board the Kodiak amphibian through the front left pilot door, I'm struck by the notion that this is a large flying machine to have swooped into little Skaneateles Aerodrome (6B9) and its two 3,000-foot runways—one grass, one blacktop. The pilot's eyeline when seated is not much shy of 10 feet up—about where it is in a 727.

The cockpit exudes quality: the high-contrast white-on-black design, the sturdy switches, the leather-wrapped control wheel and the hefty black lumps of milled aluminum through which the control shafts disappear into the panel, the absence of plastic pretty much everywhere except knobs and buttons. This is the pilot's everyday interface with the machine, and it conveys a solidity that is borne out when the airplane is in its element charging through chop on the water or in the air.

Before starting the PT6 you need to make sure both overhead fuel selectors are on. With just one engine, there's no provision for transferring fuel from one tank to the other. If the airplane is parked on a slope with both selectors on, fuel will migrate to the downhill wing, so you turn them both on before start as part of the preflight.

Beyond that, the process is simple and requires little more than keeping the usual sharp eye out for a temperature spike during the process: fuel pump on, igniters on, hold the starter down to low throughout the sequence. At 15-percent NG, introduce fuel, monitor ITT and NG and at 54-percent NG let the starter go, having reached a peak temp of typically 680 deg C in this airplane. The green arc extends a couple of hundred degrees C beyond that. "It's a really cool-starting engine," observed Brown. Igniters off, fuel pump to standby, aux bus on, generator and alternator on, prop to max rpm, "and then I'll set 20 degrees of flap right after that because that's the setting for every takeoff," added Brown.

My first takeoff was from the hard runway at Skaneateles Aerodrome: advance the power to the top of the green on the screen, start to get the weight off the nosewheels at 55 knots, and it wants to start flying at between 60 and 65 knots. Once airborne, establish 10 degrees

Clockwise from top left: The three-screen Garmin G1000 suite dominates the panel. The steep sides of narrow and deep Skaneateles Lake dominate the view through the windshield. Quest marketing director Mark Brown pumps out the bilges of the $400,000 Aerocet carbon-fiber floats, a task that he says is much less frequent than with earlier-generation pontoons. The Kodiak amphibian launches off the 3,000-foot hard runway at Skaneateles Aerodrome on sturdy sea legs. Pod-mounted weather radar is optional.

pitch and look for 85 knots for the climb over obstacles before bringing the flaps in to 10 degrees and the prop back to 2000 rpm from the 2200 rpm used on takeoff. "Power is the same at 2000 rpm and 2200 but there's less noise inside and out at 2000," said Brown.

"The nice thing about the Garmin setup is that as long as everything stays green we're within our allotted limit," he continued. "The yellow arc on the ITT and torque gauges is the 700- to 750-shp range, so it depends on the conditions of the day (density altitude) whether you'll torque out first or temp out first." The full 750 shp for takeoff can be used for five minutes and then you have to bring the power lever back into the green arc. If you stray beyond the yellow power arc on takeoff and climb you get an aural alert as well as a bright warning on the PFD that you have overpowered the engine.

Even with the headset lifted away from the ears momentarily, the noise level inside the Kodiak is low, thanks in part to inflatable door seals that are standard equipment and inflate automatically when the master switch is turned on. The quality in the cabin continues the standard set in the cockpit. Leather is standard for all seating packages. The aircraft flown for this report had the

Continues on next page ▶

First Generation vs Third Generation: Helio 800 vs Kodiak

Both of these STOL utility aircraft have missionary and disaster-relief roles in their roots, and they show how far the concept has evolved in the four decades that separate the start of H-295 Helio production in 1965 (it ended in 1974) to certification of the Kodiak in 2007. The 1984 Helio 800, S/N H-18, in the photo below is the last one built in Kansas when production resumed briefly in Kansas in 1982 for the last time.

In a nutshell: flying the Kodiak is simple and relatively effortless; the Helio is a workout, and putting it on floats serves to magnify some of the quirks. Note how close the ends of the floats are to the runway during rotation to the sharp angle of attack at which that wing can clamber aloft with slats extended like claws. Now imagine trying to give the wing that angle of attack on water with the floats extending far behind the axis of rotation and buoyantly resisting being pushed deeper into the water by backpressure on the wheel. It can be done, but it's awkward; patience is better if there's enough water.

As the floats begin to rise out of the water, easing the backpressure gets them up onto the step. If you hold the correct attitude to nail the floats' sweet spot, the acceleration builds nicely and takes the speed to the point that lift can prevail without awkward alpha, and a gentle nudge of backpressure breaks the floats free of the water. It takes more water and more time, but this technique is more elegant than yanking the airplane into the air at a forced alpha and then having to do a balancing act to stay airborne while building speed and reducing alpha.

The Kodiak seems to shrug off the water takeoff with less drama, not least because there's 750 shp on the prop and the slickest floats you can buy slicing through the swell. The Kodiak's handling is a lot less brawny and more refined.

Landing the Helio on water is a more relaxed affair when it's not in tight confines, and narrow Skaneateles Lake's 16-mile length makes for a low-stress runway. After checking that the gear is retracted into the floats, select 20 degrees of flap, bring back the power and set up a nice shallow rate of descent. As the water gets closer, raising the nose will lower the speed and cause the slats to pop out, calling for a not timid application of power as the drag rises. Holding that attitude and power almost to the water and then pulling back gently on the wheel and power makes for a smooth splashdown, followed by a sharp pull back on the wheel to the stops to make sure the floats' prows don't dig in. The technique is similar with the Kodiak, but without the abrupt extension of slats and need for power to compensate.

On wheeled landing gear, the Helio 800 excels, leaving the ground in 290 feet or less. The best technique is not to try to lift the tail and accelerate in a level attitude, as you would on most taildraggers, but to accelerate on all three wheels and let the airplane fly from that attitude when it's ready.

The cockpit and cabin of the 4,000-pound Helio are cramped compared with the much larger Kodiak's, and up front there's only one door (on the pilot's side), but one each side in the cabin. Each front-seater gets a door in the Kodiak, and there's also the big door on the left side of the cabin.

As with the takeoff using wheeled landing gear, the Helio prefers to be on all three wheels throughout the landing, and the far-forward main-gear attachment geometry lets you stomp on the brakes as hard as you like. The landing run for the 800 is published as 228 feet, but in expert hands at light weight in a good breeze it can be considerably less than that. —*N.M.*

Quest Kodiak

▶ Continued from preceding page

mid-range Timberline interior with four forward-facing passenger seats in the cabin, slip-resistant flooring under removable carpet, eight passenger headset jacks and PSU vents and reading lights. The Summit interior is the top offering, providing more comfortable and versatile seating with three-point harnesses in a club configuration with two fold-out tables, two cabinets with removable ice bins and Thermos provisions, carpet, overhead air and lighting and oxygen and charging ports at each seat and an optional sixth passenger seat; this is the choice for an airplane destined for business or family use. Tundra is more of a commuter style, offering no carpet but instead a floor protected by a layer of rubber compound, no ultrasuede sidewalls and fewer amenities, but it still has leather seats (four in the cabin), each removable in about 30 seconds and stowable for conversion between passenger and cargo ops. Both the Timberline and Tundra passenger seats have four-point safety harnesses.

My first water takeoff in the Kodiak was to the south at the south end of Skaneateles Lake, whose steep sides create something of a canyon in this area. The airplane felt solid with application of power and back pressure on the wheel, which got the water moving beneath the floats. Soon enough, some relaxation on the wheel put the airplane on the step and set us accelerating toward liftoff at 60 knots or so and climbing strongly with five people on board and a light fuel load. The amphibian's book takeoff performance on water at max weight shows a run of 1,000 feet taking 20 seconds.

A gentle right turn toward the densely treed western slope of the canyon positioned the airplane to make a climbing left turn at 80 knots across the narrow valley and toward the equally treed eastern slope as we headed north back to the Aerodrome. The Kodiak's "discontinuous leading edge" wing design came into play in this maneuvering. The outboard, tapered section of each wing has a fixed leading edge that protrudes forward and down in relation to the inboard leading edge, an arrangement that retains full aileron control at low speeds—even sub-stall in a corner where other airplanes could be inclined to spin. It makes for handling that inspires confidence at times when your instincts are buzzing because you know you're asking a lot of the wings at low speed.

The Kodiak is certified under the Part 23 standards that were in effect when Quest submitted its application in the early 2000s. Quest asserts that the Kodiak has "more than 1,000 safety enhancements that our competition does not have," citing the seats (dynamically sled-tested to 26 g rather than just drop-tested to 9 g); flammability requirements for the entire airframe, firewall to cargo bay (not just in passenger areas); more stringent lightning-strike protections; and successful demonstration of post-takeoff engine failure at 50 feet.

The Kodiak also lays claim to being the first turboprop to have the full Garmin GFC 700 autopilot package with the level option. "We call it the level switch," said Brown, "and it's a standard safety feature. If you get disoriented at night or in IMC and you don't have the autopilot on, flipping the level switch brings you back to straight and level." The Garmin suite is a three-screen G1000 with two PFDs and one MFD. Each PFD runs off its own pitot-static and ADHRS, no different from a Part 25 airplane. Optional TKS anti-ice is certified for flight into known icing with wheeled landing gear but not with floats; the tank holds 16.3 gallons of fluid, good for about 2.5 hours at normal flow.

Versatile Vehicle

The Kodiak is game for many missions. Brazil's National Skydiving Center, 70 miles from São Paulo, uses the Kodiak to take 15 jumpers to 12,000 feet in 9.5 minutes. Botswana's Ministry of the Environment uses the airplane to monitor wildlife, conduct search-and-rescue, deliver equipment and deter poaching, loitering for up to 9.9 hours with three crew. In Japan, the Bella Vista Spa & Marina smoothed out the "last mile" by introducing Kodiak amphibian service to bring incoming guests from Hiroshima Airport. The amphib has a useful load of about 2,630 pounds. Flown by one pilot (175 pounds), the resort's amphib can carry three couples and their bags (1,350 pounds) to the resort in 15 minutes, eliminating a 90-minute bus ride. Book max cruise speed for the amphib is 162 ktas. Key numbers for the tricycle-gear wheeled airplane: 174 ktas cruise at 12,000 feet for a max range of 1,005 nm/5.8 hours at 45 gph/301 pph with the full 320 gal/2,144 pounds of fuel.

Missionary and humanitarian aid, the role the Kodiak's designers had in mind at the outset, continues to feature in the airplane's résumé. It served with Samaritan's Purse and Mission Aviation Fellowship affiliate Alas de Socorro del Ecuador in the aftermath of the 7.8 earthquake in a remote coastal region of Ecuador last year.

Befitting an airplane with so many roles, the list of options is substantial. An external cargo compartment (ECC) mounted on the belly can carry 750 pounds and handle loading of 65 pounds per square foot at a cost of only one or two knots in cruise speed. The ECC also allows repositioning the TKS alcohol tank from the cockpit to the nose of the belly pod. Fitting 29-inch tires takes the max landing weight to the 7,255-pound mtow. For operations on floats, the pitch latch propeller option allows the prop to remain in fine pitch when the engine is shut down. When the engine is started with the blades in fine pitch, forward thrust is available sooner—important when there's wind or current and obstructions close by. Optional 10-place oxygen replaces the standard 50-cu-ft two-place bottle with a 115-cu-ft composite bottle and ports for eight passengers. Air conditioning is optional. Standard on all Kodiaks, though, is the big cargo door (49 inches by 49 inches) on the left side of the aft fuselage providing outsize access to the 248 cubic feet of cabin volume with all but the pilot's seat removed.

When you compare the Aerocet amphib Kodiak with the standard wheeled model, the versatility of the amphib floats comes at a price on all fronts: $400,000 higher sticker because the Aerocet carbon-fiber floats are the world's primo pontoons, 400 pounds (two people) lighter than their metal equivalent; an operating weight empty 1,030 pounds higher; and a max cruise speed 21 ktas slower. But that's the cost of equipping the Kodiak to walk on water and land, an attribute that expands the utility of this impressive airplane and also, by huge measure, the fun it can provide. ❑

Quest Kodiak 100 Amphibian Specifications and Performance

Price	(base landplane) $2,075,000
	(amphibian as flown for this report) $2,625,150
Engines (1)	Pratt & Whitney Canada PT6A-34, 750 shp takeoff, 700 shp max continuous
Avionics	Garmin G1000
Passengers	1 crew + 5-9 pax
Max range (135 ktas, w/NBAA reserves, 100-nm alternate)	landplane 1,132 nm
	amphib 975 nm
High-speed cruise	landplane 183 ktas
	amphib 162 ktas
Long-range cruise speed	landplane 135 ktas
	amphib no figures
Fuel capacity	320 gal/2,144 lbs
Max payload w/full fuel	landplane 1,391 lbs
	(amphib as flown for this report) 360 lbs
Ceiling (certified)	25,000 ft
Max takeoff weight	7,255 lbs
Empty weight	landplane 3,770 lbs
	amphib as flown 4,800 lbs
Takeoff run/roll at mtow (sea level, standard)	landplane 934 ft
	amphib 975 ft
Landing run/roll	landplane 765 ft
	amphib 1,291 ft
Length	34 ft
Wingspan	45 ft
Height	landplane 14.7 ft
	amphib 17.3 ft
Cabin	Volume (excluding cockpit) 248 cu ft
	Width 4.5 ft
	Height 4.75 ft
	Length (instrument panel to rear bulkhead) 15.9 ft
Baggage capacity	variable
FAA certification (basis, date)	FAR Part 23, May 2007
Number built (through August 2017)	222

Source: Quest Aircraft

Roots

Tom Hamilton (designer of the Stoddard-Hamilton Glasair) was a co-founder of Quest Aircraft. He is also the founder and owner of float manufacturer Aerocet, based in Priest River, Idaho, not far west of Quest's hometown of Sandpoint. Hamilton designed the Kodiak knowing it would go on floats, and Quest says it's the only airplane currently made that you can put on floats without any structural upgrades. Remove the gear and bolt on the floats and it's ready to go, with no add-ons (such as the extra strakes seen on other floatplanes) or other mods needed. In 2015 Quest was acquired by Setouchi Holdings, a Japanese company in shipbuilding, transportation and related industries. —*N.M.*

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AVFUEL

Single-engine t-prop airlines fill niche in New York market

by Curt Epstein

While the New York City area is well connected by airlines, two turboprop operators have found a niche market offering scheduled flights linking the city to Boston and New England summer enclaves such as Nantucket and Martha's Vineyard.

Having just passed its 15th anniversary, Connecticut-based Tradewind Aviation is one of the largest operators of the Pilatus PC-12 in the U.S., recently adding another three of the capacious turboprop singles to its fleet for a total of 18 split between scheduled service and on-demand charter. (The company also operates a trio of Cessna CJ3s in charter service.) "We've been running single-engine turboprops since day one," noted company president Eric Zipkin.

The company made its debut in the dark days following the 9/11 attacks and instantly felt the aftershocks on the industry. "The biggest challenge to starting in this business was getting insurance," Zipkin told **AIN**. He noted that for typical piston-powered Part 135 aircraft, at that time, it was nearly impossible to obtain coverage, so as the company's founder and chief pilot, he looked to single-engine turboprops. "I'd like to say it was by choice, but it was really more by necessity, and we were pleasantly surprised with the larger turboprop singles." The company started off with the Cessna Caravan, and customers who previously considered the term "single-engine aircraft" to mean something like a 172 were quickly re-educated. "As soon as they walk up to the airstair and walk down the aisle on the airplane, they realize that the number of engines ceases to be part of the conversation," said Zipkin.

Tradewind acquired its first PC-12 in 2003, and by 2015 the company had moved to the Swiss-made airplane as the sole turboprop, phasing out the Caravans for a number of logistical reasons. "The Pilatus is 100 knots faster than the Caravan, so we can squeeze in three round trips to Nantucket versus two with the Caravan, so we're effectively increasing our capacity by 50 percent," explained Zipkin. "It doesn't require any more crewmembers, and it's a more comfortable ride because it's pressurized, so you get a lot more choices in terms of the altitude it can go." The airplane is certified for single-pilot operations, but the company uses two crewmembers on every flight, both for safety and customer service benefits.

Operating mainly from New York Westchester County Airport, one of the Northeast's most active business aviation hubs, Tradewind offers seasonal scheduled service to Nantucket and Martha's Vineyard, as well as year-round flights to Boston. "Our customer is a private charter customer who doesn't need the entire airplane, because it's just them," noted Zipkin. "From a regulatory standpoint, we're a scheduled airline, but the experience for the customer is a shared charter. Customers are going FBO-to-FBO and have the same experience a private charter customer would have."

The company reports year-on-year growth of nearly 30 percent in each of the past five years, and given the interplay between the scheduled and charter fleets, it has the flexibility to accommodate periods of high demand. "One of the nice things about the PC-12 is you have eight passenger seats, so even in the scheduled environment, if you put up an extra airplane to meet demand, you're not taking an enormous risk," said Zipkin. "We have the on-demand [charter] aircraft which are not committed, so if the airplane is not on private charter, we'll put it on for the extra capacity as needed."

In many cases the customer's single-seat purchase marks his first exposure to the aircraft, and his impression of it often leads to full charter bookings of it for other travel needs later on. "So our scheduled operation really feeds our on-demand operation," Zipkin said.

In the late fall, as traffic to the Cape Cod area dwindles, most of the company's fleet migrates to the Caribbean, where it runs shuttle service to islands such as Nevis, Anguilla, Antigua, St. Barts and St. Thomas. "We move a number of our airplanes down to San Juan, Puerto Rico, and our scheduled operations in the Caribbean are much more the traditional airline type where we are taking passengers out of the main airport," said Zipkin.

Last year Tradewind inaugurated a weekend ski mountain shuttle service between New York and Stowe, Vt. "The Pilatus was designed to be a short takeoff and landing airplane and that's what we use it as. Stowe is a smaller airport, but we can get in and out of there without any problems," noted Zipkin. "It's the same thing with many of the airports we serve in the Caribbean."

The Water Option

New York-based Tailwind Airways has taken a different approach, offering scheduled and charter service direct from midtown Manhattan using a pair of amphibious Caravans. The flights depart from and arrive at the seaplane base on the East River at E. 23rd Street, offering the ultimate in convenience for time-conscious customers. "I think a lot of people in New York don't realize that Manhattan has an airport, and we're out there trying to build awareness," said Peter Manice, the operator's vice president of sales. "New York has a lot of congestion, both at the airports and then getting to the airports." He added that using the seaplane base allows customers "to bypass TSA, bridges, tunnels, La Guardia Airport reconstruction


Tradewind


Tailwind

and getting out to White Plains or Teterboro if they fly privately."

Unlike Tradewind, Tailwind has no intention of trading in its Caravans, as their amphibious nature suits the company perfectly. It is, in fact, looking to expand its fleet of the turboprop amphibians. "It's a great aircraft for what we need," explained Manice. "It has a practical range with a full load of 250, almost 300 miles, which covers a big chunk of the Northeast from New York City." While the company's takeoffs and departures on the New York end involve water operations, at the other end they typically use airport runways. Like Tradewind, the carrier flies its aircraft exclusively with two pilots.

Tailwind began flights into and out of Boston Logan last year, and added the Nantucket route this year, in time for the Memorial Day weekend. Manice noted that traffic for Boston is bidirectional, whereas for Nantucket it flows to the vacation destination on Thursday and Friday and returns on Sunday and Monday.

The company doesn't sell the empty legs, which results in a higher price for the Nantucket flights. Manice describes the flights to the island as largely weekend commuter shuttles, for families with vacation homes. "They're just looking to get back to their office, and we can get them door to door in under two hours, which no one else can do," he told **AIN**.

During the week, the Caravans, along with the several Daher TBMs on Tailwind's certificate, are busy with charter to destinations such as Sag Harbor and Shelter Island (where the Caravans land on the water), the Hamptons and Montauk Airport. It also operates as a contractor for helicopter charter provider Blade's Aqua division.

The company has obtained FAA approval for water operations in Boston Harbor, and while it had hoped to offer that option this year, it is still working with developers to establish a permanent seaplane base downtown near the financial district.

While other operators move their equipment south to the Caribbean when winter descends on New England, once the company wraps up the Boston flights around the beginning of December it puts the Caravans into hibernation until the middle of March. Manice did not rule out the possibility of a future seasonal migration, if his company can forge the proper relationships. The company also operates an aircraft management division to keep it occupied through the colder months.

Tailwind plans to expand throughout the Northeast, with a New York to Washington D.C. route slated to begin in 2019. It is also considering Pittsburgh and Hartford, as well as Montreal, which offers U.S. Customs pre-clearance. According to Manice, Billy Bishop Toronto City Airport is in the process of developing a pre-clearance facility of its own, which would allow Tailwind to operate from downtown Manhattan direct to downtown Toronto. ❑

LABACE 2017

Industry rallies for recovery at LABACE

by Ian Sheppard

DAVID McINTOSH

LABACE, which took place from August 15 to 17, proved that South Americans, and particularly Brazilians, are eternal optimists. The event is not the place to expect big business aviation news, but the local news is invaluable to OEMs and suppliers alike.

That said, Honda did announce it had received certification for the HondaJet from Brazil's aviation regulator, ANAC, and Embraer—always keen to make a good showing on home soil—debuted the almost-certified Legacy 650E and underlined its commitment to that aircraft type, even as it noted the sales success of the Phenom 100/300 and Legacy 450/500.

Gulfstream, Bombardier and Dassault, the leaders in the large-cabin segment, were somewhat quiet at the show, where the focus tends to be on turboprops and rotorcraft. In that market the current Voom experiment to create an Uber-like air taxi service was perhaps the most progressive story. Backed by Airbus, Voom chose São Paulo for its launch as the city is synonymous with the need for helicopters to overcome stifling traffic in a city of 20 million people.

Another attraction was MAGA Aviation's MRO bus. The bus has an APU, a crane and high platform, and a ground power unit to address AOGs. The local company recently became Bombardier's first mobile authorized service provider.

Exhibitor Feedback

On the whole, organizers and exhibitors were satisfied with the summer event. Flávio Pires, director general and CEO of organizer ABAG, declared the show to be "very good. Those with smaller aircraft especially were seeing contacts and movement. Few deals were closed, but a lot of negotiations were opened." U.S. exhibitor Phoenix East Aviation commented, "It far exceeded our expectations. We'll be back next year." Alexandre Gulla of local aviation logistics firm AGS told **AIN**, "When a company brings down a $70 million aircraft, it shows confidence in the country and the economy."

However, some felt the event was smaller this year, with fewer exhibitors, fewer aircraft and, possibly the result of three days of rain, fewer visitors.

One exhibiting aircraft trader noted that "the currency fluctuations [previously] killed a lot of deals. Now that the exchange rate and the political outlook have stabilized, people are moving forward." So even though the Real remains weak against the greenback, the exchange rate has stabilized and the market is happier. However, next year's event will come in the run-up to another presidential election, in October 2018, as Brazil grapples with the long-running aftermath of the Petrobras scandal, president Rousseff's impeachment last year and the difficulties of pension reform. ❑

AirVenture 2017

by Matt Thurber

Garmin unveils new GA autopilots

Garmin's new GFC 600 and GFC 500 autopilots are retrofit systems that bring modern capabilities at a relatively low cost to the fixed-wing general aviation market, from the Cessna 172 and Piper PA-28 through high-performance piston twins and turbine aircraft. The systems are solid-state attitude-based (AHRS-derived) autopilots, according to Garmin, with performance that is not available from traditional mechanical-attitude or rate-based autopilot systems, but similar to its GFC 700 series autopilots. Both autopilots feature brushless DC motor servos.

Both the GFC 600 and 500 have Garmin's electronic stability and protection (ESP), which works even when the autopilot is switched off. ESP nudges the flight controls to lessen pitch attitude or bank angle when the aircraft exceeds pre-determined pitch, roll or airspeed limitations. The autopilots also include the level mode, which can be engaged with a button to return the airplane to straight-and-level flight or engages automatically in case a pilot becomes incapacitated, when ESP detects no activity for an extended time. The autopilots also provide underspeed and overspeed protection.

The GFC 600 is designed for airplanes equipped with Garmin G500 and G600 displays, but it can also integrate with other manufacturers' displays, instruments and navigation sources. It has a self-contained controller with its own status and mode selection display as well as a wheel for adjusting pitch, airspeed and vertical speed modes. The controller fits into normal radio stacks.

According to Garmin, the GFC 600 is already STC'd in the Bonanza A36 and Baron 55. The Baron 58 will be next, followed by more high-performance piston singles and twins and turbines.

Both the GFC 600 and 500 can be fitted with an optional autopilot annunciator panel installed in the pilot's field of view. Controlwheel steering is optional on the G600.

The GFC 500 is integrated with Garmin's G5 electronic flight instrument, which "provides input and display of altitude preselect, heading, vertical speed target, airspeed target and flight director command bars for the GFC 500," Garmin said. An optional adapter is available to interface the GFC 500/G5 to certain Garmin GPS or VHF navigators. The first GFC 500 STC will be in the Cessna 172 in this year's fourth quarter, followed by the Cessna 182 and Piper PA-28s.

Both the GFC 600 and 500 offer altitude hold, vertical speed and heading modes, as well as altitude preselect and indicated airspeed hold mode.

Coupled instrument approaches can be flown with both autopilots on GPS, ILS, VOR, LOC and back-course approaches when the appropriate navigator is installed. Pilots can also fly coupled go-arounds by pushing a remotely installed go-around button. This commands the flight director to display the correct pitch attitude for the missed approach and also activates a loaded missed approach (when paired with a GTN 650/750 navigator), according to Garmin.

The GFC 500 starts at $6,995 for aircraft equipped with the G5 or less than $10,000 for both, for a two-axis autopilot. The GFC 600 (two-axis autopilot with electric pitch trim) starts at $19,995 for the Bonanza A36 and $23,995 for the Baron 55.❑

The Garmin autopilots are designed to interface with G500/600 displays.

The King Air NextGen flight deck includes new PFDs and MFD.

NextGen flight deck coming for King Airs

Innovative Solutions & Support (IS&S) and Blackhawk Modifications announced an agreement for Blackhawk to distribute and install IS&S's NextGen flight deck and integrated turboprop autothrottle system for King Air 200s and 350s. The two models account for more than 3,000 airplanes, according to IS&S, and there are another 2,000 C90 through E90 and F90 models that are upgradeable as well.

The King Air NextGen flight deck will be similar to IS&S's STC'd PC-12 avionics upgrade, which installs new PFDs and MFD, dual SBAS GPS receivers and IS&S's integrated flight management system with LPV approach capability. The autothrottle system received its STC recently in the Pratt & Whitney Canada PT6-powered PC-12 with IS&S avionics.

In the twin-PT6 King Air application, the autothrottle will provide engine-out thrust control, which in case of engine failure automatically sets the remaining engine to the correct power level if airspeed drops below minimum controllable airspeed.

The IS&S PT6 autothrottle can exert full control of an engine with a hydromechanical fuel control, and it protects against over-torquing during takeoff or over-temping in climb and at high altitudes. The system also has over- and underspeed protection in case the pilot mismanages airspeed. If the pilot tries to move the power lever and approaches the engine's torque or temperature limits, the autothrottle has a built-in shaker to warn the pilot.

The STC for the King Air will be tested in a King Air provided by Blackhawk. IS&S expects to receive the King Air STC "shortly." ❑


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2017 Product Support Survey

Part 2: Avionics

by Matt Thurber

In **AIN**'s Product Support Survey this year, readers rated manufacturers of both cockpit and cabin electronics, and Garmin remains at the top for cockpit avionics, with an overall average of 8.3. In the cabin electronics arena, Satcom Direct tops the charts again, climbing to 8.5, the highest overall average rating for any company in the avionics survey.

The cockpit rankings nearly mirror last year's results, with Rockwell Collins in second place, climbing 0.1 this year to 8.1, followed by Universal Avionics in third place, down 0.1 to 7.8.

Honeywell and its BendixKing unit tie for fourth place this year, with a 7.4 rating.

Garmin's top ratings are overall product reliability (8.8), parts availability (8.7), cost of parts (7.3), warranty fulfillment (8.5) and technical reps (8.4).

Rockwell Collins scores highest in the AOG response category with an 8.1, while BendixKing's technical manuals receive top marks (8.3), as do its technical reps (tied with Garmin at 8.4).

Among the cabin electronics companies that **AIN** readers rated, Satcom Direct's first-place rating climbs to 8.5 from 8.3 last year. Readers laud the company for parts availability (8.6), cost of parts (7.9), AOG response (9.0), warranty fulfillment (8.7), technical reps (8.9) and overall product reliability (8.8).

Gogo Business Aviation, tied for first place last year with Satcom Direct, drops slightly by 0.1 to 8.2 for second place this year. The company rates highest for technical manuals (8.2).

In third place this year at 7.9 are Gulfstream Cabin Management and Honeywell.

Rockwell Collins sees a 0.4 drop this year to 7.5 from 7.9 last year, putting it in fourth place, down from last year's second place.

Aircraft Cabin Systems also sees a decline this year, to 7.2 from 7.8. Lufthansa Technik, manufacturer of the nice inflight entertainment system, receives a 6.7 overall average rating. ■

What have you done for me lately?

Each year, **AIN** asks cockpit and cabin avionics manufacturers to submit summaries of key improvements in their product support implemented during the past year, and the following reflects the responses of those that chose to participate.

BendixKing

BendixKing is expanding the number of products it supports via parent company Honeywell's Spex exchange/rental program. Products within Spex are shipped within 24 hours to help reduce customer downtime, and these parts also qualify for a one-year warranty on the entire product following repairs, instead of the original three-month warranty for just the repair itself. To be more competitive, BendixKing has also lowered prices for exchanges.

FDS Avionics

FDS Avionics has added personnel, among them a new sales coordinator and service and support coordinator, and continues improving training both for employees and customers.

This has helped improve turn time and support assessment, according to the company. "FDS strives for a zero-defect mindset. These efforts have resulted in a significant decrease in workmanship errors and a reduction in turn time."

In addition, FDS "is mitigating delays caused by supplier lead times by analyzing data and better forecasting component inventory needs."

Garmin

Garmin has sharpened its focus on training support agents as well as customers. The agent training processes have been "enhanced and formalized," the company said, "to ensure faster and more accurate responses to customer needs."

For customers, Garmin has added more course offerings in the form of webinars, videos and e-learning training. At this year's EAA AirVenture Oshkosh, Garmin held the first G3X Touch Academy, providing training on installation, maintenance and operation of the popular G3X avionics to 2,000 attendees.

To improve AOG service, Garmin has strengthened its AOG support infrastructure and added resources to improve AOG coverage and lower response and turnaround times.

Garmin G3000

GogoVision

Genesys Aerosystems

Genesys Aerosystems has added personnel in its call center and is cross-training field service engineers on all of the company's autopilot, Efis and HeliSas (helicopter autopilot) products. "This will enable the team to respond better to any product issues," the company said.

The S-Tec repair station (Genesys was formerly S-Tec and Chelton Flight Systems) continues to achieve five-business-day turnarounds, thanks to cross-training and improved internal processes.

Gogo Business Aviation

Gogo Business Aviation has added six field service engineers at the busiest U.S. airports, bolstering technical support staff by 20 percent.

The company's new Apple iOS-based Dash app, released in July, enables operators of Gogo-equipped aircraft to view real-time systems performance to help with troubleshooting and interaction with technical support personnel. Gogo's new network operations center provides additional capability for trouble identification and resolution, with real-time monitoring of selected Gogo-equipped aircraft.

Gogo Business Aviation customers can now select from a broader choice of wireless access point hardware that works with Gogo airborne connectivity systems, under

Continues on page 46 ▶

2017 Average Ratings of Cockpit Avionics and Cabin Electronics

	2017 Overall Average	2016 Overall Average	Ratings Change from 2016-2017	Parts Availability	Cost of Parts	AOG Response	Warranty Fulfillment	Technical Manuals	Technical Reps	Overall Product Reliability
Cockpit Avionics										
Garmin	**8.3**	**8.2**	0.1	**8.7**	**7.3**	8.0	**8.5**	8.2	**8.4**	**8.8**
Rockwell Collins	8.1	8.0	0.1	8.2	7.2	**8.1**	8.2	7.9	8.3	8.5
Universal Avionics	7.8	7.9	-0.1	7.9	6.8	7.7	7.9	7.5	8.1	8.6
BendixKing by Honeywell	7.4	7.4	0.0	6.8	5.8	7.5	7.9	**8.3**	**8.4**	8.3
Honeywell	7.4	7.6	-0.2	7.7	6.1	7.4	8.0	7.5	7.4	8.0
Cabin Electronics										
SD (Satcom Direct)	**8.5**	**8.3**	0.2	**8.6**	**7.9**	**9.0**	**8.7**	7.8	**8.9**	**8.8**
Gogo Business Aviation	8.2	**8.3**	-0.1	8.2	7.3	8.4	8.2	**8.2**	8.7	8.1
Gulfstream Cabin Management	7.9	NA	NA	8.2	6.7	8.3	8.2	7.5	8.8	7.8
Honeywell	7.9	7.5	0.4	7.9	7.0	7.9	8.3	8.2	8.2	8.0
Rockwell Collins	7.5	7.9	-0.4	7.8	6.3	7.3	7.8	7.5	7.9	7.7
Aircraft Cabin Systems	7.2	7.8	-0.6	7.6	6.4	7.5	6.3	8.1	6.9	7.6
Lufthansa Technik	6.7	NA	NA	7.5	5.6	7.4	8.0	5.2	6.1	7.2

**Companies listed in order of their 2017 overall average. Ties are listed alphabetically. Bold indicates highest number in each category*

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2017 Product Support Survey

Part 2: Avionics

Universal Avionics InSight

Rockwell Collins Pro Line Fusion

Satcom Direct network operations

▶ *Continued from page 44*

the company's new third-party router policy.

"We continue to invest in an industry-leading data analytics team," the company said, "[which has] designed predictive analytics reports and alerts that tie into our new business systems gateway with self-reporting capabilities."

Honeywell

Honeywell's MyAerospace self-service web portal has been modified to improve operators' ability to predict and manage repair and overhaul events, inventory levels and budgeting. The portal allows customers to track order status, modify shipment destination and contact the appropriate Honeywell group for the quickest response to a problem. "To save time, the portal remembers customer history, incorporating a predictability that makes the most relevant pieces of the portal the most accessible," the company said.

The Honeywell Avionics Protection Plan (HAPP) now covers 50 aircraft and provides full coverage for Honeywell avionics with no-charge loaners, 24/7 service and fleet discounts. Honeywell also offers HAPP Gold, which covers additional repair charges, and this can be added to existing HAPP agreements.

Innovative Solutions and Support

To improve customer support in remote areas and speed up response times for avionics installation issues before, during and after modifications, Innovative Solutions and Support (IS&S) has added field engineering representatives near high-volume international airports.

IS&S's flat-panel displays have interactive software applications that allow customers to identify and troubleshoot installation and operational issues, the company explained. "The result allows faster diagnosis and correction of issues affecting the aircraft, shorten[ing] maintenance downtime and maintain[ing] high dispatch reliability and/or operational readiness."

Rockwell Collins

To support the growing number of Pro Line Fusion-equipped aircraft entering service, Rockwell Collins has invested in its global service and support infrastructure by adding test capabilities and exchange pools in Europe and Brazil. As ADS-B mandate deadlines near for the U.S. and Europe in 2020, Rockwell Collins has expanded manufacturing capacity, exchange pools, training material and customer support engineering teams "to ensure a smooth transition into the new airspace."

The Rockwell Collins Service First iOS and Android app enables customers to access support engineers and dealers. Evidence that Rockwell Collins's efforts to improve customer support are working: an increase in the "customer effort" metric, "which measures the ease of customer interaction and resolution during a service request," to 93 percent from 90 percent over the past year.

Rockwell Collins Venue cabin management

Universal Avionics Systems

Universal Avionics recently received FAA TSO authorization for its new InSight Display System as well as the first STC, in a Citation VII, for the InSight integrated cockpit. To support dealers and customers for the new InSight system, Universal has added an InSight familiarization course, which joins its FMS and UniLink operations familiarization courses in the UniNet online service center. Universal also offers classroom training in Tucson, Ariz., and Wichita.

Customers can access the latest information on Universal Avionics in the UA Hub, which consists of four channels of material of varying levels of technical detail, available on the company website or sent to customer email inboxes. These include the UA Blog, Customer eNews, *Universal Flyer* magazine and Dealer/Integrator Tech Notes.

For Asia-Pacific operators, Universal Avionics hired Thomas Chow, a regional manager of technical support for Asia and West Pacific, based in Singapore. Chow will provide support for dealers, aircraft manufacturers and operators. ❑

SURVEY RULES AND METHODOLOGY

As with **AIN** Publications' previous annual Product Support Surveys, the objective this year was to obtain from the users of business jets, turboprop airplanes and turbine-powered helicopters statistically valid information about the product support provided by manufacturers of business aircraft, avionics and engines over the last year and to report this information to our readers. The ultimate goal of the survey is to encourage continuous improvement in aircraft product support throughout the industry.

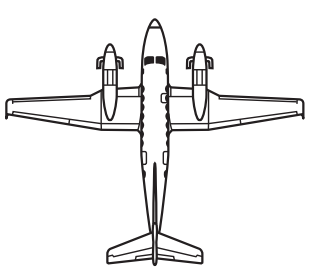
This survey was conducted via a dedicated website, created by **AIN** from the ground up to provide improved ease of use and to encourage greater reader participation. **AIN** emailed qualified readers a link to the survey website and also sent a postcard invitation with login credentials to the survey website.

The survey website was open from May 1 to June 9. Respondents were asked to rate both cockpit avionics and cabin electronics and to indicate the region where these products are normally serviced. Respondents were also asked to rate, on a scale from 1 to 10, the quality of service they received during the previous 12 months in the following categories:

- **Parts Availability**–in stock versus back order, shipping time.
- **Cost of Parts**–value for price paid.
- **AOG Response**–speed, accuracy, cost.
- **Warranty Fulfillment**–ease of paperwork, extent of coverage.
- **Technical Manuals**–ease of use, formats available, timeliness of updating.
- **Technical Reps**–response time, knowledge, effectiveness.
- **Overall Product Reliability**–how the product's reliability and quality stack up against the competition.

Respondents were also asked to recognize individuals who have provided them with exceptional product support and service. The full list of these people is available online at www.ainonline.com/above-beyond-2017.

The 2017 **AIN** Product Support Survey aircraft results were published in the August issue, and engines will be featured next month. ■



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COCKPIT AVIONICS: PART 2

New rules unleash helpful HUDs

by Matt Thurber

The FAA's new rules allowing the use of enhanced flight vision systems (EFVS) instead of natural vision to descend below 100 feet above touchdown zone elevation and then land and roll out will likely lead to installation of more head-up displays (HUD) and wearable head-mounted displays in an expanding variety of aircraft types. Avionics manufacturers are ready for the rule change and preparing for the added utility offered by their HUD systems, and some are offering products that can meet the new rules' requirements for aircraft not equipped with a HUD. *(See page 50 for information about the new rules.)*

Elbit Head-up Displays

A couple of thousand airplanes are equipped with Elbit's EFVS, according to Dror Yahav, v-p of the company's commercial aviation-aerospace division. "A lot of them will be able to leverage the new rules," he said, especially airlines, which should be able to take advantage of the new credits for dispatch, takeoff, approach and landing.

What makes the new rules so beneficial for operators is that they focus on the performance of the enhanced vision system (EVS) that is a key part of an EFVS. "As long as the system meets certain criteria, they will be able to enjoy the credit," he said.

Elbit's cryogenically cooled Kollsman EVS camera systems are installed on airliners and Gulfstream and Falcon business jets. Generally, the Gulfstream installations are fitted with a Rockwell Collins head-up guidance system. Dassault was the launch customer for a complete Elbit EFVS with Elbit's HUD and ClearVision camera/sensor system, and this is branded as FalconEye, available in new Falcon 2000s, 900LXs and 8Xs.

The FalconEye EFVS blends synthetic, database-driven terrain imaging and actual thermal and low-light camera images into a single view, heightening situational awareness in poor weather and all flight conditions. FalconEye incorporates a multi-sensor camera to present images in both the visible and infrared spectrums, enabling a clear view of LED lights on airports where these are being implemented. Images are combined with three worldwide synthetic vision databases that map terrain, obstacles, navigation and airport and runway data.

While the EFVS is already available in these aircraft, Elbit is working on validation of its system to allow operators to take full credit under the new rules. The FAA has issued draft guidance on how this validation can be accomplished, and it will involve ground and flight tests to test the system's performance in varying weather conditions. Elbit expects to complete the validation by year-end.

Business airplanes being flown under FAA Part 91 regulations have always been allowed to begin an IFR approach even when the airport's weather is below minimums, but airlines can't do this, constraining their operations. Under the new rules, Yahav explained, airlines will be able to dispatch and begin an approach with weather reported below minimums. So, he added, "I think the main interest [in the new EFVS rules] is coming from the airlines."

Rockwell Collins

From its founding in 1979, the former Flight Dynamics, now Rockwell Collins Head-up Guidance Systems (HGS), designed products to help keep pilots in the loop, or fully engaged in the process of flying. The company's first HUD came about because Alaska Airlines was losing money diverting to other airports when destinations were fogged in. The airline found that the new HUDs could deliver much more utility for a fraction of the price of expensive autoland systems, all while helping pilots stay in the loop.

HGS has manufactured 8,500 HUDs that have flown 60 million hours in commercial and military service. Rockwell Collins is also partnered with Elbit Systems on the Lockheed Martin F-35 helmet-mounted display.

Now the HGS division is working on certifying its latest digital HUDs and EVS camera systems to meet the new EFVS rules. Combined vision, which fuses EVS and synthetic vision system (SVS) imagery on a single display (HUD and primary flight display) will eventually be covered by the new rules as well.

The Rockwell Collins 6000-series digital HUDs use LCDs to project the image onto the combiner display mounted in the pilot's view. Earlier HUDs are analog and use CRTs to project the image, but LCDs deliver a brighter picture. "The faster you write [the image] for video," explained Robert Wood, senior fellow HGS Commercial Systems, "the less energy is available for brightness." The digital nature of LCDs involves switching individual pixels on and off, and this allows the full brightness capability of the LCD projector to be used to draw images on the combiner. Both the analog and digital systems are termed "relay-lens" HUDs because of the way the imagery is projected.

HGS has pushed HUD technology even further with the HGS-3500 compact HUD, which for the first time uses a waveguide instead of a projector to send the image to the combiner. The first application for the HGS-3500 is in Embraer's Legacy 450/500. The benefit of the waveguide HUD is that it takes up far less space in the cockpit and is thus adaptable to smaller aircraft with no room for a full relay-lens HUD.

Designing the waveguide HUD, said Wood, "was no small task." The project involved evaluating head-injury criteria in the cockpit and extraordinarily detailed optical engineering, for example, manipulating precise placement of diffraction grates that keep the light inside the waveguide on its way through complex turns of up to 90 degrees, then finally delivering an accurate image to the combiner.

"It's complex," Wood said. "You can't buy software to design a waveguide. We had to develop models, predict performance, then measure it, then tweak the model."

Rockwell Collins HGS's development of the compact HUD system also depended on the EVS-3000 camera, which consists of three cameras/sensors; one detects visible light, so it can "see" the LED lights that are growing in popularity at airports all over the world (they're not visible by infrared sensors). The other two cameras are a short-wave and a long-wave infrared sensor, and all three are uncooled, which simplifies the installation and makes maintenance cheaper than it is with cryogenically cooled EVS systems.

At present, Rockwell Collins HUDs don't offer combined vision, but HGS is researching this technology and preparing to offer it as a commercial product. Rockwell Collins does offer switchable views, between EVS (infrared) and SVS, just not both at the same time. "We're trying to get the best view and show it to the pilot," Wood said. "We want to filter our elements that aren't enhancing vision. We're close to launch for a combined vision customer, and there's no reason it couldn't work on both the 6000- and 3500-series [digital HUDs]."

Rockwell Collins combined vision

Dassault FalconEye

Astronics

Astronics Max-Viz is collaborating with the FAA in a research project to study operational concepts for the use of EFVS in helicopters. While EFVS rules address approaches to runways at airports, there are no comparable regulations for EFVS aboard helicopters flying to onshore or offshore helipads/heliports.

For the study, Astronics is providing Max-Viz 1500 and 2300 EVS to the FAA for installation in the agency's Sikorsky S-76 testbed. Flight-testing is being conducted by the FAA's William J. Hughes Technical Center at Atlantic City International Airport in New Jersey. The Max-Viz 1500 sensor will provide baseline testing, which will be followed with the installation of the Max-Viz 2300 for observation of LED lighting on the blended high-resolution long-wave infrared image. The helicopter will fly in various weather and visibility conditions, day, night and twilight and on alternative approaches. The FAA will use the results of the study to evaluate the effectiveness of EFVS technology for helicopter flight safety and operations.

Garmin Joins the Party

Garmin unveiled its first foray into the head-up display (HUD) market in May, the new Garmin head-up display (GHD 2100), which Textron Aviation has selected for the Cessna Citation Longitude. The super-midsize Longitude has a Garmin G5000 flight deck, and the GHD 2100 was installed in the prototype Longitude (the first flight-test article).

The GHD 2100 is designed to fit into light, midsize and super-midsize business jets and consists of a single display unit with a self-contained projection system.

Information displayed on the GHD 2100 is consistent with Garmin symbology and provides flight-critical primary flight display information and Garmin's synthetic vision technology (SVT).

Garmin's SurfaceWatch is integrated on the GHD 2100. It uses performance data entered into the Garmin avionics before takeoff to provide visual and aural cues to warn pilots about taking off or landing on the wrong runway or on a taxiway, or that a runway is too short.

Garmin plans to add options to the GHD 2100, such as displaying imagery from external cameras, infrared-based EVS and blended EVS and SVT to deliver a combined vision system. The company says the GHD 2100 will "target" the new EFVS rules, according to a Garmin spokeswoman.

Head-down Still an Option?

The new EFVS rules are HUD-centric, which is good for HUD manufacturers but leaves others, for now, out of the running for credits allowing dispatch, takeoff, approach and landing in certain kinds of poor weather or below-minimums conditions. While HUDs allow pilots to view flight symbology on a combiner display mounted in the view through the windshield, so-called head-down displays (primary flight displays or PFDs) pull the pilot's view back into the cockpit, down and away from the windshield.

"That's a correct interpretation of what the rule says," acknowledged Thea Feyereisen, aerospace fellow at Honeywell's Flight Safety Systems Group in the company's Advanced Technology research arm. "Head-down displays are precluded from [the new rules]."

But Honeywell's human factors engineers and researchers "have done a lot of research on head-down displays and continue to do so," she said. At the same time, the software that Honeywell has developed to run on its PFDs is easily portable to HUDs or wearable "near-the-eye" displays. "The software is portable between different display mediums," she explained.

There are advantages to head-down displays, chief among them their ability to handle information-rich imagery and deliver far more detailed and colorful SVS pictures than can be done on lower-resolution HUDs or wearable displays. Infrared sensors by themselves have many limitations on what they can bring to a display, especially when it comes to penetrating obscuring phenomena such as moisture-rich fog. "The big hurdle in certification is the performance of the sensor," Feyereisen said. "If you're using only infrared, it's going to work only as well as the sensor. The biggest hurdle in terms of [showing what looks like] reality is not software to show pretty pictures; it's being able to do the picture to show what's required."

What this means is that combined vision delivered on a head-down display is Honeywell's goal. And its first product is coming soon on the Gulfstream G500 and G600, a synthetic vision-based 3-D airport moving map.

The idea here is that the HUD and EFVS (which will be installed in the G500/G600)


Garmin GHD

might help the pilot make it down onto the runway, but the fog might be so bad that the pilot can't taxi. "This rule only addresses landing," she said, "but how do you get to the gate [or FBO]? As a designer, I can do a lot more pretty pictures if more colorful pixels are available than today's see-through display technology. We go for more of a combined vision system, and combine infrared with database information. That's when we get the best picture for the pilot."

Honeywell has tested head-down displays extensively, with pilots in simulators and Gulfstream and Falcon jets, using combined vision to land in simulated and real weather conditions. The research found that pilots could easily land only by reference to the head-down synthetic vision display, combined with infrared imagery, and to a high degree of repeatable accuracy as documented by measurement of the touchdown location.

One aspect of the new rule

Continues on next page ▶

Honeywell synthetic vision

Helpful HUDs

▶ *Continued from preceding page*

puzzles Feyereisen. "It never requires you to transition to external visuals," she explained. "If the pilot doesn't need to see out the window, why are you [including] this 'look out the window' requirement? This rule enabled what pilots were doing already; they're never transitioning outside, their eyeballs were looking forward, but fixated on symbology, and never transitioning to the real world. It takes a special pilot to transfer from the imposing dominance of green stuff [on the HUD combiner] in front of your face and then to see through it."

There is a parallel in simulator training, where pilots learn to fly a jet solely by reference to a simulated environment. "[The head-down display] is an electronic representation of the external scene," she said. "Every time pilots go to FlightSafety, it's not the real world, the visuals are electronically represented. It's a little different from flying in the real world, but they're able to complete the task with an appropriate level of safety."

The new rule is somewhat frustrating for Honeywell researchers in that it is still too focused on specifying a particular technology—HUDs—instead of a target level of safety. "It should be performance-based," Feyereisen said, "rather than specifying technology. Technology is moving so fast. When we bring in a new techno-widget, having a performance-based requirement would be much faster and easier."

For Honeywell, a colorful head-down display offers many benefits, most important being that pilots have to spend more cognitive effort interpreting green HUD symbology compared to a head-down display with high-definition resolution and millions of colors. "There is a certain amount of interpretation for 64 shades of green [on a HUD],"she said. "People think the sky is blue and the earth is brown. There is a requirement [for pilots] for color vision. Why? So they can differentiate runways from taxiways [at night using different colored lights], so color is a big part of encoding the aviation infrastructure. Yet now they're saying that you can land and taxi and you don't need color? How are you mitigating that lack of color?"

A head-down display is generally larger than a HUD combiner. "Bigger is better in this case," she said, "because of the visual experience you can provide for the pilot."

One of Feyereisen's favorite subjects is visual systems: "Optical flow, which is this sensation of how you move through the world. If you move your head right or left, there are different visual angle points that accelerate as you move right or left, and that helps orient you as you turn. A dotted centerline, how that passes [gives you] certain speed cues and orientation cues. Having optical flow with color helps pilots with orienting, and a large display can do a lot to orient a pilot."

Ultimately, Feyereisen concluded, "Vision systems, whether they're enhanced vision, synthetic vision or combined vision, are transforming how people are flying and how people will fly. Think of that in terms of providing the pilot with a picture that's worth a thousand words. A good picture helps the pilot significantly in terms of orientation and awareness of what's happening."


Elbit SkyLens

Wearable HUDs

Elbit Systems expects to certify its SkyLens wearable "near-the-eye" (NTE) dual-display HUD in the ATR 72 in the middle of next year, according to Yahav. The advantage of the NTE HUD is not only its cost (much lower than an installed HUD) but the ability to retrofit it into many cockpits where a HUD, even a compact Rockwell Collins waveguide system, can't be mounted.

Elbit expects full credit under the new EFVS rules for the SkyLens system when a compatible camera/sensor system is installed. In the ATR 72 application, the HUD will be worn by one pilot, but some potential single-aisle airliner customers are asking for a dual-HUD installation, one for each pilot. "It doesn't take lot of space," he said. Installation time is low, taking one to two days compared with weeks for a full HUD retrofit. "The impact on the cockpit is minor. The functionality is quite significant. [Customers] will get a new enhanced, synthetic and combined vision system."

The SkyLens NTE works with Elbit's ClearVision camera/sensor (also found in Dassault's FalconEye) and has six sensors, from visible to longwave infrared. The visible sensor is for detecting LED lights.

SkyLens weighs 650 grams, and the 250-gram display unit that sits in front of the pilot's eyes is offset by a counterbalance on the head harness. If pilots want to remove the SkyLens after takeoff, they can put it in a special storage box then strap it back on before landing.

What sets the NTE HUD apart from traditional HUDs is that the pilot can see on the display any part of the outside world viewable by the sensors mounted on the aircraft but also as represented by synthetic vision.

In a traditional HUD, the pilot can see imagery only in front of the airplane and limited to the 30- to 40-degree field of view of the HUD itself. A pilot wearing the SkyLens can look 180 degrees to the left or right and see synthetic vision imagery of, say, a mountain ridge while flying along a valley, something not possible with a traditional HUD, at least without turning the airplane and pointing it at the ridge.

The SkyLens-wearing pilot also is not constrained to sitting at a specific position that optimizes the view through the HUD, because the NTE HUD is strapped to and moves along with the head.

In addition to airline retrofit opportunities, Yahav believes there is a decent market in business aviation cockpits. "In general if you have a midsize airplane and below, it's hard to get a reasonable [retrofit] offering," he said. "This is an option."

In addition to the undisclosed ATR 72 customer, Elbit is also working with a customer that wants to certify SkyLens in various Leonardo helicopters. "We've been flying this for a long time," Yahav said. Elbit is also working with the FAA to equip the agency's research Sikorsky S-76 with SkyLens.

The EASA is supporting the FAA's approach to the new EFVS rules, Yahav said. "In India and China there is big interest in EFVS technology for flying in smog, and they have indicated they will adopt the [FAA] rules as they are today."

Thales is targeting the wearable NTE HUD market with the TopMax head-worn display. A prototype display has been flight-testing aboard turboprop aircraft and in a simulator. TopMax can merge infrared images and synthetic vision, and display traffic information from ADS-B or TCAS. Compared with a conventional aircraft-mounted head-up display, TopMax provides an unlimited field of vision and easier installation at half the cost, according to Thales. ❑

New EFVS Rules Benefit HUD Ops

The new rules on the use of enhanced flight vision systems (EFVS) instead of natural vision to descend below 100 feet above touchdown and also land and roll out, issued on December 16 last year, make EFVS equipment even more valuable.

Under the regulation, pilots can continue past 100 feet to touchdown and rollout, flying the airplane, but looking through a HUD and seeing the approach lights and runway lights and markings as EFVS imagery.

Notably, the new rule does not specify the type of sensor required in an EFVS, leaving it to industry to develop and certify new technology that may replace infrared sensors or use them in new ways, or married to other sensors that help the pilot see the runway and its environment. While the old rule required a HUD, the new rule allows other types of image-delivery mechanism, leaving the door open for new products such as wearable HUDs. Head-down displays (instrument panel displays) cannot be used for EFVS operations, however, but the copilot in a two-pilot aircraft can use a head-down display to monitor the pilot's view through the HUD.

According to the AC, "We have made every attempt to write EFVS regulations that are performance-based and not limited to a specific sensor technology. The regulations accommodate future growth in real-time sensor technologies used in most EFVSs and maximize the benefits of rapidly evolving instrument approach procedures (IAP) and advanced flight-deck technology to improve safety and access during low-visibility operations."

Approaches that meet the criteria for EFVS operations to touchdown and rollout are standard IAP or special IAP with a decision altitude (DA) for precision approaches, or decision height (DH) for approach procedures with vertical guidance (APV). In some cases, pilots may also fly certain non-precision approaches (those that use a minimum descent altitude as a DA/DH) using EFVS, with OpSpec C073, MSpec MC073 or LOA C073 approval.

EFVS operations are not permitted for circling approaches, so pilots can't use EFVS to view "an identifiable part of the airport" to descend below minimum descent altitude (MDA); they must use natural vision. However, the AC does go on to note that pilots can use the EFVS "to supplement natural vision and improve situational awareness at any time."

It should be noted that the enhanced visibility facilitated by the EFVS cannot be less than the visibility specified for the particular approach procedure.

Operators might need specific approvals for EFVS operations. Part 91 operators are not required to obtain approval for operations to 100 feet above TDZE, but they will need approval—OpSpec, MSpec or letter of authorization (LOA)—for EFVS operations to touchdown and rollout. Commercial operators (91K, 121, 125, 129 or 135) need OpSpec, MSpec or LOA approval for both types (to 100 feet and rollout/touchdown).

An added benefit for commercial operators is that they can receive approval for dispatching or releasing a flight with low takeoff minimums and "beginning or continuing an approach when the visibility is reported to be less than the visibility minimums prescribed for the IAP to be flown. *—M.T.*

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NEWS UPDATE

More Medicare Money Sought for Medevacs

Last month a bipartisan bill (H.R.3378, the Ensuring Access to Air Ambulance Services Act) was introduced in the U.S. House of Representatives seeking to raise Medicare reimbursement rates for air medical transports to at or near actual cost. A study funded by the Association of Air Medical Services (AAMS) and released earlier this year found that Medicare covers just 59 percent of the typical cost of air medical transport and that 70 percent of those transports were unpaid or underpaid. AAMS warned that "the air medical industry is facing an unsustainable future" largely as a result of underfunding.

Sikorsky Provides Program Updates

On August 2, Sikorsky's S-97 Raider compound helicopter prototype suffered a hard landing while hovering at the company's flight-test facility in West Palm Beach, Fla., substantially damaging the undercarriage. Both crewmembers were unharmed. On July 28, the first VH-92A next-generation Marine One presidential helicopter flew from Sikorsky's plant in Stratford, Conn. The Navy awarded a $1.24 billion contract to Sikorsky in 2014 for two test and four production VH-92As, derivatives of the civil S-92A. Options for 17 more aircraft will be finalized in 2019 and the fleet could start to enter service the following year.

CHC Takes First H175

CHC Helicopter has taken delivery of its first Airbus Helicopters H175 super-medium twin and plans to base it in Aberdeen, Scotland, for offshore-energy passenger transport. According to Airbus, the 15 H175s delivered have logged 12,000 hours; 13 of the 15 are flying oil-and-gas missions, the majority of them operating in the North Sea and one in the Gulf of Mexico.

R66 Gets the News and the Hook

Robinson Helicopter has received FAA certification for the $1.307 million turnkey R66 ENG (electronic news gathering) Turbine Newscopter. The standard fit provides a five-axis gyro-stabilized gimbal with an Ikegami HD camera and Canon 22-to-1 HD lens, three HD micro cameras, two seven-inch monitors and two Geneva digital audio controllers. In the aft compartment, camera controls are located on the center and laptop consoles and images display on several HD monitors. Separately, Onboard Systems announced that its cargo hook kits for the R66 have received FAA STC approval. The system has an optional remote hook electrical release kit, enabling pilots to release loads from the cockpit, and an onboard weighing system that shows the exact weight on the hook.

Thales Qualifies Sim in China

Thales has received Civil Aviation Administration of China (CAAC) qualification for the first level-D full flight simulator there representative of the Airbus EC135 light twin. The Thales Reality H EC135 simulator is housed in the aviation safety facilities at the Haite Group's flight training center in Tianjin and will be used to provide initial, recurrent and mission-specific pilot training to EMS and commercial operators. *—Mark Huber*

Bristow, ERA to keep Super Pumas grounded

by Mark Huber

On July 20, regulators in the UK and Norway lifted the grounding of Airbus Helicopters H225s; however, two of the large fleet operators of the type have no plans to do so, their CEOs told analysts during separate conference calls last month.

ERA Group CEO Chris Bradshaw said, "While the regulators have issued their directives permitting the return to service, we believe H225 helicopters have returned to service in only a few countries in Asia. Beyond regulatory approval and the completion of the accident investigation, the other key milestones for potential broad-based return to service of these helicopters include confidence among the helicopter operators, our oil-and-gas customers and the labor unions representing their employees. ERA will not operate the H225s in our fleet unless and until we can develop a detailed safety case that demonstrates that the aircraft can be operated safely. As previously disclosed, ERA filed a lawsuit in November last year seeking damages from Airbus related to our purchase of H225s. We cannot predict the ultimate outcome of the litigation and we might spend significant resources pursuing our legal remedies against Airbus." According to company filings, ERA has nine H225s.

The operators plan to establish a safety case for the helicopters before returning them to service.

That lawsuit charges Airbus with systematic fraud in marketing the H225 as a safe helicopter and accuses Airbus of offering it for sale with known design defects. Airbus has denied the charges. The company is also being sued separately on the H225 by ECN Capital and Wells Fargo Bank. The charges of design defects stem from the fatal crash of an H225 near Turoy, Norway, in April last year in which the main rotor hub and blades detached in flight, a failure investigators ascribe to a damaged second-stage main planet gear. The root cause of the gear damage remains under investigation by the Acccident Investigation Board of Norway (AIBN), which has yet to issue its final accident report.

Bristow Group CEO Jonathan Baliff echoed much of Bradshaw's sentiments, saying, "Aircraft operations with our 27 H225s remain suspended globally. Bristow is going to be very cautious, very deliberate and very methodical as we develop and implement a return to service, or RTS, for the H225. We will complete an extensive safety case before any flight takes place, even test flights. And we are committed to collaborating with HeliOffshore, our clients and our passengers and their unions as part of any RTS plan."

Baliff said, "There is not a lot of demand for the H225 to conduct offshore transportation missions, mostly because of macro oil and gas marketing conditions, and the understandable concern about the aircraft in transport mode by our oil-and-gas clients, especially in the North Sea." He said Bristow's immediate priority with the type is readying four H225s for test flights as part of a planned lease return, adding that the company is keeping its options open with regard to seeking a cure from Airbus. "When it comes to Airbus we continue to monitor all litigation and are exploring all options with that company."

For its part, HeliOffshore said it is "liaising with technical experts from our member operators with a view to carefully considering all data provided to the UK and Norwegian authorities in support of their decision to lift operating restrictions on the Super Puma. The association will use its proven tools and collaborative approach to enhancing safety to give operators the solid technical foundation they need for making their individual operational safety decisions." ❑

RUSSIA UNVEILS COAXIAL SINGLE

Two months after announcing that it had received major financing from Russia's state-owned Vnesheconombank (VEB) for the project, Russian Helicopters unveiled a mock-up of the long-awaited VRT500 new light civil utility single in late July. Developed by Russian Helicopters' subsidiary VR-Technologies, the coaxial design features two three-blade main rotors with shaped carbon-fiber blades to cut noise emissions, extensive composite construction, glass-panel avionics and sliding rear cabin doors. Plans call for its turboshaft engine to be Western-sourced, possibly from Safran.

The five-seat helicopter is intended to compete with the Bell 505 and the Robinson R66. Russian Helicopters plans to market it in the U.S. and Europe and pursue EASA and FAA certification, with serial production projected for 2020 or 2021. The Russian manufacturer indicated it will develop the VRT500 with unidentified European partners.

Preliminary specifications call for the VRT500 to have a maximum takeoff weight of 3,527 pounds, a payload of 1,600 pounds, a cruise speed of 124 knots, a service ceiling of 20,000 feet and a maximum range of 410 nm.

Russian helicopter companies have successfully fielded medium and heavy helicopters for decades, primarily for domestic military and export consumption, most notably the ubiquitous Mi-8/17 series medium twins. But past efforts to develop an indigenous light single have fallen flat for lack of expertise and resources and differing national priorities. Russian Helicopters CEO Andrey Boginsky acknowledged the company's dive into unfamiliar territory earlier this year, noting that the goal is to create a product that is simultaneously appealing to commercial operators and private pilots and can pass muster with Western regulators. He also said that the new helicopter must appeal to markets beyond Russian Helicopters' traditional client base.

Arguably, the last successful light helicopter developed by Russia was the Mil Mi-1; 2,600 of the three-seat, 3,700-pound singles were produced between 1950 and 1965, mainly for military consumption. During the early 1990s, an attempt to develop an indigenous single by Russia's Kazan Helicopters, based on the Airbus AS350, failed. *—M.H.*

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Bell sees recovery in Latin America

by Mark Huber


Bell's new 505 Jet Ranger X light single shows great promise in Latin America. While most orders thus far are for tour operators, private pilots and utility roles, law enforcement and EMS also show potential.

Bell Helicopter is seeing a slow but meaningful sales rebound in Latin America, according to Jay Ortiz, vice president of Latin American sales. "If you look at the entire product line, by April this year we basically matched all the orders we had in 2016," Ortiz told **AIN** in an interview before LABACE. "We are starting to see a bit of recovery. Some of the programs where seeds were planted two years ago are starting to yield. Right now things are moving, just not as fast as we would like."

Given the state of the overall economy in the region, Ortiz is pleased with Bell's progress. "Volume is down but we are capturing the majority of deals that are out there. We continue to work programs realizing that some of these deals may take a year or two for the funding to materialize because of the state of economies and the political uncertainties in some countries," he said.

Ortiz said there's an overall uptick in both parapublic and corporate activity. On the parapublic side, "That is driven by natural disasters and law enforcement and EMS requirements. You know how governments work: Two years ago this was a problem and today it is a crisis. So that generates movement. Because we have been working with our customer base in the region and hanging in with them during the tough times, they have responded pretty well. As the problems are acute and they are starting to move, we are well positioned" to meet the demand, he said. Among the recent opportunities in that sector are fire suppression, EMS and drug enforcement. Ortiz noted the sale of 15 Bell 407s to Mexico two years ago to aid with drug eradication and said there is an opportunity to expand sales there "along those lines."

He also said that Colombia's shift off a war footing to law enforcement drove localities there to select the 407 for that mission. In Puerto Rico, Bell worked with the government of that economically distressed territory to return its law enforcement helicopters to airworthy standards and to deliver a new EMS helicopter. This June, Bell received a U.S. foreign military sales (FMS) contract for four new 412 medium helicopters for the Argentine Air Force.

Many government sales into the region take the form of multi-mission helicopters. This is particularly true of the Bell 429 light twin, Ortiz said. "We sell the 429 with multi-mission capability. We will sell it as a corporate aircraft for the governor of a province, but it will also go down with litters and loose EMS equipment so that, when needed, it can be configured for EMS. State agencies typically buy them in a multi-mission capacity."

Corporate Market

Private customers are also coming back. "We're seeing an uptick on the corporate side as well," Ortiz said. "[Customers] had their reasons for not moving forward a year or two years ago, and as that cloud of uncertainty lifts they are moving forward. In my opinion there is still a great deal of pent-up demand. Based on business, the demand is there, and as the uncertainty eliminates itself in a particular market or with a particular customer, they move forward and purchase."

Latin America has been a particularly bright spot for the 505 Jet Ranger X light single. "We've had tremendous success with the 505. Latin America is second only to China on 505 orders. The only reason we were second is that the Bell representative in China placed a huge spec order. We had in excess of seventy 505 orders in the region and we are getting ready to deliver our first one into Central America. The aircraft thus far has acquitted itself pretty well with customers who have come up [to Canada or Texas] and flown the demonstrator."

While the 505 will eventually have law enforcement and EMS kits, Ortiz said it is too soon to gauge its popularity in those roles in the region. Orders so far, he said, have come from private pilots, tour operators and utility operators.

The potential for Bell's still under-development 525 super-medium twin in the region is uncertain given the decline in demand for offshore oil exploration and the restructuring of the largest energy player in the region, Brazil's Petrobras. However, once the 525 is certified next year, Ortiz thinks it will be attractive for offshore energy and parapublic missions such as search and rescue.

"We have engaged with Petrobras on the 525 in the last several years," he said. "We've had them fly the simulator and had them out to the plant in Amarillo to look at the aircraft and the assembly line. They are pleased with the progress on the program. The feedback they've given us is that they love the aircraft, they love the flexibility and the diversity that it will provide the fleet. It is just a matter of time. They've had to push some of their [exploration] projects back, and that aligns with our certification of the aircraft. So hopefully by the time they clear up their issues, we'll be in a good spot. They've reduced their contracts, and the number of aircraft flying on contracts has gone down. So they have to make some decisions on the future." Ortiz thinks search-and-rescue customers for the 525 will materialize, but "customers in that market want to fly the aircraft first and see its capabilities."

In addition, Bell is beefing up its service capabilities in Latin America and plans to add authorized service centers in Argentina, Ecuador and Peru in the near future. However, he said most existing Bell sales reps in the region are already authorized service centers and have a vested interest in keeping customers in Bell aircraft by providing the maintenance.

He also said that Bell has had success enrolling new aircraft sold into the region into the company's Customer Advantage Plans (CAP) maintenance agreements. ❑

VIRGINIA POLICE AVIATION COMMANDER KILLED IN CRASH

The commander of the Virginia State Police aviation unit, Lt. Jay Cullen, and fellow trooper-pilot Berke Bates were killed at 4:51 p.m August 12 when their Bell 407 crashed and burned in a wooded area near the Birdwood Golf Course seven miles southwest of Charlottesville. Eyewitnesses said the aftmost part of the 2001 helicopter's tailboom, including the tail rotor and the vertical fin, separated from the aircraft in flight.

An NTSB spokesman said the crew did not transmit a distress call. The officers had been dispatched from the State Police base in Lynchburg in late morning to provide surveillance and tactical support for law enforcement dealing with a day-long violent and racially charged protest in Charlottesville that left one dead and dozens injured.

They had taken off from Charlottesville Airport on their final sortie of the day at around 4 p.m. Cullen was a 20-year veteran of the police force and a 14-year member of the aviation unit and was a CFII in fixed- and rotary-wing aircraft. Bates had joined the unit in July. —*M.H.*

Marenco rolls out third test helicopter

Marenco Swisshelicopter rolled out the third prototype (P3) SKYe SH09 in late June, according to an update the company issued last month. P3 "comes close to the serial version," said the company. P2 has flown 50 hours, 30 of them in the last three months. Counting ground tests, P2 has been run for more than 100 hours. Plans call for P4 to be added to the test fleet early next year.


CEO Andreas Lowenstein

Meanwhile, the company is ramping up for serial production of the turbine single, ordering parts, expanding physical plant and adding to payroll. The physical plant consists of a 41,000-sq-ft production hall in Mollis that houses administrative offices and training and support facilities. A second production hall in Nafels will be used as a logistics center and the production location for rotor blades, since it has a large autoclave. Employee rolls have risen to 213 from 136, mainly among the engineering staff, and the company said overall employment will continue to grow in the 20 months leading up to serial production.

CEO Andreas Lowenstein said the company remains on track to certify the SKYe SH09 next year and deliver the first helicopters to customers from Mollis in 2019. Currently, the company holds fixed purchase contracts for 12 helicopters and international purchasing commitments for "more than 100."

Marenco unveiled the $3.5 million single-turbine utility helicopter in 2009. The SH09 has all-composite construction, a flat-floor cabin and rear clamshell doors. It is a large single with a five-blade bearingless main rotor system and a shrouded tail rotor and is designed to carry one pilot and up to seven passengers. Power comes from a single Honeywell HTS900-2 turboshaft with Fadec. The SH09 will also be equipped with the Honeywell health and usage monitoring system (Hums), enabling operators to monitor mechanical rotating components and subsystems continuously and discover potential problems before they occur. Performance targets: 5,842 pounds mtow, 140-knot cruise speed and 430 nm range. —*M.H.*

New tech unveiled at ALEA

by Mark Huber

In addition to education and training opportunities, the annual Airborne Law Enforcement Association annual convention, held in Reno, Nev., in late July, provided a venue for companies to announce orders and showcase technology to enhance operators' missions.

Robertson Fuel Systems (RFS) began flight-testing an Airbus Helicopters AS350 crash-resistant fuel tank (CRFT) after completing 50-foot drop testing. Robertson noted that legislation was recently introduced in the U.S. House of Representatives (H.R. 4574) that would mandate installation of crashworthy fuel systems on all new-build helicopters regardless of their original certification date.

The FAA Reauthorization Act has an amendment that requires the agency to make helicopter owners aware of fuel system retrofits and urge them to install retrofits "as soon as practicable." RFS CEO Newman Shufflebarger said the company hopes to have the CRFT certified this year.

The CRFT is being developed by RFS and Vector Aerospace as a direct replacement for all AS350 models, including the H125 (AS350B3e), as well as for the EC130B4. The design features a crash-resistant fuel bladder and uses a magneto-resistive fuel quality transmitter to prevent the tank from being compromised in an accident.

New Zealand-based aircraft tracking and management specialist **Spidertracks** announced a partnership with cloud-based aviation software company Aeronet to deliver a process that simplifies keeping a current and accurate flight log and maintenance schedule.

Spidertracks CEO Dave Blackwell said the partnership will provide a simple way for operators to manage their fleet maintenance. "We see a lot of examples where aircraft operators are having to work in disparate systems and duplicate data entry in an effort to get the job done. We're automating these work flows and integrating systems to provide greater efficiency and more reliable data."

Aeronet founder Aaron Shipman said the derivative solution will "provide operators with a truly integrated maintenance operation."

Texas-based **AeroBrigham** announced plans to install and support a new generation of compact, encrypted video streaming equipment from aircraft. The company said it would provide integration, distribution and support for Serastar Technologies' Surveillance, Target Acquisition, Recon System (Stars) that streams video in a compact ISR video transmission and recording platform using simultaneous Wi-Fi, 3G/4G, Manet Radio and Harris tactical transceivers and therefore is not dependent on line-of-sight access.

Via a secure back-end server (Internet), the signal can then be distributed to authorized and authenticated users around the globe. The system can record up to six hours of video and integrates with Android Tactical Assault Kit (Atak) and has remote playback and recording with VLC, QuickTime or other compatible player mediums.

AeroBrigham emphasized that the Stars is lighter and less expensive than traditional microwave downlinks from aircraft.

Airbus Helicopters delivered two new H125 AStars to the San Bernadino County (CA) Sheriff's Department, part of a long-term plan to update the department's six AS350B3s. San Bernadino uses the helicopters for patrol, high-altitude rescues and fire suppression. The department flies 22,000 hours per year. According to Airbus, 220 H125/AS350s are in use across the U.S. with 54 different law enforcement agencies, making it the most popular law enforcement helicopter in the U.S. and accounting for one-third of deliveries into the sector over the last decade.

Leonardo announced that the the New York City Department of Environmental Protection Police has selected the AW119Kx for operations in support of water-supply protection. It will be equipped with FLIR, external loudspeakers, rappelling and cargo hooks, expanded fuel system, a foldable stretcher, high-visibility crew doors on both sides of the aircraft and provisions for a Bambi Bucket to be used for firefighting operations. Delivery of the aircraft is expected next year. ❑

NEWS UPDATE

Boeing Raises Pilot Forecast

Boeing expects the world's commercial aviation industry will require nearly 1.3 million pilots and mechanics over the next 20 years, placing an unprecedented strain on airline recruiters and training organizations to keep up with demand. According to the airframer, the airline industry will require 637,000 new pilots, 648,000 new mechanics and 839,000 cabin crewmembers during the period.

The eighth such annual forecast produced by Boeing, the 2017 edition shows a 3.2-percent gain in demand for pilots compared with the 2016 outlook, and a 4.6-percent decline from the previous year's forecast for mechanics. Boeing attributes the decrease to its projections of fewer maintenance hours needed on the 737 Max compared with those needed for the airplane that now predominates among Boeing operators, the 737NG.

The Boeing forecast shows the most pronounced demand for pilots, technicians and flight attendants in the Asia-Pacific region, which, according to Boeing, stands soon to surpass North America as the world's biggest commercial aviation market. Specifically, Asia-Pacific will need 253,000 new pilots over the forecast period.

Singapore Unveils Fourth Terminal

Singapore Changi Airport in late July unveiled a 225,000-sq-ft terminal capable of handling 16 million passengers annually. Expected to start operations by year-end, Terminal 4 will raise total capacity at Changi to 82 million passengers annually. Although only half the size of Terminal 3, Terminal 4 will accommodate roughly two-thirds of the passenger traffic thanks to technology advances.

Nine airlines will operate from Terminal 4: Cathay Pacific, Cebu Pacific, Korean Air, Spring Airlines, Vietnam Airlines and four airlines from the Air Asia Group. T4 will comprise 21 gates, three of them large enough for the A380.

T4 will become the first terminal at Changi to employ full end-to-end "Fast and Seamless Travel" (Fast) infrastructure in collaboration with SITA for departing passengers. The majority of check-in facilities will be self-service, supported by 65 SITA-supplied kiosks and 50 bag drop machines.

Qatar Airways Drops Bid for AA

Qatar Airways announced on August 2 that it will not pursue an ownership stake in American Airlines in another sign of the deepening dispute between U.S. and Persian Gulf carriers. American Airlines recently notified both Qatar Airways and Etihad Airways of Abu Dhabi that it will discontinue its codesharing partnerships with them.

In June, Qatar Airways notified American Airlines of its interest in acquiring a 10-percent stake in the U.S. carrier, an investment that American Airlines opposed. With its latest announcement, the Gulf carrier said it has dropped the proposal.

"Qatar Airways has taken the decision not to proceed with its proposed passive financial investment in American Airlines," the carrier stated. "Further review of the proposed financial investment, taking into account the latest public disclosure of American Airlines, has demonstrated that the investment no longer meets our objectives."

The Doha-based carrier said it will continue to investigate "alternative investment opportunities" in the U.S. and elsewhere.—*Gregory Polek*

Swiss International Airlines' Bombardier CS100s can fly as far as 2,228 nautical miles with a full passenger load from London City.

Swiss C Series flies first revenue service into LCY

by Gregory Polek

The Bombardier C Series CS100 completed its first revenue service into London City Airport with a flight by Swiss International Airlines from Zurich, Bombardier Commercial Aircraft announced on August 8. Plans called for a Swiss CS100 to operate regularly from Zurich starting that day, and from the airline's main hub in Geneva starting next summer.

"As part of our fleet modernization plan, we are gradually replacing the Avro aircraft with the C Series and today we start with our CS100 flight operations from Zurich to London City as the world's first airline," said Swiss C Series fleet chief Peter Koch. "We are excited to offer our guests the benefits of the C Series such as more comfort on this important route."

The C Series now ranks as the largest, longest-range passenger aircraft certified to operate from London City Airport, flying 2,228 nautical miles in a single-class configuration. It can also fly nonstop from London City to New York in an all-business-class configuration.

The CS100 gained Transport Canada and European Aviation Safety Agency approval to fly into and out of the steep-approach, noise- and obstacle-limited runway at London City. The approval effectively more than doubled the range an aircraft can viably fly from the docklands airport, according to C Series program chief Rob Dewar.

Bombardier vice president of product development and chief engineer François Caza attributed the CS100's ability to gain the certification largely to its use of the latest technology in aural and head-up display systems.

Steep takeoff and approach requirements at London City call for a 5.5-degree glideslope, and Bombardier had to test and validate the C Series to 8.5 degrees to qualify to operate there. In its full dual-class 108-seat cabin layout, the CS100 can fly some 2,350 nautical miles into and out of the field. It can reach New York from LCY in a 42-passenger configuration. British Airways' Airbus A318 flies 36 passengers on that route with a stop in Shannon, Ireland, for refueling. Late last summer it cut the frequency on the route to once a day from twice daily. ❑

ETIHAD SWINGS TO LOSS AS EQUITY PARTNERSHIPS WEIGH ON FINANCES

Etihad plans to retire the last of its Airbus A340s in October.

Etihad Airways registered its first loss since 2010 last year, largely because of "one-off impairment charges," including financial exposure to equity partners such as Alitalia and Air Berlin, the Abu Dhabi-based airline reported in late July. Recording a Fiscal Year 2016 loss of $1.87 billion, Etihad took $1.06 billion in aircraft charges related to lower market values and early retirements of certain models. Charges related to losses associated with now bankrupt Alitalia and foundering Air Berlin totaled $808 million.

The airline also pointed to disadvantageous legacy fuel-hedging contracts and greater pressure on cargo revenue and yield, even though it saw a slight improvement in freight carried during the 12-month period.

"A culmination of factors contributed to the disappointing results for 2016," said Etihad Aviation Group's Mohamed Mubarak Fadhel Al Mazrouei. "The board and executive team have been working since last year to address the issues and challenges through a comprehensive strategic review aimed at driving improved performance across the group, which includes a full review of our airline equity partnership strategy."

Etihad Airways CEO Peter Baumgartner cited macroeconomic influences to which the airline must adjust to reverse its spiraling losses. "We are in an industry characterized by overcapacity, declining market sizes on key routes, and changing customer behavior as a weak global economy affects spending appetite," he said. "Our answer to these challenges is innovation and reinvention, and this gives Etihad Airways a competitive edge as we seek to leverage opportunities offered to us by a changing environment."

Etihad's review of its equity partnership strategy recently resulted in a total divestment in its 33.3-percent stake in Swiss regional carrier Darwin Airline. Announced on July 20, the move came just weeks after former CEO James Hogan left the company as part of a "controlled restructuring" that will also see a modest reduction in headcount during the second half of the year.

In early May Alitalia entered bankruptcy protection after Etihad refused to infuse further capital without steep concessions from employees. In a statement, Etihad expressed disappointment that the €1.4 billion investment it committed to Alitalia in 2014 proved fruitless. "We have done all we could to support Alitalia, as a minority shareholder, but it is clear this business requires fundamental and far-reaching restructuring to survive and grow in the future," Hogan said at the time. "Without the support of all stakeholders for that restructuring, we are not prepared to continue to invest."

Although Etihad said its involvement in Alitalia delivered "significant improvements" to the Italian airline's performance, stiffer competition from low-fare carriers and the effects of terrorism on tourism demand resulted in a need for further restructuring efforts.

Notwithstanding its pledge not to inject further funds into Alitalia, Eithad said it considers Italy an important market and that it will continue to work with the Italian flag carrier as a "commercial partner." —*G.P.*

Airbus remains optimistic on A320neo delivery target

by Ian Sheppard

Airbus expressed confidence it can deliver 200 A320neos and 700 commercial aircraft overall this year despite continuing in-service problems plaguing A320neos powered by Pratt & Whitney PW1100G geared turbofans. The problems, ranging from carbon seal defects to premature combustor liner wear, mean that by the end of June the Toulouse, France-based manufacturer had delivered only a third of the GTF-powered aircraft it had expected to ship by now, while 30 to 35 remain parked without engines, Airbus CEO Tom Enders admitted in a call with analysts in late July. Nevertheless, he said the 200-delivery projection for both GTF- and CFM Leap-1A-powered neos "is still a realistic target."

"We have seen frustrated and angry airline customers, but we don't see them leaving the GTF," Enders continued. "The key is that Pratt & Whitney supports those customers."

Enders further reflected on the "healthy commercial aircraft environment" and "robust backlog of 6,771 aircraft which supports our ramp-up plans," before fielding questions about the engine issues and Qatar Airways' cancellation of four A350 widebodies in June, which potentially presents a larger problem because, as Enders pointed out, Qatar stands as Airbus's largest customer for the type.

"Clearly we are dependent on the engine manufacturers delivering on their commitments to us and to the airlines," he said of the narrowbody situation.

Russia's S7 Airlines took delivery of its first Pratt & Whitney PW1100G-powered A320neo on July 19.

Enders said the OEM booked gross orders for 248 airplanes in the first half of the year (203 net, after cancellations). "We're essentially sold out until 2022 on single-aisle aircraft," he said, adding that the commercial aircraft order book stood at €981 billion ($1.15 trillion) as of the end of June.

Airbus remains on track to accelerate the delivery rate of A350s to 10 per month by the end of next year—Enders characterized the process as "going relatively smoothly"—and that A350-1000 flight-testing remains on track. He said negotiations continue with Qatar Airways but noted that the situation remains "challenging" in the Middle East, following tensions between Qatar and its Arab neighbors.

However, Enders reported that circumstances surrounding the A380 "are not so great" as the company lowers the delivery rate from 12 to only eight aircraft a year by 2019. He denied the decline made the program too costly to continue, however, and expressed hope the rate will pick up again in the future.

"Our operations are continuing under a lot of stress and strain but I'm optimistic," concluded Enders. "We have a great team who will show what they can achieve in the second half of the year. I'm sure we will succeed with our plan with a little help from our engine friends."

"We should have a small tailwind on the A350 now but a small headwind on the A380 with the volume drop this year over last year," added Airbus CFO Harald Wilhelm. ❑

SERIES OF TRANSACTIONS TO CONSOLIDATE POWER IN AIRLINE BUSINESS

Delta Air Lines, Air France-KLM, Virgin Atlantic and China Eastern have all agreed to participate in partnership deals aimed at fending off competition from powerful Persian Gulf airlines and emerging long-haul, low-fare carriers plying the North Atlantic. The centerpiece of the activity, all announced in late July, involves the launch of a long-term joint venture among Delta, Air France-KLM and Virgin Atlantic supported by a 31-percent investment by Air France-KLM in Virgin Atlantic next year. As a result, Sir Richard Branson will relinquish control of Virgin Atlantic, as his share falls to 20 percent from 51 percent.

The memorandum of understanding among Air France-KLM, Delta and Virgin Atlantic lays the foundation for a combination of two existing joint ventures, one between Air France-KLM, Delta and Alitalia and the other between Delta and Virgin Atlantic. The MOU promises to establish, in the words of Air France-KLM, "one of the most advanced partnership models in the airline industry," allowing for what the company calls an "unrivaled proposition on the transatlantic axis."

According to Air France-KLM, the single joint venture will, in effect, drive capacity growth of the partners, create an associate partner status allowing for the inclusion of other players at a later stage and generate "significant synergies" thanks to new code shares to and from London, sales coordination, cost savings and the extension of the partnership to 15 years.

Meanwhile, Delta and China Eastern have each agreed to take a 10-percent stake in Air France-KLM by subscribing new shares through capital increases totaling €751 million ($882 million). Air France-KLM said the China Eastern investment will "secure and reinforce" its presence in the Chinese market thanks to the associated long-term partnership and give it a European leadership position in Shanghai. —*G.P.*

UTC-Rockwell Collins talks underscore supplier pressures

by Sean Broderick

United Technologies' interest in acquiring Rockwell Collins reflects growing pressure on even the largest suppliers by top-tier manufacturers seeking cost reductions, several analysts have concluded.

"We believe at least part of the motivation for [UTC] is the incremental pressure on the supply chain from Boeing, both from a price and economics standpoint," said Canaccord Genuity analyst Ken Herbert. "We expect the supply chain to continue to look to get bigger, both to potentially increase leverage in the marketplace, and also to provide additional opportunities to take out cost and realize synergies."

A UTC-Rockwell Collins combination "would also be more challenging to bully" into cost-reduction agreements, such as those behind Boeing's Partnering For Success, "whereas smaller suppliers are easier to push around," said Vertical Research Partners analyst Robert Stallard. UTC generates about half of its $57 billion in annual sales from its Pratt & Whitney and UTC Aerospace units. Rockwell Collins generates about $5.3 billion in annual revenue.

News of talks between the companies, first reported by Bloomberg and Reuters on August 5, comes amid pressure at UTC to deliver on major programs while reducing costs. UTC subsidiary Pratt & Whitney is working to accelerate geared turbofan production and address in-service performance issues. Meanwhile, UTC is looking for ways to streamline.

"As we think about next year, one of the things that we are focused on is structural cost reduction," UTC president and CEO Greg Hayes told analysts on a late July earnings call. "It's organization. At the same time, the need to continue to reduce factory footprint remains. We're going to continue to go by the playbook of taking out high-cost locations for low-cost locations where the markets are moving."

While a Rockwell Collins acquisition would not create a simpler organization, it could bring other benefits.

UTC and Rockwell Collins both contribute significant content to the Boeing 787 program.

"We believe UTC has sought greater scale in its aerospace business for some time, and [Rockwell Collins] enjoys leadership positions in many segments of the aircraft market, such as avionics, interiors and connectivity," Herbert said. "We would not be surprised if Boeing was not warm to this acquisition, as the [combination] would have a very large presence on the 787, for example, and would be clearly the largest systems supplier to Boeing."

Suppliers' ability to push back against aircraft OEMs could become useful as supply-chain strategies evolve. Hayes has been outspoken about the challenge that stronger OEM aftermarket pushes, such as Boeing's new dedicated avionics business, presents for suppliers.

"One of the fundamental strategic issues…is who gets to participate in the aftermarket," Hayes said in July. "And the model has always been that the [OEMs] take big risks and invest big dollars, along with the first-tier suppliers, to develop all of these innovative products and solutions. I think we need to have these discussions—as we have started to do with the big [OEMs]—about partnership risk revenue-sharing arrangements. But clearly, you can't continue on with the current business model if the OEMs are going to demand a bigger and much more significant chunk of the aftermarket." ❑

Maintenance News

China's Civil Aviation Flight University will provide repair and overhaul of Hartzell propellers.

HARTZELL NAMES SECOND CHINESE SERVICE PROVIDER

Hartzell Propeller has named the aircraft repair and overhaul plant of China's Civil Aviation Flight University (CAFUC) a service and support center. The largest civil aviation university in Asia, and one of the world's largest flight-training institutions, CAFUC was founded in 1956 and established an aircraft repair and overhaul plant two years later. With flight training bases at five airports, it is responsible for maintaining the largest fleet of prop-driven aircraft in China. This latest announcement makes the Guanghan City facility the second Hartzell-authorized service center in the Asian nation.

FAA's NEW RCCB TO CLARIFY ARTICLE REPLACEMENT QUESTIONS

The FAA's Regulatory Consistency Communication Board (RCCB) has agreed to resolve questions surrounding the ability of repair stations to replace an "article" during maintenance. The Aeronautical Repair Station Association (ARSA) has been concerned that past agency attempts to determine when a particular action is manufacturing is not supported by the regulations.

In June ARSA asked the RCCB to clarify that repair stations could replace 100 percent of an article that is not an aircraft, engine, propeller, propeller hub or blade during maintenance without a need for production approval. "The industry and the agency have been attempting to address this issue for years," ARSA told the RCCB. "However, clear direction on compliance does not exist."

CENTEX GETS FAA NOD FOR HIGHER-WEIGHT KING AIRS

Waco, Texas-based aftermarket manufacturer CenTex Aerospace has received FAA approval for a 1,500-pound increase in max takeoff weight for the King Air 200, A200 and B200 with high flotation landing gear, taking the limit to 14,000 pounds. Dubbed Halo 275, the conversion raises the max landing weight by 1,000 pounds and, for model years 1993 and later, gives zero-fuel weight a 500-pound boost.

Certified in the Part 23 commuter category, the Halo 275 conversion installs five safety systems that add 80 pounds to the empty weight: engine fire extinguishers, elevator trim warning, overspeed warning, emergency cabin lighting and an ice mode for the stall warning. Overall, the net payload increase can equate to eight 170-pound passengers with 60 pounds left over for baggage or another 1,420 pounds of cargo or fuel.

WIJET RE-UPS WITH GAMA AVIATION ON FLEET MAINTENANCE

European jet taxi operator Wijet has extended its maintenance support agreement with Gama Aviation indefinitely. The deal covers base, line and AOG maintenance support for Wijet's 15 Cessna Mustangs, the largest such fleet in Europe. Wijet offers on-demand service to 1,200 airports in Europe and North Africa, using the four-passenger twinjets.

Gama also inked two new maintenance support agreements with European fleet operators. The deals cover 10 aircraft—five Globals, two Challengers, two Hawkers and a Beechjet—for services that range from inspections to AOG support for the two fleets. Gama will provide both of these operators with the support at Oxford Airport in the UK.

SWISS OPERATOR ADDS TRIO OF JETS TO CAMO PROGRAM

Switzerland-based aircraft charter and management provider Nomad Aviation has added three aircraft—the Cessna Citation CJ1 and CJ2+ and Dassault Falcon 50—to its continued airworthiness management organization (Camo) portfolio. The Camo certificate includes all of the company's managed aircraft, as well as its owned charter jets, which range from the Premier I to the G650.

The certificate provides for acceptance and registration, scheduled and unscheduled inspection and maintenance planning, aircraft maintenance program development and management, and airworthiness review certificate renewal. The company also offers certificate of airworthiness support.

VECTOR SOUTH AFRICA COMPLETES FIRST PT6A-140 OVERHAUL

Global MRO services provider Vector Aerospace recently completed the first full overhaul of a Pratt & Whitney Canada PT6A-140 turboprop at its facility in South Africa. The engine powers the Cessna 208B Grand Caravan and is available as an upgrade for earlier Caravans.

The shop, located at Johannesburg Lanseria International Airport, was appointed a designated overhaul facility for the engine in July 2014 and is currently the only such independent facility for this particular model. It is also a P&WC distributor and designated overhaul facility for other PT6As, among them the -114/114A variants used in earlier versions of the Caravan.

JET EAST EARNS NON-DESTRUCTIVE TESTING NOD FOR FALCONS

Trenton, N.J.-based MRO provider Jet East has received approval from Dassault to conduct non-destructive testing (NDT) on Falcons at home base and by its mobile repair unit. The company added NDT services last year, and has already secured permission to perform testing on Citations and Gulfstreams.

With this latest authorization the company is cleared to provide tests such as dye penetrant, magnetic particle, eddy current, ultrasound and radiographic testing on the French airframer's entire product line.

RBR MAINTENANCE AND MILLENNIUM FORM PARTNERSHIP

Dallas-based FAA Part 145 repair station RBR Maintenance has been awarded elite partner status by avionics specialist Millennium International. As part of the agreement, RBR will handle sales and installation of Millennium's avionics packages for Citations. The agreement is exclusive to Cessna avionics components such as the Honeywell DU-870, ED-600 and ED-800 display units and communications systems, including navcom, radio management and Tcas.

RBR's engine expertise includes the TFE731; JT15D, PW530, PW535, PW545 and PW617; and FJ44.

As a result of the agreement, Millennium will offer 24-month warranties on overhauled display exchanges handled by RBR.

DUNCAN AVIATION ADDS OHIO MOBILE ENGINE UNIT

Duncan Aviation has expanded its aircraft engine support in Ohio, with the addition of a new rapid response mobile engine unit based at John Glenn Columbus International Airport. The unit, Duncan's 16th, will offer area operators more convenient access to mobile engine services such as scheduled and unscheduled maintenance, AOG support and engine changes.

GE, AERO-DIENST RENEW DEAL FOR CF34 MAINTENANCE

General Electric has extended its approval of Aero-Dienst as an authorized service center for the CF34, which powers the Bombardier Challenger 601 and successor models. In April 2011, GE selected the Nuremburg-based MRO as one of the first service providers in its European business and general aviation network.

The location stocks OEM parts and provides AOG and mobile repair team services, along with scheduled and unscheduled repair and removal and installation of external engine components for warranty and GE OnPoint engine maintenance plan support. ❑

Aero-Dienst services more than 100 CF34-powered Challenger 604s and 605s annually.

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NOV. 29 - DEC. 1

FAA funding

▶ *Continued from page 1*

independent ATC organization. "The rigorous and yearly oversight of the budget and programs of the FAA is necessary to ensure the transparency and integrity of the public's investment in the ATC system," the Senate appropriators said. "The proposed shift does not serve the public interest and would only create a new bureaucracy that is unaccountable to the public and the communities surrounding our network of airports."

They questioned the need for the change, noting that the FAA is continuing to upgrade the system and pointed out that airspace improvements have already provided $2.7 billion in savings, a number that is projected to climb to $160 billion, at a cost of $35 billion. "The budget request, with its privatization proposal, will serve only to delay the progress that has already been made."

The committee also expressed concern about the "seamless collaboration" with the FAA's safety duties and the potential harm to small communities. It "is not convinced that the proposed governing board or the so-called 'protections on access' will protect the universal access that has been the hallmark of our large and diverse aviation system," the report added. Rather than providing funding for a transition to a new organization, the committee is expanding the FAA's transfer authority and providing multi-year flexibility to transfer funds for air traffic operations.

The House version, meanwhile, included a $51 million boost in NextGen funding. At the same time, the House Appropriations Committee took the White House to task for an "ill-advised, short-sighted approach that would put the modernization of our ATC system at risk." The White House had recommended cuts in the program.

Legislative Agreement

The House and Senate bills carry a number of similar provisions, such as full support of the contract tower program, research on a replacement unleaded aviation gasoline, and studies on advanced materials and additive manufacturing.

In addition to the FAA's operations, all of the agency's accounts—facilities and equipment, research, engineering and development and the Airport Improvement Program—would see increases under the Senate bill.

The House bill has provisions designed to assess ways to streamline the certificate process for MROs with multiple locations; seek an update on the FAA study of the Part 135 community; and evaluate ways to streamline the single-pilot Part 135 air carrier certificate process. It also calls for a committee to study Part 135 and 91K flight- and duty-time regulations. ❑

CBO: ATC PLAN WOULD ADD $100B TO U.S. DEFICIT

The U.S Congressional Budget Office (CBO) is estimating that the House proposal to create an independent ATC organization would increase the federal deficit by nearly $100 billion through 2027. An earlier CBO estimate forecast a $20.7 billion increase to the deficit, which did not factor in tax changes and other recent additions to the ATC proposal. Democratic leaders requested the CBO take a new look at the costs associated with the proposal.

GA leaders pointed to the estimate as another reason the proposal should be shelved. "Adding to the budget deficit, just to help the big airlines, is the definition of bad public policy," said NBAA president and CEO Ed Bolen. ■

FAA authorization

▶ *Continued from page 35*

a monopoly and always will be a monopoly—taking this public asset and turning it over to a private board of 13 special interest groups. That is not a conservative principle, and we think it is a very dangerous principle."

As the debate rages on, the American Association of Airport Executives (AAAE) noted, "With the various controversies surrounding what is in [and what is not in] pending House and Senate FAA reauthorization bills and with the clock quickly winding down, we appear to be headed for yet another extension."

The group is continuing to push for other infrastructure issues such as the passenger facility charge and Airport Improvement Program funding, and added, "It is our hope that Congress and the administration…will find a way to provide more clarity—and progress on meeting promised infrastructure investments—than has been yielded so far this year." ❑

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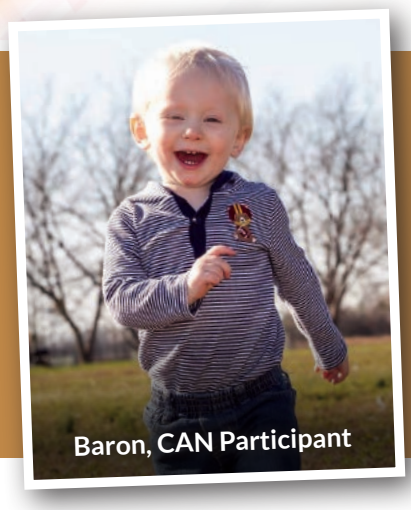
Held in conjunction with NBAA-BACE, the *Fund an Angel Cocktail Reception*, formerly the NBAA/CAN Soiree, will once again be benefiting Corporate Angel Network (CAN) and the critical work they do to support cancer patients.

NEW THIS YEAR: The reception will feature a shorter format that will allow you to attend other networking opportunities later on that evening. Attendees will still enjoy:

Cocktails & Passed Hors D'oeuvres ✈ Networking with Industry leaders ✈ Live & Silent Auctions



Baron, CAN Participant

"From the moment we got on the plane, to the moment we arrived at the hangar, the hospitality was unreal. The pilots were fantastic. This flight took away so much of our stress and it was also much easier for Baron. We are very grateful for the opportunity to fly with Corporate Angel Network."
-Baron's Parents

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SIGNATURE OPENS NEW SEATTLE FBO

Signature Flight Support opened its newest FBO at Boeing Field/King County International Airport (BFI) in Seattle last month. The $11.5 million, 6,250-sq-ft terminal offers a pair of meeting rooms, passenger lounge, pilots' lounge with flight-planning area, snooze room, shower facilities, a business center, dishwashing service, crew cars and onsite car rental.

The project, part of a local airport redevelopment initiative in cooperation with Boeing Field King County Airport and the King County Water and Land Resources Department, is hosting an experiment in storm water management. The system will be monitored as environmental officials mull whether it should become the gold standard for airport facilities at BFI and elsewhere.

Built on the site of the demolished former Landmark Aviation FBO and hangar, the new facility does not yet have its own hangar but that will soon change, according to Signature president and CEO Maria Sastre. "We're working on a hangar opportunity on the field as we speak," she said at the opening reception. "So I'm hopeful that in the next year we'll be able to accommodate customers who would like to be tenants with Signature at Boeing Field." In the meantime, Signature's ramp area is large enough to handle "super-heavy jets," she noted.

The new facility is Signature's second in the Seattle area. The company also operates an FBO at Seattle Tacoma International Airport (SEA), just south of Boeing Field.

L.A. AIRPORT GETS SECOND FBO

Los Angeles-area Jack Northrop Field/Hawthorne Municipal Airport received a second FBO with the opening of Hawthorne Hangar Operations. Located in the Wolfe Air hangar at turnoff Delta on the 4,956-foot runway, the Avfuel-branded location offers full- and self-service fueling (jet-A and avgas) from its $1.6 million fuel farm, which has a capacity of 30,000 gallons of jet-A and 2,500 gallons of avgas. The facility offers 14,000 sq ft of office space and has a 2,000-sq-ft passenger terminal with 12-seat A/V-equipped conference room, passenger lounge, shower facilities, crew cars and concierge service. The complex also operates an adjoining 18,000-sq-ft hangar, which can accommodate a G650.

"We've been a presence on this field for seven years in hangar operations, aerial photography and production, under our owner Dan Wolfe's umbrella of companies," noted Jim Schulte, general manager of the facility. "We recognized a need for another FBO on the field, and seized the opportunity."

The company began renovations on a 3,000-sq-ft, two-story building that was formerly part of Northrop Aviation's research division, which it expects to introduce as a passenger terminal by the end of this month. In 2019, plans call for that building to be razed in preparation for a new 10,000-sq-ft, four-story terminal building that will sit on top of a two-level, 200-space underground parking garage. In addition, the $13 million project will construct a new 15,000-sq-ft hangar, with two rooftop helipads, complete with fueling capabilities, which will be able to accommodate the latest big business jets. Construction of the campus is expected to be completed by 2020, Schulte told **AIN**.

Hawthorne Hangar Operations at Hawthorne Municipal Airport is making improvements over the next few years and plans to complete a new multimillion-dollar facility by 2020.

JAPANESE FBO TO CEASE BUSINESS AVIATION HANDLING

Noting a decline in international transient aircraft, Nakanihon Air Service, one of two FBOs at Japan's Aichi Prefecture Nagoya Airport (RJNA), will cease ground-handling operations at the end of this month.

In 2005, after the opening of the larger Chubu Centair International siphoned away the commercial activity from RJNA, the Aichi prefectural government purchased the airport with the intention of developing it to serve business aviation alone, with high-speed rail links to Tokyo, Osaka and Kyoto.

"Our airport was the first of its kind in Japan, and we developed a comprehensive and efficient model to handle all the needs of our customers," said Misao "Mickey" Nagae, general manager of Nakanihon's international business aircraft enterprise division. "Nakanihon filled an important need in providing quick services to aircraft that would otherwise have been unable to access the Tokyo airports in a reasonable time frame."

That situation changed, he added, starting in 2010 with improved acceptance of business aviation at Haneda and Narita airports. The move will leave Aero Asahi as the lone business aviation services provider at Nagoya.

NEW YORK FBO CHANGES HANDS

Canandaigua Airport in central New York State received a new operator for its lone FBO last month, when MFC Aviation Services, a subsidiary of non-profit medevac provider Mercy Flight Central, took over from Canandaigua Air Center, which will concentrate on its core aircraft MRO business. MFC is based at the airport, and while it is currently operating a small lounge from its hangar, it expects to install a temporary terminal structure with passenger and pilot lounges in the next few weeks, according to Jeff Bartkoski, MFC president and CEO.

"All net income that we generate through the FBO will come right back to our not-for-profit helicopter air ambulance service within this community," he said.

The FBO is open daily from 7 a.m. to 5 p.m. with after-hours callout available. In addition to fueling (jet-A and avgas) it provides concierge services, onsite car rental and crew cars. The Ontario County Industrial Development Agency, which owns the airport, plans to break ground by the end of the year on a new hangar complex consisting of seven bays, each approximately 3,600 sq ft.

"Canandaigua Airport has received significant advancements over the past few years, expanding its runway to 5,500 feet and improving the instrument approaches," Bartkoski told **AIN**. "It's been in operation for quite a few years but with those enhancements we're starting to see more traffic and there was a desire to elevate the level of service." He added that the airport and FBO have been working with the state to build a permanent terminal within the next few years.

REBRANDED NEW YORK FBO JOINS SIGNATURE NETWORK

Talon Air, one of three FBOs at New York Republic Airport, has rebranded as Republic Jet Center, and has joined the Signature Flight Support network as a Signature Select facility. The location, which comprises 100,000 sq ft of hangar and office space, offers a pilots' lounge with snooze rooms and shower facility, conference room, refreshment center and onsite car rental, and is the only FBO at FRG with its own FAA Part 145 repair facility, which can provide MRO services, avionics repair and installation, and interior work. It also operates a mobile service team for AOG support.

The Signature Select program allows independent FBOs to become branded members of the network, which numbers 200 locations worldwide. In addition to point-to-point coordination with other Signature locations, the facility now offers the full suite of Signature customer loyalty programs such as Tailwins and Signature Status.

Republic Jet Center, formerly Talon Air at New York's Republic Airport in Farmingdale, is the latest member of Signature Flight Support's network.

CHARTER NEWS NOTES

- Van Nuys, Calif.-based **Jet Edge International added a Legacy 600**, taking its charter fleet to 55 aircraft. The jet is based in Oakland, Calif., and has a 13-passenger cabin with a forward four-place club seating area, mid-cabin four-place seating with conference table and aft divan facing a two-place club.
- **Windsor Jet Management** of Fort Lauderdale, Fla., **is offering a 14-passenger GV** equipped with an aft galley and three seating areas: a four-place forward club, center four-place divan opposite dual club seats and aft four-place conference group opposite a credenza.
- **Three aircraft have joined** Pittsburgh, Penn.-based **Voyager Jet's fleet**: a Hawker 800XP and two refurbished G200s. All are equipped with Gogo Business Aviation air-to-ground connectivity, which is offered to passengers at no charge.
- **DC Aviation Al-Futtaim** (DCAF), the DC Aviation and Al-Futtaim joint venture based in Dubai, **has added a Challenger 605 to its management fleet**, where it joins two Globals, three Challengers and a Falcon 7X. DCAF is also building a 73,000-sq-ft hangar, which will allow it to add two maintenance bays and more workshop and storage space.
- **Business Aviation Solutions**, based in Atlanta, Ga., **has added a G550 and Citation Sovereign**, taking its management fleet to nine aircraft. By the end of the year, the company expects the fleet to number 12 aircraft. Both the G550 and Sovereign were refurbished with new interior and paint after joining Business Aviation Solutions. ■

National Jets at Florida's Fort Lauderdale-Hollywood International Airport is a TSA-approved gateway to Ronald Reagan Washington National Airport under the DASSP.

FLORIDA FBO JOINS TSA's DASSP PROGRAM

The TSA has added another FBO to the list of approved participants in the DCA Access Standard Security Program (DASSP), which was established in 2006, for private aviation customers wishing to fly directly into Ronald Reagan Washington National Airport (DCA).

National Jets, one of four FBOs at Florida's Fort Lauderdale-Hollywood International Airport, has become the latest DCA gateway. According to Reggie Nichols, the facility's general manager, the application process took three months and involved paperwork, establishment of a security program, training and TSA inspections, which determined that the facility would not require any modifications to comply with the agency's FBO standard security program.

Chicagoland's B. Coleman Aviation, whose FBO at Gary/Chicago International Airport was named to the list in 2015, announced that its Coleman Jet aircraft charter and management division has also earned authorization to operate directly into DCA.

The TSA began restricting access into the airport after the 9/11 attacks. Any private aircraft flying into DCA must arrive from a designated gateway facility and comply with all aspects of the program.

ITALIAN AIRPORT SEES BIZAV HUB IN ITS FUTURE

Riviera Airport in Italy, home to Piaggio Aerospace's new manufacturing plant, intends to market itself as a new business and general aviation hub for the Northern Mediterranean. Management of the privately owned and operated airport, which is located in Villanova d'Albenga in Liguria, is pursuing construction of a new runway, associated infrastructure and onsite customs and immigration formalities. The current 4,688-foot (1,429-meter) runway can handle aircraft with a takeoff weight of up to 66 tons (60 metric tons).

"Riviera Airport represents a competitive alternative in the existing mature market," said Clemens Toussaint, chairman of Aeropolis, which owns 99 percent of the airport shares. "Riviera Airport could also be a strategic option for the Principality of Monaco, which has no runway of its own," he added, noting that Monte Carlo is less than an hour's drive or a 20-minute helicopter flight.

The concept could be further developed into a regional business aviation center. "A bi-national airport managed jointly by the Italian State and by the Principality of Monaco would create extraordinary business opportunities in the entire area," Toussaint concluded.

FIRST CHINESE FBOs GET IS-BAH NOD

The International Business Aviation Council's (IBAC) International Standard for Business Aviation Handling (IS-BAH) is taking root around the world, as China's Deer Jet has become the first service provider in the nation to achieve registration under the voluntary safety management system-based set of industry best practices. Deer Jet, the largest private jet operator in Asia, operates nine FBOs in China, and the locations at Sanya and Haikou are its first to be recognized under IS-BAH Stage I. The company expects the other locations will eventually follow suit.

Deer Jet's facilities at Sanya Phoenix International and Haikou Meilan International airports are open 24/7 and offer assistance with Chinese inspection and quarantine services.

CLEVELAND AIRPORT REOPENS AFTER MAJOR RUNWAY PROJECT

The sole runway (5,100-foot 6/24) at Cleveland Cuyahoga County Airport has reopened after a two-month reconstruction project. According to the county authority, the $9 million job—paid for by FAA grants (90 percent), the Ohio DoT and the county—involved milling and resurfacing the runway and adding a taxiway connector.

But to allow the surface to cure completely, the runway was closed again on August 19 and 20 to cut drainage grooves in the surface. Cleveland Jet Center, the lone FBO on the field, took advantage of the idle period to conduct minor renovations, while many of its based aircraft relocated to other area airports. The airport is currently awaiting FAA grant approval for next year's project, which will involve installing an engineered materials arresting system at both ends of the runway. ❑

FBO PROFILE: Cutter Aviation (COS)

THE COLORADO FACILITY GETS A LONG-PLANNED UPGRADE

Founded in 1928, Cutter Aviation claims to be the oldest family-owned aviation service provider in the world, and last month the company unveiled its newest FBO in a grand opening at Colorado Springs Municipal Airport. Cutter has had a presence there since 2006, when it purchased the former Colorado Springs Aviation.

The company knew the older facility would need to expand eventually, but with the economic downturn arriving shortly after the purchase, it deferred major capital investment until last November, when it broke ground on the new terminal. "With the industry coming back, and our financial position, it made sense to do the expansion." noted Cutter CFO Steve Prieser.

Around the same time, Cutter also acquired a 23,000-sq-ft hangar with 45-foot-high doors from the city of Colorado Springs. Capable of sheltering a 737-400, it took the location's heated hangar space to 33,000 sq ft.

The expansion added a parcel of land adjacent to the newly purchased hangar, in an area of the airport more accessible to larger aircraft than the existing FBO. As a result, Cutter's footprint on the airport more than doubled, to 19 acres, with an option on five more acres.

The Phillips 66-branded location also recently added a $600,000 fuel farm with capacity for 50,000 gallons of jet-A and 12,000 gallons of avgas, served by a 5,000-gallon and a 3,000-gallon jet-A tanker and a 1,000-gallon avgas truck. The old fuel farm will be decommissioned by year-end.

This month, Cutter also expects to put the final touches on a $12 million, 60,000-sq-ft hangar, built to suit tenant Sierra Nevada, which will occupy the entire building. The FBO contributed one third of the cost of a new taxiway leading to the hangar. As part of the lease obligations, Cutter is required to add another hangar of at least 20,000 sq ft over the next several years.

Prieser is confident these latest improvements will improve Cutter's share of business at the airport, which he estimates at 30 percent now. The facility has a staff of 13 and is open every day from 6 a.m. until 10 p.m., with after-hours callout available.

The facility is a DCA gateway under the TSA's DASSP program. U.S. Customs service is available on request, with agents meeting the arriving aircraft at the FBO.

Cutter recently opened its new larger facility at Colorado Springs, an investment planned since it purchased the terminal.

At 9,300 sq ft, the new $3.5 million terminal dwarfs the older facility, which Cutter will retain for use by lighter general aviation, and possibly rented to flight schools. The new terminal, just off Runway 17L/35R, will be dedicated to business jets and turboprops.

FBO Amenities

Furnished in the grand mountain lodge style with timber and stone throughout, the new structure provides a covered porte-cochere, a large fireplace, pilots' lounge with flight-planning area, snooze room, 12-seat A/V-equipped conference room, a large catering kitchen, business center, concierge service, onsite car rental, and on the airside of the terminal, a patio offering spectacular views of the airport and nearby Pikes Peak.

General manager Calvin Martin said the FBO's peak season stretches from May until November. The proximity of the U.S. Air Force Academy helps drive traffic, and in winter the location sees plenty of aircraft that diverted from airports serving the state's ski resorts.

In fact, many aircraft that drop passengers at Montrose or Aspen will relocate to Colorado Springs because it is less congested. "For the most part we are outside the extremely inclement weather," said Martin. "Our airport does really well with making sure the runways are clear enough for aircraft to get in and out." Those runways are 13,500 feet, 11,022 feet and 8,270 feet.

Martin's customer service philosophy is to have his NATA Safety 1st trained staff ready to anticipate whatever might be required. "I believe that if we are always looking forward, we'll be able to satisfy our customers' needs," he told **AIN**. In one example he cited, the company received a request from an aircraft two hours out, carrying a sheikh, requesting seven black SUVs to carry him and his retinue, plus a separate van for luggage. "We were able to knock it down in a two-hour span," said Martin. —*C.E.*

PRELIMINARY REPORTS

CARGO FLIGHT CRASHES ON LANDING IN WEST VIRGINIA

Short SD3-30, May 5, 2017, Charleston, W.Va.—An early-morning arrival at Charleston Yeager International Airport (CRW), Charleston, W.Va., ended badly for Air Cargo Carriers Flight 1260, a Short SD3-30, when it crashed on approach to Runway 5, killing both pilots and destroying the airplane. The Part 135 cargo flight was arriving from Louisville International Airport (SDF), Louisville, Ky., in IFR conditions. The NTSB is investigating the cause of the accident.

MU-2 LOSES CABIN WINDOW IN FLIGHT

Mitsubishi MU-2, May 18, 2017, Little Rock, Ark.—An MU-2 pilot on a Part 91 flight sustained minor injuries after one of the twin turboprop's cabin windows blew out at altitude near Little Rock, Ark. The pilot initiated an emergency descent to a successful landing in Little Rock.

AS350B2 HITS TERRAIN IN FOG NEAR HERBERT GLACIER

Airbus AS350B2, May 22, 2017, Juneau, Alaska—A commercial pilot flying seven passengers on a Part 135 on-demand sightseeing flight to glaciers above Juneau, Alaska, in an Airbus AS350B2 struck remote mountainous snow-covered terrain 21 miles northwest of Juneau. The pilot and three passengers sustained minor injuries in the accident and the helicopter was substantially damaged.

VFR conditions were degrading rapidly in what the pilot termed "flat light" on the Herbert Glacier at the time of the accident, and company flight-following procedures were in effect.

During an interview with the NTSB investigator, the pilot reported that she departed from Juneau International Airport to pick up cruise ship passengers from a remote dog sledding camp on the Herbert Glacier. She landed at the camp, picked up six passengers and headed back. Three-quarters of a mile from the camp, while descending over an area of featureless, snow-covered ice, the pilot reported that she was maintaining visual reference with a rock wall on the right side of the helicopter. As the flight progressed downslope, she saw an area ahead that was "fogged in" and she chose to turn back to the dog sledding camp. While slowly turning 180 degrees to the right, the helicopter hit the ice and came to rest inverted.

All the occupants exited the helicopter, and the pilot used a handheld radio to request emergency assistance. The personnel at the dog sledding camp contacted the operator's headquarters in Juneau, which sent another company helicopter to extract the pilot and passengers from the accident site.

According to the pilot, in addition to fog, flat light conditions were present at the time of the accident. The helicopter sustained substantial damage to the fuselage, the main rotor system, the tailboom and the tail rotor system. The wreckage was recovered and transported to a secure facility.

LET L-410UVP DESTROYED ON LANDING

Let L-410UVP-E20, May 27, 2017, Nepal—A Let L-410UVP-E20 turboprop twin operated by Summit Air was destroyed in an accident when it attempted to land on Runway 6 at Lukla-Tenzing-Hillary Airport in Nepal, killing both the captain and copilot. The aircraft was operating a cargo flight from Katmandu with a crew of three. An airport CCTV recording shows the aircraft descending through the clouds, then climbing, possibly in an attempt to go around. The aircraft then lost altitude in a nose-up attitude and hit the ground in steep, rocky, wooded terrain, nine feet below the runway threshold level.

KING AIR E90 NIGHT FLIGHT ENDS SECONDS AFTER TAKEOFF

Beech King Air E90, June 13, 2017, Ruidoso, New Mexico—A Beech King Air E90 with just the pilot and one passenger aboard lifted off on a night flight from Sierra Blanca Regional Airport in Ruidoso, N.M. and traveled less than half a mile from the departure end of the runway before hitting the ground and being consumed by fire, killing both occupants.

An IFR flight plan was filed for the flight, which was heading to Abilene Regional Airport, Abilene, Texas. The airplane wreckage path was distributed along a heading of 138 degrees and was 168 feet long. Both propellers were separated from the engines and were resting along the debris path. Both propellers exhibited S-shaped bending, leading-edge damage and chord-wise scratching consistent with engine power at the time they struck the ground. The NTSB is continuing to investigate the cause of the accident.

SOUTH AFRICAN MD500E DOWN IN BULFONTEIN

MD Helicopters MD500E, June 14, 2017, Bulfontein, South Africa—No one was injured when an MD500E with South African registration was substantially damaged in a forced landing near Bulfontein, South Africa. The pilot and two passengers were on a private flight when the pilot made the emergency landing. The South African Civil Aviation Authority Accident and Incident Investigations Division is investigating, and engaged the NTSB since the helicopter's engine and design are of U.S. origin. ❑

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.

FINAL REPORTS

NETJETS EMBRAER PHENOM 300 OVERRAN RUNWAY

Embraer Phenom 300, April 19, 2014, Conroe, Texas—The NTSB determined that the copilot's application of the emergency parking brake (EPB) during landing on a wet runway caused the aircraft's braking system to lock up, resulting in a runway overrun of the NetJets Embraer Phenom 300 on a Part 91 relocation flight from Nashville, Tenn., to Lonestar Executive Airport (KCXO) in Conroe, Texas. The aircraft came to rest in a ditch past the end of the runway, sustaining substantial damage. No one was injured.

The cockpit voice recorder (CVR) proved that the pilots received the automatic terminal information service (ATIS) information and calculated the runway length required for a wet runway landing. They then chose to land on Runway 1, the longer runway. The pilot-in-command (PIC) told investigators that the flight encountered light rain during the approach but that the rain was moving away from the airport and that this alleviated any concern about standing water on the runway. He added that both he and the copilot had previously landed the Phenom 300 in moderate-to-heavy rain with no decrease in braking ability.

The CVR recorded the pilots briefing for the approach and missed approach procedures. Subsequently, the tower controller cleared the Runway 1 Rnav approach, and the pilots then discussed alternate airports in the area. The tower controller cleared the airplane to land and stated that moderate-to-heavy rain was at the airport. The pilots conducted the before-landing checklist and continued the approach. The copilot was flying. They saw the runway at 600 feet agl, and the copilot disengaged the autopilot at 400 feet. At 200 feet, the copilot reduced the power and adjusted the attitude and airspeed for a stabilized approach with a maximum airspeed of 130 knots.

According to the air traffic controller who witnessed the accident, the airplane touched down just past the 1,000-foot marker on the runway and did not appear to decelerate as it continued down the runway.

In his post-accident written statement, the captain noted that the landing appeared "smooth." The copilot stated that he began braking with half pressure and continued to increase the brake pressure to maximum, a normal braking procedure for the Phenom 300.

Sounds on the CVR consistent with the airplane touching down were followed by the pilots exclaiming that the airplane was not slowing down. The copilot said, "Brakes. Emergency brakes," followed by "Nothin' man" and "I got nothin'."

The captain exclaimed, "Where's the brakes? Don't go sideways, don't go sideways." The airplane exited the departure end of the runway and continued about 400 feet through soft/muddy terrain before coming to rest halfway down a ditch. The distance between the ground tracks made by the nose tire and the right main gear track was 18 inches, indicating that the airplane skidded after it departed the runway surface. A flat worn spot was visible on both the left and right main tires. Both tires showed evidence of reverted rubber hydroplaning.

The NTSB performed a detailed analysis of both runway conditions at the time of the accident and aircraft performance factors, determining that per the aircraft's performance tables, there was both adequate distance for stopping and adequate traction. An examination of the brake system and the data downloaded from the brake control unit (BCU) indicate that the brake system functioned as commanded during the landing.

The performance study determined that if the EPB had not been set and the braking friction had continued at levels attained early in the landing roll, then the airplane would have come to a stop with 331 feet of runway remaining. This turned out to be considerably less than stated in the performance section of the Phenom 300 Pilot's Operating Handbook. The study concluded that the braking friction deficit observed in this and other accidents examined during the course of this investigation showed that the airplanes' stopping performance was more consistent with airplane flight manual landing distances for runways contaminated with standing water than for runways that were merely "wet."

The NTSB stated, "The root cause of the wet runway stopping performance shortfall is not fully understood at this time; however, contributors are runway conditions such as texture (polished or rubber-contaminated surfaces), drainage, puddling in wheel tracks and active precipitation. Analysis of this data indicates that 30 to 40 percent of additional stopping distance may be required in certain cases where the runway is very wet, but not flooded."

As a result of this accident NetJets has issued three Flight Operations Bulletins addressing braking on wet runways, and added a section to its Aircraft Operations manual. Embraer has also issued (and revised several times) a Flight Operations Letter addressing braking on wet runways for the aircraft type, noting, "The emergency parking brake will always deliver worse performance when compared to the normal brakes with anti-skid protection."

MEXICAN CARAVAN CRASHED AFTER ENGINE REPAIR WORK

Cessna 208B Caravan, April 1, 2016, Durango, Mexico—The Dirección de Investigación de Accidentes, a part of the Dirección General de Aeronáutica Civil (DGAC), determined that the probable cause of the 2016 crash of a Cessna 208B Caravan that killed three people, including the pilot, and seriously injured six others was the loss of engine power from a fatigue fracture of a compressor turbine (CT) disc blade. The engine had undergone compressor turbine vane ring reworking without authorization from the manufacturer, and those parts were installed in the overhauled engine.

The pilot was flying from Tayoltita Airstrip to Durango-Guadalupe Victoria Airport (DGO), Mexico, with nine passengers when the aircraft lost engine power 15 minutes into the flight while climbing through 9,500 feet. The pilot got off an emergency call before deciding to land in a riverbed in a canyon, and during the landing the left wing hit a tree, swinging the fuselage, which subsequently hit several large boulders embedded in the riverbed, causing the aircraft to split into two sections. A search-and-rescue mission launched within five minutes of receipt of the emergency radio transmission, which aided in the survival of six of the passengers.

The DGAC determined that the aircraft's PT6A-114A was overhauled on May 21, 2015, after more than 3,000 cycles. All 100-hour inspections subsequent to the accident were nominal. The engine was extracted from the wreckage and sent to Pratt & Whitney Canada, which found that the turbine compressor vane ring processed and installed in the overhaul (part number STI8) was released for service by Southwest Turbines. The FAA-approved repair consists of replacing the entire CT vane ring core, leaving only a portion of the inner cover bracket. Pratt & Whitney Canada does not approve of the Southwest Turbines repair, and determined that it was the cause of the engine power loss that subsequently caused this accident.

Pratt & Whitney Canada conducted a number of tests on repairs similar to those performed by Southwest Turbines at the CT vane ring and noted a significant increase in vibratory stresses in CT blades caused by dimensional deviations of the CT vane in comparison with the engine vibration criteria. ■

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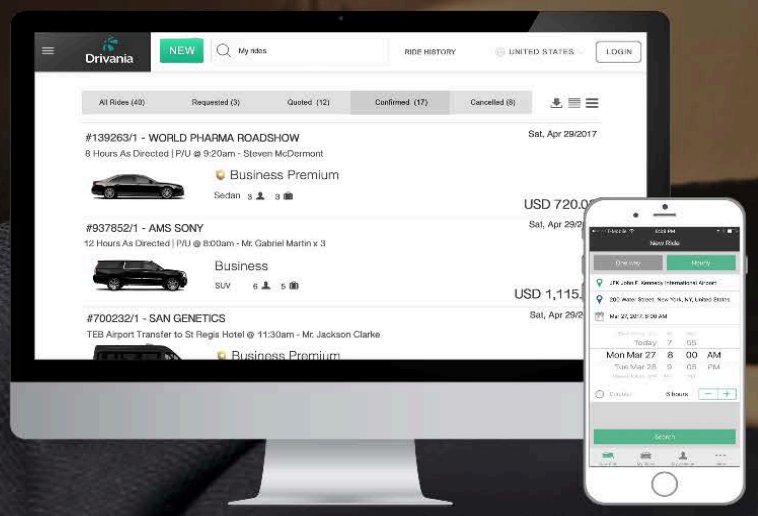

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Completion & Refurbishment

by James Wynbrandt

Fokker Technik Signs on To Complete Dutch BBJ

Boeing Business Jets has contracted GKN subsidiary Fokker Technik to design and perform the interior completion of a BBJ ordered by the Dutch Government for transport of government officials and the Dutch Royal family. Configured in a two-cabin layout for 24 passengers (12 VIP, 12 staff), it will have a crew rest area and lavatory. The current state transport, a Fokker 70 (PH-KBX), has been in service for two decades. Interior design activities are under way and the aircraft is scheduled for delivery to the Dutch Government in 2019.

Rockwell Collins Cabin Products Chosen for Comlux Completions

Comlux has signed a letter of intent with Rockwell Collins for installation of the latter's cabin products in the Swiss company's VIP completions. The products include Rockwell Collins's Venue cabin management system, VIP seating, divans, Nano 3X interior lighting and the option for Inmarsat Jet ConneX service for Wi-Fi connectivity.

The deal marks the first program combining products and services from Rockwell Collins's commercial systems, information management services and new interior systems businesses since it acquired B/E Aerospace in April.

Interior Projects Under Way at Jet Aviation

Jet Aviation won its first BBJ completion contract in 1999, and the Swiss company recently redelivered that same BBJ, which had been out of service for "a number of years," following a complete refurbishment and exterior repainting. All the seats, sidewalls and carpets were replaced, as was some of the wood marquetry. The company also performed a modification to reduce the cabin altitude, installed improved soundproofing using the company's targeted sound prediction technology and completed a C-1 check and general defect rectifications.

Jet Aviation is also performing medevac conversions on two Legacys at its Basel facility: a Legacy 600 for an Asian customer and Legacy 650 for a Middle Eastern client. Both are intended to fly medevac as well as charters. Jet Aviation has developed STCs for modifications allowing operators to switch the two interiors in a matter of hours.

Comlux To Perform ACJ320 neo Completion

Switzerland's Comlux will install the executive interior on an ACJ320 neo, its first neo completion, for an undisclosed Asian customer at Comlux America in Indiana. The green aircraft will arrive in September 2019 and require 10 months for completion. Four design firms—Alberto Pinto Design, DesignQ, Unique Aircraft and Winch Design—have been invited to submit design concepts to the customer, with final design selection expected in the third quarter.

Comlux Completion is conducting several ACJ neo and BBJ Max cabin completion sales campaigns and is "expecting to sign more contracts before the end of the year," said CEO Scott Meyer.

AMAC Delivers Head-of-State 777

Twenty months after receiving the green aircraft, AMAC Aerospace re-delivered a 777-200LR following a head-of-state completion incorporating "state-of-the-art technology systems, high-end in-flight entertainment systems with large monitors, the latest generation of soundproofing, and RGB mood lighting as well as customized artwork, custom furniture, monuments and exotic material," the Swiss company reported.

AMAC also redelivered a head-of-state A340-200 following a full cabin refurbishment and 12-year base maintenance inspection.

DHL Express Orders Converted A330s

German courier DHL Express has contracted Germany's Elbe Flugzeugwerke (EFW), a joint venture between ST Aerospace and Airbus, for four firm and 10 optional A330-300 passenger-to-freighter (P2F) conversions. DHL contracted four similar conversions last July, and the first is under way at EFW's facilities in Dresden, scheduled for redelivery by year-end. Conversion work on the second aircraft, also scheduled for redelivery by year-end, is set to begin at ST Aerospace's facility in Paya Lebar, Singapore.

The A330P2Fs are available in two versions: the A330-200P2F and the larger A330-300P2F. DHL Express is EFW's first customer for the A330-300P2F conversion program.

Global Express XRS Repainted at Ruag

Ruag's Munich paint shop repainted SBK Holding's Global Express XRS with a "carboneum" honeycomb scheme created by France's Happy Design Studios. SBK Holding, sovereign investment fund of the United Arab Emirates, chose a full repaint of its eight-year-old aircraft "to express its own dynamic and innovative image," according to the company. Reproducing the design patterns on the nacelles required the digital creation of "extraordinarily detailed" templates for the honeycomb effect. To make the most of the downtime, Switzerland's Ruag performed a 15-month inspection simultaneously with the paint project. ■

'Carboneum' by Ruag and Happy Design Studios.

Compliance Countdown by Gordon Gilbert

Within 6 Months

▶ **Sept. 25, 2017** NEW

Update to EASA-qualified Simulators

A new notice of proposed amendment (NPA) from the European Aviation Safety Agency is aimed at updating flight training simulators to keep pace with current and proposed training requirements addressing approach-to-stalls; upset prevention and recovery; increasing the fidelity of the simulation of engine and airframe icing effects; and developing and deploying an instructor operating station feedback tool. Additionally, the NPA proposes the option to qualify simulators for the post-stall regime based on a special evaluation. These optional fidelity and testing requirements would support simulator operators having dual-qualified devices (both FAA- and EASA-qualified). Comments on the NPA are due Sept. 25, 2017.

▶ **Sept. 30, 2017** NEW

Comments Due on Canada's Duty/ Rest Time Proposal

Transport Canada has published the latest version of its flight crewmember duty and rest requirements for commercial operators, including air taxis. Comments can be submitted through September 30. The current proposal addresses comments submitted to a notice of proposed amendment (NPA) issued on Sept. 15, 2014, and subsequent meetings with stakeholders. The original proposal has been modified to set implementation of the new standards for air-taxi operators to four years after publication of the final rule.

Within 12 Months

▶ **Dec. 7, 2017 and Jan. 30, 2020**

Expansion of Datalink Com in North Atlantic

Phase 2 of the North Atlantic datalink mandate began with Phase 2a in February 2015, at which time flights within the North Atlantic Tracks (NAT) between FL350 and FL390 were required to be equipped with Fans-1/A controller-pilot datalink communications (CPDLC) and ADS-C. The program expands to these altitudes in the entire ICAO NAT region on December 7 this year, and to all flights in this region above FL290 on Jan. 30, 2020, a month sooner than the previous revised date.

▶ **Jan. 1, 2018**

Deadline for European 8.33-kHz Spacing

Starting January 1 next year, aircraft might not be able to operate in any EU member state's controlled airspace unless they are equipped with communications systems that have 8.33-kHz voice-channel spacing. Eurocontrol says extending 8.33 kHz below FL195 down to ground level is important, as "Europe has a known shortage of voice communication frequencies." The 8.33-kHz requirement for higher altitudes in controlled airspace has been in effect for some time. According to Eurocontrol, the consequences should this shortage of com frequencies not be addressed are "significant: there will be more air traffic delays; it will be harder to implement safety improvements; and we will lose flexibility in introducing operational enhancements."

▶ **June 16, 2018 and Jan. 1, 2019**

Upgraded CVRs and Underwater Locators Required

New regulations from the European Aviation Safety Agency (EASA) will require upgraded cockpit voice recorders (CVRs) and underwater locating devices (ULDs) to be installed. Starting June 16 next year, ULDs must be capable of transmitting for at least 90 days instead of 30 days. By Jan. 1, 2019, airplanes with an mtow of at least 59,500 pounds with more than 19 passenger seats and performing transoceanic flights must be retrofitted with an "additional ULD with very long detection range." Also by Jan. 1, 2019, all CVRs with 30-minute recording duration must be replaced by units that can record for two hours. CVRs recording on magnetic tape must be replaced by solid-state units.

Beyond 12 Months

▶ **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 applicable on November 8 next year. The new requirement will be made formal as Amendment 39 to Annex 6—*Operation of Aircraft,* Part I. The new standard is the outcome of recommendations stemming from the disappearance of the 777 operating as Malaysia Airlines Flight MH370 while en route from Kuala Lumpur to Beijing, China, on March 8, 2014. The search for the 777 was called off in January this year.

▶ **Jan. 1, 2020**

U.S. ADS-B OUT Mandate

ADS-B OUT equipment must be operational starting Jan. 1, 2020, in aircraft that fly in the U.S. under IFR and where transponders are currently required, namely class A, B and C airspace.

▶ **Jan. 1, 2020**

Taiwan ADS-B OUT Compliance

The Republic of China has pushed the deadline to Jan. 1, 2020 for compliance with ADS-B OUT equipment within the Taiwan FIR above FL290. China was forced to delay compliance because too few aircraft were equipped to render the original ADS-B plan achievable. The new deadline for Taiwan coincides with the Jan. 1, 2020 U.S. mandate for ADS-B OUT compliance.

▶ **Jan. 1, 2020, Jan. 1, 2023 and Jan. 1, 2028**

Aircraft CO_2 Emissions Standards Adopted

The first international standards for CO_2 aircraft emissions have been enacted by ICAO and initially apply to large subsonic jets, including business jets, for which the application for a type certificate was submitted on or after Jan. 1, 2020. The standard would apply to new deliveries of current in-production large aircraft starting Jan 1, 2023. All covered in-production airplanes must meet the standard by Jan. 1, 2028. Jet airplanes with an mtow under 12,500 pounds, and piston-engine airplanes and turboprops below 19,000 pounds mtow, are exempt.

▶ **June 7, 2020**

European ADS-B OUT Mandate

The ADS-B OUT retrofit requirement in Europe takes effect June 7, 2020. This date is about six months later than the U.S. ADS-B OUT mandate.❑

People in Aviation Compiled by Kerry Lynch

The Senate on August 3 confirmed **Robert Sumwalt** as a member and chairman of the NTSB and **David Pekoske** as assistant secretary of homeland security, *Transportation Security Administration* (TSA). A pilot for 32 years who has amassed 14,000 flight hours, Sumwalt has served on the Board since August 2006 and was previously vice chairman. He formerly managed a small flight department for a utility company in South Carolina and has served as a member of NBAA's Safety Committee. Pekoske, who was also confirmed on August 3, fills the role vacated by Peter Neffenger earlier this year. Pekoske had a 33-year career with the U.S. Coast Guard, retiring in 2010 as the second-in-command and COO of the service.

Delta Private Jets named **Gary Hammes** president. A 30-year airline veteran, Hammes was most recently COO at Virgin Australia and has also served as senior v-p and COO at World Airways and Astar Air Cargo.

C&L Aviation Group appointed **Tim Brecher** president of C&L Engine Solutions. Brecher spent 15 years leading GE Aviation's Engine Leasing, Trading and Acquisitions business and has 27 years of aviation experience.

Andy Hudson was appointed to the board of governors of the *Asian Business Aviation Association*. Hudson is CEO of Down-Route, an international business aviation bookings and expense management provider. AsBAA also named **Caspar Baum** to the board of directors, further reinforcing the association's presence in Southeast Asia. Baum is director of aviation for Surbana Jurong, a Singapore-based consultancy focusing on infrastructure and urban development.

Global Jet Capital named **Christopher Paul** senior managing director and general counsel. Paul, who has 20 years of experience practicing law, joins Global Jet Capital from CIT Aerospace, where he was general counsel.

London Biggin Hill Airport appointed **Gary Chapman** CFO. Formerly Chapman was finance director at Nippon Yusen Kaisha's (NYK's) Energy Transport business in London, and before that he spent six years as the group's European head of tax.

Jet Access Aviation has added a number of executives. **James Jones** joined the company as vice president of sales after spending 14 years working with luxury brands in the apparel business, among them Ralph Lauren. **Rebecca Boren** brings 16 years of sales experience, including a decade in private aviation sales and marketing, to her new role in owner and client services. The company also expanded its operational control center with the additions of **Diijon Lyn Shue**, **Shawn Wilkinson**, **Robert Levino** and **Paige Verville**. Shue has 10 years of aviation experience, beginning in line service and later as flight operations supervisor. Wilkinson has 20 years of both on-demand passenger and cargo charter experience. Levino brings 17 years of experience in private aviation and on-demand charter experience with a range of aircraft types and with international travel. Verville has 11 years of aviation experience, including a stint at Gulfstream Aerospace.

The *Aerospace Industries Association* appointed **David Silver** vice president of civil aviation. Silver previously spent 20 years with Boeing Commercial Airplanes, logging stints as director of engineering and regulatory affairs and as deputy fleet chief of the Boeing 787 program. He also served with the Washington Army National Guard for 22 years.

Jetcraft appointed **Danie Joubert** vice president, sales, based in Johannesburg. Joubert, who will represent Jetcraft in Africa, formerly was COO of Absolute Aviation Group and before that held roles at Adonai Aviation and ExecuJet Aviation Group.

Air BP appointed **Matt Elliott** chief commercial officer, based in Sunbury on Thames, UK. Since joining Air BP in 1994, Elliott has held roles in sales, marketing and operations and most recently was managing director of BP New Zealand.

Aircraft Propeller Service named **Stephen Aragon** vice president of operations.

The Giles Group added **Steve Boyd** and **Tony Janco** as senior associates. Boyd has experience in aircraft and systems design and engineering, as well as human factors, having worked with both the FAA and Boeing. Janco has a background in air carrier line maintenance and technical support and also has held inspector and advisor positions with the FAA.

Roy Gioconda was appointed director of maintenance for *Guardian Jet*. Previously he was a senior managing consultant for IBM Global Business Services' Digital Operations and has also served with Camp Systems International, American Airlines, Flight Options, Jet Logistics and FlightWorks.

Elliott Aviation hired **Mitch Boyles** as director of avionics at its maintenance, repair and overhaul facility in Moline, Ill. Boyles brings 40 years of aviation experience, half of it in business aviation, to his new role.

Dallas Aeronautical Services (DAS) named **Rick Armstrong** director of technical sales. Armstrong joins DAS with 30 years of aviation experience ranging from composite/sheet metal repair and manufacturing to component overhaul, including with Aerocell Structures and Aero Fabricators.

Brian Walker rejoined *Cutter Aviation* as regional sales manager for the Eastern U.S. Walker originally joined Cutter in 2007 as operations manager for the FBO in McKinney, Texas, and since then has held management roles at other Cutter facilities, as well as Signature Flight Support's Houston Hobby facility. The company also promoted **Christopher Gradisar** to manager of aircraft services in Addison, Texas. Gradisar, a former floor inspector for Raytheon Aircraft, joined Cutter in 2005 as chief inspector for the maintenance facility at Dallas Executive Airport and later became service supervisor.

Kasey Harwick was appointed director of maintenance for *Duncan Aviation*'s facility in Battle Creek, Mich. Harwick joined Duncan in 1999 as an interior shop assistant and was most recently airframe department manager at the facility in Lincoln, Neb.

Stevens Aviation appointed **Tony Raines** large-cabin sales representative. Raines has 32 years of aviation experience, beginning as a lead mechanic with the U.S. Air Force and later holding roles as director of maintenance and quality assurance at Flightworks and director of maintenance at Presidential Aviation.

Rebecca Groom Jacobs has joined Florida-based consulting firm *Groom Aviation* as communications director. Jacobs previously spent three years at Sullivan Higdon & Sink (SHS) in Wichita and before that worked in marketing at Piper.

Straight Flight added **Jennifer Stoffels** as technical sales representative in Englewood, Colo. Stoffels most recently served as a technical sales representative for Stevens Aviation.

Aspen Avionics expanded the role of director of flight operations **James Buck** to include regional sales manager, covering Arizona, New Mexico, Colorado and Utah.

West Star Aviation named **Jason Cohen** technical sales manager for Challengers/Globals.

Duncan Aviation named **Nick Hansen** safety specialist at the facility in Lincoln, Neb. Hansen, who spent nine years in the U.S. Marine Corps, joined Duncan in 2012 as a return to service inspector.

Allianz Global Corporate & Specialty appointed **Joshua Jeter** as an aviation underwriting specialist.

The *Helicopter Association International* hired **Matt Callan** as director of regulations and international affairs. Callan joins HAI from the U.S. Coast Guard, where he had the rank of captain and most recently was the designated lead for the Transportation Industry Study at the National Defense University, Eisenhower School, located at Fort Lesley McNair in Washington, D.C.

Kelly Gray joined *C&L Aerospace* as regional sales manager for corporate aircraft parts in the Western U.S.

CEFA Aviation has named **Claire Freudenberger** director of international communication. Freudenberger, who also joins the company's executive committee, has a 15-year business and communications background in the automotive and construction industries.

Professional Aircraft Accessories hired **Michael Fantaski** as a regional manager for the western region. ❑

Awards & Honors

Sheltair chairman, CEO and founder Gerald Holland was inducted into the Florida Aviation Business Association Entrepreneurial Excellence Hall of Fame on June 20. The hall of fame honors individuals who make significant contributions to Florida's business aviation industry.

Holland jumped into the business world in 1963, when he established a Fort Lauderdale-based real estate development and construction firm, Holland Builders. Over the next 25 years that firm grew and expanded into other areas, including the aviation industry, resulting in founding of Sheltair Aviation in 1988.

Sheltair began with the construction of two FBOs and has grown into a chain of 17 facilities along the U.S. East Coast, 11 of them in Florida. Sheltair also encompasses aviation property management and leasing, office and hangar construction, among other activities. In addition to being honored for the growth of Sheltair, Holland is recognized for the resulting investments in airport facilities, creating numerous opportunities for the general aviation community. ■


Robert Sumwalt


Matt Elliott

Rick Armstrong


Brian Walker


Rebecca Groom Jacobs

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Panelists: John Peterson, Senior Director,
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AIN Calendar

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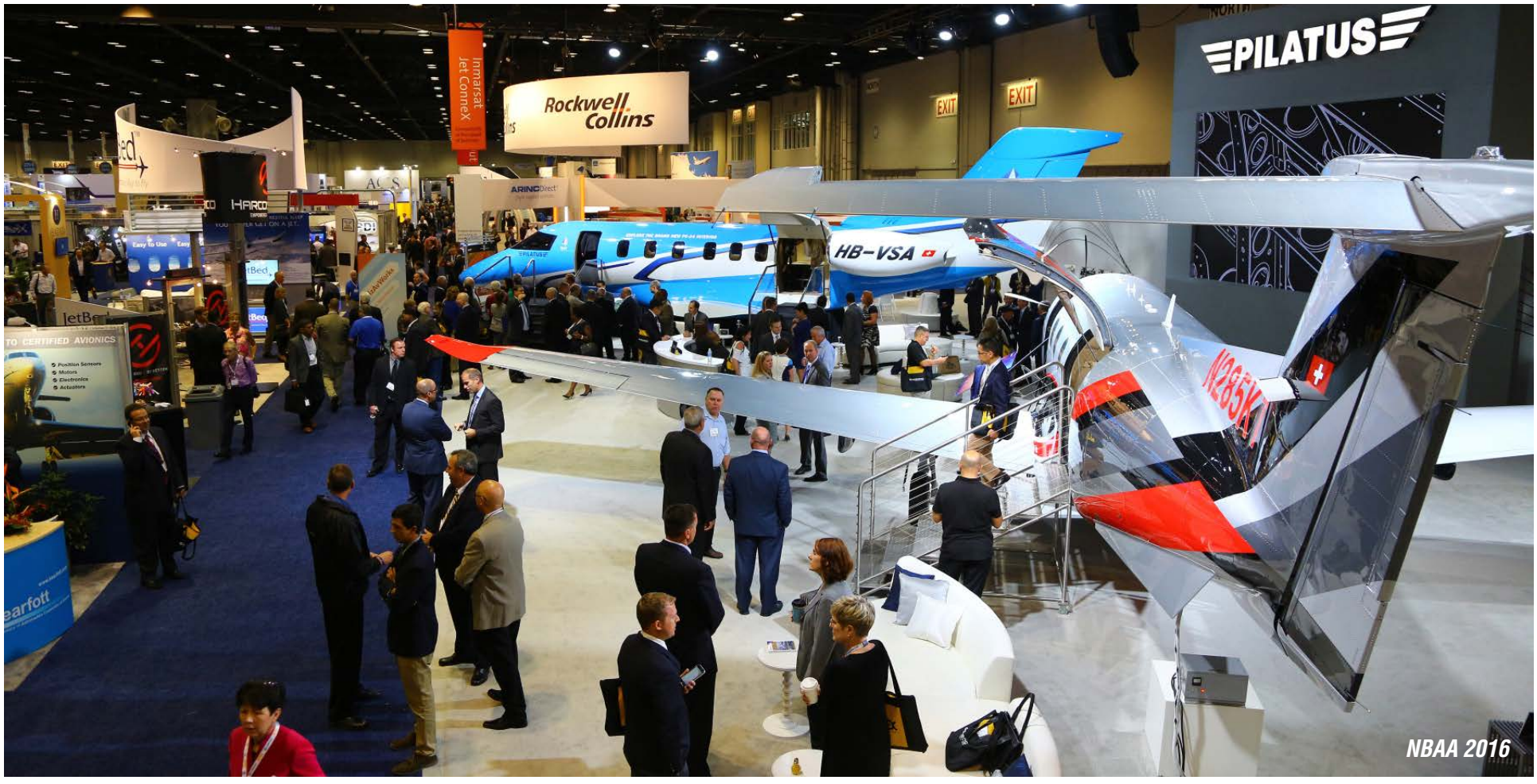

DAVID McINTOSH

NBAA 2016

SEPTEMBER

JETNET IQ GLOBAL BUSINESS AVIATION SUMMIT…September 5-6, The Westin New York, New York. Info: www.jetnetiq.com/summit.

EASA AIRCREW TRAINING CONFERENCE… September 6, EASA Headquarters, Cologne, Germany. Info: olga.rando@easa.europa.eu; www.easa.europa.eu/newsroom-and-events/events/aircrew-training-conference-advanced-approach-pilot-training.

NBAA REGIONAL FORUM…September 7, Morristown Airport, Morristown, NJ. Info: www.nbaa.org/events/forums/2017MMU/.

EBAA EUROPEAN CABIN SERVICE CONFERENCE…September 7-8, Hilton Brussels Grand Place, Brussels, Belgium. Info: bdorneanu@ebaa.org; https://ebaa.events.idloom.com/ECSC.

JETEXPO MOSCOW 2017…September 7-9, Vnukovo-3 Business Aviation Center, Moscow, Russia. Info: info@jetexpo.ru; http://2017.jetexpo.ru/en/.

AOPA FLY-IN…September 8-9, University of Oklahoma Westheimer Airport, Norman, OK. Info: www.aopa.org/community/events/aopa-fly-ins/2017-aopa-fly-ins.

NBAA MANAGEMENT FUNDAMENTALS FOR FLIGHT DEPARTMENTS WORKSHOP…September 11-12, NBAA Headquarters, Washington, D.C. Info: taustin@nbaa.org; www.nbaa.org/events/pdp/management-fundamentals-for-flight-departments-workshop/20170911/.

ENGINE LEASING SEMINAR…September 12, Holiday Inn Kensington Forum, London, England. Info: events@everestevents.co.uk; www.everestevents.co.uk/event/engine-leasing-seminar-2017/.

NATA ADVANCED LINE SERVICE WORKSHOP…September 12-13, Duncan Aviation, Lincoln, NE. Info: safety1st@nata.aero; http://nata.aero/2017-Advanced-Line-Service-Workshops/ALS-Workshop-Lincoln-NE.aspx.

AIRCRAFT ASSET MANAGEMENT SEMINAR… September 13, Holiday Inn Kensington Forum, London, England. Info: events@everestevents.co.uk; www.everestevents.co.uk/event/aircraft-asset-management-seminar-2017-2/.

MBAA 6TH ANNUAL SCHOLARSHIP GOLF TOURNAMENT…September 14, The International, Bolton, MA. Info: massbizav@gmail.com; www.massbizav.org/events/mbaa-6th-annual-scholarship-golf-tournament/.

AIR OPS EUROPE…September 20-21, Cannes Airport, France. Info: nvandeputte@ebaa.org; http://airopseurope.aero/air-ops-europe.

NTBAA SAFETY SHOW-DOWN…September 20-21, Addison Conference Centre, Addison, TX. Info: brande.waddle@glazers.com; www.ntbaaonline.com/SafetyShowDown.

GAMA GENERAL AVIATION AIR SAFETY INVESTIGATORS WORKSHOP… September 26-27, Union Station, Dallas, Texas. Info: info@gama.aero; https://gama.aero/.

SAE 2017 AEROTECH CONGRESS & EXHIBITION…September 26-28, Fort Worth Convention Center, Fort Worth, TX. Info: CustomerService@sae.org; www.sae.org/events/atc/.

WAI CONNECT DAYTON…September 29-30, Marriott at the University of Dayton, Dayton, OH. Info: mmartin@wai.org; www.wai.org/wai-connect-dayton.

OCTOBER

DRONE WORLD EXPO…October 3-4, San Jose Convention Center, San Jose, CA. Info: info@jdevents.com; www.droneworldexpo.com.

AOPA FLY-IN…October 6-7, Groton–New London Airport, Groton, CT. Info: www.aopa.org/community/events/aopa-fly-ins/2017-aopa-fly-ins/.

NBAA IS-BAO FLIGHT OPERATIONS MANUAL WORKSHOP…October 8-9, Las Vegas Convention Center, North Hall, Las Vegas, NV. Info: taustin@nbaa.org; www.nbaa.org/events/pdp/is-bao-flight-operations-manual-workshop/20171008/.

NBAA TAX, REGULATORY & RISK MANAGEMENT CONFERENCE…October 8-9, Las Vegas Convention Center, Las Vegas, NV. Info: sobrien@nbaa.org; www.nbaa.org/events/taxes/2017/.

▲●◆ **NBAA BUSINESS AVIATION CONVENTION & EXHIBITION**…October 10-12, Las Vegas Convention Center, Las Vegas, NV. Info: (202) 783-9000; www.nbaa.org.

GENERAL AVIATION STRUCTURES WORKSHOP…October 16-17, EASA Headquarters, Cologne, Germany. Info: Structures.Workshop@easa.europa.eu; www.easa.europa.eu/newsroom-and-events/events/general-aviation-structures-workshop.

ENGINE LEASING SEMINAR…October 17, Crowne Plaza, Fort Lauderdale, FL. Info: events@everestevents.co.uk; www.everestevents.co.uk/event/engine-leasing-seminar-2016/.

INTERNATIONAL AIR SAFETY SUMMIT… October 23-25, Clayton Hotel, Burlington Road, Dublin, Ireland. Info: events@flightsafety.org; https://flightsafety.org/event/iass2017/.

INTERNATIONAL AVIATION TRADE SHOW AND CONGRESS…Oct. 25-27, JW Marriott Cancun Resort & Spa, Cancun, Mexico. Info: www.expo-ciam.com.

AOPA FLY-IN…October 27-28, Peter O. Knight Airport, Tampa, FL. Info: www.aopa.org/community/events/aopa-fly-ins/2017-aopa-fly-ins.

BOMBARDIER SAFETY STANDDOWN… October 31-November 2, Hyatt Regency Hotel, Wichita, KS. Info: (316) 946-7876; www.safetystanddown.com/.

NOVEMBER

AVIATION FORUM HAMBURG…November 7-8, Hamburg Messe, Hall A3, Hamburg, Germany. Info: +49 (0) 511 473 147 90; www.aviationforumhamburg.com/.

▲●◆ **DUBAI AIRSHOW**… November 12-16, Airport Expo, Dubai, UAE. Info: +97 1 4286 7755; www.dubaiairshow.aero.

DAVID McINTOSH

DUBAI 2015

NATA ADVANCED LINE SERVICE REGIONAL WORKSHOP…November 14-15, Base Operation at Page Field, Fort Myers, FL. Info: safety1st@nata.aero; http://nata.aero/2017-Advanced-Line-Service-Workshops/ALS-Workshop-Ft-Myers-FL.aspx.

AIRCRAFT ECONOMIC LIFE SUMMIT… November 28, Gibson Hotel, Dublin, Ireland. Info: events@everestevents.co.uk; www.everestevents.co.uk/event/aircraft-economic-life-summit-2017/.

AFBAC CONFERENCE AND EXPO… November 29-December 1, ExecuJet South Africa, Johannesburg, South Africa. Info: info@afbaa.org; http://afbaa.org/conference_expo?destination=/events.

DECEMBER

AIRCRAFT ACQUISITION PLANNING SEMINAR…December 5-6, Scottsdale Plaza Resort, 7200 Scottsdale Rd., Scottsdale, AZ. Info: (800) 832-2025; www.conklindd.com.

JANUARY 2018

NBAA REGIONAL FORUM…January 24, Palm Beach International Airport (PBI), West Palm Beach, FL. Info: info@nbaa.org; www.nbaa.org/events/forums/2018pbi/.

FEBRUARY 2018

SCHEDULERS & DISPATCHERS CONFERENCE…February 6-9, Long Beach Convention Center, Long Beach, CA. Info: www.nbaa.org/events/sdc/2018/.

▲●◆ **SINGAPORE AIRSHOW**…February 6-11, Changi Exhibition Center, Singapore. Info: info@singaporeairshow.com; www.singaporeairshow.com/public/.

▲●◆ **HELI-EXPO**…February 26-March 1, Las Vegas Convention Center, Las Vegas, NV. Info: heliexpo@rotor.org; http://heliexpo.rotor.org/.

MARCH 2018

BUSINESS AIRCRAFT FINANCE, REGISTRATION & LEGAL CONFERENCE… March 18-20, Sanibel Harbour Marriott Resort & Spa, Fort Myers, FL. Info: sobrien@nbaa.org; www.nbaa.org/events/finance-registration-legal-conference/2018/.

WOMEN IN AVIATION CONFERENCE… March 22-24, Peppermill Reno, Reno, NV. Info: www.wai.org/conference.

NBAA INTERNATIONAL OPERATORS CONFERENCE…March 26-29, Las Vegas, NV. Info: info@nbaa.org; www.nbaa.org/events/ioc/2018/.

APRIL 2018

▲●◆ **ASIAN BUSINESS AVIATION CONFERENCE & EXHIBITION**…April 17-19, Shanghai Hawker Pacific Business Aviation Service Centre, Shanghai, China. Info: info@abace.aero; https://abace.aero/2018/.

MAY 2018

NBAA MAINTENANCE CONFERENCE…May 1-3, Albuquerque Convention Center, Albuquerque, NM. Info: info@nbaa.org; www.nbaa.org/events/maintenance-conference/2018/.

NBAA BUSINESS AVIATION TAXES SEMINAR… May 10-11, Dallas, Texas. Info: info@nbaa.org; www.nbaa.org/events/taxes-seminar/2018/.

▲●◆ **EUROPEAN BUSINESS AVIATION CONVENTION & EXHIBITION…** May 29-31, Palexpo Convention Center, Geneva, Switzerland. Info: info@ebace.aero; https://ebace.aero/2018/.

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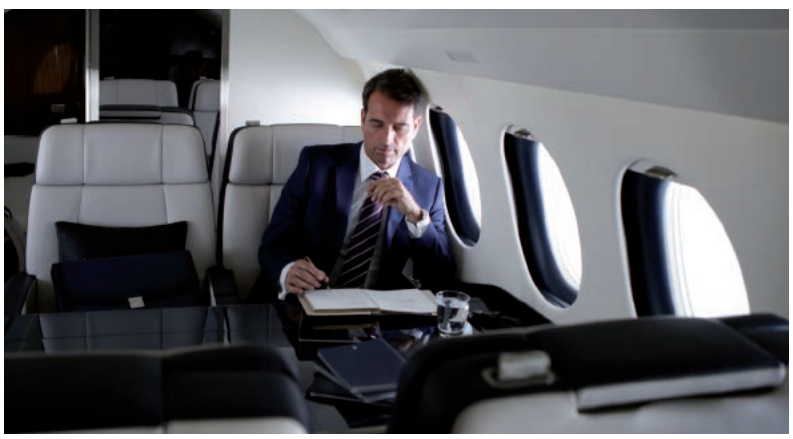

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