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Landmark's 68 FBOs are part of the deal for BBA to acquire the company from affiliates of the Carlyle Group.

Signature set to be FBO titan following Landmark deal

by Curt Epstein

BBA Aviation is betting big on a business aviation resurgence with the September 23 announcement of a $2.065 billion deal to buy Landmark Aviation from The Carlyle Group. This would make its Signature Flight Support subsidiary the world's largest FBO chain. Included in the deal are Landmark's 68 FBOs in North America and Europe and its MRO business, as well as its aircraft charter and management division, which would give BBA its first involvement in that segment.

The transaction, subject to approval by regulators and company shareholders, would dwarf Landmark's purchase last year of Ross Aviation and its 19 FBO locations for approximately $375 million. The acquisition would enable customers to benefit from an extension of Signature's service across a much larger network of locations, according to BBA CEO Simon Pryce, who added that "combining Signature and Landmark Aviation also would realize significant cost synergies as well as substantial tax benefits."

Signature operates 133 FBOs worldwide, and between the two companies there is currently redundancy at 12 locations, nine of them in the U.S., which would entail official scrutiny of the deal under the Hart-Scott-Rodino (HSR) Antitrust Improvements Act. At Washington Dulles International Airport, the two chains are the only service providers present. It's the same situation at Fresno Yosemite International Airport and Scottsdale Airport, where Landmark last year was required to divest an FBO

Continues on page 64 ▶

New compliance philosophy: FAA's next evolution in safety

by Kerry Lynch

As business aviation and airline ops reach ever higher levels of safety, the FAA and industry are looking at the agency's recently rolled out "compliance philosophy" as the next step forward in improving collaboration and further reducing the number of accidents.

The new policy, described last month by FAA Administrator Michael Huerta during a Flight Safety Foundation breakfast, shifts the agency's approach from enforcement after unintentional violations to providing training and other remediation to ensure compliance. The policy relies on use of data to enable inspectors to focus on areas that need the most attention.

The idea, Huerta said, is to foster an open exchange of data between the FAA and industry. "Mutual cooperation and mutual trust is very, very difficult to achieve," he said. "We don't want operators who might inadvertently make a mistake to hide it because they fear being punished. If there is a failing, whether human or mechanical, we need to know about it, to learn from it and make the changes necessary to prevent it from happening again." The philosophy is about finding and fixing the problem, and then making sure it stays fixed, he added.

Empowering Inspectors

The FAA released an order in June that implemented the policy, and the agency has spent considerable time working with its inspectors on the changed approach, Huerta said. He noted that this is "a significant cultural change for any agency. We are talking about this a lot with the inspectors." The inspectors are more empowered to exercise judgment on using a compliance approach, but Huerta also stressed that the inspectors are given a framework and they know that they have resources to fall back on when they need them.

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Tankering Benefits Tangible and Achievable

There are many ways to calculate whether to carry extra fuel that is cheaper or buy expensive fuel at the destination.
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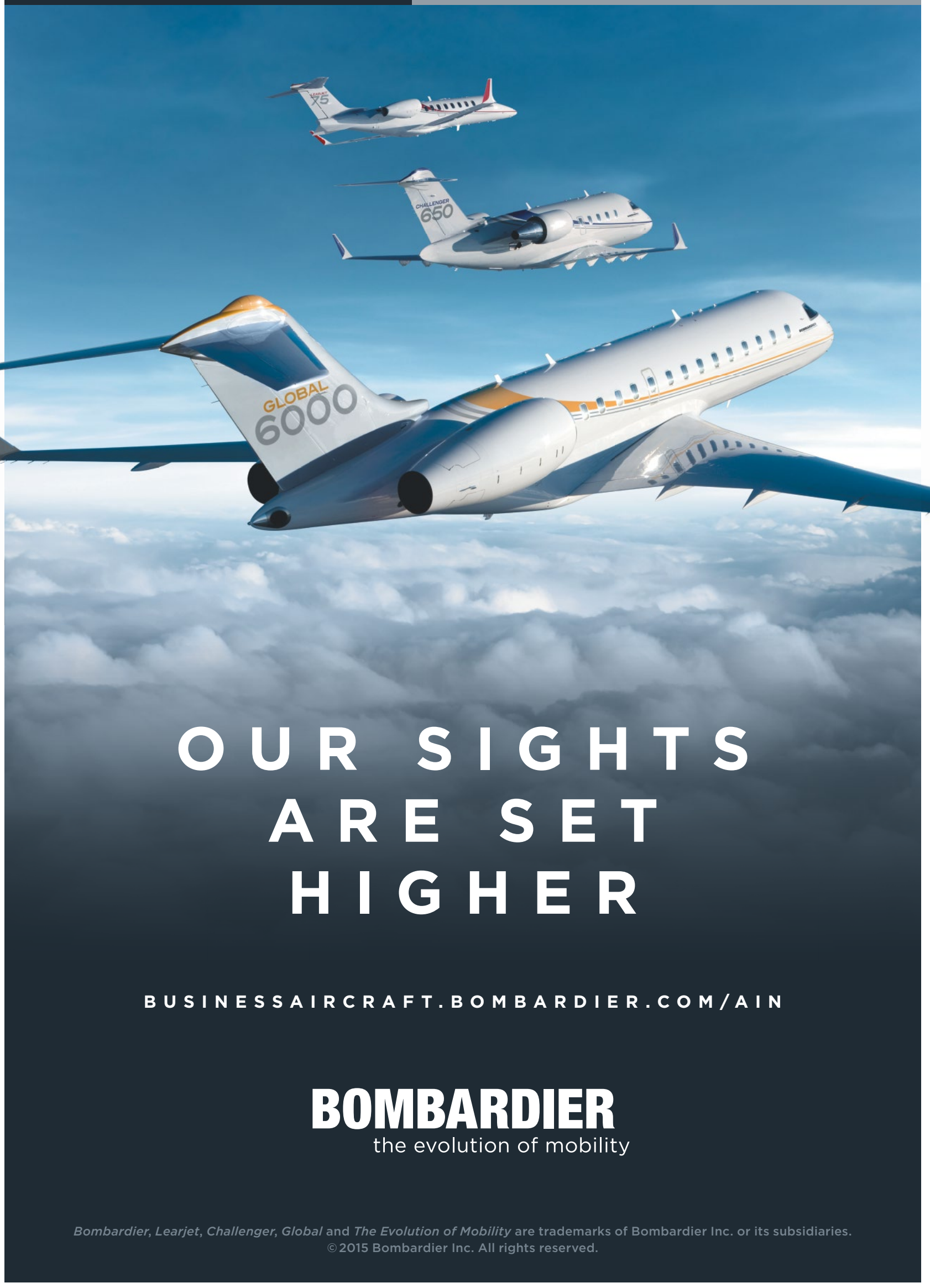
LEARJET CHALLENGER GLOBAL



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Inside this issue

SPECIAL REPORT

2015 New Business Jets

As the sun sets on 2015, we assess the status of projects under way to develop new and upgraded business jets. One thing is clear: jet buyers are expressing a preference for the size, comfort and long range that come with the ever expanding upper echelons of the segment. **Page 20**

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THE CONVENTION NEWS COMPANY, INC. – AIN PUBLICATIONS

Aviation International News (ISSN 0887-9877) is published monthly. Periodicals postage paid at Midland Park, N.J., and additional mailing offices. **Postmaster:** Send address changes to Aviation International News, P.O. Box 9058, Lowell, MA 01853-9053 USA. Allow at least eight weeks for processing. Include old address as well as new, and an address label from a recent issue if possible. Subscription inquiries: +1 (203) 798-2400.

As we go to press

FALCON 5X TIMING REMAINS UNCLEAR

During an October 21 meeting with AJPAE, the French association of aerospace journalists, Dassault Aviation CEO Eric Trappier said he is "still waiting for a new calendar from Snecma" regarding delays with the Falcon 5X's engines. When the 5X was rolled out in June, its first flight was pegged for September, but the new twinjet has yet to fly. Trappier declined to announce a new date for the maiden flight until Snecma provides a better timeline. The immediate problem with the Silvercrest involves slight deformation of the engine casing during high-temperature testing, which Snecma is working to address. "This problem has no consequence on the integrity of the engine or on our capacity to certify the Silvercrest," Snecma said in a written statement, adding that it still plans to earn certification for the engine in the middle of next year.

EMBRAER HANDS OVER 300TH PHENOM 300

Embraer Executive Jets handed over the 300th Phenom 300 last month to an undisclosed U.S. customer, just one year after achieving the same milestone for the smaller Phenom 100/100E. The commemorative Phenom 300 was assembled at and delivered from Embraer's facility in Melbourne, Fla.

G500 PROGRAM FLYING RIGHT ALONG

The flight-test campaign for Gulfstream's G500 program has surpassed 100 hours in the course of more than 45 missions, a milestone reached exactly one year since the large-cabin twinjet, as well as its larger and longer-range G600 sibling, were launched on Oct. 14, 2014. In the five months since its maiden flight, the first flight-test G500 (T1) has reached an altitude of 38,500 feet and a maximum airspeed of Mach 0.80. T1 is currently involved in flutter and envelope expansion testing. Meanwhile, the company is preparing T2 and T3 for flight with the start of ground and load testing on T2 and avionics testing on T3. A fourth flight-test G500, T4, will come on line next year and focus on human factors and supporting systems. FAA certification of the G500 is expected in 2017, followed one year later by approval of the G600.

U.S. DOT PLANS DRONE REGISTRY

Seeking to create "a culture of accountability and responsibility" among people who fly drones for recreation, the U.S. DOT announced plans to establish a national registry to track drone ownership. The federal government's push to register still-unspecified types of small unmanned aircraft responds to a surge of reported drone sightings near major airports and by the pilots of manned aircraft. The DOT has appointed a task force to develop the registration process, with instructions to deliver its recommendations by November 20. The agency wants rules in place by mid-December.

MAGELLAN LAUNCHES CORPORATE JET CARD

Business jet charter card provider Magellan Jets launched a Corporate Membership program. The new card for companies committing to a minimum of 100 flight hours promises greater flexibility and value with features such as guaranteed aircraft availability with six hours' notice and no peak-day restrictions, surcharges or black-out dates. Other benefits include newer aircraft; the freedom to push back departure times by up to two hours; $100 million liability insurance; catering; Wi-Fi in midsize or larger aircraft; 15-percent credit for roundtrip flights; and 5-percent credit on legs of more than four hours.

EMBRAER DOUBLES BIZJET SHIPMENTS

Brazilian airframer Embraer enjoyed a 50-percent gain in deliveries in the third quarter, thanks in part to the 30 business jets it shipped during the period, compared with 15 in the same time frame last year. Phenoms continued to lead the delivery tally at 21, up from 15 a year earlier. But the greatest gains came with its larger jets, with nine deliveries in the most recent quarter. The Legacy 650 accounted for most of these gains, with six delivered in the quarter. The airframer also handed over three Legacy 500s.

COMPLETIONS BEGIN ON FIRST FALCON 8Xs

Dassault Aviation has begun completion work on the first customer-bound Falcon 8X long-range trijet as the company progresses toward certification and deliveries next year. The aircraft, S/N 04, arrived in the Dassault Falcon Jet completion facility in Little Rock, Ark., last month. S/N 02 arrived there this summer for installation of an interior that will be used for the 8X cabin comfort and functionality test program. Dassault expects to secure both EASA and FAA certification in the middle of next year.

SENTENCE FINAL FOR LEGACY MIDAIR PILOTS

Brazil's Supreme Court upheld the conviction of U.S. pilots Joe Lepore and Jan Paul Paladino in the September 2006 midair over the Amazon that brought down a Gol Linhas Aéreas 737 with 154 people aboard. Under a legal cooperation treaty, the sentence of three years, one month and 10 days would be served in the U.S. It is likely that the sentence will be served under probation, not in jail.

Congress kicks the can: no resolution on ATC

by Kerry Lynch

In a burst of activity in late September, Capitol Hill passed legislation that averted a government shutdown and renewed the FAA's operating authority. But in the end, all the players really accomplished was to delay contentious debates on government funding and ATC reform by a few months.

Congress faced a September 30 deadline to renew FAA authorization and adopt a Fiscal Year 2016 budget for the government. But both long-term reauthorization and government appropriations bills had stalled over disputes. FAA reauthorization was hung up by disagreement about the future of the ATC system. For the fiscal 2016 government-wide appropriations, Planned Parenthood funding threatened to shut down the entire government.

House and Senate lawmakers instead agreed to a six-month extension of the FAA's authority while they hashed out the final details of a long-term comprehensive bill. As for appropriations, Congress simply extended government funding through December 11 but kept the amounts at fiscal 2015 levels.

The divide over long-term FAA reauthorization was evident as the House approved the Airport and Airway Extension Act of 2015 (H.R.3614) by voice vote.

Rep. Rick Larsen (D-Wash.), the ranking Democrat on the House aviation subcommittee, expressed "great disappointment" that lawmakers were not considering long-term legislation. "I had hoped we would avoid serial extensions this time around, but today we start down that path," he said in a statement on the House floor.

ATC Privatization Debate

Larsen maintained that the House leadership has reached bipartisan agreement on most of the major issues, but questioned the push by House Transportation and Infrastructure (T&I) Committee leaders to separate the ATC system into a nonprofit government corporation funded by user fees. "An entire bipartisan bill is being held up simply because stakeholders can't agree on the details of a complex, untested proposal to privatize air traffic control," Larsen said.

T&I chairman Bill Shuster (R-Pa.), a proponent of ATC privatization, had originally hoped to bring the bill to the House floor in July. But with opposition mounting to his ATC plan–a cornerstone of his reauthorization proposal–the chairman agreed to defer debate.

Complicating progress on the FAA reauthorization bill was lack of progress on renewal of highway reauthorization. Unable to reach agreement on this issue, the House and Senate passed a three-month extension in late July. The T&I Committee has jurisdiction over both issues, but has had to devote its attention to hashing out a compromise with the Senate on highway reauthorization. With much larger issues looming such as a budget agreement, lawmakers opted to wait until next year to debate FAA reauthorization.

Industry Groups Keep Pressure On

Although aviation groups were eager to see a long-term agreement in place, they welcomed the short-term compromise in the interim. "While a long-term reauthorization package is needed for the FAA, we know that the temporary bill completed this week will ensure that necessary safety functions, and additional services the agency provides the industry, will continue uninterrupted," said NBAA president and CEO Ed Bolen.

Although the ATC proposal has generated controversy, industry groups believe that the outline of the long-term reauthorization proposal released by the T&I committee includes numerous promising measures to correct a number of concerns, such as certification inefficiencies.

While industry groups followed reauthorization progress, they braced for a potential government shutdown in September as Congress appeared deadlocked over Planned Parenthood funding. Without a comprehensive appropriations bill, funding for most of the federal government, including the FAA and the NTSB, would have expired on October 1 (the reauthorization bill extended the FAA's authority but did not actually fund the agency).

NBAA had told members it is monitoring developments closely given the ramifications for the business aviation industry. When the government shut down in 2013, the FAA furloughed more than 15,000 employees and shuttered the aircraft registry in Oklahoma City, halting all business aircraft transactions, title searches and other necessary elements of aircraft financing and sales. NBAA warned that the 2013 closure could be repeated during a shutdown this time around.

But just hours before the current government funding was set to expire, the House and Senate approved a "clean" short-term extension of government funding. The extension was approved without the Planned Parenthood measure, but also without an agreement over the future of the measure, setting the stage for another funding showdown in December.

"This yearly, destabilizing practice is bad for the U.S. economy, bad for the reliability of important government programs–including our national defense–and wastes federal money by arbitrarily postponing actions that make better use of taxpayer dollars," said House Appropriations Committee chairman Hal Rogers (R-Ky.). "However, this legislation is absolutely necessary, as the alternative–a government shutdown–is reckless and irresponsible."

The House and Senate Appropriations Committees each have cleared all 12 separate agency appropriations bills, including fiscal 2016 Department of Transportation funding, but Rogers emphasized that Congress must reach a more comprehensive budget deal to move forward on full-year appropriations. "It is crucial that Congress fulfill its constitutional duty and enact actual, line-by-line Appropriations legislation for the next fiscal year. To do this, a larger budget agreement must be enacted," he said.

Lawmakers and the White House have since held a series of closed-door discussions on a potential two-year budget deal. "Although there are reports that congressional leaders have discussed with President Obama negotiating a two-year budget deal, it is possible that in early December we will once again find ourselves at a budget precipice," the National Air Transportation Association warned members. "We will continue to educate lawmakers about the ramifications of a shutdown to general aviation and urge them to reach a long-term solution." ❑

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NEWS BRIEFS Compiled by Chad Trautvetter

Argus: U.S. Bizav Flying Surges

September business aviation flight activity in North America climbed by 3 percent versus a year ago, according to data from aviation services group Argus International. This more than quadrupled the company's forecast for 0.7-percent growth, prompting its data researchers to dub it the "September surge." The Part 135 charter segment once again led this charge, climbing 7 percent from a year ago; Part 91 activity rose 1.4 percent, while fractional activity lapsed by 0.4 percent. All aircraft categories saw gains, with turboprops up 5.6 percent from a year ago. Large-cabin and light jets saw advances of 3.4 percent and 2.8 percent, respectively, while midsize jet activity eked out a 0.1-percent increase. Argus's TraqPak data logs serial-number-specific aircraft arrival and departure information on all IFR flights in the U.S. and Canada.

Dassault Service Center Under Way

Dassault Aviation broke ground on October 16 for a new heavy-maintenance, repair and overhaul facility in Mérignac, France. This will complement Dassault Falcon Service's three dedicated heavy MRO facilities in Paris Le Bourget; Little Rock, Ark.; and Wilmington, Del. The new 7,200-sq-m/77,500-sq-ft Dassault Falcon Service facility is slated to open in the middle of next year and will accommodate up to six large-cabin Falcons. The new DFS service center will be adjacent to the Falcon and Rafale assembly plants and include a paint hangar and cabin refurbishing.

FAA Levies Fine against UAS Operator

On October 6 the FAA announced the largest-to-date civil penalty–$1.9 million–against a UAS operator for posing a threat to airspace safety. The proposed fine against Chicago-based aerial photographer SkyPan International is punishment for an alleged 65 unauthorized flights the company conducted between March 21, 2012, and December 14 last year around New York and Chicago. The agency alleges the company violated airspace regulations and operated in a careless or reckless manner.

European Bizav Flying Continues Slide

Business aviation departures in Europe continued to trend downward in September, according to WingX Advance. It tracked 72,650 business aviation departures in Europe that month, falling 4 percent from September 2014. Year-to-date departures are 1.4 percent below the year-ago period. Flights from the UK were off by 800 flights, or about 8 percent, year-over-year, placing it among the weakest European markets for the month, WingX said. Other large declines were reported in Italy, Spain and Switzerland, while flight numbers remained depressed in Turkey and Russia. France and Germany were down only slightly in September but were still ahead year-to-date.

FAA Contingency Plans Fell Short after Chicago Fire

After a thorough review of the shutdown of the FAA's Chicago Center ATC facility on September 26 last year following a fire intentionally set by a contract worker, the U.S. DOT Inspector General said the FAA's contingency plans did not adequately address redundancy or resiliency. The DOT watchdog also said the plans were insufficient to restore operations quickly after the fire. This damage highlighted weaknesses in the FAA's ATC infrastructure, including limited response to system failures, according to the IG's report. The IG gave the FAA seven recommendations to improve redundancy and operational contingency plans and security protocols.

Fatality-free U.S. bizjet streak ends

by Gordon Gilbert

On August 16 one of the longest streaks without a fatal accident among U.S.-registered business jets came to an end. On that day, a Sabreliner and a Cessna 172 collided in midair near San Diego, killing all four people aboard the jet and the sole occupant of the Skyhawk. The civilian jet was operating under Part 91 but on a mission for the military at the time of the collision. Until this event, no N-numbered business jet had been involved in a fatal crash between January and mid-August.

However, both N-numbered business jets and turboprops incurred more overall accidents year-over-year. According to **AIN** research, 15 people were killed in four crashes in the first three quarters of last year, a higher toll than the four fatalities in the San Diego Sabreliner accident this year. Part 91 operations accounted for all the fatal accidents in both periods.

The NTSB recently concluded its investigation of one of the business jet fatal accidents last year: the crash of a GIV attempting to take off at Bedford, Mass., on May 31, 2014. The Safety Board determined the probable causes to be "the flight crewmembers' failure to perform the flight control check before takeoff, their attempt to take off with the gust-lock system engaged, and their delayed execution of a rejected takeoff after they became aware that the controls were locked."

Contributing to the accident were "Gulfstream's failure to ensure that the GIV gust lock/throttle lever interlock system would prevent an attempted takeoff with the gust lock engaged, the FAA's failure to detect this inadequacy during the GIV's certification and the flight crew's habitual noncompliance with checklists." In addition, the investigation revealed that a flight control check had not been completed on 98 percent of the previous 175 flights in the airplane.

Another completed investigation involved a deliberate descent below DH that led to an accident that killed all nine aboard. The crash of a Learjet 35A on a second ILS approach in IMC to Runway 6 at Freeport International Airport, Bahamas, on Nov. 9, 2014, was caused by "the poor decision making of the crew in initiating and continuing a descent in IMC below the authorized altitude without visual contact with the runway environment," according to the final report from the Bahamas Air Accident Investigation & Prevention Unit (AAIPU).

The AAIPU report lists contributing factors as bad weather, improper planning for the approach, insufficient situational awareness, inadequate CRM and the crew's deliberate disabling of the Taws. According to the CVR transcript, one of the crewmembers said, "Aw shut up," after which the Taws alerts of "too low, terrain, pull up" ceased.

Continues on page 54 ▶

U.S.-registered Business Jet and Turboprop Accidents/Incidents Worldwide

(First Nine Months 2015 vs. First Nine Months 2014)

Business jets	Total		Part 91		Part 91K		Part 135		Public/Gov't		Mfr.	
	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014
Nonfatal accidents	15	5	12	4	1	0	1	1	1	0	0	0
Fatal accidents	1	4	1	4	0	0	0	0	0	0	0	0
Total accidents	**16**	**9**	**13**	**8**	**1**	**0**	**1**	**1**	**1**	**0**	**0**	**0**
Fatalities	4	15	4	15	0	0	0	0	0	0	0	0
Incidents	31	34	28	26	1	4	1	4	0	0	1	0

Business turboprops	Total		Part 91		Part 91K		Part 135		Public/Gov't		Mfr.	
	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014
Nonfatal accidents	23	12	19	10	0	0	4	2	0	0	0	0
Fatal accidents	8	8	7	8	0	0	1	0	0	0	0	0
Total accidents	**31**	**30**	**26**	**18**	**0**	**0**	**5**	**2**	**0**	**0**	**0**	**0**
Fatalities	25	20	16	20	0	0	9	0	0	0	0	0
Incidents	25	15	21	13	0	0	4	2	0	0	0	0

All data preliminary. Sources: FAA, NTSB, Aviation Safety Network, **AIN** *research*

Involving Non-U.S.-registered Business Jets/Turboprops

Business jets	Total		Private		Charter		Other*		Unknown	
	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014
Nonfatal accidents	8	4	4	2	2	1	1	1	1	0
Fatal accidents	2	4	1	0	0	1	1	2	0	1
Total accidents	**10**	**8**	**5**	**2**	**2**	**2**	**2**	**3**	**1**	**1**
Fatalities	11	19	4	0	0	5	7	6	0	8
Incidents	7	3	4	0	1	2	2	0	0	1

Business turboprops	Total		Private		Charter		Other*		Unknown	
	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014
Nonfatal accidents	11	7	5	1	2	4	3	2	1	0
Fatal accidents	8	7	4	3	1	2	3	1	0	1
Total accidents	**19**	**14**	**9**	**4**	**3**	**6**	**6**	**3**	**1**	**1**
Fatalities	28	28	13	14	1	7	14	5	0	2
Incidents	8	4	5	1	2	0	0	2	1	1

**For example: air ambulance, aerial survey, ferry, training, testing, government (non-military) and head of state.*

AIN *tables show "incidents" as well as "accidents" to distinguish mishaps based on their degree of severity. Investigators often draw fine distinctions between the two events, but, typically, incidents result in minor or no damage and their investigations are sometimes delegated to local officials.*

Accidents are events that range from minor damage to destruction and/or injuries. Also, some incidents ultimately get upgraded to accident status during the investigative process. ■

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NEWS BRIEFS Compiled by Chad Trautvetter

GE Capital's Bizjet Portfolio Sold

Business jet financing firm Global Jet Capital announced an agreement to purchase the aircraft lease and loan portfolio of GE Capital Corporate Aircraft in the Americas, representing approximately $2.5 billion of net assets. Terms of the deal, which is expected to close by year-end, were not disclosed. As part of this transaction, the GE Capital Corporate Aircraft team will join the Global Jet Capital organization. Global Jet Capital was launched last year.

BJT Survey: 40% of Bizjet Pax Plan To Fly More Next Year

Nearly 52 percent of current business jet users plan to fly the same amount over the next 12 months, while 40 percent say they will fly a bit more (32 percent) or a lot more (7.9 percent), according to the Fifth Annual Readers' Choice Survey from **AIN** sister publication Business Jet Traveler. About half said they flew the same amount over the past year as during the year before, while 21.7 percent flew a bit more and 15 percent a bit less. Survey respondents rated "saving time" as the number-one reason that they fly on business aircraft, followed by the ability to fly into airports not served by airlines and work and/or hold meetings in flight. Nearly 62 percent of their flights are mostly or almost always for business, while 28.1 percent were an even mix of personal and business flying.

Pentastar Unveils Interior Design Studio

Pentastar Aviation opened a new aircraft interior design studio at its Oakland County (Mich.) International Airport headquarters to support the company's aircraft completions business. "With the opening of this studio, our clients can meet our experts and touch and feel the high-quality materials we use to bring aircraft cabin visions to life," said Pentastar chairman and owner Edsel Ford II. The shop will allow the company to redesign entire aircraft interiors "to make them more efficient and more attractive."

Gov'ts Must Support Emissions Goals

Twenty-seven company executives and trade association officials are calling on international governments to work with industry to help reach established goals for reducing aircraft emissions. In an open letter to "governments," aerospace executives and leaders of organizations, including GAMA and IBAC, outlined their goals to achieve carbon-neutral growth in aviation by 2020 and to cut the net CO_2 emissions in half by 2050. But the leaders said they need government to support these goals through air traffic management investment, new technology research, a policy framework that would accelerate alternative fuel availability and a "smart regulatory environment" that encourages aviation development. As for market-based measures, the letter states support for "a single global carbon offsetting scheme."

Flexjet/Flight Options Union Vote Cleared

The National Mediation Board (NMB) issued a ruling recognizing Flight Options and Flexjet as a single carrier, setting up a vote on whether the combined pilot groups will be unionized. The International Local Brotherhood of Teamsters (IBT), which represents approximately 380 Flight Options pilots, sought a ruling that the companies operate as a single transportation system for representation purposes under the Railway Labor Act. The IBT has been seeking to organize the current 310 Flexjet pilots as one group with Flight Options pilots. The former also lauded the ruling, saying it brings the two companies one step closer to fully merging the operations under parent Directional Aviation. A vote on union representation is expected by year-end.

U.S. election season is here: no end in sight for TFRs

by Kerry Lynch

Three years ago, NBAA faced one of the most difficult security scenarios to affect its convention. President Barack Obama, hoping to make a last-minute appeal to Floridian voters before the November election, had planned to fly into Orlando on the eve of the late-October NBAA Convention. The event threatened to curtail access to Orlando Executive Airport–site of the static display for the convention–in the two days leading up to the big event.

NBAA worked closely with the FAA and security chiefs to minimize the impact, and shortly before the event, the temporary flight restriction (TFR) was curbed to about a 24-hour period. Several hours into the TFR, it was cancelled. Hurricane Sandy and other pressing needs in Washington forced President Obama to cancel the scheduled trip to Orlando.

The TFR served as a sharp reminder of the uphill battle business aviation continues to face with the so-called "pop-up" or "VIP" TFRs. "That was one for the record books," recalled NBAA COO Steve Brown. But he added that TFRs remain problematic for the industry. "We know that there's plenty to work on [with TFRs]."

The ultimate goal is to ensure access to airports and/or fly-through TFRs, he said. The business aviation community has offered numerous proposals, incorporating various security programs and/or protocols, to gain access. But, Brown said, "We've had only limited success."

As the 2016 presidential election season gets into full swing, expect TFRs to pop up around the candidates and the dignitaries stumping on their behalf.

Incremental Improvements

That's not to say there hasn't been some improvement, he added. "It's gotten a lot better over time." The improvements have been incremental, such as shorter duration, narrower in scope and sometimes less encompassing.

The FAA, which issues TFRs in concert with requests from security agencies such as the Secret Service and/or Transportation Security Administration, said it "continues to work with its government, industry and general aviation partners to provide maximum access to America's airspace while also enabling critical homeland security, national defense and law enforcement operations."

The agency cites collaboration on concepts such as gateway screening procedures and earlier notification as among the efforts it uses to minimize TFRs. "Striking the right balance between airspace access and airspace security remains one of our top priorities," the FAA said. But while the FAA issues the TFR, it might not be free to limit the restriction or provide relief. The business aviation community, even operators vetted through programs such as Twelve-Five or the DCA Access Security Program, still do not have the same access as commercial carriers. "We are not there yet," Brown said.

While the FAA regulates airspace access, most of the TFR conversations involve law enforcement, which is more focused on security than guaranteeing access. Turnover at those agencies requires a constant education effort, Brown noted. While the dialog doesn't change, "it lengthens" every time a new person steps into a key law enforcement position.

The community still grapples with expansive TFRs such as the one put in place for the recent papal visit, involving a 30-mile restricted access radius and gateway requirements and/or prohibitions of general aviation flights at certain airports in New York, Philadelphia and the Washington, D.C. areas during specified periods.

The FAA had provided nearly a month's notice that it was planning an expansive TFR in Philadelphia. That much advance notice is not always available, particularly for presidential TFRs. Brown explained that there is a balance between providing time for coordination and awareness but still providing protection. "Too much advance notice works against protecting the individual who needs protection," he pointed out.

The FAA, which posts TFRs, requires pilots to be "well aware of Notams along their route of flight, including those for short-notice TFRs." It works to disseminate as much information as possible and looks to organizations such as NBAA or the Aircraft Owners and Pilots Association to help with early warnings. NBAA also tries to get involved early in the coordination. It has a nearly front-row seat with its GA Help Desk representative stationed at the FAA Command Center. This facilitates dialog with FAA officials.

Early warnings might become more difficult as the next presidential election season kicks off. In 2012 the number of VIP TFRs, typically involving the President, jumped significantly, reaching 496. That was nearly 60 percent more than the 305 VIP TFRs established last year.

The number of TFRs over the next year might not match the 2012 tally because an incumbent is not running. TFRs, however, might become more unpredictable as they are based on risk assessments, and the risk could vary greatly, depending on the candidate, events surrounding the candidates and whether the President or other notable officials play a role.

As Pope Francis arrived on the East Coast, Chinese president Xi Jinping was kicking off a week-long U.S. visit on the West Coast, but his visit did not require such extensive security precautions. The popularity and outpouring of attention on this papal visit drew heightened security consciousness rivaling that reserved for President Obama.

Brown, however, expects that TFRs will pick up as the election draws near next year, especially once the major parties select their nominees. In the interim, the association plans to continue working with agencies such as the TSA, FAA and others to help keep the TFRs reasonable.

As for the FAA, the advice has not changed: "Pilots should always monitor TFRs and all other Notams before they fly. They need to be particularly aware of events in the areas in which they are flying." ❑

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NEWS BRIEFS Compiled by Chad Trautvetter

Tamarack Nears OK for Active Winglets

Tamarack Aerospace Group's active winglet system is nearing European approval for use on straight-wing Cessna CJs, with FAA certification expected to follow. "We are currently on track to certify our active winglets [in Europe] on all CJ 525s by the end of the year," Tamarack COO Brian Cox told **AIN**. FAA STC approval is expected early in the second quarter of next year, he added. The Tamarack winglet uses an active-technology load alleviation system (dubbed Atlas) to move a small control surface mounted near each winglet, which counters the aerodynamic stresses from wing loading and unloading.

Milestone Aviation Extends Reach

Helicopter lessor Milestone Aviation has reorganized its management while rapidly expanding into new markets. As a result, it has hired eight new executives and opened offices in Dallas, Dubai, Hong Kong, São Paulo and Singapore. The new offices complement its existing office in Columbus, Ohio, and headquarters in Dublin, Ireland. Milestone has structured its commercial organization into two segments–Europe and the Americas and emerging markets. Walter Horsting becomes senior v-p of commercial for Europe and the Americas. Jonty Nel is the v-p of commercial for emerging markets. Newly named vice presidents of commercial in the Europe and the Americas organization are Sebastien Moulin, continental Europe; John Parnell, northern Europe and Canada; François Arnaud, Latin America and Caribbean; and Scott Fitzgerald, U.S. Joining the emerging markets organization as vice presidents of commercial are Stephanie Tovoli, northern Asia and Russia; Brett Rankin, southern Asia-Pacific and central Asia; and Michael York, Turkey, India, Middle East and Africa.

Textron Rolls Out 2,500th Caravan

Textron Aviation rolled out the 2,500th Caravan utility turboprop single at its Wichita headquarters in late September. Alaskan charter operator Bering Air was on hand for the celebration, and this milestone Grand Caravan EX is the seventh of a firm order for nine for the operator. The Nome, Alaska-headquartered operator is the sole means of transportation for some 9,000 people who live in 32 villages in a roadless area the size of New England.

Falcon 2000 Joins Corporate Eagle Fleet

Corporate Eagle expanded its fractional fleet offerings, taking delivery of the first of four pre-owned Falcon 2000s. The aircraft marks the third type in Corporate Eagle's fleet, joining the Hawker 800XP and King Air B200. The Waterford, Mich.-based membership, fractional and managed aircraft operator invested close to $1 million in upgrades to the Falcons and said all four will be identical. The Falcon 2000s join four Falcon 2000s already in Corporate Eagle's managed fleet. The service has increased its membership to 40 from 20 in 2010, it said.

APS Joins USAIG's Performance Vector

USAIG added Aviation Performance Solutions (APS) as a member of the Performance Vector safety initiative, which delivers safety support to policyholders who insure turbine-powered aircraft or place multiple policies with USAIG. Eligible policyholders can choose from a range of safety-enhancing programs and services, such as APS's upset prevention and recovery training, a program that can help develop pilots' ability to recognize, prevent and recover from virtually any recoverable airplane upset, unusual attitude or escalating stall/spin condition. Under Performance Vector, USAIG will cover the tuition for one covered pilot to attend the course at APS's Phoenix or Dallas locations.

Pilot's Bill of Rights 2 gathering momentum

by Kerry Lynch

General aviation advocates are encouraged that Sen. James Inhofe (R-Okla.) has secured a filibuster-proof 67 co-sponsors for the Pilot's Bill of Rights 2 (PBOR 2) bill, S.571, clearing the way to proceed on the measure. Inhofe, who told an audience at the Experimental Aircraft Association's AirVenture in July that his goal was to reach 60 co-sponsors on the bill, appealed to his colleagues in the Senate in late September to back consideration of the legislation "in the next very short period of time."

EAA and AOPA have called on their members in recent months to appeal to lawmakers to support the bill. As a result, the bill has reached a "supermajority" co-sponsorship, and the House version had garnered 145 co-sponsors by mid-October. Senators Joe Donnelly (D-Ind.), John McCain (R-Ariz.) and Michael Bennet (D-Colo.) were the three co-sponsors who pushed the bill over the 60 mark.

"The Pilot's Bill of Rights 2 was authored by and for the general aviation community, and it is their persistence with their elected officials that has resulted in more than a majority of the Senate supporting this legislation," Inhofe said. "This second edition will continue to improve and streamline the antiquated regulatory system faced by GA pilots and industry alike."

Third-class Medical a Top Concern

Building on the original PBOR enacted into law in 2012, PBOR 2 would expand the third-class medical exemption to recreational pilots. In addition, the bill would strengthen certificate-holder protections during investigations or enforcement procedures; expedite updates to the Notice to Airmen (Notam) Improvement Program that the original PBOR bill mandated; and provide further Good Samaritan protections, among other measures.

While the third-class medical exemption remains controversial, the certificate-holder protections have attracted support for the bill from a range of pilot groups, including the NetJets Association of Shared Aircraft Pilots (NJASAP). Pedro Leroux, president of NJASAP, wrote in support of the bill earlier this year, saying Inhofe's work is "highlighted by efforts to extend the due-process rights of all certificate holders facing FAA investigation or enforcement action as well as enhancing the Notice to Airmen Improvement Program." The Allied Pilots Association and Southwest Airlines Pilots' Association have offered support too.

Senate backers Joe Manchin (D- W.Va.) and John Boozman (R-Ark.) introduced PBOR 2 as an amendment to the Senate version of highway reauthorization legislation, but that effort faltered when the Senate failed to reach agreement with the House on the bill. It is still unclear whether PBOR 2 will be attached to another must-pass vehicle or stand alone. One other possibility is that the third-class medical provision moves forward separately, either as an amendment or stand-alone bill.

"There's still a lot of work left to do before third-class medical reform becomes a reality, but we are closer than we've ever been before to getting this done," said Jim Coon, AOPA senior vice president of government affairs. "We'll keep working to build momentum for PBOR 2 and we'll continue to look for opportunities to have medical reform language included in other types of legislation that are moving through Congress." ❑

Aerion is developing the Mach 1.5+ AS2 in partnership with Airbus.

'Supersonic age' coming, predicts would-be builder

by Chad Trautvetter

Aerion chairman Brian Barents said at the Wichita Aero Club in late September that we are on the verge of a "new supersonic age" in air travel. In partnership with Airbus, Aerion is developing the Mach 1.5+ AS2 supersonic business jet (SSBJ), for which it expects to receive certification in 2023. Final assembly is likely to be conducted in the U.S., he revealed.

While the now-retired Concorde was "truly an awesome technical accomplishment, it was a financial failure that set back development of subsequent supersonic designs. No one could see an economically viable path forward for supersonic transports," Barents noted. "Until Aerion, that is."

With Concorde as a "cautionary tale," he pointed out that a new generation of supersonic jets must be both "practical and efficient," which Barents believes is possible with the AS2's laminar wing technology. Because of its laminar wing, the AS2 can efficiently cruise at Mach 0.95 and Mach 1.4, allowing the aircraft to fly about 5,000 nm subsonic over land (as current regulations mandate) or supersonic over water.

The company's market studies suggest a demand for 600 SSBJs over 20 years, even at the three-engine AS2's $120 million price tag and with a restriction that the aircraft be operated subsonic over land, he noted. "For the first 10 to 15 years, the supersonic market will consist of entrepreneurs, ultra-high-net-worth individuals and, over time, more corporate customers, as well as perhaps governments," Barents said. "These will be the pioneers of the new supersonic age."

Noise Standards Key

Addressing the AS2's powerplant, he said that Aerion is seeking an engine that meets Stage 4 noise and emissions standards and provides for growth.

"We have had some fruitful discussions with the major engine suppliers," Barents noted, "about which we hope to have more to say soon."

Continues on page 54 ▶

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NEWS BRIEFS Compiled by Chad Trautvetter

Gestures Control Dimmable Windows

Business aircraft window equipment specialist Vision Systems is further developing dimmable windows into more self-contained products. Its new Nuance Touchless window is controlled via gesture, no longer needing any contact between a user's finger and a physical control, CEO Carl Putman told **AIN**. Passengers can set the windows from the clear to the dark position, one after the other and from the top down like a Venetian blind, just by making their hand approach the window and then moving it upward or downward, as well as sideways to set the desired level of opacity.

Capital Infusion Boosts Wheels Up

A group of financial institutions led by T. Rowe Price announced a $115 million capital injection for private flight membership program Wheels Up on September 28. Wheels Up founder and CEO Kenny Dichter said the fresh funds will support further expansion of the company's U.S. operations, as well as its plan to begin operations in Europe and the development of new services, such as its Wheels App member-to-member flight sharing feature. As of late September, Wheels Up had 1,600 members served by 45 Beechcraft King Air 350is and 10 Cessna Citation Excel/XLSs.

Learjet Operator, Crew Cited in Midair

The midair between a Learjet 35 and a German air force Eurofighter on June 23 last year is attributed to the business jet's operator and crew, as well as to the air force, in the recently released final report from the German Federal Bureau of Accident Investigation (BFU). The Learjet was being flown by a civil operator participating in a so-called "Renegade" mission, where the "unknown" civil aircraft had to be intercepted, identified and accompanied by a pair of Eurofighters to a military airport. The BFU said that just before the collision, the Learjet conducted a left-hand turn with an "excessive bank angle despite the loss of visual contact with the Eurofighter flying at the inside of the turn." After the collision, the Learjet crashed, killing the two pilots. The pilot of the Eurofighter managed to land his severely damaged airplane.

NASA Tests New Traffic Planning App

NASA completed a few tests of its new Traffic Aware Planner (TAP) application aboard a Piaggio Avanti, clearing the software for a more formal three-year test program in partnership with Virgin America and Alaska Airlines. TAP connects to the aircraft's avionics to make "traffic-aware strategic aircraft requests." The application reads aircraft position, altitude, flight route and other real-time information to define the airplane's situation and flight plan. "Then it automatically looks for a variety of route and/or altitude changes that could save fuel or flight time and displays those solutions directly to the flight crew." The app also connects with the airplane's ADS-B receiver to scan signals of nearby air traffic for potential conflicts.

ACSF's ASAP Covers Contiguous U.S.

The FAA's Central and Northwest Mountain Regions signed a memorandum of understanding allowing charter operators, corporate flight departments and fractional program managers to participate in the Air Charter Safety Foundation's Aviation Safety Action Program (ASAP). The ACSF-managed ASAP program is now approved in the contiguous U.S. ASAP, an FAA/industry partnership, provides a near consequence-free environment in which participants can identify and report safety issues that could be critical in identifying potential precursors to accidents. The collective data can be reviewed for specific safety trends that offer companies a chance to implement corrective actions before an accident happens.

Hangar space for large business aircraft such as the G650 is dwindling, particularly in popular markets.

JERRY WYSZATYCKI

Hangar shortage looms for large business aircraft

by Curt Epstein

The increasing size of high-end business jets and the shortage of hangar space in the New York metropolitan area to accommodate them revealed itself as a growing concern at a recent Aviation Professionals Sharing Information (APSI) meeting held in a hangar at Jet Aviation's Teterboro Airport facility. Against the backdrop of a Bombardier Global, APSI president Victoria Reina-Duffy, vice president of sales for Priester Aviation, noted that popular business aviation airports in the area such as Teterboro (TEB) and Westchester County (HPN) are currently at 150 percent of capacity, with many hangars in the region unable to accommodate the newest ultra-long-range corporate jets.

"I understand in other parts of the country it's not as big an issue, but these big airplanes are coming to our part of the country," Bill Beversluis, Jet Aviation's vice president of aircraft management, told the gathering.

"As soon as Gulfstream announced it was going to build the G650, I started getting up on my soapbox, asking where the industry would store such aircraft," said Beversluis. "The [Bombardier] Global 7000 is going to be 111 feet long; where we are going to put that thing I have no idea, and when you spend $75- to $80 million for an airplane, having it sit outside does not particularly sit well with people."

As international trade becomes more and more global, the large-cabin jet segment has propped up the business jet industry for the past several years. "We have owners who have Citation Xs or the small Challengers; these are the ones who are coming to us saying 'I'm going to replace that and I need a big Global,'" said Todd Anderson, senior vice president of real estate and development for Sheltair, which operates several FBOs in the region. "No problem, we have plenty of room for it? That's not the answer."

Adding to the crunch on hangar space is the popularity of winglets on most modern business jets, effectively eliminating wing-over-wing storage. "Where you used to be able to stack a hangar with airplanes closer than you would normally like, that doesn't happen any more," Beversluis noted.

While more distant airports stand to benefit from owners willing to reposition their aircraft when needed, such concessions come with drawbacks as well. If a crew has to arrive at a distant airport and position the aircraft to Metro New York locations, that time eats into a crew's duty day. "When you are taking delivery of these aircraft you want them to be able to be used to their full capacity," said Reina-Duffy. "It's not going to do anybody any good if you are going to cut the range of the aircraft by two hours," with the disruption of the duty day.

Long-term Repercussions

For many business jet users that's not a palatable option, and one seemingly at odds with the freedom, utility and ease of access that business aviation provides. "You worry about flight departments going away," said Westchester County Airport manager Peter Scherrer. "That's the biggest concern. If they can't get space, after a while they say, 'Why should I have a flight department? It's too much work, too expensive, maybe I'll go to a fractional operator or I'll charter an airplane.' A flight department is supposed to be easy. You see a lot of them closing because it gets too complicated."

Beversluis also believes the shortage of hangar space could eventually have a deleterious effect on the industry. "What is happening could eventually put us in jeopardy not only to sell airplanes but also to fly them and manage them." He imagines that the mere fact an aircraft is based at TEB or HPN could boost its attractiveness to buyers who could possibly assume its hangar lease.

Some companies, among them Sheltair, which co-sponsored the APSI gathering along with Jet Aviation, have space to improve their local facilities. The Florida-based company manages more than 3.5 million sq ft of aviation properties in New York, Florida and Georgia.

"Building a hangar is not something that just takes six to eight months; it takes a lot of planning, a lot of time and a lot of financial resources," said Anderson. "We've gotten to the point now where we can't build them fast enough." His company recently broke ground on a 41-acre project at Long Island's Republic Airport, which will eventually yield more than 300,000 sq ft of hangar space. The environmental permitting process alone for the expansion spanned six years.

Sheltair is also ready to begin development on a 25-acre parcel at Long Island MacArthur Airport in Islip, and plans to build another 55,000 sq ft of hangars at Francis S. Gabreski Airport on the eastern end of Long Island. "Bigger airplanes need bigger facilities," noted Anderson. "The cost to build these facilities in 2015 is much more than it was 20 to 25 years ago; sometimes there's sticker shock for people who own these big airplanes over what rent you really need to make this hangar work financially."

Westchester County Airport is undergoing a rework of its master plan, one that eventually will earmark more land for hangar development, Scherrer told **AIN**, adding that the list of proposed plans has been winnowed to a handful with input from airport users. After the airport officials determine the best course of action, politicians will get involved before an environmental impact study is launched.

Once a plan is agreed, the new parcels will be put through the request-for-proposal process for development, all of which adds up to a number of years before any additional hangar space will be available at the airport. "Going through the whole process takes time, and you find that with every single airport. It doesn't just happen tomorrow," said Scherrer. ❑

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Former Bell Helicopter CEO John Garrison

Garrison leaving Bell, Snyder takes CEO post

Bell Helicopter CEO John Garrison resigned October 15 after six years at the helm of the Fort Worth, Texas-based Textron subsidiary. Garrison is leaving to take the reins at Terex, a $7.3 billion manufacturer of heavy equipment based in Westport, Conn., effective November 2.

He is being replaced at Bell by Mitch Snyder, a senior executive with deep company experience who recently served as Bell's executive vice president for military business. Before joining Bell, Snyder worked in a variety of senior leadership positions at Lockheed Martin in engineering, business and manufacturing.

Garrison led Bell through a rejuvenation of its culture and a period of dynamic and dramatic transformation that included fixing the troubled 429 light twin and getting it to market; revising and updating legacy models such as the 407 and the 412; and launching the 525 super-medium twin–the largest commercial helicopter Bell has ever built–and 505 light single, as well as the V-280 next-generation military tiltrotor. He also led an aggressive charge to find new markets for the Bell/Boeing V-22 tiltrotor and oversaw the modernization of Bell's Fort Worth campus. *–M.H.*

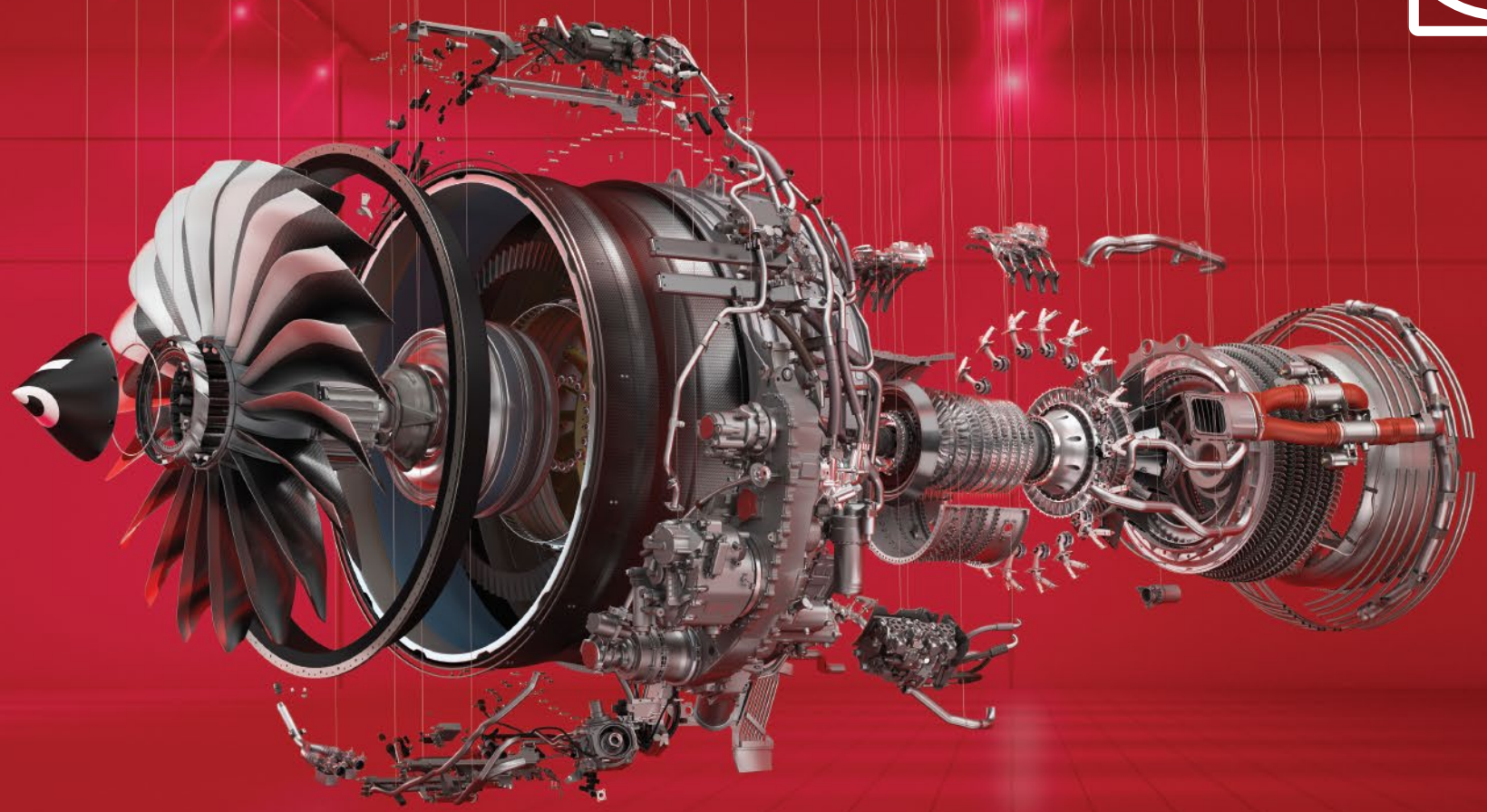
DEPRECIATION GARNERS SUPPORT ACROSS INDUSTRIES

A cross-section of more than 200 industry groups, including NATA, is urging U.S. lawmakers to renew the bonus depreciation and Section 179 expensing measures that expired at the end of last year. Their appeal is part of a series made to Congress in recent months to act on the measures.

"It is essential that Congress act to renew important tax provisions that expired at the end of 2014," the organizations said in the joint letter. "The current uncertainty about these tax policies is discouraging investment in the U.S. and, in some cases, keeping companies on the sidelines. This impacts both companies that make investments and companies that manufacture capital equipment and reduces job growth that typically accompanies such investments."

Lawmakers are staged for a repeat of last year's debate, with the U.S. House of Representatives pushing for permanent extensions of certain tax measures, including bonus depreciation, and the Senate seeking a two-year extension. Last month the House Ways and Means Committee voted 24-13 to move forward H.R.2510, which would make bonus depreciation permanent.

Earlier this year the committee approved a similar bill to make Section 179 expensing breaks permanent. The Senate Finance Committee approved a two-year tax extender in late July for a number of the tax measures, including bonus depreciation and Section 179 expensing. *–K.L.*



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Flexjet plans to take delivery of five Legacy 500s by year-end.

Embraer hands over Legacy 500s to Flexjet

by Chad Trautvetter

Dallas-based fractional provider Flexjet took delivery of its first Embraer Legacy 500 on September 29, and subsequently accepted the second early last month, at the aircraft manufacturer's headquarters in São José dos Campos, Brazil. These are part of the five Legacy 500s that Flexjet will have in its fleet by year-end, in addition to Legacy 450s that will start to enter its fleet in June next year.

All will be LXi models, meaning they will have specially outfitted "bespoke" interiors exclusive to Flexjet, as well as onboard Wi-Fi.

In May, Flexjet placed an order for an unspecified number of fly-by-wire Legacy 450 and 500 midsize jets to augment the company's order for 60 Bombardier Learjet 85s, a program now in limbo after Bombardier "paused" it in January. "It's a great privilege to have been selected by Flexjet for the expansion of its world-class fleet," said Embraer Executive Jets president and CEO Marco Tulio Pellegrini. "The Legacy 500, and soon the Legacy 450, will deliver true innovation to Flexjet customers."

FBW Introduction

Flexjet's fractional program already features Embraer Phenom 300 light jets, but the midsize Legacy 500 marks the first fly-by-wire aircraft to enter its fleet. The fractional provider expected to put the first Legacy 500 into customer service by the end of last month, following the completion of FAA-required proving runs.

"We're excited about [the Legacy 500]," said Flexjet CEO Michael Silvestro. "It really rounds out our fleet, and I can't wait to get it in the program." Flexjet is currently evaluating whether to add the Legacy 450/500s to its recently announced Red Label program.

Meanwhile, the company is gearing up to add another new model–the Gulfstream G650–to its fractional fleet. Flexjet plans to begin crew training on the ultra-long-range jet next month, in anticipation of first deliveries early next year.

It will also have six G450s in its fleet by year-end; deliveries of this model to Flexjet began in late June. These Gulfstream models, along with the in-development G500, are part of a 50-aircraft order announced in October last year. ❑

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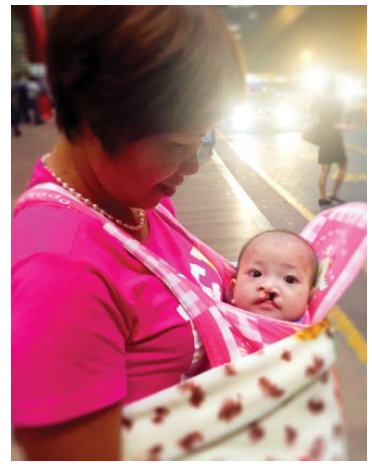
Chinese orphans are first to benefit from Angel Jet

by Charles Alcock

Angel Jet Network (AJN), a Hong Kong-based charity providing medical transportation for underprivileged patients across the Asia-Pacific region, made its first flights in late September. The organization, which is inspired by the U.S.-based Corporate Angel Network (CAN), uses flights in aircraft donated by private individuals and companies.

The first three flights carried three orphans from the Chunhui Children's Foundation to Chinese hospitals for major surgery. One flew from Haikou in Hainan province, and the other two from Zhanjiang in Guangdong province. AJN works with other charities providing free medical care to poor patients, but which are generally not able to provide free transportation. In some cases, the flights will carry medical personnel to remote locations.

Companies and individuals worldwide are invited to contribute empty seats, empty legs and flight hours. The organization also accepts airline frequent flier miles and tickets, ground transportation, hotel accommodation and financial contributions.



Three Chinese orphans from remote cities were the first to benefit from Angel Jet Network's free flights using donated private jets.

"Usually free medical care is available only in first- or second-tier cities. Some of the patients are located far away from these cities, and ground transportation may take days," explained AJN co-founder and executive director Lydia Sheng. "For now, the majority of our patients are children, and some of them are little babies. Their fragile little bodies just cannot take too much traveling. There are many cases we know of when patients passed away before they had necessary procedures, either because they could not afford to travel at all or the travel via ground transportation was too much to take."

Sheng, who is also marketing director with the Shanghai-based Avicus charter brokering group, pointed out that while it is still difficult for foreign operators to fly within China, AJN wants to be able to help patients from across the region. The organization is also looking for operators willing to provide flights between the U.S. and Asia as part of its plan to organize medical missions involving American doctors who would provide medical procedures and training.

The AJN board includes Avicus global operations director Abby McBride; Textron Aviation senior vice president of business development William Schultz; Richard Ding, chief editor of China *Air Medical and Rescue* online magazine; and Katie Littlefield, marketing director with Heart-to-Heart Shanghai. The group was formed in April and its advisory board includes CAN co-founder Pat Blum and former executive director Dick Koenig, as well as **AIN** group publisher David Leach. ❑

Veterans Airlift transports heroes

by Kerry Lynch

The Veterans Airlift Command recently transported Marine Sgt. John Peck to a friend's wedding, and the association has plenty of missions that corporate aviation can help complete.

As the Veterans Airlift Command (VAC) readies for its busiest season of the year, it recently completed what it called one of the most "demanding missions in recent memory." The charitable organization, which arranges flights for post-9/11 combat wounded veterans and their families, recently completed a mission that enabled Marine Sgt. John Peck to attend the wedding of a friend in Texas.

Travel has been difficult for Peck, a quad amputee who General Aviation Manufacturers Association president and CEO Pete Bunce said has "had an amazing number of obstacles thrown in his path toward gaining use of any limbs but remains resilient." He has been on the arm transplant list at Brigham and Women's hospital in Boston and must be able to reach Boston within six hours of a donor being found, day or night.

The Edwards Group facilitated the travel, supplying a GIII and crew. Unlike typical missions, which involve either dropping off and/or picking up, for this trip the crew had to stand by in case Peck received a donor call.

Volunteers flew him from Manassas, Va., to Texarkana, Texas, on September 25 and remained the weekend, returning Peck to Manassas on September 27. While he did not get a donor call, Peck was able to enjoy the wedding with the knowledge that he could get to Boston in time for a transplant.

Along with The Edwards Group, the mission received support from APP Jet Center in Manassas, Va., Tac Air in Texarkana, and the Disabled American Veterans in Little Rock.

Peck was one of more than 1,100 passengers that VAC transported through the first nine months of the year. The organization typically arranges flights for between 1,700 and 1,800 passengers a year, with the busiest season in the last three months of the year. It is particularly busy around the holidays.

"With the war essentially over, we anticipated we would see fewer trip requests, but in fact that's not the case at all," said VAC executive director Jen Salvati. "These injuries are lifelong, and many of our passengers need specialized treatment that is not readily available at the local VA hospitals." In fact, the VAC website, www.veteransairlift.org, had more than four dozen unassigned mission needs awaiting potential takers listed in early October.

VAC passed the 10,000-patient milestone earlier this year. Bunce said of Peck's mission: "This should make us all proud of what lengths general aviation and corporate America will do to help make life better for one of our severely wounded heroes." ❑

2015 New Business Jets

BY MARK HUBER

Go big or go home

The late and rotund actor and poet Victor Buono, whom you recall as King Tut from the long-ago *Batman* television series, once opined, "Being thin is where it's been, but being fat is where it's at." When it comes to new business jets this is indeed the marketing mantra that OEMs pray will ring the register. The svelte fuselages spawned from the minds of Bill Lear and Ed Swearingen are now the stuff of disdain, flying archeological curiosities left over from the bygone era of the average 170-pound American male of the 1960s.

What today's bizjet customers want are wider seats adjoining ever wider aisles in a utopia of super-size fuselages. Gulfstream and Dassault Falcon have already set the new standard of galloping girth with the 102-inch cabin cross-section on the new G650ER and 5X twinjets, respectively, for purpose-built bizjets. Of course if you want wider than that there are always the bizliner variants from Airbus, Boeing, Embraer, Sukhoi and likely soon from Bombardier and Mitsubishi.

Inner space is key even farther downstream, with OEMs battling keenly to show that even the smallest of aircraft are "space craft." From the HondaJet to the new Cessna Citation Latitude, OEMs are emphasizing cabin comforts like never before, regardless of aircraft size category. Over the summer I visited One Aviation's Eclipse maintenance facility at Chicago Executive Airport where the virtues of that aircraft's comparatively Lilliputian cabin space were touted–once you removed two of its six seats. Fractional provider Flexjet stresses the comfort of its new Learjet 75s, which also subtract two cabin seats from the standard configuration.

With as much as four fifths of private jet dollars forecast to be spent on large and super-large jets over the next decade the race to the top is on; the old theory that you develop customers over time by moving them "up the food chain" into progressively larger and larger aircraft seems less valid in today's global economy. Increasingly a customer's first jet is a big one. And there is no shortage of choices. But will this race to the top create an eventual glut of too many consumer options that the market simply cannot sustain? Or to channel Buono, the belt of today's crop of new jets is definitely not svelte. But with this new offering of widebodies there is more to like than just the size.

The trend toward attention to total lifecycle costs continues to evolve, with a new generation of engines with either no overhaul requirement or suggested intervals that are so long as to be essentially irrelevant, just like their on-condition airline cousins. These engines, such as the GE Passport and the Pratt & Whitney Canada PW800, feature lower specific fuel consumption and emissions as well. The amount of maintenance data aircraft are transmitting and will be able to transmit in real time is on the rise, too, thanks to new Ka-band satellite technology. The flexibility of hourly maintenance plans available from aircraft OEMs also seems to be getting better every day, covering more items and for longer durations as components become more reliable. Digital fly-by-wire flight control technology and cockpit sidesticks are migrating down to midsize aircraft such as the Embraer Legacy 450 and 500 and partially in the Cessna Citation Longitude. Touchscreens have eliminated most of the switchology in new cockpit designs.

Cabin technology is also making strides. You can now order a steam shower in the Falcon 8X and Lufthansa Technik offers an aftermarket galley dishwasher. The aforementioned Ka-band satellites open up a whole new frontier of speed and connectivity for in-flight information and entertainment with wider coverage areas. Cabin carpeting can be embedded with a light show. Seats on the upcoming Bombardier Global Expresses will not only recline; they will literally rock you all night long. Granted there is something incongruous about sitting in a rocking chair attached to a floor that moves at 600 mph–and maybe faster. Supersonic bizjets seem to be nudging ever closer to reality.

So here is the current crop of new business jets as the sun sets on 2015.

Bizliners

Airbus ACJneo

Airbus will make its re-engined "neo" (new engine option) A319, A320 and A321 available for the Airbus Corporate Jet (ACJ) program in 2018. For power, Neo customers have a choice of either the CFM Leap-X or the Pratt & Whitney Pure Power PW1100G.

Airbus ACJ350

Airbus began delivering the A350 XWB to the airlines late last year. In VIP configuration the aircraft will be known as the ACJ350 and without an interior will sell for $254 million. In typical executive configuration with 25 passengers, it will have an unrefueled range of 10,050 nm–about 20 hours in the air–allowing direct connection between most major city pairs on the globe. Top speed is Mach 0.89. The cabin measures nearly 170 feet long, more than 18 feet wide and eight feet tall, yielding almost 3,000 sq ft of floor space. Mtow is close to 600,000 pounds. Obviously, an aircraft this big can't land just anywhere: it needs 6,100 feet to stop. Takeoff distance at maximum weight is 8,770 feet.

While the 350's cabin is wider than the 787's, the windows on the latter are noticeably larger and feature electro-chromic dimming, while the Airbus relies on old-technology electro-mechanical shades. The larger windows on the 787 create the illusion of more interior space. However, the smaller windows on the A350 mean the cabin is marginally quieter. The claimed fuel-efficiency advantage over the 787 appears to come from Airbus's wider use of composites–53 percent versus 50 percent on the 787. The Airbus also employs a new winglet design called a "sharklet," which reduces drag and boosts top speed to Mach 0.89 from Mach 0.85. The two aircraft feature the same engine technology. Given the thrust these engines generate, they're remarkably quiet.

With so much space to work with, the interior options on the ACJ350 are limited only by what you care to spend. Airbus has floated a few ideas, including a grand entryway; above-deck crew rest areas; forward and mid-cabin gourmet galleys; a forward master stateroom suite with bedroom, bathroom with shower and private office; a mid-cabin lounge; an oversized circular dining table with seating for 10; three junior staterooms with shared bathroom and shower; and an aft cabin media room/theater with a dozen reclining seats and a large flat-screen monitor mounted to the aft bulkhead.

Boeing BBJ Max

Boeing Business Jets (BBJ) announced in 2013 that it will build the BBJ Max, an executive version of the 737 Max outfitted with CFM Leap 1-B engines. Deliveries are expected to begin in 2018, to date in two variants, the Max 8 and Max 9. They are based on the current BBJ2 and BBJ3, respectively, and have the same cabin sizes as their predecessors but significantly more range. The BBJ Max 8 will have a range of 6,325 nm, a 14.6-percent

Boeing BBJ Max

improvement over the BBJ2. The BBJ Max 9 will offer a 6,255-nm range, 16.2 percent more than the BBJ3.

The new aircraft will be 14 percent more fuel efficient than current-production single-aisle BBJs, thanks to new-design winglets and the new engines, which are mounted farther forward and higher on the wing and connected by new and more aerodynamic pylons. The Max also gets a more aerodynamic vertical stabilizer.

To provide adequate ground clearance for the larger engines, the landing gear will be lengthened so the airplane will stand a little taller on the tarmac. The Max will employ limited fly-by-wire controls, mainly to the wing spoilers. Other planned technology includes the addition of four big 15.1-inch Rockwell Collins flight displays in the cockpit–the same ones that are on the larger Boeing 787 Dreamliner.

Maintenance on the Max will be easier than on the BBJs, as fault data, once collected by instruments in

the forward equipment bay, will now be available for technicians and pilots on the cockpit display screens. The Max will also hold more maintenance data on its enhanced onboard network system and network file server, doubling the amount of maintenance information available during flight and transmitting it live to ground stations so that issues can be quickly resolved in flight or shortly after the airplane lands. This will further enhance the aircraft's already high dispatch reliability. (Boeing quotes a 99.7-percent dispatch rate for the current-generation 737.)

Ultra-long-range

Bombardier Global 7000/8000

Bombardier announced its new Globals as a counterweight to the Gulfstream G650 back in 2010 but the program has been beset by delays as Bombardier strains under the weight of the CSeries regional jet program and developing fly-by-wire and a new wing for its next-generation Globals. It now looks as if the Global 7000 will not be delivered until 2018. The order book for both is thin, but growing, and Bombardier is believed to have commitments for about 100 between the two. Major players such as fractional ownership leader NetJets have placed orders for the aircraft.

The first Global 7000 is being assembled now and the engines are on, and while it conceivably could fly before year-end, Bombardier would be hard-pressed to do so. Further program delays will allow Gulfstream to stretch its market lead in the new-generation, large-cabin, long-range space even further. However, when they do come to market, the new Globals hold the promise of new dimensions of cabin comfort and efficiency.

The $75 million Global 7000 will have a maximum range of 7,300 nm, while the slightly shorter $71 million Global 8000's range will be 7,900 nm (for both aircraft, those range numbers assume 10 passengers, four crew and a cruise speed of Mach 0.85/487 knots). Top speed for both is Mach 0.90. Both aircraft use the current Global 6000 fuselage but stretch it–the 7000 by 11 feet, 3 inches and the 8000 by two feet, three inches–and add bigger cabin windows some 80 percent larger

Bombardier Global 7000

DAVID McINTOSH

than the 6000's and extending higher up the sidewall. With 2,637 cu ft of cabin volume, the Global 7000 offers substantially more room than the Gulfstream (at 2,138 cu ft). The Global 8000's cabin is marginally larger too, coming in at 2,236 cu ft. However, the Gulfstream's cabin is taller and wider, at six feet five inches and eight feet six inches, respectively, compared with the Globals' six feet three and eight feet two inches for those same dimensions.

The new aircraft will feature full fly-by-wire flight controls, a new thin high-speed wing, more fuel-efficient GE Passport engines (16,500 pounds of thrust each) and the Bombardier Global Vision flight deck. The latter is built on Rockwell Collins Pro Line Fusion avionics, with sidestick pilot controls and the latest touchscreens and safety features. The Pro Line system is the first avionics system with synthetic vision on a head-up display (HUD), a visor that folds down and presents the pilot with all the necessary aircraft performance, mapping and terrain information.

GE reported in May that the new engines concluded flight-testing with more than 100 hours and 20 sorties. The engines should deliver new metrics of quiet, low emissions and vibration, reliability and economy. They are based on the guts of the new high-efficiency CFM Leap engines being developed for new-generation Airbus Neo and Boeing Max series. Among the new technologies incorporated into the engines are a 52-inch titanium "blisk," a single forging of the fan blades and turbine disk that saves weight and reduces vibration; a lightweight aerodynamic nacelle; and a "super-finish" on the blisks and compressor blades that further improves efficiency by smoothing airflow.

Aside from their new engines, wings, flight controls and their range and speed, the new Globals promise heightened passenger comfort; a quiet cabin divided into three or to four zones, a galley that is 20 percent larger than that on the Global 6000 with double convection/microwave and convection/steam capabilities, a mid-cabin/self-serve galley, redesigned and larger crew rest areas, large passenger windows that give the cabin an airy feel, improved heating and cooling, redesigned seats, a center lounge/media room with 42- to 50-inch flatscreen adjustable-color LEDs in the ceiling, a conference/dining table that seats six, private stateroom, optional stand-up steam shower, more robust environmental control system and a capacious 195 cu ft baggage hold.

The new Globals also sport an all-new passenger seat design that incorporates a rocking motion. There is a new integrated cabin management and in-flight entertainment (IFE) system that will allow passengers to control all cabin functions such as LED lighting and window shades as well as communication, entertainment and information access and streaming with their personal smart devices with the same content providers they use at home via new high-speed, Ka-band satellite technology.

Dassault Falcon 8X

Dassault Falcon 8X

Dassault Aviation unveiled the Falcon 8X trijet in May 2014. It's a significant step up from the 7X. A longer cabin offers more layout possibilities, including the option to install a large aft lavatory with a steam shower and a crew rest area in the front section and still have a comfortable three-lounge cabin in between. The 8X also has longer legs–a maximum of 6,450 nm. From Los Angeles, Beijing is within reach. From New York, the 8X can travel nonstop to Dubai. The aircraft first flew in February, and three test aircraft are currently flying. Dassault says certification is on target for next year, with deliveries set to begin in the second half. The model will reportedly sell for about 10 percent more than the

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7X, which would put the price in the neighborhood of $58 million. Direct operating costs are estimated at $4,075 per hour.

Gulfstream G500/G600

Gulfstream Aerospace formally launched two new large-cabin jets in October last year to replace the G450 and G550. The $43.5 million G500 has a range of 5,000 nm at Mach 0.85 or 3,800 nm at Mach 0.90. The larger $54.5 million G600 can fly 6,200 nm at Mach 0.85 or 4,800 nm at Mach 0.90. The top speed for both aircraft is Mach 0.925, the same as the G650ER flagship. With the introduction of the G500/600, all Gulfstream large-cabin models will pay homage to the need for speed.

The G500 rolled out under its own power during its debut at Gulfstream's Savannah headquarters last year and first flew on May 18. Gulfstream is adding two flight-test G500s to the fleet this fall and two more are under construction. The company anticipates it will obtain G500 type certification from the FAA and EASA in 2017 and begin deliveries in 2018. Certification for the G600 is projected for 2019.

The G500 is the first business aircraft manufactured with a data concentration network (DCN) to significantly reduce cables, parts and weight. Power for the pair will come from Pratt & Whitney Canada's new PW800 series. The 16,000-pound-thrust-class PW814GA and PW815GA have the same core technology used in the company's line of geared turbofan commercial engines. They have a 10,000-hour TBO and no midlife inspection requirement.

The finished passenger cabin cross-section of each aircraft measures 91 inches wide and 74 inches tall–about seven inches wider and two inches taller than cabins on the current-production G450 and G550–and they can be configured for up to 19 passengers. The G500 has three living areas and the G600 has up to four, as well as an optional crew rest area. Both aircraft have forward and aft lavatories and include a full-size galley that can be located either forward or aft. The flexible galleys allow a high degree of customization and feature a 4-cu-ft refrigerator, a microwave/convection oven, optional steam oven and oversized sink.

The cabin length on the shorter G500 measures 41 feet, 6 inches; 45 feet 2 inches on the G600. The baggage compartment is accessible through the aft lavatory, has 175 cu ft of usable volume and has additional floor and ceiling tracking to allow for flexible loading. The baggage compartment provides fold-down shelving and space that can be individually configured to store golf clubs, ski gear or oversized suitcases. The main baggage door has been enlarged.

The G500 and G600 will sport a new design of single passenger seat that locates all the seat controls on the inboard armrests and has pockets sculpted into the interior arms for more hip room. Some architecture from the Elite interiors developed for the G650 and later used in the G550 and G450 is adopted in the G500 and G600, such as the high-tech display of galley and IFE equipment. For now, a 32-inch flatscreen appears to be the largest monitor that can be mounted above a mid-cabin credenza while maintaining adequate access to emergency egress. However, Gulfstream executives emphasize that this is a largely all-new cabin interior design and likely not the final cut. IFE offerings in particular

Bombardier Challenger 650

MARK WAGNER

Gulfstream G500

CHAD TRAUTVETTER

are expected to evolve between now and 2017, and a final determination has yet to be made. The cabins feature more built-in storage nooks in the sidewalls and the seats, as well as USB charging ports. Both aircraft provide a cabin altitude of 4,850 feet at 51,000 feet and 100 percent fresh air. The aircraft use the same large oval windows that are on the G650 with dimming provided by a system of dual roller shades. The cabin noise level for the G500 and G600 is expected to be extremely quiet, less than 50 dBA. The new latching mechanisms for the cabinetry are also quieter.

The aircraft's common cockpits provide fly-by-wire active control sidesticks and the new touchscreen Symmetry flight deck driven by Honeywell Primus Epic avionics. The avionics include Gulfstream's enhanced vision, Honeywell's synthetic vision with 3-D taxi and a head-up display system. The full three-axis digital fly-by-wire system offers flight-envelope protection, stability augmentation, increased redundancy and reduced maintenance.

The streamlined and highly styled cockpit is the most striking feature of the aircraft's interior, finished in black leather with metallic accents. Most of the visible switchology found in earlier designs has been eliminated. Inputs are made through a group of five Honeywell touchscreens with large and easily viewed icons. Gulfstream's familiar cursor control devices (CCD) are integrated into the center console at the head of the hand grips. The console extends aft of the pilot seats, but it is lower-slung, making step-over entry and exit easier.

The CCD gives each pilot control of three of the four main display screens and allows data to be shifted between them in the event of a failure. Out the windshield and over the nose visibility is expansive. The gaspers are large and located to provide optimum ventilation. The new-design Ipeco crew seats have multiple adjustments. The elbow rests behind the sidesticks are adjustable, as are the rudder pedals. There is ample storage in the sidewalls for personal items. Two 110-volt power outlets are located aft of the pilot seats.

Large-cabin

Bombardier Challenger 650

Deliveries of the latest iteration of Bombardier's 10-passenger Challenger 600-series large-cabin business jet began earlier this year. The $33.35 million 650 features a redesigned cockpit and cabin interior and optimized GE CF34-3B MTO turbofan engines that will provide additional takeoff thrust on a limited basis to facilitate shorter takeoff distances, greater payloads and more range from "challenging" airports during high/hot operations. Maximum range of the new model is 4,000 nm (with six passengers and standard NBAA IFR reserves). The GE engines have 5 percent more takeoff thrust than the engines on the Challenger 605. The additional thrust is pilot selectable via a new performance thrust setting. The higher thrust setting does not affect engine maintenance, provided it is used for no more than 10 percent of takeoffs. New standard equipment includes a galley pocket sliding door and a bulkhead monitor with a baseline audio/video-on-demand (AVOD) system.

The Challenger 650 features the Bombardier Vision flight deck based on the Rockwell Collins Pro Line Fusion avionics system, originally designed for the Global 6000. Vision has 15-inch displays and includes head-up guidance, synthetic vision, enhanced vision, MultiScan weather radar and the Integrated Flight Information System.

The 650's passenger cabin borrows design elements from the cabins of the canceled Learjet 85 and recently refreshed Challenger 350. Improvements include wider

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BY EMBRAER

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seats, a galley with a high-temperature oven, more personal storage in and around the seats and Lufthansa Technik's Nice HD cabin management/in-flight entertainment system, which accommodates technologies such as HD and audio/video on demand. Styling cues adopted from other Bombardier models include larger interior window cutaways to let in more natural light, bullnose accents that run the length of the drink rail, in-wall speakers and stylized passenger service units.

Dassault Falcon 5X

The $45 million 5X twinjet was announced in 2013 and introduces an 8.86-foot fuselage diameter, slightly wider than that of the 8X; it yields 6.5 feet of headroom and cabin volume of 1,766 cu ft. Available configurations include seating for 12 passengers. Dassault claims that the aircraft will be 50 percent more fuel efficient and cost 30 percent less to operate than competing models from other manufacturers. It will feature fly-by-wire controls with sidesticks and new Snecma Silvercrest engines (11,450 pounds of thrust each). The avionics will be based on the Honeywell EASy system, which includes dual head-up displays with synthetic and enhanced vision information. The large cockpit will incorporate a windshield that is 32 percent larger than the one on the 7X as well as pilot seats that recline 130 degrees, allowing one crewmember to rest while the other flies.

The 5X will have an mtow of 69,600 pounds and a range of 5,200 nm, which equates to 11.5 hours in the air. It will be able to take off from 5,000-foot runways but still land fairly slowly with an approach speed of just 105 knots. It will do this without sacrificing high-speed cruise performance. The 5X will have a top speed of Mach 0.90. An all-new wing incorporates a fresh winglet design; leading-edge slats that enable lower approach speeds to shorter runways; and flaperons.

The 5X offers a brighter cabin, with windows 30 percent larger than those on the 7X. The entryway can be filled with natural light, courtesy of an electronically dimmable "Zenith window" skylight from Vision Systems above the galley aisle. The "smart glass" in the skylight can adjust tint in virtually any degree to modulate the amount of incoming light and solar heating. The 5X's pressurization system creates a cabin altitude that is only 3,900 feet while the airplane cruises at 41,000 feet; and it's just 6,000 feet at the 5X's service ceiling of 51,000 feet. The cabin features the Falcon HD in-flight entertainment system, is available with various layouts, and the seats can be fully reclined to produce sleeping areas for up to six passengers. The pressurized 155-cu-ft main baggage area is accessible through the aft lavatory, providing dressing space in flight. The single executive seats have been redesigned with a slick-looking shell back and mechanical functions such as slide, swivel and recline controlled by an electric switch in place of the traditional, and maintenance-prone, cabling system. Full-electric-function single seats are an option.

Super-midsize

Cessna Citation Longitude

Cessna is expected to announce a significant redesign of its in-development super-medium jet that builds on the same fuselage cross-section of the recently certified Citation Latitude. The $25.9 million Longitude was expected to enter into service in 2017. As originally envisioned, the Longitude shared the smaller Latitude's avionics, cabin management system, seats, windows and fuselage cross section, but is nine feet longer and was to use Snecma's Fadec-controlled Silvercrest engines (11,000 pounds of thrust each) with autothrottles for power. The Longitude will have limited fly-by-wire (FBW) capabilities for controlling the rudder, spoilers and brakes ("brake-by-wire"). The 30-degree swept wing will incorporate leading-edge slats, winglets, centrifugal ailerons and five speed-brake/spoiler panels per side. Cessna has selected the Garmin G5000 for the Longitude, using the same three-screen "touch control" avionics architecture that the company is using on both the Latitude and the revised X+ and Sovereign+. The CMS will build on the new wireless Clairity system.


Cessna Citation Longitude


Dassault Falcon 5X

The Longitude will have seating for eight passengers, a full-fuel payload of 1,950 pounds, a maximum range of 4,000 nm at Mach 0.82 and an MMO of Mach 0.86. Takeoff distance at an mtow of 55,000 pounds is estimated at 5,400 feet, but that drops to 4,000 feet on missions of 2,000 nm or less with lighter loads. Service ceiling is 45,000 feet. The cabin features a large forward galley and aft lavatory with vacuum flushing toilet. The forward cabin may include a crew lavatory as well as a third crew/flight attendant seat.

Like the Latitude's, the Longitude's interior cross-section is 72 inches tall and 77 inches wide. The forward club-four configuration is capacious and the single executive seats are fully berthing. There is room for another club-four in the aft cabin or a three-place divan, certified for takeoff and landing, opposite an entertainment center with large flat-screen monitor.

Midsize

Cessna Citation Latitude

The Cessna Citation Latitude received FAA certification on June 6, and deliveries were scheduled to begin by the end of September. Fractional provider NetJets has ordered up to 150 of the light-midsize jets. Max range is 2,850 nm; high-speed-cruise range is 2,700 nm. Landing and takeoff distances are 3,580 feet. The Latitude features the Garmin G5000 avionics system and Pratt & Whitney Canada PW306D turbofans (5,700 pounds of thrust each) with Fadec.

The Latitude features seating for eight and a new and large ovoid fuselage. The Latitude's new flat-floor cabin is 27.5 feet long, 72 inches tall and 77 inches wide. The standard seating arrangement accommodates passengers with a forward, dual seat, side-facing divan, a club-four grouping of single seats and two more single seats aft. The Latitude has the wireless Clairity cabin management system. It will be compatible with personal electronic devices. The G5000 suite in the Latitude's cockpit features three 14-inch LCD primary and multifunction displays and four touchscreen control panels. It includes synthetic vision, electronic charts, Garmin's Safe Taxi airport charts, dual FMS, Waas and Taws.

Cessna unveiled the $14.9 million Citation Latitude in 2011.

Embraer Legacy 450

The $16.6 million Legacy 450 made its first flight in late December 2013 and received FAA certification on August 31 this year. It has been optimized with a six-inch cabin stretch and a range increase to 2,500 nm over the original design specifications. The shorter sibling of the Legacy 500 midsize, the 450 shares many of the same systems, including fly-by-wire (FBW) flight controls, engines, avionics and fuselage diameter. Power comes from a pair of Honeywell HTF7500Es (6,540 pounds of thrust each) that can propel the aircraft to 43,000 feet in 22 minutes. The pressurization system keeps cabin altitude at 6,000 feet at the 450's maximum cruising altitude of 45,000 feet. Maximum cruising speed is Mach 0.83. The 678-cu-ft-cabin offers seating for seven to nine

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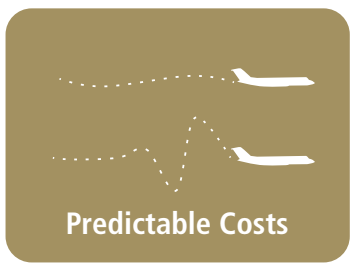

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2015 New Business Jets

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passengers. Cabin management and IFE is courtesy of Honeywell's HD Ovation Select cabin-management system, which allows for control of entertainment, communications, lights, temperature, window shades and more via units mounted in the drink rail, wireless handheld remotes or a galley touchscreen. The system can interface with high-speed satellite communications and consumer electronics.

The cockpit offers Rockwell Collins Pro Line Fusion avionics. The four large active-matrix LCDs in the panel connect the pilots with synthetic enhanced vision with an optional head-up display; electronic charts, maps, graphical weather depiction from an intuitive MultiScan weather radar system that sees up to 300 miles out; and an airport surface-management system that minimizes the chances of ground mishaps. Fusion can grow to accommodate future technology add-ons such as voice recognition, surface guidance and automatic dependent surveillance-broadcast (ADS-B).

Pilatus PC-24

MARK WAGNER

Light

Honda HA-420 HondaJet

Honda expects to receive full FAA certification of the $4.5 million light twin later this year. The HA-420 will have a range of 1,180 nm, a maximum speed of 420 knots, an initial climb rate of 4,000 fpm and a maximum altitude of 43,000 feet. Honda claims the aircraft has greater fuel efficiency and higher speed than competing models. The four- to six-passenger jet will be certified for single-pilot operation.

The HondaJet mates a carbon-fiber composite fuselage with metal wings. That, coupled with the positioning of the engines on over-the-wing pylons, reduces drag and creates a larger cabin volume with generous passenger legroom and less vibration. Honda expects most customers to opt for a cabin configuration that features a single-place, side-facing divan opposite the entry door followed by club-four seating and an aft-cabin lavatory with privacy door.

Key suppliers include GE Honda Aero Engines for the HF120 engines (2,050 pounds of thrust each); Garmin for the G3000 touchscreen avionics; and B/E Emteq for its SkyPro HD IFE and cabin-management system, which features audio/video on demand, interactive 3-D moving map, exterior camera and wireless cabin control of lighting and monochromatic window shades at each seat via passengers' personal electronic devices.

More than 800 employees are working at Honda's massive 83-acre campus in Greensboro, N.C., which has 500,000 sq ft under roof and should be able to turn out 70 to 100 aircraft per year when production is fully ramped up. The first two years of production are already sold.

Honda HA-420 HondaJet

One Aviation Eclipse 550

The $2.995 million update of the original EA-500 features cockpit avionics upgrades with synthetic and enhanced vision; sharper, more powerful display screens; a separate avionics standby display unit; dual integrated flight-management systems; and autothrottles. The 550 also has new electronic antilock brakes. The 550's upgraded cabin has higher-grade, piped leathers; finished carpets; more robust table and cup-holder attachments; better hand rails; a one-piece headliner that improves aesthetics; portable server; iPad and Bluetooth connectivity; and an intercom system for pilot-passenger communications. Eclipses are offered with Iridium satphones capable of transmitting aircraft engine data for monitoring. The 550 has a top speed of 375 knots and a range of 1,125 nm. Deliveries of the 550 began earlier this year.

Pilatus PC-24

The first PC-24 test aircraft rolled out of the hangar on Aug. 1, 2014, and made its first flight this past May. The first two years of production quickly sold out. Pilatus aims to have the up to 10-passenger, $8.9 million all-metal aircraft certified by 2017 and approved for single-pilot operations. The OEM has temporarily stopped accepting new orders. The aircraft combines light jet operating economics with super-midsize capabilities and comfort and is aimed at more conventional offerings from Cessna and Embraer.

Like the PC-12 turboprop single, the PC-24 has an aft cargo door and the capability to operate from unpaved and unimproved fields, needing as little as 2,690 feet at an mtow of 17,650 pounds. Power comes from a pair of Williams International FJ44-4As each rated at 3,435 pounds of thrust. The engines have unique features including automatic thrust reserve, passive thrust vectoring nozzles, quiet power mode in place of an APU to provide ground power, integral pre-cooler to condition bleed air and reduce drag losses, and an anti-ice and noise-suppressing inlet. They have a 5,000-hour TBO and a hot section time of 2,500 hours. The engines help propel the PC-24 to FL450 in less than 30 minutes and achieve a high-speed cruise speed of 425 ktas at FL300. Range with four passengers is 1,950 nm and at mtow the maximum payload is 2,500 pounds. Up front, the customized avionics suite (dubbed PACE–Pilatus Advanced Cockpit Environment) is based on the Honeywell Primus Apex system and features all the latest advances.

The voluminous passenger cabin provides more overall space than either the Cessna XLS+ or the Embraer Phenom 300 and has a flat floor, which means less headroom in the aisle. The aircraft will come with seven different interior layout options, among them executive, commuter, combi and quick-change configurations, as well as options for an externally serviced lavatory, either forward or aft, and galleys. Like the PC-12, the PC-24's dominant feature is its rear cargo door, which measures 4.1 feet wide and 4.25 feet tall.

SyberJet SJ30i and SJ30x

MSC Aerospace is planning two new versions of the SJ30 light twinjet: the SJ30i will have an upgraded Sybervision avionics suite featuring the Honeywell Primus Apex 2.0 system with 12-inch displays and a new interior. The avionics and interior are lighter than their progenitors and take an estimated 200 pounds out of the airplane. A follow-on aircraft, the SJ30x, will have uprated Williams International FJ44-3AP-25s with dual Fadec and is expected to provide higher cruise speed at altitude, swifter climbs, more payload and better hot and high performance. It will also provide single-point refueling. Price for both aircraft is expected to be in the $8 million (2014 $) range.

The SJ30 program began in the late 1980s and the airplane, the SJ30-2, finally received FAA certification in 2005. Since then, the company has had several different corporate owners and produced only eight examples of the Mach 0.83, 2,500-nm, seven-seat jet. The aircraft holds three world records for speed and

Continues on page 28 ▶

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2015 New Business Jets

▶ Continued from page 26

distance. It is designed with a 30-degree swept wing for high speed and efficient cruising and with leading-edge slats and flaps for low-speed approaches. The SJ30 has a service ceiling of 49,000 feet, maintains a sea-level cabin to 41,000 feet and is approved for single-pilot operations.

Singles

Cirrus Vision SF50

Cirrus now has three conformal test aircraft flying and is well on its way to earning certification late this year or early next for the $1.96 million SF50 jet single. Range is estimated at 1,000 nm at 300 knots; 1,200 at 210. The single FJ33-4 Williams turbofan is expected to power the aircraft to 25,000 feet. The five-plus-two layout is retained but options such as weather radar, a "relief station" and upgraded leathers have been added. The SF50 will feature an emergency whole-aircraft parachute that will deploy from the nose.

Cirrus is beginning to gear up for production by adding factory robotics and a fuselage lay-up mold for the all-composite aircraft. The company has received deposits for more than 550 of the jets. As the SF50 bucks up against the $2 million price mark, company chairman Dale Klapmeier indicated last year that Cirrus may tap its owner, China Aviation Industry General Aircraft (Caiga), to build certain component parts in that country to cut costs. Klapmeier said the company plans to spool up SF50 production gradually to 125 per year after certification.


Cirrus Vision SF50

DAVID McINTOSH

Flaris LAR 01

The Poland-based aviation newcomer unveiled its $1.5 million five-seat, single-engine light jet at the 2013 Paris Air Show. Certification has slipped to the middle of next year as the company grapples with the need for an engine more powerful than the originally envisioned 1,460-pound-thrust Pratt & Whitney Canada PW610F. This past summer the company indicated it had signed a deal with Williams International to secure the FJ33-5A (1,900 pounds of thrust) for the aircraft.

The LAR 01 is fitted with dual Garmin G600 avionics. Other features include rear-hinged main cabin doors reminiscent of 1960s Lincoln Continentals, detachable wings and stabilizers, a fuselage fuel tank, electric deicing and a whole-aircraft ballistic parachute mounted in the nose. The aircraft's target performance includes maximum cruise speed of 380 knots, stall speed of 62 knots, 1,400 nm of range, a 45,000-foot ceiling and the ability to take off from short grass strips. The company said a second airplane is nearly complete and construction is under way on two more fuselages.


Aerion AS2

The Supersonics

Aerion AS2

Last year, Aerion revamped its proposed supersonic bizjet as a trijet with more range and a larger cabin. The new AS2–Aerion supersonic second design–retains its predecessor design's supersonic natural laminar-flow wing, but will now have a range of at least 5,000 nm and a cabin cross-section nearly the size of a Gulfstream G550's. The 30-foot-long cabin, which is 17 feet shorter than the G550's, will feature a two-lounge layout, galley and both forward and aft lavatories, plus a baggage compartment accessible in flight. Mtow grows to 121,000 pounds and the fuselage is lengthened to 170 feet. Balanced field length is 7,500 feet at mtow, but that is reduced to 6,000 at weights of less than 100,000 pounds. Flying at the lighter weight reduces range by approximately 20 percent. Maximum speed is Mach 1.6; however, the aircraft is designed to cruise efficiently at Mach 0.95 to comply with existing supersonic overflight bans.

Aerion says a variety of existing engine cores in the 15,000-pound-thrust range could be applied to the new design, including the Pratt & Whitney Canada PW800, GE Passport and Rolls-Royce BR710. Last year it announced an agreement to collaborate with Airbus to collaborate on technologies associated with the future of high-performance flight, and exchange knowledge and capabilities in design, manufacturing and certification. Aerion said the deal would lead to a first flight by 2019 and certification by 2021. Over the longer term, Aerion said it would provide proprietary technology and assistance to Airbus Group in its high-performance aircraft technology development.


Spike Aerospace S-512


HyperMach SonicStar

HyperMach SonicStar

This design proposes a top speed of Mach 4.5, a maximum range of 6,500 nm and seating for up to 32 passengers. The company says it has completed several rounds of financing and is continuing to develop its revolutionary "65,000-pound-thrust H-Magjet 4400 hybrid turbofan ramjet engines" with sister company SonicBlue. First flight for the $180 million aircraft is estimated in 2022 and certification in 2025.

Spike Aerospace S-512

Spike's twinjet design features a windowless cabin with seating for 12 to 18 passengers, fly-by-wire flight controls, a range of 4,000 nm and a top speed of Mach 1.6. Engine selection remains pending. The company continues to search for additional funding for the $1 billion program and estimates a market for 600 aircraft between 2020 and 2030. ❑

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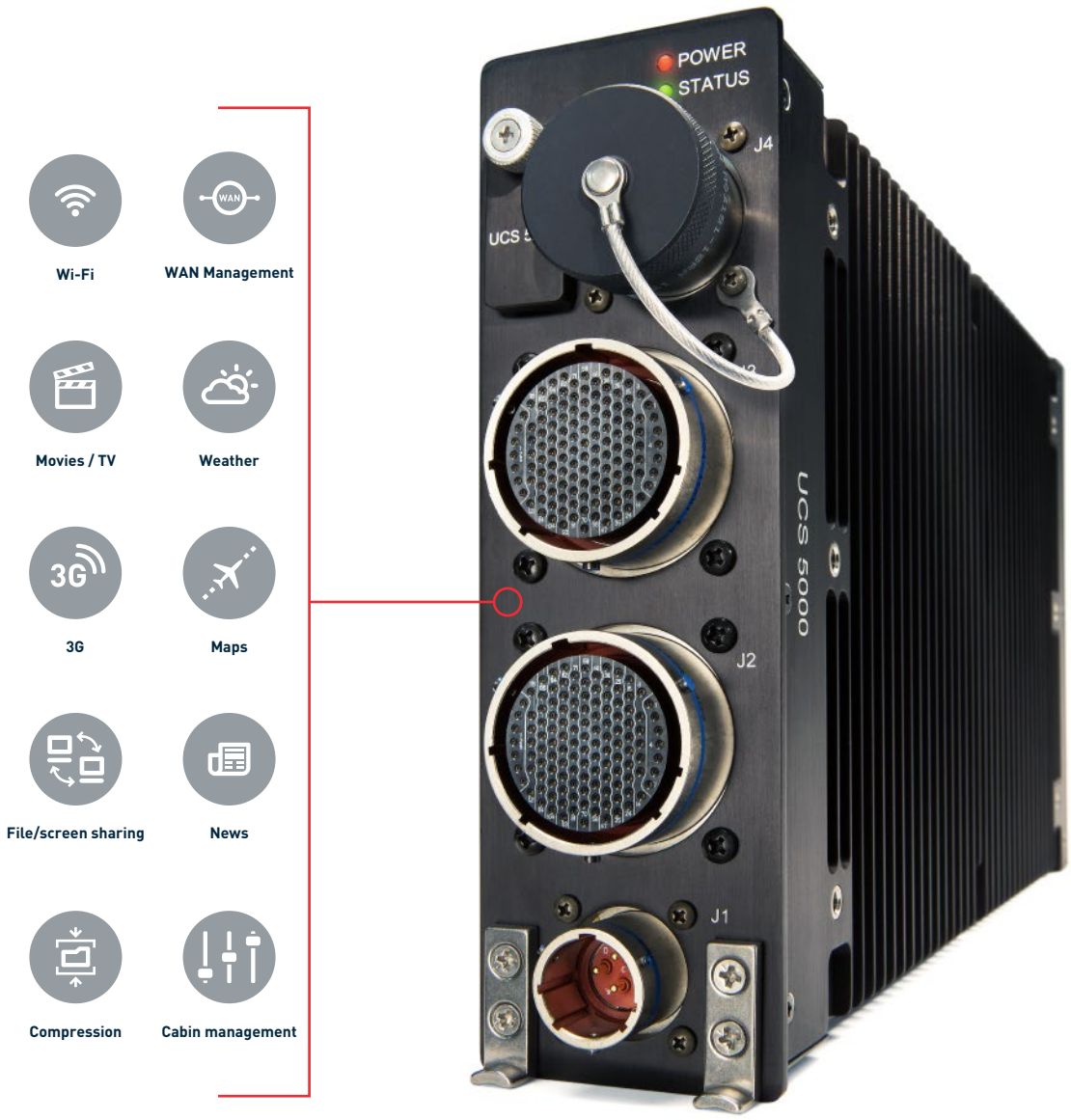

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Growing product line spurs expansion, process evolution

by Kerry Lynch

When Gulfstream opened its two G500/600 production plants, the company unveiled its most advanced facilities yet. Built adjacent to Savannah/Hilton Head International Airport, the facilities were part of an investment program that is now nearing $1 billion and has spanned more than a decade. This investment has transformed the Savannah site from one that executives once viewed as an airport with a factory on it into a factory with an accompanying airport.

The transformation has occurred as Gulfstream has grown from a one-aircraft company to what will become a lineup of as many as seven. Of those, five are being built at its headquarters in Savannah.

To accommodate this growth, the company has turned to new approaches, new technologies and new manufacturing techniques. "Gulfstream's manufacturing processes and efficiencies…have resulted in a significant increase in aircraft deliveries," said Greg Collett, Gulfstream vice president of production and completion operations. "In 2004 Gulfstream delivered 77 completed aircraft. By last year, that number had jumped to 150."

The original 260,000-sq-ft manufacturing facility opened in 1967, initially to produce the GII. The GII production eventually transferred over to the GIII. By 1982 the GIV had supplanted its predecessors.

The airframer's Savannah campus includes two 400,000-sq-ft factories for production of the in-development G500 and G600. The company uses one of the factories for wing and tail construction, activities it brought in house for these aircraft, and the other for fuselage production and final assembly. G500 shown here.

Except for a short time when GIIBs and GIIIs were produced simultaneously, the facility had been used primarily for production of one aircraft type and at much lower volumes. GIV deliveries were averaging only about two dozen a year when Gulfstream introduced the GV in 1995. While the space didn't change, the facility went from producing only the GIV to a two-aircraft production plant with the addition of the GV. By the mid-2000s, deliveries of GIVs and GVs had nearly tripled.

The plant continues to produce the follow-on G450 and G550. With sales still solid, the facility uses all available space to keep both aircraft lines flowing. To do that, Collett said, "We have implemented lean processes and introduced new tools, including an auto riveter in 1999/2000, to increase efficiency and quality."

He cites as an example the "kitting" and labeling of all the pieces and parts for a particular aircraft and use of a vending machine with high-use tools (such as drill bits) in a high-traffic area to cut down on the need for employees to walk through the factory to a tool crib for an item.

Gulfstream also established a continuous improvement program to encourage employee input on making the process more efficient. "For example, technicians realized if they had a pouch around their waist to hold insulation pins, they wouldn't have to repeatedly bend down to pick up pins to insert on aircraft stringers, saving time as well as wear and tear on their bodies," Collett said. "Year-round, employees are encouraged to create ways to improve how they work."

The management team has also paid close attention to workflow. One Gulfstream executive recently shared an anecdote about Joe Lombardo, who led Gulfstream before being promoted to an executive v-p position at General Dynamics: after learning of a worker's back pain, he personally designed a tool to ease the burden of lifting certain equipment in the completions process.

Gulfstream designed the manufacturing facility for the G650 specifically for the aircraft, and anticipated producing a significant volume. It handed over 100 of the aircraft within the first two years of service.

Gulfstream opened its second major manufacturing facility when it announced the G650 in March 2008. This facility, part of a $400 million expansion announced in 2006, came with 316,650 sq ft (203,000 sq ft of it dedicated to manufacturing). Unlike the G450/550 facility that was adapted over time to accommodate new models, the G650 facility was designed specifically for the company's largest aircraft to date.

It also was designed with volume in mind. Before deliveries began, the G650 had quickly racked up orders for more than 200 aircraft, an initial backlog that stretched into 2017. Production moved so swiftly in the initial ramp-up that Gulfstream had to slow the flow temporarily while completions caught up. Phebe Novakovic, CEO of Gulfstream parent company General Dynamics, dubbed this a "disequilibrium," and eliminating it took several months. But production ramped back up, and within two years of the aircraft's entering service, the 100th G650 was delivered–a milestone reached a year ago.

Process Improvements

The facility incorporated a few significant changes in production to assist with the flow. These included the introduction of precision-build carts and wider use of machined parts, "all of which contribute to tighter tolerances, reducing the effort required to assemble the aircraft," Collett said. The company installed workstations at each build area, enabling technicians to rely on electronic model-based design and work instructions. "This increases efficiencies, because technicians can see exactly what they need in 3-D to proceed with the build process," he said.

Perhaps one of the most significant changes is the use of an integrated panel assembly cell (IPAC) to install frames to bonded panels. Using chemically bonded panels dramatically reduces hand riveting. This improves skin quality, reduces the number of fasteners and "lessens cabin air leakage when the tube is pressurized," he said. With the use of IPAC and its other efficiencies, the G650 has 50 percent fewer parts and 80 percent fewer fasteners than the G550. The change reduces both cost and noise in the factory.

This evolution continued with the opening of two factories for the G500/600, each larger than the previous two, encompassing 400,000 sq ft apiece. These facilities were part of an additional $500 million expansion strategy that Gulfstream announced in 2010. The first opened in September 2012 for research and development on wing manufacturing. That facility is now used for wing and tail construction for both the G500 and G600, marking a shift for the manufacturer, which previously had outsourced that work. The second facility, used for fuselage production and final assembly, opened in September last year in time for the rollout of the G500.

The new facilities build on improvements incorporated in the G650 facility. But instead of using the IPAC, which is stationary, Gulfstream has added an integrated multi-panel assembly cell tool, which moves in concert with the "work piece" or section under development. This improves accessibility when workers need to reach the more challenging areas of a given section, Collett noted.

Gulfstream has also added robotics in the wing assembly area to drill the majority of the panel, particularly in challenging areas such as near the root, he said. The factory has begun to fold in so-called "additive manufacturing," or 3-D prototyping, to produce tools and create prototype parts, he said.

As its manufacturing has slowly evolved, the company has looked beyond the bounds of aerospace for new concepts and techniques. "Gulfstream has visited several high-end carmakers to see how they approach design and manufacturing," Collett said. "We have also looked at the yachting industry, which has some similarities to aircraft in terms of furniture and the use of space." Similarly, in completions, the manufacturer has explored the commercial furniture industry. In turn, Gulfstream has showcased its advancements to not only other General Dynamics divisions, but also to NASA.

The new factories have been busy building prototypes and components as the company ramps up for deliveries of the G500 in 2018 and the G600 a year later.

Gulfstream now occupies a total of 3.2 million sq ft in Savannah. ❑

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A T-1A Jayhawk flying from Vance AFB

U.S. AIR FORCE/TERRY WASSON

Contractor pitches Eclipse 550 as alternative USAF trainer

by Chris Pocock

U.S. defense contractor Science Applications International (SAIC) is proposing that the U.S. Air Force replace its Beechcraft T-1A Jayhawk twinjet trainers with Eclipse 550 very light jets (VLJs) that the company would provide on a turnkey, service contract basis. SAIC claims significant benefits for adoption of the VLJ: a 50-percent reduction in operating costs compared with the current trainer and a fifth-generation cockpit that is more relevant for training today's multiengine military pilots. The Air Force has a fleet of more than 150 Jayhawks that it uses to train airlift and tanker pilots, and to support navigator training.

John Parkes, SAIC's Air Force business development manager, told **AIN** at the recent AFA Convention in Washington, D.C., that the Eclipse burns only 70 gallons of fuel per hour, compared with 225 gallons per hour for the T-1. The Jayhawk entered service more than 20 years ago and to comply with FAA airspace requirements needs an upgrade that will cost $300 million, he claimed; the Eclipse is RVSM, ADS-B and GPS approach compliant. Further, the Eclipse has an all-glass cockpit with smart reconfigurable displays and can offer "live virtual constructive" training. It is also the only light jet with autothrottles as used on current USAF tankers and airlifters, according to SAIC.

Parkes said that SAIC would provide a fleet of Eclipse VLJs for no up-front investment by the government, at a fee per flight hour that is one-third of the current flying hour cost to the Air Force of operating the T-1A fleet. The VLJ could have more applications, according to the company. It could also cost-effectively replace the Learjet 35As (C-21) the Air Force uses for operational support. Those aircraft are being retired without any obvious replacement, he noted. Another application could be as an "adversary trainer"; Parkes told **AIN** that SAIC is evaluating the use of a digital radio-frequency jamming system that could be carried by the VLJ.

SAIC is also suggesting that the Air Force replace its remaining T-38A companion trainers with VLJs. These are original versions of the Northrop supersonic jet trainers, which did not get an avionics upgrade to T-38C standard for continued service as advanced jet trainers. The T-38As are flown by the Air Force's B-2 and U-2 wings at Whiteman and Beale AFBs, respectively. The service is seeking to replace the much larger fleet of T-38Cs via the T-X acquisition program. But SAIC asserts that the Eclipse would be a more cost-effective replacement for the T-38A companion trainers, with an annual saving of $14.5 million at the U-2 wing alone, stemming from the fuel cost savings and the opportunity to train multiple pilots per sortie. ❑

A modified Eclipse 550 could save the USAF a significant investment in upgrading its current trainer to meet coming mandates.

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Big show heads to Las Vegas

by Matt Thurber

Since 2011, the annual NBAA Business Aviation Convention and Exhibition has bounced between Orlando, Fla., and Las Vegas because of the unique logistical requirements of the show, especially the need for a nearby airport that can safely accommodate almost 100 business jets on static display. This year the show returns to the Las Vegas Convention Center and Henderson Executive Airport from November 17 to 19, and already some interesting news and exciting events are on tap.

The static display at Henderson will feature more than 80 aircraft this year, and another 15 aircraft and two mockups at the indoor static display at the convention center. At the convention center static display Elliott Aviation will be showing, for the first time at a convention, its Hawker 400XP upgraded with a Garmin G5000 flight deck. All manner of OEMs are planning to highlight their products at the two static displays and in the exhibit hall, and not all are business jets and turboprops. Icon Aircraft is planning to bring its unique A5 amphibian to the show *(see article on page 66)*. This might seem an odd exhibit at a business aviation convention, but many NBAA attendees are smack in the middle of the target market for this highly appealing sport aircraft. **AIN** expects some other surprises at the static display this year, but lids are tight until the show opens on November 17.

Education Efforts

Safety is an important issue, as always, and NBAA has bracketed the show with two major safety-related events. On November 16, the association is hosting its annual Single Pilot Safety Standdown, open to both members and nonmembers. The focus this year is on loss of control in flight (LOC-I) incidents and accidents.

"This growing problem has been with us for some time, but it has not been sufficiently highlighted to gain the level of attention it deserves from our community," said Jim Lara, head of the NBAA Safety Committee's Single-Pilot Working Group. "This does not affect just the single-pilot operator; this is a universal problem that all business aircraft operators must address.

"Therefore, we are focusing on just this one issue to get everyone to recognize, prevent and handle LOC-I issues. We want to make this a personal issue for all concerned." Speakers include NTSB member Earl Weener; Paul "BJ" Ransbury, president and CEO of Aviation Performance Solutions; and Garmin engineer Noel Duerksen.

New this year is the National Safety Forum on November 19, the final day of the show. "The National Safety Forum is designed to bring together international business aviation leaders to engage in discussions with top FAA and NTSB officials so they can together address the major business aviation safety issues in an open forum," said NBAA Safety Committee chair Steve Charbonneau.

Confirmed opening speakers include NTSB chairman Christopher Hart and FAA director of accident investigation and prevention Wendell Griffin. In addition, the forum will include presentations by Flight Safety Foundation CEO Jon Beatty, International Business Aviation Council director general Kurt Edwards and members of the NBAA Safety Committee focus teams. Topics to be discussed at the forum will include runway excursions, fitness for duty, data sharing, professionalism and (in the aftermath of the Hanscom GIV crash) procedural compliance and airport and ground handling safety.

Earlier this year at the NBAA Schedulers & Dispatchers Conference, attendees were treated to an unusual event, a live emergency response simulation. The interactive drill proved popular, and Fireside Partners, which staged the event, is bringing it to the NBAA show on November 18 from 2 to 3 p.m. The simulation shows how an unprepared flight department handles a crisis, and it highlights the strong emotions and consequences that result when the company airplane is involved in an accident, including a poorly handled but all too realistic interaction with local media.

INGRID TAYLOR

Capt. Chesley Sullenberger will discuss his 2009 ditching in the Hudson in the context of professionalism, leadership and preparedness training.

Another pre-show educational session is offered by ServiceElements on November 15. Touted as "a full-day workshop designed to get the participants to think differently about teams and how they work," the session addresses issues such as finding new talent, team-building, creating an inclusive environment, project management and interactive roleplaying, breakout sessions and group discussions.

Other educational sessions cover myriad business aviation subjects, from the two-day NBAA Tax, Regulatory & Risk Management Conference on November 15 and 16 to Professional Development Program courses and sessions on domestic and international flight operations, weather, career issues, supersonic business jets, charter, lithium-ion batteries, unmanned aircraft systems and much more.

Dual Opening Days

The November 17 opening-day session will feature Gil Kerlikowske, Commissioner of U.S. Customs and Border Protection; U.S. Rep. Dina Titus (D-1-Nev.); FAA Administrator Michael Huerta; and Oklahoma Governor Mary Fallin.

Chesley "Sully" Sullenberger, who along with first officer Jeffrey Skiles ditched their Airbus A320 in the Hudson River in January 2009, will kick off the second-day opening session on November 18. "We've asked Capt. Sullenberger to speak about the relevance of the 2009 water landing, about the significance of that in terms of aviation safety, about leadership, professionalism and preparedness training," said NBAA president and CEO Ed Bolen. Nevada Lt. Gov. Mark Hutchison will also welcome attendees to the second-day opening session.

Also planned for the second-day opening session is announcement of the 2016 class of enshrinees in the National Aviation Hall of Fame and presentation of the NBAA Meritorious Service to Aviation Award to winglet czar Joe Clark.

At 6 p.m. on November 18, the NBAA/Corporate Angel Network Soiree kicks off at the Venetian Hotel Ballroom with a reception and silent auction, followed by dinner and then the live auction. The musical entertainment, featuring The Zippers, starts at 9:30 p.m. The Zippers got their start on the *StarSearch* TV show, and their specialty is performing music from the Top 40 Dance Hits list to '80s Dance Hits to the Fabulous '50s.

Expect a ramp chock full of airplanes at Henderson Executive. The airport will host some 80 display aircraft during the show. In addition, the convention hall will house another 15 aircraft and two mock-ups.

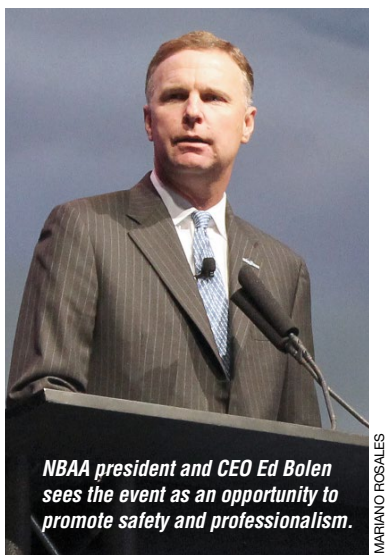
With the FAA funded through March 31, 2016, and the threat of a government shutdown deferred until December 11, some pressure has been relieved and this year's NBAA show can focus less on dysfunction in D.C. and more on business aviation, although the association remains vigilant on the funding front.

Issues Du Jour

"I think NBAA shows have a variety of different components," said Bolen. "[Some] that always drive a lot of attention are clearly new products, new technologies and services. In a lot of ways that's always the real story at any NBAA event–what is new–and our expectation is that there will be some exciting announcements.

"In addition to that, we try to use the convention as an opportunity for NBAA to help educate our members about what is going on in the world around them and how they can consistently learn from each other–best practices and ideas. That includes the areas of safety and security."

Bolen is excited about bringing the emergency response simulation to a wider audience. "We're taking what we thought was a meaningful interactive event and making sure it wasn't a one-time thing. We're using this as an opportunity to help people make sure that they're prepared. Safety is going to be very much a focus of the convention, especially emergency response."



NBAA president and CEO Ed Bolen sees the event as an opportunity to promote safety and professionalism.

MARIANO ROSALES

The issue of attracting new talent to business aviation is perennial, and NBAA is hearing from members having trouble finding qualified personnel. At a meeting with business aviation leaders in September, Bolen said, "Those companies were struggling with finding pilots and retaining pilots. There has been talk for decades about the impending pilot shortage. Over time there was a sense of, 'Well, it's always talked about and maybe it never comes,' but my sense is that people now are feeling it. With the growth of commercial aviation worldwide, it seems we're at a point where there is more demand than there is pilot capacity. And if some of NBAA's largest operators are feeling it, then it must be affecting all the membership."

To help introduce young people to business aviation, there are a number of events on November 19 for the Careers in Business Aviation Day. "We continue to build on career day," he said, "and we're going to be working with a lot of students to encourage new people to get into our industry.

MARIANO ROSALES

The annual convention offers plenty of education sessions on issues ranging from safety to legislation, but for many attendees the show floor is the center of the action. It is in the halls that attendees see new products and technologies and get deals done.

"We expect it to be a great show driven by technologies, products and services that are being introduced, the opportunity for the industry to continue to raise the bar in terms of professionalism and in terms of safety, communicate with government officials and cultivate that next generation," Bolen concluded. "It's a big agenda over a relatively short period of time, but we're really excited about the way this has come together." ❑

Amac expands footprint with another mx hangar

by Charles Alcock

Building on its reputation as a completions specialist, Switzerland-based Amac Aerospace is taking on a growing portfolio of maintenance work. The company expanded the scope of its work when it secured FAA repair station status in June and will open a fourth hangar at its Basel headquarters by year-end.

So far this year, Amac's maintenance team has been busy handling heavy base checks for a mix of airliner-class private and head-of-state aircraft, including a pair of Airbus A320s, an A340, an A330-200, an A319, a couple of Boeing Business Jets and a 777-200. It has also worked on a Bombardier Global Express operated by a head-of-state flight department.

Amac Aerospace is expanding its Basel, Switzerland headquarters with the addition of a fourth hangar. As well as completions projects, it provides maintenance for larger private jets.

In many cases, owners elect to combine maintenance with projects to improve cabin interiors and the installation of new equipment. For instance, in late September, a private A320 arrived in Basel for a landing-gear overhaul and seat refurbishment. Another A320 operator took advantage of a heavy base maintenance check to upgrade the aircraft's satellite communications and cabin connectivity.

Like a lot of non-U.S. maintenance providers, Amac faced a long delay in getting FAA-approved repair station status rooted in U.S. government restrictions imposed on foreign repair stations. "When this policy changed there was a long line of companies trying to get approved, and so we had to wait," explained Amac COO Bernd Schramm. In the end, the approval did not involve any significant additional requirements beyond the company's existing EASA certification.

The U.S. approval for the company's Basel headquarters covers the same aircraft types: a mix of Airbus, Boeing, Bombardier and Gulfstream jets. It clears Amac to support N-registered aircraft based in Europe or being operated outside the U.S. Separately, Amac's facility in Istanbul, Turkey, is currently awaiting FAA clearance.

Amac aspires to authorized service center status with one or more business aircraft manufacturers, but Schramm acknowledged that these OEMs are generally reluctant to add too many more new facilities in the same region. "On the completions side of our business we have established a good name for Amac and have shown that we can deliver high-quality projects on time," he told **AIN**. "The same level of service is available for maintenance work and our customers feel they are in good hands." ❑

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LOC-I prevention efforts encompass training, tech

by Kerry Lynch

The aviation industry has come together in a multipronged effort to attack one of general aviation's most pervasive safety problems: in-flight loss of control (LOC-I).

Statistics point to LOC-I as the leading killer in fixed-wing accidents, dwarfing all the other major categories. From 2008 to 2014, LOC-I played a role in 46.4 percent of all fatal accidents and 45.8 percent of fatalities from fixed-wing aircraft crashes. The overwhelming majority of the LOC-I fatal accidents involved general aviation flights operated under Part 91 for personal reasons. And while flight into poor weather is often thought of as a typical cause, only 12 percent involved instrument meteorological conditions.

The NTSB added prevention of general aviation loss of control in flight to its Most Wanted List of Transportation Safety Improvements this year "in response to some alarming trends in crash statistics," NTSB member Earl Weener said.

The good news, Weener told **AIN**, is the level of attention the issue is getting across the industry. The harder part is what to do about it.

Weener recently presided over a day-long forum to delve into human performance, training and equipment factors that either play into or could help prevent LOC-I accidents. The forum drew a cross section of safety specialists from government, academia, manufacturers, flying clubs and general aviation organizations.

The general aviation community, through the General Aviation-Joint Steering Committee (GA-JSC), began to take a data-driven approach to analyzing accidents in 2011, similar to that taken by the Commercial Aviation Safety Team. "But we are at the very beginning of the journey," said Wendell Griffin, director of the FAA's Office of Accident Investigation & Prevention and co-chair of the GA-JSC.

Culture Changes

Examining the data, the committee has devised 33 "safety enhancements" that are either now in place or under way to tackle general aviation safety, including LOC-I accidents. Chief among them is the Fly Safe Campaign, a massive community outreach initiative deployed by nearly 2,500 volunteers to disseminate safety messages. He estimated that these efforts have reached 1.6 million people.

GA-JSC participants have looked at safety outreach as the quickest, easiest way to reach the pilot community. While it might rank as low-hanging fruit, it is important as a mechanism to change pilot habits and culture. "At its core, loss of control is a human performance issue," Weener said. "It takes only one moment of inattention, a miscalculation or a mistake to precipitate a loss of control in flight."

Participants agreed that the bedrock culture of pilots has to change if the tide of LOC-I accidents is to be turned. "This is our biggest challenge," said Sean Elliott, vice president of advocacy and safety for the EAA. "The way to change behavior is to change the culture. That is what we have ahead of us," he said.

A number of researchers have studied the human-factors role involved with use of various technologies in the cockpit and how it could play into accidents such as LOC-I. Frederic Dehais, professor with the Institut Superieur de l'Aeronautique et de l'Espace, cited studies showing that pilots

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LOC-I prevention

▶ *Continued from page 38*

who get aural warnings do exactly the opposite of what they are expected to. "They are supposed to pull on the stick and they push." Other studies show pilots simply ignoring the warnings.

Colorado State University professor Christopher Wickens said aural warnings can create a "startle" effect, introducing or intensifying stress and impairing decision-making, particularly in the context of LOC-I. He favors a command-based system rather than a simple aural warning.

Panelists at the NTSB forum suggested a fresh approach to training. "Pilot training is stuck in the 1970s," said George Perry, senior v-p at AOPA and head of the association's Air Safety Institute, noting a lack of simulator training and absence of attention to angle of attack (AOA) and a stabilized approach in training documents.

The Society of Aviation and Flight Educators (Safe) has launched a "Learn to Turn" initiative because "pilots remain unconsciously incompetent with regard to flight," said Rich Stowell, a master aerobatic instructor with Safe. "[Pilots] believed their training would teach them how to maneuver an airplane and we failed them. We have a training delivery problem," Stowell said, noting that LOC-I frequently occurs in maneuvering phases.

In surveys, pilots were asked what happens while an airplane turns. One-quarter answered that the rudder makes the airplane turn, even though core pilot training publications make it clear that the rudder does not turn the airplane. "It's no wonder that loss of control while maneuvering is the top reason for fatal accidents. The pilot is miscommunicating with the airplane," Stowell said.

Stasi Poulos, president of simulation and training specialist Mindstar Aviation, noted that the company established a simulation experience to show pilots how to recognize the potential for LOC-I in an inadvertent transition from VMC into IMC. "We should be getting people to recognize these problems in simulators long before they get into the real airplane," Poulos said.

The FAA and industry have been drafting new airman certification standards to reflect the evolving environment. Those standards are currently being prototyped, and officials hope to release them next year.

Embrace Technology

While the FAA collaborates with industry on cultural and training changes, Weener sees technology improvements as "the most desired" approach to solving loss of control. Pointing to other technological successes such as ground proximity warning systems, he said, "If you can solve the issue with technology, then you don't have to change behavior."

The ASTM F44 international standards committee is turning its attention to follow-on technologies for stall warning, now that the FAA has paved the way for easier installation of AOA indicators. The committee is looking at "version two," which might include some tactile warning for stall warning. The committee is exploring concepts such as low-cost vibration technologies that could either augment an AOA or be incorporated as a multi-mode stall warning system.

As for the AOA indications, attendees at the forum discussed a need to standardize the displays. Dennis Berringer, senior scientist for flight-crew performance research in the FAA's CAMI Human Factors Laboratory, noted a lack of specific display standards for AOAs in the aftermarket. "We need to put into place display standards for these things to make sure they are effective across the board," he said. Steve Jacobson, senior v-p for product development at Avidyne, said he could see avionics manufacturers making AOAs standard equipment in their avionics suites in the future. ❑

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Pilot Report:

Citation M2

by Matt Thurber

This Citation is turning out to be a best-seller

Since entering service in 2013, the $4.5 million Citation M2 has garnered a significant share of the light jet market and even of Textron Aviation's own smaller jet series. The M2 is the newest member of the CitationJet (525) series, and 12 were delivered in 2013, even though certification was not awarded until late that year; during its first full year of production last year, 46 M2s were delivered. This year is off to a slower start, but in the first half Textron Aviation delivered 17 M2s, the most of any of the CitationJet line and 12 more than the five Mustangs that were delivered.

Although 2015 is off to a decent start for the Mustang, the last year that the Mustang saw significant deliveries was in 2013, with 20 joining the fleet. What these numbers seem to show is that the M2 has taken over as the entry-level airplane of choice for owner-pilots moving up to a light jet. The M2 program was announced in 2011, the same year that production of the CJ1+ ended.

What makes the M2 so attractive has a lot to do with the performance improvements it has over the original CJ1. The CJ1+'s and M2's 1,965-pound-thrust, dual-channel Fadec-controlled Williams FJ44-1AP introduced light jet pilots to greatly improved climb performance. The non-Fadec FJ44-powered CJ1 took about 58 minutes, including a step, to climb to FL410, while the M2 (its engine is the FJ44-1AP-21) can climb to FL410 (maximum altitude) directly in just 24 minutes.

And while the M2 looks a lot like a refreshed CJ1+, it outperforms the CJ1+, with a maximum cruise speed of 404 versus 389 ktas, and offers more pilot leg room, touchscreen-controlled Garmin G3000 avionics, a newly designed interior and winglets.

Simple Systems

The M2's systems, like those of all the smaller Citations, are simple and reliable. The flight controls are cable- and pushrod-actuated, and a 1,500-psi open-center hydraulic system moves the flaps and speed brakes. Tabs on the ailerons, elevator and rudder are used for trim, and pitch trim is operated by a switch on the yoke or a mechanical wheel on the center console. Aileron and rudder trim controls occupy the aft end of the center console.

The trailing-link landing gear is held retracted by uplocks, which in a landing-gear emergency are released to allow the gear to freefall. The extended gear is then locked in place by nitrogen blow-down.

The wings hold 492 gallons or 3,296 pounds of fuel, and there is no need for fuel anti-icing additives such as Prist because an oil heat exchanger warms the fuel. Fuel filling is typical CitationJet, via filler caps on each wing (although the CJ4 does have single-point refueling).

Dual 24-volt, 300-amp starter-generators power the electrical system. Further simplifying the electrics is a second independent battery mounted in the nose. This allows M2 pilots to switch on all the avionics before engine start to set up flight plans, check weather and obtain clearances. An added benefit of the auxiliary battery is the extra power it contributes during an electrical system emergency, providing one hour instead of the typical 30 minutes. While buyers can opt for a Nicad main-ship battery, the nose aux battery is a lead-acid type.

The automatic pressurization system is easy to manage with the G3000 avionics, and it knows exactly how to schedule the cabin climb and descent when a destination is programmed into the flight plan.

MATT THURBER

MATT THURBER

The Garmin 3000 is well suited for single-pilot operations, and the pilot can reach the touchscreen controls from either seat. The trimmed-down center console houses the power levers, flaps lever and trim controls.

Bleed-air heat exchangers and a vapor-cycle air-conditioning system provide environmental control, the same as all CitationJets through the CJ3+. The air-conditioning system can be run on the ground using a ground power unit or it can be switched on as soon as the right engine starts because the compressor is mounted on that engine. The compressor shuts off briefly during left engine start. With an 8.5-psi differential, the pressurization system maintains a sea-level cabin to 21,280 feet, and at the maximum operating altitude of 41,000 feet the cabin is at 8,000 feet.

There are two external baggage compartments in the M2: in the nose 20 cu ft/400 pounds and in the tailcone 30 cu ft/325 pounds. A ski tube for the tailcone is optional. While the tailcone baggage compartment isn't heated or pressurized, it does receive some warm air from the outflow valves.

Airframe de-icing is provided by bleed-air in the wing leading edges, which helps maintain the wings' laminar flow, and rubber boots on the empennage, which saves weight in the tail. The boots work fine, according to demo pilot Tony Paolucci, and the only limitation is that they can't be switched on if the ram-air temperature is -35 degrees C or lower. "The [wing's] heated leading edge is a big selling point," he said.

Textron Aviation says it is on a mission to make maintenance easier, and the M2 incorporates features that should help drive down maintenance costs. "We talked to the service centers," said JD Terry, Textron Aviation's business leader for jets, "and asked them, 'What are the pain points?'"

An example is the lightning diverter strips on the radome; some OEMs are embedding these strips into the composite material of the radome so it looks smoother, but bonding the strips on the outside of the radome makes repairs less expensive, he explained. The angle-of-attack vane is an all-in-one unit removable from the outside of the airplane, and thus needs no time-consuming and costly disassembly of interior panels and cabinets. "These features are based on maintenance feedback," he said.

The nosewheel turns up to 20 degrees using the rudder pedals, then casters past that with application of power and brakes, up to 65 degrees. "You can turn around on a 50-foot-wide runway," Terry said.

Cabin Comforts

The M2's cabin width (58 inches) and height (57 inches in a drop-aisle) haven't changed from the CJ1 through CJ4, but compared with the Mustang the M2 is 15 inches longer, three inches wider and three inches taller, which adds comfort for passengers, especially in the four-club main seating area. A belted toilet seat is available, as is a side-facing seat up front, for a total of six passengers plus two pilots or seven passengers and one pilot. The flushing lavatory must be serviced from inside the airplane.

An acoustic buffer seal around the entry door keeps noise levels low, and bagged insulation installed on the fuselage interior also helps hush the ride.

The cabin entry stair is equipped with three steps instead of the typical two, which makes climbing on board easier for pets and for passengers wearing high heels. This entry stair is also found on newer CitationJets. The steps fold in half as the stair is pulled up, and a gas spring keeps the steps from banging down when the top half of the stair is lowered after opening the door, with rubber insulators protecting parts from banging together. There is no weight limit for the steps.

The M2 cabin features a four-club main seating area plus seating for another two passengers and two pilots.

The lavatory area can be enclosed by an optional dual-side hard wall or a curtain. With the curtain option, the right rear-seat occupant can recline the seat farther. Both sides of the club seating area are equipped with 115-volt power outlets. Next to each passenger seat is a headphone and microphone plug to tap into the intercom, although the noise levels are so low that this is rarely necessary. Textron Aviation's Clairity wireless cabin management system is an option for the M2.

Galley cabinets on the front left side of the cabin are available in two sizes. The larger cabinet can accommodate a coffee pot, while the smaller cabinet provides more space for the pilot seat to move.

Cockpit Features

CitationJets and particularly the M2 are designed for owner-pilots and pilots flying without a copilot, and the Garmin G3000 flight deck is particularly well suited to that mission. Comparing the M2 cockpit to that of the CJ1+ illustrates some key differences, particularly the shrinking center console. In the CJ1+ the console dominates, with a large FMS taking up a lot of space between the seats, flanked by knobs and switches. The Rockwell Collins Pro Line 21 displays, in portrait orientation, don't fill that much panel space on the CJ1+, and there is a lot of empty area.

In the M2, the center console is considerably smaller, primarily a place to house the power levers, flap lever and trim controls. At the front end of the console where it meets the instrument panel, two Garmin GTC 570 touchscreen controllers are angled for easy reach from either front seat. The G3000 FMS is essentially incorporated inside the avionics, and the interface is the much more intuitive touchscreens.

With most systems controls embedded in the G3000 avionics, many knobs and switches are eliminated, for a much cleaner cockpit. Each pilot has a GCU 275 display controller mounted under the glareshield, with a single flight director/autopilot mode controller in the center. An L-3 Avionics ESI-1000 Trilogy standby display is mounted next to the pilot's GCU 275. The display controller is somewhat redundant in that most of its capabilities are mirrored in the GTC 570 touchscreen controllers, although it is handy to use the GCU 275 to manage the G3000 primary flight display (PFD) inset display. The GCU 275s also act as mechanical

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During AIN*'s demo flight, the M2 took off nearly 1,000 pounds shy of the airplane's 10,700 mtow.*

Pilot Report: Citation M2

▶ Continued from preceding page

backups for the touchscreens.

Three 14.1-inch displays with WXGA (1,280- x 800-pixel resolution) fill the available instrument panel space, with a PFD for each front seat and a multifunction display (MFD) in the middle. Reading charts without zooming is easier on the higher-resolution G3000 displays in the M2 than on the lower-resolution G1000 displays in the Mustang. The G3000 screens can be split to show a two-thirds and one-third screen on the PFD or two half vertical strips alongside the engine indicating strip on the MFD, giving pilots a lot of flexibility for display formatting. Pilots can save their favorite profiles, including a choice of male or female annunciations and screen layout choices, and call them up with a simple preferences selection on the touchscreen controller.

The G3000 displays not only offer higher resolution than the G1000 displays in the Mustang, but their sizes differ, too. In the Mustang a 15-inch MFD is flanked by two 10.4-inch PFDs, and this gives the Mustang's glareshield a taller look than in the M2. Visibility in the M2 is excellent; the glareshield is a smooth curve from side to side, in marked contrast to the Mustang glareshield's bulging center.

The solid-state Garmin GWX 70 radar and Sirius XM WX in the M2 provide pilots with more flexibility, in that it's possible to overlay weather radar or Nexrad imagery onto the moving map (but not both at the same time). Or the pilot can display Nexrad on the PFD and weather radar on the MFD to compare the strategic and tactical views simultaneously. With two pilots up front, each can independently control the GWX 70's tilt and range.

The M2 has two angle-of-attack indicators, one above the glareshield in the center with the green "donut" indicator for ref speed and another small indicator on the PFD below the airspeed tape.

Flying the M2

When I climbed into the left seat of the M2, Paolucci showed me how the smaller center console makes entry easier. Compared with the console in the CitationJets equipped with the Pro Line avionics, the M2 console is four to six inches shorter, but it is also sculpted to be smaller where possible, and I was thus able to slide my feet between the bottom of the console and the seat, instead of having to step over to get my feet in front of the seat. This is a welcome feature and shows great attention to detail.

The M2 seems to be establishing itself as the entry-level airplane of choice for Cessna owner-pilots moving up to a jet.

Other design details revealed themselves, including a cellphone holder forward of the power levers and the leather-wrapped yoke that has become standard in Citations.

We crafted a flight plan to take us west of Wichita and up to FL410. At a basic operating weight of 7,239 pounds and with 2,550 pounds of fuel and no passengers, our taxi weight was 9,789 pounds. Less 50 pounds of fuel for taxi, takeoff weight was 9,739 pounds, nearly 1,000 pounds below the 10,700-pound maximum takeoff weight.

To start the FJ44s, push the button on the center console, then move the throttle off the cutoff gate and back to idle. We had to set the speed bugs because the performance software is not available yet for the G3000. Paolucci said this feature will be added in an upcoming software update. Paolucci prefers to use the M2's simplified criteria for basic performance calculations, but iPad apps are also available for more detailed performance information if needed. At this weight, V_1 was a low 105, V_R 107 and V_2 111 kias.

The wind was from 170 at 13 knots, and I taxied the M2 to Runway 19L. The outside air temperature was warmer than normal, ISA +15 to +13 through the mid-thirties, so the climb was slower than it would have been at lower temperatures.

From the left seat the M2 wears comfortably, one of those airplanes that makes the pilot feel instantly at home. The nosewheel responds crisply and the steel-disc anti-skid brakes, powered by a separate electrically powered hydraulic pump, are solid.

Fadec makes it easy for a single pilot to set power on takeoff: just find the takeoff detent for the power levers and leave them alone until it's time to pull back to climb power, one detent below the takeoff setting. The engines gave us a quick push and it wasn't long before it was time to rotate and accelerate to the initial climb speed of 220 kias. Takeoff field length at our weight was just over 3,000 feet, according to the planning guide.

It took about 12 minutes to climb to FL230, where we had to turn on the wing/engine heat while penetrating some clouds, and this took the climb rate below 1,000 fpm. The rate built back to 1,200 fpm after we emerged from the clouds at FL280, even with the OAT at ISA +14 degrees C.

We decided to level off at FL400, a level we reached 29 minutes from takeoff. The OAT had dropped to ISA +2 degrees C. With power set at max cruise, the M2 settled down to 394 ktas and Mach 0.683, burning about 720 pph. This was about four knots faster than the book numbers. There is no detent to set the power levers in long-range cruise, but the book showed that pulling the power back would yield 318 ktas and about 500 pph. Paolucci said that it's hardly worth flying so much slower to save 200 pph of fuel, and most M2 pilots stick with the high-speed cruise detent, unless more range is truly necessary.

After the performance check at FL400, we descended to 13,500 feet. I flew steep 360-degree turns to the left and right, which are made easier by positioning the flight path vector on the G3000 PFD right on the horizon line. The M2 handles like most other Citations, which means it is never too light on the controls and enjoyably comfortable to hand fly.

I slowed down for a clean stall and recovery; the M2 has a stall shaker, and I held the stall into the shaker, and the ailerons were still effective, thanks to stall strips on the wing leading edges. There was no tendency for either wing to drop. Adding 50 percent N_1, extending full flaps and deploying the landing gear, I slowed down to try a simulated approach-to-landing stall, and it was similarly uneventful.

Returning to Wichita, I hand-flew the ILS to Runway 19L. With relatively low approach speeds, the M2 in the terminal environment feels like a much smaller airplane, and this is part of its attraction as a move-up airplane for owners of high-performance piston singles and single- and twin-engine turboprops. VREF was about 104 kias, and the M2 felt like it was on rails once trimmed.

Paolucci explained that the straight-wing M2 is a little more tolerant of not being exactly on ref speed during the landing, but it is important not to let it float after leveling off in the flare. I hardly felt like I had to raise the nose at all before the mains touched down gently, then after lowering the nose, he raised the flaps to the takeoff position and I added power for the touch-and-go. The second and final landing was just like the first, and the anti-skid brakes helped me slow quickly to make the turn back to the Textron Aviation hangars. We could have used the M2's 60-degree ground-flap setting and speed brakes to shorten the rollout even further, and this can be done as soon as the mainwheels touch.

After flying the M2 for 1.5 hours, I felt it wouldn't take much more training to feel safe in this capable jet. While the M2 is one of the smallest Citations, it manages to deliver a lot of performance and flexibility for a sub-$5-million jet that can carry up to seven passengers. The ability to climb quickly to FL410 is helpful for getting on top of weather, although the top speed of 404 ktas comes at FL330. With full fuel, maximum no-crew payload is 704 pounds, and that allows a range of 1,300 nm (NBAA IFR, 100-nm alternate) or 1,580 nm at long-range cruise speed.

More than 1,600 CitationJets have been delivered since the first one entered service in 1993, and new versions like the M2 will undoubtedly keep the series flying long into the future. ❑

Citation M2 Performance & Specs

Price (typically completed and equipped)	$4.5 million
Engine (2)	Williams International FJ44-1AP-21, 1,965 lbs ea
Passengers (typical)	1 crew + 6 pax
Range (w/NBAA reserves, 100-nm alternate)	1,300 nm at 392 ktas
High-speed cruise	404 ktas
Long-range cruise	336 ktas
Fuel capacity	3,296 lbs
Max payload w/full fuel	704 lbs
Maximum operating altitude	41,000 ft
Cabin altitude at ceiling	8,000 ft
Max takeoff weight	10,700 lbs
Balanced field length at mtow (sea level, standard)	3,250 ft
Landing distance	2,590 ft
Length	42.6 ft
Wingspan	47.0 ft
Height	13.9 ft
Cabin	Volume: 198 cu ft
	Width: 4.8 ft
	Height: 4.75 ft
	Length (seating area): 11.0 ft
Baggage capacity	50 cu ft/725 lbs
FAA certification (basis, date)	FAR Part 23, 12/23/13
Number built	75 (2H/15)

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Under a recently approved plan, the runway at Aspen-Pitkin will be moved to the west, widened and strengthened, allowing the airport to meet the current Group III design and accommodate the largest bizjets.

With proposed development, Aspen fit for largest bizjets

by Curt Epstein

Officials in Colorado took a major step toward determining the future of Aspen-Pitkin County Airport (ASE) at a recent county board of commissioners meeting when they voted to approve one of 18 airport layout plans (ALP) for the development of the airport. Group III airport design requires at least 400-foot separation between the runway centerline and the taxiway centerline. With only 320 feet of separation, the airport has been operating for the past decade under an FAA-granted modification to standard. As a result, the maximum wingspan allowed there was 95 feet, not the 118 feet permitted by the Group III standard. While that limit allows operations by the Global 5000 and 6000 and G550, which span 94 feet, it excludes the G650, which exceeds the modified standard by more than four feet, and the future Global 7000 and 8000, which will span 104 feet.

An Eye to the Future

While that exclusion concerns the area's well heeled residents and visitors, the plan the County has set in motion is concerned mainly with ASE's future viability, as it seeks to avoid any disruption to scheduled commercial service, according to airport director John Kinney. "The workhorse aircraft here, the Q400 and the CRJ700, are going to be retiring, mostly by 2025," he told **AIN**. "The majority of regional jets coming on board have a wingspan greater than 95 feet." According to Kinney, the FAA has emphasized it prefers that any AIP grant-assisted development plans at the airport be aimed at achieving full Class III status, to allow these new aircraft to operate safely there.

The final proposal, 8A, as approved by the Pitkin County Board of Commissioners, includes relocating the airport's 8,000-foot single runway 80 feet to the west, widening it to 150 feet from 100 feet, and raising its weight-bearing capacity to 150,000 pounds from 100,000 pounds. The $90 million project includes construction of an 80,000-sq-ft commercial terminal to replace the existing 40-year-old 17,500-sq-ft structure.

The plan approval now triggers an 18- to 20-month environmental assessment (EA) that airport officials hope will find no significant impact. A large part of the EA will involve feedback from the local community, among them business jet owners and operators. "We're talking with people who have primary or secondary residences in this community and can't bring the jet into their backyard," Kinney said. Among the issues the EA will address will be the suitability of larger aircraft such as the Boeing 737 (which spans 117 feet, five inches with winglets) and the similarly sized Airbus A320 operating at ASE after the runway improvement. "Can it physically fit in the box? Yes, but can it operate at these altitudes?" questioned Kinney, referring to the airport's challenging terrain and the performance requirements for a single-engine missed approach.

Kinney is confident that funding for the project will be available at the successful conclusion of the EA process. "I've never seen the FAA leave an airport standing at the altar when it comes to the character of the airport being changed or scheduled service being interrupted because grant funds were not delivered in a timely way," he said. "Even if we decided to push the button today, and say we are going to develop and modernize the runway and the FAA pushed a bucket of money right toward us, what we are doing today [launching the EA phase of the project] is exactly what we would be doing if they presented the money to us tomorrow." If all goes according to plan, the project is slated to break ground in 2018, for completion around 2025.

The selection of Plan 8A, and its stated priorities of runway improvement and the construction of a new terminal, also puts a hold of at least 10 years on proposed development of the west side of the airport, including the establishment of a second FBO, a discussion that has churned for the past several years, as it would involve the rerouting of a local road. ❑

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Tankering benefits tangible and achievable

by Matt Thurber

Although jet-fuel prices are lower because of the dramatic drop in the price of oil, operators of airplanes that can carry large loads of fuel, especially the increasingly popular ultra-long-range Globals and Gulfstreams, may benefit from tankering low-cost fuel instead of carrying just the amount of fuel and reserves needed for a particular flight. For many business jet owners, it is precisely the flexibility that long-range jets offer that makes these chariots popular.

Yet pilots often struggle with deciding whether it makes sense to carry extra cheap fuel or to fly the fuel tanks down to a healthy reserve without carrying around the extra weight of apparently cheaper fuel.

There are many ways to approach this conundrum, from tried-and-true and not-so-true rules of thumb to complicated calculations aided by sophisticated software. The advent of cheap computer power and ubiquitous Internet connectivity has led to systems such as Fuelerlinx's tankering calculator, which incorporates real-time fuel pricing and fees to provide tankering go/no-go advice for unlimited trip legs. Other tools pilots use include CAVU's EFB-Pro performance-calculating iPad app, which includes a tankering module, and a relatively simple-to-use iPhone app–AvFuelSaver–developed by Specific Range Solutions.

AIN asked business jet OEMs if they provide specific information to operators about tankering; most said that they do not publish tankering advice. Gulfstream does offer information in its flight manuals. According to the company, "We provide fuel tankering information for our large-cabin operators in the Airplane Operating Manual Chapter 11 (Preflight Planning and Performance). This section includes break-even fuel-cost ratios between destination and origin for given route speeds and flight duration. They are found specifically in section 11-07."

Burn It Off

The simplest way to start thinking about tankering is with the burn-off percentage, often referred to as the tankering rule of thumb. A typical burn-off percentage is 4 percent, and that means that for every unneeded 100 pounds of fuel carried, the aircraft will burn an extra four pounds. Some pilots use 3 percent, but the point is that there are penalties for carrying excess fuel, and that penalty is not only the elevated fuel burn but also more wear and tear on engines, which might require more power to propel excess weight; the effect on climb rates and the ability to reach optimum cruising altitudes at higher temperatures; longer takeoff and landing distance; and possible additional wear on the landing gear and brakes.

Corporate pilot Bart Gault, who flies all over the world, considers these and other factors when deciding whether to tanker fuel. He considers the following:

- price of fuel at departure and destinations
- does destination have fuel? (I have gone to locales that do not have sufficient jet-A)
- estimated fuel burns at the various weights with cost calculations and differences
- takeoff runway requirements–conditions (wet runways/icing), altitude, length (Part 25 FAR)
- alternate fuel needs
- landing requirements–conditions (wet runways/icing), altitude, length (Part 25 and 135)
- and parking and handling fees

With those considerations in mind, he said, "one does a numeric calculation to ascertain the necessity of tankering and compares cost."

In a 2010 NBAA presentation about saving money on fuel, Specific Range Solutions owner and engineer Omer Majeed explained the tankering calculation that his company has developed.

According to Majeed's presentation, "Payload burns the equivalent of 2.5 to 5 percent of its weight in fuel per flight hour, depending on the aircraft and the flight conditions. The payload percent fuel burn is therefore purely a function of time.

"Carrying 1,000 pounds of fuel for a two-hour flight means 8 percent in carried fuel, or 80 pounds [4 percent/hour times two hours]. Therefore, the fuel at the arrival airport must be less than 8 percent cheaper than the price of the payload fuel to justify tankering in the fuel.

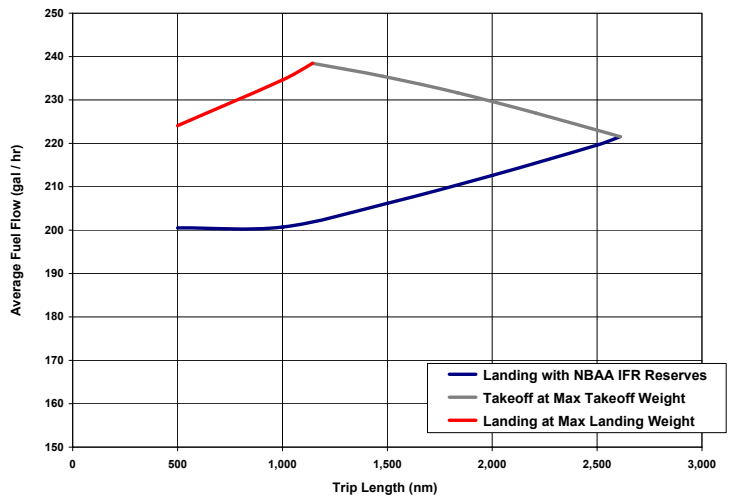
"Per the above formula, tankering favors shorter legs as opposed to longer ones. The facility and other fees must also be taken into consideration in the price analysis." In other words, for a shorter flight, tankering has a lower impact on the overall cost of the flight. When calculating the burn-off percentage per hour, as Majeed does, for a longer flight the cost impact of tankering necessarily is much higher, and the savings at the destination would have to be higher to justify tankering.

Majeed's iPhone app, AvFuelSaver, costs $1.99 and is available in the Apple Store. The app is relatively simple and calculates a tankering savings for a two-leg trip, comparing tankering fuel versus uploading fuel for each leg.

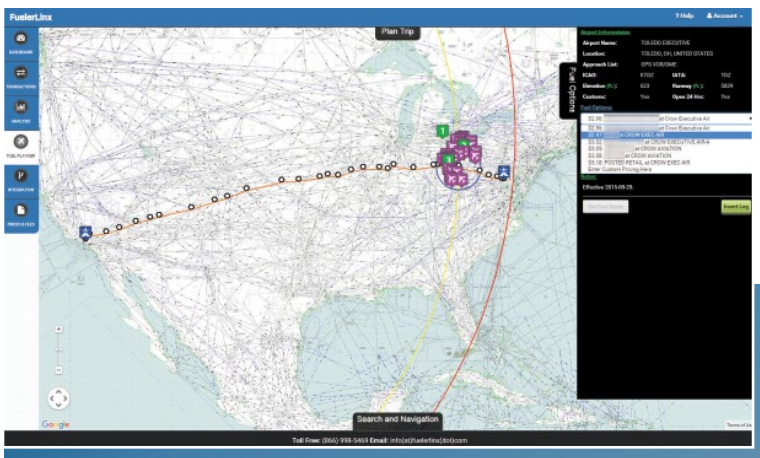
Aviation cost analysis company Conklin & de Decker has looked at the tankering situation and generally advises, "Buying fuel at home base for less than on the road can keep your average fuel cost down." However, the company added, "There is a caveat to this. Carrying extra weight causes you to burn more fuel because climb times are longer and cruise fuel burn is higher. In a Citation II, a thousand extra pounds raises your fuel flow at altitude by about 8 percent."

Conklin & de Decker illustrates the tankering decision using the chart above for an actual

Fuel Flow Versus Tankering and Speed



Conklin & de Decker generally advises that tankering fuel from home can help keep costs in check. This chart reflects the fuel burn versus range for an unspecified midsize jet. In this case tankering makes sense only if the operator saves 15 percent on fuel.



Tankering fuel is an option for operators of long-range aircraft who want to ensure they are getting the best possible price. A number of software options, such as FuelerLinx, are available to simplify the decision.

midsize jet (type not specified). "The chart above shows average fuel burn versus range for either (a) carrying the required fuel plus reserves or (b) carrying as much fuel as the aircraft will allow for the trip to be flown. Note that in the middle, for a 900-nm trip at Mach 0.80, you will burn an average 17 percent more fuel if you carry extra fuel from the home station. For the aircraft in the chart above, you'd better save about 15 percent or more in fuel cost per gallon before you consider tankering fuel."

iPad Calculator

CAVU Companies includes a tankering calculator in its EFB-Pro iPad app, but its approach is to keep the process simple and avoid adding too many variables. The way EFB-Pro does this is by limiting the tankering calculation to a single leg.

"There are different ways of looking at how to do tankering," said CAVU president James Deuvall. "We got a lot of input from a lot of people, asked questions and listened." While he acknowledges that some people won't buy EFB-Pro because it doesn't look beyond one leg for tankering, he believes that there are too many variables involved with factoring in additional airports, especially when destinations change during a long multi-leg trip.

"I don't know how in the world you'd run that calculation," he said. "It wouldn't be practical day-to-day. Our premise is that you're taking off and going somewhere else, and we limit tankering to that segment."

The variables that EFB-Pro does consider include takeoff weight, altitude, temperature, speed, destination fuel price and how much fuel must be purchased to eliminate a ramp fee. "We take the view that you can take off with fuel you buy at a discount, but you have to pay for delivery of that fuel to a new location because it weighs down your airplane," he explained. "With those parameters, we give a side-by-side analysis of what is the best solution for each number of gallons that you're going to have remaining after you pull up to the terminal at your destination."

Deuvall said that EFB-Pro sometimes delivers results that show that tankering isn't always the best choice. "The price is really one variable but not the only variable," he said. "We've gotten results that completely surprised people." This happens usually when the time in the air is longer because of headwinds, and in these cases, even a $2 fuel price difference doesn't make tankering worthwhile. "As you run the calculation, there is usually a bell curve where it makes sense to tanker for a while," he said, "then it levels off then makes sense to buy at the other end, depending on the price savings."

Typical EFB-Pro customers using the tankering calculator are flying midsize and larger jets, according to Deuvall, although even CitationJet and King Air pilots have asked about tankering.

Viewing the Falcon 50 in the EFB-Pro app as an example shows that at a takeoff weight of 35,000 pounds and cruising at above ISA temperature at FL350 for a 4.5-hour flight could yield savings of $860 by purchasing 884 pounds of fuel at $4/gallon at the departure point versus paying $7/gallon at the destination. This takes into account a minimum purchase of 300 gallons to secure a $500 rebate. Removing the rebate (which could also be considered a ramp fee), the money saved by buying the 884 pounds jumps to $1,360. This is a somewhat extreme case, with a fuel price difference of $3/gallon, but prices these days are volatile, and at some larger metropolitan airports, jet-A prices remain quite high.

"We came across many conditions where if crews use the rule-of-thumb they actually hurt themselves," Deuvall said. "In reality tankering would cost them more than the savings."

EFB-Pro doesn't take into account intangible costs such as running engines longer at higher power settings. "You can go to insanity with this stuff. It gets a little bit nuts," he said.

In any case, there are other considerations besides pure savings on fuel. "Choose the FBO based on the service and total cost of the stop," Deuvall explained, "not just the cost per gallon. If you save 50 cents per gallon but get mediocre service and pay to park, for using the flight planning room and for the car to go get lunch, did you really save?"

The better way to save money on fuel is tried and true, according to Deuvall: "Slow down. Pulling back on the power levers can save 5 to 25 percent in total fuel used for the same trip. On many short trips, this may mean arriving only a few minutes later. In a business jet, fuel is half to two-thirds of your variable cost. While the whole purpose of the aircraft is to save time, a bit slower speed and careful trip planning can keep your costs down."

EPB-Pro calculates the value of tankering one leg at a time. The program considers a number of variables to evaluate whether tankering offers the operator an advantage.

Complex Tankering

Fuelerlinx has taken a further technological step with tankering and recently introduced integration with iFlightPlanner's flight-planning system to allow consideration of many more parameters and multiple legs when making a tankering decision. One advantage that Fuelerlinx has is its own real-time fuel pricing system, which delivers prices based on customers' relationships with fuel providers. When customers sign up with Fuelerlinx, they provide their logon information to whichever of the dozens of available fuel providers that they work with, and Fuelerlinx finds the best prices. The combination of real-time fuel prices and flight planning enables much finer tankering calculations.

Fuelerlinx has offered tankering calculations for a while, but the integration with iFlightPlanner adds more capability. "It runs 500,000 to 8 million scenarios, depending on the complexities of the trip," said Fuelerlinx founder and president Kevin Moller. "It's our server array that calculates [the solution], and iFlightPlanner servers work in conjunction with ours."

Open System

Fuelerlinx is an open system, and Moller said the company is willing to work with any flight planning provider on integrating the tankering solution. He wants Fuelerlinx customers to be able to use the flight planning vendor of their choice. Fuelerlinx also works with all of the major scheduling software packages such as Ascend/FOS, Avianis, Avmosys, Bart/Seagil, Camp, FlightTrak and SchedAero.

What iFlightPlanner does is allow users to check weather, calculate weight and balance, create a flight plan and then choose routing (including direct, customized, recent ATC routes, airways and so on). The user can view winds aloft and optimum altitudes, then look at various fuel loads and how they affect the cost of the trip. The price of fuel at each destination of a multi-leg trip is taken into account, including ramp fees. "Sometimes it makes sense to carry extra fuel at the destination," Moller said, "even though it's heavier. We tell the pilot or the dispatcher, 'When you land at the second stop, skip buying fuel and pay the $500 ramp fee. Sometimes it makes more sense to tanker and pay the penalties than to take on more expensive fuel. That's not always the case."

To build a trip in Fuelerlinx, the user begins at the dashboard page (or using scheduling software first). After he enters the departure and each leg's destination, Fuelerlinx gets the current fuel prices based on the user's own fuel vendor accounts and presents them in a drop-down menu, categorized by low to high prices. Adding the dates for each leg of the trip pulls in wind information, and automatic fuel releases are generated for the selected FBOs at each destination. The next step is to click on the Trip Planner tab, and this is where Fuelerlinx and iFlightPlanner work together, optimizing each leg, showing the tankering suggestions and potential savings on fuel cost. At each destination, the system will show the user whether or not to take on extra fuel and how much to carry, as well as a savings index showing the benefits of tankering.

Changing a destination either before or during a trip is simple, and everything is recalculated on the fly. "It's designed for somebody with very little flight planning knowledge," Moller said. Of course, pilots who like to "can get surgical" and refine the parameters and get into deep detail if desired. One variable that users can adjust is the burn-off percentage. Fuelerlinx starts at 4 percent, but that can be changed, as can many performance parameters.

"The larger the airplane, the more fuel it holds, the more the ability to tanker," he said. "But we always produce a savings index; it shows the saving potential for each trip. Even if we don't recommend tankering, people still like to do it, even if it saves only $50."

Another useful Fuelerlinx tool is the proximity map, which shows airports in a particular area with a user-set minimum runway length and with current fuel prices. This is helpful for finding a good place to stop or when looking for alternatives in metropolitan areas when the major airports have excessively high fuel prices.

The tankering calculations are included in a Fuelerlinx subscription. Prices begin at $199 per month for one aircraft and grow to $349 per month for two to three aircraft or $549 for six aircraft. Fleet pricing is available, too. Fuelerlinx currently has about 1,500 aircraft enrolled, and the customer base is split evenly between Part 91 and 135 operators.

"Fuel pricing is always volatile and it will go up," Moller concluded. "Even if it is low it is the single largest part of direct operating costs. If you can save more when fuel is cheaper, you'll be saving even more to the bottom line when prices do go up." ❑

With traffic at the London-area airport on an upswing, the operator is adding amenities for crews and passengers alike.

TAG Farnborough cleared for IS-BAH

by Curt Epstein

Last month, TAG Farnborough Airport achieved certification under IBAC's International Standard for Business Aircraft Handling (IS-BAH), an industry-created, voluntary code of best practices. A joint program between IBAC and the National Air Transportation Association (NATA), IS-BAH incorporates a safety management system in all aspects of FBO operations and is structured on the earlier International Standard for Business Aircraft Operations (IS-BAO).

"We have a sophisticated and well tried safety management system (SMS) that is regularly audited by our regulator, the Civil Aviation Authority (CAA), but to have it audited by this independent organization with regards to our business aviation handling was important," said Brandon O'Reilly, Farnborough's CEO. Since TAG already had an SMS in place, the entire procedure took approximately three months.

"This recognition demonstrates that TAG Farnborough Airport shows a clear commitment to business aviation safety on the ground and goes beyond what is required to mitigate risks for its customers and employees," said IBAC director general Kurt Edwards. The London-area business aviation gateway is the second UK facility to receive the registration, following Inflite-The Jet Centre at London Stansted Airport in August, and the ninth overall, according to IBAC.

"I think it gives operators who come to Farnborough and any airport that is accredited to IS-BAH comfort, the confidence that the handling company is going to look after their welfare, their aircraft and all of the handling procedures are going to be in accordance with these parameters," said O'Reilly, noting that some operators have already cancelled their scheduled audits of the facility on the news that it had achieved the certification. "It's more efficient, it saves time for both of us from an audit perspective. Operators don't need to audit airports as much as they did in the past; we've seen evidence of this already."

Ready for More Traffic

O'Reilly reported that Farnborough saw a 2.5-percent boost in overall operations through the first half of the year, punctuated by a 12-percent rise in traffic among airliner-derived private aircraft such as the BBJ and ACJ.

Responding to that trend, the TAG Aviation-operated facility embarked on several improvements to its FBO earlier this year. "We assumed and predicted that this growth was going to continue," O'Reilly told **AIN**. "So we made a decision to build the infrastructure further at Farnborough to handle this increasing number of particularly large aircraft."

As part of the just completed $1 million refurbishment of its passenger terminal, Passenger Lounge Five was created, a secure area separated from the rest of the passenger spaces, and tailored specifically to handle higher volume flights of more than 20 passengers, such as sports teams. "We get auto manufacturers taking dealers to particular events, and they are using larger aircraft types to do this and we want to be able to handle those customers as best we can," O'Reilly told **AIN**.

Also included in the refurbishment project was a crew gym, which at press time was scheduled to open soon. According to O'Reilly, this latest addition was the direct result of internal customer surveys. "We ask what can we do better at Farnborough to make your life easier when you originate or you arrive, and the top item that was requested was to have a gymnasium," he said. "It's an example of us trying to ensure that crews that come through Farnborough as well as passengers are well looked after. The things that they've asked for, we deliver."

Though the airport has made gains in operations year-over year, the number of noise complaints it has received has fallen by more than 50 percent, according to O'Reilly. To reduce them even further, the operators in July submitted an airspace change proposal to the CAA, which if approved would modify the airspace around the airport from uncontrolled to controlled, allowing the use of instrument departures and standard terminal arrival routines. Farnborough anticipates a decision from the regulators by year-end. ❑

DOT IG FINDS FAA OVERSIGHT OF AIRCRAFT MANUFACTURERS LACKING

The FAA, under criticism from a government watchdog for its staffing and approach to monitoring the Organization Delegation Authorization (ODA) program, has been developing a new risk-based oversight process that it hopes to put in place in upcoming months. The Department of Transportation Inspector General (IG) released a report this week finding the FAA's staffing and approach to ODA oversight lacking. The IG conducted the investigation at the behest of Rep. Peter DeFazio (D-Ore.), the ranking Democrat on the House Transportation and Infrastructure Committee. The report also comes as a joint government/industry advisory group is recommending that the agency expand the ODA program to make its certification efforts more efficient.

Under the ODA program, the FAA delegates to authorized individuals certain functions, such as approving new designs and other certification tasks. The IG noted that one manufacturer with ODA recognition "approved about 90 percent of the design decisions for all of its own aircraft." The IG estimates that 80 organizations are authorized under the ODA program to approve work for the FAA at airlines, manufacturers and repair stations.

The program has continued to evolve, the IG said. But as it has grown, the agency has not established a comprehensive process for determining the resources it needs to provide ODA oversight. The agency's oversight staffing model does not take into account factors such as a company's size and location, type of work performed, past performance, and project complexity and volume, the IG said. "Without a comprehensive, data-driven approach, the FAA cannot be assured that it has the right number of people in the right places to oversee the ODA program effectively," the IG said. The IG noted the FAA conducted oversight of only 4 percent of ODA personnel for suppliers last year.

The IG also faulted the FAA's "program controls" for ODA, saying the agency does not use a risk-based approach. Instead, it employs "minimum requirements in program guidance," that primarily involve a checklist completed annually along with a biennial audit. The guidance provides little direction on how to accomplish the checklist. In addition, the FAA's teams have not been given tools or guidance on data to identify high-risk areas. "As a result, the FAA's oversight is not data-driven and fully targeted toward the areas of highest risk."

In response, the FAA told the IG it is "committed to continuously enhancing its oversight of the program" and is currently putting in place policy and training improvements to enhance oversight. "These changes include a greater emphasis upon risk-based approaches to the surveillance of ODA holders, which will result in better use of FAA inspector resources and more effective oversight," the agency said.

"Since the ODA program was first introduced…it has continued to evolve, and without it U.S. aircraft production and repair activities would be unacceptably delayed," the agency said, adding, "The ever expanding magnitude of the U.S. aerospace industry requires that the agency delegate an increasing number of oversight functions through the ODA program."

The IG in its report acknowledged the FAA's response, saying the new oversight process "will represent a significant change in its approach." The FAA is prototyping the new process in one oversight office, but the IG added, "it will not be implemented until next year at the earliest."

The IG also expressed concerns about potential problems the FAA may face in implementing such a system, noting that the agency is still finding "barriers" in training and policy adoption and that "transitioning to a risk-based oversight process presents cultural challenges and paradigm shifts."

The IG recognized the importance of an efficient certification process and acknowledged that delegation is an essential part of meeting the agency's certification goals. "However, robust FAA oversight that is systems-based and targeted to high-risk areas is necessary to ensure that ODA companies maintain high standards and comply with FAA safety regulations," the IG said. In all, the watchdog made nine recommendations seeking for strengthened staffing and oversight models. *–K.L.*

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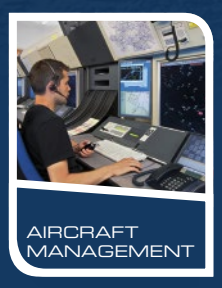

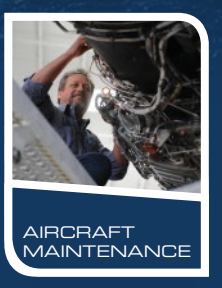

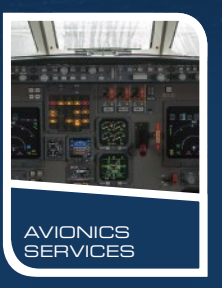

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Operator provides hurricane relief

by Curt Epstein

Shortly after Hurricane Joaquin moved through the Caribbean early last month, Florida-based Part 135 operator Tropic Ocean Airways accepted a booking for a charter flight into the Southern Bahamas region. The company, which has conducted flights in the area since 2011 with its fleet of Caravans, had received some requests for assistance and supplies from local residents and businesses it had dealt with in the past. With little information available in the media about the situation in the Southern islands of the Bahamas, company founder and CEO Robert Ceravolo loaded up the remaining cargo space on the airplane with some relief goods.

After the flight landed, Ceravolo received word from his pilots that while Joaquin had skirted the more densely populated areas of the country, the Out Islands such as San Salvador, Rum Cay and Long Island had taken the brunt of the storm, which lingered over the area, razing entire villages.

At that point, Ceravolo, a former U.S. Navy fighter pilot, decided to take action. He headed off to his local big-box warehouse and loaded up on urgently needed supplies, which he brought back to the company's base at Fort Lauderdale International Airport. After several shopping trips he had enough supplies to pack two of the company's seven Caravans and set off for Rum Cay.

The company also decided to deploy one of its staff members to serve as the on-the-ground coordinator for its efforts and liaison with the Red Cross. "People heard that we were there so they started reaching out to us," he told **AIN**. Eventually, Ceravolo and his company became a vital link between the Bahamian Government and aid organizations. For nearly a week after that first charter flight, Tropic Ocean declined all bookings to dedicate most of its 40 staff members and equipment to the relief effort.

"We used forward-deployed aircraft in the Exumas at George Town, and we ran two or three airplanes back and forth from South Florida," Ceravolo reported, noting some areas could be reached only by the float-equipped Caravans.

During the week-long effort, Tropic Ocean logged more than 100 flight hours and delivered approximately 50,000 pounds of supplies, nearly half of it donated by Resorts World Bimini, a casino in the hard-hit area, which delivered two heavily laden flatbed trucks to the company's Fort Lauderdale hangar, and also loaned the use of two of its own aircraft: another Caravan and a Cessna 206. Eastern Airlines contributed a relief flight on one of its 737s to Exuma International Airport, which delivered approximately 7,000 pounds of supplies.

Tropic Ocean delivered some 50,000 pounds of supplies to the Bahamas.

TROPIC OCEAN AIRWAYS/CAPTAIN KEN WHITE

Financial donations to the relief effort have tallied approximately $30,000, and Tropic Ocean received fuel assistance from its home Sheltair FBO, as well as Odyssey Aviation in Exuma and Jet Aviation in Nassau. That helped offset the company's expenses in the effort, which have totaled nearly $100,000.

Tropic Ocean began to draw back its efforts and get back to business, as the government and aid agencies stepped up their response, but the company is still organizing the donation of supplies through its website (www.flytropic.com). ❑

TOO CLOSE FOR COMFORT

Even though Joaquin did not make landfall in the U.S., the storm contributed to record flooding in the Carolinas as it drifted up the East Coast and eventually out to sea. Joaquin claimed the lives of nearly 20 people and caused widespread evacuations as floodwaters inundated cities such as Columbia and Charleston. As it has been in the wake of past storms, the Civil Air Patrol was tasked with taking aerial photos of the disaster area using its geotagging-capable cameras. CAP aircrews from North and South Carolina, Maryland, Georgia and Virginia conducted more than 100 flights and took nearly 4,000 aerial photos, providing emergency responders with the time-critical information needed to prioritize deployment of resources. The flights also marked the CAP's debut of the Garmin Virb camera. It attaches to wing struts and captures ground images directly below the aircraft. Three of the devices deployed in damage assessment flights allowed officials to make much faster use of the images. ■

Standards released for large unmanned aircraft

by Bill Carey

The aviation standards organization supporting the FAA in developing the technical criteria for allowing large unmanned aircraft systems (UAS) to fly in civilian airspace has achieved a "significant milestone" in that effort. Preliminary requirements for airborne collision avoidance and communications with the ground have been completed, RTCA announced on October 2.

The "interim" documents establish minimum operational performance standards for "detect and avoid" and command and control, core functions the FAA will require for unmanned aircraft to fly with manned aircraft in unrestricted airspace. RTCA expects to produce final standards next summer after verification testing of the requirements. RTCA standards are incorporated by the FAA in its regulatory and advisory documents, and provide guidance to designers and manufacturers in building and certifying equipment.

NASA's Ikhana, foreground, is shown with a Honeywell-operated King Air intruder.

NASA/KEN ULBRICH

Under RTCA's auspices, a committee of industry and government experts designated Special Committee 228 (SC-228) has been at work since 2013 developing detect-and-avoid and command and control, or C2, requirements for large unmanned aircraft. The resulting interim documents "focus on an initial scenario: the operation of civil unmanned aircraft 'to' and 'from' Class A airspace" the layer of airspace above 18,000 feet, RTCA said.

"This is a historic milestone on the path to integrating UASs into the airspace in a safe and efficient manner," RTCA president Margaret Jenny said of the preliminary standards.

The RTCA release followed a September 16 announcement by NASA that it has completed a third phase of detect-and-avoid flight tests of its Ikhana unmanned aircraft at Armstrong Flight Research Center, part of Edwards Air Force Base, Calif. Those tests are informing the standards-development effort.

NASA, the FAA and industry partners have flown the five-ton Ikhana, a variant of the General Atomics MQ-9 Reaper, in "scripted encounters" with manned aircraft over the Mojave Desert. "Depending on the specific scenario, either the Ikhana detected one or more approaching aircraft and sent an alert to its remote pilot to take action, or the Ikhana itself took action on its own by flying a programmed maneuver to avoid a collision, an aviation first," NASA said.

The Ikhana was fitted with a detect-and-avoid system consisting of a prototype General Atomics electronically scanned radar, an ADS-B transponder from BAE Systems, and a second-generation Honeywell Tcas computer. Honeywell also provided software that fused the operations of the three sensors and a specially instrumented King Air "intruder" aircraft for the scripted encounters. ❑

NBAA TO FAA: ISSUE UAS RULES NOW

A hearing last month before the U.S. House Committee on Transportation and Infrastructure's aviation subcommittee highlighted the "urgent need" for the FAA to issue federal regulations for the unmanned aircraft systems (UAS) industry.

According to NBAA president and CEO Ed Bolen, "It is now more apparent than ever that we urgently need guidance…that produces a national regulatory framework that enhances safety and creates a reliable set of operating procedures for UAS operators and the broader public alike," he noted.

The agency issued a proposed framework earlier this year, but most observers do not expect it will issue a final rule until next year.

"UAS should not share airspace with manned aircraft until they have certification and airworthiness standards equivalent to those for manned aircraft, including the ability to take timely directions from ATC, and to sense and avoid other aircraft and UAS," Bolen said. –*C.T.*

Aerion ready for 'supersonic age'

▶ *Continued from page 10*

He said the largest hurdle for the company is not sonic boom mitigation, but meeting airport noise standards. "Without a change to community noise regulations, a new generation of low-boom supersonic aircraft will literally not get off the ground," Barents maintained. "That is why we are advocating in our discussions with NASA, the FAA and international bodies for new research aimed at the development of an appropriate noise standard for supersonic aircraft–one that provides a level of noise reduction equivalent to that required of subsonic aircraft."

This "physics based" approach is consistent with the "equivalent technology" and "economic reasonableness" principles that the FAA has employed in the noise-reduction requirements in current rules. "A new standard would enable the development of supersonic aircraft that are aerodynamically efficient, fuel efficient and minimize community noise emissions consistent with maintaining economic viability," Barents said.

Meanwhile, Airbus "will play a large role in the development of the AS2," he noted, adding that the consortium is "our OEM partner" and is with Aerion "to the finish line." Barents also pointed to Airbus' "significant U.S. resources," saying that he would not be surprised to see the collaboration include Airbus divisions in the U.S. "Aerion will own the AS2 type certificate," he said. "And we anticipate Aerion will conduct final assembly in the U.S., with extensive support from Airbus in engineering, manufacturing and certification." ❑

August crash ends fatality-free streak

▶ *Continued from page 6*

Eight fatal U.S. turboprop mishaps during the third quarter killed 25 people, compared with 20 deaths in eight accidents (all Part 91) for the same period last year. Of the eight fatal mishaps this year, seven were Part 91 and one was Part 135. The one air-taxi fatal mishap involved a de Havilland Canada DHC-3 Turbine Otter. Reduced visibility prevailed on June 25, 2015, when the aircraft hit a near-vertical rock face at an elevation of about 1,600 feet msl while on a sightseeing flight in Alaska. The pilot and all eight passengers perished in the crash.

Non-U.S.-registered turbine business airplanes also suffered more nonfatal accidents in the recent period versus last year. But it wasn't until the third quarter of this year that non-U.S.-registered business jets had their first fatal crashes. This year, 11 people lost their lives in two accidents, one of which was a private operation and the other an air ambulance flight. Between January and September last year, 19 people died in four accidents, and only one was operating on a private mission.

The fatality toll among non-N-numbered turboprops remained unchanged in both comparable periods: 28 people died in eight crashes in the third quarter of this year and 28 were killed in seven accidents in the corresponding nine months last year.

The statistics in this article and the accompanying charts do not include the August 28 ground collision that damaged a Falcon 2000, a Falcon 50 and a King Air C90 at Las Vegas McCarran International Airport. According to the NTSB, the pilot of the Falcon 2000 said that after the preflight and before-takeoff checklist had been completed, and with the parking brake set to ON, a ground handler pulled the chocks and the airplane immediately began rolling. Neither the toe brakes nor emergency braking slowed or stopped the airplane, the pilot told investigators. ❑

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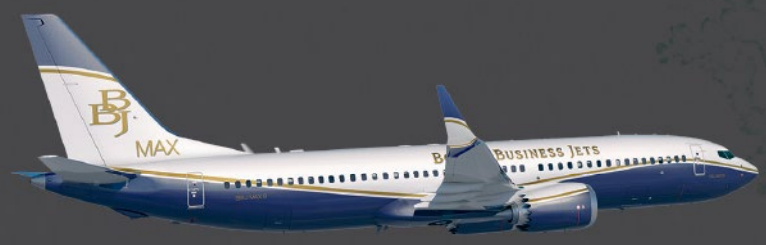

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BOEING

Triton Aviation plans for rebound in Nigerian business

by Peter Shaw-Smith

As a leading player in the Nigerian business-jet sector, aircraft manager Triton Aviation is one of a number of West African companies bringing a measure of maturity to the business aviation market. The company has seen growth stall as the nation's economy has slowed but nonetheless is looking to expand its capabilities so it is better positioned for an expected rebound.

The business aviation market in Nigeria has proved tougher this year than last, Triton CEO Ayo Oyewole, told **AIN**. He said, "2014 was a year of strong growth for us and the industry in Nigeria in general. However, 2015 has seen severe pressure on the industry from the fall in oil prices and uncertainty over the Nigerian elections."

The company started operating in 2010 as an outsourced flight department, and Oyewole joined the following year to develop it into a premium charter operator and aircraft handling service provider. Triton manages a Hawker 900, a Hawker 4000, a Challenger 300, a Falcon 900DX and a Global Express. It handles a Challenger 605 and also has a Hawker 850 on charter. Oyewole estimates that there are a total of 100 business jets in Nigeria. Of those aircraft, he said, "Bombardier is dominant…it has stolen a lead on the others," an advantage he attributes to the company's investment in local support, specifically spares inventory and engineers at the service center in Lagos.

Business aviation is growing in Nigeria, he said. "It's a broad spectrum, from government to oil and gas and banking. We are focusing on the niche for the smaller of the large-cabin bizjets. We see a lot of growth there. Our focus is on building our capabilities and revenues in that sector." In fact, growing oil and gas exploration and shipping and trade have spurred progress all over the continent. "We do fly all over the world. Predominantly, it's Europe. Regional Africa is South Africa, Angola, Mozambique, Kenya and the west coast of Africa, from Nigeria all the way to Senegal. In Central Africa it's the Democratic Republic of Congo. Gabon is getting more interesting. I see that inter-Africa is continuing to grow," he said.

"You find plenty of Europe and Middle East. There are plenty of good commercial

PETER SHAW-SMITH

Ayo Oyewole, CEO of Triton Aviation (left), said his company is positioning itself to be prepared for an uptick in business when oil prices rebound. With him is Femi Adewole, the company's operations team lead.

options. We found with the slowdown in the global economy, a lot of the jaunts are taken out. Somebody who wants to go to London on the weekend will probably wait for British Airways or similar. In the past, they would not think twice of going private. Now people are more judicious with the use of their funds."

Nonetheless, he is bullish on the number of wealthy individuals in Nigeria. "There are lots. Those who fly to Europe and the U.S. will generally be owners of the aircraft, and not people chartering. They'll fly everywhere, with several flights to the U.S. every month. It's primarily New York, Houston, Los Angeles and Toronto. In Europe, it's London and Paris."

These travellers need the flexibility that business aviation can provide, and Nigerian regulators are beginning to understand the industry's needs. "Their procedures are still geared toward commercial operations, but they have recognized the existence of bizav, which is a big step, and are looking at ways of implementing appropriate regulations. That will only enhance our operations and the business environment there," said Oyewole.

Expansion Plans

Triton currently operates under a partner's AOC but is in the process of acquiring its own. The local market is fragmented, with mostly one- and two-aircraft operators, so Oyewole foresees some consolidation. The company also intends to operate FBOs as part of its management service to improve the customer experience. "Most African countries lack proper FBOs," he said. "We have first-class service until you arrive at the airport. There are very few FBOs where you'll get the really high standard that you get in Europe or the U.S."

Triton uses third-party MRO services and has no immediate plans to bring those operations in house. "We have many options within and outside Nigeria, so there are really no issues working with third parties," said Oyewole.

However, he noted, "The quality [of MRO services] is quite patchy. I think a lot needs to be done to get to the level of service we get in Europe or the U.S. We find that the quality of work, the professionalism, doesn't seem to match the service you would get at a service center in Europe or the U.S." The company has its line maintenance completed in Nigeria; more complex work is sent outside the country. ❑

AfBAA symposium in Addis Ababa outlines challenges in Africa

by Kaleyesus Bekele

Hefty import taxes, high fuel prices, exorbitant airport fees and flight permits and lack of access to financing are the major impediments to business aviation in Africa, operators reported at the annual African Business Aviation Association (AfBAA) regional symposium, held in Addis Ababa, Ethiopia, in September. In particular, operators identified securing flight permits as a particular obstacle to their business. Triton Aviation CEO Ayo Oyewole said, "Business people want to move quickly. A person might want to fly from Lagos to Addis Ababa now, but securing a landing permit in Addis Ababa might take two days. If you want to fly on weekends in Nigeria, getting a flight permit is a big challenge, even for a Monday flight, because getting a clearance on Saturday and Sunday is difficult, as the offices are closed." Getting a visa is also a problem, he said.

Companies that provide medical evacuation services voiced their grievances with the African civil aviation authorities that grant flight permits. Sean Culligan, program manager at Phoenix Aviation, said that patients are dying because of delays in acquiring flight permits.

"Securing flight permits in African countries like Equatorial Guinea and Ethiopia is a nightmare," said Volker Lemke of FAI rent-a-jet. The director general of the Ethiopian Civil Aviation Authority, Col. Wossenyeleh Hunegnaw, told **AIN** that different countries have different procedures in granting flight and landing permits. "We grant landing permits to business aviation operators or VIP flights. Especially for medical evacuations, we immediately grant permits. But there is information that we require from the operators. And at times they do not have the required information we request," Hunegnaw said.

PETER SHAW-SMITH

Ethiopian transport minister Workneh Gebeyehu was at the AfBAA meeting in Addis Ababa to listen to business aircraft operators express their concerns about impediments to the industry in the region.

Solomon Gizaw, managing director of Ethiopian charter operator Abyssinian Flight Services, outlined additional challenges in Ethiopia. He said building his business has been a struggle in every way since he started it 16 years ago. For example, Gizaw said that his company, based in the capital Addis Ababa, conducts most of its maintenance work there, but is forced to take its light aircraft to Nairobi for overhaul, "because we did not have a maintenance hangar at our base at Addis Ababa Bole International Airport. We have been begging the Ethiopian Airports Enterprise for a site at the airport. And now, after 16 years, we are [finally] building our maintenance hangar."

Gizaw went on to say that "aviation" in Ethiopia usually means only Ethiopian Airlines, a situation he attributes to regulators' lack of understanding of business aviation. "We have a world-class airline. But in business aviation we have failed miserably. Addis Ababa is the seat of the African Union. There are about 2,000 NGOs [non-government organizations] and embassies in Addis Ababa, but there is not a single business jet in the country."

AfBAA is working with governments on the continent to address these problems, said association president Tarek Ragheb. "We are working to solve the problems. We need to [collaborate] with African governments. We will get there but we have to work together," he told the participants. Gizaw offered a similar opinion, saying that stakeholders need to help educate regulators in their countries about business aviation. ❑

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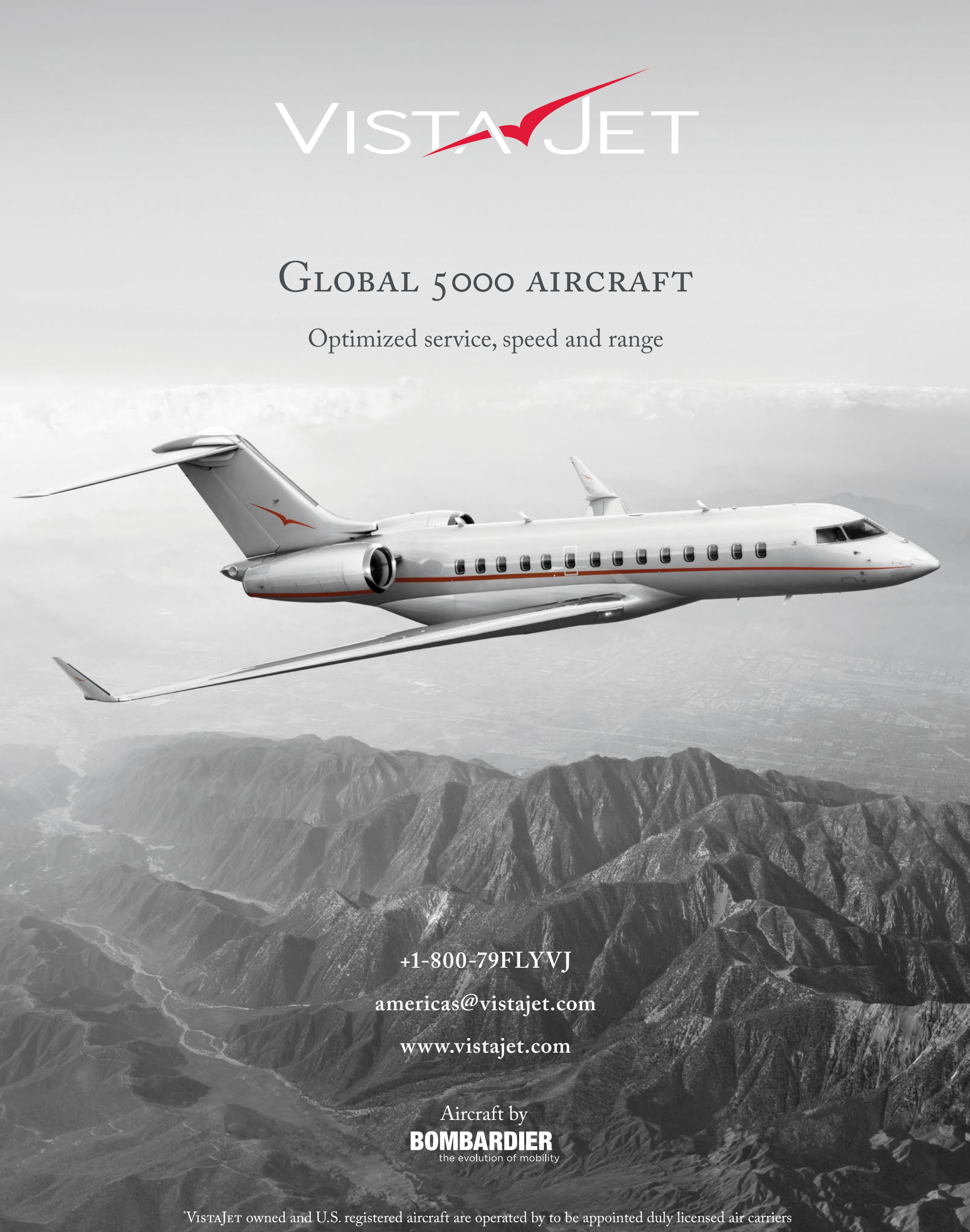

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The static display attracted six aircraft–a Dassault Falcon 7X, Cessna Caravan, Diamond DA42, Bombardier Global 6000, Beechcraft Hawker 900XP and a Gulfstream G550.

Exhibitors get a foot in at MEBAA Morocco

by Ian Sheppard

With parts of North Africa, most notably Libya, still struggling to emerge from the failed Arab Spring in the region, business aviation has continued to prove its worth as a vital transportation tool. This was the takeaway from the recent MEBAA Show Morocco, held in Casablanca. The event marks the first to be run outside Dubai by the Middle East and North African Business Aviation Association (MEBAA), keen as it is to stake a claim and push the newer African Business Aviation Association (AfBAA) to focus farther south.

With 2,000 visitors the show wasn't huge but it was a start, and MEBAA founding chairman Ali Alnaqbi was clearly pleased. Speaking of the region in general, Alnaqbi said, "The African business aviation market has been resilient through the global financial crisis and new aircraft sales have fared better than in developed markets such as Europe and North America…Africa's business jet fleet has more than doubled in the last 10 years."

Against that backdrop, visitors were curious about Morocco and what it might have to offer, and officials were on hand to outline what the nation can provide the industry. Moroccan Transport Minister Aziz Rebbah explained, "Already, Morocco represents about 50 percent of the business jet activity in North Africa. Our geographic position linking Europe with Africa is well known, but also our historic and cultural links with the Arab world have made us an attractive base for many expanding Middle Eastern businesses…We recognize the value that business aviation brings to a national economy and understand why developing the infrastructure and the support services is so vital for its continued growth." Overall, Morocco has more than 8,000 business aviation flights a year, which includes diplomatic flights and helicopters.

Rebbah continued: "The development of infrastructure is one of the key levers for higher growth and economic development in Morocco. In fact, all the commercial and touristic activities of Morocco will benefit from improved transport, compliant with the best international standards." ❑

African bizav assesses results of low oil prices

by Kaleyesus Bekele

Oil prices could drop to $40 a barrel, and in Africa that could be either a good thing or a bad thing, depending on who is doing the flying; that was the message at the regional symposium of the African Business Aviation Association in Addis Ababa, Ethiopia.

Low fuel prices are a good thing, said Dawit Lemma, founder and managing director of Krimson ACMC, an aviation consulting firm based in Addis Ababa, during a panel session on the subject. "The cost of fuel is a major portion of operating cost. And in general, lower fuel prices make flying corporate jets more affordable," he said. Lemma added that more charter flying would also boost earnings for support operations, such as FBOs.

Not all the panelists agreed, however. Some argued that the declining price of oil does not necessarily spell prosperity for business aviation in the long term. Jacobus Phillipus, executive director of National Airways of South Africa, said, "What we need is a stable price." He cited business in sub-Saharan Africa, which has not picked up despite declining oil prices. "I think there is a good reason for that. Take South Africa and Angola, where the currency does not match with the U.S. dollar. Real oil prices remain the same. Oil does not get less expensive in those countries even if it is cheaper in dollars."

In addition, he noted that big oil companies are flying less because there are fewer oil exploration opportunities in the region. He concluded, "Business aviation involving small aircraft sees some benefit from the declining price. But that doesn't make for a significant impact industry-wide."

For some, in fact, the declining price of oil has a devastating effect. According to Ayo Oyewole, CEO of Nigeria's Triton Aviation, the declining price was a complete disaster for oil-producing countries. "Ninety percent of Nigeria's income comes from oil. People stop flying when the oil price drops, and business has been very slow since December last year. Also, the government cuts spending, so there's an adverse trickledown effect on the overall economy. We keep looking at the commodity price and hope for recovery. We hope to see the price of oil back at $100 per barrel." ❑

MEBAA Exhibitors

Swissport Executive Aviation

The Swiss company received a license to provide ground handling and executive aviation services in Morocco two-and-a-half years ago and is already operating at nine airports. The busiest are Casablanca and Marrakech but it also serves Rabat, Agadir, Fes, Oujda, Nadar, Tangier and Essaoira.

Air Ocean Maroc

Rabat-based Air Ocean Maroc offers charter services to destinations in Europe, Africa and the Middle East. However, its main business is medical air transport, said Mohammed El Masaoudi, the local company's CEO. Its fleet includes a Citation VI, 404 Titan and King Air 200, and it recently added a Citation 650 so it can fly into central Africa for medevacs, for example.

El Masaoudi said that the company hopes to add another long-range aircraft next year so that it can fly farther, and link directly to the Middle East. He told **AIN** that maintenance is carried out at Ben Slimane Airport.

JP Jets

The company operates FBO facilities in Amman and Aqaba, Jordan, and believes Casablanca is the best place for it to put down roots in North Africa, said Nader Manna, general manager of the Jordanian JP Jets Group.

Its main goal at the show was to find a local partner.

"We're here to discover the North African market and see opportunities to open a branch in Morocco, especially Casablanca," said Manna, who explained that "people from the Gulf have switched from other destinations to Morocco, seeing it as safer than the likes of Libya."

Manna added that the company views Mohammed V Airport as its first choice for an FBO, as it has "all the infrastructure" and is committed to business aviation.

G-Ops

G-Ops has opened an operations control center (OCC) in Casablanca, where it guarantees the same level of quality service as it does in Europe, said Franck Canu, European commercial director. "Morocco concentrates more than half of business aviation in North Africa, so it was obvious for G-Ops to start here," said Canu.

G-Ops has more than 10 years of experience in ground support with flights ranging from business aviation/VIP to diplomatic, cargo, medical and military. The company assists in arranging traffic rights, permits and slots, handling worldwide, hotel booking, catering, limousines and helicopter transfer. It supervises more than 3,000 flights per year.

Prime Aviation Services

The Italian company, which says it is the first GA FBO in Italy, was at MEBAA to explore "the growing North African market."

General manager Chiara Dorigotti said, "We offer the most complete set of ground-handling and concierge services at Milano Linate [Airport]… We have approximately 24,000 movements per annum in Milan, with eight hangars on a 65,000-square-meter [16 acres] apron." She added, "African aviation is now strong, with traffic increasing, so it makes sense to present here at MEBAA."

Lektro

The U.S. provider of electric towbarless aircraft tugs was displaying its latest vehicle at the MEBAA event. It is ideal for business aircraft, and in fact any aircraft up to 120,000 pounds, according to training director Tyler Bellmore, who was attending MEBAA Show Morocco. He said that the company has already supplied tugs to Egypt, Nigeria and South Africa and is pursuing sales leads in a new market.

Jet Aviation

The Swiss company already has strong links in Morocco and professed to being curious to learn more about the market's potential opportunities, although it has nothing specific in mind. Ruedi Kraft, vice president of business development for the company's Basel completions division, said that Jet Aviation also wanted to support MEBAA in opening its new show. Kraft is on the MEBAA board.

XJet

XJet founder and CEO Josh Stewart was exhibiting at the show, aiming to attract North African customers to its new, huge FBO at London Stansted Airport that can accommodate two 747s, or two 777s alongside some large-cabin business jets. The company touts its private immigration and customs rooms, which allow travelers to "get straight off the airplane, into the car and be on the M25 motorway within seven minutes."

Among the OEMs exhibiting were Bell Helicopter, Boeing Business Jets, Bombardier, Cessna, Dassault, Diamond Aircraft and Gulfstream; Saudi Private Aviation, NasJet, GDC Technics and Satcom Direct added to the diversity of exhibiting companies keen on developing business in North Africa. ■

Rising mx demand drives expansion at Germany's FAI

by Guillaume Lecompte-Boinet

German charter company and maintenance provider FAI operates a fleet of more than two dozen aircraft and is adding a maintenance hangar at its Nuremberg headquarters to make room for continuing growth.

German business aviation services group FAI Aviation Group announced plans to build a new hangar at its Nuremberg headquarters. The 48,439-sq-ft building, designated hangar eight, is expected to open in the spring of 2016 at a cost of approximately $7.9 million. It will double the size of FAI's facilities, following the April 2014 opening of a 53,821-sq-ft hangar 7, which is used mainly for parking customer aircraft.


Siegfried Axtmann, FAI founder and chairman

FAI lays claim to being one of the largest general aviation operators in Germany. Its 21-aircraft fleet is the second largest in the country, and the aircraft logged 12,400 hours last year. The fleet, all of which was acquired pre-owned and entirely consisting of Bombardier models, includes three Global Expresses, four Challenger 604s, nine Learjet 60s, five Learjet 55s and a Learjet 35A. The company is in the process of buying a fifth Challenger 604, which will replace two of the Learjet 55s.

This year FAI expects to boost revenue by some 10 percent, to more than €84 million ($95 million), after achieving a similar increase last year. FAI chairman and CEO Siegfried Axtmann explained that the new hangar will be used primarily for parking aircraft. The need for extra space has been triggered by FAI's maintenance business, which has outgrown its existing hangar. FAI's main activity is charter, with a focus on supporting special-mission operations and medical evacuation services.

Special missions and air ambulance work account for as much as 80 percent of the company's flying. Air ambulance work alone is set to account for around €40 million ($45 million) in revenue this year, making the company one of the largest fixed-wing-only operators worldwide in this sector. Half of this flying is done with the Learjets and the other half with the Challengers.

The company's special missions division, active since 2004, mainly provides flights for the United Nations and generates approximately €25 million ($28 million) with six aircraft and a seventh on standby for maintenance cover. FAI employs 80 pilots (out of a workforce of 180); four-fifths of them are on the payroll full-time and the remainder contractors.

Over the past 12 months FAI has flown 708 air ambulance missions in 123 countries, logging 2.11 million nautical miles. "One of the hardest challenges in our business is to balance operational and logistical constraints with safety requirements," explained sales and marketing director Volker Lemke. Mainly on behalf of the UN, FAI often flies into dangerous regions across Africa and the Middle East (including Iraq and Afghanistan).

Air ambulance and special-mission operations are generating more and more of its maintenance activities. "We're currently handling maintenance work in hangar six but it's spilling over into hangar seven, which is next door. So this is why we need to add more space," explained Axtmann, who bought the company back in 1989. Hangar eight, situated immediately opposite hangars six and seven, will be large enough to take three aircraft of A320 size or five Global Expresses.

In addition to maintenance, special missions and air ambulance flying, FAI also offers executive charters. Most of FAI's charter clients are large insurance groups or companies specializing in providing emergency assistance. Among the end customers are energy groups supporting remote operations.

Most of the firm's executive charter work is carried out in the Global Express. "But this is a niche for us, providing supplementary revenue to cover our running costs," explained Axtmann. "Air ambulance work is still our core business." The company does not plan to expand into helicopter operations since, in its view, this is a heavily regulated sector, especially in Germany. ❑

Flights in both the Legacy 500 (shown here) and the mid-light 450 demonstrated the airplanes' similarities.

Legacy 450 flies fine steep approach

by Matt Thurber

Embraer expects to receive steep approach approval for the Legacy 450 "midlight" and 500 midsize jets next month, and **AIN** flew the 450 in Brazil recently to try the new capability.

The Legacy 450 and 500 share so much commonality in systems, avionics, fly-by-wire flight controls, handling and pilot techniques that the FAA has issued a "AAA" common type rating, which means no differences training is required. Having flown both airplanes–the Legacy 500 twice and the 450 once–I can confirm that the feel and handling are exactly the same.

The major physical difference between the two airplanes is the fuselage, which is unique to the 450 and not just a 500 fuselage with segments removed. This was necessary so that the 450's windows would be positioned properly for passengers' seat locations. The other difference, of course, is performance. The 450's range is less than the 500's–2,575 versus 3,125 nm–but otherwise the airplanes are similar, with small differences in takeoff and landing distance, and full-fuel payload.

Both share the same Rockwell Collins Pro Line Fusion flight deck and Honeywell HTF7500E engines.

The cockpit of the Legacy 450 felt instantly comfortable. It is so well laid out and systems and controls so logically placed that I don't think it will take pilots long to learn to fly the new Legacys. The fly-by-wire flight controls are operated by a sidestick for each pilot, functioning individually; the rudder pedals are mechanically connected between the pilot and copilot side. Elimination of the bulky yoke is a big benefit of fly-by-wire, and the Legacy 450/500 cockpit takes full advantage of all the extra space. There is even a slide-out work table for each pilot.

Flying the Steep Approach

I flew left seat alongside chief test pilot Eduardo Camelier for the flight from São José dos Campos Airport, where Embraer's headquarters is located and the new Legacys are assembled. (Legacy 450/500 assembly at Embraer's facility in Melbourne, Fla., will begin in the middle of next year.) Our takeoff weight, with two pilots and three Embraer personnel, was nearly 29,500 pounds, well below the 35,274-pound mtow. We carried 5,660 pounds of fuel, about half of the 10,851-pound maximum fuel load.

For this flight, we decided not to climb directly to the 450's initial cruise altitude of FL430 (maximum is FL450), but stopped at FL300 so we could spend more time flying maneuvers and the steep approach. As I did with Camelier during my first Legacy 500 flight, we pushed the 450's fly-by-wire flight controls to the limits of the flight protection envelope. In the high-speed regime, we left the autothrottles at a high power setting, pushed the nose down and let the airspeed build to the Mach 0.83 MMO redline, at which point the fly-by-wire automatically pulled the nose up to keep the speed within limits.

After descending to 15,000 feet we explored the other end of the envelope, decelerating with full flaps and landing gear down to the minimum possible flying speed at 1.04 VSO. I had experienced this in the 500, and it was once more amazing to be flying a 30,000-pound business jet at 87 kias and retaining full control. While in this configuration, I held the stick fully aft and moved it from side to side and watched as the flight control system automatically maintained the 1.04 VSO margin; in the bank the airspeed climbed slightly to about 94 kias to maintain the margin over stall speed, then it dropped below 90 kias as the wings leveled.

To prepare for the real thing, we first flew in the steep approach configuration while still in the mid-teen altitudes, using a 5.5-degree glideslope. This angle is adjustable, and we moved it down to 7.5 degrees to see what the view outside the windshield looked like. The 7.5-degree angle is a required certification test. The steep approach mode is activated by a button: on this 450 it was on the aft center console but will be moved to the copilot's right ledge area for the certified steep approach configuration.

In steep approach mode, the flaps must be fully extended. After the pilot pushes the button, a white CAS message illuminates, showing that the mode is armed. The system remains in the armed mode until selection of full flaps and gear down, at which point it engages and the CAS message turns green. The mode turns off automatically in certain conditions, including flaps not full, aircraft on ground, takeoff/go-around, angle-of-attack near stall or flap extend speed exceeded.

Rather than selecting just open or closed, the fly-by-wire system modulates the wing spoilers throughout their extension range to maintain the selected glideslope. When Camelier changed the glideslope to 7.5 degrees and I pitched the nose down, the spoilers opened further to maintain the descent angle without increasing airspeed, and we could see the actual amount of spoiler deployment on the flight control synoptic on the cockpit displays. According to Camelier, "When going to a pitch angle greater than 6.5 degrees, the system changes the sidestick-versus-spoiler deflection curve."

I then flew some maneuvers trying out the 450's direct mode, which shuts off envelope protection and makes the flight controls act like those in a normal airplane. In direct mode I flew an approach to stall and recovered, and the 450, like the 500, handles this without any wing drop. In direct mode I had to use the elevator trim switch because this mode deactivates automatic adjustment.

MATT THURBER

To prepare for the steep approach we flew a 5.5-degree approach with autobrakes set.

We switched back to the fly-by-wire normal mode and flew two touch-and-goes at São José dos Campos before setting up for the steep approach. I set the autobrake control to medium, which would help us get stopped if we used more runway after the steep approach. Camelier assured me that a normal touchdown is possible after the steep approach, and this turned out to be the case. I set up the 450 at about 1,500 feet agl closer to the runway this time, and Camelier switched on the steep approach mode. The autothrottles and spoilers helped manage the descent, and I used the fly-by-wire's TCS trim button on the stick, which works in landing configuration, to set the airspeed right at VREF. Staying on the 5.5-degree glidepath was just a matter of a few tiny moves of the stick, but the fly-by-wire system maintains the selected flight path, so a lot of stick movement is unnecessary.

I was getting better at avoiding too much flare before the touchdown in the Legacys, and as we passed through 50 feet the autothottles retarded, I pulled the nose gently to the horizon and the Legacy 450 touched down on the mains. The automation then lowered the nose and applied the brakes to slow us down with plenty of runway remaining. ❑

Like the larger Legacy 500, the 450 features a fly-by-wire Rockwell Collins Pro Line Fusion flight deck. The front office has an uncluttered feel, as sidesticks take the place of conventional ram's horn yokes.

TRU ProFlight opens Florida facility

TRU Simulation + Training officially opened its ProFlight satellite pilot training center in Lutz, Fla., on September 28, marking the Textron subsidiary's major push into the business aircraft training arena. Textron formed TRU in 2013 and in July last year acquired ProFlight, a Cessna CitationJet and Conquest training provider based in Carlsbad, Calif. TRU will be the provider of factory training for all new Textron Aviation and Bell Helicopter Textron aircraft.

The company's facility in Lutz, which is 15 miles north of Tampa International Airport, earned FAA Part 142 certification in June and now has two simulators installed: an FAA level-D Citation CJ3 device and a King Air 350i/250 Fusion simulator with similar approval pending. It also has several classrooms, a King Air flight training device with a projection visual display and a "next-gen" CJ3 procedures trainer that is essentially a non-certified flight training device that uses three high-definition monitors placed side-by-side as its visual display.

Expansion Plans

Next year, the Lutz location will add level-D CJ4, Grand Caravan and Citation Latitude simulators, while the existing King Air device will also be approved for C90GTx training. By the end of 2018, up to a dozen full-motion simulators for new Cessna and Beechcraft products are expected at the Lutz center, TRU president and CEO Ian Walsh told **AIN**, though this will require an expansion–already planned–of the current three-bay simulator facility.

Next year will also see a CJ3+/M2 device added at TRU's ProFlight facility in Carlsbad, Calif., as well as Bell 429 and 525 simulators at a new TRU location in Valencia, Spain, that is slated to open next year. Further expansion is planned in Brazil, which will have Bell 412EPI, 429 and 525 simulators when it opens in late 2017/early 2018; and Singapore, which is slated to open in 2018 and offer Bell 429 and 525 simulator training.

In addition, TRU opened a 35,000-sq-ft aircraft maintenance training center at the Textron Aviation campus in Wichita last month. Training initially will focus on King Airs with Rockwell Collins Pro Line Fusion avionics: the C90GTx, 250 and 350i. It plans to expand maintenance training in 2017 to include all current-production Cessna and Beechcraft airplanes.

Walsh, a 14-year Textron veteran, said he expects ProFlight's business aircraft training business to quadruple in the next three years, with the helicopter training side also experiencing healthy growth. That would likely mean adding another ProFlight training center at some point, though Walsh is focused on further developing the Lutz and Carlsbad facilities in the near term. *–C. T.*

KERRENTON SNOW

The Florida site has full-motion Citation CJ3 and King Air 350i/250 Fusion devices.

Landscape after Signature deal

▶ Continued from page 1

as part of its purchase of Ross Aviation. Signature acquired that location and, if the deal is completed, would likely be required by the Department of Justice to shed the Landmark facility. At Jacqueline Cochran Regional Airport in Palm Springs, Calif., Signature and Landmark are the only full-service FBOs, while recent acquisitions at New York Westchester County Airport resulted in each company having two FBO locations at HPN; the only other FBO there is operated by Million Air. Signature already occupies two FBOs at Teterboro; the addition of a third would give the company control of half the service providers at that key Northeast business aviation airport. Other North American locations where there would be duplication include Alaska's Ted Stevens International Airport; Dallas Love Field and San Antonio International Airport in Texas; and Vancouver International Airport.

In Europe, the two companies compete at Paris Le Bourget, where Landmark opened a new FBO complex last year, and at London Luton Airport, which was added to Landmark's portfolio last year when it purchased the former RSS Jet Centre's three UK locations.

"With all the hurdles that have to be overcome, it will be a challenge to get this deal done," cautioned one industry insider, yet even if BBA divested at all 12 locations, the purchase, which could be finalized early next year, would see Signature's network swell to 187 FBOs worldwide. Atlantic Aviation, its next largest competitor, holds 69 FBOs, all in the U.S. "This is a strategic fit for the Signature network," noted Signature president and COO Maria Sastre. "It will significantly expand our reach within North America, as well as globally."

If consummated, the transaction is not likely to change the landscape of the FBO industry significantly, in the opinion of FBO industry consultant John Enticknap, a founder of the Aviation Business Strategies Group. "Landmark and Signature were big chains anyway, so Signature just gets bigger." Enticknap counts approximately 1,600 "viable" FBOs in the U.S. and Canada, categorizing them as those at airports with improved runways 4,000 feet or more in length. Based on those numbers, FBO chains constitute roughly 17 percent of those total locations, concentrated mainly at top-tier general aviation airports. "That doesn't really change with this merger," Enticknap told **AIN**.

In addition to the Ross Aviation purchase last year, which fattened its U.S. FBO network by more than 50 percent, Landmark also expanded its managed fleet through a series of corporate purchases. Earlier this year it further elevated that tally with the purchase of international charter and management provider TWC Aviation, which was rebranded with the Landmark name in September. The company now manages 110 business aircraft, trailing only Executive Jet Management, which has some 200 under management.

Legal Ramifications

Yet the disposition of Landmark's aircraft charter and management division will present an extra consideration for UK-based BBA: U.S. regulations prevent majority foreign ownership of a commercial aircraft operator. "In the period before completion of the deal, preparations are being made in respect of any restructuring of the charter transportation and aircraft management business, which is required to comply with the U.S. Department of Transportation's U.S. ownership and control requirements," a BBA spokesperson told **AIN**.

"Following completion [of the deal], we plan to limit our ownership of the Landmark charter and aircraft management business to a non-controlling stake to address the U.S. DOT U.S. control requirements," the spokesperson continued. "We will create a wholly owned new entity, which will provide charter brokerage services, which are not subject to U.S. ownership and control requirements, to Landmark's clients and to other charter operators."

Carlyle, which would be selling Landmark for a second time, reacquired it from GTCR Golder Rauner and Platform Partners in 2012. While the purchase price was not disclosed, experts estimated its value at approximately $700 million. At the time, GTCR's leadership said that for Landmark to continue its success, it "required continued access to capital to grow through acquisition and new site development and the current owners had exhausted their resources during the four years of ownership and significant growth."

In the September 23 announcement of the pending BBA purchase, Landmark president and CEO Dan Bucaro thanked the Carlyle Group for its support and added, "We are confident that the success we have achieved at Landmark will carry forward under BBA Aviation's ownership." ❑

FAA embraces 'safety evolution'

▶ Continued from page 1

"We are using data, not calendar dates, to determine when and where to conduct surveillance and inspections," Huerta said, adding, "We are emphasizing that we expect our employees to use critical thinking, which is essential to successful implementation of the compliance philosophy."

Huerta noted that the agency previously had heard concerns from inspectors that they felt constrained by the rigidity of the former policies. "We need flexibility to use data," he said.

Applying Airline Model

Huerta called the policy the next evolution in safety. After a spate of accidents in the 1980s and 1990s, the airline industry set a goal of reducing fatal accidents by 80 percent, a goal that drew skepticism from many in the industry. But by turning to the data-driven approach of the Commercial Aviation Safety Team, the airline industry has reduced fatal accidents by 83 percent over 10 years.

"The system has gotten so safe, a lot of people don't think about it. But we in aviation think about it every day," Huerta said. To reach the next level, he said, the industry must look at trends to identify risk. The agency needs to "assess shades of gray, and that's much more complicated."

Last summer, the Administrator had told an audience during the Experimental Aircraft Association's AirVenture the new philosophy "is a big cultural change, not just for us at the FAA but across the entire industry." Huerta emphasized more recently that "industry is committed, and this is part of the evolution. Fifteen years ago the FAA couldn't just approach an operator and say, 'Give me all your data,' but the industry now is working to collect more data to be able to share and pool information to identify trends."

Billy Nolen, senior v-p of safety, security and operations for Airlines for America, agreed. He noted that people who drive fast on the roads would not stop and tell local police that they had just been speeding. But in aviation, "that is what we are asking you to do," Nolan said. The industry, however, recognizes that an informed culture creates a "really rich, strong safety culture."

> "If there is a failing, whether human or mechanical, we need to know about it, to learn from it and make the changes necessary to prevent it from happening again." - *FAA Administrator Michael Huerta*

As for the policy shift, Nolen said, "we're thrilled" the FAA has taken that approach. "We've come a long way," he said. He acknowledged that the use of the philosophy can be subject to interpretation, and work still needs to be done to "calibrate" the approach.

But the new compliance philosophy works in tandem with a push by airlines to employ a "just culture" that encourages reporting of issues. This is important because a review of tens of thousands of reports reveals that minor issues account for the overwhelming majority. But those minor issues could suggest a trend. A "just culture" enables the industry to train for the unexpected, by fostering the encouraging data-sharing and focusing on risk. "We are learning more and more through voluntary safety reporting," he said.

While much of the focus has been on the airlines, Huerta stressed that the FAA is implementing this policy in its dealings with all facets of the industry: from charter and repair stations to manufacturers. In fact, the Administrator had already engaged the general aviation community through his comments at AirVenture in July. But he also noted that it will be implemented only where possible, and not all operations will be treated the same.

The change comes as the business and general aviation communities also turn to data sharing based on lessons learned from the commercial world. "[The National Air Transportation Association] applauds the FAA's recently announced decision to shift its oversight emphasis from enforcement action to safety compliance. The value of improving safety performance through voluntary safety reporting systems is now widely recognized throughout the industry," development of a large volume of data that people industry-wide can use to assess trends, he said. "We're not there yet, but that's what we have to do."

Mark Millam, vice president of technical for the Flight Safety Foundation, echoed that sentiment, saying he was pleased with Huerta's remarks because they suggest that the agency is said NATA president and CEO Thomas Hendricks. "The effectiveness of this change requires an open and transparent exchange of information and data between the FAA and the aviation community. NATA supports the initiative and will continue to work with the agency to realize the full benefits of this important policy change."

Hendricks noted operators have long believed a focus on compliance is more effective than relying solely on enforcement. "Initiatives like the Air Charter Safety Foundation's Aviation Safety Action Program are strengthened by the agency's commitment to this new path," Hendricks said.

While the FAA is giving inspectors more leeway to exercise judgment, NATA noted that the agency has provided detailed guidance to ensure it is applied consistently. The association plans to monitor the application of this judgment. Hendricks acknowledged that the transition could take years to mature, but he noted that "Administrator Huerta's personal advocacy sends a strong message of agency commitment to this important policy change."

While the emphasis is on compliance, Huerta cautions that this is not a get-out-jail-free card. "That doesn't mean we're going to go easy on compliance, or that we're ignoring minor issues, or making anyone feel they have a free pass," he said. "We still have zero tolerance for intentional reckless behavior or inappropriate risk taking. Enforcement is, and always will be, one of the tools we will use to ensure compliance."

The agency will enforce in cases of willful or flagrant violations, or for refusal to cooperate in corrective action, he said. ❑

Eclipse flies into the sunshine

by Mark Huber

One Aviation is hard at work upgrading the original Eclipse fleet to more modern systems.

MARK HUBER

You wouldn't know to look at it from the outside, but there's a lot going on in Hangar 4 at Chicago Executive Airport (KPWK). This is one of two factory-owned service centers for One Aviation's Eclipse very light twinjets. In any given 12-month period, nearly 150 of the 282 strong Eclipse fleet will pass through these unmarked doors or those at Eclipse's Albuquerque, N.M. headquarters for service, inspections and installation of a plethora of available upgrades.

Since 2009, when the remains of the original company were bought out of bankruptcy, the Eclipse team has been working diligently and quietly to finish adding promised equipment and upgrades to the aircraft and providing quality service to its far-flung fleet.

"We've been busy for six years," said One Aviation president Ken Ross. "We've got 350,000 hours on the fleet. It is a sophisticated little airplane. There's never been a Part 23 airplane with autothrottles, and we've added anti-skid brakes [as part of an upgrade package]. At both locations we'll have 20 airplanes at any given time, doing service and performing remedial upgrades, converting some aircraft to special editions (SEs). We'll run through a third of the fleet at this location annually and probably the same in New Mexico."

In addition to the factory-owned centers, Eclipse has two factory-authorized centers in the U.S.: Boca Aviation in Boca Raton, Fla., and Crown Air in San Diego, Calif. There are a half dozen others in Johannesburg, Dubai, Istanbul, Germany, the UK and Holland. The Eclipse is certified in 46 countries; 92 airplanes are flying internationally from Singapore to South Africa.

Upgrades in Progress

Many of the original factory aircraft were either delivered with systems short of what was promised or with systems that needed upgrading. So before restarting the production line, Eclipse's new ownership focused on filling those needs and providing existing customers with the service they required, Ross explained. "We've been doing service and performing remedial upgrades, while converting [and remanufacturing] some aircraft to SEs."

"Today two-thirds of the fleet is upgraded to IFMS [integrated flight management system avionics] or greater. There are still about 40 airplanes total that have the [old] Avidyne [avionics]. Some have the Garmin 400, which acts as the navigation system for ILS and GPS approaches. Upgrading those airplanes will run $700,000 and up [the Eclipse 500 Plus Package]. A lot of those airplanes are on the secondary market and the new buyers come in and do the upgrades. When they are done they have an all-in cost that is extremely competitive with a [remanufactured] SE or new 550 [$2.995 million]. The SE airplanes come with three-year warranties and three-year maintenance plans. That's the highest in our industry and in our class; no one else offers that. Our new airplanes come with a five-year warranty and a five-year maintenance plan. All scheduled maintenance and inspections are covered by the factory," Ross said.

A Plus package includes new cockpit displays, hardware and expandable architecture; anti-skid brakes; in-seat power supply; new glass-faced PPG windshields; new software, including dual FMS, EFIS based autothrottle, fuel timing and tall terminal charts; and enabled keyboard cursor device.

Ross said One Aviation continues to improve Eclipse customer support. "Ninety-eight percent of our AOG events are solved within 24 hours domestically; 48 hours worldwide. We are continually trying to lower prices on high-utilization items, such as batteries," Ross said. ❑

The Icon A5 was intended to meet the 1,430-pound weight limit for amphibious LSAs, but the redesign for spin resistance added weight to the airframe. The company has secured an exemption for a takeoff weight to 1,680 pounds.

PHOTOS: MATT THURBER

Icon A5 amphib offers pilots a satisfying ride

by Matt Thurber

Nine years after its founding, Icon Aircraft delivered its first A5 amphibious light sport aircraft (LSA) to the EAA Young Eagles this past summer. The type passed its FAA audit in June, and the A5 delivered to the Young Eagles was the first production model to receive its special-LSA airworthiness certificate. The audit approval opens the door for the next phase in Icon's journey: building and delivering the more than 1,500 aircraft for which it holds deposits. Particularly noteworthy: 40 percent of these buyers are non-pilots. Clearly, this refreshing entrant in the arena of fun flying has captured people's imagination, and it's an airplane that could appeal to professional pilots who yearn for a return to flying's simple pleasures (and who have the disposable income to handle the $197,000 basic or $247,000 fully loaded price tag).

At AirVenture, Icon invited the aviation media to fly the A5; my demo pilot was Kirk Hawkins, CEO and founder of Icon and a former U.S. Air Force F-16 and American Airlines Boeing 767 pilot who also holds a master's degree in mechanical engineering.

Sitting in the water on a gorgeous summer afternoon, the A5 looks like it wants to go–flying, camping on a beach, carving liquid donuts on the smooth lake's surface.

The most prominent instrument on the panel is a large angle-of-attack (AOA) indicator, smack in the center of the pilot's field of view. The actual AOA is depicted by a wing shape instead of a needle.

After water-taxiing away from the dock, Hawkins unleashed the full 100 hp from the Rotax 912 four-cylinder four-stroke piston engine, entered a graceful water turn and lifted the A5 off the water at about 40 to 45 knots. Unlike those of other light sport aircraft that I've flown, the A5's controls are highly harmonious; pitch and roll forces feel natural and well matched, and the pitch control is not too sensitive.

The two-place A5 "is just what general aviation needs," EAA chairman Jack Pelton said while accepting delivery of the aircraft at this year's AirVenture. Angle-of-attack indicators are making their way into light general aviation aircraft, and the device is the most prominent instrument on the A5's panel, below.

Hawkins demonstrated some of the spin-resistant airframe features that should make the A5 safer for the average and new pilot. The A5 can be stalled, but three key design goals dictated what happens at the stall. First, it must resist spinning; second, it must remain controllable in a stall; and third, it must have a low descent rate during a power-off full stall to allow a crash to be survivable.

Controllable in the Stall

When he pulled the power back, the A5 remained fully controllable in the stall while descending at about 600 fpm. The fact that the A5 doesn't react to a stall by dropping a wing suddenly, even when the pilot steps on the rudder, is a significant accomplishment.

Hawkins also demonstrated an accelerated stall right into the buffet, and the A5 didn't drop a wing and remained solidly stable as he unloaded the wing and recovered from the stall. He also showed me how the A5 will climb in a full stall with full power applied, and he said it would do so even at mtow. The bottom line for the spin-resistant features, he said, is that even at a high AOA, the outboard one-third of the wing remains flying, which is what allows the pilot to still have control of the A5 in a stall. "The key is not to punish people if they're not perfect pilots," he explained. "It's an extraordinary safety benefit."

I flew around some more and landed and took off a few times. With the flaps set at full (30 degrees) and the gear up, I brought the power back and let the A5 gradually descend. The touchdown on the water was a little anti-climactic; the hull made contact briefly, skipped back into the air, then touched down again and stuck. I pulled the power back and the hull grabbed the water more firmly and we were down.

"Airplane development is super challenging," Hawkins said after the flight, and the A5's gestation took "longer than planned. The downturn hurt." When he first committed to bringing a new airplane and company to market, it was a soul-searching moment, and little did he know it would take 10 years. But thanks to the huge backlog, he added, "Our goal is to hit break-even next year. Financially we're in great shape." ❑

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NTSB

"We're engaged on a thousand battlefields with an elusive enemy, the enemy of human error. It's elusive, it's stealthy, it's opportunistic, it's indiscriminate. It lies in dormancy and strikes on its own terms. It has no shelf life or expiration date. It has no schedule. We need to defeat this enemy now and stop pretending it doesn't exist."—Al Gorthy, Retired U.S. Navy Commander, pilot

Standdown speakers beat drum for professionalism

by Robert P. Mark

Bombardier's 2015 Safety Standdown proved itself again last month to be an antidote to a dangerous time for aviation safety: a six-year period with no commercial aircraft accidents. While the business aviation safety record is not quite as stellar, it has certainly been impressive. Discussions at the standdown about dangers to the industry focused on how periods of accident-free flying can breed complacency.

Managing distractions was the focus of this year's Bombardier Safety Standdown. Lapses can include when a crewmember is impaired by drugs or alcohol, or pilots who lose focus because their knowledge of their own glass cockpit operations barely meets standards for safe flight. The week's talks centered on how seemingly innocuous events left unchecked can and have become hazards or led to accidents. As Retired U.S. Navy Commander and pilot Al Gorthy reminded the audience, "Attention control techniques is the theme [for this year's standdown]. There are no easy answers to these kinds of complex cognitive problems…it's sometimes difficult to see through the window and into the human mind. But whatever the cause, inattention is an invitation to increased risk and error."

A recurring theme at all standdowns, however, is the importance of personal and professional responsibility, a topic all presenters seem to believe is just as critical as understanding what action to take when faced with potentially hazardous situations.

Presenters acknowledged the hurdles employees everywhere face to ignore safety issues when pressured, such as fear of losing their job or reprisal by their boss. Those fears alone can make people clam up. But many of the speakers believe a bit of reluctance to speak up today can grow mightily into a personal philosophy that sounds like, "They don't listen to me anyway."

Also spoken about is what it takes to be considered a true professional at everything, meaning someone who's better than just mediocre. Gorthy said, "It's time you realized that good is the enemy of great. And greatness requires risk and risk can mean failure. But failure is necessary for growth and growth leads to success. It's time to be dissatisfied with our personal performance and raise the level of our expectations."

The theme of personal responsibility and raising performance above the mediocre "minimum standards" label is a favorite of Tony Kern, CEO of Convergent Performance. At this year's event, he blended those ideas with his philosophy for dealing with distractions. "For us to pay attention, we have to have an intention," Kern said, "a reason to care about what it is we do, or we'll simply go back to the way we've always conducted business." He declared the era of pilot cynicism, apathy and frustration over, although he conceded that full compliance could take a while.

Kern acknowledged the bad times of much of the past and he believes a better industry is just around the corner, but only for those people who can manage to get themselves unstuck from dissatisfaction with the job. "Before you can do anything, you've got to care," he said. Simply pontificating about a lousy work atmosphere absolves the individual of his own role in maintaining the status quo, no matter his rank in the organization. "You need to decide you want a positive outlook, because negative emotions close down much of a person's concentration and focus," he told the audience. "It doesn't mean ignore the dark side, but

Continues on page 70 ▶

The 450 participants at the Wichita event were only the tip of the iceberg; 1,100 tuned in on the live web feed. With the NTSB's recent release of the probable cause of the Gulfstream crash at BED, speakers once again highlighted the need to be better than required.

High-profile Accident Provides Teachable Moment

The NTSB investigation of the 2014 crash of a Gulfstream IV at Bedford confirmed that the two experienced pilots, members of a flight department preparing for IS-BAO stage 3 certification, ignored numerous pre-takeoff warnings and started the takeoff with the jet's control lock still engaged. All seven people aboard died when the Gulfstream ran off the end of Bedford's Runway 11. The investigation also revealed that, on many flights before the accident, the crew had failed to conduct the standard flight control checks before takeoff, a simple task that would have called attention to the lock.

Tony Kern, CEO of Convergent Performance and a speaker at this year's standdown, asked the audience which of those missed control checks they thought was most important. Most answered, "the one just before the accident."

Kern offered a thought-provoking response. "[I think] it was the first one. Whatever were they thinking about when they got to the end of the runway, knowing full well how important flight control checks were and they didn't do them? If you could just find that moment in time." Former NTSB member John Goglia discusses the crash in this month's Torqued *(page 96)* and news editor Chad Trautvetter examines what the accident says about IS-BAO certification *(page 110)*. ■

STANDDOWN TOPICS

- The need for responsible leadership in a demanding aviation environment, Jay Dankoff
- Individual potential for leadership, NTSB member Robert Sumwalt
- How to manage cockpit distractions created by even the most sophisticated technology, Chris Lutat
- Personal attitudes that can lead to an upset or a complete loss of aircraft control BJ Ransbury
- Human factors in aircraft maintenance
- Crew resource management

A complete topic list is available at safetystanddown.com/seminars, as are videos of many of the opening sessions. ■

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Safety Standdown

▶ *Continued from page 68*

consider changing the bad things and how that effort alone positively affects your outlook. What's going on around you doesn't matter as much as your attitude." Kern believes professionals, people who consider safety a serious concern, "need to admit they can be better, that they can be excellent in their job. If we feel helpless, we'll be helpless. First you have to care and second you need to take control of the things you can control."

Imagine tying the concept of safety together with efficiency, Kern suggested. The bean counters might sit up and take notice if the flight department explained how running a safer operation makes the whole business more efficient. "The idea that safety and efficiency of operation must be in opposition is nonsense," he said. He swung back to talking about the need for pilots, flight attendants and maintenance technicians to be better than the minimum standards required by the regulations. "Think about a marketing slogan that tells people our department is so safe that we're proficient to minimum standards," he said. Compliance with SOPs is important but hardly enough for Kern.

To support his philosophy of being better than simply meeting standards, Kern asked the audience to imagine a flight and how they'd perform when their life and the lives of their passengers depends upon performance that is near perfect. "Mother Nature could quite easily give you an exam that exceeds 100 percent of your potential, let alone demand

U.S. Navy Commander (Ret.) Al Gorthy addressed the issue of inattention, warning it can be as dangerous as error.

performance above minimum standards. There's quite a bit of work to be done in that huge gap between FAA standards and perfection.

"The only one who can close that gap is you," he said. "But why would you bother when you're cynical and bummed out? You need to take this to heart: be a role model." Kern told the audience to "stay on top of their game … read stuff, share stuff. Have courage, be humble. Remember the love you had coming into this industry. You need passion for what you do. It's tough to pay attention when you have a negative mindset. Take some personal responsibility. No one is going to do it for you."

Gorthy asked the audience simply to pay attention during his talk and to give his words careful consideration. "The world is filled with knowledge but very little understanding," he said. Gorthy told the audience the average adult attention span is 20 minutes and they hear only every fourth word. That's a challenge. What's important is what we allow ourselves to hear and seek to understand, because "understanding is the number-one antidote to risk. Attention requires an incredible amount of focus. I've had many of those *What am I doing?* moments or *What am I thinking?* moments over my career." Gorthy also believes it's time for individuals to begin rising above the limitations imposed by other people and situations.

Addressing Inattention

Clearly there is no magic pill or seminar that can improve a person's attention to avoid distractions. As he watched many in the audience checking their smartphones every few minutes, Gorthy said, "The gratification from those devices is addictive. [But] it is your choice to allow that device to remain on and distract you. You need to make the decision not to allow those distractions into your life that interfere with your focus. That begins with willpower. Why not turn them off?"

Gorthy set the stage for the rest of the week by challenging attendees to understand themselves, their airplanes and the threats of the real world. "As leaders of the industry, it's time to stop tip-toeing," he said, "it's time to realize we have a problem with inattention and error and it's time to lead with disciplined people, thought and action."

Safety Standdown is not about trying to achieve perfection, although everyone believed that might be a step in the right direction. "You're not expected to be perfect," Gorthy said, "but in this business good enough just isn't. If you don't have the time to do it right now, you might not get a chance to do it over again. I believe you already have exactly what you need [to manage distractions] right between your ears. But you have to have the willpower to put it into motion. If it's important to you, you'll find a way. If it's not, you'll find an excuse. And any excuse involving safety is invalid."

As a man who has lost comrades, Gorthy presented a chilling challenge. "We're engaged on a thousand battlefields with an elusive enemy, the enemy of human error. It's elusive, it's stealthy, it's opportunistic, it's indiscriminate. It lies in dormancy and strikes on its own terms. It has no shelf life or expiration date. It has no schedule. We need to defeat this enemy now and stop pretending it doesn't exist. If there was ever a time to make a difference it is now. Let's not postpone our responsibilities any longer." ❑

STANDDOWN ATTENDEE DEMOGRAPHICS

- 450 attendees in Witchita from the military, government and law-enforcement agencies, as well as corporate flight departments.
- 1,100 tuned in via the live feed on the Internet
- pilots: 52 percent
- management: 22 percent
- maintenance technicians: 11 percent
- flight attendants: 1 percent

FSF global data project moves ahead

by Kerry Lynch

The Flight Safety Foundation (FSF) is moving into the next phase of its data-sharing project with plans to hold workshops and develop guidance. The foundation launched its Global Safety Information Project (GSIP) last summer to help improve safety and advance data sharing by determining how information is collected and used throughout the Asia-Pacific and Pan-America regions.

The project builds on the FSF's past efforts to develop safety tool kits and guidance that draw on common industry methods and best practices, said Mark Millam, vice president of technical for the foundation.

In recent months the foundation held a series of focus groups in the Asia-Pacific and Pan-America regions to gather information on how safety data is collected and used, and to discuss prevailing concerns about data sharing. Wellington, New Zealand; Kuala Lumpur, Malaysia; New Delhi, India; and Panama City, Panama; were among the cities where focus groups were held. The focus groups involved stakeholders ranging from operators and manufacturers to ATC organizations, investigatory agencies, flight data analyzers and legal experts.

"We've seen positive results with a diverse group of passionate safety professionals in our focus groups," Millam said in announcing the initial results of the focus groups. The groups gave "balanced but preliminary insight" into collection systems. The participants expressed support for voluntary safety reporting programs, he said.

Tool Kit Development

International Civil Aviation Organization standards are pushing more stakeholders and government agencies to look at data-reporting and -sharing systems. But he added that stakeholders are interested not only in complying with ICAO standards but also because they see a benefit. "We have yet to find somebody who doesn't see the value in doing this," he said.

The discussions also revealed a number of concerns: the quality of the data and consistency of collection systems; inconsistencies in widespread sharing of the data; developing good mitigation systems from the data without adding to the regulatory burden; and protection of data.

The FSF created a website (www.fsfgsip.org) to support the project and report on its findings. Beginning next year it will host workshops in the targeted regions. The organization will use the information collected to develop guidance materials that can be used for safety data collection and sharing.

Ultimately the FSF hopes to develop tool kits to assist in the development of voluntary safety reporting systems. The idea is to make sure that best processes are used to gather data to advance safety, he said. The foundation also wants to help ensure safeguards are in place for the data collected. There will be different needs among various states and stakeholders, said Millam, and the foundation is hoping to develop tool kits that will "serve them all."

While GSIP is focusing initially on Asia-Pacific and Pan-America, Millam did not rule out expansion into other regions. But he added that at this stage, while it establishes the program, the foundation doesn't "want to spread too far and to too many places." ❑

FlightSafety Adds GV to Upset Recovery Training Course

FlightSafety International added upset prevention and recovery training (UPRT) for the Gulfstream V at its center in Wilmington, Del. This follows the company's inaugural UPRT course for the G550 that was announced in early August. The course offers training that can help pilots deal with loss of control, the accident category with the greatest number of fatalities in business aviation.

Course training is conducted in a full-motion simulator with an expanded aerodynamic model for upset prevention and recovery training that is qualified by the FAA's national simulator program. The UPRT course presents "compelling scenarios" based on actual aircraft incidents, FlightSafety said. This allows pilots to safely experience and recover from in-flight loss of control and extreme high-speed events that would otherwise be too dangerous in an aircraft, according to the pilot and maintenance training firm.

UPRT is just one of a series of new advanced FlightSafety courses designed to help pilots develop and maintain core airmanship skills. Others include rejected takeoff go/no-go, energy management and CRM/human factors line oriented flight training. *–C.T.*

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Pilot Report: Piper PA-46 M500

by James Wynbrandt

Upgrades put the focus on safety

The PA-46 M500 refines Piper's pitch to well heeled, value-conscious general aviation pilots considering the transition from piston to turboprop, making its upsell not with increased power and performance but with enhanced safety. It's the definitive answer to concerns safety experts, insurance companies and pilots raise about the challenges of stepping up to higher performance aircraft, questions the original PA-46 helped crystallize.

Piper's pressurized, piston-powered PA-46 Malibu, introduced in 1982, created the modern cabin-class single, a category now dominated by turboprops, with Daher, Pilatus and Cessna offering interpretations of the concept. Meanwhile, Piper built out its PA-46 "M-Class" line, upgrading the Malibu into the Mirage and flanking it with the flagship Meridian–certified in 2000, which brought the Vero Beach, Fla.-based manufacturer into the single-engine turboprop echelon–and the entry-level, non-pressurized Matrix recip.

Earlier this year Piper revamped and rebranded the turboprop Meridian as the M500 and the Mirage as the M350, and also announced the M600, a more powerful version of the M500, expected to receive certification by year-end.

The successful growth of the PA-46 product line stands in contrast to its entry into service. In its first iteration, powered by a 310-hp Continental, a series of in-flight break-ups and other accidents prompted the FAA to issue an AD removing the PA-46 Malibu's certification for flight into known weather, before the agency withdrew the directive after further testing of the design. The break-ups were attributed largely to pilot error, and subsequent PA-46 models demonstrated no such accident proclivity. The new upgrades aim to move loss-of-control accidents into the realm of impossibility.

The M500's primary enhancement is electronic stability protection (ESP), incorporated into the Garmin G1000 autopilot flight control system. (The M350 also incorporates ESP, as will the M600.) ESP–operative whenever the autopilot isn't engaged, and augmented by underspeed protection (USP) and overspeed protection–acts like an invisible copilot, ready to intervene any time the aircraft approaches the edges of its normal airspeed or bank angle envelopes. The M500 also has a coupled go-around and automatic level mode among its list of safety features.

Piper distributor Columbia Air Service, at Connecticut's Groton-New London Airport invited **AIN** to fly the M500 (and the M350) and see the results of the upgrade. Columbia's experience with Piper turboprops predates the PA-46 era; it was heavily involved in the Piper Cheyenne aftermarket before becoming a Piper dealer in the mid-1990s. Soon after, Columbia recruited Gordon Ramsay, a Hartford native who's been buying, rebuilding and selling airplanes since he was a teen, to serve as Piper program manager.

The M500 Outside and In

Sitting relatively high off the ground, its long wings uncluttered by engine cowls, the PA-46 has always had a sleek, eye-grabbing ramp presence, and the small, horn-like exhaust stacks poking from the cowl of turbine-powered PA-46s add a brawny swagger to its visual appeal. Externally, the M500 and the Meridian are identical, distinguishable from piston-powered PA-46s by the extensions at the leading edge of the wing roots (for more fuel capacity); the 37-percent larger empennage; and vortex generators on the wings. There's no nose baggage compartment, either, as the cowl is occupied by the M500's Pratt & Whitney Canada PT6A-42A, flat rated to 500 shp.

Piper has been refreshing the interiors of the M-Class in recent years while also striving to differentiate them. All PA-46 models formerly shared the same basic interiors. Now Piper's cabin appointments reflect the model's position in the fleet, putting the M500 at the apex of its interior styling efforts. Its standard Premier Elegance color-coordinated leather seats, carpet and headliner are offered in two neutral-tone color schemes: Dune or Glacier.

Meanwhile, new PA-46 cabins all benefit from work done by Boston's Blokx Design, which Piper engaged to rethink and redesign cabin elements such as armrests, cup holders and stowable table, without changing production tooling. USB charging ports in the cabin and cockpit have been added to the M500.

The M500 offers a GSR-56 global satellite datalink Iridium satellite transceiver. Piper

The Garmin G1000 in Piper's M500 incorporates electronic stability protection, which helps nudge the controls back to a stable flight mode when some parameters are exceeded.

added the option with an eye on the international market, as a conduit for getting in-flight weather in areas without access to XM weather or similar services. It has found 90 percent of all buyers want the system, primarily for telephone and text communication.

The enhanced cabins dovetail with changing ownership demographics. Whereas previously about 90 percent of PA-46s were owner flown, today the figure is about 80 percent, the remainder flown by professional pilots with the owner riding in the back.

Getting into the cockpit is still a bit of a squeeze, eased by the fold-down captain and copilot's seats, but once seated in front there's ample room, and the uncluttered panel adds to the feeling of spaciousness. The Garmin G1000 flight deck is dominated by the two 10.4-inch primary flight displays (PFDs) and center-mounted 12.4-inch multifunction display (MFD). An Aspen EFD1000 standby instrument has replaced electromechanical backup gauges and wet compass, unifying the appearance of the panel and, more important, easing pilot workload in the event backup instruments are needed, as the data presentation basically mirrors what's on the Garmin screens.

Switches for electrical, engine start, lights, ice protection and other systems are on a pair of overhead panels, separated by a smaller control panel for cockpit lighting. The GCU 476 keypad on the pedestal simplifies entering flight plans and other data into the G1000.

Meanwhile, the landing gear safety lights now appear on the MFD instead of cluttering the panel with a dedicated display, and in another upgrade, system aural alerts and the stall horn are now audible through the headsets. The intercom has 3-D audio.

Engine Operation and Management

The greatest challenge in transitioning from piston to turbine is operating and managing the engine, and Piper has put lots of effort into making the M500's turbine operations simple. There's no prop lever on the pedestal. Once the engine spools up, it turns the prop at 2000 rpm at all times, leaving only the throttle to control the power.

Also, the condition lever is simply a two-position fuel control, either in the ON or OFF position. Other turboprop installations typically require fine-tuning the idle setting with the condition lever on the ground, to meet changing demands for powering onboard equipment. The M500's ground idle–a minimum of 63 percent NG–provides sufficient power in all situations. The fuel system is also a simple on-off design. Automatic crossfeed keeps the wing tanks in balance. In the event of an imbalance, a fuel pump automatically engages, raising fuel pressure on the overloaded side and accelerating its fuel feed, until the imbalance is corrected.

The manual bleed-air system requires more attention than an automatic or electrically operated design, but it keeps the aircraft's systems simple. Bleed air is kept off during engine start to ensure all the air is used for cooling the engine, rather than diverted to run other systems.

The M500's autostart function simplifies the engine start, among the most intimidating parts of the turbine transition. After the G1000 completes its self-test, the fuel pumps and igniter switches are set to manual from the pilot's overhead panel and autostart is engaged, which starts the engine spooling.

At 13 percent NG the igniters fire, and the ITT and NG both climb. At 56 percent NG the starter automatically engages. Turn the fuel pumps to AUTO, and turn off the igniter. The engine is now started. Activate the generator, alternator, avionics, cabin pressurization and bleed air. The M500 is now ready to fly.

Before-takeoff checklist items include the overspeed governor, to ensure it limits prop speed to less than 1900 rpm, and reverse lockout, which prevents the engine from going into beta range in the air.

Our destination was Westchester County Airport (HPN), a mere 76 nm west. ATIS reported the wind as 250 at 12 with gusts to 16, and a scattered deck at 4,500 feet. With the tanks half full and the two of us on board we had room for about another 450 pounds of payload before hitting our 5,092-pound mtow.

Piper offers two color schemes–Dune and Glacier–for the standard Premier Elegance cabin. The company has also redesigned elements such as armrests, cupholders and tables.

Flying the M500

Engaging the flight director and following the command bars on takeoff yields a 125-knot climb-out once the gear and flaps are retracted, and we ascended at 1,700 to 1,800 fpm. A 145-knot climb-out delivers about 1,100 fpm. The pilot advances the throttle manually during the climb to keep power between 1,250 and the maximum allowed 1,300 pounds of torque.

Ramsey describes the M500 as a "point and go" airplane: simply pick a hole in a scattered or broken deck, point the nose at it, and blast through cloud layers piston-powered aircraft would have to pick their way around to climb above.

Leveling at 15,500 feet, we reduced power to 1,140 pounds of torque and TAS crept up to 232 knots, with a fuel burn of 290 pounds per hour (just under 40 gallons). If you're going to own and fly this airplane, this is about as low as you'd want to flight plan, so you can take advantage of the fuel savings and airspeed gains that come with altitude. Headwinds are rarely strong enough to negate the speed and fuel burn obtainable at altitude.

We didn't need to get into the high 20s for our brief flight to HPN (service ceiling is 30,000 feet, where fuel burn in cruise is about 37 gph/248 pph), or to check the M500's top cruise speed of 260 knots. (The M500 and Meridian have identical performance numbers; last year in a flight in a new Meridian at FL240 at -20 degrees C and some 350 pounds below mtow, I saw 264 ktas in cruise.) Range-wise, the M500's 170-gallon fuel capacity can take it 1,000 nm with IFR reserves at economy cruise, but at normal power settings the range is about 750 nm.

Enhanced Protection Capabilities

We tried out the ESP as well as the other protection modes on a flight in an M350 immediately before flying the M500; the systems operate identically in both aircraft. ESP provides a "resistive force to the pilot deviating from nominal flight attitudes," as Piper engineering test pilot John Kronsnoble explained in a subsequent debrief, likening it to a "flight instructor, to make you know you're flying the wrong way."

Piper isn't the only OEM offering stability protection through a Garmin (or other) interface. It's available on the King Air 200, the Cirrus SR-22 beginning with this year's model, and experimental aircraft outfitted with Garmin G3X glass cockpits. But each OEM tweaks the system for its own aircraft. Piper's ESP engages at 45 degrees bank, and the resistive force reaches its maximum at 60 degrees, disengaging when the aircraft is returned to 30 or less degrees of bank.

The pilot can manually override the system by overpowering the resistive force, and the ESP, USP and overspeed protection can also be disconnected–during training, for example–through the Garmin Aux page. But as the default mode, full protection will be restored whenever the Garmin boots up.

USP engages when pitch attitude reaches 17 degrees nose up, with forward pressure increasing to its maximum at 21 degrees pitch up, and disengages when upward pitch drops to 14 degrees positive. In extreme high-pitch attitudes, USP disengages at 50 degrees nose up.

Continues on next page ▶

Pilot Report: Piper PA-46 M500

▶ *Continued from preceding page*

The addition of USP to the safety package enabled Piper to add coupled go-around to the M500, allowing pilots to fly a missed approach without disengaging the autopilot. Should the pilot forget to add power, rather than follow the command bars up into a stall the USP will override the autopilot and lower the nose, giving the pilot a chance to take corrective action.

Overspeed protection engages at 189 kias or minus 15 degrees, reaching maximum resistance at 196 knots or 21 degrees nose down, and disengaging when airspeed slows to 188 kias or pitch is shallowed to 12 degrees negative or less.

In the real world, or the skies over Connecticut in our case, this works out well. Normal maneuvers are unencumbered, but as the bank increases into steep territory, or the nose is pulled up or pushed down beyond what you'd use for normal operations, the force serves as a reminder and assistant. In addition to its corrective forces, the system provides aural alerts and visual caution warnings on the PFD when activated.

The M500 also has an automatic level mode, activated by a blue button–a panic button, if you will–in the center of the panel. When pressed, it engages the flight director and autopilot and restores the aircraft to straight-and-level flight.

Together, all these safety enhancements add peace of mind, confidence and a sense of lightened workload, particularly in single-pilot operations.

But there's an additional concern facing transitioning pilots: the threat of hypoxia, which is believed to have had a role in several recent fatal accidents involving high-performance singles. The M500's hypoxia recognition system provides alerts should the cabin altitude climb above 14,900 feet when the autopilot is engaged. However, Piper elected not to incorporate in the M500 the automatic descent mode (ADM) featured in the M350.

When activated automatically by lack of pilot response to hypoxia warnings, ADM brings the aircraft down to an altitude at which the pilot can recover. But since the M500 cruises near its VMO of 188 knots, engineers determined that quickly descending to a breathable altitude at cruise power could easily exceed the aircraft's maneuvering speed, and Piper ultimately decided ADM is impractical in the M500. ADM will be incorporated into the M600, which will have a higher VMO than the M500, thanks to its stronger wings.

Meanwhile, the Garmin integrated pressurization system simplifies regulating cabin altitude. Turn it on before takeoff and tell it the elevation of your destination airport, and the system pressurizes and depressurizes en route automatically.

Additional onboard systems further bolster safety margins for handling weather and traffic. The Garmin GWX 68 digital color radar augments the XM WX Satellite Weather services available through the optional GDL 69A, and an optional GTS 825 traffic advisory system coupled with the GTX 33ES provides ADS-B IN and OUT functionality.

Flight into known ice capability, air conditioning and yaw damper are standard.

Operating in Real-world Conditions

While the M500 represents a step up for most buyers, it puts them in the company of many higher performing business aircraft. Twelve nm northwest of New Haven, we checked in with New York Approach and requested the Rnav 34 approach into our destination, to see the M500 fly a coupled approach. We wouldn't know if we'd get the approach for a couple of controllers down the road–it was a sunny afternoon in the busy Northeast corridor–but we were given a squawk code and directed to descend to 3,500 feet.

Pulling back the power to 345 pounds of torque produced a 1,450-fpm descent at 225 knots. Reducing to 60 pounds of torque steepened the descent initially to 2,700 fpm and then to 3,200 fpm. For an emergency descent, drop the gear, pull the power and point the nose down, keeping the airspeed at its 168-knot indicated maximum gear speed. With the four-blade prop acting as a speed brake, the M500 can descend at 6,000 fpm.

The wind at HPN was from 290 at 7, gusting to 17. A couple of controllers later, on a seven-mile right base along the shoreline, we were told to expect the Rnav 34 approach, and keep our best forward speed for jet traffic seven miles behind. It was the type of scenario that tests whether airplane and pilot are ready for prime time. Could the M500, known for its piston-like pattern speeds, fly fast enough down low to keep the Challenger comfortably behind us, and how easily could a transitioning pilot handle the demands of the slam dunk arrival in a high-traffic environment and blustery crosswinds?

We had no problem maintaining 155 knots, and after capturing the glideslope and starting down, we disengaged the autopilot to hand fly final. As for crosswinds, the big empennage makes landings in turbine-powered PA-46s exceptionally smooth. With power reductions and the flaps deployed, and the gear extended over the final approach fix, we had slowed to 95 on short final. That's a little hot for standard M500 operations, but whatever the approach speed, with a landing roll of 1,020 feet, there's rarely need for using reverse thrust, another way the M500 keeps things simple. But having jet traffic behind us altered the equation.

As soon as all three wheels were down, we put the throttle into reverse and were able to exit the active at Hotel, the second turnoff, leaving the runway clear for the Challenger. That's the kind of flying that says a transitioning pilot has arrived. With a standard equipped price of $2.264 million, the M500 can get them there with simplicity and economy. ❑

Piper M500 Performance & Specs

Price (typically completed and equipped)	$2.264 million (2015 baseline price)
Engine (1)	Pratt & Whitney Canada PT6A-42A, 500 shp
Passengers (typical)	1 crew + 5 pax
Range (w/NBAA reserves, 100-nm alternate)	1,000 nm at 225 ktas
High-speed cruise	260 ktas
Long-range cruise	225 ktas
Fuel capacity	170 gals/1,139 lbs
Max payload w/full fuel	559 lbs
Ceiling (certified)	30,000 ft
Cabin altitude at ceiling	9,500 ft
Max takeoff weight	5,092 lbs
Balanced field length at mtow (sea level, standard)	1,650 ft
Landing distance	1,020 ft
Length	29.6 ft
Wingspan	43 ft
Height	11.3 ft
Cabin	Volume: 106 cu ft
	Width: 4.2 ft
	Height: 3.6 ft
	Length (seating area): 12.25 ft
Baggage capacity	internal 20 cu ft/100 lbs
FAA certification (basis, date)	FAR Part 23, amendment 23-50 (1/7/05)
Number delivered (through 10/7/15)	27

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Dayton is ground zero on The Aviation Trail

by Matt Thurber

To say that I was amazed by all the aviation history that I saw during a recent visit to Dayton, Ohio, would be an understatement. The National Aviation Heritage Alliance (NAHA) invited a group of aviation writers to the first Aviation Writers Summit in Dayton and shared with us many stops on The Aviation Trail, a series of 16 historical aviation sites open to the public and centered around the activities of the Wright Brothers.

My reaction, which mirrored that of my aviation writer colleagues, is common for anyone interested in aviation who hasn't yet visited Dayton, according to NAHA executive director Tony Sculimbrene. Before the trip, if anyone had asked me about Dayton's significance to aviation, I would have answered that it was where Orville and Wilbur Wright began researching their airplane designs and where much of early aviation history took place. That barely scratches the surface, as our journey on The Aviation Trail soon revealed. We spent three days on the Trail, and there was a lot that we didn't have time to see.

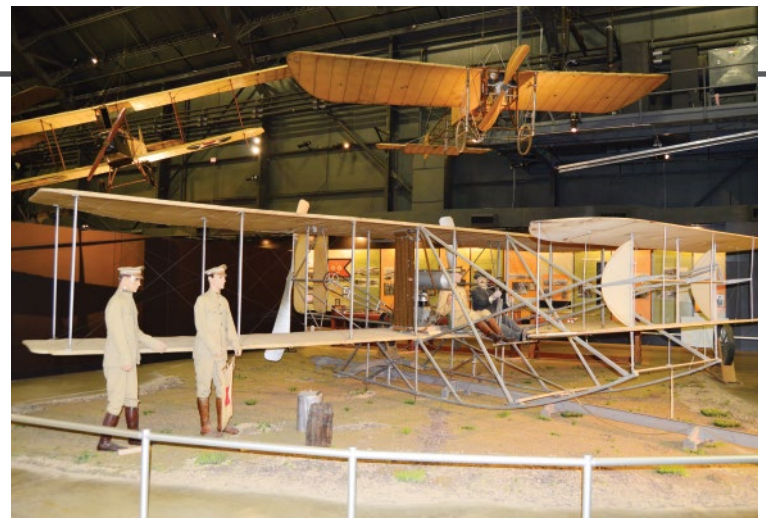
We started with a private tour of the National Museum of the United States Air Force at Wright-Patterson Air Force Base, given by museum curator Dr. Doug Lantry. Although the museum has an online virtual tour that gives a great view of the collection (including amazingly high-resolution Cockpit360 views that are the only way to see inside the collection's cockpits), seeing the aircraft up close is far more involving. And the exhibits are set up to illustrate the technology in context, so the visitor can experience why each display is important.

There are approximately 300 aerospace vehicles at the Wright-Patterson site, and more on loan at other museums and military bases. "We keep the record copy," Lantry explained, "and try to focus on the most meaningful equipment." He further explained the in-context display technique: "All of this is about people. While we have lots of technology here, technology doesn't grow itself, make itself or direct itself. People direct technology, [but] that's not to say we don't find beauty in technology. There is a trend toward more cultural history illustrated by technology or vice versa. It's not just airplanes lined up [in a museum]."

Some examples include a World War II Curtiss P-36A Hawk, depicted with a model of a ground crewman helping a pajama-clad pilot climb aboard. The idea is to show that this was a typical scene during the war, Lantry explained, when time was critical. Another display shows a nosed-over North American BT-14 in a tableau with an officer/instructor yelling at a cowed student pilot while two mechanics look over the damage. "It's a ground accident with some learning going on," he said. "Not everything goes to plan, and we thought we should show that." Older visitors to the museum often comment about these kinds of displays, he added, saying, "Yeah, that really happened."

The National Museum of the United States Air Force is full of too many gems to mention, and we were lucky to see a few, including the museum's restoration center. Here, there were many projects under way by dedicated volunteers, including restoration of the original *Memphis Belle* B-17F and a brace of massive Titan 4B rockets.

After dinner under the wings of museum airplanes, we were introduced to Amanda Wright Lane, the great grandniece of the Wright Brothers, at the National Aviation Hall of Fame adjacent to the museum. "You are on sacred ground," she told the assembled writers and Dayton-area aviation history preservationists.



A reproduction of the Wright Brothers' 1909 Military Flyer at the National Museum of the U.S. Air Force. The original is at the National Air and Space Museum.

The National Museum of the U.S. Air Force at Wright-Patterson Air Force Base, Dayton, Ohio, houses more than 300 aerospace vehicles with unique Air Force backgrounds.

Restoration Track

The next day, those of us who chose the Restoration Track traveled to Grimes Field in Urbana, Ohio, to visit the Champaign Aviation Museum. This is no ordinary museum: executive director David Shiffer, a former corporate jet pilot who also flies the museum's B-25, welcomes visitors into the hangar to talk to volunteers who are restoring *Champaign Gal,* a B-17G Flying Fortress. The Shiffer family started the project in 2005 and it is expected to take another seven years to get the old bomber flying again.

During the visit, I met mechanical engineer and volunteer Bill Heater, who is repairing cracked chords in the B-17's wing spars. The chords are square tubular aluminum extrusions that have a taper, and the tooling is long gone. But fortunately, the museum was able to get all the original blueprints and Boeing repair schemes, one of which is how to fix a cracked chord.

The team of volunteers has been working on the wings for the past eight years, and the project will take another two to complete. "A lot of it was making gussets and pieces to assemble it," he said. "We started assembly two years ago." Heater's team works on the project only two days a week. "I'll be lucky if I'm alive when this flies," he said.

We next traveled to Troy, Ohio, and the Waco Air Museum, where we were treated to a tour by historian Val Dahlem. This is another museum that pilots can fly into as it is located on Waco Field, a 2,000-foot grass strip on 78 acres.

Most pilots know that the name of the company is pronounced "Wah-ko," but might not know that it originates from Buck Weaver, founder of predecessor Weaver Aircraft Company. While the company is known for its classic biplanes, during World War II Waco designed and built nearly 1,000 Waco CG-4A troop-carrying gliders (of a total of almost 14,000). The glider was towed by C-47s (DC-3s), then released during night assaults behind enemy lines. What many people might not know is that thousands of the CG-4As were landed intact and recovered, using a snatch mechanism where the C-47 would fly over at 100 mph and catch a hook attached to a looped 1,000-foot

line. The line would pay out gently enough so that the glider and its pilots weren't harmed.

Restoration Central

A highlight of the trip–truly every location was a highlight–was a visit to the Air Force Museum's Restoration Center, where a team of volunteers is restoring the original B-17F *Memphis Belle*, which famously completed 25 missions with the same crew. There was a key difference between the work done at the Air Force Museum's Restoration Center and the Champaign Aviation Museum. The Air Force team's work is intended to make the *Memphis Belle* look as original as possible, but even though the volunteers manufacture many parts in-house, this B-17 is never going to fly again. But everything about it, even parts that can't be seen, has to look correct. An example is the wiring, which was originally cloth-wrapped, and in the restored version is done in the same fashion using the same materials and even the correct-size wire. "We're going to great lengths to make it as historically accurate as possible," said volunteer Tom Gardner.

The Champaign B-17, however, is going to fly, and when the volunteers at Grimes Field make a part, it has to meet FAA standards.

Another B-17, a D model, is under restoration, too. This is named *The Swoose* and is the oldest B-17 in existence and was flown by actress Swoosie Kurtz's father, hence her unusual first name.

Wright Sites

Although there is plenty of non-Wright Brothers-related aviation history on The Aviation Trail, we were treated to a deep-dive into the brothers' Dayton activities. We next visited Carillon Historical Park, where the John W. Berry, Sr. Wright Brothers Aviation Center houses an original 1905 Wright Flyer III. Orville Wright helped assemble this Flyer for display at the park. "We call this the world's first pilot's last project," said Alex Heckman, director of education and museum operations.

I couldn't help wondering why two men who made their living manufacturing bicycles didn't think of mounting wheels on their early airplanes, including the Flyer III, considered the first practical airplane. Heckman explained that the rail-launch mechanism that the brothers used was much more reliable because few flying fields were perfectly flat; after all, there were no airports. If you wanted to guarantee a clean launch, he said, "with the rail every time you could get in the air."

Dinner that night was at Orville and sister Katherine Wright's home, Hawthorn Hill, now part of the Dayton Aviation Heritage National Historical Park. He lived there for 35 years before his death in 1948. Wilbur, sadly, never got to enjoy Hawthorn Hill, having died in 1912 of typhoid fever.

On the final day, we toured the Wright Company factory in Dayton, which NAHA is negotiating to purchase and preserve. It was oddly compelling to stand in the factory where, more than 100 years ago, the

Continues on page 79 ▶

The Wright Company factory in Dayton still exists, and plans call for restoring the core building as a tourist attraction and hub of aviation education activities.

Cessna TTx: power and poise on six pistons

by Matt Thurber

The speedy Cessna TTx has been in production for about two years, and since Cessna (now Textron Aviation) purchased the former Columbia Aircraft in 2007, the company has delivered 80 of the various versions of the low-wing, composite, single-engine, piston-powered airplane (Cessna 350/400 and TTx). The TTx was certified in 2013 under a new type certificate and is the only version now available. Retail price is $799,000, which includes everything but optional TKS fluid-based flight into known icing (FIKI), Sirius XM weather and Stormscope.

Powered by a 310-hp Continental TSIO-550-C equipped with twin turbochargers and intercoolers, the TTx is a serious traveling machine, capable of flying 1,250 nm at long-range cruise speed and up to 25,000 feet. Maximum cruise speed at 25,000 feet is 235 ktas, seven knots slower than the fastest Mooney (the Acclaim), but the TTx accomplishes this speed with fixed landing gear. The TTx is certified in the utility category, which makes the airplane operationally more flexible, with higher maximum structural cruising and maneuvering speeds.

I flew the TTx with Textron Aviation senior instructor pilot Dave Richardson on September 23 at Wichita's Dwight D. Eisenhower National Airport. During the walkaround and the flight, it was clear that the TTx is a major step up in the Textron Aviation line. While it shares the Garmin avionics lineage of the company's high-wing piston singles, the TTx has a G2000 system with a touchscreen controller instead of only the G1000's buttons and knobs. Because many new Citations are equipped with touchscreen-controlled G3000 and G5000 avionics, the TTx makes moving into the Citations much easier. The TTx's initial approach speed of 110 knots, while much faster than a Cessna 172's, is also helpful for future Citation pilots, much closer to that of the single-pilot M2, as Davidson pointed out.

Speed brakes are a necessary feature for descending at a decent rate in the slick TTx, which can fly at up to 235 ktas at 25,000 feet. The all-composite single is powered by a 310-hp twin-turbocharged Continental TSIO-550-C, and TKS fluid-based flight-into-known-icing is a popular option for serious travelers.

MATT THURBER

MATT THURBER

On final approach on the ILS Runway 19L at Wichita's Dwight D. Eisenhower National Airport. The Garmin G2000's automatic flight control system smoothly manages the approach, depicted on the PFD's synthetic vision display.

A Serious Traveling Machine

Taxiing the TTx might take getting used to for pilots not familiar with a castering nosewheel, but I found it worked perfectly fine. I took off, rotating at about 75 knots, then climbed to 11,500 feet, initially at the VY of 110 kias then transitioning to 130 kias for a cruise climb. At 10,000 feet, we were still climbing at 1,150 fpm. There is no time limit for full power, and the single automatic wastegate maintained power during the climb. There is no yaw damper or rudder trim, but a rudder hold button allowed me to step on the right rudder the necessary amount during the climb, and pushing the button held the rudder in the desired position to make a long climb more comfortable. Stepping on a rudder pedal releases the hold.

Setting 85 percent power at 11,500 feet, I dialed back the vernier throttle to 85-percent power, about 33 inches MAP, and the prop to 2500 rpm. Fuel flow at rich-of-peak was 24 gph and speed 202 ktas, slightly lower than the book speed of 207, but it was ISA +12 degrees C that day. When I leaned the mixture -50 degrees lean-of-peak, MAP dropped to 30 and fuel flow to 17 gph, for a 190-ktas cruise speed.

I tried the Garmin electronic stability and protection feature, which automatically helps "nudge" the controls back toward a stable flight mode when certain limits are exceeded, even with the autopilot not engaged. In the low-speed regime, ESP prevented the TTx from flying slower than 80 knots, and did so by lowering the nose, which resulted in a 550-fpm descent. We also tried some stalls with power on and off, and the TTx handles these easily, with plenty of control retained using the rudder, but the ailerons also remain effective thanks to a cuff in the wing leading edge.

Deploying the speed brakes allowed me to come down at a high rate of descent while carrying 85-percent power. There are no speed limits for the speed brakes.

Returning to the airport, I set power to about 40 percent and used the speed brakes to slow down enough to extend the flaps to the takeoff setting, which caused the TTx to balloon slightly and right onto the glideslope for the ILS Runway 19L. I flew the ILS using the autopilot, then took over at about 500 feet. The TTx is responsive, thanks to pushrod controls, and I was able to put it right where I wanted to in the slight crosswind.

After adding power for a touch-and-go, we took off and remained in the pattern for a second landing. I've become accustomed to the Garmin touchscreens in other airplanes, and the TTx's systems are so simply laid out that it wouldn't take much longer to become fully checked out. The TTx is clearly not an entry-level airplane, but it offers a lot of performance in a well designed package and should appeal to buyers who want a lot of bang for their buck. ❑

MATT THURBER

Dayton trail

▶ *Continued from page 77*

Wrights oversaw an enterprise that employed hundreds of people who ultimately produced 120 Flyers. "This was the first factory in America for the production of airplanes," said NAHA's Sculimbrene. "This was the birthplace of America's aerospace workforce."

One plan for the Wright factory is to build a new Wright B Flyer replica. The Wright "B" Flyer organization built the first replica in the 1970s, and that one still flies, but it suffers from marginal performance. The only way to bring the existing replica to airshows is to ship it, and that is a costly and time-consuming activity, according to Wright "B" Flyer president Jay Jabour. "The new one will be much lighter," he said, and it will be designed for disassembly and shipment in a standard shipping container.

The plan is to involve local kids in building the new Flyer. Aviation companies such as Dassault Systèmes (SolidWorks design software) and Lycoming (engine) have already signed on to help with the project.

During a tour of the Wright-Dunbar neighborhood in Dayton, we saw the restored Wright bicycle shop. We then headed back towards Wright-Patterson AFB, where the Huffman Prairie site of the Wrights' early Dayton flights has been preserved, adjacent to one of the base's runways.

At the Huffman Prairie site, a replica of the Wrights' hangar is the sole building, although there is also a not-to-scale replica of the rail-launch system. Here it's easy to see why wheels wouldn't have been a good fit; the prairie is often boggy and way too rough, especially for such a lightweight vehicle. And it's easy to position the rail into the wind.

Standing in the prairie next to the Wrights' building and watching military jets taking off and landing right next door highlighted the incredible changes in aviation during the past 100-plus years.

We had two final stops on the Writers Summit tour; the first was back to Wright-Patterson AFB and the new Building 4 at the Air Force Museum, where a "roll-in" event was held to highlight the first airplane to move into the new hangar. This was the collection's North American X-15 hypersonic rocketplane, notably equipped with bulky auxiliary fuel tanks. What made this event even more special was the presence of Maj. Gen. Joe Engle, the last living X-15 pilot.

Although Engle never flew this particular X-15–the second of three–because it was damaged, he did fly the other two and has fond memories of those rapid but short sub-10-minute high-altitude flights. "It was a really rewarding experience," he told **AIN** while standing in front of the X-15. Asked about how it felt to see the X-15 again, he said, "It's a good feeling, it's really good to see it; a lot of good memories coming back. I'd love to get back in and go through this again!"

For the final visit on The Aviation Trail, we returned to Grimes Field for a flight in the Champaign Aviation Museum's B-25J. With Shiffer in the left seat and Bill Weidenhammer flying copilot, we took off for a brief but enormously satisfying flight over the Ohio farmland. Shiffer spends most of his time at his family's manufacturing company but every afternoon heads over to the museum. And while he has thousands of hours in Citations, flying the B-25, he enthused, "is way more fun." ❑

MATT THURBER

Champaign Av. Museum's B-25: David Shiffer (left) and Bill Weidenhammer.

As corporate belts tighten, flight departments strategize

by Matt Thurber

With bean counters focused on the cost of operation, departments need to emphasize the value they create.

NBAA Leadership Conference co-chair Bob Hobbi sees some worrying trends affecting business aviation, and he is trying to shine light on the issues, not only at the next conference (to be held in San Antonio from February 22 to 24) but also among flight departments.

"Things continue to grow more complex," he said. "There are more regulations than ever, and more business complexities. Strategizing and trying to manage everything becomes almost an impossible task." And at the same time, flight departments are under closer scrutiny to justify their existence.

Hobbi, president of customer-service training organization ServiceElements, is familiar with these issues, and he and his company's trainers address how flight departments need to adapt to these fundamental changes. The broad concept that Hobbi offers is that flight departments must embrace a cultural change so that leaders can avoid the perceived need to constantly micromanage their employees, freeing up time better spent on strategy. For example, he pointed out, "If you're trying to focus on a safety culture, that means that you don't have to check on people. You know you have an organization that prevents people from crossing the line when it comes to safety. That's culture."

When working with clients, Hobbi said, "We do address this. When we go into a flight operation, we talk about culture as something that the entire group has to be involved in." That said, there is often resistance to efforts to change the culture at flight departments. "We've had chief pilots and directors of aviation get upset about it," he said, explaining that he is not suggesting ignoring details. "We advocate paying attention to all details," he explained, "not only aircraft operational items but the minutest details about passengers and their needs, and finding a value for each [business aircraft] user in each organization."

What this means is that as a Part 91 corporate operator, a flight department must create a culture where the focus isn't just on safely flying the company airplane. "That's a basic expectation," Hobbi said. "Ultimately you have to create a culture where the entire organization is aware of every passenger's basic needs or additional needs…a culture where pilots go in to do a preflight and they allow themselves extra time not only for technical and safety aspects, but also for the customer aspects of the preflight. That's where we talk about the value of the flight department to the enterprise, and making the operation indispensable.

"The new trends don't show up with fireworks so everybody sees them," Hobbi continued. "They just kind of creep in. It starts out with the complexity that's increasing constantly, whether it's technology, regulation, the business environment and the speed with which things get done or changed. All of that has an impact on a flight operation. We address the culture issue, but it's about addressing safety and culture without adding more work."

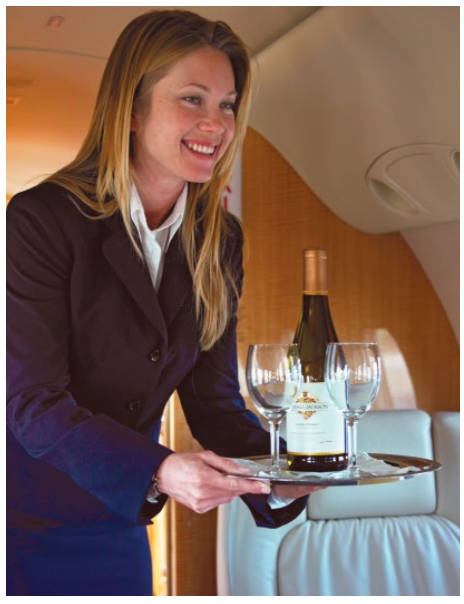
Culture in the Field

Flight department leaders are aware of these issues, and **AIN** interviewed two companies' aviation managers to learn how they are addressing culture and maintaining safe operations while dealing with the ever-increasing complexity of business aviation. Both preferred to remain anonymous so they could speak freely with **AIN**.

The manager of one *Fortune* 500 firm's flight department pointed out that for his company, the complexities don't stem solely from new FAA rules but have a lot to do with international travel, including the need to comply with International Civil Aviation Organization (ICAO) requirements. Many countries default to the International Standard for Business Aircraft Operations (IS-BAO), which was designed to meet ICAO standards and recommended practices outlined in ICAO Annex 6, Part II.

"There is more paperwork to comply with, and all of this causes more people to be involved with the day-to-day operation of the flight department," he explained. "In the past we could have one person doing scheduling, training and [other] requirements and have pilots, a mechanic and a dispatcher. Now there are a lot of additional duties. Flying has gotten a lot more complex than it used to be. The days of coming in and checking the weather and blasting off are gone."

This manager is acutely aware that his flight department is a cost center for his company, and adding more work naturally increases the cost of running the operation. Working with Hobbi, he learned that it is important to focus on the department's mission, and also to define that mission so that each employee understands how his or her job relates to the mission. The idea was to get away from just thinking the job was only to get executives from point A to B safely, he added, "and to focus on why we're actually there and what value we present."



Passengers remember their experience, and the whole department must make sure it is a good one.

The department hired a facilitator to work with all employees to help define its mission and vision statement. This made the process important to everyone and not just a mandate handed down by the department manager. The same process was used for creating the department's safety management system (SMS). "If we don't have buy-in, it's all eyewash," he said, "and we're not safer."

"We're fortunate to work for a good company that has staffed us correctly," he said. "They're willing to provide resources to enable us to be productive, and that allows me to operate effectively and us as a team to accomplish the mission." He credits his colleagues with helping to make it all work because everyone is willing to share information. "If you don't have a culture that encourages you to share, that hinders your job and ultimately affects your passengers. And if it affects their life, you're going from an asset to a liability."

In this case, the company appreciates what its flight department does. "The CEO has mentioned a number of times that he couldn't do [what he does] without the corporate airplane," he concluded.

A Different World

The director of aviation for another large company contrasts today's flight department with what used to be the so-called "sacred cow" corporate operation, where there were few questions about how money was spent. He acknowledges that it is normal "for everyone to think that I have it harder than the generation before me." But, he added, "there is increasing pressure on two fronts: external things such as trying to comply with IS-BAO, changing avionics requirements (RVSM, RNP, CPDLC, ADS-B is coming, Free Flight may be in the future), and on top of that you have a lot of internal things going on in these big companies.

"The world I live in is so different now. For the most part we're pretty well integrated with the company. We are subject to [the same] pressures to cut costs and to do things more efficiently [that] everyone [else] in the corporation is subject to."

There is no escaping the need to keep proving the worth of the flight department. "What is the value aviation brings to the company?" he asked, citing typical questions he faces every day. "Can we justify the costs? Are [flight department personnel] following rules with regard to how to spend money, where they stay overnight, when they're training and so on? There is a lot of internal pressure, too, to cut costs and do more with less."

This director's strategy reflects the need to focus on the people who work in the flight department, especially considering the challenge of finding qualified personnel. "You have to surround yourself with good people and give them the freedom to do what they need to do," he explained.

"We no longer live in the world where the chief pilot could look at every bill and deal with the FAA. He could handle whatever decisions had to be made about the trips, and also fly. If you don't have a team of people that's really good at what they do and that you trust with responsibility, you'll hamstring yourself. You'll never understand everything, just like the IT people know a lot more than you. It's all about having people you trust and who are really good at their jobs."

The company he works for supports this philosophy, he said. "It is heavily focused on development of its people. The best way is to develop that kind of talent from within if you have that ability. If you have the right people, you can always [help] get them more proficient, as long as they are quick on their feet and tuned in to the organization. The more time you spend in this business, the more you realize how critical every hiring decision is." ❑

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Jetcraft 10-year forecast: spotty growth followed by dip

by Charles Alcock

The 10-year business jet market outlook published on October 20 by pre-owned aircraft broker Jetcraft reflects a marked recalibration of growth expectations once inflated by what has proved to be the industry's unfounded belief that so-called emerging markets would trigger a supposed golden age of growth.

The report predicts a gradual ascent in new jet deliveries to a new peak in 2021, before a moderate downturn kicks in between 2022 and 2024. Jetcraft sees North America and Europe (together accounting for just over two-thirds of the world market) continuing to dominate the largely flat market.

According to Jetcraft's analysts, 8,755 new aircraft will be delivered between 2015 and 2024, generating revenue of $271.1 billion. Annual delivery totals are set to rise at a cumulative annual growth rate (CAGR) of 7.4 percent to 1,127 in 2021 from 735 aircraft this year.

Over the 10-year period, the forecast sees 54 percent of the new deliveries going to North America (4,728 aircraft), with Europe accounting for 14 percent (1,225), the Asia-Pacific region 12 percent (1,050), Latin America 9 percent (788), Russia and the CIS 5 percent (438), followed by the Middle East and Africa, each with 3 percent (263 apiece).

But even in the relatively healthy North American economy, old assumptions about aircraft purchasing patterns can no longer be relied on, according to Jetcraft. "We noticed some definite behavior in the current business cycle," said the U.S.-based company's president, Chad Anderson. "Customers are tending to shy away from emotional purchases. Companies are allocating some cash reserves to buy back shares [at the expense of aircraft purchase]."

In terms of both numbers of aircraft to be delivered and the revenue they will generate, ultra-long-range jets are expected to command the lion's share (*see charts*). Super-light aircraft are seen as the least significant in terms of anticipated deliveries, while very light jets hold this unwelcome distinction in the forecast for revenues. The highest CAGR gain over the forecast period is set to be among midsize jets, with large aircraft expected to achieve the lowest growth.

Commenting on anticipated aircraft production patterns in the coming 10 years, Anderson maintained, "OEMs are developing more widebody models [at the expense of new narrow-body models], crowding the higher segment with multiple offerings."

In Jetcraft's view what it calls "the most intriguing aircraft development opportunity" would be for Dassault to launch a stretched version of the new Falcon 5X twinjet as a new ultra-long-range contender.

Bombardier stands to win the largest share of the deliveries, accounting for 24.3 percent of the aircraft and 31.6 percent of the revenue, according to the forecast. Other anticipated winners are Pratt & Whitney Canada and General Electric, which the broker says will soon challenge Rolls-Royce across all market segments. It believes Honeywell will be the leader of the pack among avionics suppliers, alongside Rockwell Collins and Garmin.

The forecast envisions deliveries next year climbing by 8.7 percent to 799 (from 735 this year), but this will be followed by weaker growth of 4.1 percent in 2017 to 832 deliveries. Following the peak in 2021, the numbers will dip again, sinking to just 688 in 2024.

Bracing for a Fall

"We are now planning for another dip in the market, and this is not something that other forecasts have anticipated," Jetcraft chairman Jahid Fazal-Karim told **AIN**. "We have no agenda with our forecast and produced it simply to work out how to position our company in terms of where we allocate resources and when we need to be aggressive in offloading [aircraft inventory]. So it's a neutral analysis."

Jetcraft's analysts combined classic data, such as economic forecasts and various market growth projections, with their own knowledge of the industry. "There is a bit of subjectivity," Fazal-Karim acknowledged. "But history is important and we looked carefully at past cycles."

The Jetcraft founder admitted that he was among those in the industry whose past assessment of market prospects proved to be overly optimistic. "Three or four years ago, I thought the market would be strong by 2015, and even that it would put us back to the glory days, but it's still not there yet," he told **AIN**. "The recovery has proved to be much slower than in previous cycles." Another disruptor of a more comprehensive recovery has been the fact that the moderate bounce-back enjoyed by the North American economy has been out of sync with other world economies that have still lagged, constraining demand for aircraft as tools of business expansion.

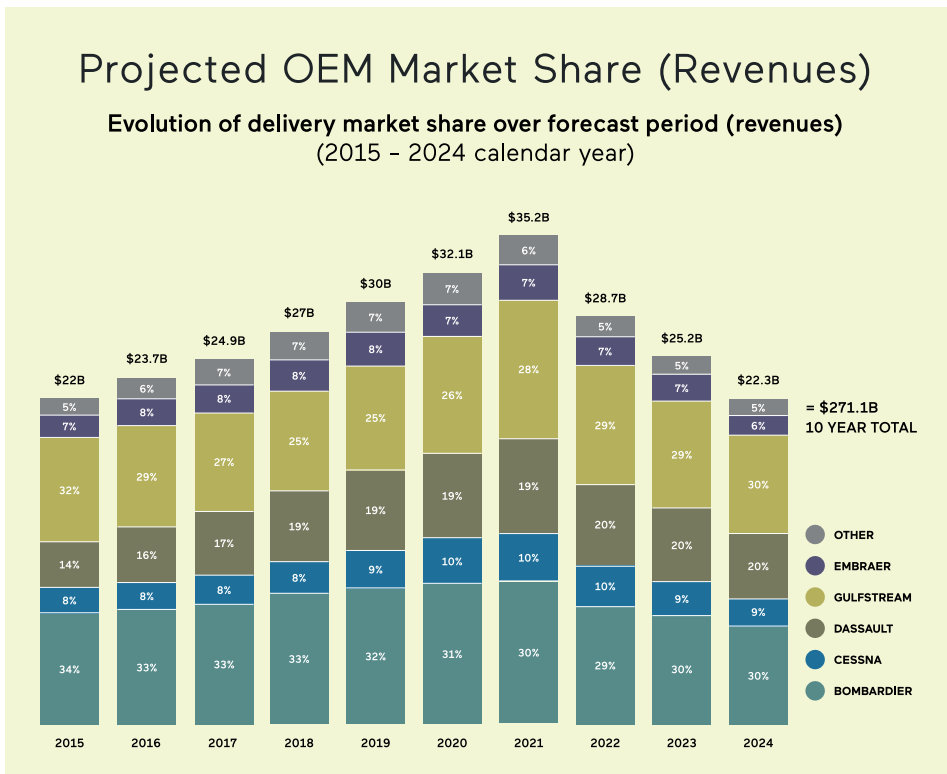
Politics Gets in the Way

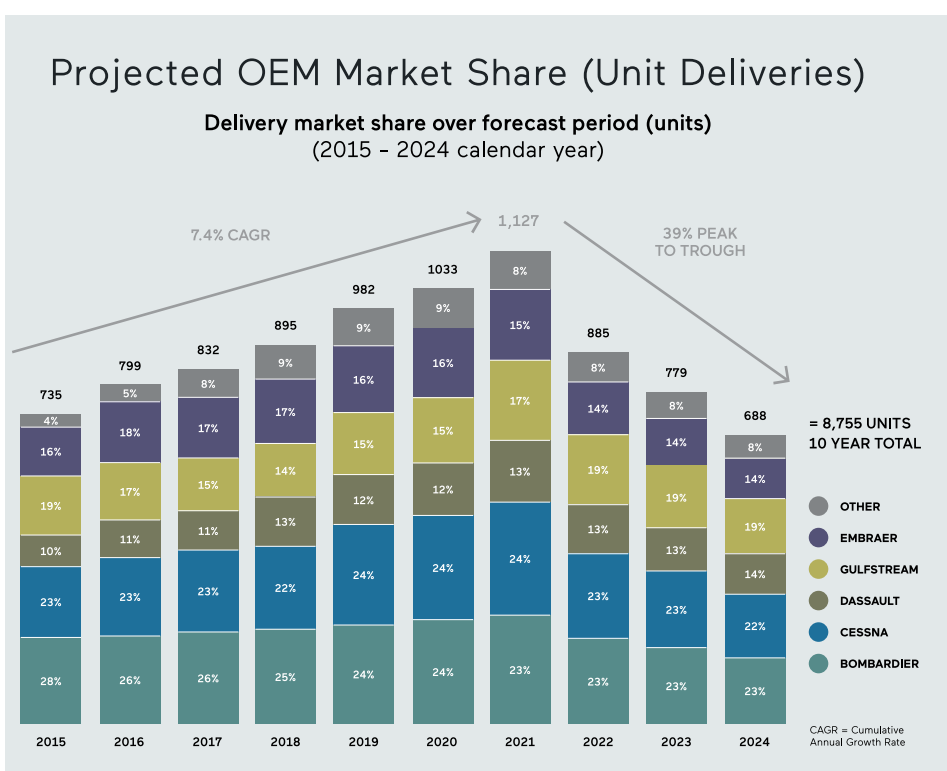
In his view, hard-to-predict geopolitical changes in key emerging markets have undermined previous assumptions about the drivers of market growth. "No one predicted the war with Ukraine and the economic sanctions that this brought to Russia," Fazal-Karim commented. Similarly, he indicated that the business aviation industry was caught off guard by a change of government in China that saw old-school Communists take power and introduce policies that effectively have discouraged the use of private wealth to buy aircraft in the name of combatting alleged corruption.

"In 2009, 2010 and 2011 when the mature markets were down and the emerging markets were carrying us, the biggest mistake that many of us made was that we looked at these new markets and thought they would act in the same way as mature markets," he said. "We underestimated the impact of political changes in places like China, Nigeria and Russia."

More particularly, Fazal-Karim acknowledged that the business aviation industry might have made ill-founded assumptions about how new groups of privately wealthy individuals would spend their money. "In places like China we underestimated how governments can influence the way these people behave," he said, while adding that the emerging markets, by their inherently unpredictable nature, could yet swing a surprise on the market that could result in a reversal of fortunes.

Jetcraft anticipates that the pre-owned business aircraft market will follow much the same curve as for new models. "The new deliveries will mean more availability of pre-owned aircraft because most buyers are upgrading," said Fazal-Karim. ❑





Bizav likely to blaze trail for adoption of Gagan

by Neelam Mathews

Even as India's airlines waver about whether to adopt Gagan, the nation's indigenous Waas-like navigation system for domestic airspace, the general aviation industry is likely to embrace the system once modalities on validation and certification are agreed. That was the takeaway from the first meeting among the Airports Authority of India (AAI), OEMs and members of the Business Aircraft Operators Association (BAOA) held in September.

The AAI is developing procedures to enable Gagan at 63 medium and small airports. Further, an independent directorate within the AAI for Communication, Navigation & Surveillance (CNS) is being proposed to ensure Gagan be given "a focus and priority."

"It is a good beginning," said R.K. Bali, BAOA managing director. "Since airlines already have their systems in place and use only 20 percent of existing larger airports, the business aviation industry will find this useful given that the new civil aviation policy focuses on regional and remote connectivity." He added that Gagan "will support more direct air routes, reduce separation standards, cut fuel consumption and improve safety for business aircraft."

Gagan reduces dependency on ground-based infrastructure by using the precision and accuracy provided by satellite technologies. For a suitably certified aircraft, Gagan can provide approach procedures to runway ends to minimums as low as 250 feet, nearly the same performance as a Category I ILS.

Equipage Benefits

To derive the maximum benefit from end route and approach guidance would require operators to equip all aircraft with global navigation satellite system (GNSS) avionics. With charter operators encouraged to start regional and remote operations, the key will be to minimize operating costs, without which small charters will be unable to survive, said Bali. "We are hoping in our future discussions with OEMs that they will be able to modify existing software to keep costs low."

Another incentive to equip for Gagan, he added, are waivers of parking charges at alternative airports. "However, in all this there must be complete hand-holding by the Directorate General of Civil Aviation (DGCA) as far as validation and certification goes," he said, alluding to the fact that in the past general aviation has often been hamstrung by bureaucratic procedures and red tape.

The AAI and Indian Space Research Organization officially launched Gagan this year. Two satellites in geostationary earth orbit are broadcasting signals for the Indian Flight Information Region, augmenting the performance of GPS signals received in Indian airspace.

According to consultancy RNMarket Research, China and India dominate the business jet market in Asia. Analysts predict that in the next decade India will emerge as the third largest aviation market by 2020.

The BAOA takes a more measured view. Bali believes once measures to improve infrastructure are implemented and taxes reduced, the industry will grow in line with projections. "However, for that we will need to be prepared, and adopting Gagan is an important step." ❑

L-3 extends standby line with Part 23 ESI-500

by Matt Thurber

L-3 Aviation Products introduced its newest electronic standby instrument, the ESI-500, designed for Part 23 airplanes (Class I, II and III pistons, turboprops and jets) and Part 27 helicopters.

The device fits in a three-inch round case so it can be installed in a standard instrument cutout. The high-resolution display is 24-bit color and offers optional synthetic vision with terrain alerting and obstacles, driven by L-3's own database.

Other features that can be displayed on the ESI-500 include altitude, attitude, slip/skid, aircraft track, airspeed awareness cues and vertical speed. An Arinc 429 interface accepts navigation data to drive vertical and horizontal nav indicators. The pilot can select metric altitude and altimeter setting.

An optional magnetometer, newly developed by L-3 Aviation, is available for magnetic heading display. During installation, the ESI-500's airspeed tape can be programmed for VNE and VMO airspeed limitations. Battery life of the unit's internal lithium-ion battery is guaranteed for one hour but normally lasts up to three hours, according to L-3.

The ESI-500, for Part 23 airplanes, offers an optional synthetic vision display.

The ESI-500 is priced at $5,600, plus $200 for the data configuration module and $336 for the installation kit. Options include synthetic vision, $1,333; nav data, $667; and magnetometer and installation kit, $1,567.

The ESI-500 has received FAA technical standard order approval, and L-3 Aviation Products expects the unit to be installable under an approved model list STC for a variety of aircraft models. *–M.T.*

SPIRIT ISSUED FANS STC FOR CHALLENGER 604

A new STC is now available from Spirit Aeronautics for Fans (future air navigation system) 1/A, ADS-C (contract) and controller-pilot datalink communications (CPDLC) in the Challenger 604 equipped with Rockwell Collins Pro Line 4 avionics. The STC uses the existing FMSs and control display units and includes a new Rockwell Collins CMU-1000 communications management unit and L-3 Aviation FA2100 cockpit voice recorder, which is needed to store the data messages that are central to Fans operations.

"This is what Challenger operators have been waiting for and it is truly one of those occasions where they'd better move fast to reserve a slot because the equipment and capacity levels will be stretched to the limits to meet the mandated deadlines. There are simply more aircraft that need Fans upgrades than installation facilities and equipment OEMs can keep up with," said Tony Bailey, president and COO of Spirit Aeronautics. ■

NEWS UPDATE

TrueNorth Offers Wireless Access to Smaller Aircraft

TrueNorth Avionics has unveiled a new "N" wireless access point and integrated router designed for light to midsize jets and turboprops. The Optelity Hot Spot is a certified device permanently installed in the aircraft. It weighs slightly more than half a pound and comes either with an integrated antenna or external antenna, but it does not include telecom gear. For communications outside the aircraft, the Hot Spot is connected to the aircraft's satcom or air-to-ground telecom system. The Hot Spot can host embedded applications, such as TrueNorth's MyStylus app, which allows users to make voice calls using their iOS and Android devices.

"We've been providing communications systems to heads of state, VIPs and *Fortune* 50 aircraft passengers, and now we're bringing executive-level communications capabilities to the light aircraft market," said TrueNorth CEO Mark van Berkel.

Universal Avionics, TrueNorth Ink Dealership Deals with SoCal Jets

Van Nuys, Calif.-based business jet maintenance provider SoCal Jets has added dealership agreements with Universal Avionics and TrueNorth Avionics. Under the Universal Avionics agreement, SoCal Jets is a "value-added reseller" for the entire Universal product line, and the company can participate in the avionics manufacturer's incentive programs and promotions. For TrueNorth, SoCal Jets is a reseller for the Canadian company's Simphonē OpenCabin airborne telecom products.

SoCal Jets also holds dealerships for Alto Aviation, Avidyne, Flight Display Systems, FreeFlight Systems and Gogo Business Aviation. The TrueNorth and Universal Avionics agreements should be helpful as SoCal Jets adds ADS-B and Fans solutions for its customers that need to comply with upcoming NextGen mandates. "Both of these partnerships will allow SoCal Jets to increase support capabilities–both here and in Mexico," said SoCal Jets CEO and founder Robert Roig.

Esterline Receives TSO for CMA-6800 Display

Customers can now purchase the Esterline CMC Electronics CMA-6800 replacement display, after it received Transport Canada technical standard order (TSO) design approval. The approval is also recognized by the FAA. The LCD-based CMA-6800 is a form, fit and functional replacement for Honeywell ED-800 cathode-ray tube (CRT) displays. The new unit "retains the use of existing symbol generators and control panels, with no retraining required," according to Esterline. Weight saving is about four pounds per display, and the CMA-6800 will cost far less over its lifetime than trying to keep the older CRTs flying. Within the next few months, Esterline expects to receive an FAA Part 25 approved model list (AML) STC for installation of the CMA-6800 in the Citation III/VI/VII, Hawker 800, Falcon 900 and Bombardier Dash 8. *–Matt Thurber*

NEWS UPDATE: ADS-B

Exemption Available for Part of ADS-B OUT Requirements

Airlines and general aviation aircraft owners and operators can apply to the FAA for an exemption to part of the ADS-B OUT equipment requirements, which could make meeting the U.S.'s Jan. 1, 2020 ADS-B mandate temporarily simpler. The exemption basically allows use of a less-capable GPS or global navigation satellite system (GNSS) sensor—basically non-WAAS—coupled with a rule-compliant ADS-B transponder to meet the ADS-B OUT deadline.

The exemption requires the upgraded transponder, new wiring to allow installation of the compliant GNSS so it is a simple swap and a plan for how and when the final upgrade will be completed, according to General Aviation Manufacturers Association v-p of operations Jens Hennig. "The operator is also required to qualify its existing GPS to support ADS-B and use the Service Availability Prediction Tool (SAPT) for every flight," he explained.

"The delay is only for the position source, not the ADS-B transponder/transmitter," said Ric Peri, vice president of government and industry affairs for the Aircraft Electronics Association.

Flying Colours STCs ADS-B for Older Challengers

Flying Colours has secured an FAA supplemental type certificate for ADS-B OUT for the Bombardier Challenger 604 and 605. The first aircraft to be fitted with the DO260B-compliant system, a 605, was completed at the company's St. Louis, Mo. facility in late September. The STC will be submitted for validation by both Transport Canada and Europe's EASA this year.

Following the 604/605 certification, Peterborough, Ontario-based Flying Colours has moved on to a second ADS-B installation on a Challenger 300. FAA approval of this STC is anticipated before the end of the year.

The STC will be available for installation at all Flying Colours facilities.

FlightStar ADS-B for Learjet 40/45

Avionics installation and repair shop FlightStar, of Savoy, Ill., is in the final stages of earning an ADS-B OUT supplemental type certificate (STC) for the Learjet 40/45, one of a series that the company plans to offer for older business jets.

The FlightStar upgrade will cost approximately $65,000, depending on what equipment needs replacing, but this is far less than the more than $300,000 for Bombardier's 40/45 service bulletin for ADS-B, according to FlightStar avionics sales manager Greg Vail.

While the Bombardier bulletin calls for replacing the existing FMSs with dual Waas-capable FMSs, the FlightStar upgrade includes a single Universal Avionics UNS-1Ew. Or owners can opt to add a Honeywell Waas GPS sensor instead of replacing the FMS, which would cost about $20,000. The FlightStar STC will also include upgrades to the transponder and control heads, similar to what is done under the Bombardier bulletin, Vail explained.

FlightStar received type inspection authorization for the Learjet 40/45 ADS-B OUT STC in September. Flight-testing is scheduled in December, and FAA approval is expected by year-end.

Comments due this month on new RVSM guidance

by Gordon Gilbert

The FAA's proposed Advisory Circular 91-85A describes various acceptable means for operators to obtain initial operational authorization or amend an existing operational authorization to conduct flight in airspace or on routes where reduced vertical separation minimums (RVSM) are applied. RVSM airspace includes any airspace or route between FL290 and FL410, inclusive, where aircraft are separated vertically by 1,000 feet.

This proposed circular also provides information on RVSM performance specifications, obtaining and maintaining RVSM airworthiness certification for aircraft, specific elements of an RVSM authorization, policy and procedures for RVSM operations and the methods for an airman to demonstrate his or her qualification as an "RVSM Knowledgeable Pilot." The FAA said the advisory material contained in this AC has been "substantially modified" since the circular was issued in its original form in 2009 as AC 91-85. The 71-page document applies to all operational segments seeking RVSM initial and continued approvals for Part 91, 121, 125, 135 and 121 operators. Comments on draft AC 91-85A are due by November 12. ❑

CHICAGO JET EXCLUSIVE DISTRIBUTOR FOR ADONIS IFE

Avionics specialist Chicago Jet Group has inked an agreement to be the exclusive distributor for Paradigm Technology's new AdonisOne portable in-flight entertainment system, which includes a moving map.

The system comes pre-loaded with 75 movies, 15 magazines, 10 music albums and the moving map. All content is provided under licensing agreements with studios and publishers, and monthly content updates include five recent-release movies. The monthly service fee is $169. Buyers can also customize the content with passenger briefing cards and other documents such as catering menus, crew profiles and so on.

AdonisOne offers in-flight entertainment for 10 pax.

Up to 10 passengers can access the content on the AdonisOne via the unit's built-in Wi-Fi signal. Any smart device can connect to the system, which is controlled via an html 5 web user interface, and passengers can change destination information for the moving map using their devices. A lithium-ion battery provides up to 10 hours of viewing time and 15 hours of standby time. The current version of AdonisOne (the LT) is updated via flash memory, but the next version (the LX) will offer Wi-Fi updating when the aircraft is parked on a ramp with Wi-Fi Internet access. The LX will also offer streaming access for up to 15 passengers. An XR model for up to 60 passengers is on tap, designed for charter airlines.

The AdonisOne LX weighs 2.9 pounds and, in addition to battery power, operates on 12 to 28 VDC or 100 to 240 VAC. The unit measures 7.75 x 6.25 x 2.25 inches. No certification is required, and the AdonisOne can be carried from aircraft to aircraft. "If you have more than one airplane, now you've got a real entertainment system," said Mike Mitera, Chicago Jet Group director of operations. Retail price is $13,900. *–M.T.*

Avionics Source offers 'one stop' online shop

Avionics Source is a new online service that is designed to become a single location for information about new avionics and equipage for upcoming mandates, availability of used avionics and listings of avionics sales, installation and repair facilities.

The new site was launched by Chase Larabee, who founded (and later sold) FBO software company AllFBO. After that sale, Larabee worked for more than four years at an avionics shop as regional sales manager, and he noticed market confusion among avionics buyers, especially with the upcoming 2020 ADS-B OUT mandates in the U.S. and Europe.

"That's where Avionics Source came about," Larabee explained, "to create a third-party source that brings aircraft owners, manufacturers and avionics shops together in one place. It's a hub and spoke for discovering new products, buying used avionics and connecting with shops."

Larabee launched Avionics Source in September. The idea is to be able to show aircraft owners in one place all the options for avionics upgrades, including the option of quality used avionics. "This lets customers see products built by a variety of manufacturers at varying prices," he said. "There aren't enough avionics shops with the capacity to display something like this."

Another feature of Avionics Source is its resource center, where information about subjects such as ADS-B is available, as are news about avionics, manufacturer and avionics shop promotions, trade shows and webinars. "It's an avionics industry hub," he said.

The revenue model for Avionics Source is via consigning, brokering and acquiring then selling used avionics. Avionics Source can be the exclusive sales agent for trade-in avionics, for example, or resell products that a manufacturer needs to offload. By consigning or selling used avionics to Avionics Source, shops can get old inventory off their shelves and free up money for other purposes.

Used avionics are repaired, tested and certified before being sent to Avionics Source. For consignment sales, the company charges a commission.

Avionics Source is working with U.S.-based avionics shops for now, but Larabee plans to expand abroad. The initial focus is avionics for Part 23 aircraft, but this month he expects to add Part 25 avionics to the mix. He values the used avionics market at $200- to $300 million per year, because so much equipment is removed when new avionics are installed.

"Customers [avionics shops] that are using our service are extremely happy that we're here," Larabee said. "I've experienced these [companies'] pain points. We're solving some industry issues, and these solutions will directly benefit aircraft owners." *–M.T.*

FAA policy simplifies attitude indicator change

In a new policy statement, the FAA announced that electronically driven attitude indicators can directly replace vacuum-driven attitude indicators in aircraft flown under VFR and IFR. The installation can be done as a minor alteration.

Under a strict interpretation of the applicable regulations, the previous policy sometimes required installation of an independent standby attitude instrument as a backup for electronic flight instrument systems, or a vacuum system with vacuum-driven instruments to act as backups. Under the new policy, the FAA is allowing direct replacement of vacuum-driven attitude indicators with electronically driven attitude indicators because the electronic type is far more reliable.

According to the FAA, "The FAA's Safer Skies initiative from 2001 identified vacuum system failures as a significant cause of or contributor to fatal accidents in instrument meteorological conditions (IMC). The study showed vacuum systems have a high failure rate and the failures tend to be insidious because [the devices] degrade slowly, making the potential for failure difficult to recognize. Additionally, data indicates that pilots may not have the proficiency to recover and land the airplane, in spite of instrument-rated pilots receiving partial-panel training."

The FAA added that mean time between failure of vacuum-driven attitude indicators "is only a few hundred hours." And vacuum pumps can fail after as little as 500 hours. "Electronically driven attitude indicators eliminate this type of failure. In addition, they provide more precise attitude indication, greater internal error-checking ability and internal redundancy, improving functionality over vacuum-driven attitude systems."

To install the new electronic attitude indicator, some conditions must be met. These include the need for a backup and independent standby battery to power the new indicator; the new indicator must fit into the same location as the indicator it is replacing and be set to indicate level flight; only minor changes to the electrical system and vacuum connections required; and the new instrument must be powered from a new dedicated circuit breaker. *–M.T.*

4G airborne connectivity from Gogo in 2017

Gogo announced that its Gogo Biz 4G airborne connectivity system will be available for the business aviation market in early 2017, offering service more than three times faster than its existing air-to-ground system.

Gogo's air-to-ground connectivity system runs on a network of approximately 160 cellular telephone towers with antennas oriented toward the sky to provide coverage over the Continental U.S. and portions of Alaska and Canada. The 4G air-to-ground service has been operational with airlines since 2012, and more than 1,000 airliners currently fly with Gogo ATG 4, according to the company.

The existing Gogo Biz air-to-ground service offers peak speeds of up to 3.1 Mbps, while the 4G service reportedly runs at up to peak speeds of 9.8 Mbps. The existing service uses the EV-DO Rev. A (evolution data optimized) telecommunications standard, while the new 4G service is EV-DO Rev. B. However, a Gogo spokesman explained, "This is a system designed and tailored specifically for the business aviation market. EV-DO Rev. A [to] Rev. B is indeed part of the difference in technologies, and there are others–all of which will contribute to a significantly more capable service, including support for streaming video."

In addition to streaming video, the Gogo Biz 4G service will allow streaming audio, email with attachments, web browsing, voice calling and VPN support.

Owners of existing Gogo Biz systems who want to install the 4G equipment will be offered "loyalty programs with significant trade-in incentives," according to Gogo, as the existing transceivers will not be upgradeable to 4G. The 4G system includes dual-band 802.11ac Wi-Fi "and a host of other features" in a single box. After launch of 4G service for the business aviation market, Gogo plans to continue selling the existing Gogo Biz systems to give buyers more options for airborne connectivity. *–M.T.*

ACR touts low-cost 406-MHz ELT

ACR Electronics has received Cospas-Sarsat and FAA approvals for its Artex ELT 345 emergency locator transmitter, and the device is now for sale.

The small and lightweight Artex ELT 345 can be readily retrofitted to any aircraft and transmits on both 406 MHz (Cospas-Sarsat) and 121.5 MHz (local search-and-rescue). Cospas-Sarsat is a 41-nation international search-and-rescue system that uses satellites to detect and locate emergency beacons carried by ships, aircraft or individuals.

A built-in GPS sensor provides position accuracy to within 100 meters. When activated using either the remote switch or the switch on the ELT or by triggering the g-switch, the ELT 345's encoded digital message contains aircraft identification and registration information, aircraft position and access to owner contact details.

The ELT 345 transmitter, dual-band whip antenna, remote switch, mounting tray and all required hardware cost less than $600, according to ACR Electronics. The stainless-steel mounting tray is drilled with multiple hole patterns to match up to typical mounting holes used for many popular 121.5 ELT types, including Artex, ACK, Kennad and AmeriKing models. Added functionality includes the ability to test the ELT with Artex's proprietary online satellite confirmation testing service, 406Test.com. The ELT 345 weighs two pounds, including the mounting tray. Power is provided by a six-year lithium-ion battery using lithium-manganese-oxide technology.

Based in Fort Lauderdale, Fla., ACR Electronics designs and manufactures safety and survival products such as Artex ELTs, battery packs, ELT accessories, personal locator beacons, search-and-rescue transponders, strobe lights, lifejacket lights and boat searchlights. It is also certified as an FAA Part 145 repair station. *–B.C.*

IRIDIUM TO INTRO PUSH-TO-TALK COMM

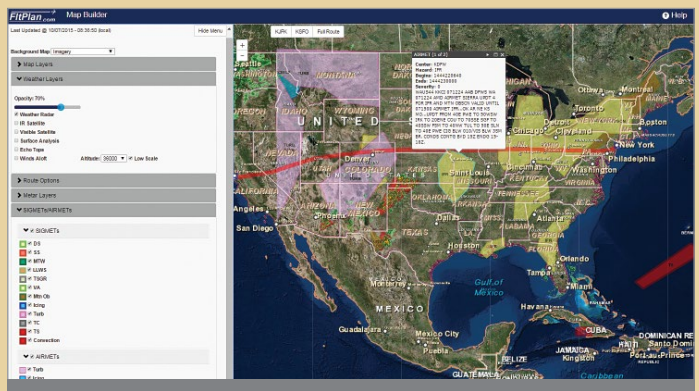
Satellite operator Iridium will offer push-to-talk capability late this year or early next and a new broadband service shortly after. The push-to-talk capability will allow collaborative communications, as opposed to a one-to-one conversation, Brian Pemberton, general manager of aviation and maritime business, told **AIN**. Typical costs for an operator will be $1,000 to $2,000 up front and $1,000 per year. "For the functionality it provides, it is a good case," Pemberton said. VHF is free to use but the operator has to build and maintain the infrastructure.

Within a couple of years, the company will offer a broadband service, Certus, that needs only small lightweight antennas, Pemberton said. Throughput, at up to 200 kB per second, will be compatible with transmitting real-time graphical weather information.

Iridium has 15,000 subscribers in the rotorcraft industry, according to Pemberton. The company claims its service has a shorter latency than others since the waves have to travel a shorter distance. The great number of satellites also allows the antenna to "look" laterally, avoiding through-rotor transmission for more reliable communication, Pemberton said. *–T.D.*

AVIATION SOFTWARE UPDATE

Hilton Software has added Amazon's inexpensive Kindle Fire to the lineup of mobile devices that can run its **WingX Pro7 app**. The Android-based Fire tablet has a seven-inch display and sells for $49.99 with a sponsored lockscreen or $64.99 without. WingX Pro7 for Fire includes moving-map with VFR sectionals, high and low en route charts, planned routes, weather, TFRs, special-use airspace, FAA Airport/Facility Directories, geo-referenced approach charts and integration with Lockheed Martin flight services. There is no extra charge to add WingX Pro7 to a Kindle Fire for existing WingX Pro7 subscribers.



FltPlan Mapbuilder

FltPlan has added a new overlay in its Web-based online flight-planning program: the ability to view Sigmets and Airmets. FltPlan is a free service and includes free VFR and IFR charts for the U.S. and Canada, accessible via Web browsers on any device and also on the FltPlan Go iOS and Android apps.

CloudAhoy, the online flight briefing service and iOS app-based flight logger, now allows users to share flights using a thumbnail image. The image can easily be embedded in an email or in a Facebook update. The recipient of the emailed thumbnail or Facebook user can simply click on the image to view the flight details and play back the flight in CloudAhoy's playback system. *–M.T.*

CloudAhoy

NEWS UPDATE

CAE Adds H225 Training in Oslo

CAE's H225 full-flight simulator in Oslo has been qualified to Level D. Located near the Norwegian city's Gardermoen Airport, it supports initial and recurrent training as well as mission-specific training for offshore, search-and-rescue and military operations. The CAE 3000 simulator is equipped with the CAE Tropos 6000 visual system and uses Airbus Helicopters' original data package. The airframer is expected to approve the simulation center later this year.

JSSI Offers S-92A Engine Coverage

Jet Support Services announced a new hourly maintenance program that covers the GE CT7-8 turboshafts that power the Sikorsky S-92A. The program includes scheduled and unscheduled events as well as life-limited parts. Operators can enroll by making one annual payment, which varies with hours flown annually.

H160 Flight Tests Progress

Development of the Airbus Helicopters H160 is "moving forward as expected and even faster in some forms," CEO Guillaume Faury said in late September. The first prototype, powered by Pratt & Whitney Canada PW210Es, has reached 175 knots and 10,000 feet. The second prototype is "progressing as per plan" since power-on in June. The Turbomeca Arrano engines will be installed and tested before PT2 performs its first flight by year-end.

Asia-Pac Rotor Leasing Grows

Lessor LCI has finalized two long-term debt facilities to support more than $200 million of fleet growth in Australia. Westpac Banking will act as sole lender, security trustee and agent to support LCI's recent multi-year agreement to lease four new AgustaWestland AW139s to Australia's Westpac Rescue Helicopter Service. The helicopters will be delivered in next year's second half. In Papua New Guinea, Waypoint Leasing has placed an Airbus H145 on lease with Pacific Helicopters, an operator active throughout the Asia-Pacific region. Waypoint CEO Ed Washecka described the transaction as "seminal."

New Autopilot Option for R44s

The same Genesys Aerosystems HeliSAS (helicopter stability-augmentation system) and autopilot that was FAA approved on the Robinson R66 turbine single earlier this year is now available on Robinson's piston-powered R44. The R44 autopilot has all of the same modes and functionality as the R66's, including basic stability augmentation, heading hold, altitude hold, navigation signal tracking and approach guidance. The autopilot is now available as an option on R44s and R66s equipped with Aspen's EFD 1000H primary flight display (PFD). The price for an autopilot installation with Aspen PFD is $60,200.

Air Methods Buys San Antonio Op

The largest helicopter EMS company announced last month that it had acquired San Antonio Life, the service owned by Baptist Health System of San Antonio/Tenet Corp, and Bexar County Hospital District doing business as University Health System. Air Methods will acquire two Bell 430s owned by University Health System and a third leased by the Baptist Health System. *—T.D., M.H.*

Three aircraft are engaged in the flight-test program for the Bell 505 Jet Ranger X, with the goal of Canadian approval early next year.

Bell reports progress on new models

by Mark Huber

Work is proceeding apace on Bell Helicopter's two new civil models, the 505 light single and the 525 super-medium twin. Bell officially dedicated its new 82,300-sq-ft assembly plant for the 505 Jet Ranger X in Lafayette, La., on August 27. The facility is expected to have up to 100 employees. The 505 is approximately halfway through its flight-test program and the company said the aircraft remains on track to earn Transport Canada certification early next year. The first two flight-test vehicles have surpassed 300 flight hours and recently completed hot testing in Havasu, Ariz., and high-altitude testing in Colorado.

A third flight-test vehicle made its first flight on July 16. That aircraft is currently being used for certification, noise and handling qualities testing. It is also configured with optional equipment such as Tcas, air conditioning, standby flight instruments and a second VHF radio. It will finish its certification testing near the end of the year with function-and-reliability testing.

Bell currently reports orders for more than 350 copies of the Jet Ranger X, which features the 504-shp Turbomeca Arrius 2R with dual-channel Fadec and Garmin G1000H avionics. Configurations available initially will be utility, law enforcement and corporate/VIP.

Turbomeca delivered the first production Arrius 2R for the 505 to Bell in August on schedule in Lafayette. The Arrius 2R is the only turbine in the 500-shp class to feature dual-channel Fadec. Jean-François Sauer, Arrius 2R program vice president, said, "We are perfectly on track to meet Bell Helicopter's expectations, and moving at a steady pace toward EASA engine certification by the end of 2015."

The Arrius 2R made its first ground run in April last year and its first flight aboard 505 FTV1 at Bell Mirabel (Quebec) in November last year. Production Arrius 2Rs will be assembled at Turbomeca USA's facility in Dallas, Texas, and integrated in Lafayette. Initially, the 2R will have a time between overhaul (TBO) limit of 3,000 hours.

Relentless Moving Toward First Flight

Bell's other new helicopter development program also is making progress. The company is readying its second super-medium 525 twin for first flight later this year. The first Bell 525 flight-test vehicle made its maiden flight on July 1 at the company's Amarillo, Texas plant.

Larry Roberts, Bell executive vice president of sales and marketing for the 525 program, said ship one had accumulated approximately 50 hours of test flying through the summer and that, other than some minor teething issues, has performed "extremely well." He added, "It flies better than the simulator."

The company remains on track to complete flight-testing, with five ships flying an estimated 1,500 hours by the end of next year as it pursues concurrent FAA and EASA certification, he added. Bell currently holds letters of intent (LOIs) for 68 copies of the 525 and expects to exceed its goal of LOIs for 70 by year-end. The company plans to release an "industry price" for the 525 next year, Roberts told **AIN**. "Those who have signed an LOI and a non-disclosure agreement already have a price," he said.

Roberts said Bell is working with Mecaer and other vendors to develop executive and VIP interiors for the 525. Mecaer developed the VIP interior for the Bell 429 light twin.

Roberts expects more offshore energy operators to take an interest in the 525, even in the current weak energy market. "The helicopter continues to be extremely well received across the board, including by the big leasing companies, operators and individual owners," Roberts said. "We see a pretty good cross-section of people signing up for the aircraft."

"When we did our market analysis for the 525 back in 2010, our goal was to create a helicopter that we could place in that sweet spot between the mediums and the super heavies," Roberts said. "The 525 allows our customers to do everything they can do with a medium or a competitor's super-medium and quite a bit, about 60 percent, of what they are doing with the heavies. It gives them a good slot position to take care of both the lighter and the heavier ends of the work. They recognize that when you have super heavies flying out beyond 200 miles, most of the time, they have only six to eight passengers on board. Because of the 525's fuel capacity and flight economics, we are able to transport six to eight people out 250 nautical miles depending on the cargo load. So we think we will be competitive with what the heavies, mediums or super-mediums can do and that is attractive, especially to the offshore energy companies."

Bell announced the 525 Relentless in 2012. It features sidestick, triple-redundant fly-by-wire controls and the Garmin G5000H touchscreen avionics system. Power comes from a pair of 1,800-shp GE CT7-2F1 turboshafts driving an all-composite five-blade main rotor and a four-blade tail rotor. The 525 is Bell's largest civil helicopter, with a rotor disc diameter of 54.5 feet, and features hybrid aluminum/composite construction. It is expected to have a max cruise speed of at least 155 knots, range of 500 nm, an mtow of 19,300 pounds and a useful load of 7,400 pounds. ❑

Airbus reaps rewards of product support efforts

After years of scoring last for helicopter product support in **AIN**'s annual survey, Airbus Helicopters jumped into second place this year just behind perennial winner Bell Helicopter. *(See* **AIN**, *August, page 21.)* How did the world's largest producer of civil helicopters advance so quickly and decisively after decades of falling short?

According to company executives, it all began with the annual video the company showed to all of its employees worldwide last year. "That video had about eight different customers from all over the world, including a few from the U.S.," said an Airbus Helicopters spokesman. "In so many words, all of the customers were saying, 'Get me the parts. Keep me flying.' This was the first time that message was delivered to our employees in that way."

"We got clear, precise direction from CEO Guillaume Faury," said Anthony Baker, Airbus Helicopters vice president for customer support. Faury took over as CEO in January 2014. "Guillaume went out and talked with our customers. He listened to them," Baker said.

Indeed, just months after rejoining Airbus Helicopters, Faury told an audience at the 2014 Heli-Expo convention that it was time for the company to develop "new priorities" and moved quickly to expand parts inventories worldwide by more than $100 million. Among the beneficiaries were the inventories at the company's Grand Prairie, Texas campus and Dallas Fort Worth Airport distribution center, which were plumped to more than $110 million. "We looked at our fastest moving parts and we almost doubled those inventories," Baker said. Last month Airbus Helicopters converted the Fort Worth warehouse and logistics center to a seven-days-a-week operation from a Monday-to-Friday shop. "Our customers wanted to be able to access parts on weekends," Baker explained.

BARRY AMBROSE

At Heli-Expo 2014 CEO Guillaume Faury committed to improving the company's support for its in-service fleet.

The moves have already produced positive metrics, according to the company: On-time parts delivery has jumped 10 percentage points in the last 18 months, to 94 percent; the 24-hour AOG response rate was 96 percent in June, up from 90 percent a year ago; critical parts on back order have been slashed by 77 percent in the last year; and the commercial helicopter fleet availability rate is now better than 90 percent.

However, the company concedes it still has more to do. Company-wide, Airbus Helicopters is instituting new process training for its employees. The training teaches employees how to analyze problems systematically and attack them at the root cause with corrective processes, as opposed to constantly being in a reactive "putting out the fires" mode. The training teaches employees how to be more customer-focused and solution-oriented. Faury and his top executives took the training first before introducing it to the rest of the company.

Putting Data to Use

Airbus Helicopters is also honing predictive tools such as the data analytics that plug directly into customer enterprise resource planning systems to foresee customer needs and unscheduled maintenance events, and the reasons for them. The company is also hiring more customer support managers (CSMs) who work with select customers to analyze the causes of unscheduled maintenance, recommend solutions and use the data to shape the design of future products. CSMs also help customers balance and make the most of their parts inventories.

In Grand Prairie, Airbus Helicopters is developing onboard health usage and monitoring systems capability for its light singles and light to medium twins. "This will help customers do predictive maintenance," Baker said, adding that the system is scheduled to be rolled out next summer for the first model. The prototype device weighs just seven pounds, said the spokesman, and is now undergoing dynamic testing. At present the data is offloaded from the helicopter on the ground via a wireless app on a smart device and also transmitted to Airbus Helicopters for analysis.

The company is reviewing all of its scheduled maintenance requirements, beginning with the H130. "We are trying to spread out the scheduled maintenance tasks so that the customer is not doing a heavy inspection at the same time it is doing a 12-year inspection. We hope to have the revised plan done by the end of this year," Baker said.

Implementing customer suggestions more quickly is another goal for the company. It recently formed customer focus groups and has conducted meetings with them in an effort to measure customer sentiment and receive data from them. The company planned to hold the first customer focus group meeting in the U.S. early this fall at its plant in Columbus, Miss., attended by senior company executives. From those meetings, Airbus Helicopters will devise a list of what Baker calls the "top five customer irritants" and commit to solve them through the company's product support office. Top company executives, including Faury, review the list monthly.

Airbus Helicopters is also revamping its hourly maintenance plans to make them more attractive to customers, Baker said. The traditional "buy-in" for owners of used helicopters will be eliminated, and the company plans to roll out an aggressive marketing campaign for these plans in the coming months. Baker said Airbus Helicopters is also moving to strengthen its relationship with its authorized service centers and helping them improve quality where indicated and to raise U.S.-manufactured content on its aircraft where practical.

"We're taking all of the changes customers have asked for seriously," Baker said. "We still have a lot to do. The challenges are still there." *–M.H.*

MARENCO REDESIGNS SKYE SH09 ROTOR HEAD

Marenco Swisshelicopter is testing a redesigned rotor head for the SKYe SH09 light single and now expects to receive EASA certification between June and October next year. Despite a series of delays, the would-be manufacturer maintains it will have the helicopter in production in 2017.

After a flight-test campaign using the first prototype (P1) last spring the company decided to improve the helicopter's main rotor head, chief commercial officer Mathias Sénès told **AIN**. Design engineers have endeavored to reduce vibration and complexity, while enhancing "tolerance to future upgrades," and have found an "interesting solution." Ground testing of modified blades is under way on the company's whirl tower at Mollis Airport, Switzerland.

First to receive the new rotor head and blades will be the second prototype (P2). It will also benefit from improvements that are expected to make production and maintenance easier. "The maintainability concept we developed for P1 remains the same but comfort and access will be better," Sénès said.

Subassemblies of P2 are being put together, such as the fuel system and the main gearbox. Final assembly was scheduled to begin last month. Rollout is anticipated by November and P2 will then be the main test vehicle.

The modified P1 will fly later. So far, the company has explored only a small portion of the flight envelope. Maximum speed has been 50 knots–forward, sideways and rearwards, Sénès said–and no significant altitude has been reached. He noted noise performance has been good, thanks to the five-blade main rotor, the Maestro shrouded tail rotor and the Honeywell HTS900-2 turboshaft.

Marenco is now considering a third prototype. Should the company go ahead with P3, it would be put together in next year's first half.

Marenco has redesigned the SKYe SH09's main rotor head to reduce vibration and complexity, while enhancing its adaptability to accept future upgrades.

The launch customer is scheduled to receive its first SH09 late next year. Marenco wants the first operator to be one engaged in aerial work in the Alps, an application that would generate initial service data in the toughest conditions, including sling-load missions.

Sénès claims to hold letters of intent for 72 of the aircraft and plans to deliver between 20 and 30 in 2017. The SKYe SH09 sells for $3.35 million, "with a high level of equipment," Sénès said, citing the full glass cockpit, the dual hydraulic system and the dual sliding doors.

FAA validation of the EASA certification will be a relatively swift process, Sénès predicts. Late last year, Marenco expected EASA approval by late this year–a window that is about to close. He blamed the slipping schedule on the complexity of the development and delays at some suppliers.

The 5,842-pound-mtow SH09 is designed to carry one pilot and seven passengers, which positions it at the higher end of the single-engine helicopter segment. *–T.D.*

HELITECH 2015

by Thierry Dubois

HELITECH MAKES ITS MARK AS EUROPE'S HELICOPTER SHOW

The Helitech International show, held this year at the ExCel exhibition center alongside London City Airport, now appears well established in a format that dates back only to 2013. The exhibit floor–although not as sizzling as Heli-Expo's–was active and the conference program proved relevant and informative. Attendance numbers were unavailable at press time but a European Helicopter Association (EHA) executive told **AIN** he was happy with the show.

Organizers (Reed Exhibitions and the EHA) were happy to report the orders inked early last month. Waypoint Leasing announced two major orders, committing to 20 Airbus Helicopters H135s and firming up an order for 18 aircraft from AgustaWestland (an unspecified mix of AW139s, AW169s and AW189s). AgustaWestland announced an order from Heliservices for an AW169 to be used for offshore missions in the North Sea. The Anglo-Italian manufacturer confirmed contracts in Asia for 10 AW139s (eight for the Royal Thai Army for passenger transport and utility and a further two to an undisclosed customer for law enforcement). AgustaWestland valued the announced contracts at €140 million ($160 million).

PDG signed for an Airbus H135 and will operate it to and from lighthouses in the UK and Ireland. Airbus received other orders for the H135 and H145.

Next year's Helitech International will take place from October 11 to 13 in Amsterdam. ■

DAVID McINTOSH

Helitech International returned to London this year, where it last took place in 2013. Attendance figures were not made available but organizers said they were happy with the turnout. Next year's show will be held in Amsterdam from October 11 to 13.

AgustaWestland is planning to fly its next-generation civil tiltrotor in 2021. The 20-passenger rotorcraft, which is much larger than the in-development nine-seat AW609 tiltrotor, is now in the conceptual design phase.

AGUSTAWESTLAND SETS SIGHTS ON TILTROTOR

AgustaWestland plans to fly a next-generation civil tiltrotor (NGCTR) in 2021. The 20-passenger rotorcraft, much larger than the AW609 nine-seater now in flight-test, is in the conceptual design phase. "Preliminary design will start next year," James Wang, senior v-p helicopters and services marketing, told **AIN**. Manufacturing of components might begin in 2017. The NGCTR's cruise speed would be close to 300 knots. Last year, the company hoped to fly the aircraft in 2019. The research portion is funded under Europe's Clean Sky 2 joint technology initiative, meaning the Clean Sky joint undertaking will choose AgustaWestland's initial partners, Wang noted.

Meanwhile, certification of the AW609 is slated for December 2017, Wang said. The production rate is targeted at 20 to 30 aircraft per year. Wang reiterated AgustaWestland's view that a pressurized tiltrotor fills the gap between helicopters and turboprops in terms of speed and altitude, the latter allowing it to vault weather. A new James Bond-style promotional video portrays the AW609 as a vehicle capable of traveling 270 nm in one hour and offering a smooth cabin environment. An AW609 prototype recently covered 627 nm in two hours 18 minutes. ■

North Sea operators adjusting to new regs

The UK CAA's CAP 1145 review, released last year, continues to occupy North Sea operators' attention as they absorb its impact on their daily job–and in the knowledge that the EASA is preparing yet more rules to promote safety.

In the next decade the industry will see significant gains in safety, specifically through improvements to the helicopters themselves, according to Tim Glasspool, head of flight operations for Bristow Helicopters. "Helicopters nowadays are not massively safer than older ones. But in 10 years, when we have the next-generation aircraft, we'll fly in incredible weather above incredible waves in shirt sleeves because the helicopter will not fail," he said. Peter Chittenden, an EASA cabin safety expert, countered that flying in shirt sleeves above sea state 7 or 8 is something our children or grandchildren might see.

In the meantime, North Sea operators are adjusting to the more stringent safety regulations. "The topic of 'getting out of the aircraft' is just a few lines in the CAP 1145 but it has involved a huge amount of work," said Glasspool. Almost 60,000 workers have been trained to use category 1 emergency breathing systems (EBS).

Most of them underwent dry training or wet training without compressed gas. The most realistic training conditions–in a swimming pool with compressed gas–require the trainee to obtain a diver's medical certificate, Glasspool said. Surprisingly, crews will not be trained until this winter.

The new EBS were tested for compatibility with every survival suit and safety belt. Recharging facilities have been installed at every heliport. Each helicopter carries some spare EBS devices on board in case the system becomes unserviceable, often because a passenger "plays" with his EBS and inadvertently releases some gas.

THIERRY DUBOIS

EASA heavy helicopter safety expert Clément Audard discussed changes.

When the sea state 6 limit was implemented, operators estimated it would translate into eight or nine days lost per year. In fact, "it is a bit more; we canceled 230 flights," Glasspool said. The legally binding weather forecast has proved highly accurate: within six inches of the actual wave height most of the time. Glasspool warned that global warming will create sea state 6 more frequently, and that designers and engineers need to go beyond the capabilities of today's helicopters.

Complying with CAP 1145 standards has had various side effects, among them an end to VIP flights and CAA access to oil and gas platforms. It also spelled the end of operating the Sikorsky S-76 in the North Sea, since its exit windows are too small and its floats are rated only for sea state 4.

The EASA has treated CAA recommendations as if they were coming from an investigation board, said Clément Audard, a heavy helicopter safety expert.

Certification of a new product shall now include prioritization of maintenance alerts in vibration health monitoring (VHM). Research projects have been completed in main gearbox loss of oil and the optimization of VHM technologies. According to Jean-Marc Sacazes, an EASA operational suitability expert, "The most critical point is not the engine but the main gearbox, the transmission and the tail rotor." A review of current practices in operations management is under way. "Helioffshore helps a lot," Audard pointed out.

To address accident survivability, the EASA will propose rules for new designs–those that will start flying in 10 years or so–explained Chittenden. Some of these standards will follow CAP 1145 recommendations.

One new requirement for survivability is the "air pocket" concept. After a helicopter has capsized, the volume of air in the cabin should be large enough and accessible for all passengers to breathe.

Egress from the air pocket must be feasible even though a sliding door is open in front of the exit windows. For crews, immersion suits have been mandatory when water temperature is 10 degrees C or below. Chittenden suggests raising this limit to 12 degrees C.

A notice of propose amendment will accept public comment late this year or early next. ❑

Rotor industry suffers as oil biz retrenches

The downturn in the offshore oil-and-gas market remains a prominent concern for the helicopter industry, which is trying to understand how demand in the segment might evolve. "I am not sure I can put a number on the decline [in the number of tenders]... Minus 30 percent might be a good number," Mike Platt, CEO of Lease Corporation International (LCI), said at Helitech International 2015's Business Leaders Forum. The tenders that remain are more competitive, he said, because when an operator needs to fly more hours, it tries to do so with the same number of aircraft. Those helicopters that were flying for exploration are redeployed to oil-and-gas production platforms. History confirms that the production rate of helicopters built for offshore operators closely follows the price of oil.

"All operators have excess aircraft now," Platt said. "We are in a cycle where our customers require lower costs; they are squeezing us to a difficult point and we have to ensure this does not erode our margins," said David Balevic, senior v-p of engineering and operations for CHC Helicopter. Against such a gloomy picture, LCI's Platt expressed hope for the longer term, as 43 percent of helicopters in oil-and-gas are more than 25 years old and thus ripe for replacement. In the short term, LCI's analysts are pondering what to order for the next couple of years.

Glenn Isbell, Bell Helicopter's senior v-p of customer support and services, noted that low oil prices are bad for the oil-and-gas market "but help everybody else."

Other sectors may offset the offshore trough somewhat. "What's about to happen in China's EMS is fascinating," LCI's Platt said. The long-awaited growth in the country's helicopter market is about to materialize, speakers agreed. "In five to 10 years, the infrastructure will be in place," Bell's Isbell said.

Meanwhile, future engine technology aimed at cutting consumption of oil-based fuel, remains in its infancy. "What's the next thermodynamic cycle? Electric or hybrid linked to a conventional turboshaft maybe?" Jim Payton, Rolls-Royce's v-p customer business, civil helicopters, suggested. "We need more power but not at any cost to society," he added. ❑

DAVID McINTOSH

L to r: Mike Platt, CEO, LCI; Jim Payton, v-p customer business, civil helicopters and light turboprops, Rolls-Royce; moderator Aoife O'Sullivan, head of aircraft finance, Kennedys; Glenn Isbell, senior v-p customer support and services, Bell Helicopter; and David Balevic, senior v-p, engineering and operations, CHC; discussed the effect low oil prices have on their business.

AIRBUS UPDATES H135 LIGHT TWIN

Airbus Helicopters unveiled further improvements to the H135 light twin–an avionics upgrade with the Helionix suite, the addition of a four-axis autopilot and extra cabin space–and announced that Norwegian EMS operator Norsk Luftambulanse has placed an order for three.

The Airbus-designed Helionix suite will reduce pilot workload, Axel Humpert, head of the H135 program, told **AIN**. It will have the same interface and displays as the suite in the H145. Under the "blue line" concept, in the event of an engine failure a graphic will indicate to the crew whether it is on the safe side, Humpert explained.

Features include a "hover hold" function and flight envelope protection, such as preventing aircraft and engine overspeed. The electronics bay has also been moved forward.

Certification is planned for late next year, with first deliveries to to follow in 2017. ■

TURBOMECA TO BOOST OPERATOR SUPPORT

Turbomeca is striving to expand its by-the-hour contracts with small fleet operators, while developing ways to make the most of turboshaft operation data.

Entry into service of the Bell 505 Jet Ranger X next year will provide a major opportunity for the company to offer a new catalog of services to operators that have between one and five helicopters in their fleet, executive v-p support and services Franck Saudo told **AIN**. To appeal to those operators, the company will offer a per-hour contract for accessories only and triple the number of certified maintenance centers by 2020 to ensure ease of access.

In addition, beginning next year the company will "push" relevant service bulletins to the operator via an e-documentation feature. An e-logbook will help maintain continuing airworthiness thanks to automated configuration checking. In a second step, health monitoring and trend monitoring will be offered. The idea is to capture early signs and perform preventive maintenance, Saudo explained.

Meanwhile, by the end of the year the turnaround time for an Arrius or Arriel engine overhaul will be 50 days, down from 85 days in 2013. ■

H145 gets Mercedes interior

Airbus Helicopters has received orders for four of the Mercedes-Benz Style version of the H145 light twin, an evolution of a similar variant of the EC145. Deliveries are to start by year-end. The luxury helicopter offers a redesigned cabin interior that includes in-flight Wi-Fi, an improved infotainment system, a new lighting concept and more ergonomic seat design.

Customers can select from three different "harmonies," or interiors, that they can combine with a wooden floor or carpets. Multi-purpose storage is made possible by numerous attachment points on the floor and walls, while a new integrated cabinet raises storage volume. The seats, galley and walls are mounted on rails, so the cabin can be reconfigured for four to eight passengers or removed to transport more luggage or large items.

"Customers wishing to further personalize their aircraft will be able to work directly with Airbus Helicopters and the creative design teams at Mercedes-Benz Style to define their unique cabin environment," said Frédéric Lemos, Airbus Helicopters head of private and business aviation for Europe.

Airbus Helicopters reports that it has sold more than 400 helicopters over the last five years in the private and business aviation segment. ❑

PHILLIPPE FRANCESCHINI

Airbus has logged orders for four H145s with Mercedes interiors. Deliveries will begin late this year.

Rockwell Collins offers touchscreen-based upgrade

Rockwell Collins is working with Vector Aerospace to offer a cockpit upgrade for the Airbus Helicopters AS332 Super Puma with the Pro Line Fusion avionics suite for helicopters. AgustaWestland has chosen the system for the AW609 tiltrotor. The system, which is similar to the fixed-wing version that inaugurated touchscreens for primary flight displays, is not yet certified on any rotorcraft. A demonstrator with four 14-inch displays was exhibited at Helitech.

The Pro Line Fusion suite for helicopters follows a "head up, eyes forward" philosophy. The content of the flight management system has been reduced by 60 percent (measured in number of pages). "You can add a SID in three clicks," said senior system engineer Guillaume Zini. An electronic flight bag has been integrated, as opposed to available on a separate screen.

The touchscreens feature a fingertip-size gutter anchor for the crewmember to stabilize his hand. Another way to control the cursor, especially in turbulence, is via a conventional point-and-click device.

Mission-specific operational profiles can be preconfigured, such as airborne radar approaches for offshore operations and mark-on-top for search-and-rescue. Situational awareness has been improved, with power lines and airports displayed conspicuously on the synthetic vision system.

Pro Line Fusion is scalable, said a spokesman. Display size can be 13 to 15 inches. The Super Puma will be fitted with three displays but a four- or five-display layout is feasible. A light twin or single might even get a single-display version. Next in line after the Super Puma STC will be the Airbus Helicopters AS365 Dauphin and the Bell 412. ❑

Blade works with Part 135 operator Liberty Helicopters to offer flights from several Manhattan heliports to area airports.

Blade is the new (Uber) Black

by Mark Huber

Your next helicopter ride is just a smartphone app away. And when Manhattan traffic is snared in gridlock, what could be more convenient?

During the Pope's recent visit to New York City–and ensuing ground traffic nightmare–helicopter service Blade was offering rides via its smartphone app from the East to the West side via the southern tip of Manhattan for $95 a seat. Bye bye, gridlock. Of course that's not the service's métier. It emerged two years ago as a comparatively painless way to escape Gotham to the pleasures of the Hamptons and since then more than 45,000 have downloaded the company's smartphone app, which lets you book whole helicopters, crowd-source them or hitch a ride on a flight someone else has originated.

Blade itself is not a Part 135 operator; it partners with Liberty Helicopters for that piece of the business. Blade merely packages the service, from the smartphone app to the decidedly retro lounges at Manhattan's West 30th Street, East 34th Street and 23rd Street heliports. Its Bounce service can deliver you to any of the area's airports in six to 12 minutes with 20 minutes' notice for $895 for the whole helicopter. During the summer last year, Blade booked 800 trips to the Hamptons.

That attracted the attention of some heavy-hitting investors, among them Google chairman Eric Schmidt; Discover Communications CEO David Zaslav; IAC's Barry Diller; Alex von Furstenberg, Raine Ventures; and iHeart Media chairman Bob Pittman. Together they have helped to raise almost $6 million. The company now has a valuation of $25 million.

Blade was founded by former Warner Music COO Rob Wiesenthal, who had the idea to do for helicopters what Uber did for the taxi business. It didn't take long for the idea to catch on.

It has since expanded to Blade Aqua, a seaplane service that runs from Manhattan to Nantucket and Martha's Vineyard in season. ❑

BOND DELIVERS UPGRADED EC135 TO NPAS

Bond handed over the first of seven redesigned and upgraded EC135T2+ helicopters to the National Police Air Service (NPAS), the organization that manages English and Welsh police aircraft, last month at Helitech. The new version introduces numerous improvements: augmented reality, updated camera technology and weight savings of 150 pounds thanks to the new integrated gyropod. The interface has been updated with touchscreens, too.

Augmented reality allows street names and house numbers to be overlaid on the camera's image, and the new camera technology represents a quantum leap over the previous one, introduced 10 years ago, NPAS senior pilot David Crisall told **AIN**. Searchlights and public-address loudhailers have been replaced. A typical crew consists of one pilot, one camera operator (in the left seat) and one mission commander (sitting in the back), Crisall said.

The upgrade costs less than £1 million per helicopter, according to Crisall. Bond, a Babcock International Group company, was awarded the contract in 2014 and carried out the work at its facilities in Staverton. *–T.D.*

AW189 full ice gear expected next year

by Mark Huber

AgustaWestland will continue icing trials this winter in Alaska on the AW189 in pursuit of certification of the full icing protection system (Fips) on the AW189 super-medium twin. That helicopter received certification in 2014 and is currently available only with limited icing protection (Lips), similar to the icing protection system installed on the smaller AW139 medium twin.

Certification of the full icing protection system is anticipated by the middle of next year, a spokesman told **AIN** last month. AW noted that any operating restrictions currently imposed on the AW189 could be eliminated "in the near term."

"It is also worth noting that AW189s used for offshore transport in the North Sea have logged a significant number of flying hours that provide further evidence of the capabilities, reliability and high availability of the AW189," the spokesman said.

However, the absence of full icing protection prevents Bristow from employing AW189s in the near term on that company's UK government SAR contract. Bristow had planned to deploy up to 11 AW189s on that contract, but is now substituting Sikorsky S-92s as a stop-gap measure. Bristow does operate AW189s on commercial contracts in the North Sea successfully.

UK SAR bases will bridge the gap with a combination of AW139s equipped with Fips and more S-92s as an interim measure. The AgustaWestland Fips allows flight into known icing conditions. The package includes ice detectors, automatic activation system with manual backup, electrical power generators, engine intake protection grids, and heated windshield and blades (main and tail rotor). Helicopters equipped with Fips retain the performance and procedures for Category A operations and are not subject to any restrictions during IFR operations.

Fips differs from Lips inasmuch as the latter permits flight within a known and defined envelope of icing conditions provided that the capability to descend into a known band of positive temperature is available throughout the intended route, typical of conditions encountered, for example, over the North Sea. Lips is intended for flight in limited icing conditions for operations such as offshore and passenger transport as well as search-and-rescue. The system is available as an option and includes ice detectors, supercooled large droplet marker, ice accretion meter and heated windshield. It does not require heated rotor blades and associated equipment, while the engine air intake heating system is already incorporated into the standard AW189.

The AW189 equipped with Lips retains the performance and procedures for Category A operations and has only limited restrictions in terms of low temperature and ice presence during IFR operations. ❑

AgustaWestland will continue icing trials on the AW189 this winter, as it pursues certification of the full icing protection system. Certified in 2014, the helicopter is currently equipped with a limited icing protection system.

Bombardier expects to gain certification for the CSeries by the end of this year.

Airbus, Bombardier end talks over CSeries stake

by Gregory Polek

Airbus and Bombardier have each confirmed that the two companies had explored "certain business opportunities" together but have since ended talks following a report by Reuters that Bombardier had offered a majority stake in the CSeries to the European airframer. Both companies said they wouldn't comment further, but Bombardier noted that it continues to explore "initiatives" such as a possible participation in industry consolidation.

The apparent effort to put the CSeries on surer fiscal footing belies Bombardier's past efforts to dismiss suggestions that it didn't control sufficient resources to overcome sluggish sales of the airplane and a two-year delay to certification, now scheduled for late this year. Bombardier still hasn't reached its target of selling 300 of the narrowbodies before certification. A cash shortfall resulting from cost overages and a paucity of order deposits has prompted it to raise $3 billion in debt and equity this year and announce plans to sell part of its train business to further boost its balance sheet.

With firm orders for 243 aircraft, the CSeries program has actually outsold the A319 and Boeing 737 Max 7–the smallest members of the re-engined narrowbody series whose core products have nevertheless drawn orders for several thousand aircraft. However, questions about the overall size of the market Bombardier has targeted with the CSeries persist given the cool market reception it and its direct competitors have experienced so far.

Although Bombardier still expects to gain certification by the end of this year, it has given itself a substantial time buffer to ensure it doesn't miss yet another entry-into-service goal, setting a first-half 2016 target for EIS by launch customer Swiss International Airlines.

The cautious approach would seem warranted, as potential customers exhibit what Bombardier Commercial Aircraft president Fred Cromer called a "wait-and-see attitude" until certification authorities issue their approvals. "The general sentiment is that everyone wants us to get it right up front," said Cromer during an interview with **AIN** in late spring. "We are now proving that to be the case considering what we're now seeing with the impressive performance–we're building that market confidence."

By late August the CS100 had completed more than 80 percent of its flight-testing, with six airplanes logging some 2,250 hours of flight-testing. By September 10 the program had finished all noise performance testing, which, according to Bombardier, validated claims that the GTF-powered jet would prove the quietest airplane in its class. Soon afterward, the first production CS100 began function and reliability testing, signaling the start of the final flight-testing phase. ❑

A350 'PERFECTLY ON TRACK' AS AIRBUS DELIVERS FINNAIR'S FIRST

During a ceremony in Toulouse to celebrate delivery of Finnair's first A350-900 early last month, Airbus CEO Fabrice Brégier reported that the program remains "perfectly on track" to deliver 15 airplanes this year. Finnair's A350 marks the seventh delivery since certification and the first to a European operator. Brégier said also that Airbus will more than double deliveries next year, and will reach a monthly rate of 10 aircraft by the beginning of 2018.

The CEO confirmed that the future A350-1000, a longer version of the A350-900, will enter service in the summer of 2017. Airbus plans to install the first Rolls-Royce Trent engine on an A380 soon to start flight-tests. This first campaign will prove quite short and end with the first flight of the A350-1000 in the middle of next year, said Airbus. Certification of the new variant will involve three aircraft. Airbus plants at Broughton, UK; Saint-Nazaire, France; and Hamburg have all begun preparing to deliver shipsets to Toulouse for final assembly to start in the first quarter of next year.

Airbus CEO Fabrice Brégier (left) congratulates Finnair CEO Pekka Vauramo upon delivery of the airline's first A350.

Brégier acknowledged, "A350 ramp-up is of course challenging." Airbus has to cope with delivery delays at some cabin suppliers, notably its French seat maker, Zodiac. "We are working with them to solve the problems, and all our programs are suffering from this situation," he said. In the short term, Airbus sent its own personnel to help Zodiac. In the longer term, the airframer will provide tools to help the company adapt its processes. "Most of the cabin suppliers are under heavy stress because of the ramp-up," added Didier Evrard, former A350 program manager and now Airbus's executive vice president and head of programs.

Another challenge involves the number of "heads of version," or an operator's first airplane, that Airbus must deliver in a short time: three this year to Finnair, Vietnam Airlines and, soon, Brazil's TAM. The airframer must deliver at least four more heads of versions next year, to Cathay Pacific, Singapore Airlines, Ethiopian and Lufthansa. Consequently, Airbus has reinforced its final assembly line by adding four work stations at different steps. The production cycle at Toulouse, which now takes several months, will reach between seven and 11 weeks by the end of 2017.

Finnair CEO Pekka Vauramo downplayed any suggestion of a problem with the A350's weight. "It's not a problem… just a few hundreds of kilos to win, and it will be done," he concluded. *–G.L.B.*

NEWS UPDATE

BA 777 Engine Failure Uncontained

The NTSB confirmed last month that the British Airways Boeing 777-200ER that caught fire during its takeoff roll at Las Vegas McCarran International Airport on September 8 suffered an uncontained engine failure. Examination of the GE90-85B revealed that a portion of the stage 8-10 spool in the high-pressure compressor (HPC) section had failed, shedding fragments that breached the engine case and cowling. Investigators recovered more pieces of the HPC spool from inside the engine for metallurgical examination.

The NTSB said it had collected all pieces of the engine's damaged stage 8 disk rim and found that the fracture started in the HPC stage 8 disk web, a part of the stage 8-10 spool. GE continues to perform "high-priority, focused inspections" of HPC hardware from other GE90 engines. The Board added that whatever inspection data it and GE gather will determine any further investigative actions.

Malaysia Pilots Brace for Shakeup

As a result of its latest moves to shed excess capacity, Malaysia Airlines Berhad (MAB) has hatched plans to offer 100 to 120 Boeing 737-800 pilots to interested airlines for secondment next year. If the plan does not materialize, the company would offer pilots either a two-year leave without pay or a 15-day work month at half salary.

According to an official at the carrier's flight operations center in Sepang, two miles outside Kuala Lumpur International Airport, the excess crew resulted from a reduction of the 737-800 network as part of an exercise that started in late August. The airline plans further reductions in the coming months "where necessary."

The official said the airline will know exactly how many pilots it will need to offer for secondment by year-end. Some have already served the required three months notice to resign, and the precise number will depend on how many more follow suit.

In August MAB arranged to send 50 to 70 Boeing 777 pilots to Korean Air on temporary assignment. That plan met with opposition from KAL's pilots' union, despite a shortage of cockpit crew.

Airbus Readies Short-field A320neo

A team at Airbus's plant in Filton, UK, has designed, built and tested a package of aerodynamic improvements for the A320neo wings designed to generate more lift at low speeds, the company recently revealed. The option, dubbed Sharp (short airfield package), enhances takeoff and landing performance for operations on short runways.

A Kevlar composite panel modification to the wing's root fillet fairing is key to the improved landing performance. Airbus said that operations from the 4,265-foot runway at Rio de Janeiro's Santos Dumont Airport drove development of the mod. Along with the short runway, a mountain to one side and a long bridge on the other add to the landing challenge. Airbus said several operators would like to fly A320neos into the airport.

The UK team, working with engineering colleagues in Bremen, Germany, had considered various proposals to reduce the approach speed, said Airbus. The modification to optimize the airflow over the root fillet fairing panel, expected to be available as a retrofit, proved the ultimate "winner." *–Gregory Polek*

Airliner makers set to vie for Iranian business

by Vladimir Karnozov

VLADIMIR KARNOZOV

A Sukhoi Superjet 100 participates in a flying display at August's MAKS airshow in Moscow.

The possibility of an end to international sanctions against Iran has piqued the interest of aircraft manufacturers around the world with the promise of a lucrative new market for airliners. But an apparent division between Iran's ruling elite and air transport industry, along with mixed signals from Iranian government officials over sourcing, has led to ambiguity over which airframers stand to benefit. To modernize its fleets fully, Iran would have to spend $20 billion on 400 passenger airplanes, approximately 100 of which it needs immediately, according to the officials.

Iran's supreme religious leader, Ali Khamenei, has pledged Tehran will not cooperate with the West beyond the recently struck nuclear deal, and, instead, will develop economic ties with China and Russia. His views have met with the uncompromised support of the defense ministry and local manufacturers under the government's banner, whose interests lie primarily with development of in-house capability with Russian assistance.

However, Iran's minister for roads and urban construction recently told reporters that the Sukhoi Superjet–the newest and most technologically advanced Russian civil airliner now in production–is not an option for Iran's airlines. "We have already reached preliminary agreements with the world's leading manufacturers," Ahmad Abbas Akhundi said, referring to Airbus and Boeing.

Akhundi's comments came only weeks after Soren Sattari, Iranian vice president for science and technology and the head of a national delegation at the MAKS 2015 airshow in Moscow, told Moscow-based newspaper Kommersant that Tehran wants to buy Sukhoi civil and military aircraft and manufacture them under license.

"One of the local airlines has attested to the Superjet 100 with a positive conclusion," Sattari said. If Russia offers attractive financial terms, "many Iranian airlines will be willing to acquire Superjets," he added.

The Right Patnerships

Sattari also said that Tehran "will not repeat mistakes of the past," including the sale of natural resources in exchange for high-tech imports. Today, it would rather make better use of 500 universities and 400 scientific-industrial centers in the country to develop high-tech products of its own. "It is important [to ensure] that our cooperation develops in the way of joint projects," he noted. "In other words, we want joint development."

Russian minister for transportation Maxim Sokolov confirmed that negotiations on Superjets continue. According to Russian sources, Iranian airlines would have access to three aircraft for operational trials, wet leased from a Russian airline, late this year or early next. As a next step, Iran and Russia would negotiate a larger deal at the next meeting of the inter-governmental commission later this autumn. Shortly after MAKS, however, the secretary of Iran's Aviation Companies Association, Maghsud Asadi Samani, told the Iranian government's ISNA news agency that the statements by Sattari "had been made in general" and should not be considered a commitment by Iran to buy Superjets.

A month after MAKS 2015, Manouchehr Manteki, CEO of Iran Aviation Industries Organization (IAIO), told reporters that during the show the national delegation held negotiations on Russian-made jetliners.

"Delegation members carried out an analysis of advantages and disadvantages" of the Superjet, he said.

Ilyushin Finance (IFC) general manager Alexander Roubtsov told **AIN** in late September that his company has been talking to four Iranian airlines about the Superjet, as well as the Tupolev Tu-204 and the Irkut MC-21. The lessor has kept in touch with those airlines and other Iranian carriers for years, he acknowledged. Nevertheless, Roubtsov said IFC has not officially offered the Superjet or other types to Iran because of the sanctions. "No one wants to get on the list of international sanctions for dealing with a country that is still under international sanctions. We will make an official offer to the Iranian airlines as soon as the sanctions regime is lifted."

A spokesman for Sukhoi Civil Aircraft (SCAC) and its parent company, United Aircraft (UAC), declined to comment on the prospects for Iranian sales, citing an official policy not to do so by UAC and its member companies.

Christopher Buckley, Airbus executive v-p for Europe, told reporters at MAKS that he considers talk of selling airplanes to Iran premature. "We are excited about the opportunity, but today it is extremely early to speak about that," he said.

During a recent interview with **AIN**, Boeing v-p of sales for the Middle East, Russia and Central Asia Marty Bentrott expressed similar sentiments. He added, however, that while he expects Airbus to share in the spoils of an open Iran, the prospect of any Russian incursion with the MC-21, for example, would appear remote in light of the country's historical preference for Western airplanes. ❑

AIRLINE CEOs DEFEND INDUSTRY'S PROFITABILITY AT AVIATION SUMMIT

While finally earning profits that are in line with those of other large companies, U.S. airlines are facing unwarranted criticism for being profitable, airline industry executives said in late September. Defending the industry's performance, they said new, passenger-focused regulations that have been proposed are unnecessary.

Speaking on September 28 at the Airlines for America (A4A) Commercial Aviation Industry Summit in Washington, D.C., A4A president and CEO Nicholas Calio described the industry's progress since he joined the trade association in January 2011.

"In five years a lot has changed," Calio said. "Through a painful series of restructurings, budget cuts, employee cuts, bankruptcy and consolidations, [airlines] got on the right foot and also changed the business model…We're now being attacked for being profitable by many people. Certain policy makers and other people in the public don't like the idea that airlines can be profitable…Profits are a good thing; they're usually considered very American."

During the first half of the year, the 10 publicly traded U.S. airlines the association tracks invested $8.5 billion in products and services, or $23 per enplaned passenger, Calio said. Yet the cost of an airline ticket has not kept pace with inflation.

In August, A4A reported that major U.S. airlines collectively had doubled their net profit in the first six months of the year compared with the prior-year period. The large carriers the association tracks reported $8.7 billion in net profit in the first half, up from $3.9 billion in the first half of last year. A 34-percent drop in fuel expenses helped drive profitability.

Meanwhile, in September, an advisory committee to the federal Department of Transportation (DOT) recommended that airlines be required to clearly disclose the cost of change and cancellation fees in selling tickets, as well as the size of an aircraft's seat. Already, the DOT issues a monthly "Air Travel Consumer Report" that provides data on flight delays, mishandled baggage, oversales, consumer complaints and airline reports of the loss, injury or death of animals during transportation. According to Calio, a baggage handling "performance mandate" has been proposed in legislation to reauthorize the FAA. Such rules "have nothing to do with safety and nothing to do with things that any other business is subject to," he complained.

BILL CAREY

From l-r, Bradley Tilden, Gary Kelly and Robin Hayes speak at the A4A Commercial Aviation Industry Summit.

Airline CEOs appearing on a panel at the summit echoed Calio's remarks. Southwest Airlines CEO Gary Kelly said lower airline fuel costs should not be linked with lower fares. "I think people quickly forget the struggles that the industry has gone through to get to this point," he said. "What our customers want is stability. As a low-fare carrier, what we really disliked doing was having to chase fuel prices up and up and up over a long period of years with never ending fare increases…I think that air fares have not kept pace with inflation and it's because of competition, and lower fuel prices in terms of transportation is nothing but a great thing."

In the century since the airline industry started, it probably has "negative retained earnings," remarked Bradley Tilden, Alaska Airlines CEO. "We're moving from that history to where we're starting to make a little bit of money and people are saying, 'Oh my God, they're making excess profits.' I don't think the industry is," Tilden said. "I think we're making profits that are necessary to continue to grow and invest in service."

Commenting on the prospect of a baggage performance mandate, JetBlue CEO Robin Hayes said such requirements, while well intentioned, often have unintended consequences. "No one wants to get to a destination without their bags, so clearly we have an incentive to make that work," Hayes said. "Let us compete and offer the best quality service. It will be a far better outcome than the unintended consequences of selective mandates."

Kelly said Southwest's "Bags Fly Free" policy–which allows passengers to check one or two suitcases without being charged, a practice unmatched by other major carriers–gives his airline a competitive advantage. "It's huge," he said. "Every company would love to have points of distinctiveness…It's astounding how many people hate bag fees, hate change fees. They just don't like being nickeled and dimed." *–B.C.*

In Berlin ERA calls for a level playing field

by Ian Sheppard

The annual General Assembly of the European Regions Airline Association (ERA) took place in Berlin last month, with airlines calling for a greater focus on the importance of aviation to Europe's regions and a move away from the overburdening of the sector with regulatory costs–especially disproportionate and unfair passenger rights.

Boet Kreiken, ERA president and managing director of KLM Cityhopper, said that the European transport strategy emerging from Brussels is expected to include "a special chapter on regional aviation–so we're making a lot of progress," but he took a swipe at the continuing expense of compliance with EU Regulation 261/2004, which mandates airlines pay for delayed flights.

Kreiken then called on the European Investment Bank to assist in providing financing to small airlines. "ERA has asked them to help finance regional airlines directly [where aircraft are used for] intra-European flights." He added, "Only by bringing in new aircraft can we achieve a 50-percent reduction in CO_2 emissions."

Simon McNamara, ERA director general, took a cautiously optimistic view of the future, pointing to an improving economy in Europe and low oil prices. However, he warned, "We know in our industry that even when things are good they're tough.

"At the CEOs meeting this morning we talked about 54 percent of the market being [held by] only five airlines, while the remaining 46 percent is shared among 136 other airlines. So we have a David & Goliath situation–and the big airlines are exercising their power." The industry is likely to continue to consolidate, he predicted.

Patrick Edmond, managing director of International Aviation Services Center at Shannon Airport (right), accepts the airport of the year award from ERA director Simon McNamara.

McNamara said that ERA's 54 member airlines have 629 aircraft (and 92 pure freighters) which log 960,000 flights a year between 1,200 destinations, a total of 45 million passengers and an average sector length of 71 minutes, "and contribute €47 billion to Europe's GDP." The split between jets and turboprops is 46:54, he added, with 72 seats being the average size of aircraft.

Like Kreiken, McNamara put passenger rights and compensation at the top of his agenda. "We're in there fighting for the cause; there is almost no escape from paying compensation when an aircraft has technical [issues]." He looked forward to the new EU transport strategy, scheduled to be published in December; the industry expects it to highlight the importance of regional aviation and connectivity…"but let's see what it says on access to hub airports and the building of new airports [too]."

In the subsequent panel discussions, session chair Stefan Pichler, CEO of Air Berlin, said, "Productivity gains have been neutralized by the negative impact of regulatory decisions, and this positions us as the underdogs to the international competition. It's not a level playing field." He noted that ATM costs have climbed 40 percent over the past year, and also singled out the costs of the German passenger tax and the Emissions Trading Scheme (EU ETS). But he added, "Protectionism cannot be the answer… the problem is not just fierce competition; it is the regulatory burden," and compared the situation Europe's carriers face to those in the Middle East and Asia, "where nations treat airlines as engines for growth."

He concluded by saying, "We need to present our interests as a unified group…we can't act as individual airlines."

The ERA General Assembly next year will be held in Madrid from October 11 to 13. ❑

AIRLINE AWARDS

The ERA Annual Awards dinner was held at the Berlin Classic Remise car museum, with newly rebranded ASL Airlines (formerly Air Contractors) being revealed as the gold airline of the year award winner 2015/16. The award was presented to ASL Airlines CEO, Colin Grant, by Patrick de Castelbajac, CEO of awards sponsor ATR.

The silver award went to Aurigny, which is based in the Channel Islands (Guernsey) and the bronze to Air Nostrum of Spain. The airport award went to Shannon Airport for the second year running.

ASL Aviation Group director of corporate affairs Andrew Kelly told reporters, "ASL Airlines… has seven AOCs, a new low-cost carrier in South Africa [FlySafair] and commercial Hercules operations in Africa, India and Thailand. In Europe we have just rebranded…We have 80 aircraft in all, 60 percent cargo and flying for the major express integrators–we are the largest operators in Europe for FedEx and UPS, and also fly for DHL and TNT. We fly to Bagram [Air Base] at Kandahar [Afghanistan] every night for DHL, using an [Airbus] A300-600." ■

MANUFACTURERS PROVIDE PROGRAM UPDATES

Several companies gave press briefings before the ERA general assembly, while the airline CEOs were holding their traditional private meeting.

Franco-Italian turboprop manufacturer **ATR** reported it is on course to produce more than 90 aircraft this year, as planned, but the plant could eventually take production up to 120 aircraft a year.

The company has a backlog sufficient for three years of production (almost 300 aircraft); its final assembly and completion hangars now cover 32,000 sq m of floor space, four times what it had in 2005.

Whether there will be a 90-seater is still up in the air; it appears that while the Italian shareholders are all for proceeding now, the French side (Airbus Group) wants to wait "until production is stabilized at 100 aircraft a year…they think there is no risk right now [of the competition launching one] and there is not an immediate need [sufficient demand not there yet]," said an ATR spokesman.

Nazario Cauceglia, CEO of **SuperJet International** (SJI), said that so far 100 SSJ100 Superjets have been produced and that the fleet has logged 135,000 hours. "The market is appreciating our product more and more."

The company announced its "first European customer," with Irish regional carrier CityJet ordering 15 of the type and taking options on 10 more. They will be purchased by an as yet undisclosed lessor and CityJet will then lease them. Sukhoi expects to deliver the first of the 98-seat aircraft in the first quarter of next year.

Hideyuki Kamiya, director and head of strategic marketing with **Mitsubishi Aircraft**, said the MRJ was due to make its first flight by the end of last month, from Nagoya, with first delivery planned in the second quarter of 2017. Five flight-test aircraft are being prepared, and production at the final assembly building currently under construction will start "next spring." The aim is to ramp up to a rate of 10 aircraft per month.

Bombardier's Ross Mitchell, v-p of business acquisition, said that the CSeries airliner is "more than 90 percent complete" and in the final stages of flight-testing, with the first production aircraft about to begin function and reliability testing.

The first aircraft for launch customer Swiss is now in production, he said.

Pat Byrne, executive chairman of CityJet, explained why the carrier has become the newest customer for the CRJ900, with an order for 14 (which it will operate for SAS). Byrne described the -900 as "the obvious choice…bullet-proof."

Mitchell said Bombardier has 60 operators in Europe, with around "650 aircraft in service or on order." Meanwhile the Q400 turboprop has been ordered by ERA member Air Iceland, he said, with services planned to start at the end of this year. Local airline Air Berlin already operates 17, he added, and has recently acquired seven more.

Mathieu Duquesnoy, **Embraer** v-p for Europe, the Middle East and Africa, forecast a need for 6,350 jets in the 70- to 130-seat class over the next 20 years. The fleet in Europe will "roughly double," he said, to 1,500 aircraft. Embraer's E-Jets, he added, account for 60 percent of deliveries in this segment; the series has notched orders for 146 aircraft worldwide so far, with E175s selling particularly well in North America. In Europe, 304 Embraer commercial aircraft are flying with 25 airlines, he said, "with a lot of small operators, such as Aurigny and Air Moldova." He noted that Austrian is to start operating a fleet of 17 E195s "to replace Fokker 70s and 100s to feed its hub at Vienna." Meanwhile Borajet/AnadoluJet will have 15 E190/195s by year-end.

The E2 jetliner is "on track," he said, with the first fuselage assembled and first flight slated for next year's first half. Entry into service is expected in the first half of 2018.

Dave Jackson of 328 Support Services held a joint press conference with Pratt & Whitney Canada's Richard Dussault to explain that **TRJet**'s program to restart production of the 328Jet and Dornier 328 turboprop is progressing well in Turkey. TRJet is a wholly owned subsidiary of Sierra Nevada. "We are working closely with the Turkish government on their 50 aircraft and have identified where to build the aircraft," said Jackson, at an airfield near Ankara. He added that TRJet would like to manufacture the proposed 628Jet, but initially it will modify four existing airframes (three 328Jets and a 328 turboprop) and then build five initial production airplanes. Production will gradually switch from Oberpfaffenhofen, Germany, to Turkey by 2018, and then the production rate will be 20 to 25 aircraft per year. ■

TEXTRON AVIATION BOLSTERS EAST COAST SERVICE

Textron Aviation's company-owned service facilities in Greensboro, N.C.; Wilmington, Del.; Newburgh, N.Y.; and Atlanta have received new certifications from the FAA, expanding their capabilities to provide service and support to King Air, Citation and Hawker customers. Under the expanded certifications, both the Newburgh and Greensboro facilities are authorized to service 90-, 200- and 300-series King Airs and 125-series Hawkers, while the Wilmington and Atlanta facilities are authorized to service the Citation X, Sovereign, Excel and Mustang.

The Greensboro and Newburgh facilities previously serviced Citations and Caravans exclusively, while the Wilmington and Atlanta locations were previously certified to service Beech and Hawker aircraft. Of the 21 Textron Aviation-owned service centers, 11 have received expanded certifications over the last year to service more Textron Aviation products. The company expects all of these facilities will have expanded capabilities by year-end.

Textron Aviation, through its Beechcraft, Cessna and Hawker brands, has a network of some 400 authorized service centers and 21 company-owned facilities that offer maintenance, inspections, parts, repairs, avionics upgrades, equipment installations and refurbishments.

RED AVIATION ACQUIRES DFW INSTRUMENT

Red Aviation–a provider of parts and services for Globals, Challengers, Learjets and Gulfstreams–has acquired aircraft instrument repair firm DFW Instrument of Addison, Texas. According to Red Aviation president and CEO Steve Davis, the DFW acquisition will allow Red Aviation "to provide the industry with more innovative service and repairs for today's aircraft."

DFW Instrument provides flight-critical instrument and equipment repairs, including air-data equipment, engine instruments, flight directors, horizontal situation indicators, gyroscopes and other products. In addition, its avionics line service support team manages aircraft maintenance requirements for general aviation, business aircraft operators and government/military agencies. The Red Aviation Repair Group has a Part 145 FAA-/EASA-certified repair facility in Georgetown, Texas, with unlimited capabilities for airframe and powerplant.

PRATT & WHITNEY OPENS TECHNICIAN TRAINING CENTER

Pratt & Whitney is opening a technician training center, its third worldwide, in Hyderabad, India. The center, housed at United Technologies India's existing facility, will train aircraft technicians on current and new engine models, beginning with the GTF and V2500. The center will have capacity to train 2,000 students attending a one-week class per year, with growth capability for up to 4,000 students per year. The engine manufacturer has similar facilities in East Hartford, Conn., and Beijing.

In an effort to promote further aviation education and training, Pratt & Whitney has also signed a memorandum of understanding with Embry-Riddle Aeronautical University Asia to expand undergraduate and graduate aviation and engineering degree opportunities for those in India. The agreement will assist in developing aviation education and training, corporate scholarships and research opportunities between the two institutions. "We hope that this agreement will enable Embry-Riddle to establish the same collaborative relationship [with Pratt & Whitney] we share in the United States," said Graham Hunt, head of Embry-Riddle's Asia campus.

GAS PATH ANALYSIS AVAILABLE FOR ROLLS-ROYCE BIZJET ENGINES

Engine condition trend monitoring specialist Spectro Jet-Care has extended its gas path analysis (GPA) service for Rolls-Royce engines powering business aircraft. The UK-based group recently started offering GPA support for the BR700-710C4, BR700-725A12, BR700-725A1, Tay 611-8, AE3007A and AE3007C.

The process detects deterioration and faults in the engine core by analyzing key flight data parameters, including fuel flow, shaft speeds and gas temperatures. "These new additions to our already extensive range of Jet-Care GPA engine trend programs allow operators of single or mixed engine types to tend their entire fleet with one quality provider," said Jet-Care CEO David Glass.

"We feel strongly about providing full support to an operator and always look at any potential engine issues from an operational perspective. We do not expect an operator to work on a 'no news is good news' basis, nor to work it out for themselves, as is the case with so many of the other commercially available trend programs."

JET AVIATION SINGAPORE GAINS CHINESE CAAC MX APPROVAL

The Civil Aviation Administration of China (CAAC) granted Part 145 maintenance facility approval to Jet Aviation Singapore. The designation expands the company's maintenance, repair and overhaul capabilities to support Chinese operators of Bombardier and Gulfstream aircraft.

For Gulfstreams, the scope of permissible work extends to the largest possible checks on the GV (192 months) and GIV (144 months). According to Jet Aviation Singapore, it and the Gulfstream Aerospace Service Center in Savannah, Ga., are the only two service centers to hold that degree of CAAC approval. The authorization also extends to Bombardier Global Express series up to 20-year inspections and Challenger 604/605s up to 24-year inspections. In addition, interior services and approved outsourcing for paint are allowed.

"This approval marks the start of a new era of Gulfstream support for operators in the region and we look forward to working closely with them…to provide the highest service levels possible," said John Riggir, vice president and general manager of Jet Aviation Singapore.

Jet Aviation Singapore provides scheduled and unscheduled maintenance, aircraft repair, defect troubleshooting and rectifications, aircraft modifications, interior refurbishment, avionics modification and exterior painting services.

FLORIDA SHERIFF'S ASTAR UNDERGOES 12-YEAR INSPECTION

Grand Prairie, Texas-based Airbus Helicopters (née American Eurocopter) has delivered to the Lee County Sheriff's Office in Fort Myers, Fla., its AS350BA AStar after completing the aircraft's second 12-year inspection. The 12-year inspection effectively resets the helicopter's inspection cycles to zero, updates the aircraft with all applicable factory configuration changes and confirms its compliance with applicable FAA requirements.

Airbus Helicopters' U.S. sales and service division offers on-site repair of composite structures, rotor blades, dynamic components and other key components using the latest tools and test equipment. Engine work and parts required during the inspection are available from Turbomeca USA, which is located adjacent to the Airbus Helicopters facility.

Aircraft inspected and repaired by Airbus Helicopters are returned to service in turnkey condition. Customers can expect to spend no more than one day reviewing aircraft records and conducting an acceptance flight before returning to their home base, the company said.

CAYMAN ISLANDS APPROVE PRIVATESKY AS AMO

Fort Myers, Fla.-based PrivateSky Aviation Services received approved maintenance organization (AMO) status from the Civil Aviation Authority of the Cayman Islands. The MRO specializes in maintenance, avionics and interior refurbishments for large-cabin Gulfstreams.

"We are looking to broaden our customer base and provide Gulfstream owners and operators the best support and service possible," said PrivateSky COO Royce Stevens Jr. This year PrivateSky has received DGAC approval from Mexico and approval for its maintenance implementation plan required by Transport Canada.

Additionally, PrivateSky, an FAA Part 145 repair station, is in the process of obtaining approval from the Civil Aviation Authorities in Bermuda and plans to continue to maintain approvals from the CAA of Uganda and Ministry of Transport in Bahrain.

HARTZELL PROPELLER NAMES SERVICE CENTER IN CHINA

Shenyang Avias Aviation Maintenance Engineering has been named the first Hartzell Propeller service and support center in the People's Republic of China. Shenyang Avias is located near Taoxian Airport in Shenyang, the provincial capital and

An AS350BA AStar belonging to the Lee County Sheriff's Office recently underwent a 12-year inspection at the Airbus Helicopters Grand Prairie, Texas facility. It is the second such inspection for that helicopter.

Dean Ward, Hartzell Propeller director of aftermarket parts and service, congratulates Sha Wei, general manager at Shenyang Avias Aviation, left, on the latter company's status as a Hartzell support center.

largest city of Liaoning Province in Northeast China.

"This latest initiative demonstrates that Hartzell Propeller is committed to Chinese owners, operators and mechanics," said Weiqing "Max" Wang, Hartzell Propeller managing director for China, based in Shanghai City. "While Shenyang Avias is our first service and support center in China, Hartzell will continue the long-term expansion of the service and support network to meet future growth of general aviation in China."

The ongoing relationship with Shenyang Avias provides Hartzell Propeller with in-country service, support and warranty capability, in addition to existing on-site representation in Shanghai and 24/7 Mandarin AOG telephone technical support. Hartzell recently completed translations of propeller owner manuals into Mandarin for the most popular turboprop and piston-powered aircraft flying in China.

DALLAS AERONAUTICAL OPENS BRAZIL FACILITY

Dallas Aeronautical Services' new Brazilian facility received approval from ANAC, Brazil's civil aviation authority. The repair and overhaul facility for composite and structural aircraft components occupies more than 21,500 sq ft in São José dos Campos and aims to serve the business, commercial and military aviation markets in Brazil, and eventually in Mercosul, under the name DAS Brasil.

DAS's Brazilian mechanics are currently training in Dallas, with formal inauguration of the São José dos Campos facility planned after their return, before year-end. The company has already invested more than $500,000 in equipment, tooling and specialized training for mechanics.

The company chose the location for its "privileged logistics"–proximity to airports, seaports and highways, as well as being close to commercial aviation maintenance centers and the "service centers for the executive aviation market in Sorocaba and Jundiaí."

Eliezer M. da Silva, DAS's managing director of Brazilian operations, told **AIN** that the company plans to add EASA and FAA certification within the next two years, after which it will consider other South American certifications.

JET AVIATION BASEL EXPANDING COMPLETIONS CAPACITY

Jet Aviation Basel recently signed an agreement with Basel Euroairport authorities to expand its completions production capacity to meet rising demand for services. The company's Basel location is expanding its production operation within its completions center, where it produces interior components and integrated systems for corporate and private jets.

The expansion includes establishing

Continues on next page ▶

TORQUED by John Goglia

Is Gulfstream IV crash at BED the wakeup call bizav needs?

On May 31, 2014, at about 9:40 p.m., a GIV crashed after a rejected takeoff at Hanscom Field (KBED) in Bedford, Mass. The aircraft was unable to stop and overran the runway, hitting approach lights and a localizer antenna, finally stopping in a ravine outside the airport perimeter fence. The post-impact fire killed all seven people on board: the two pilots, a flight attendant and four passengers (among them David Katz, owner of the *Philadelphia Inquirer*). The aircraft was operated as a corporate flight under Part 91 and was returning to Atlantic City.

I first wrote about the crash in August last year. The NTSB had issued a very preliminary report that raised questions about whether the crew had performed a routine pre-takeoff check of the flight controls and whether the failure to perform that routine check could have led to the accident. At the time, it was too early to reach any conclusions about what the crew had or had not done. But it led me to consider the implications of a possible lackadaisical attitude toward checklists and the dangers that poses to aviation safety, and I wrote about guarding against a culture of complacency.

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

Now the NTSB report has been completed and the Board has issued its determination of probable cause. *(See* **AIN** *September, page 1.)* The NTSB concluded that the probable cause of this accident "was the flight crewmembers' failure to perform the flight control check before takeoff, their attempt to take off with the gust lock system engaged, and their delayed execution of a rejected takeoff after they became aware that the controls were locked."

While this probable-cause finding was not unexpected given the preliminary report, what was shocking was one of the contributing factors: "the flight crew's habitual noncompliance with checklists." (The other contributing factors are also significant: "Gulfstream Aerospace Corporation's failure to ensure that the GIV gust lock/throttle lever interlock system would prevent an attempted takeoff with the gust lock engaged, and the Federal Aviation Administration's failure to detect this inadequacy during the GIV's certification.")

This was not a low-time crew perhaps inexperienced with the significance of checklist compliance. This was a senior and seasoned crew. The pilot-in-command, 44 years old, held an ATP certificate with single and multi-engine airplane ratings and type ratings for the BE-400, GII/III, Learjet and MU-300, as well as the GIV. At his last medical, about a month before the crash, he reported 11,250 hours. According to information in the NTSB accident file, the captain was "associated with the accident airplane owners for approximately 12 years, about 8.5 years in the GIV."

The copilot, 61 years old, was an even more senior and experienced airman, reportedly with the airplane owners for 27 years. He held an ATP with single and multi-engine airplane ratings and type ratings for the GII/III, JetStar and GV, as well as the GIV. He also held a flight instructor certificate with single and multi-engine airplane, and instrument airplane ratings and an A&P mechanic certificate.

Habitual Noncompliance

According to the report, the accident crew were familiar with flying together, they normally flew together, trading seats between flights as they were both qualified in the aircraft. The copilot on the accident flight served as the chief pilot and director of maintenance. He was not only a crewmember but also had management responsibilities for the operation and maintenance of the aircraft.

So how does this incredibly experienced, long-time crew end up with a habitual failure to comply with checklists? Checklists are the foundation of the standardization that preserves safety in aviation. They are particularly critical during taxi, takeoff and other high-stress activity when attention to detail is especially critical. And yet the Board determined that during the accident flight, the crew failed to discuss checklists and failed to perform a flight control check. It further determined that the crew failed to perform complete flight control checks on almost all of their last 175 flights.

According to the NTSB: "The flight crewmembers' total lack of discussion of checklists during the accident flight and the routine omission of complete flight control checks before 98 percent of their last 175 flights indicate that the flight crew did not routinely use the normal checklists or the optimal challenge-verification-response format. This lack of adherence to industry best practices involving the execution of normal checklists and other deficiencies in crew resource management eliminated the opportunity for the flight crewmembers to recognize that the gust lock handle was in the on position and delayed their detection of this error."

It seems that not only was this accident fully preventable by use of a routine checklist, but that the crew likely never used checklists, since the investigators found that the crew did not perform complete flight control checks on 171 earlier flights. I can't imagine how heartbreaking that must be for the families and friends of the victims. Or what a sense of betrayal the aircraft owner's family must feel for the complete dereliction of duty of their long-time crew.

A number of aircraft owners have taken this finding to heart, wondering whether they and their families are vulnerable to pilots who don't perform their jobs properly, especially when it comes to critical items such as checking the flight controls. I know you can't cite one accident to generalize about the professionalism of thousands of other corporate pilots. But that's not what aircraft owners want to hear when they entrust their own lives and the lives of their families and friends to these pilots. They want to know how they can be absolutely assured that their pilots are complying with industry best practices when it comes to checklists in general and, crucially, pretakeoff control checks.

Emphasis on Professionalism

The Board makes two recommendations regarding requirements for flight control checks. First, it recommends the International Business Aviation Council "amend International Standard for Business Aircraft Operations auditing standards to include verifying that operators are complying with best practices for checklist execution, including the use of the challenge-verification-response format whenever possible." And to NBAA it recommends: "Work with existing business aviation flight operational quality assurance groups, such as the Corporate Flight Operational Quality Assurance Centerline Steering Committee, to analyze existing data for non-compliance with manufacturer-required routine flight control checks before takeoff and provide the results of this analysis to your members as part of your data-driven safety agenda for business aviation."

I would make one more: install video cameras in the cockpits of corporate aircraft that can be regularly reviewed to ensure that crews are properly complying with safety protocols, including checklists and flight control checks. While video cameras in the cockpits of airliners have been controversial with pilot unions, the NTSB has recommended their installation to aid in accident investigations. The same union issues do not apply to most corporate operations and are probably the most cost-effective way of assuring owners that their pilots are conforming to professional standards on their flights. ■

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

▶ *Continued from preceding page*

an additional 39,826-sq-ft facility dedicated to finishing and integration activities, as well as expanding manufacturing capacity in its current cabinet shop. Plans also include investments in equipment. The expansion is expected to be completed in the first quarter of next year.

LUFTHANSA TECHNIK INSTALLS WINGLETS ON BBJ

Lufthansa Technik has installed split-scimitar winglets on a customer Boeing Business Jet (BBJ). With this modification, the aircraft is the third BBJ in the world to be equipped with these aerodynamically optimized winglets from Aviation Partners Boeing.

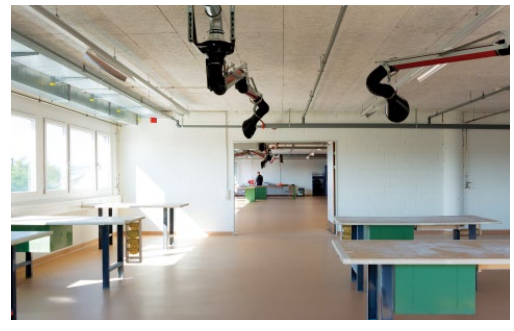
"The results met my expectations completely," the unidentified client said. "This was a new task for Lufthansa Technik, and the company fulfilled it on schedule and with high quality. Even the new paint on the wingtips where the installation took place was adapted to the existing complex color scheme."

Among other things, the specialists at Lufthansa Technik's VIP and executive jet maintenance product division reinforced various areas on the inside of the airframe, particularly in the wing tanks, to install the winglets. The modification took 10 days.

The new winglets cut fuel burn by 2.2 percent and thus increase the aircraft's range, said Aviation Partners Boeing.

AEROWORX REPLACES GCUs WITH AVRPLUS TEST STAND

Torrance, Calif.-based AeroWorx has completed the installation of the latest AVRplus K838AX generator test stand



AeroWorx will use a generator test stand from AVRplus to perform all types of repair, overhaul and return-to-service testing for a variety of generators.

from Avtron Aerospace. The new stand is intended for repair, overhaul and return-to-service testing of all types of aircraft AC and DC generators. The system supports main, auxiliary and APU generators and DC starters for business jets, commercial and military airplanes and helicopters.

The AVRplus test stand replaces flight-worthy generator control units (GCU) for testing generators and other equipment. This flexible and adaptable test system can replace 100 different GCUs to help reduce the cost and complexity of testing. A single software tool is used to download GCU emulation personalities, update firmware and perform calibration and maintenance all through a serial port further streamlining testing procedures. ❑

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The Pontiff delivered a blessing from the airstair at Atlantic Aviation's FBO at the end of his U.S. visit.

ATLANTIC'S PHILADELPHIA FBO HOSTS PAPAL GOODBYE

As Pope Francis wrapped up his historic first visit to the U.S., his last stop before heading back to Rome and the Vatican was one of the hangars of Atlantic Aviation's facility at Philadelphia International Airport, where he delivered a farewell address. Among the 500 VIPs and volunteers packing the hangar for the event were U.S. Vice President Joe Biden and his wife, Jill; Pennsylvania Governor Tom Wolf; Philadelphia Mayor Michael Nutter; business leaders; and numerous high-ranking clergy. The venue was selected by the World Meeting of Families, an international event that takes place every three years and was hosted this year by Philadelphia. After his speech, in which he thanked all involved in the preparations for his visit, the Pontiff met privately with the Biden family.

As he boarded his American Airlines flight chartered by the U.S. Conference of Bishops, dubbed Shepherd One, Pope Francis gave his final blessings from the top of the FBO's airstair and bid goodbye to Philadelphia and the U.S.

LOS ANGELES FBO EXPANDING AIRCRAFT STORAGE SPACE

Jet Center Los Angeles, the lone service provider at L.A.-area Jack Northrop Field/Hawthorne Municipal Airport, expects to complete the construction of two new hangars providing 43,200 sq ft of aircraft storage space, along with 9,000 sq ft of new office space, this month. The new buildings, which can accommodate a G650, will bring the FBO's aircraft storage space to more than 53,000 sq ft. According to the company, the new hangars were built with input from the nearby Hollywood film industry, which often uses the airport and FBO for on-location shooting, to facilitate easy access for set-up and production.

Today's large aircraft are taxing the supply of hangar space in key markets, and L.A. provider Jet Center Los Angeles is making room for more, adding two new hangars with room for a Gulfstream G650.

ATLANTIC FBO OK'D AT SLC

Atlantic Aviation has been selected as the winner of the request-for-proposal process for a second FBO at Salt Lake City International Airport (SLC). The Plano, Texas-based company, which owns 69 FBOs in the U.S., is slated to begin operations at the Utah gateway starting next month. Under the terms of the agreement, Atlantic's leasehold includes more than 17 acres of ground and ramp space along with four hangars. The company will operate temporarily out of the old Sports Terminal building, as it expects to break ground in the spring on a new $25.5 million FBO terminal, more hangars and a new fuel farm.

"We are pleased to enter the Salt Lake City market," said Atlantic CEO Lou Pepper. "Salt Lake is a dynamic and growing city and a great complement to the Atlantic network." SLC has been served by one FBO since 2011, when the two existing locations there were consolidated. That business was acquired by current service provider Tac Air the following year.

NEW U.S. CUSTOMS FACILITY OPENS AT FORT LAUDERDALE EXECUTIVE

Florida's Fort Lauderdale Executive Airport (FXE), home to approximately 280 business jets, recently opened a U.S. customs inspection station. Located at the east end of Taxiway G on the airside and at 5301 East Perimeter Road by land, the expanded $5.6 million facility will be adaptable to future workloads, technologies and operational needs, according to the U.S. Customs and Border Protection (CBP) agency.

"The City of Fort Lauderdale has been a tremendous partner by providing

The U.S. Customs and Border Protection Agency opened a facility at Fort Lauderdale Executive Airport.

a facility with style and functionality, that is one of the best equipped facilities in the country," said CBP port director Jorge Roig. "We look forward to building on our partnership to serve our community better."

Along with the new 7,900-sq-ft location come extended hours of operation: three hours later than previously, from 8 a.m. until midnight daily. CBP staff there can be reached at (954) 491-5647 or (954) 771-5160.

FAA ISSUES UPDATED LIST OF COLD-TEMP RESTRICTED AIRPORTS

Just in time for winter, an updated list of U.S. airports where operations could be limited by the effect of extremely cold temperatures on aircraft altimetry is available from the FAA. A number of airports have also been dropped from this new version, InFO 15002. The agency reminds pilots that they, not ATC, are responsible for including temperature-based altitude corrections into their approach planning. However, advising ATC of planned altitude corrections in the final segment is not required.

The new document follows an extensive agency risk analysis of precisely which instrument approach procedures (IAP) can be affected during winter weather. The agency also reminds pilots that temperatures for cold temperature-restricted airports are separate from the temperatures published on area navigation (Rnav) approaches. Temperature restrictions on Rnav approaches for lateral navigation (Lnav)/vertical navigation (Vnav) minimums must be followed, even if they are warmer than the temperature associated with the "snowflake" icon on the associated IAP.

The study was guided by using the coldest recorded temperature for an airport in the last five years and specifically investigated if there was a probability that expected barometric altimetry system errors could exceed the required obstacle clearance used on procedure segment altitudes.

FLORIDA FBO ADDING HANGAR, OFFICE SPACE

Stuart Jet Center, one of two FBOs at Florida's Witham Field/Martin County Airport, has broken ground on a 24,000-sq-ft hangar that, when completed in next year's first quarter, will allow the Avfuel-branded service provider to shelter the latest ultra-long-range business jets. The $2 million project, wind-coded to meet Miami-Dade specifications for hurricane safety, will include an additional 3,750 sq ft of office space. Stuart Jet Center is home to approximately 30 jets, and is expecting the arrival of several G650s as owners take delivery of their new aircraft.

The company already has 250,000 sq ft of hangar space at the site and offers more than 15 acres of lighted ramp space.

HADID EXPANDS SERVICE NETWORK WITH DJIBOUTI, AFRICA FACILITY

Flight management provider Hadid International Services has expanded its network in Africa with the establishment of a new office for full supervisory capabilities at Djibouti International Airport. The unsettled political situation in the region, which has driven gains in the number of flights landing in and overflying the small African nation, prompted its Civil Aviation Authority to designate Hadid to take control of all permit requests.

Since the beginning of the year, Hadid has served its customers more than 350 times in Djibouti, supporting them with procedures such as obtaining overfly and landing permits, handling services, refueling, hotels and airport transfers. The country, located on the travel routes between the Middle East and Africa, is well positioned as a technical stop. In 2014, Djibouti International handled 250,000 passengers on 7,000 scheduled stops, as well as 1,200 non-scheduled landings.

The news follows recent announcements of Dubai-based Hadid offering business aviation supervisory activities in Ethiopia, Niger, Algeria, Kenya and the Republic of Congo, toward its goal of covering the entire continent.

SOUTH DAKOTA FBO UNVEILS NEW FACILITY

Westjet Air Center, the only full-service FBO at South Dakota's Rapid City Regional Airport (RAP), held the grand opening for its new facility last month. With a stone exterior and copper ceilings, the 5,000-sq-ft terminal included in the $1 million-plus project is designed to resemble a luxury home

or hotel. The facility offers a flight-planning center, pilots' lounge with a pair of snooze rooms, conference room and a children's play room. Westjet has an agreement in place with a local gym to provide day passes to crewmembers. The company is also in the process of renovating its adjoining 6,000-sq-ft former terminal, part of a hangar, which contains offices and meeting space.

The location has 56,000 sq ft of hangar space and can accommodate a DC-9, and is home to approximately 14 turbine-powered aircraft ranging from a Citation V to a Meridian. Westjet's maintenance staff is certified to provide on-call repairs for the airlines that serve the airport. The company, which has been a Phillips 66 fuel dealer since 1958, provides fueling to the airlines at RAP as well as GA traffic. Earlier this year Westjet upgraded its fuel farm, which now holds 88,000 gallons of jet-A and 23,000 gallons of avgas.

MANAGEMENT PROVIDER OPENS FBO AT WISCONSIN AIRPORT

Known primarily as an aircraft management provider for the past 15 years, Wisconsin-based Stein's Aircraft Services (SAS) last month held the grand opening for its own FBO at Kenosha Regional Airport, where it is now one of two service providers. The newly built 44,000-sq-ft Shell-branded facility features more than 30,000 sq ft of hangarage, with room for a BBJ; a two-story attached terminal with passenger lounge; pilots' lounge; exercise room; game room; and a Part 145 repair station.

The company previously had to lease hangar space and "finally decided that we could do a better job ourselves and control what was happening a little better," said SAS owner Michael Stein. The new base is home to the majority of the company's managed fleet of 16 aircraft, from a trio of Falcon 900s to a Turbo Commander.

After a lengthy process, the company also received permission to transform its former headquarters facility at Waukesha County Airport into an FBO. It is expected to begin operations there by year-end.

MOUNTAIN WEST ACQUIRES TWO LOCATIONS IN NEVADA

Mountain West Aviation, a service provider with locations at California's Lake Tahoe Airport and Nevada's Carson City Airport, has acquired El Aero Services, which operated FBOs and Part 145 repair stations at Carson City and at Elko Regional Airport, also in Nevada. The Carson City FBO includes an 8,300-sq-ft terminal and 15,000 sq ft of hangar space sized for aircraft up to a Falcon 2000. While the deal will make Mountain West the sole aviation services provider at Nevada's capital, the company will continue to operate the two locations as separate businesses. At Elko, the modern FBO, the only one on the field, offers a 7,000-sq-ft terminal with 10,000 sq ft of aircraft storage. With the purchase, the new locations will join Mountain West's existing FBOs in Epic branding.

FAA OKs NEW AIRPORT FOR N.D.

The FAA last month authorized a $27 million Airport Improvement Program grant to the City of Williston, N.D., to purchase land to build a new airport, which will eventually replace Sloulin Field. North Dakota is America's second largest oil-producing state, and drilling operations have provided a boost to the local economy along with traffic to the airport. According to the agency, passenger enplanements at Sloulin between 2008 and 2014 climbed ten-fold, to 114,281 from 10,894, and more growth is expected. The AIP grant will help fund the purchase of 1,540 acres of land for the new airport.

The transaction is expected to close next summer, with construction starting soon after, as the FAA's environmental assessment found no significant concerns. Upon its anticipated opening in 2018, the new gateway will be called Williston Basin International (XWA). Total cost for the project, the first replacement airport to be funded in the U.S. since Utah's St. George Municipal in 2011, is estimated to be $254 million, with future funding from the city of Williston, the state and possibly more FAA grants. ❑

CHARTER NEWS NOTES

- **Jota Aviation**, which began operating at Southend Airport in the UK a year ago, plans to add **more Avro versions of the BAe146** this year. The company's BAe 146-200 has flown nearly 800 hours in its first year.
- **The first G650 to enter service in Germany** is being managed by **Munich's MHS Aviation**. The G650 is available for charter. MHS now operates 17 aircraft.
- Charter operator **Tradewind Aviation** has introduced **scheduled shuttle service from Westchester County Airpor**t in New York **to Boston Logan International** (began October 5) **and Morrisville-Stowe State Airport** in Vermont (starting mid-December). Trips are flown in PC-12s and CitationJets.
- Hong Kong-based charter broker **L'Voyage has signed an agreement to market flights using two Challenger 300s outside China for Hanhwa Business Jet Airlines**. The two jets are based in Dalian and Shenzhen. "More and more we are seeing entrepreneurs flying into China; hence, small group executive travel has increased. We are now experiencing the early phase of this trend and we can see the demand for super-midsize jets increasing over the coming few years," said L'Voyage managing director Diana Chou.
- **Epps Aviation** of Atlanta, Ga., and **Associated Air Group** of Wappingers Falls, N.Y., have been added to the **Air Charter Safety Foundation Industry Audit Standard (IAS) Registry**. ■

FBO PROFILE: Starport

Starport's Part 145 FAA repair station at Orlando Sanford Airport performs heavy maintenance, inspections and AOG service on a variety of corporate aircraft.

BUSY FACILITY PLANNING EXPANSION, IS-BAH APPROVAL

With an 11,000-foot main runway, Florida's Orlando Sanford International Airport is second in the region only to Orlando International's pair of 12,000-foot ribbons. A former U.S. Navy training facility during WWII and an attack jet base during the Vietnam War, it was given to the city of Sanford in the late 1960s and has since grown from a regional general aviation airport to the 85th busiest airport in the U.S., with more than 650 operations a day.

Since 2000, Starport, one of two FBOs on the field, has served Sanford's private aviation customers. The 20-year-old facility occupies 18 acres and was formerly known as Jet Air. It served briefly as a Million Air location before its current family owners purchased it. The 7,000-sq-ft terminal, slated to undergo a lobby refurbishment next year, features a pilot lounge with snooze room, shower facilities, pilot shop, business center, pilot briefing room, a pair of 12-seat A/V-equipped conference rooms and a children's play area. Freshly prepared sweet tea and popcorn are always available.

Brisk GA Business

Currently the facility has 70,000 sq ft of hangar space, which can accommodate the latest ultra-long-range business jets and is home to six turbine-powered aircraft, from a King Air to a Phenom 300. According to company COO Joe Doubleday, Starport has already begun discussions with the airport for permission to construct another 30,000-sq-ft storage hangar, which it expects to begin within the next two years.

The location is open from 6 a.m. until 10 p.m. every day, with call-out service after hours. For international arrivals, U.S. Customs and Immigration service is available at the passenger terminal's Gate 1 with advance notice. According to general manager Geoff Lane, Starport handles approximately 60 percent of the GA business at the airport, which translates to more than 3,500 operations and nearly 11,000 passengers annually.

In addition to providing FBO services, the site is home to the company's Part 145 repair station, which can perform heavy maintenance, inspections and AOG service on corporate aircraft, from a King Air to a Global 6000. It also offers avionics installation and repair, as well as interior refurbishment, and recently upgraded its paint and woodworking shops to meet demand.

Between the FBO and MRO businesses, Starport has a staff of 82, and its line service technicians are NATA Safety 1st trained. They draw approximately 500,000 gallons of fuel annually from Starport's tank farm, which holds 40,000 gallons, split evenly between jet-A and 100LL, using a pair of jet fuel tankers (5,000 gallons and 3,000 gallons) and a 1,500-gallon avgas truck.

Starport, like many FBOs, is pursuing certification under the recently introduced International Standard for Business Aviation Handlers (IS-BAH). "We think this is the beginning of something we can build on for the whole company," Doubleday told **AIN**, adding that he anticipates a higher assurance of safe operational practices as a result. "It certainly focuses on the FBO operation, but we see applicability across the maintenance arena as well." The company has just embarked on the lengthy process that will see the eventual establishment of a robust safety management system. It expects to undergo its first audit next summer.

Like other Florida airports, Sanford sees a seasonal boost from Northerners seeking to escape winter. Lane noted that between November and March it experiences a 15- to 20-percent boost over normal traffic.

The location, which is a member of the Paragon Aviation Network, has hosted the last two biennial Mitsubishi MU-2 proficiency training courses, which saw its ramp inundated with more than 20 of the twin-engine turboprops.

Another event that occurs more frequently is the Kids Fly Free gatherings, which are presented in cooperation with the Experimental Aircraft Association's Young Eagles program and a local flight school. Several times a year, dozens of area youngsters aged 8 to 17 arrive at the FBO, and after a breakfast cooked by its staff, the fun begins. "We take the kids and show them the aircraft and tell them how the airplane works, and then we stick them in the airplane and take them for a flight around the pattern," said Lane. "It introduces aviation to our youth."

Last December, Starport was home to Operation North Pole, an airport business-sponsored charity event that collected $17,000 in donations. Approximately 130 underprivileged children boarded an airport-based MD-80 at the commercial terminal and taxied to the "North Pole" to visit Santa Claus. For the occasion, the FBO's ramp was covered in man-made snow for the children to play in, after which they received presents. *–C.E.*

PRELIMINARY REPORTS

MOSQUITO CONTROL HELICOPTER STRIKES TREES

MD 369E, New Smyrna Beach, Fla., Sept. 3, 2015–Visual meteorological conditions prevailed at the time of the Part 137 aerial application flight for pest control, conducted by the helicopter's owner-operator, East Volusia Mosquito District. After finishing spraying a field at approximately 3:20 p.m. EDT, the pilot entered a 270-degree turn to line up with a second field perpendicular to the first and glanced over his shoulder to identify a visual reference to the field.

Upon looking ahead through the windshield again, the pilot realized the helicopter was approaching a tree line bordering the field. Despite the addition of power to climb, the helicopter collided with the trees and came to rest on its left side. The tailboom, tail rotor and one main rotor blade separated from the helicopter on impact.

NTSB LOOKS AT OVERHAULED PROP FOLLOWING DHC-6 LANDING MISHAP

de Havilland Canada DHC-6, Louisburg, N.C., Sept. 6, 2015–The Twin Otter's pilot told investigators that he noticed the right engine sounded like "the [propeller] was heading toward beta" when he reduced power to descend for landing at North Raleigh Airport (00NC). The sound disappeared when he added power, but recurred when he reduced power on short final, and the aircraft yawed to the right. The pilot compensated for the yaw, but the aircraft "pushed hard to the right" when engine power was reduced to idle over the runway threshold and continued after the pilot applied full power to attempt to go-around. The aircraft yawed approximately 30 degrees off the runway centerline, touched down on grass alongside the runway and hit trees, substantially damaging the wings and fuselage.

The pilot and two passengers on board received serious injuries. Subsequent investigation revealed the propeller installed on the right engine had recently been overhauled, with 8.7 hours flown since a September 4 test flight. The aircraft is owned by FHC Group of Colorado Springs, Colo., and the accident flight was operated by Rampart Aviation of Franklinton, N.C., under Part 91.

PARTIAL LOSS OF POWER DOWNS AG HELICOPTER

Bell 206B, near Woodville, Texas, Sept. 24, 2015–The Bell JetRanger, operated by Chem-Air, received substantial damage following a reported partial loss of engine power while conducting a Part 137 aerial application flight in daytime VFR conditions over a forested area.

The sole-occupant pilot told local media he had been airborne for approximately one to two minutes when the helicopter's engine lost power while in a turn, forcing a hard landing in a nearby field. The helicopter came to rest on its right side, and the pilot received serious injuries.

TURBINE OTTER FLOATPLANE STRIKES TERRAIN ON TAKEOFF

de Havilland Canada DHC-3T, near Iliamna, Alaska, Sept. 15, 2015–The turbine-powered Otter floatplane collided with tree-covered tundra terrain approximately one mile north of Iliamna Airport in Alaska after takeoff at about 6 a.m. ADT. The accident flight was conducted under Part 91 to transport guests of Rainbow King Lodge on a fishing trip, with a lodge employee reporting that cargo had been loaded before their arrival.

Dark nighttime conditions prevailed as the aircraft taxied out for departure, but the lodge employee told investigators that he was able to watch the airplane's takeoff to the west. He added that the aircraft descended shortly after lifting off and that the floats contacted the water. The aircraft then became airborne again before the employee lost sight of it as it descended behind rising terrain.

Of the 10 people on board, three passengers died at the scene, and the ATP-rated pilot and six passengers were injured. A rescue operation conducted by lodge personnel, local residents and Alaska State Troopers was delayed by the darkness.

The aircraft was owned and operated by the lodge to transport guests to a remote fishing location approximately 75 miles northwest of Kodiak. Reported weather conditions at Iliamna shortly before the accident flight included wind 270 degrees at seven knots; scattered clouds at 700 feet with an overcast layer at 4,400 feet; a narrow temperature/dew point spread of 48 degrees F and 47 degrees F, respectively; and altimeter 29.61 in Hg.

The NTSB retained the aircraft's Honeywell TPE331 turbine engine for detailed examination. ❑

FINAL REPORTS

ACCIDENT PILOT FLEW PROHIBITED COUPLED APPROACH

Cessna 208B, near Muskegon, Mich., March 10, 2015–The Cessna Caravan pilot, operating under Part 135 for air cargo provider Martinaire, flew a coupled approach to minimums in instrument meteorological conditions (IMC) to Runway 24 at Muskegon County Airport (MKG). As the aircraft exited IMC at decision height, the approach light system (ALS) became visible and the pilot disconnected the autopilot. The pilot then realized he was right of the runway surface, and the aircraft subsequently collided with portions of the ALS while the pilot maneuvered to realign with the runway. The pilot was not injured, but the aircraft's horizontal stabilizer received substantial damage.

At the time of the accident, a permanent Notice to Airmen (Notam) was in effect prohibiting a coupled approach to Runway 24 at MKG. The pilot told investigators he was unaware of the Notam, effective since February 2014, and the pilot's approach chart did not note the restriction.

Weather conditions were reported as wind from 250 degrees at five knots; one-half statute mile visibility under a 200-foot overcast layer; temperature and dew point at 32 degrees F.; and altimeter 30.04 in Hg.

CANADA'S TSB: LACK OF POWERLINE MARKERS LED TO COLLISION

Airbus Helicopters AS350, near Sept-Îles, Quebec, May 13, 2014–The helicopter collided with powerlines because they lacked the standardized, triangular markings used by Hydro-Québec to warn pilots of their presence, according to Canada's Transportation Safety Board (TSB).

The helicopter's pilot and a Hydro-Québec employee on board were both seriously injured when their helicopter's main rotor contacted a transmission line in daytime visual conditions during an inspection flight of a power distribution line in a valley north of Sept-Îles, Quebec. The pilot first noticed the larger, unmarked power line perpendicular to the direction of flight while in a right turn; the helicopter's skids hit trees during the emergency landing attempt to a nearby clearing, causing the helicopter to roll left and fall 50 feet through the trees, coming to rest on its left side. Both occupants were able to exit the helicopter.

Investigators determined the distribution line lacked the standardized markers to warn pilots of the upcoming intersection with a transmission line, as well as deficiencies in the process of collecting and distributing air navigation information. Nav Canada is working with Hydro-Québec to improve the accuracy of reported powerline locations, and helicopter operator Héli-Boréal implemented measures to improve its internal training for powerline inspection flights.

LOSS OF SITUATIONAL AWARENESS LED TO TWIN OTTER FATAL

de Havilland Canada DHC-6-300, near Port Moresby, Central Province, Papua New Guinea, Sept. 20, 2014–The flight crew of the Twin Otter lost situational awareness while attempting an ILS approach to land in IMC at Jacksons International Airport (AYPY) in Port Moresby, according to the Papua New Guinea Accident Investigation Commission (AIC). The aircraft struck terrain near the 1,700-foot agl summit of Mt. Lawes, 12 km NNE of the destination airport, and was substantially damaged. Both pilots and one passenger were killed, and another passenger later died from injuries sustained in the accident. Five passengers survived.

The accident flight, operated as a charter by HeviLift, departed Woitape, Central Province, on an IFR flight plan in daytime VFR conditions to Port Moresby. Reported weather at the destination was low visibility in rain, with most of Mt. Lawes enveloped in clouds.

ATC cleared the crew to begin descending 36 nm from the airport, maintaining visual separation from terrain and setting up for a left base entry for Runway 14R at AYPY. When the aircraft came within 9.5 nm of Port Moresby, the pilot-in-command (PIC) told ATC they encountered "a bit of cloud" and requested the ILS approach "if that's OK." The ILS was not available from the aircraft's position without vectors back to the approach course from ATC. The crew also reported having the current Port Moresby ATIS, which noted that all aircraft approaching the airport were required to fly an ILS approach.

Using data captured by a cockpit voice recorder (CVR) and an onboard video camera/data logger, investigators determined the crew's assessment of their position to the airport was incorrect, despite the PIC assuring the copilot, "We know where we are, keep it coming down." The AIC also determined that the PIC did not meet currency requirements to fly an ILS approach, and theorized it was "likely" that is why the PIC did not initially request the ILS.

INFLATED WING BOOTS DEGRADED KING AIR TAKEOFF PERFORMANCE

Beechcraft King Air 200, near Darwin, Northern Territory, Australia, May 17, 2015–Australian investigators have attributed a stall warning incident earlier this year to the significant performance penalty imposed by inflated de-icing boots on the wings.

During takeoff from Darwin International Airport (YPDN) on an aeromedical retrieval flight to Jabiru, the pilot of a King Air 200 heard the stall warning sound and noticed that performance was degraded. The pilot continued the takeoff, and after retracting the landing gear established a positive, though shallow, climb rate. The stall horn continued to sound through 200 feet agl.

The pilot then determined the pneumatic de-icing boots along the leading edge of the wing were deployed, resulting in the need for substantially higher power settings to maintain speed. The pilot also noted much lighter-than-normal aileron forces, believed to be attributable to the disturbance in airflow caused by the inflated boots at low speeds.

After attempting unsuccessfully to cycle the boots to return them to their stowed position, the pilot elected to return to Darwin and made a successful landing. The boots remained inflated until engine shutdown.

Engineers later determined that the de-icing boots had inflated during the pretakeoff engine run-up. The pilot reported checking operation of the de-icing system before the flight with no apparent issues, but could not recall verifying that the boots had deflated after the check. The pilot told investigators it was likely they had remained inflated following the preflight check.

The boots returned to normal operation after cycling the surface de-ice control. The Civil Aviation Safety Authority (CASA) cautioned pilots of King Air 200s, and other aircraft with pneumatic de-icing boots, that inflated boots might not be immediately noticeable under some conditions, adding that the incident also reminds pilots how wing damage or distortion can significantly degrade performance and handling.

POWERLINE COLLISION FOLLOWED REQUEST TO FILM HELO'S DEPARTURE

Eurocopter EC130B4, Somerset, Colo., July 3, 2015–A tour guide advised the pilot of the Part 135 charter flight operated by Aspen Heli Charter that they would be filming the helicopter's departure from a local ranch for the operator's web site. Following departure, the pilot made a low pass near the ranch for the video and was flying toward the mountains when he heard a "small ting" and realized the helicopter had struck a wire. The pilot then made an off-airport landing in a nearby clearing, with no injuries to the pilot or the four passengers on board.

Investigators later determined the helicopter had collided with a copper static wire. The pilot told NTSB investigators he had seen wires in the area on prior flights and had spoken with local fishing guides about wire locations. Two of the EC130's three main rotor blades were found to be "beyond repair," along with at least two stator blades of the helicopter's Fenestron tail rotor. The entire stator blade assembly required repair. ■

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.

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Compliance Countdown by Gordon Gilbert

Within 6 Months

▶ **Nov. 17, 2015**

Bird Strike Certification Revisions

The FAA is seeking comments on the need for, and the possible scope of, changes to the bird strike certification requirements for FAR Part 25 transport-category airplanes. The agency is not currently proposing specific regulatory action, but is gathering comments from airplane manufacturers and other interested parties on six specific questions about the subject. Two of the questions are: Should the bird weight requirement be applied consistently across the airplane structure, windshields and airfoils; and should the bird weight requirement be increased to eight pounds for all certification testing (from four in some cases) or to some other value? Comments are due by Nov. 17, 2015.

▶ **Dec. 1, 2015** REMINDER

Mandatory Upgrade to 90-day Underwater Locator Devices

The deadline is Dec. 1, 2015 for manufacturers to comply with Technical Standard Order C-121B, which mandates discontinuing production of acoustic, self-powered underwater locator devices (ULDs) with 30-day batteries installed, and instead producing ULDs with batteries meeting a minimum performance standard of 90 days. The TSO also requires operators flying aircraft with 30-day ULD batteries installed to upgrade to the higher standard as those batteries expire, or are no longer serviceable.

▶ **Dec. 1, 2015 and Jan. 1, 2017**

European Union Tcas Version 7.1 Directive

Turbine aircraft that are approved to carry at least 19 passengers, certified before April 1 last year and equipped with Tcas II version 7.0 must be upgraded to the latest version of 7.1 traffic alert and collision avoidance system software by Dec. 1, 2015. Although ICAO does not require that version 7.1 software be installed for international flights as a retrofit until Jan. 1, 2017, all other applicable airplanes were required to have 7.1 Tcas II software installed by April 1 last year.

▶ **Dec. 31, 2015** NEW

Maintenance Technical Schools Proposal

The regulations governing the curriculum and operations of FAA-certified aviation maintenance technician schools would undergo several major changes, if the agency adopts recent rulemaking. These amendments would "modernize and reorganize the required curriculum subjects in the appendices of the current regulations," the FAA says. "They would also remove the course content items currently located in the appendices and require that they be placed in each school's operations specifications so they could more easily be amended when necessary." Existing curricula are "outdated, do not meet current industry needs and can be changed only through notice and comment rulemaking." Comments are due by December 31.

▶ **Dec. 31, 2015**

Deadline to Meet Stage 3 Noise Levels

One month remains to the Dec. 31, 2015 deadline after which jets up to a mtow of 75,000 pounds can no longer operate in the contiguous U.S. unless they meet Stage 3 noise levels. When the rule was published on July 2, 2013, the FAA said the mandate affected 457 U.S.-registered owners of 599 principally Stage 2 business jets, though several models can now, or will be able to be, hushkitted or re-engined to meet Stage 3 before the deadline. The rule also applies to non-U.S.-registered aircraft.

▶ **December 2015 (expected)** EXTENDED EXPECTED DATE

ICAO Position Reporting Plan

Member countries of the International Civil Aviation Organization recommended the adoption of a tracking standard for aircraft crews that requires them to report their positions at 15-minute intervals. Adoption by the ICAO Council is expected by year-end. ICAO said this is considered a first step toward implementation of a more comprehensive three-tiered approach to tracking normal, abnormal and distress conditions.

▶ **Apr. 22, 2016**

Helicopter Ambulance Control Centers

New FAR Part 135.619 requires operators with 10 or more helicopter air ambulances to have operations control centers beginning April 22, 2016. Operational control specialists must undergo an FAA-approved initial training program and pass a knowledge and practical test. The operations control center must at a minimum maintain two-way communications with pilots, provide pilots with weather briefings, monitor the progress of the flight, and participate in the preflight risk analysis required under recently revised Part 135.617.

Within 12 Months

▶ **June 8, 2016**

Europe ADS-B OUT Mandate

The ADS-B OUT requirement in Europe is June 8, 2016, for new aircraft and June 7, 2020, for retrofit. The date for retrofits is about six months later than the U.S. ADS-B OUT mandate.

▶ **Aug. 25, 2016**

European Safety Standards for Private Ops

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

Beyond 12 Months

▶ **Feb. 2, 2017** NEW

Australian ADS-B Mandate

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

▶ **Jan. 1, 2020**

U.S. ADS-B OUT Mandate

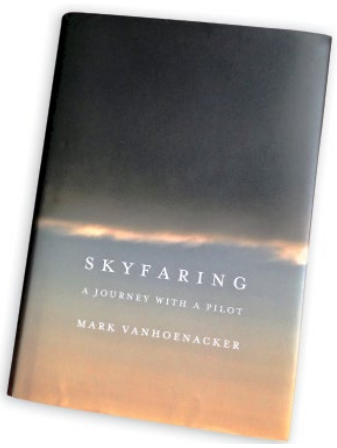
ADS-B OUT equipment must be operational starting Jan. 1, 2020 in aircraft that fly in the U.S. under IFR and where transponders are currently required, namely class A, B and C airspace. ❑

747 pilot in awe of magic of flight

by Nigel Moll

Flying remains among the most miraculous manifestations of humans' capacity to evolve beyond the impossible, and it all happened in the nano-moment of the last 100 years or so. Yet within one lifetime, flying for most people in the developed world has become an unpleasantness to be endured, the price of getting someplace else quickly and, these days, with a great deal of assurance that the return to earth will be a safe arrival. The pilots who fly these aerial crowd conveyances are not immune to this disaffection, this blindness to the wonders of lifting 400 tons off the earth's crust and returning it to the clutches of gravity thousands of miles away.

Plenty of pilots retain the awe, though, and a minuscule few of their number have the gift of conveying what fuels the wonder. Mark Vanhoenacker, who earns his living from the lofty perch of British Airways 747s, is that rare breed of pilot who can write about his craft in



For British Airways 747 pilot Mark Vanhoenacker flight is still magical.

a style so compelling it lifts the blinkers. Consider, for example, his take on the mundane process of being deposited in a metropolis on the other side of the globe:

"It is right that our first hours in a city feel wrong, or at least bewildering, in a way we can't quite specify. We are not built for speed, certainly not for this speed. When we cross the world, some lower portion of our brains cannot understand what has, we might say, taken place. I can say matter-of-factly to myself: 'I flew from home to Hong Kong. Clearly, this is Hong Kong: the destination signs on the fronts of the buses, the rivers of pedestrians, the surface of the harbor where the lights of so many boats race over the heaving, blurred reflections of skyscrapers.' Equally, I know that a day or two ago I was at home. I have the everyday memories, the receipts to prove it. Yet, just as with two disparate times from my own past, I am the connection between these wildly different places across 6,000 miles of intervening continent. Somewhere in my lower-brain consciousness, *I* am the most obvious answer to the question of what these places, separated not by an inconceivable distance but by mere hours, have in common. And that makes no sense at all."

Don't look for an easy read here. Many passages you'll want to reread for full absorption. Vanhoenacker tackles the perplexing, the inexplicable, the stuff that's so obvious it doesn't warrant a second thought. He applies his prism to something as mundane as an overcast:

"One of the best reasons to become a pilot, especially if you are from a cold and often cloudy place, is the chance to surface from the world of clouds; to know that sunlight will be present on nearly every day of your working life. An overcast sky now appears different to me on the mornings of the days I am going to fly, because I know I will soon be on the other side, that the clouds, a backdrop of one low scene, are only a curtain drawn over a brighter and more elementary one." ❑

Pre-Owned Update

by Bryan A. Comstock

Severe lack of buyer interest portends slower than usual Q4

Any time I hear a financial news broadcast on CNBC tossing out biblical phrases along the lines of "the four horsemen of the apocalypse" or the term "death cross" to define the bearish environment on Wall Street, I think, *This is not good for aircraft sales*. In simple terms, the death cross refers to a time when the short-term moving average (such as the 50-day) breaks through (or crosses), the long-term trend (such as the 200-day). Four major indexes did just that at the beginning of the quarter, hence the Four Horsemen reference. The last time this happened was in 2011.

There's some solace knowing that bad news in recent years, or even good news for that matter, has had little effect on aircraft values, which have been on one track–down–for the last several years. In fact, despite the Dow's doubling since 2008, many aircraft have lost half their value. The steep, across-the-board price drops seem for the most part to be over and the rate of depreciation is on a much more linear slide.


Learjet 45XR

At the beginning of this quarter, inventory levels were where they had been at the same time last year. The surprising rate at which buyers gobbled up aircraft in last year's fourth quarter effectively pushed inventory in January to this year's low, a mark not likely to be eclipsed between now and the end of the year unless a similarly surprising wave of buying kicks in.

Some markets continue to perplex buyers, sellers, brokers and bankers. The first one that comes to mind is for the G450, bereft of buyers. The 12-month low, which was a year ago, contrasts with 30 today–the high for the year. Nine sold over the last six months, up from the five that sold in the previous six-month period. The average sale price was squarely at the $19 million mark, with a low coming in just under $15 million and the high fetching $27.5 million. Expect lower lows as a trio of early serial-numbered offerings currently for sale have posted asking prices of less than $15 million. In fact, two are priced below $14 million. The current choices represent just under 10 percent of the more than 300 in operation worldwide, but the supply could become top heavy if more of the aircraft spill onto the market. The U.S. market fares even better, with just 13 available, or 7.5 percent of the N-registered fleet.

The Global 5000 also offers up about 10 percent of its fleet to the used market but, here again, only five of the nearly 20 choices, or about 7 percent, are U.S.-based. Over the past six months Global 5000s have sold at a rate of approximately one per month, an improvement from the previous six-month period, when trading was non-existent. The high sale price reached $32 million, according to data provider AircraftPost, with a low of $17.5 million.

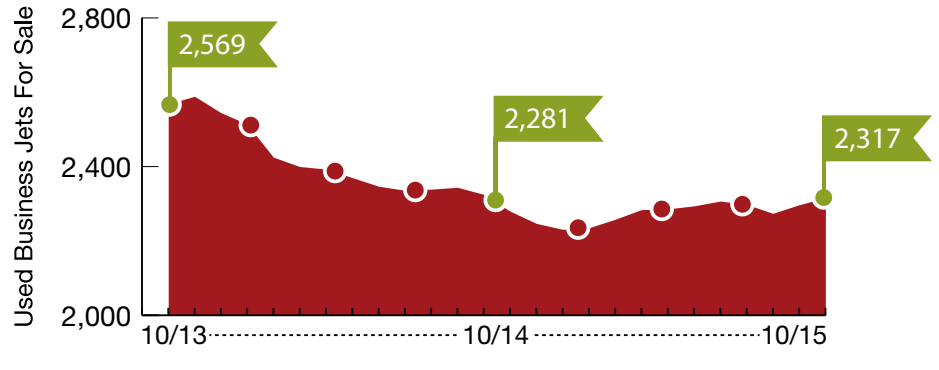
The Learjet 40/40XR has seen its numbers inflate from nine a year ago to 23 today, and as a result the average price has fallen by $1 million, to $2.7 million today. Lack of buyer interest has dominated this model, with only three selling over the past six months. The 45/45XR market is divided, with attractive pricing in the 45 segment drawing buyers and reducing inventory to 26 today from 38 a year ago; the XR offerings climbed to 24 from 17 during the same time frame. The Learjet 45 currently sells at a rate of one per month and carries an average price of $1.9 million. The 45XR moves at the same rate at an average sale price of $4.63 million, according to AircraftPost.

One model type decidedly back in favor among buyers is the Falcon 2000, which started the year with 21 for sale, just under 10 percent of its fleet. Consistent month-over-month drops through August whittled the number of choices to six, which is likely to be the low for the year after a few aircraft were added to the mix this fall. Despite the few that have been added, the U.S. supply stands at five; three are based in Europe and one in South America. Over the past six months 2000s have traded at a two-per-month clip and pricing has ranged from as low as $2.9 million for an early variant up to $8.3 million for a 2004 model.

Despite Wall Street rumblings, the market has been uncharacteristically active in the typically slow third quarter. Given the expected seasonal fourth-quarter push, the number of transactions will approach 2,000, a smaller figure than in either of the past two years. ■

Bryan Comstock is a cofounder and managing director of aircraft broker Jeteffect

Two-year Inventory Trend



Sources: JetNet, AircraftPost

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Completion & Refurbishment

by James Wynbrandt

Comlux Delivers Fourth ACJ Completion

Comlux America has concluded its ninth executive airliner completion with the redelivery of a privately owned ACJ320, its fourth green ACJ completion since it became an authorized Airbus service center in 2010. Comlux Creatives led the design team under the direction of Lauri Church in partnership with Fiona Riddle of In Flight Solutions, the customer design representative.

Designed to be a family-friendly environment that can also serve as a traveling office, the interior blends elegant modernism with classic European style. A muted color palette, with shades of white and cream contrasting with dark veneer, "allows the flow between rooms to feel natural and relaxing," said Riddle. A master suite for the owner is complemented by business class seating, along with a forward lounge and staff area.

A division of Comlux the Aviation Group, the Indianapolis facility is also active on the Boeing front, and was just designated an authorized BBJ warranty repair and service center, offering customers "yet another option for specialized BBJ service" said BBJ president David Longridge. The facility has installed interiors on five BBJs, one of them a BBJ3.

Jet Aviation Basel Hands Over ACJ340

Jet Aviation Basel recently redelivered a new ACJ340-600 executive interior completion for an undisclosed client in Europe. This marks the 18th Airbus delivery from the Basel Completion Center since 1999. The aircraft's IFE system features satellite TV and a wireless LAN linked to primary and alternate satellite high-speed data communication networks. A humidification system heightens comfort during long-haul flights.

Widebody Projects Under Way at Greenpoint

Greenpoint Technologies has two new Boeing widebody completions–a 777 and 787–in the works. The 787, the company's second Dreamliner completion, has been inducted into the company's widebody facility in Moses Lake, Wash. The 18-month project is scheduled for delivery in early 2017. On the 777-200LR project, for an undisclosed client, interior design and engineering developments are in progress and the aircraft is scheduled for induction early next year.

Amac Wraps Several Projects

Amac Aerospace received an EASA STC for an ACJ319 executive cabin completion scheduled for return to service "in the next weeks." The Switzerland-based MRO has also returned a head-of-state A320 to service following heavy maintenance that included installation of a satcom and cabin connectivity upgrade for enabling onboard GSM usage.

Innotech Touts A La Carte Services

Montreal's Innotech Aviation, known for its green completions and tip-to-tail refurbishments, is marking its 60th anniversary this year with expanded service offerings. Rob Brooks, v-p and general manager, said the company will emphasize a la carte services to OEMs and operators. "We want to get the message out that you don't have to show up with an airplane needing major work," he said. "We'll build you a set of cabinets, or you can send your old cabinets in for refreshment. We'll build you a set of seats, or we can send an engineering team to manage an installation."

Headquartered at Dorval Airport, Innotech has experience with Dassault, Gulfstream, Hawker Beechcraft and Citation aircraft, as well as its signature work on Bombardier models.

Jormac Marks 20 Years

Advent Aerospace's Jormac Division, provider of components and systems for head-of-state and executive aircraft interiors, is also marking its 20th anniversary. Launched as a two-man stress analysis firm by founders Steve Jourdenais and Mike McAllister, Jormac became a force in the completions market with the introduction of the BBJ and has provided components for 96 BBJ completions. Its VIP headliner systems are installed in 58 of them.

Since its acquisition by Yankee Pacific (now Advent Aerospace) a decade ago, Florida's Jormac has shifted its focus from providing engineering services to providing

Jormac found a niche in the BBJ market and has provided components used in 96 BBJ completions.

engineered products. Said Jourdenais, now president of Advent Aerospace, "The synergies we've established between Jormac and our other division, Cabin Innovations, are allowing us to offer the highest quality and commitment in this competitive marketplace."

Pac To Provide Seats for Lufthansa Technik BBJ Completions

Lufthansa Technik (LT) has tapped seating specialist Pac to provide seating for two BBJ completions. The order includes highly customized double lie-flat sleeper seats, as well as Pac's Model 1400 single track and swivel seats. This is the first time Hamburg-based LT has worked with Pac.

Alto Aviation and Innovation Advantage Partner on A/V System

Alto Aviation of Sterling, Mass., added to its line of premium cabin entertainment systems for business aviation, having reached an agreement with Innovative Advantage to use the latter's AVDS nodes as part of the Alto audio/video solution under a private label. AVDS video distribution systems support video switching to multiple monitors in either standard definition or high-definition modes. Aimed at the retrofit market, Alto's systems provide advanced, cost-efficient, turnkey cabin entertainment upgrade options. With the addition of the AVDS node and an onboard wireless Wi-Fi router, the audio and video system may be controlled by Apple or Android personal devices. ❑

ACA ionization system kills pathogens in cabin

by Charles Alcock

Refinements to ionization techniques have allowed Aviation Clean Air (ACA) to develop a system that promises to remove harmful pathogens, allergens and unpleasant odors from aircraft of just about any size. The U.S. company already holds STCs to fit the system on Boeing Business Jets and the Gulfstream G550 and is now looking to offer it more widely to other corporate and private aircraft.

ACA has adapted the bi-polar cold plasma ionization applied for some time in buildings such as hospitals to clean both the air and the surfaces inside aircraft. The Aviation Ion Generator is built around an ion generator weighing just 1.34 pounds that can be discretely installed near the aircraft bleed air/cabin air systems. It continuously removes volatile organic compounds, odors, pathogens and allergens from the cabin and cockpit.

According to the Pooler, Ga.-based company, the system significantly reduces the risk of health threats such as E.coli, tuberculosis, avian flu, swine flu, Sars, staph, mold spores, the common cold and seasonal flu. It presented findings from independent, certified laboratory tests showing reductions in harmful pathogens as follows: E.coli (99 percent removed from surfaces in 15 minutes), tuberculosis (69 percent in 60 minutes), C.diff (86 percent in 30 minutes) and MRSA (96 percent in 30 minutes).

Bi-polar System

"Ionization has been around for a long time, but the problem has been that it has created ozone, which is harmful to the lining of lungs and is especially serious for people with asthma," explained ACA partner Tom Davis. "Our product has a low ozone level well below the maximum levels permitted."

Until now, HEPA filters and UV lights have been used to kill bugs in aircraft cabins, but ACA asserts that these solutions are by no means completely effective. "Our bi-polar ionization goes out into the aircraft interior space and kills pathogens wherever they are," said Davis. "It doesn't have to drag pathogens back through a filter."

The system creates both positive and negative ions. Working in conjunction with the environmental control system, the system disperses these ions throughout the aircraft, where they surround harmful pathogens and sever the hydrogen bonds that hold them together at a molecular level. This stops the pathogens from mutating, growing or reproducing, and kills them quickly.

The solid-state hardware has been tested to Do-160 standards. ACA says that the system's established track record with ground-based applications promises a high mean time between failures and simple, on-condition maintenance. Unlike other systems with the same purpose, says ACA, this one has no filters to change or charged plates to be cleaned.

In addition to its existing U.S. STCs, the manufacturer was close to getting European approval for the technology by the end of last month, and it already holds the approval of Bermudan authorities. ACA will be offering maintenance providers the chance to install the system through STCs or for individual aircraft under the FAA's field approval Form 337. It has already been fitted to a Falcon 2000 and a G650. ❑

People in Aviation Compiled by Kerry Lynch

Barry Knuttila, formerly senior v-p of technology and marketing for *King Schools*, was promoted to CEO, while **Dave Jackson**, who had been president and CEO, becomes president and COO. **John and Martha King** remain co-chairmen. Jackson, who joined the company from the movie industry in 1997, took on the role of president in 2000 and CEO in 2006. He recommended the promotion of Knuttila, who joined the company from the enterprise software industry in 2002.

Wheels Up named **Robert Garrymore** president of corporate sales. Garrymore, formerly president of Executive Jet Management, joined Wheels Up in 2013 as president of ventures.

The *Air Charter Safety Foundation* (ACSF) added **Steve Cok** and **Robert Hamel** to its Board of Governors. Cok, who has more than 5,600 hours and more than 12 years of aviation experience, is director of operations and chief pilot for Northern Jet Management. Hamel, safety manager for JetSuite, has 15 years of experience with the U.S. Navy and on-demand operators.

Ken Goodman has joined *Jet Support Services (*JSSI) as CFO. Goodman was formerly senior vice president of financial planning and analysis for NetJets.

Milestone Aviation has reorganized its management and hired eight new executives. **Walter Horsting** was named senior vice president of commercial for Europe and the Americas. **Jonty Nel**, who joined the company from GECASE, is the vice president of commercial for emerging markets. In addition to Nel, newly named vice presidents of commercial in the Europe and the Americas organization are **Sebastien Moulin**, continental Europe; **John Parnell**, northern Europe and Canada; **François Arnaud**, Latin America and the Caribbean; and **Scott Fitzgerald**, U.S. Joining the emerging markets organization as vice presidents of commercial are **Stephanie Tovoli**, northern Asia and Russia; **Brett Rankin**, southern Asia-Pacific and central Asia; and **Michael York**, Turkey, India, Middle East and Africa.

Embraer Executive Jets realigned its North American sales team, naming **David Armstrong** to lead the team as senior v-p of North American sales. Armstrong joined Embraer in 2013 after holding a series of sales positions with Cessna and Flexjet. Joining Armstrong on the leadership team are **Ryan Scott**, who was promoted to vice president of sales for the Eastern U.S., and **Cameron Gowans**, who becomes vice president of sales for the Western U.S. Scott has served with Embraer for 25 years in product support, sales engineering, marketing and sales positions. Gowans, meanwhile, has 25 years of aviation experience in total, eight of them at Embraer. Also joining the team are **Timon Huber**, regional sales director for the Southeast; and **Dylan Haynie**, regional sales director for Texas. Huber moves to the Executive Jets division after four years with Embraer Commercial Aviation. Haynie previously held sales and legal services positions with Flexjet.

Leading Edge Jet Center named **Phillipp Spitzer** general manager. Spitzer has 12 years of general aviation experience, having most recently served as safety and training manager for TAC Air at Denver Centennial Airport.

Executive AirShare appointed **Kerry (Len) Durr** director of managed aircraft, based at Fort Worth Meacham International Airport in Texas. Previously Durr was assistant director of operations for Era Helicopters in Lake Charles, La.

Aero Precision named **Stacey Burden** vice president of supply chain management. Burden has more than 25 years of industry experience, having held roles with Bell Helicopter, Boeing and most recently CHC Helicopter.

West Star Aviation appointed **Chad Adams** as Bombardier Global aircraft program manager. Adams was most recently lead technician at Bombardier.

APP Jet Center promoted **Jose Quezada** to assistant general manager of its FBO in Hayward, Calif. Quezada previously served as line service towing supervisor for the Hayward facility.

Comlux America appointed **Philippe Karam** as chief procurement officer and **Johannes Seeger** as head of MRO programs. Karam, who joined Comlux in 2011, previously held procurement, transport logistics and contracts administration responsibilities for Airbus. Seeger's 25-year aviation career includes a stint as head of VIP project management and customer service for Lufthansa Technik Switzerland.

Gulfstream Aerospace promoted longtime employee **Brian Durrence** to serve as vice president of engineering. Durrence joined the company as a structural engineer in 1990 and most recently was chief engineer. **Bill Skinner** has been named vice president, treasurer and financial planning. **Kimberly Benson** will succeed Skinner in his former role as vice president, corporate controller. Benson most recently was director of financial reporting, planning and analysis. Gulfstream further hired **Sheryl Bunton** to serve as chief information officer (CIO). Bunton has held CIO roles for Agco and Southwire. She also served as general manager for MYTecSoft. In addition, **Jim Bunke** has joined as sales director, North American sales, West division. Bunke, who has 37 years of industry experience, previously held sales roles with Beechcraft and Bombardier Aerospace.

FlightSafety International promoted **Jeff Rose** to manager of the company's learning center in Atlanta. Rose joined FlightSafety in 2001 and has served the company as an instructor for the Cessna Citation 500 series in Toledo, program manager of Citation Ultra aircraft training, program manager of Hawker 400XP training, director of standards, director of training and, most recently, assistant manager of the Savannah, Ga. center.

Aspen Avionics named **Robert Blaha** director of business development, which will include Aspen's newly acquired NexNav GPS product line. Blaha has served with Aspen since 2007, previously as regional sales manager and director of international sales.

Flying Colours appointed **Clint Bloom** sales manager-interiors. Bloom previously spent 16 years with Bombardier, working with Challenger and Global refurbishment and green completion projects.

Ralph Crosby joined *Airbus Helicopters* as executive director of corporate and VIP sales. Previously Crosby was vice president of sales for Dallas Jet International and before that was a sales director for Hawker Beechcraft.

Jet Quest appointed **David Bailey** as its South Central U.S. sales representative. A former U.S. Army Apache commander, Bailey previously led a medical equipment sales team.

Greenpoint Aerospace added **Ron Worley** as regional sales manager. Worley brings more than 30 years of experience to his new role, having previously held sales positions at Sagem, Dallas Airmotive, Rockwell Collins, Honeywell and Gulfstream.

HeliOffshore, a global association focused on the safety of the offshore helicopter industry, appointed **François Lassale** operations director. Most recently Lassale was managing director for the aviation services firm Vortex and before that was director of safety and strategic development for the UAE Presidential Flight.

Banyan Air Service appointed **Arlisa Jernigan** as director of people relations. Jernigan has 28 years of human relations management experience, most recently as director of human resources for Coventry Health Care.

Banyan Air Service appointed **Andy Joran** as a sales manager for HondaJet Southeast. Joran has more than 25 years of aviation experience, previously holding roles as a regional sales director at Flexjet and sales director at Cessna Finance.

Matt Olafsen has joined *Johnsonville Sausage's* flight department as a captain. Previously he had served as the presidential pilot of New Guinea, Africa, and as a captain for ExpressJet Airlines.

John Walker joined *Stevens Aviation* as North Central regional sales manager, based in Dayton, Ohio. Walker has more than 25 years of sales and management experience, previously serving with Jet Quest, GNC and Quaker State.

Executive AirShare named **John Igrec** senior sales director in the Great Lakes region. Igrec has nearly 20 years of business aviation experience, and was previously regional sales director for Flexjet.

West Star Aviation appointed **Veta Traxler** as paint and interior designer. Traxler has more than five years of interior design experience, previously serving as paint and interior sales manager at Elliott Aviation. ❑


Chad Adams


Johannes Seeger


Barry Knuttila (left) and Dave Jackson


David Bailey


Ron Worley


Arlisa Jernigan


Andy Joran

Final Flights

Donald Holbert, chairman of Central Flying Service and member of the Arkansas Aviation Hall of Fame, died September 27 in Little Rock. He was 75. Holbert spent more than 60 years serving with the business his father, Claud Holbert, founded in 1939. His work at Central Flying Service began when he joined the company at the age of 15 as a line service tech fueling aircraft. He later became a charter pilot.

Holbert served as a U.S. Army helicopter pilot and platoon leader in Vietnam. Upon returning to the U.S. he rejoined Central Flying Service in 1968. He became v-p of operations and later president, before stepping in as chairman in 1981 when his father retired. He also served as president of airline fueling business Airports Services.

A founding member of the board of the Arkansas Aviation Historical Society, Holbert was inducted into the Arkansas Aviation Hall of Fame in 2006.

Dick Taylor, known as the "father of Etops" (extended-range twin-engine operational performance standards), died on October 4. Taylor joined Boeing as an engineer in 1946 after serving as a U.S. Army artillery spotter pilot in World War II. He held several senior executive positions during his 45 years at Boeing. He also served as a test pilot on numerous aircraft, including the B-47 Stratojet and KB-29. Taylor paved the way for two-pilot cockpit crews in the 737, 757 and 767 and played an instrumental role in demonstrating the reliability of long-range travel in twin-engine airplanes, leading to Etops.

He was honored with the FAA Distinguished Service Award, as well as named an Elder Statesman by the National Aeronautic Association. He passed his love of aviation to his family, with son Steve Taylor serving as chief pilot for Boeing and formerly as head of Boeing Business Jets and chairman of GAMA.

Norman Goyer, a former aviation business owner and long-time journalist, died of heart failure on October 6. He was 89. Goyer's passion for aviation was sparked when his father took him to see the Gee Bee racers fly. He learned to fly when he joined the Navy. Goyer continued to fly after the war, but became a radio operator for the state police and later a camera operator at a local television station.

His journalism career began there, where he ultimately became news director and an on-air talent in Springfield, Mass. He also became involved in producing documentary films, which led him to become director of marketing for Yankee Motors, of Schenectady, N.Y. Shortly after, he moved across country and bought an airport business in Apple Valley, Calif. Within a few years, he had transformed the business into a thriving flight school and had expanded to four fixed-base operations.

Goyer later became a journalist for Challenge Publications, serving as editor-in-chief of *Scale R/C Modeler* magazine. He edited, wrote and served as a photographer for *Air Progress*, *Sport Pilot*, *Affordable Flying* and *Ultralights* magazines. He also regularly contributed to *Private Pilot* magazine. ■

Awards & Honors

NBAA has named longtime flight department leader and former NBAA chairman **Jeff Lee** as 2015 recipient of the John H. Winant Award. The award recognizes former NBAA directors whose service to business aviation continues well beyond their tenure on the board. Lee has served as vice president of flight operations at American Express since 2011, and before that spent more than 30 years with IBM as director of flight operations. He served on the NBAA board from 2001 to 2013, including one term as chairman beginning in 2008. In addition, Lee has spent a number of years as president of the Westchester Aviation Association in New York. There he developed an Aviation Career Fair to attract interest in the industry among students. He is also credited with spearheading a series of safety events in the New York area.

NBAA named Aviation Partners (API) chairman and CEO **Joe Clark** as this year's recipient of the Meritorious Service to Aviation Award and former Showalter Flying Service chairman **Robert "Bob" Showalter** as the recipient of the John P. "Jack" Doswell Award.

Clark, who co-founded API in 1991, has an aviation career spanning six decades. During that time he founded the first Learjet dealership, served with Raisbeck Engineering, co-founded Horizon Air and founded Avstar. At API, he pioneered blended winglet technologies that have cut fuel burn for thousands of business and commercial aircraft.

Showalter has spent most of his 43-year career with the FBO his family started in 1945 at Orlando Executive Airport, retiring as chairman last year.

The *National Aeronautic Association* (NAA) selected renowned aerospace engineer **Burt Rutan** as this year's recipient of the Wright Brothers Memorial Trophy. Rutan has made a mark for his advancements in the design of light, strong and energy-efficient aircraft, such as *Voyager*, the first airplane to fly around the world without stopping or refueling. Five of his aircraft designs are on display at the Smithsonian's National Air and Space Museum. ■

Is IS-BAO worth the paper it's printed on?

My colleague at **AIN** and former NTSB member John Goglia correctly asks in his "Torqued" column *(page 96)* if the May 2014 Gulfstream IV takeoff crash in Bedford, Mass., is a wakeup call for business aviation. The answer is a resounding yes.

Crews have certainly paid attention to the prevailing message: complacency and noncompliance with checklists can kill. And in the case of the GIV crash it did, as the accident claimed the lives of both pilots, the flight attendant and all four passengers.

But the hazier message is whether the International Standards for Business Aircraft Operations (IS-BAO) are effective or even worth doing. After all, the two-person flight department that operated the Gulfstream was IS-BAO Stage 2, meaning that its safety management system (SMS) was "functioning with the results being measured," according to the International Business Aviation Council (IBAC), which administers the IS-BAO program.

Since the flight department was Stage 2, it passed not one but two separate third-party audits to validate that its processes and procedures met or exceeded a recognized set of standards. Yet after all the work to draft a small bookcase full of manuals, putting every minor detail and procedure on paper, the pilots still crashed a perfectly good airplane.

According to the NTSB probable cause report, the crew did not verbalize any checklist before the accident flight and had not performed a flight control check–a procedure that assuredly would have broken the accident chain. Undoubtedly, using the checklist each and every time would have been one of the procedures listed somewhere in the IS-BAO-audited manuals.

Worse, data taken from the airplane's quick access recorder found that the crew did not complete any flight control checks on 98 percent of the previous 175 flights in the airplane. This was the crew's procedure, though it was unwritten.

Procedures Ignored

By failing to consistently operate as per the written procedures, the accident crew cast doubt on a set of best practices that was intended to increase, not decrease, aviation safety.

This gave ready fuel to IS-BAO opponents, who quickly took to NBAA Air Mail and pilot message boards to complain that the best practices are just another paperwork exercise, with the result just more manuals that will likely collect dust.

But the problem is that IS-BAO takes more than just these three tangible ingredients; it also requires "buy in" by the whole department. *Everyone* must participate in the IS-BAO process and fully believe in and use the end product that is then audited.

And when the actual operating practices no longer match these written procedures, then it's time to correct the problem via training or updating the IS-BAO manuals, which are intended to be living documents that change with the needs of the department, not dust collectors.

Pieces of paper certainly won't prevent you from ever having an accident, but an ingrained safety culture, backed up by documentation that everyone believes in and adheres to, will go a long way to making sure that your emergency response plan is never put to use. ❑

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NOVEMBER

AIR TRAFFIC CONTROL ASSOCIATION CONFERENCE AND EXHIBITION…Nov. 1-4, Gaylord National Resort, Washington, D.C. Info: (703) 299-2430; www.atca .org.

AIRCRAFT ELECTRONICS ASSOCIATION REGIONAL MEETING…Nov. 2-3, Queenstown, New Zealand. Info: www.aea.net/regional.

INTERNATIONAL AIR SAFETY SUMMIT…Nov. 2-4, Miami Beach, FL. Info: www.flightsafety.org.

SAFE SYMPOSIUM…Nov. 2-4, Orlando, FL. Info: (541) 895-3012; www.safeassociation.com.

AIRCRAFT INTERIORS EXPO AMERICAS…Nov. 4-5, Seattle, WA. Info: +44 203 840 5686; www.aircraftinteriorsexpo_us.com.

AIRCRAFT REPOSSESSION CONFERENCE…Nov. 5, Dubai, United Arab Emirates. Info: +44 2- 8123 7072; www.aeropodium.com.

ASIAN BUSINESS AVIATION ASSOCIATION INDUSTRY AWARDS AND CHARITY GALA DINNER…Nov. 6, Hullett House Hong Kong. Info: www.asbaa.org.

AIRCRAFT ACCIDENT INVESTIGATION AND MANAGEMENT CERTIFICATE COURSE…Nov. 2-6, Embry-Riddle, Daytona Beach, FL. Info: (386) 226-6928; www.erau.edu.

◆● DUBAI AIRSHOW

Nov. 8-12, Dubai World Central, Dubai, United Arab Emirates.
Info: dubaiairshow.com.

ASIAN BUSINESS AVIATION ASSOCIATION SAFETY SYMPOSIUM…Nov. 9-10, Lantau Island, Hawaii. Info: asbaa.org.

AVIATION LOGISTICS AND SUPPLY CHAIN MANAGEMENT CONFERENCE…Nov. 9-10, Embry-Riddle, Daytona Beach, FL. Info: (386) 226-7214; www.erau.edu.

ASIAN-AUSTRALIAN ROTORCRAFT FORUM...Nov. 16-18, Indian Institute of Science, Bengaluru, India. Info: www.arf.vtol.org.

TAX, REGULATORY AND RISK MANAGEMENT CONFERENCE…Nov. 17-19, Las Vegas Convention Center, Las Vegas, NV. Info: (702) 783-9000; www.nbaa.org.

AEROSPACE STRUCTURAL IMPACT DYNAMICS INTERNATIONAL CONFERENCE…Nov. 17-19, Aeropolis Technology Park, Seville, Spain. Info: www.asidconference.org.

TAX, REGULATORY AND RISK MANAGEMENT CONFERENCE…Nov. 17-19, Las Vegas Convention Center, Las Vegas, NV. Info: (702) 783-9000; www.nbaa.org.

AEROSPACE STRUCTURAL IMPACT DYNAMICS INTERNATIONAL CONFERENCE…Nov. 17-19, Aerosols Technology Park, Seville, Spain. Info: www.asidconference.org.

AVIATION SAFETY MANAGEMENT SYSTEMS: APPLICATIONS AND IMPLEMENTATION…Nov. 17-19, Embry-Riddle, Daytona Beach, FL. Info: (386) 226-6928; www.erau.edu.

PROFESSIONAL CERTIFICATE IN AVIATION MANAGEMENT COURSE…Nov. 24-26 Abu Dhabi, United Arab Emirates. Info: +971 50 921 3852; www.aeropodium.com/pcam.

DECEMBER

AIRCRAFT RECORDS CONFERENCE…Dec. 9, London, England. Info: (305) 767-4707; www.aeropodium.com.

JANUARY 2016

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

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

FEBRUARY 2016

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

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

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

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

MARCH 2016

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

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

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

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

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

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

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

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

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

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

APRIL 2016

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

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

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

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

MAY 2016

AVUSI XPONENTIAL…May 2-5, New Orleans, LA. Info: www.xponential.org.

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

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

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

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

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

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

JUNE 2016

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

JULY 2016

◆ FARNBOROUGH AIRSHOW

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

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

◆ EUROPEAN BUSINESS AVIATION CONVENTION & EXHIBITION

May 19-21, Palexpo, Geneva, Switzerland.
Info: www.ebace.aero

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