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ROTORCRAFT: THE DEADLY NIGHT S-92 CFIT ACCIDENT

Special Report: Bizav proves its value

Joby eVTOL: a new way to fly

AIN flies the Joby electric vertical takeoff and landing aircraft simulator

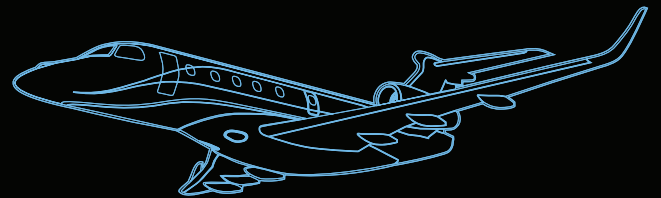




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A new look for AIN

News Briefs

Welcome to the new year and the redesigned Aviation International News!

As we celebrate our first 50 years and embark on our next 50 years of aviation publishing, we wanted to highlight some upcoming changes.

For the past 50 years, our readers have relied upon AIN's no-nonsense, informative, and non-partisan coverage of business aviation. Our print issues have always been a large tabloid-sized magazine, starting with our convention issues, which launched the company in 1972, then a bimonthly magazine, which eventually became monthly as we transitioned the name of the magazine from Aviation Convention News to Aviation International News. (For a complete history of AIN, see Gregg Polek's excellent story online at: www.ainonline.com/aviation-news/business-aviation/2021-10-10/50-years-ain-and-still-going-strong)

As you can clearly see, the issue in your hands has a different look and a different size than what you are used to. Let us know your thoughts, and give yourself a chance to get used to it. One thing I can assure you is that the quality information and content that you rely upon has not and will not change.

So what has changed and why?

The cover and layout of the inside pages have been fully redesigned for a clean and more modern design, one that will match our new website, which is coming soon.

We redesigned the logo to highlight the red "AIN" that many of you associate with the AINAlerts newsletter and AINonline website.

The size is smaller making it easier to fit the book in your flight bag. While cost isn't the primary factor, moving to a standard size magazine ensures our ability to publish the magazine for many years to come.

You will notice less dedicated news in the print magazine. Our AINAlerts and AINonline products are tremendous vehicles for delivering timely news. In its place we are planning in-depth content to help you better

understand today's business aviation landscape.

In places you will also notice a new "AIN Media Group" name. For the last 50 years, the formal name of the company has been "The Convention News Company" due to our start publishing daily issues at the NBAA Convention in 1972. "AIN Media Group" is more accurate in describing the breadth of brands and products that we offer including:

- » The AIN suite of products: Aviation International News, AINAlerts, AINonline
- » Business Jet Traveler
- » FutureFlight.aero
- » Convention News and Airshow News published at aerospace events globally
- » Video-based stories and coverage from aerospace events
- » Live events and webinars on important business aviation topics

The aviation industry is constantly changing, and those who love this industry will never give up learning about what interests them, how to operate safer, the impact of new technologies, and where the industry is going in the future.

This issue of AIN that you're holding in your hands heralds the next era in AIN Media Group's service to the aviation industry, with a new form factor, a beautiful clean new design by AIN's talented designer Greg Rzekos, and more in-depth content that is worth saving for future reference.

As always, we welcome your comments, insights, and suggestions and we thank you for joining us on this rewarding and fascinating journey.

Matt Thurber
Editor-in-Chief
mthurber@ainonline.com
AIN Media Group

BEECHCRAFT DENALI COMPLETES FIRST FLIGHT

Textron Aviation's Beechcraft Denali single-engine turboprop lifted off on its first flight on November 23 from Wichita Eisenhower National Airport. During the 2.5-hour test flight, the clean-sheet airplane reached an altitude of 15,600 feet and a top speed of 180 knots, according to Textron Aviation. The first flight, piloted by Peter Gracey and Dustin Smisor, comes after initial runs of the new GE Aviation Catalyst engine on the Denali prototype in late August. Two other flight-test Denalis are in development. Denali certification is expected to take place next year.

GRANDVIEW TACKLES FATIGUE, INCREASES PAY FOR PILOTS

Charter operator GrandView Aviation has formally implemented a fatigue management program that cuts the duty day for its 50 pilots by two hours, to 12 hours. Additionally, GrandView pilots will be seeing a \$15,000 increase in pay, with starting pay for a Phenom 300 captain and first officer now \$110,000 and \$80,000 a year, respectively. The company is looking to add 70 more pilots this year.

DASSAULT FALCON CONSIDERS CLOSING WILMINGTON MRO

Dassault Falcon Jet is weighing whether to shutter its 300,000-sq-ft heavy service center at New Castle Airport in Wilmington, Delaware. According to the company, there are "continuing challenges specifically facing the Wilmington facility" and its management team has met with the site's union representatives to discuss "steps that may need to be taken in the future," which includes the possibility of the site's "orderly closure."

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Transport Canada certifies Falcon 6X's PW812D engine

BY JERRY SIEBENMARK

Pratt & Whitney Canada (PW&C) has received Transport Canada type certification for the PW812D turbofan that powers the Dassault Falcon 6X, moving the twinjet a step closer toward its planned late 2022 certification. More than 4,900 hours of testing has been conducted on the PW812D, including more than 1,150 of flight testing, along with 20,000 hours on the engine core that it shares with the company's Pratt & Whitney GTF, according to P&WC.

The engine delivers 13,500 pounds of thrust and is expected to provide the 6X with a range of 5,100 nm at Mach 0.85. "It's a major step forward in fuel efficiency, maintainability, and performance, helping make the 6X an outstanding new Falcon," said Dassault Aviation chairman and CEO Eric Trapier. "With this milestone and the aircraft's

test program progressing smoothly, we are on track for a successful and timely entry into service of the Falcon 6X."

Dassault's three flight-test 6Xs have logged more than 500 hours and 150 flights to date. Soon, an initial production 6X with a fully outfitted cabin will join the development program for a global tour to evaluate aircraft and system performance, including operation in remote locations and other "challenging environments," according to Dassault.

In November, a Falcon 6X test aircraft landed at Paris-Le Bourget Airport, where the French airframer said it became one of the first aircraft to refuel in the field using a sustainable aviation fuel (SAF) blend from TotalEnergies. Dassault said it will continue to use SAF in the 6X testing to minimize its carbon footprint. ■



Dassault Aviation's three Falcon 6X test aircraft have accumulated more than 500 flight test hours and 150 flights to date.

News Briefs

JETCRAFT: \$57B IN USED BIZJET SALES OVER 5 YEARS

Some 12,261 preowned business jet sales transactions worth \$57.2 billion are expected over the next five years, according to a new forecast from business jet acquisition and sales firm Jetcraft. The company expects preowned aircraft transaction volume and value to maintain their current "healthy" growth rates, reaching 2,647 transactions worth \$12.4 billion annually by 2025. Midsize and large-cabin jets are predicted to lead overall volume and value growth. Jetcraft is calling for transaction values and depreciation to eventually return to normal by 2025.

DAHER HANDS OVER 300TH KODIAK

Daher has delivered the 300th Kodiak turbo-prop single, reaching the milestone some 11 years after the rugged multi-mission aircraft was introduced. Daher, which acquired the Kodiak program in 2019, said the delivery further underscores its commitment to the aircraft remaining a part of its future plans for its single-engine turboprop portfolio. Kodiaks are in service in North America, Asia-Pacific, Europe, Africa, Latin America, and South America, and the global fleet has logged more than 278,700 flight hours.

SENATE CONFIRMS SULLENBERGER AS U.S. REP TO ICAO

The U.S. Senate confirmed C.B. "Sully" Sullenberger III as ambassador and representative of the U.S. before ICAO. Famed for his role in the "Miracle on the Hudson" emergency landing, Sullenberger has been serving as a safety advocate, author, and keynote speaker. General aviation groups widely lauded the appointment.



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News Briefs

CHALLENGER 650 TO JOIN NETJETS EUROPEAN FLEET

NetJets is adding the large-cabin Bombardier Challenger 650 to its European fleet beginning in 2022 as it continues to see “unprecedented demand.” Because of this demand, it is also pulling aircraft deliveries forward where it can and pausing aircraft dispositions. NetJets expects to take delivery of more than 125 new aircraft by the end of this year, with at least 25 arriving in the spring. Hiring at NetJets is also on the increase, with 550 new employees—250 pilots and 300 non-crew—through last month, with recruitment underway for another 100 pilots and 120 staff.

NASA SUPERSONIC TESTBED NEARS FINAL ASSEMBLY

The NASA and Lockheed Martin X-59 Quiet SuperSonic Technology (QueSST) research aircraft is moving toward final assembly and “stand[ing] on its own,” NASA said. To be used to conduct noise trials involving quiet supersonic technology, the X-59 was recently removed from the jig and will be tested for its structural soundness and readiness for final assembly. First flight is planned for later this year.

COLLINS COMPLETES FLIGHTAWARE BUY

Collins Aerospace is building on its suite of information services with the completion of the acquisition of global aircraft flight tracking, data, and analysis company FlightAware. Collins is folding the business into a newly formed Connected Aviation Solutions business unit. FlightAware senior executive James Sulak will be part of the new business unit, Collins said.



Gulfstream's large-cabin G500 and G600 each capped off their steep approach demonstrations with speed records from London City Airport.

Gulfstream's G500, G600 demonstrate steep-approach

BY KERRY LYNCH

Gulfstream Aerospace's G500 and G600 have both demonstrated steep-approach landings into London City Airport in England, as well as Lugano Airport and Sion Airport in Switzerland. With their low-speed handling and short-field landing capabilities demonstrated, FAA and EASA steep-approach approvals for these jets are anticipated next year.

These approvals will open access for the large-cabin twinjets to London City, which requires certification because of its short runway and stringent noise-abatement requirements, as well as Lugano and other airports in the mountainous region of Switzerland. Gulfstream noted that Lugano, which is situated in the mouth of a valley, requires an extremely steep approach.

“The takeoff and landing performance we demonstrated in Europe was key in the process of securing customers' access to even more locations worldwide, saving them even more valuable hours per year,” said Gulfstream president Mark Burns.

Following the completion of the landing demonstrations, the G500 and G600

each logged city-pair speed records from London City Airport. They both averaged cruise speeds of Mach 0.90 or above.

The G500 made a 3,077-nm journey to Teterboro Airport near New York in 6 hours and 46 minutes. This was a 12-minute improvement on the previous record despite encountering challenging headwinds, Gulfstream reported. Meanwhile, the G600 flew to Seattle, completing the 4,235-nm flight in 8 hours and 39 minutes.

These records are pending approval by the U.S. National Aeronautic Association and Fédération Aéronautique Internationale in Switzerland. The aircraft siblings collectively hold more than 60 city-pair records.

In addition to steep-approach approval, the G500 is on track for certification of improved takeoff performance operations on grooved runways in wet conditions in early 2022. The G600 has already received this approval from the FAA and EASA, which Gulfstream said provides increased flexibility and range options when operating in wet runway conditions. ■

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GAMA: airframers continue strong post-Covid Q3 rebound

BY CURT EPSTEIN

General aviation airplane manufacturers continued their strong rebound from the Covid-19 pandemic slump, posting a 13 percent year-over-year (YOY) increase in billings during the first nine months, to \$13.4 billion, according to the General Aviation Manufacturers Association (GAMA).

For business jet makers, deliveries rose by nearly 16 percent, moving from 378 aircraft in the first nine months of 2020 to 438 in the same period in 2021. Almost all OEMs saw improvement, led by Textron Aviation, which saw a more than 70 percent increase in jet deliveries through the first three quarters, doubling the number of M2s it handed over from 13 to 26 and posting gains across its entire Citation product range.

Embraer tallied 11 more business jet deliveries YOY, good for a nearly 26 percent boost, while Bombardier's totals increased from 70 aircraft deliveries in the first nine months of 2020 to 82 through the end of September last year, bettering its number by more than 17 percent. While

the company delivered six fewer Challengers, it boosted the output of its Global family by 19 units. Pilatus Aircraft handed over three more PC-24s than it did a year ago.

Some airframers reported fewer deliveries in the first nine months of 2021, among them Gulfstream, which handed over four fewer G280s and three fewer large-cabin jets YOY. Honda was two units off its 2020 pace and Cirrus saw one less SF50 VisionJet delivery.

Airbus and Boeing respective ACJ and BBJ totals grew by two each year-to-date.

TURBOPROPS SOAR

The turboprop market saw even stronger growth, improving by more than 40 percent YOY. The high-end pressurized turboprop segment was up nearly 26 percent over the first three quarters of 2021, with all airframers posting gains.

Florida-based Piper Aircraft improved over its 2020 numbers by nearly 35 percent, delivering eight additional M600/SLS single engines in the first nine months of 2021,

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News Briefs

GLOBAL BIZAV ON TRACK FOR NEW 2050 ENVIRONMENTAL GOALS

Business aviation's success in meeting its new goal of net-zero carbon emissions by 2050 will hinge heavily on the widespread adoption of sustainable aviation fuel (SAF) and development of improved aircraft technology, according to Bombardier head of strategy and analytics Thomas Fissellier. "We are now on track to reach about four million tonnes of CO₂ emissions by 2050 as an industry, which would represent about a 70 to 75 percent reduction compared to 2005," he said. Estimates call for neat (unblended) SAF to comprise between 66 and 81 percent of total jet fuel consumption by 2050.

CAE TO ADD GLOBAL 6500 SIMULATOR IN DUBAI

CAE will deploy a new Bombardier Global 6500 full-flight simulator at the Emirates-CAE Flight Training Centre in Dubai. The Global 6500 simulator, the first to appear outside the Americas, will be available for training in 2023 at the center in the Al Garhoud zone near the Dubai International Airport. CAE's Global 6500 training is currently available only at its Montreal training center.

JETCLUB EXPLORES MIDEAST EXPANSION WITH JETEX

JetClub has entered into a memorandum of understanding with global FBO operator Jetex to explore serving the Middle East as its next market for its fractional-share operation. JetClub is the European sister brand launched earlier this year to North Carolina-based Jet It. Combined, the two companies currently operate a fleet of 14 HondaJets.



Business jet deliveries in the first nine months rose 16 percent, to 438 aircraft, according to data from GAMA. Pilatus Aircraft was among the OEMs contributing to that gain.

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AIN's 50th anniversary: looking back at January news

BY CURT EPSTEIN

With AIN Media Group's Aviation International News and its predecessor Aviation Convention News celebrating the company's 50th year of continuous publication this year, AIN's editorial staff is going back through the archives each month to bring readers some interesting events that were covered over the past half century.

Chrysler flight dept. disbanded; new FBO created in its place



(Aviation Convention News 1/15/82 p.69)

THEN: A new corporate FBO, Pentastar Aviation, has been formed in Detroit. Located at Detroit's Willow Run Airport, Pentastar embodies the personnel and facilities of the former air transportation department of Chrysler Corp.

The new company holds an FAA-certified repair station license with ratings in airframe, powerplant, accessory, instrument, and specialized services. On airframes it is licensed to work on the Gulfstream I and II, Sabreliner 40 and 60, Cessna Citation I and II, and all models of Learjets. Its powerplant ratings extend to Rolls-Royce Darts and Speys; Garrett 731s and 331s; P&W JTD12s and 15s; and General Electric CJ610s.

The firm has a FAR 135 certificate under which it is offering charters with a Gulfstream II, two Learjet 35s, and a Citation II.

Chrysler was forced to sell the airplanes in its flight department—a Gulfstream II and Learjet 35—last year as a condition for obtaining a large loan from the federal government. However, it retains a Citation II on lease.

NOW: Pentastar opened a second FBO at Oakland County International Airport in 1989 and by 1994 had fully moved its headquarters there, selling off its Willow Run location in 1997. Nearly four decades since its debut, the company remains a perennial top finisher in AIN's annual FBO survey.

Super King Air 300 bows in at \$2.34 million



(Aviation Convention News 3/1/84 p.1)

THEN: With surprisingly little fanfare Beech Aircraft has certified the airplane destined to become the new flagship of the company's corporate turboprop product line and is gearing up for its first deliveries in April.

The Super King Air 300—a higher performing, heavier, more powerful, and more expensive follow-on to the company's highly successful Model 200 Super King Air—received its type certificate quietly on January 24 in Wichita. The TC was an amendment to the certificates awarded to the Model 200 in 1973 and 1980.

Because of its 14,000-pound max gross weight, the Super 300 was required to meet the airworthiness regulations of SFAR 41C.

NOW: Despite the airframer's ownership undergoing several changes over the years, the King Air 300-series has remained in production to this day as the top of the Beechcraft line. The latest version, the 360/360ER, received FAA certification in October 2020.

Aviation Convention News rebrands to Aviation International News



(Aviation International News 1/1/1986 p.1)

THEN: Prior to Aviation International News, the publication founded to provide industry coverage of events such as Heli-Expo, NBAA's annual convention, and the Reading Air Show was known as Aviation Convention News. In addition to publishing show daily issues,

continues on page 16 ▶

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BY TEXTRON AVIATION



continued from page 14

preview and post-event issues for each event were mailed to subscribers, six in total. “In those six issues we started covering news and information in addition to just the show-only news,” said AIN co-founder and managing director Wilson Leach. “We outgrew the name.”

At the start of 1986, Aviation Convention News was rebranded to the current Aviation International News. While AIN still would publish its show issues under the Convention News title, its bimonthly mailed subscription publication would now be known as Aviation International News.

NOW: Nine years later AIN would move from a bimonthly publication to monthly, with its readers receiving a new issue packed with the current industry news at the beginning of each month.

Kit-built Supersonic jet single next on Jim Bede’s hit list



(Aviation International News 3/1/89 p.91)

THEN: A pre-production version of Jim Bede’s newest kit-built aircraft, a supersonic derivative of his BD-10, is expected to be completed by mid-summer, the Cleveland-based kit builder said. With the exception of some minor work, engineering on the aircraft to be known as the BD-10J is complete and fabrication of the composite materials will begin shortly.

Bede told Aviation International News that he expects to build only about 20 to 30 or the two-place, single-engine supersonic aircraft through

his company Advanced Aircraft. No final price has been set for the BD-10J but Bede said it will probably cost about \$160,000 sans engine and avionics.

NOW: A completed jet flew in July 1992, and by the following year, the price had grown to nearly \$700,000 per kit. In 1994, former US Air Force pilot Mike Van Wagenen acquired all production and marketing rights to the design, which he called the Peregrine Falcon, and declared his intent to gain FAR Part 23 certification. After two successive prototype crashes that killed Van Wagenen and his successor, the design was purchased by a Canadian company that was unsuccessful in a plan to convert it into an unmanned military drone (AIN 1/1/97 p.8). The lone owner-flown example broke up in flight in 2003, killing its pilot.

Diamond Joins the small-jet fray



(Aviation International News 2/1/2003 p.1)

THEN: Diamond Aircraft, which manufactures composite single- and twin-engine piston aircraft, has announced it will build a single-engine jet. The five-place all-composite D-jet is projected to sell for “well under \$1 million,” and have an mtow of 4,700 pounds. The jet single is expected to be able to operate from 2,000-foot runways and reach its max cruising altitude in eight minutes (an average of 3,125 fpm).

NOW: Diamond was one of the airframers that sought to fulfill the prophecy of “skies darkened by clouds of very light jets.” While it successfully produced and flew a prototype, the cash-starved

program was repeatedly interrupted by funding difficulties. In 2016, the manufacturer was acquired by China’s Wanfeng Aviation, which considered restarting the D-jet, but the aircraft has since faded away.

MNG Jet: employee acted alone in arranging escape flights for fugitive Ghosn



(Aviation International News Feb. 2020 p.17)

THEN: As part of the probe into indicted auto executive Carlos Ghosn’s daring escape from Japan in December 2019, Turkish police apparently continue to hold four pilots named as Turkish nationals. Also being held is an employee of Turkish charter provider MNG Jet as part of their investigation into how two of the Istanbul-based operator’s aircraft were used by the automotive executive to escape from Japan to Lebanon.

NOW: As he was awaiting trial and under house arrest in Japan on charges of financial misconduct, former Nissan CEO Ghosn conducted a Hollywood-style escape, being smuggled aboard a Global 6000 hidden in a music equipment box. In Istanbul, he was transferred to a Challenger 300 for the flight to extradition immunity in Beirut. While others were prosecuted for their role in helping plan and conduct the scheme, Ghosn has thus far escaped justice. ■

Watch AIN@50 videos on youtube.com/AINtvonline

TRIVIA QUESTION: In 1972, AIN’s first year of existence, NBAA’s membership was:
A) 500, B) 1,000, C) 5,000, D) 10,000

ANSWER: B) 1,000



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Flying the Joby Simulator

BY MATT THURBER



AIN editor-in-chief Matt Thurber trying out the fly-by-wire flight controls in Joby's eVTOL simulator.

Much of what Joby Aviation does is secret, hidden in a valley surrounded by steep mountains near Santa Cruz, California. But, especially in the wake of the company's recent New York Stock Exchange flotation, more details about Joby's electric vertical takeoff and landing (eVTOL) aircraft are being revealed, and the company has been sharing more videos of the aircraft flying, including demonstrations of its amazingly low noise levels.

In fact, according to Joby—whose founder, JoeBen Bevirt, has been at this since 2009—FAA certification of its four-passenger aircraft is well underway and on track for 2023, which would be five years after Joby applied for type certification. The first conforming Joby aircraft is flying while the second test aircraft, should fly soon, if it hasn't already.

Joby has locked down the certification basis for its aircraft, and it will be certified under the regulatory framework in Part 23 of the FAA regulations.

To introduce the Joby eVTOL to various stakeholders and those who can help spread the word, Joby has designed its own fixed-based flight simulator, one of which is at its Washington, D.C. government affairs office. I was recently invited to fly the simulator, and it was a fascinating experience because it highlighted a sea change in the way pilots will operate aerial vehicles in the future.

Joby has no short-term plans to offer an autonomous (non-piloted) aircraft, although that may come later. Its current design will carry four passengers and be flown by a qualified commercial pilot, and

the company will operate its aircraft under the Part 135 regulations governing commercial aircraft operations.

DISTRIBUTED PROPULSION

The simulator is built to look like the cockpit of the real Joby aircraft, and it uses X-Plane simulation software for visualization and terrain display, but the flight modeling is all Joby-developed. Granted, anyone can design a wild-looking aircraft using X-Plane, but my experience showed me that Joby's engineers are serious about replicating the complex distributed propulsion machine that the company has designed.

The advantage of electric propulsion is that instead of having one or two propellers driven by large combustion engines,

continues on page 20 >

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multiple smaller electric motors driving smaller propellers can be placed at optimum locations all over the airframe. Each motor has just one critical part, a bearing, plus the propeller. These electric propulsion units (EPUs) provide power exactly where and when it is needed, giving designers extraordinary latitude to create aircraft that can fly in ways that many of us never imagined.

In Joby's case, there are six propellers that can articulate to provide vertical or horizontal thrust or a combination of both. Each propeller is driven by two electric motors, for redundancy. If one motor fails, the other can easily take up the slack. Each motor is connected to a different battery pack, eliminating a single point of failure for that propeller. All of the propellers tilt, which is somewhat like a tiltrotor but far less complicated because there is no big turbine engine with hundreds of parts getting fed by copious gallons of fuel and being rotated by hydraulic pressure created by yet more moving parts attached to each engine.

A tiltrotor aircraft like the Bell-Boeing V-22 or Leonardo AW609 requires great skill to fly because it combines helicopter and fixed-wing attributes. Helicopters by themselves also demand that pilots have a lot of training and skill, not to mention constant practice and recurrent training to stay sharp.

All this is to underscore how different it is to fly the Joby aircraft. I have not flown a real tiltrotor, but I have flown helicopters, and the Joby is far simpler. When flying it, you don't notice the transition between vertical and horizontal flight because it is all part of the design of the pilot-machine interface and also benefits from the way electric propulsion works.

For someone like me who doesn't design aircraft, it would seem that a goal for a piloted eVTOL aircraft would be precision control made easy; you need to be able to make it do what you want, when you want,

and fly exactly where you want. The more it can do this without forcing the pilot to have to think about how to manipulate a complex set of controls in precise little movements (I'm thinking helicopter here), the more it will succeed at its mission.

“ The beauty of a fly-by-wire flight control system is that it gives designers even more control over how the aircraft feels to the pilot...”

By this, I don't just mean flying passengers from A to B, but a higher-order mission: freeing pilots' overworked minds from the complexities of controlling the trajectory so they can spend more valuable brain cycles on the critical aspects of flying. That means selecting the appropriate trajectory but with simplified controls; navigating safely and avoiding flying into thunderstorms, other aircraft, buildings, or mountains; and communicating as needed with air traffic control and in this new and modern age, ground-based assistants.

HOW JOBY FLIES

Based on my experience in the simulator, I believe the Joby more than meets the above requirements. I'm going to assume the real aircraft flies similarly, and I hope to learn more about that eventually.

The cockpit features two displays, which are Garmin G3000 avionics, plus a single

Garmin touchscreen controller for entering information, creating flight plans, and managing systems. The primary display has conventional airspeed, altitude, attitude, and vertical speed indicators as well as a flight-path marker. The main systems page shows a graphic of the six EPUs, with a bar graph for each indicating the torque that is being applied. This bar turns red if too much torque is being demanded, but the system prevents the pilot from applying too much power to any of the EPUs for too long. The pilot has two controls, one

for each hand, and no pedals. The left control is the speed control: move it forward to speed up, backward to slow down. This seems to be a more intuitive way to design a throttle/power lever. The righthand control is an inceptor or sidestick, and it controls three axes, pitch, bank, and yaw, but it also enables a function that is new to most pilots but that makes sense for an eVTOL aircraft: up and down.

Like all eVTOLs, the Joby features a flight control system that is fly-by-wire, and this is pretty much the only way possible to control a distributed-propulsion aircraft effectively and safely. The beauty of a fly-by-wire flight control system is that it gives designers even more control over how the aircraft feels to the pilot and lets the pilot make it act in a stable manner, even when the control system is essentially corralling a wildly unstable vehicle.

continues on page 22 ►



Joby's electric vertical takeoff and landing aircraft is complex but easy to fly.

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I'm not saying the Joby is unstable, but it would probably be impossible to make it act in a stable manner controllable by a pilot with conventional cable and push-rod controls at an efficient weight. This is inherent with many fly-by-wire aircraft, such as the F-16 fighter, F117 Nighthawk, F35A, and others and is nothing new to flight control system engineers.

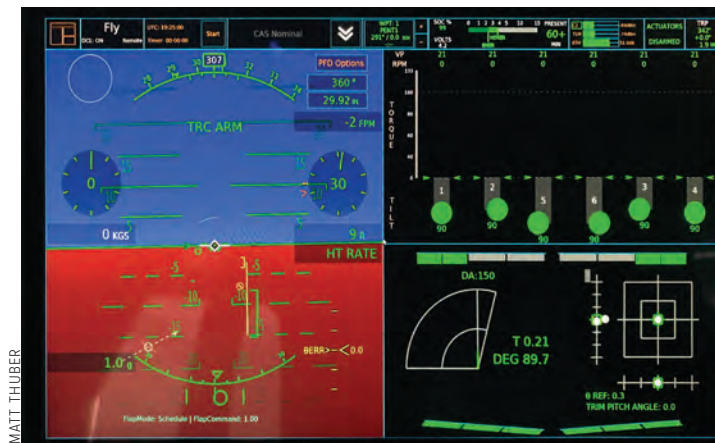
With just a short briefing on how the controls work, I was almost immediately making the Joby do exactly what I wanted. The pilot-machine interface is beautifully designed and implemented. I have never felt so in control of an aircraft and so free to focus on flying tasks rather than on constant control manipulation.

To get into a hover, all I had to do was pull the inceptor back with my right hand, and the Joby climbed smoothly a few feet; then I let the control spring back to center and the aircraft simply hovered in place.

This was like flying a fictional, imaginary perfect aircraft; I can't think of any other way to describe it. At first I had no idea what was going on outside, although if I were flying the real Joby I would have been able to look outside and see the propellers spinning and some of them translating forward and backward. But there is also the information about the state of the propellers on the display, with indicators for rpm, torque, and tilt for each EPU, and that helped give me some perspective, although ultimately, if the aircraft moved exactly the way I wanted, do I really care how it got there? This is an interesting question, and the answer is that some pilots will be geeked enough to want to know a lot of detail about how the aircraft works and others will be happy just to fly it—the same as any group of pilots.

TRC MODE

For takeoff and landing, the Joby goes into "translative rate control" (TRC) mode, which limits speed to seven to eight knots to make it easier to have precise control when you're close to the ground. That speed has been increased in newer versions of the flight control software. I tried a turn, again using the righthand inceptor control, but I managed to twist and yaw at first, instead of moving the control to the left or right to induce a bank. I found that relaxing my grip on the control helped; all you need is two fingers to push the control, and this helps avoid unconscious twisting. I did some banks, then practiced yawing while level, and the Joby responded perfectly, allowing me to point the nose at various Washington, D.C. landmarks.



The flight and systems display on the Joby aircraft's Garmin G3000 avionics.

I had taken off from simulated Reagan Washington National Airport (DCA) and was flying near the Pentagon, which is discombobulating because as much as eVTOL developers want to offer their services to busy metropolitan areas all over the world, some cities like Washington just aren't going to cooperate. The 9/11 attacks so upset the powerful elite that they banned small aircraft from DCA, unless they are flying military missions or for a government entity like the police or first responders. That is unlikely to change just because eVTOLS are cool, quiet, and electric.

Once out of TRC mode, I yawed around so the Joby faced the end of a runway at DCA,

then pulled the inceptor back to raise the nose and pushed the lefthand speed control to gain speed. I kept the speed at around 70 knots and the nose pointed up and continued climbing to about 600 feet, then leveled off.

I played with the controls to get a feel for how Joby's as-yet-unnamed aircraft responded. I liked how the speed control worked. It felt natural and intuitive. But the inceptor left me with some questions.

In wing flying mode (propellers forward), pulling back on the inceptor induces a change in the nose position, raising it above the horizon, but limited to a certain amount. Once set to a different pitch attitude, letting go of the inceptor leaves the nose in that attitude. This is similar to a flightpath-stable fly-by-wire system, as seen in Airbus,

Embraer, and Falcon designs. You move the stick to set a flightpath up or down or level, then let go and the airplane stays right in that attitude (it's really a flightpath).

But oddly, in the Joby, when you bank left or right, it steepens to a maximum of 30 degrees, but when you let go of the inceptor, the bank angle goes back to zero or wings level. For a pilot raised on regular flight controls and with some fly-by-wire experience,

this seems strange, but it ended up working once I wrapped my head around it. (In the flightpath-stable airplane designs, in a banked turn, the airplane remains banked when you let go of the sidestick controller.)

I have to imagine that a ton of activity is going on with the computers and the motor controllers and fly-by-wire system to make everything integrate so smoothly, and for the pilot, that is the result: smooth banks, smooth pitch changes, smooth yawing motion with no wing dipping.

Climbing to 1,100 feet, I followed the Potomac River to Rosslyn, then I descended and circled the aircraft around the Pentagon and aimed for a

landing at the military facility's helipad.

Slowing to a hover, which happens faster by pointing the nose up a little while pulling the speed control backward, I brought the Joby to a standstill a few dozen feet above the ground. I then tried flying backward, which just requires pulling the speed lever back for "negative" airspeed. Maximum speed going backward is about 20 knots.

Pushing the speed control forward slowed the aircraft to zero and put it back into a hover. In this configuration, I then was able to descend straight down by pushing the righthand inceptor forward. This illustrated the difference between vertical mode and wing mode: when the propellers are all pointed straight up, moving the inceptor forward or backward causes the aircraft to go straight down or up. But when the propellers are pointed forward, moving the inceptor changes the nose position, which should make the aircraft follow the nose and descend or climb.

PRECISION CONTROL

Approaching the helipad, I went back into TRC, and this is where the precise control proved its mettle. All I had to do was fly near the helipad and inch my way gradually over until I was positioned exactly above the center with the nose pointed where I wanted it using the yaw control. Then I just pushed the inceptor forward and lowered the aircraft straight down for a gentle touchdown. Simple and sweet, almost nothing to it.

The Joby can also be flown on a runway for a wing takeoff or landing, with the propellers pointed forward. Landing safely after a propeller or EPU failure can be done vertically or horizontally.

Although this was just a simulation, I was impressed with how easy it is to fly. Within minutes, I felt comfortable and in full control. The Joby did exactly what I wanted, though obviously with some limitations. I didn't have to think about how to configure the EPUs to get it to do what I needed. I'm eager to dig deeper into the technology and see how pilots will be trained.



Flying over simulated Reagan Washington National Airport in the Joby simulator.

If this is the future of piloting, I'm all for it. We all know that there is a limited segment of the population capable of becoming safe pilots in conventional aircraft, and traditional flying requires a huge amount of initial and ongoing proficiency training. In traditional aircraft, whether fixed-wing or rotary-wing, pilots can easily get

themselves in trouble because they have to focus so much on control manipulation along with other critical tasks. Eliminating the massive effort needed for control manipulation and allowing pilots to focus on higher-order tasks is a significant accomplishment and one that will likely bring giant leaps in safety. ■

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Bizjet proves worth on regional roadshow

BY MATT THURBER



PHOTOS: MATT THURBER

Sean Lynch's IAI Westwind II is ready to take off on another leg of the Blue-collar Bizav Roadshow.

It seemed like a great idea, one of those where you kick yourself for not thinking of it sooner.

The plan: go on a typical sales trip with the owner of a small business to see exactly how he or she uses the company's jet for efficient travel.

We talk endlessly about how flying in a personal aircraft saves time and allows business people to conduct more frequent meetings while covering a larger area. But is that really true? I was about to find the answer, thanks to Sean Lynch, founder and program coordinator for Engine Assurance Program (EAP), which offers pay-by-the-hour maintenance coverage for older jet engines.

Lynch called me early last year and asked whether I'd like to join him on a sales trip in his 1984 Westwind II, a classic business jet from the days when ultra-long-range, large-cabin jets were usually converted airliners. The idea was for me to witness firsthand, and write about, how a business jet benefits a company like EAP, and to illustrate the benefits of business

aviation from the perspective of someone who takes advantage of those benefits.

During the trip—which Lynch called the “Blue-collar Bizav Roadshow,” given the relatively small size of his company and the modest character of his jet—he flew to five states in four days and had more than 15 meetings, just one of which more than paid for the journey.

Arranging this kind of trip is no easy task, and soon after buying the Westwind in 2020



The Westwind II's cabin is spacious for a small jet, with plenty of room for EAP founder Sean Lynch (left) and Aeristo president Alex Schmidt.

at a fairly reasonable, pre-pandemic-inflated price, Lynch realized that he didn't have the time to manage the intricacies of taking care of the maintenance of the jet. Of course, the engines—Honeywell TFE731-3s—are enrolled in Engine Assurance Program but keeping after the myriad details of routine maintenance proved burdensome. So Lynch signed up to have the Westwind managed by Trinity Jet, a Dallas-based charter/management company, which also provides pilots for his trips.

Lynch's reasons for buying the jet had to do mostly with growing his business without having to hire another full-time salesperson. The per-year cost of a new hire for the sales department would have roughly equaled what he paid for the airplane and would have also matched the annual budget for the amount of flying he needed to build EAP.

This Westwind isn't for family travel; Lynch uses it only to visit customers and make sales calls three or four times a year.

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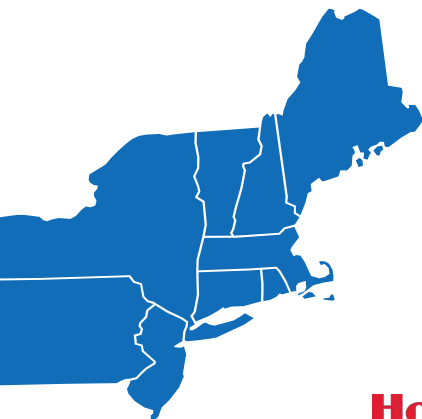
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With the jet, he can cover a large region of the U.S. and in one week arrange 15 to 20 face-to-face meetings. “I have not used it once for leisure travel,” he said. “Every time I take it out it’s a purpose-built trip.”

Of even more value to Lynch, however, is that he can have breakfast with his family on a Monday morning and drop his kids at school, then take off in the Westwind, do a lot of business, and be back home for school pickups on Thursday or Friday. “In this one-week trip, we’re going to save easily three days,” he said. “The trip would have taken eight days to do commercially with rental cars. My kids are young, and I hate coming home after a five-day trip and seeing that they’ve literally grown up while I was gone.”

Accomplishing such a trip via airlines and rental cars is impossible; Lynch would be able to make fewer than half as many visits, would spend less time with his family, and would need to log much more time trying to get to his customers’ locations, many of which either aren’t served by airlines or take multiple legs to get to a destination, followed by a long drive and many more hotel nights. There is also the intangible benefit of pulling up to a customer’s hangar in the neat-looking Westwind, powered by engines in the program that Lynch is profiting. Not to mention the reduced risk of flying in one’s own aircraft versus being jammed in with dozens or hundreds of others on an airliner and the massive increase in safety of flying in a business jet versus the extra exposure time of all that driving.

With the pandemic dragging on, the argument about whether online video calls can make up for cutting back on travel is gaining ground. But Lynch will never subscribe to that philosophy. His regional trips since buying the jet have proven that over and over again. Each one of the trips has been worthwhile, easily covering the cost of the flight and justifying the use of the jet.

The Westwind II can be generously described as a classic. Even in today’s red-hot market, buyers aren’t lining up to bid

and enormous expenses of maintenance.

Lynch’s Westwind is a workhorse, with a comfortable but unambitious interior and original instrumentation; the airplane’s only nods to modernity are two Garmin GPS navigators and some USB ports in the cabin. Most important, the airplane works great for regional trips and fits Lynch’s mission for the 30 to 40 hours a year he wants to travel on sales calls.

Although it can fly up to 2,500 nm, Lynch rarely goes that far on his sales trips, preferring to target different regions of the U.S. and fly around within each region. “We don’t fly over states,” he said. “There is business everywhere. We’re usually stopping every 45 minutes to an hour. The Westwind has been [perfect]; you’re not getting into super-short fields, but we can usually find an airport long enough.”

Maintenance isn’t an issue, even though the Westwind is relatively old. But if some parts are hard to find or staggeringly expensive—like the brakes, the cost of which averages out to

about \$300 per landing—well, that’s all part of the pleasure of owning an airplane.

Joining us on the trip were Kristin Spear, who was documenting the journey on social media, and Aeristo president Alex Schmidt, a friend of Lynch’s who also had some sales calls to make during this trip for his leather interior products company.

We started the trip at Love Field in Dallas, where the airplane is based, and our first stop was Centennial Airport south of Denver, a two-hour flight.

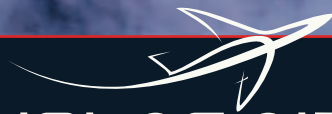
“In this one-week trip, we’re going to save easily three days, The trip would have taken eight days to do commercially with rental cars.”



up the prices of old Westwinds, but it suits Lynch’s needs perfectly.

One important attribute of the jet is its Honeywell (formerly Garrett, to give the jet’s age some recognition) TFE731-3 engines. These are the engines that launched EAP into the pay-by-the-hour maintenance coverage business, and customers appreciate that Lynch shows up in an airplane with engines covered by his company. At the same time, Lynch gets to experience firsthand what it’s like to be an aircraft owner and deal with the headaches

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The weather ended up being perfect during our entire trip.

At Centennial, we visited a prominent corporate flight department, renewing some of Lynch's long-time friendships, and had lunch at the airport's excellent restaurant, The Perfect Landing, with another of Lynch's friends. While to me it didn't seem like a whole lot of selling was going on, I learned later that this is just part of Lynch's selling process and the magic of sales, which is only enhanced by face-to-face meetings.

Back on the airplane, it was just over an hour to Lincoln, Nebraska, and an in-depth tour of Duncan Aviation's headquarters. Again, it didn't seem as if Lynch was actively selling, but this just reflects my ignorance of how a good salesperson works.

We spent the night in Lincoln and got an early start the next morning with a one-and-a-half-hour flight to Battle Creek Executive Airport in Michigan, where Duncan Aviation has another main-

tenance facility. These short legs in the Westwind were plenty comfortable, and the relatively tall, nearly rectangular-shaped cabin gives passengers lots of elbow room. Our groundspeed regularly exceeded 480 knots, underscoring the Westwind's great performance and that replacing it with something more modern and with equivalent specs would cost millions more dollars

Dinner at WACO Kitchen, the restaurant adjacent to the WACO Aircraft factory, showed that airport restaurants can aspire to a higher level of food quality and service. The restaurant offers fresh, locally sourced food and a well-stocked bar; and during the day, patrons can look through windows into the WACO factory hangars and watch classic biplanes being built.

The next morning, Lynch and I took a side trip using a car kindly loaned by Duncan Aviation's Battle Creek FBO, while Schmidt spent the morning visiting



Sean Lynch (left) meeting with the leadership team at Northern Jet Management in Lansing, Michigan during last September's Blue-collar Bizav Roadshow.

Duncan's interiors specialists. We could have flown in the Westwind to visit Northern Jet Management in Lansing, but Lynch felt that it would be more efficient to drive. However, I couldn't help pointing out on the way back that Northern Jet CEO Charles Cox would have loved to see his spiffy-looking Westwind.

“ This is the best we've seen it in 20 years. ”

Lynch again worked his sales magic during the visit; then we drove back to Battle Creek for the next leg of the trip: a flight of less than an hour to Aurora, Illinois. Here we spent some time with Chicago Jet Group owner Mike Mitera and saw firsthand his team's Falcon 50 and 900 Universal Avionics flight deck modernization upgrades. Of course, those jets are powered by TFE731s, ripe targets for EAP's services.

After lunch with Mitera and crew, we climbed back into the Westwind for another sub-one-hour flight to St. Louis Regional Airport in Alton, Illinois. We visited West Star Aviation's largest facility, where the crew accomplished more than 100,000 hours of maintenance on Falcons alone last year, three times as much as the company's facilities in Chattanooga, Tennessee, and Grand Junction,

Colorado. “This is the best we've seen it in 20 years,” said Eric Kujawa, v-p Falcon product development.

Due to my tight work schedule, I left the Bizav Roadshow in Alton and caught a ride to St. Louis for my flight home on the airlines—definitely not as comfortable as the Westwind. Lynch went on to another visit in

Oklahoma on the way back to Dallas on the following day, thus concluding a successful trip and once again

proving the value of business aviation.

“I've closed at least one deal every time we took the airplane out,” Lynch told me after the trip. “The most important part was getting in front of the [key] players, seeing their repair stations, and meeting leaders and sales teams. If all they've ever done is read about [our product], that's not going to do much. That relationship and rapport are so critical; people aren't going to buy off sending you \$100,000 a year if they don't have a real gut feeling on the situation.”

On the previous Roadshow, Lynch signed up six enrollments. “It more than paid for the airplane,” he said. The most recent trip was such a beautiful example of what you can get done with an airplane,” he concluded. “It really was a general aviation jet requirement to get all those meetings done in four days.”

AEA: avionics shops see wage, rate hikes

BY KERRY LYNCH

The Aircraft Electronics Association's (AEA) 2021 Rate and Labor survey underscores the upbeat outlook for the industry, with some 60 percent of respondents expecting to see their retrofit business increasing and 40 percent predicting business will remain the same, according to an article in the association's latest edition of Avionics News. "You can count those predicting a decline by hand, with leftover fingers," the article adds.

At the same time, however, labor remains a challenge, which is leading to hourly rate increases for many technicians across the U.S. Installers, in particular, saw wage jumps as more operators are opting to replace, rather than repair, equipment, particularly as spare parts for legacy systems become harder to track down, the association said.

In the Central U.S. region, install technicians saw a 6 percent increase in starting pay to \$19.36 an hour.

Overall, 76 percent of shops reported salary increases that averaged 5 percent. More telling, according to AEA, is that 52 percent of shops gave incentive pay. This is up from 35 percent in 2020.

However, some wages in the Central region did see declines. Instrument technicians, for example, witnessed a 2.2 percent slide and bench technicians in the region saw a 7 percent decrease overall.

The only other pay slide in the U.S. came in the East, with instrument techs experiencing a 4.1 percent reduction. However, bench techs in the region received the biggest jump at 9.2 percent. Overall, 81

percent of shops in the region reported increased pay, which averaged 5.6 percent. In the West, nearly 75 percent increased salaries an average of 6 percent. But, in contrast to the Central region, only 35 percent offered incentive pay. That was up from 25 percent a year earlier.

Meanwhile, 64 percent in the Central region increased their shop rates by an average of 7 percent and instrument shop rates alone increased nearly 10 percent. In the East, two-thirds of the shops anticipate an average of a 7 percent increase while 52 percent in the West are planning rate hikes of 7.4 percent next year. This is an increase from 2021 when 32 percent of shops in the West reported an average increase of 6.9 percent. ■



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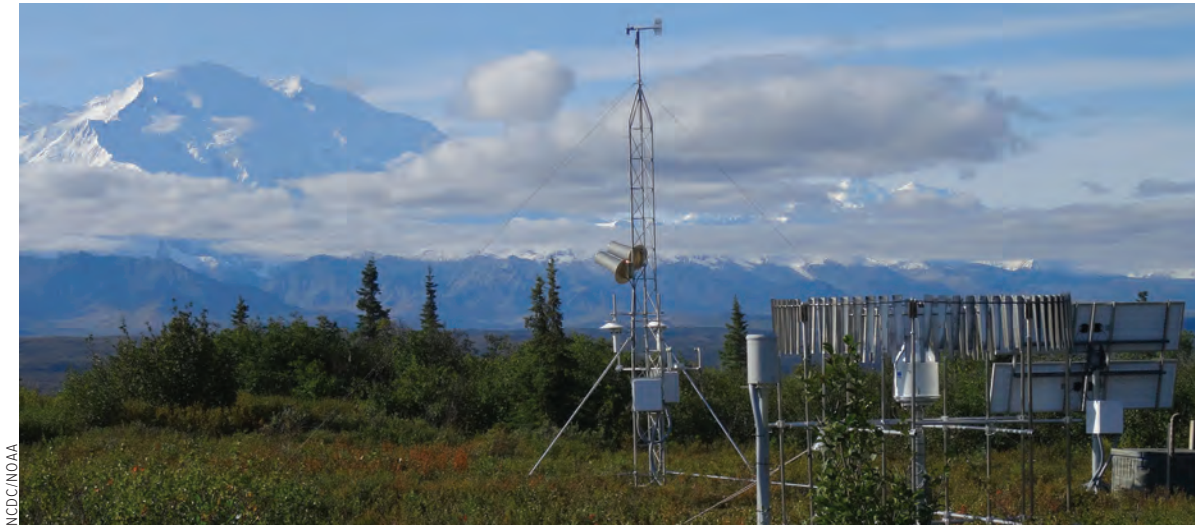
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The Denali USCRN station with (from left to right) the station's main instrument tower, precipitation gauges, and power systems in addition to Denali (Mt. McKinley) in the background.

FAA releases final Alaska Aviation Safety Initiative report

BY COLLEEN MONDOR

On October 14, the FAA released the final report of its Alaska Aviation Safety Initiative (FAASI). Developed in response to a recommendation from the NTSB, the report addresses such longstanding issues as Alaska's underfunded and broken infrastructure, lack of certified weather availability for published instrument approaches, and broad gaps in areas of communication and surveillance.

The report noted plans to install eight more Automated Weather Observing Systems (AWOS) at rural airports by September 2022, increasing the total number in the state to 97. Along with Automated Surface Observation Systems (ASOS) and trained human weather observers, AWOS provide certified weather reports needed for pilots to fly instrument approach procedures.

According to the FAASI, there are 133 ASOS stations in Alaska, compared with about 1,800 in the lower 48 states. However, there are 396 public-use airports in the state, of which 284 are on land, 108 are seaplane bases, and four are heliports.

Neither the FAASI final report nor the

earlier interim report published in April provide the number of airports that have instrument approach procedures but lack necessary weather reporting.

This has been a longstanding problem in the state and inhibited the success of FAA and industry efforts to increase IFR operations. It was a topic not only at the 2019 NTSB roundtable but also among the stakeholders who participated in the FAASI process, including Part 91 and 135 operators and pilots, the University of Alaska, the Alaska Department of Transportation and Public Facilities, and the Aircraft Owners and Pilots Association (AOPA).

In the 2019 roundtable, Dan Knesek, v-p of operations for Part 135 commuter Grant Aviation, tackled the problem of IFR investment head-on, saying, "As long as the appropriations for Alaska and the FAA are made based on a cost-benefit analysis, putting an AWOS or an instrument approach in a tiny little village in western Alaska is never going to pass that. So we can have all these meetings and do all we want, but we need to be able to come up with the money and the

investment on the federal side...Tell us to fly IFR, provide us the infrastructure to do it."

Several stakeholders took issue with a statement on this subject from the interim FAASI, which reads in part: "a substantial segment of Part 135 operations in Alaska will remain VFR-centric regardless of FAA efforts to enhance the use of IFR routes and suitably equipped aircraft." The final report also says, "Many of the aircraft used for...Part 135 operations in Alaska are only equipped for VFR flight."

By failing to quantify the terms "substantial" and "many" or differentiate between commuter and seasonal tour operations, the FAASI team instigated a conflict in perspective that has plagued members of the state's aviation community and the FAA for decades. As one stakeholder put it: "There is a circle that the aviators need to invest in equipment, but they don't want to pay the expense when the FAA doesn't invest in the infrastructure. The FAA doesn't want to invest in the infrastructure until the aviators equip their aircraft. We need to find a solution to the circle so both

the FAA and aviators can move forward.”

There are no funding amounts related to the expansion of IFR infrastructure discussed in the FAASI although the final report does note that airports can apply for Airport Improvement Program funding for equipment such as AWOS.

Another topic that was much discussed in the initiative was ADS-B, for which Alaska holds a unique historical position. Because of the federally funded Capstone program, which ran from 1999-2006, Alaska was at the forefront of ADS-B development. Unfortunately, due to budget considerations, the state still does not have full coverage.

In 2007, the FAA’s Surveillance and Broadcast Services Capstone Statewide Plan was developed and approved—with industry input. It identified nine “service volume” areas to receive coverage and five that did not meet the necessary “benefit-to-cost ratio.” Ten years later, AOPA

pushed for expansion of ADS-B coverage, specifically in Alaska. The FAASI classified this as a high priority; the FAA is awaiting a funding decision for the final five areas.

One issue that was not addressed by the FAASI concerns FAA staffing. As detailed in an August analysis of three accidents involving Alaskan Part 135 operator Taquan Air Service, ample evidence of FAA inspectors subjected to heavy assignment loads can be found in NTSB accident dockets.

In the Taquan investigations, principal operations inspectors (POIs) stated responsibility for anywhere from 30 to 67 operators. Further, in an 18-month period surrounding Taquan’s three accidents—which included nine fatalities and 15 serious injuries—the Ketchikan-based company had five different POIs, two of which were based 2,800 miles away in South Carolina.

At the time the article on Taquan Air was published, the FAA stated it “has increased

inspector staffing in all of the Alaska safety offices as we have elsewhere in the country. The number of operators per inspector is in line with agency standards.”

However, four days before the FAASI report’s release, the FAA closed the Polaris Certificate Management Office (CMO) in Anchorage. Established less than a decade ago following a series of Part 135 accidents, it was responsible for oversight of the largest Part 135 commuters in Alaska. According to the FAA, the CMO’s inspectors have now all returned to offices in the state, where standard duties are performed.

The next step for the FAASI team is formation of a “tiger” team to “develop the roadmap based on the recommendations in the FAASI final report with a prioritized emphasis on those recommendations that may be quickly integrated into the national airspace.” That report will be released no later than September 2022. ■



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Long-haul single-pilot operations face turbulence

Cathay Pacific is working with Airbus to introduce a concept that reduces the number of flight crew on long-haul flights. Project Connect, as it's known internally at Airbus, would certify the Airbus A350 for single-pilot operations during the high-altitude cruise phase of flight. Cathay hopes to introduce this idea on long-haul passenger flights beginning in 2025.

The project will likely encounter some turbulence on its path to widespread acceptance. Regulators must first be satisfied that safety is not compromised. Then passengers will have to come to grips with a single pilot at the controls of an airliner for hours on end.

In a post-737 Max environment, convincing regulators and passengers that automated technology is the best solution won't be easy.

Airbus said it leverages technology to improve safety and enhance efficiency across its product range. Project Connect would provide a sales advantage for the A350, because rival Boeing cannot compete with its technology.

As an example, Airbus plans to upgrade the A350 autoflight and warning systems for a lone pilot to manage failures. The aircraft is already equipped with an automated feature that initiates a descent without pilot input in the event of a rapid depressurization.

For Cathay, it is about the money. The airline could increase profits and cut expenses by reducing payroll on its struggling long-haul segments. Today, Cathay rosters long-haul international flights with three to four pilots, it hopes to cut that to just two with Project Connect.



BY STUART "KIPP" LAU
PILOT, SAFETY EXPERT, CONSULTANT,
AND AVIATION JOURNALIST

Pilot groups are uneasy with this program. In an interview, Otjan de Bruijn, head of the European Cockpit Association, said, "We struggle to understand this rationale...the program's cost-cutting approach could lead to higher risks."

In the U.S., Air Line Pilots Association (ALPA) president Joe DePete said in an ALPA white paper on this topic that "the most vital safety feature in transport-category aircraft now and for the foreseeable future are two experienced, trained, and rested professional pilots in the cockpit."

Project Connect calls for both pilots to be in the cockpit during critical phases of flight, but not during the high-altitude cruise phase. Once at altitude, the two pilots would alternate rest breaks.

With one pilot in the bunk, the remaining pilot at the controls would be constantly monitored for alertness and health by onboard systems. In the event of an emergency or medical issue—incapacitation or otherwise—with the pilot flying, the pilot in rest would be notified and summoned to return to the flight deck.

This delay with the other pilot returning to the flight deck has caused some

concerns with earlier participants in the project. Critics cite the Air France A330 crash over the South Atlantic as an example where it would be better to have more than one pilot in the cockpit.

During this event, an airspeed sensor malfunction in cruise triggered multiple confusing warnings and the aircraft slowed and entered a deep aerodynamic stall. At the time of the upset, the captain was in rest, and the two remaining pilots lost control of the aircraft, killing all 228 onboard.

These critics also suggest that the aircraft should be capable of flying autonomously for 15 minutes without any input to prevent these accidents. This demand would be hard for Airbus or any other aircraft manufacturer to guarantee.

ALPA always calls for the necessity of multiple pilots in the cockpit to ensure safety and said single-pilot operations are a "risk not worth taking." In a multi-crew environment, the workload is shared among both pilots.

The association cites events such as the "Miracle on the Hudson," where a highly trained crew worked together in a coordinated manner to safely ditch a crippled airliner after multiple bird strikes.

In addition, routine flights often require adapting an original plan to circumvent weather or accommodate air traffic control—each of these tasks increases the workload on the crew and would be more difficult to manage with a single pilot.

With only one pilot at the controls, others suggest an aircraft may be vulnerable to pilot incapacitation, or the pilot going rogue or committing suicide.

The ALPA white paper cites an FAA report indicating that there were 39 pilot

incapacitation events during a recent six-year period. The association also suggests that this number may increase due to an aging pilot population.

From 2002 to 2013, there were eight confirmed cases of pilot suicides where a pilot intentionally crashed their aircraft, killing themselves and all onboard. There were five additional suspected cases during this timeframe.

In 2015, Andreas Lubitz, a copilot on a Germanwings Airbus A320, deliberately crashed his aircraft, killing 150 people. Other tragedies, such as the loss of Malaysia 370—a Boeing 777—remain unsolved.

Public policy and opinion, according to ALPA, do not support single-pilot operations. Current design standards and regulations call for two pilots to fly a transport-category aircraft.

The association has concerns over security, both physical and cyber. There are fears that autonomous aircraft are more vulnerable to hacking by cyber-criminals. Likewise, one less pilot in the cockpit could increase the risk of an intrusion by hijackers or terrorists.

ALPA also suggests that the public is not convinced that single-pilot operations should happen at all. According to ALPA-sponsored surveys, there is little appetite to spend taxpayer money on reducing the number of pilots on the flight deck.

By regulation, transport-category aircraft rely on redundant systems to ensure the highest level of safety. By design, these aircraft have multiple engines, electric generator sources, hydraulic systems, and other backup systems—this philosophy makes air travel the safest form of transportation.

Project Connect calls for removing the single most critical component of this system—the pilot. Each pilot brings years of experience and training to the flight deck and success is only gained from these individuals working together. One less pilot potentially equates to a lower standard of safety for those passengers who trust the air transportation system. ■



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Business aircraft brokers and sales consultants are seeing challenging circumstances surrounding buying and selling activities. Many of the problems are due to extremely tight inventory, causing some buyers to throw caution to the wind.

Tight bizjet inventory creating need for urgency, caution

BY KERRY LYNCH

As the market for used business aircraft became white hot late last year and prospective buyers raced after rapidly disappearing inventory, industry leaders gave a cautionary tale of the need to proceed with caution. There are aircraft to be had, they said. But buyers must be prepared. Otherwise, it can result in deals gone wrong.

Speaking at the National Air Transportation Association's Aviation Business Conference in November, Paul Lange from the Law Offices of Paul A. Lange said the race to close preowned business aircraft deals in the face of a shortage of inventory had already begun to result in legal cases surrounding unhappy acquisitions.

Lange said his office is seeing a "tremendous amount of aircraft transactions and like everybody else, we're seeing a tremendous amount of people who were not in business aviation before."

These transactions are coming from a range of people, both new and those returning to business aviation, he said.

"The challenge right now is that we see transactions that are just insane, the risk levels that people are taking," Lange said. "Things that would never fly before are now happening. They're self-insuring. They're taking aircraft seizure risks."

He said he had one buyer that walked away from a deal where the risk threshold was literally criminal, as the seller was under house arrest in Eastern Europe. "But it still took about a day for the buyer to think about that," Lange said. "That kind of tells you where this insane market is."

Lange noted that people are worried about losing a deal, but they may have problems after it. "We've had a fair number of depositions in our office already on deals gone bad," he noted. This involves situations such as aircraft coming from Africa with no lawyers involved and showing up with \$500,000 worth of "surprises" that nobody wants to pay.

Others involve aircraft that are imported improperly into one country and a few

months later are improperly exported to the U.S. "There's no way to fix those problems without fixing the downstream [issues]," he said.

These deals can affect aircraft management and Part 135 operators that may not know that the aircraft they take in are at risk for seizure.

Meanwhile, brokers and other legal experts speaking at Corporate Jet Investor Miami, which was held in tandem with the NATA conference, advised that customers must be prepared to move on available aircraft, but carefully, and that they may have to look for inventory in places such as Russia or China.

"Time is really a constraint in terms of trying to conduct any sort of transaction," said Par Avion founder and president Janine Iannarelli. "But...I counsel people to still go slow because the last thing I want to do is overlook a point."

She agreed that one of the biggest challenges is to find available aircraft and cautioned that there may be aircraft on

the market but “it doesn’t mean it’s the right aircraft.”

Keri Dowling, president of Air Law Office, added that buyers must be “prepared to hit the ground running,” including ensuring that clients “frontload” everything as much as possible with the structure set up and the team established. And, she warned, “The mentality these days is the seller is always right,” noting that recently an aircraft buyer’s team lost a deal because they changed an inspection acceptance duration from three to five days and the seller walked away.

“You have to prepare your clients that the seller really is running the show. You need to be prepared up front and ready to go so the seller can’t walk away with an asset that you really want or need,” Dowling said. As far as moving on an available aircraft, she added, “It’s a matter of single-digit hours for turnaround time these days. The days of three or four days to think

about it and get your money in place and figure it out are gone.”

“Time is of the essence,” said Jeremy Stumpf, v-p of Freestream Aircraft. “The perfect aircraft likely will not be available.” The message is buyers need to move when they find an aircraft that may check the most boxes and “make changes to customize the aircraft after you close. The most important thing is to secure the aircraft.”

Amanda Applegate, a partner at Aerlex Law Group, advised that buyers put together teams that have expertise in cross-border transactions. “Certainly, in the last six months, I’ve seen far more cross-border transactions than I’ve seen in probably the last five years,” Applegate said. “These are coming out of registries or countries that perhaps you wouldn’t have looked at before.”

“We are looking around the world for aircraft all the time,” said Hamish Harding, chairman of Action Aviation. He noted

that he is finding them in places such as China, but that raises other complexities. “The Chinese sellers who used to be a bit flexible are now being very inflexible. They want everything bought as is,” Harding said. “You’re lucky if you get out of China and close in Singapore, but contracts are pretty one-sided right now.”

But he added if a buyer wants a high-end aircraft, China, Russia, and certain other countries may have them.

He also said buyers can create the sell-with price. He cited as an example an aircraft owner who may be taking a new model in upcoming months and wasn’t anticipating selling just yet may be willing at the right price.

However, new buyers are coming into the market unprepared. He noted new clients will come in with dollar figures in mind without any concept of the right aircraft that would fit their needs. ■



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The Covid pandemic has added layers of complexity to the tasks of international trip support.

Trip support in the age of Covid

BY CURT EPSTEIN

Business aviation has ridden a roller coaster over the past two years because of the pandemic. Yet, according to the industry's international trip support (ITS) segment, business is currently nearing or exceeding pre-Covid levels.

That's quite a turnaround from the start of the pandemic when international travel came to a virtual halt in a matter of days. One global trip support provider noted that its business plunged by 80 percent in just weeks, causing it to institute employee furloughs and other cost-saving measures as offices in many locations became idle.

Yet, as vaccines began to appear and initial infection surges subsided, some countries started to tentatively reopen their borders to travelers, and business aviation came back strong for a variety of reasons. "One is that people who may have gone commercially on some longer flights and not used the corporate jet now don't want to do that," said Christine Vamvakis, senior charter account manager with Universal Weather and Aviation. "Obviously, they don't want to be exposed to being on the same airplane with their 200 closest

friends' or have to go through the many lines at some airports." In many cases, greatly reduced airline schedules also made flying commercial less popular.

While security and convenience have always been part of business aviation's value proposition, "Covid is just another reason to get people on that private aircraft," explained Joel Logan, Flight Pro International's director of trip coordination services. He noted that company concerns are now more focused on preventing key employees from being sidelined by the virus. That and the surge in charter and leisure travel have provided the private aviation industry with some record-breaking usage days over the past few months.

INCREASED COMPLEXITY

Meanwhile, international flight planning has become more complex. "There's no such thing as an easy trip anymore," said Henry "Duke" LeDuc, operations director with UAS International Trip Support. "Before, there were just the civil aviation authorities that were involved in the [flight] approval processes. Now you've

got health authorities involved in all the approvals throughout the world and they all have a different approach to vaccine requirements and quarantine requirements. There's not a uniform way of approaching this challenge."

In the early days of the pandemic, it was not uncommon for countries to change their travel requirements literally overnight, and most of the major ITS providers have established internal teams dedicated to monitoring the requirements for each country.

Throughout the pandemic, those ever-changing regulations have spurred an increase in aircraft operators seeking trip support assistance. "It's considerations that we never dealt with before," noted Vamvakis. "Nobody ever asked about vaccines before...We're starting to see trends where certain countries will give you a lead time. Uruguay, for example, states that you need to get your vaccination within nine months of arrival."

"When you fold in the complexities and the amount of correspondence that goes into coordinating these things, these

operators are overwhelmed with information, and they've got a lot on their plates," said LeDuc, "so they are requesting more support in different ways than they have in the past, especially in areas like the Caribbean, which typically was a target for D-I-Y [trip planning]. That may not now be necessarily the case."

INFORMATION OVERLOAD

One source of confusion is the need to decipher the various testing thresholds demanded by different jurisdictions. "What we've found is the far-out places give you a little leeway because they know that it takes a long time to get there, but that's definitely the big question and that's like a moving target," said Logan. "Is it 96 hours? Is it 72 hours? Is it before departure? Is it before arrival? Is it three days? What does three days mean? Isn't that 72 hours? So, you have all those questions come up."

Aircraft operators aren't the only people who may feel their heads spinning. Even local authorities can be confused by rapidly changing restrictions. "Some of them were not always up to date," said Akram Abbas, manager of Hadid International Services' operation control center. "Some were not always clear or aware how to react in some locations to the changes that are happening, and we witnessed some miscoordination. The good thing is that everybody understands the situation is unusual, so we have not had many complaints from clients."

"There are locations where in the past you just maybe needed to be vaccinated," Vamvakis said. "Now they want vaccination and a PCR or antigen test, so that change may have come about, but the authorities may not have announced it; they have either just published it internally...or they just made an update and sent a fax to certain operators or certain vendors in the country." Vamvakis added that this situation provides more incentive to use an ITS with "boots-on-the-ground" intelligence.

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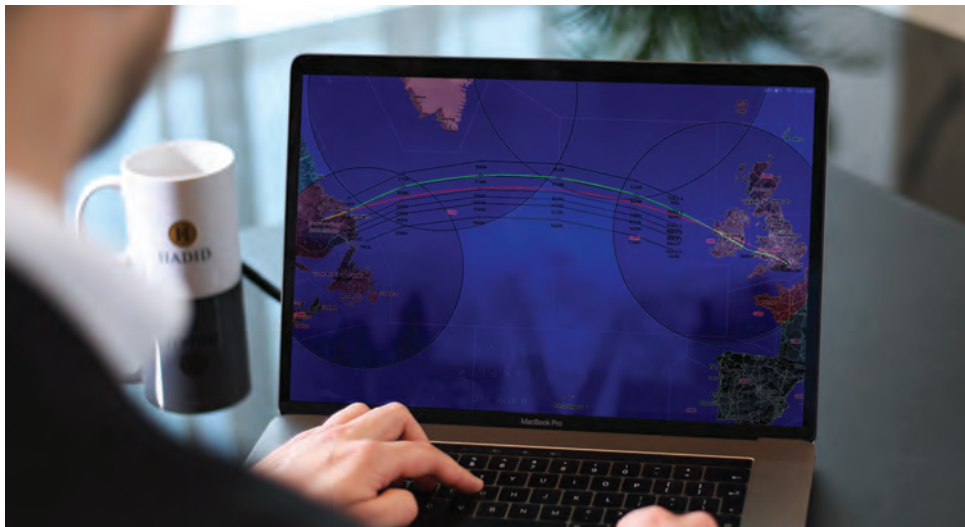
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“We’ve been classifying countries as closed, at least internally, if they require quarantine,” said Jeffrey Briand, vice president of global trip support with World Fuel Services. “No customer is going to go to a country and sit in quarantine for 10 to 15 days. Others that we consider closed are [those that allow] essential travel only.” He noted that the situation changes as countries relax their restrictions. “I’m starting to see a distinct move toward vaccinated versus unvaccinated, particularly in Europe,” Briand added. “In other words, if you’re vaccinated, you can come in. You still might require a PCR test, but once you get through the airport, you can move around the country.” Lastly, he described “open” countries as those with no vaccination mandate, just a requirement for a PCR test that could be between 36 and 96 hours old upon your arrival, depending on the country.

All those added layers of complexity and research resulting from the regulations have doubled the time it takes staff to perform international trip support requests, according to Louis Smyth, Universal’s senior manager of digital content and communications. All of the ITS providers AIN spoke with for this article stated that the flight planning process now takes longer than it did before the world faced Covid. Authorities in most countries now require longer lead times to process documents, meaning operators should add extra time to their schedules when they submit upcoming missions to their support providers.

That is not the only change the industry has experienced. “We were completely paperless before this pandemic, so the only thing we had to get our head around was working together on Zoom versus standing up and looking over a partition to talk to somebody,” said Briand. “It’s changed the way we do things significantly and with our online tools, [but] I don’t think our customers have seen any



The flight planning process now takes longer than it did before the world faced Covid.

difference in service level even as [activity] is picking up.”

On the ground, activity at some popular locations has rebounded so well post-Covid that customers are reporting delays. “For example, the fuel truck was late because there are so many aircraft on the ground that they can’t get to your aircraft on time, or clearing customs took longer because there were four aircraft in front of you,” said Vamvakis. “[As flights increase], you have limitations on parking and the old problems we used to deal with before Covid,” added Logan. “It’s nice in a way to see those challenges come up again because that means... the

world is getting back to normal a little bit.”

Another factor passengers need to consider before an international trip, along with understanding a country’s entry requirements, is where to obtain Covid testing at the destination, ahead of their return home or another leg on their trip. ITS providers maintain lists of reputable testing locations and their turnaround times.

“We believe the new normal...is that things like vaccination and PCR tests are always required,” explained Abbas. “In addition to your visa and your passport, these are additional things that we always have to look at.” ■



Limitations on parking, a pre-Covid problem, is once again in evidence.


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while Textron, despite the elimination of the King Air C90 from its lineup, bettered its previous turboprop delivery total by nine units, doubling its output of the King Air 350i/360/ER to 28.

Daher added seven more TBM 940s to its YOY total, while Pilatus improved on its PC-12 score by eight aircraft.

Epic Aircraft, which received FAA certification for its upgraded E1000GX in July, delivered five of these turboprop singles in the third quarter, improving its YOY deliveries by two airframes.

ROTORCRAFT RISE

The rotorcraft market bounced back strongly with a more than 100-unit delivery increase between the first nine months of 2020 and the same span in 2021, and a corresponding 30 percent increase in billings, to \$2.42 billion. Turbine helicopters rose from 333 to 410 deliveries, a more than 23 percent increase year-over-year.

Leonardo saw shipments rise from 50 units in the first three quarters of 2020 to 66 in 2021, a 32 percent increase, while Bell posted a nine-unit increase in deliveries of its 505 light single, which helped propel it to a better than 20 percent increase YOY.

Airbus Helicopters handed over 180 aircraft through the first nine months of 2021, good for a 15.3 percent boost YOY.

For its R66 single-engine turbine model, Robinson Helicopter posted a 17-unit increase during the first three quarters of 2021, part of the California-based OEM's overall 30 percent boost this year.

Connecticut-based Sikorsky, which delivered just one S-92 in the first nine months of 2020, handed over three in the same period this year.

“The general aviation manufacturing industry has shown perseverance with continued growth in all segments, all while still navigating pandemic-related setbacks, including ongoing supply chain and workforce challenges,” said GAMA president and CEO Pete Bunce. ■

Russian Helicopters offers Mi-171A2 and Ka-226T to commercial market

BY DAVID DONALD

Russian Helicopters demonstrated its newest commercial version of the Mil Mi-18/17 'Hip' family—the Mi-171A2—and the Ka-226T light utility helicopter at November's Dubai Airshow. Both helicopters offer new opportunities for commercial rotorcraft operators.

The Mi-171A2 represents a culmination of six decades of development following the first flight of the Mi-8 prototype in 1961. While the shape remains broadly the same, the latest aircraft incorporates major improvements in all areas.

Compared with earlier versions, the Mi-171A2 is powered by two uprated and Fadec-equipped VK-2500PS-03 engines—the civil version of the powerplant in the Mi-28NE attack helicopter—as well as having new composite main rotor blades and an X-shaped tail rotor. Combined with a strengthened transmission and a redesigned fuselage, this increases maximum speed to 152 knots, while permitting the carriage of a 4-tonne internal load or up to 5 tonnes slung underneath.

MODERN AVIONICS

A new KBO-17 digital glass cockpit and navigation suite is installed that reduces the required flight crew to two, while a range of diagnostic functions is embedded in the aircraft's systems. The Mi-171A2 has inherited its predecessors' ability to operate uncomplainingly in the harshest of weather conditions and temperature extremes, while reliability has been improved and maintenance requirements reduced.

The helicopter is designed to be rapidly reconfigurable between cargo, rescue, and passenger transport roles. In the latter it



The Russian Helicopters Mi-171A2 has been developed with versatility in mind, being rapidly convertible between a number of role configurations.

can accommodate 24 passengers on energy-attenuating seats, or 13 in a corporate configuration. In the medical evacuation role it can carry two medical modules, and can also be adapted to search and rescue, firefighting, and patrol/border security tasks.

Built at the Ulan Ude Aviation Plant, the Mi-171A2 received initial certification by Russia's Rosaviatsiya (Federal Air Transport Agency) under AP-29 Aviation Rules in August 2017, adding an extension that permitted operations at temperatures down to -50 deg C in January 2018. The first was handed over to Russian operator UTair in May 2018.

A partnership of Rosaviatsiya, Russian Helicopters, and the Rostec State Corporation has resulted in certification of the Mi-171A2 in Colombia, India, Kazakhstan,

South Korea, and recently Vietnam.

The Ka-226T, with its unique coaxial rotor design, made its international debut at the Dubai Airshow and showed off its precision maneuvering capabilities during the daily flight demonstrations.

Powered by Safran Arrius 2G1 engines, the twin-engine Ka-226T features easily exchangeable modules for quick configuration changes, modern digital avionics and autopilot with night-vision goggle compatibility, a maximum internal payload of one tonne, range of 232 nm, and cruise speed of 113 knots.

India has selected the Ka-226T for its air force and army aviation division, and plans call for joint production of 200 of the helicopters by the Ulan Ude Aviation Plant and India's Hindustan Aeronautics. ■

Bad night at Black Rock

BY MARK HUBER



A helicopter was lost and four people died trying to save a fisherman's piece of thumb.

The accident investigation that followed was one of the most thorough and painstaking in Irish and perhaps even European aviation. It touched on virtually every aspect of related technology, training, human and survival factors, navigation, operations, and regulation related to helicopter search and rescue (SAR) and spawned 42 separate safety recommendations.

It began on the evening of March 13, 2017. R118, a Sikorsky S-92A being operated as a search and rescue aircraft for the Irish Coast Guard by CHC Ireland (CHCI), was dispatched to a point 140 nm off that country's Mayo (west) coast at night, in foul weather. The mission: evacuate a crewman from a 260-foot-long fishing vessel who had lost the top part of his thumb in an accident. The shipboard medic had already staunched the bleeding, administered pain killer, and consulted with doctors onshore who advised there was little to be

done and in all likelihood the appendage could not be saved. This was not a medical emergency and while there was little medical benefit to be gained, SAR dispatchers launched R118 on its high-risk mission anyway. The wisdom of that decision would be the focus of much scrutiny in the years to come and in the pages of an exhaustive 348-page final accident report released this past November by Ireland's Air Accident Investigation Unit (AAIU). The AAIU's 2019 preliminary report triggered a flurry of objections from CHCI to the point that for the first time in its history an AAIU report was subject to reexamination.

In summarizing its own work on the accident, the AAIU noted that its report, "Highlights the importance of robust processes in relation to the following areas: Route Guide design, waypoint positioning, and associated training; reporting and correcting of anomalies in EGPWS [enhanced ground proximity warning system] and charting systems; fatigue risk management systems; Toughbook [portable computer]

usage; en route low altitude operation; and the functionality of emergency equipment. It is particularly important that an operator involved in search and rescue has an effective safety management system, which has the potential to improve flight safety by reacting appropriately to safety issues reported, and by proactively reducing risk with the aid of a rigorous risk assessment process. The final report identifies the importance of the levels of expertise within organizations involved in contracting and tasking complex operations such as search and rescue, to ensure that associated risks are understood, that effective oversight of contracted services can be maintained, and that helicopters only launch when absolutely necessary. Finally, regulatory authorities have a role to play in assuring the safety of aviation operations, including search and rescue activities."

With regard to launching rescue missions only "when absolutely necessary," the report explained that the National

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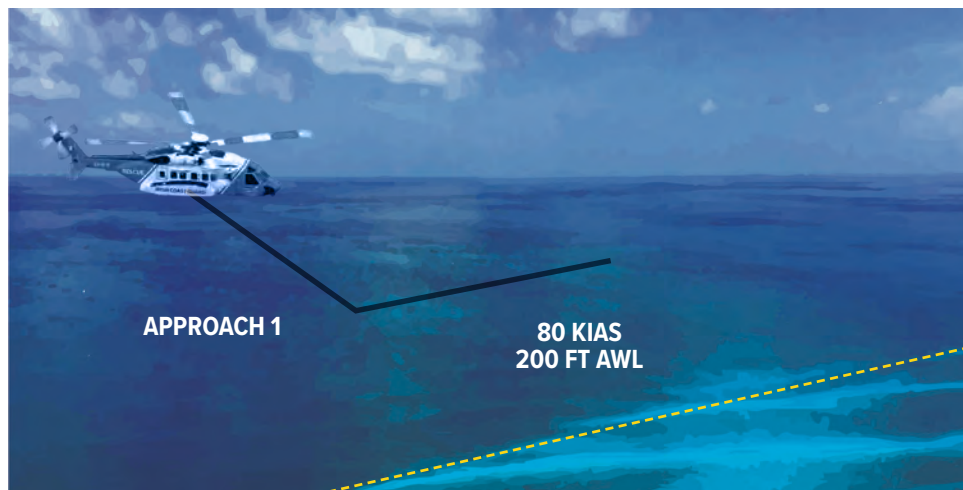
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Maritime Search and Rescue Framework provides the criteria for decisions about when to launch a rescue, including that “[SAR] comprises the search for and provision of aid to persons who are, or are believed to be, in imminent danger of loss of life.” The report added that “properly qualified officers” can use their initiative “in providing a SAR response in circumstances where these procedures are judged to be inappropriate.” However, in this case, “officers’ actions should conform as closely as possible to those instructions contained in the Framework most closely pertinent to the circumstances and they should keep all other parties involved informed.”

On the night of the accident, the Irish Air Force advised they could not provide customary fixed-wing “top cover” for the mission due to personnel availability, so CHCI dispatched a second S-92A, R116, this one from its base across the country in Dublin, to provide that service. R116’s crew already had logged a full day. Aircraft commander Dara Fitzpatrick had returned home from the day’s flying and retired for the evening when she got the call to return to base, as had copilot Mark Duffy. Winch operator Paul Ormsby and winchman Cianan Smith rounded out the crew. Fitzpatrick and her crew originally discussed routing direct to Sligo en route to refuel but later changed that decision to the Blacksod Helicopter Landing Base based on favorable weather reports received en route. Those reports—ceiling 400-500 feet and horizontal visibility of three miles—proved overly optimistic.

R116 approached Blacksod from the east at 4,000 feet, overflew it, and then began a descent to 200 feet above sea level (ASL) before reversing course to join the approach, which required it to pass

Approach 1 transitions to the low level environment



abeam Black Rock, an elevated rock cropping 9 nm west of the Blacksod helipad with a lighthouse and helipad at 282 feet ASL, with an elevation of terrain and lighthouse listed at 310 feet ASL in CHCI’s route guide. Outbound, R116 would pass to the north, inbound to the south. In conversation gleaned from the cockpit voice recorder (CVR), Fitzpatrick and Duffy admitted that they had not flown in this area in some time. Fitzpatrick said it had been close to 15 years. Although Black Rock was a known hazard, it was not loaded into the S-92A’s Honeywell EGPWS at the time, even though CHCI flight crews had noted this omission as

early as 2013. Crews with more recent local knowledge made a point of crossing Black Rock with plenty of altitude margin, sometimes flying at 900 ASL or higher.

The decision to descend to 200 ASL proved fatal as the crew likely was operating with incomplete information. As the AAIU noted, “The Flight Crew descended the helicopter to 200 feet and used the FMS to maneuver ‘Direct To’ the first waypoint, BLKMO, on the APBSS route, unaware that BLKMO was adjacent to a 282-foot obstacle comprised of terrain and a lighthouse.”

Fatigue also could have played a factor. At the time of the accident, aircraft commander Fitzpatrick had been awake for 18 hours and co-pilot Duffy for 17. The report noted, “The tempo of the mission was different to east coast missions and furthermore, the SAR support nature of the mission was known to be monotonous, increasing the risk of the Crew succumbing to fatigue.”

On the inbound course, R116 likely encountered winds from the southwest of up to 40 knots, forward visibility near nil, and a ceiling at or below 200 feet above ground level, based on subsequent weather observations from Blacksod.

“ The Flight Crew descended the helicopter to 200 feet and used the FMS to maneuver ‘Direct To’ the first waypoint, BLKMO, on the APBSS route, unaware that BLKMO was adjacent to a 282-foot obstacle comprised of terrain and a lighthouse. ”

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The wind was blowing R116 into Black Rock. While the beam at the lighthouse there was active, it was likely obscured by clouds. Reflections from the helicopter's running lights probably added to the problem. There also were issues with the cockpit lighting, altered for night vision installation, although night vision goggles had yet to be provided. The crew routinely brought their own flashlights aboard to compensate. But the diminished lighting, combined with the hard-to-read font, graphics, and color scheme of the company route guide, only added to the stress and confusion. Onboard radar likely was of little value, according to the AAIU. "Radar was operated on the 10 nm range throughout the descent and maneuvering to commence APBSS [the approach]. GMAP2 mode on the weather radar uses the colour magenta to represent terrain returns—the same color as the active track and waypoint on the S-92A navigation display. Black Rock was not identified on radar, which was likely due to obscuration caused by the magenta BLKMO waypoint marker and the magenta track line to the waypoint marker."

Nor were the charts loaded into the "Toughbook" computer used by the crew. The report found that "The 1:250,000 Aeronautical Chart, Euronav imagery did not extend as far as Black Rock. The



The multipurpose flight recorder was recovered 10 days after the accident.

1:50,000 OSI imagery available on the Toughbook did not show Black Rock Lighthouse or terrain and appeared to show open water in the vicinity of Black Rock. The AIS transponder installed on the helicopter was capable of receiving AIS Aids-to-Navigation transmissions; however, the AIS add-on application for the Toughbook mapping software could not display AIS Aids-to-Navigation transmissions."

It was winchman Paul Ormsby, operating the helicopter's infrared camera, who

saw the danger when the S-92 was a mere 0.3 nm or 600 meters from Black Rock flying at 90 knots. In the final seconds of the flight, he advised the commander to "come right." It took six seconds for the commander to acknowledge, at which point Ormsby said, "twenty degrees right, yeh."

Fitzpatrick then advised Duffy, "Okay, come right, select heading, select heading." Duffy acknowledged two seconds later, "Roger, heading selected." Four seconds later, Ormsby could see that it was too late, imploring the pilots to "Come right now..come right...come right!" Less than one second later synthetic voice "altitude, altitude" warnings sounded in the cockpit as the CVR recorded the sounds of impact.

R116 collided with terrain on the western edge of Black Rock and fell into the sea. The bodies of Ormsby and Smith were never recovered. Duffy was found strapped to his seat in the main wreckage, submerged 40 meters down. Fitzpatrick's personal locator beacon suggests that she submerged at least 10 meters before coming to the surface, but likely drowned during the ascent. The AAIU found the probable cause of the accident was, "The Helicopter was maneuvering at 200 feet, 9 nm from the intended landing point, at night, in poor weather, while the crew was unaware that a 282-foot obstacle was on the flight path to the initial route waypoint of one of the operator's pre-programmed FMS routes." But it also cited a dozen contributory factors, central of which was, "It was not possible for the Flight Crew to accurately assess horizontal visibility at night, under cloud, at 200 feet, 9 nm from shore, over the Atlantic Ocean."

The loss of R116 comes down to a tired flight crew flying in bad weather, at night, in unfamiliar territory, with incomplete information, on an unnecessary mission.

It was a bad night at Black Rock. ■



The yellow arrow shows the approximate location of the wreckage next to Black Rock.



Celebrating 40 Years of Patient Flights

In December 1981, Corporate Angel Network (CAN) completed its first flight, which transported a pediatric cancer patient home to Detroit, MI after receiving care in New York, NY. Today, 40 years and 66,000 patient flights later, CAN proudly partners with over 500 corporations to transport patients to specialized medical centers and back home again.

Thank you to the flight departments, corporate sponsors, and donors who continue to make CAN's mission possible. If you have an empty seat on your aircraft, contact CAN today to see how you can help someone in need. We look forward to the next 40 years!

"The gratitude we see every time we participate in a CAN flight reminds me how important it is that we all lead with love and step up to help those in need."

- Jeff McClean,
Vice President Global
Flight Operations,
Procter & Gamble



Textron confirms Bell's Nexus eVTOL may not make it to market

BY CHARLES ALCOCK



Bell's Nexus eVTOL was expected to carry four or five passengers to 60 miles at speeds of 150 mph.

While Textron still clearly harbors strong ambitions in the electric aviation and wider advanced air mobility sector, the U.S. aerospace group has all but confirmed that its Bell business's long-awaited Nexus eVTOL aircraft will not be its first product in this market, at least not in its current iteration. In a November 24 interview with **AIN**, Rob Scholl, the senior Textron executive appointed nine months ago to lead its eAviation team, acknowledged that Nexus is not an active program and said that the company will not confirm plans to bring a passenger-carrying eVTOL model to market until it confirms a business case for doing so.

"Nexus has been in the works for five years and it has been a useful exercise to test the [all-electric] technology and market feedback," Scholl explained. "Bell has continued to evolve designs internally and develop the technologies, and we have a good view of these in terms of the technology roadmap. We will continue to invest [in this area] as it makes sense, but we still have to see further development of the battery technology and the economic case."

Bell unveiled the Nexus eVTOL concept in early 2019 and the company was previously named by Uber as a partner in

its Elevate urban air mobility plans. However, since around early 2020, when it introduced the revised 4EX version and announced a partnership with Japan's Sumitomo group just before the Covid pandemic broke out, the company has had little to say publicly about progress with the project.

By contrast, in late September, Airbus unveiled its long-awaited plans to develop a four-passenger eVTOL aircraft called CityAirbus NextGen. This project is being led by the European aerospace group's Airbus Helicopters division, which competes directly with Bell in the rotorcraft market.

Textron's rotorcraft division has worked on its Autonomous Pod Transport drone concept with similar motivations, but, again, does not yet see a clear path to market. "We've looked at working with [defense-oriented] Textron Systems on that, but we see the same challenges in terms of economics," Scholl said. "A lot of these technologies that are in the early phases are very cost-sensitive."

Essentially, Textron appears to feel no commercial time pressure from attention-seeking start-ups racing to bring eVTOL models into commercial service around 2024. "The economics of these models are the key," said Scholl. "We could bring an aircraft to market, one that would be robust, pass the regulations, and work operationally, but it has to work for the public and that could take time; this market [for eVTOL passenger flights] could develop in waves."

So far, most of the eAviation team's efforts have focused on discussions with possible technology and capital partners. Scholl's role has been to understand what each Textron business unit is or could contribute to the group's plans for electric aviation and assess "where and how we can participate." He said that this exercise will continue into 2022, and Textron may announce further partnerships beyond those it has with Surf Air, which wants to convert Grand Caravan aircraft to hybrid-electric propulsion, and Xwing, which is working on remotely piloted operations with this ubiquitous utility model. MagniX and Ampaire are also advancing plans to convert the Caravan to electric propulsion.

Scholl said that the SkyCourier is another Textron aircraft that could benefit from electrification. Quizzed as to whether the company has similar plans for its King Air family, in view of start-up Bye Aerospace's plans to develop an electric challenger called the eFlyer 800, he noted that the task is more challenging for an aircraft of that size.

That said, Textron's customer base is increasingly pressing for the introduction



Airbus recently unveiled the design for its planned CityAirbus NextGen eVTOL aircraft.

of more environmentally sustainable aircraft. Scholl acknowledged that this market pressure, on top of momentum in the same direction from its own workforce, is a significant factor as it advances plans around reducing its products' dependence on fossil fuels, while also trying to reduce the carbon footprint of its production process.

“Nexus has been in the works for five years and it has been a useful exercise to test the [all-electric] technology and market feedback...”

"There's a lot of interest in sustainability from customers across the spectrum, and the industry would like to see fuels [like 100LL] phased out," Scholl said. "Electrification could be the way out for this, and we're talking to customers involved in areas such as training and special missions, as well as individual aircraft owners."

But autonomous flight, including remotely piloted operations, may take longer to adopt in Textron's view, even though Bell is working on increased automation for some of its existing helicopters. "Technology isn't the biggest challenge,"

concluded Scholl. "It's airspace integration and public acceptance. If we do autonomy too quickly, the public may not accept it for a long time and it could stunt its growth."

The recent launch of the CityAirbus NextGen program follows extensive flight trials with the CityAirbus and Vahana technology demonstrators. The design unveiled during a September 21 sustainability conference in Toulouse is a fixed-wing aircraft, with a V-shaped tail and eight sets of electric motors and propellers.

An engineering team led by Airbus Helicopters is working on the detailed design, with the aim of achieving the first flight with a prototype in 2023, en route to type certification in 2025. It will carry up to four passengers on flights of up to 80 km (50 miles) and at speeds of 120 km/h (75 mph).

In April, Italian rotorcraft manufacturer Leonardo confirmed plans to develop a hybrid-electric-powered light helicopter that could be available in the second half of this decade. The company said it will likely use the prototypes for its new AW09 aircraft as technology demonstrators for the new project.

Back in 2013, Leonardo announced plans to develop electric and hybrid-electric concepts for a new tiltrotor aircraft through its Project Zero initiative. This was based on a technology demonstrator that the Italian company, then called AgustaWestland, had already flown secretly in 2011 and 2012, but the project has since been abandoned. ■



Million Air To Expand Lone Star State Presence

Million Air will expand its Texas footprint with the establishment of an FBO at Laredo International Airport, where it will join two existing service providers. The Houston-based company expects to break ground on the \$15 million greenfield development this month, with an eye toward commencing operations by the end of 2022.

The facility will include a 12,000-sq-ft, two-story terminal with a passenger lounge, three conference rooms, two snooze rooms, and a pilot lounge. An initial 29,000-sq-ft hangar is planned to accommodate the latest ultra-long-range business jets, and the development will also include a 1,000-sq-ft ground service equipment maintenance facility.

Modern Aviation Buys Second FBO at KAPA

FBO operator Modern Aviation continues its expansion with the acquisition of a second terminal and hangar at Denver Centennial Airport.

Modern's latest purchase from aviation real estate developer The Sunborne Companies consists of a more than seven-acre leasehold, including a 62,000-sq-ft, three-story building that houses the Signature Flight Support FBO among other tenants, along with a 38,000-sq-ft hangar complex primarily leased by Signature.

According to Modern, it will take over the space occupied by Signature "at the expiration or earlier termination of its current operating agreement," which one industry source told *AIN* is slated toward the end of the decade. That move will allow it to encompass the entire south side of the field, giving it the largest leasehold among what would be the remaining four service providers.

Signature Buys Colorado Ski Country FBO

Signature Flight Support has expanded its U.S. FBO network with the acquisition of Vail Valley Jet Center, the lone service provider at Colorado's Eagle County Regional Airport (KEGE). KEGE serves many of the state's world-class ski resorts, and the move increases Signature's regional footprint, giving it its fourth FBO in Colorado and its first outside the Denver area.

The facility includes a 15,000-sq-ft, three-story terminal featuring a café, a coffee bar, concierge service, a conference room, a business center, and a pilot lounge with a snooze room. Also offered are crew cars, ramp-side vehicle access with complimentary valet, a heated vehicle garage, and car wash/detailing. U.S. Customs is normally available from 9 a.m. to 5 p.m. Thursdays through Mondays, with after-hours call-out available. The location also provides 25 acres of ramp with 238,000 sq ft of hangar space, which can accommodate the largest ultra-long-range business jets. An additional 57,000 sq ft of hangar space is due to open by the end of 2022.

Canada's Skyservice Expands to U.S.

Canadian FBO chain Skyservice has expanded into the U.S. via the rebranding of four Leading Edge Jet Center (LEJC) locations in the Pacific Northwest under the Skyservice banner. The two companies have shared primary ownership since 2019 through Toronto-based Instar Asset Management.

The LEJC locations are at Seattle King County Airport-Boeing Field (KFBI), Oregon's Redmond Municipal (KRDM) and Bend Municipal (KBND) airports, and Helena Regional Airport (KHLN) in Montana. Those facilities join the Canadian service provider's existing locations at Toronto Pearson International Airport, Montréal-Pierre Elliott Trudeau International Airport, Calgary International Airport, and Macdonald-Cartier International Airport in Ottawa.





Aero-One Aviation, Dothan Regional Airport

Aero-One Aviation, an FBO serving Alabama's Dothan Regional Airport (KDHN), began operations in 2010 and it has been the lone service provider there since 2014, after buying out its competitor. The company operates its main terminal in a 5,000-sq-ft building formerly occupied by the U.S. Air Force, dating back to the airport's past as a military base. While older than most FBO terminals the building has been renovated several times over its history, the most recent being four years ago. Aero-One is continually working to keep it fresh, having replaced all the interior furniture over the past year.

Amenities at the Air Elite FBO Network member facility include a passenger lounge, pilot lounge with snooze room, showers, pilot shop, conference room, flight planning area, and the Prop & Rotor Café (which of course being in Alabama serves barbeque), along with in-house car rental and crew cars.

The location occupies 130,000 sq ft of hangar space, which is home to 26 turbine-powered aircraft ranging from a Daher TBM 900 to a Citation Longitude. Aero-One expects to break ground in the spring on a new \$2 million, 15,000-sq-ft hangar, which when completed by the end of 2022 will be able to handle the latest ultra-long-range business jets.

The World Fuel Services-branded FBO sees approximately 1,200 operations a month and handles all the fueling at the airport for general, commercial, and military aviation operators. With the U.S. Army's fixed-wing flight school right across the field, along with major U.S. Navy and Air Force training bases located nearby, the latter traffic accounts for nearly a fifth of the FBO's activity. Aero-One even operates a satellite 1,100-sq-ft terminal to accommodate visiting



Established in 2010 at Alabama's Dothan Regional Airport, Aero-One Aviation now occupies 130,000 sq ft of hangar space with another 15,000 sq ft on the way.

military crews while their aircraft are being hot-fueled.

With line staff trained in the NATA Safety 1st program, Aero-One operates six 5,000-gallon jet-A tankers and one avgas truck, all of which are equipped with wireless transmitters to relay purchase information directly to the customer service desk. The trucks draw from the FBO's fuel farm, which has a capacity of 92,000 gallons of jet fuel and 15,000 gallons of 100LL avgas.

The FBO, which occupies 23 acres at KDHN, is staffed weekdays from 6 a.m. until 8 p.m. and 7 a.m. through 7 p.m. on weekends with after-hours callout available.

When it comes to customer service, general manager Scott Capehart explained, "We have a great team, but it's also what people say, that southern hospitality. We expect to always provide that kind of service, and it's out of the norm if it's not." That hospitality extends to picking up customer lunch orders from a local sandwich shop and bundling them up in a basket along with some extra treats and a thank you note before putting it on the aircraft.

According to Capehart, while Dothan is considered a small city, its population swells from 75,000 on the weekend to 275,000 during the week, based on activity at the local industries.

C.E.

BY JERRY SIEBENMARK



ExecuJet MRO Plans Expanded Malaysian Facility

ExecuJet MRO Services, through an agreement with Malaysia Airports Holdings, will build its own 144,000-sq-ft maintenance facility at Subang Airport, replacing the 64,000 sq ft of leased facilities from which it currently operates. The new facility will encompass 125,000 sq ft of hangar space and about 19,000 sq ft of office and shop space.

The new facility, which is expected to be completed in 2023, will accommodate a mix of up to 10 to 12 midsize to large-cabin, long-range jets.

The Malaysian site currently employs a staff of 70. That number is expected to reach 80 once the new facility is ready to occupy. A Dassault Aviation subsidiary since 2019, ExecuJet's Malaysia facility is authorized to perform maintenance on Falcon jets as well as Bombardier and Gulfstream aircraft.

Bombardier Adds Line Maintenance Station in Dubai

Bombardier has added a new line maintenance station in Dubai to provide Challenger and Global customers with "fast, efficient aircraft on ground service capabilities," as well as general line maintenance capabilities.

Located at Al Maktoum International Airport, the line station offers two mobile response team trucks and is staffed by a team of nine technicians. The company's facility also offers 3,000 sq ft of office space, stores, a tool room, and a general workshop.

With Move, Duncan Offers Airframe Mx at Teterboro

Duncan Aviation's relocated Teterboro, New Jersey facility within the Meridian FBO now includes the addition of airframe services, the Lincoln, Nebraska-based MRO provider announced. Previously, Duncan had provided avionics repair and installation at its Teterboro location. However, with the sale of Meridian's aircraft charter/management division, Meridian also disbanded its Part 145

repair station that primarily supported its charter aircraft.

As a result, Duncan added equipment and staff at the satellite operation, as well as FAA certification to provide airframe services at its new Meridian location.

Comlux to Build Mx Hangar at Dubai Aerospace Hub

Business aviation services provider Comlux signed an agreement with Dubai's Mohammed Bin Rashid Aerospace Hub (MBRAH) to develop a 12,000-sq-m (130,000-sq-ft) hangar facility at the site in Dubai South, due for operational launch in mid-2023.

Comlux will provide EASA and UAE Part 145-approved maintenance services and cabin upgrades as well as refurbishment for VIP aircraft at the hangar, which will be equipped to accommodate two ACJ or BBJ family aircraft types simultaneously.

Comlux Tech will manage the project for the Comlux Group, to develop synergies between Comlux Aviation's operations and Comlux Completion's know-how in VIP cabin engineering, particularly for the ACJ TwoTwenty, which is due to enter service based in Dubai in 2023 with hotels operator Five Group.

Transport Canada Gives Mx Nod to Clay Lacy KOXC

Clay Lacy Aviation's FAA Part 145 repair station at the Waterbury-Oxford Airport (KOXC) in Connecticut has been certified by Transport Canada to provide maintenance services for Canadian-registered business jets. Under the approval, Clay Lacy Connecticut can provide light line maintenance, heavy airframe inspections, jet engine and APU maintenance, and avionics and cabin entertainment upgrades and repairs.

The 65,000-sq-ft facility at KOXC offers maintenance on Gulfstream, Bombardier, Dassault, Cessna, Embraer, Hawker, and Eclipse business jet airframes. Clay Lacy also operates maintenance centers and full-service FBOs at Van Nuys Airport and Orange County John Wayne Airport.





Airshare opening maintenance services to outsiders

Airshare, a fractional and managed aircraft company based in the Kansas City area, is looking to expand its heavy maintenance facility in Wichita to include third-party maintenance even as it takes on additional aircraft in its fractional fleet. The company, which was founded in Wichita in 2000 and relocated its headquarters to Lenexa, Kansas, five years later, has begun the process of opening maintenance to business aircraft other than the 50 jets in its fractional and managed fleet, CEO John Owen told **AIN**.

“It is a place in the organization where we think there’s a lot of opportunity,” Owen said of the Wichita maintenance facility. “That’s one of the things we’re looking at right now.” Operating from a 27,000-sq-ft hangar and an adjoining 7,000-sq-ft office at Col. James Jabara Airport (KAAO), the facility opened in 2017. The operation was originally located in a 20,250-sq-ft hangar at Wichita Eisenhower National Airport when Airshare brought its maintenance in-house in 2005.

The KAAO facility became an authorized Embraer service center in 2012 in large part because Embraer Phenom 100s and 300s account for a majority of its fractional fleet. “It’s really the hub of our entire maintenance team,” Airshare COO Alex Franz told **AIN**. Augmenting Airshare’s Wichita maintenance base are smaller facilities in Fort Worth, Texas; Buffalo, New York; and Kansas City.

Wichita remains Airshare’s maintenance base because of its central location in the U.S., the Jabara facility, and the talent base in Wichita. Airshare also maintains a large managed and fractional customer base in Wichita.

Airshare senior director of maintenance Gary Veer, who is based in Wichita, was



Airshare’s primary maintenance base at Col. James Jabara Airport in Wichita.

Airshare’s first maintenance employee. “Gary has really built a great team there that allows us to continue to use that as our primary maintenance facility,” Owen added.

At any given time, the Wichita facility maintains and inspects an average of five to six aircraft, Franz said. “It is a full hangar all the time,” Franz said, adding that the facility provides heavy maintenance such as 120-month inspections.

Owen noted that even though its fractional fleet of 23 aircraft consists primarily of Embraer models—it has begun taking deliveries of new Bombardier Challenger 350s that it will offer in its fractional program beginning in December—its

managed fleet of 27 aircraft consists of Beechcraft King Airliners, Cessna Citations, Beechjets, Bombardier Global 5000s, and Gulfstream G450s, which are also maintained by Airshare maintenance technicians. “Those guys have been there a long time and have a lot of experience on different types,” he said.

Because the Wichita facility’s priority remains to maintain Airshare’s fractional and managed fleet, it will need to hire additional maintenance technicians to expand its services to include outside jet customers. “That’s going to require more employees [so] that’s kind of our focus right now,” Franz said. J.S.

BY DAVID JACK KENNY

The material on this page is based on reports by the official agencies of the countries having the responsibility for aircraft accident and incident investigations. It is not intended to judge or evaluate the ability of any person, living or dead, and is presented here for informational purposes.

Preliminary Reports

Premature Descent Claims Freighter

Dassault Falcon 20 Fanjet,
Oct. 5, 2021, Thomson, Georgia

The 1967 Falcon 20 struck 150-foot-tall pine trees almost a mile from the threshold during an instrument approach to the Thomson-McDuffie County Airport (HQU) and hit the ground 880 feet past the initial point of impact, killing both pilots and destroying the airplane. The Part 135 on-demand cargo flight was the crew's second scheduled leg. It departed from the Lubbock (Texas) Preston Smith International Airport after a two-hour, 20-minute wait for the freight to reach the airport.

The Atlanta ARTCC coordinated the last 40 minutes of the flight, during which the crew requested notams regarding the ILS approach to HQU's Runway 10. Both the localizer and glideslope were listed as out of service, but the notam for the localizer outage would not become effective until after their expected arrival. The controller advised the pilots accordingly, and they subsequently requested and were cleared for the "ILS localizer" approach to Runway 10 with instructions to cross the CEDAR initial approach fix at or above 3,000 feet msl. The controller also advised the crew that their readback came through on the emergency frequency of 121.5 MHz rather than the Center frequency.

FAA ADS-B data showed that the Falcon actually crossed the CEDAR initial approach fix at 2,500 feet and continued descending. About one minute later, the crew cancelled IFR; no further communications were received from the flight. Airport surveillance footage showed its landing lights in a steady descent on a constant heading for about two minutes

beginning at 5:42 a.m. In the last 25 seconds of the recording, however, it briefly turned right, then left. Its descent rate increased before the landing lights disappeared from view. The last ADS-B return came 1.36 nm southwest of the Runway 10 threshold at 800 feet msl.

Small aircraft fragments were found in a pine forest just past the initial point of contact. Both ailerons, pieces of both wings, the left engine, and the left main and nose landing gear were recovered from a second copse of trees. The fuselage, right wing, and right engine were found in an open field 0.7 miles from the threshold. The landing gear was down and the flaps extended to a full 40 degrees. There was no evidence of fire.

Both pilots were type-rated in the accident make and model. The captain had about 12,000 hours total time and the first officer 11,000 hours of total flight experience; both had more than 1,000 hours in type. Prevailing weather included seven miles visibility and scattered clouds at 1,200 feet with an overcast layer at 9,000 feet. Though not required by regulation, a cockpit voice recorder was present and recovered from the wreckage.

No Injuries in Caravan Emergency Landing

Cessna 208B, Oct. 22, 2021, Juneau, Alaska

The pilot and all five passengers evacuated the aircraft without injury following an emergency landing that collapsed the nose and right main landing gear, causing damage to both wings. The scheduled Part 135 passenger flight was departing from the C intersection of the Juneau Airport's Runway 08 when it abruptly veered right after reaching rotation speed. The pilot attempted to counter with left rudder, "but the pedal travel felt limited, and the airplane continued to the right toward a float

pond that parallels the runway."

Assessing that there was not enough room to stop short of the pond, the pilot continued the takeoff and maneuvered back towards the runway for an emergency landing. Once the runway was assured, "she pulled the firewall shutoff, fuel shutoff, and moved the master switch to the off position." The initial examination of the wreckage did not disclose any obvious mechanical anomalies.

Ag Copter Destroyed in Oklahoma Training Upset

Bell 206B, Nov. 28, 2021, Perry, Oklahoma

The pilot and owner was killed and the helicopter destroyed by the post-crash fire after he was unable to recover from an uncommanded left roll at low altitude and airspeed. The pilot's son, a student pilot being trained in aerial application techniques, was able to escape the burning wreckage but suffered serious injuries.

According to the NTSB's preliminary report, the pilot was a full-time helicopter air ambulance pilot who also did part-time seasonal work conducting Part 137 aerial application flights. The accident flight began with three circuits in the traffic pattern at the Perry Municipal Airport, followed by passes over a field west of the airport where he demonstrated low-level application maneuvers.

They broke off the maneuvers after seeing a coyote in the field. An uncommanded left roll began while the helicopter was flying about 50 feet above the ground at 25 knots. The pilot tried to counter but the helicopter crashed into the field next to a fence line, igniting a fire that consumed most of the aircraft. Weather conditions included 10 miles visibility and light southerly winds with no indication of turbulence or wind shear.

Final Reports

Quebec CFIT Attributed to “Flat Light” Conditions

Bell 206L-4, Jan. 22, 2020,
Lac Saint-Jean, Quebec, Canada

Canada’s Transportation Safety Board (TSB) concluded that the lack of visual references under a late afternoon overcast was the principal factor in a search and rescue helicopter’s collision with the frozen surface of Lac Saint-Jean. The pilot, though seriously injured, survived the accident and was able to call dispatch to report the accident. His use of a flight helmet, which the operator’s procedures did not require, and the four-point harness were cited as crucial to his survival.

The accident helicopter was one of two dispatched by the Quebec Service Aérien Gouvernemental (SAG) to search for a party of snowmobilers reported missing the day before. Both departed the Montréal/St. Hubert Airport (CYHU) at 7:50, stopping to refuel at La Tuque Aerodrome (CYLQ) before landing adjacent to the search area in the town of Saint Henri-de-Taillon at 10:25.

At 12:30, after nearly an hour of search operations at altitudes below 100 feet in the vicinity of several small islands near La Grande Décharge Lake, the pilot refueled at the Alma Airport (CYTF). After returning to Saint Henri-de-Taillon, it was determined that only one aircraft was needed to continue the search. Because its rear sliding door had proved difficult to close, the accident helicopter was dispatched back to CYHU. It took off at 14:02, approximately two hours before sunset, with a planned fuel stop at CYLQ.

GPS data recorded at two-minute intervals by the aircraft’s satellite tracking system showed that it climbed to an altitude of 305 feet on a track parallel to the eastern shore of the lake, then changed course to the west to avoid a group of islands while continuing to climb. The last data point was recorded 2.4 nm west of the shoreline at the flight’s maximum altitude of 330 feet. The

helicopter flew into the surface of the lake 1.34 nm further south about one minute later, at a calculated descent angle of 2.3 degrees. The distribution of the wreckage and the skid marks on the lake’s surface suggested a shallow, high-speed impact consistent with controlled flight into terrain rather than an in-flight loss of control.

On receiving the pilot’s call, the SAG dispatcher alerted the pilot of the second helicopter, still on the ground at Saint-Henri-de-Taillon. After boarding two Sûreté du Québec first responders, they located the wreckage at 14:45 and evacuated the pilot to the hospital in Roberval.

The pilot later told investigators that he thought he was in cruise flight at about 500 feet when he felt a “sudden longitudinal deceleration” and heard the engines surge as the helicopter rolled onto its side. While visibility at the nearest airport was reported as 25 miles, an overcast layer at 1,700 feet obscured the late afternoon sun, creating the soft, diffused illumination known as “flat light.” Simulations depicted in the TSB’s report show that at the accident site’s distance from the lakeshore, the views of the horizon from 50 and 330 feet were indistinguishable. They also noted that while the helicopter was equipped with both radar and conventional altimeters, SAG pilots did not routinely use the radar altimeter’s decision height bug, regarding the audible low-altitude alert as “a potential distraction that could negatively impact flight safety.” The barometric adjustment on the conventional altimeter was set .05 inch too high, causing it to read 50 feet higher than the aircraft’s true altitude.

PC-12 Survives Lightning Strike

Pilatus PC-12-47E, March 3, 2020,
Nice Côte d’Azur Airport, France

The airplane was struck by lightning while on approach in instrument conditions with thunderstorms in the vicinity. The pilots made multiple deviations during the approach to avoid storm cells. As the

airplane descended through 6,000 feet and just before it exited the clouds, the crew “saw a brief flash of lightning and heard a loud bang.” Engine and propeller instrument indications remained normal, but they requested and received clearance direct to the airport where they landed uneventfully.

Postflight inspection revealed damage to one propeller blade “that the manufacturer had never seen previously in operating conditions” as well as burn damage to the right ventral fin. A subsequent engine inspection found strike-related damage to numerous components including compressor blades, the oil scavenge pump, and elements of the propeller governor and planetary gearbox. The engine and fin were repaired and the propeller overhauled and reinstalled after the damaged blade was replaced.

A further inspection several days later revealed structural damage to the left wing “not related to the lightning strike” that required replacement of the wing. The nature of the damage was more consistent with excessive loading in flight than a hard landing, but the date and time of the overload could not be determined. France’s Bureau d’Enquêtes et d’Analyses also concluded that the airplane’s presence itself most likely triggered the electrical discharge. ■

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BY GORDON GILBERT

JUST AROUND THE CORNER

Jan. 1, 2022

Canada: Luxury Tax

A luxury tax on the sale of new high end autos and boats also applies to new general aviation aircraft sold in Canada or elsewhere and imported. It is scheduled to go into effect Jan. 1, 2022. The tax on aircraft is calculated at 20 per cent of its gross price including taxes above the threshold of \$100,000, or 10 per cent of the full value of the aircraft, whichever is lesser. “New” aircraft are defined as those manufactured beginning in 2019.

Within 6 Months

Jan. 19, 2022

NEW

U.S.: Covid Emergency Temporary Standard

The deadline for comments on a proposal to make permanent an Emergency Temporary Standard (ETS) on Covid-19 vaccination and testing has been extended from Jan. 4, 2022 to Jan. 19, 2022. The ETS from the U.S. Occupational Safety and Health Administration (OSHA) required that by Jan. 4, 2022, all private companies with 100 or more full- or part-time employees be completely vaccinated against Covid-19 or undergo weekly Covid testing. But on Nov. 12, 2021, a U.S. Court of Appeals granted a motion to stay the ETS. The Department of Labor has filed a motion to lift the stay.

Jan. 26, 2022

NEW

Europe: Helicopter Regulations

The European Union Aviation Safety Agency has proposed revising small helicopter certification regulations to provide more proportionate and cost-efficient rules to enable the use of the latest technology for equipment, systems and installations. The proposal aims to modify the application of stringent safety objectives to simpler small rotorcraft, which currently creates a cost barrier to innovation and the installation of state of the art equipment. Comments on the proposal are due Jan. 26, 2022.

April 30, 2022

Colombia: ADS-B Out Mandate

Starting on April 30, 2022, unless specifically authorized by ATC, no person may operate an aircraft within Colombian territory in any controlled airspace or other airspace in which a transponder is required without ADS-B Out operational capability.

June 10, 2022

U.S.: Pilot Records Database Reporting

By June 10, 2022, it's time to begin reporting information to the Pilot Records Database about individuals employed as pilots in commercial operations (including Part 135 air taxi and Part 91 air tour operators). Required information encompasses drug and alcohol testing results; training, qualification, and proficiency records; final disciplinary action records; records concerning separation of employment; and verification of a motor vehicle driving record search.

Within 12 Months

Sept. 16, 2022 and Sept. 16, 2023

U.S.: UAS Remote ID

New FAR Part 89 requires that after Sept. 16, 2022, no unmanned aircraft system can be produced without FAA-approved

remote ID capability. After Sept. 16, 2023, no unmanned aircraft can be operated unless it is equipped with remote ID capability as described in new Part 89 or is transmitting ADS-B Out under Part 91.

Nov. 13, 2022

Australia: Airport Certification Revised

Australian airport certification regulations (CASR Part 139) and an accompanying revised manual of standards (MOS) went into effect on Aug. 13, 2021. Under a transition period, operators of certified airports have until Nov. 13, 2022 to fully comply with the requirements and MOS publications.

Dec. 12, 2022

Canada: Duty/Rest Regulations

Revisions to duty time and rest regulations for Canadian-registered commuter and air taxi operators of turbine and non-turbine aircraft (CAR Parts 704 and 703) go into effect on Dec. 12, 2022. Transport Canada said the changes include: prescribed flight and duty time limits that respect modern scientific research and international standards to limit the amount of time a crew-member can be on the job; and fatigue risk-management systems that will require operators to demonstrate that any variance to the prescribed flight and duty time limits will not adversely affect the level of flight crew fatigue or alertness.

Dec. 31, 2022

New Zealand: ADS-B Out

Covid-19 pandemic implications prompted New Zealand to extend its ADS-B out compliance date for one year from the previous deadline of Dec. 31, 2021. The ADS-B provisions, already mandatory for aircraft flying above 24,500 feet, will apply in the rest of New Zealand's controlled airspace by Dec. 31, 2022.

Dec. 31, 2022

Mexico: CVRs and FDRs

Cockpit voice and flight data equipment requirements for turbine aircraft operations (including air taxis) go into force incrementally from Dec. 31, 2020 through Dec. 31, 2022 based on the number of aircraft that are in an operator's fleet. The rules generally apply to turbine airplanes with 10 or more passenger seats and large turbine helicopters.

Beyond 12 Months

June 12, 2023 and Sept. 9, 2024



U.S.: Pilot Records Database

By June 12, 2023, operators under Parts 91, 91K and 135 must complete submissions of reports to the pilot records database (PRD) of all historical records concerning training, alcohol testing, qualification, proficiency, and disciplinary actions dating on or after Jan. 1, 2015. Final compliance date for reporting historical records before January 1, 2015, is Sept. 9, 2024. Also beginning on Sept. 9, 2024, the Pilot Records Improvement Act ceases to be effective and will not be an available alternative to PRD for operators, entities, or trustees to which these regulations apply.

For the most current compliance status, see:

www.ainonline.com/aviation-news/compliance-countdown

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BY KERRY LYNCH

The U.S. Senate confirmed **C.B. “Sully” Sullenberger III** as the U.S. ambassador and representative of the U.S. before the Council of the *International Civil Aviation Organization*. Famed for his role in the successful “Miracle on the Hudson” emergency landing, Sullenberger has been serving as a safety advocate, author, and keynote speaker, and is a former U.S. Air Force fighter pilot and retired airline pilot who has amassed more than 20,000 flight hours.



PETER DEFAZIO

House Transportation and Infrastructure (T&I) Committee chairman **Peter DeFazio** (D-Oregon), who made a mark as a strong and outspoken aviation safety, consumer, and labor advocate over his 36-year congressional career, has decided to retire at the end

of this congressional term. First elected to Congress in 1986, DeFazio has been actively involved in the T&I Committee throughout his tenure, having served not only as chair of the full committee but also chair or ranking member of four of its six subcommittees, including aviation.

The *International Association of Aircraft Dealers* named **David Monacell** to a one-year term as chairman and **Zipporah Marmor** as vice-chair. Monacell succeeds outgoing chairman **Joe Carfagna, Jr.**, president and CEO of Leading Edge. Carfagna becomes chairman emeritus. Monacell is a partner in business aircraft broker CFSJets and has more than 20 years of private aviation sales experience. Marmor is v-p of aircraft transactions for Montreal-headquartered ACASS.



TYLER BOWRON

Hatt & Associates added **Tyler Bowron** as a new partner. Bowron, who has spent 14 years as a sales professional, was previously director of aircraft sales and acquisitions of QS Partners (formerly Cerretani Aviation) in Boulder, Colorado.

Jan Toschka was appointed president of *Shell Aviation*. Toschka joined Shell in 1998 and has leadership experience in energy transition, global marine, mobility as well as wholesale energy businesses.

Terrell Siegfried was elected president of the *Aeronautical Repair Station Association*. Siegfried, who takes the volunteer leadership position after serving on the organization’s board for three years, is assistant general counsel and corporate secretary for the Nordam Group.

Women in Aviation International named **Stephanie Kenyon** chief growth officer. Kenyon brings a background in nonprofit, humanitarian aid, and women’s initiatives working with the Aircraft Owners and Pilots Association, Embry-Riddle Aeronautical University, and Air Serv International.



STEPHANIE KENYON

Jet Aviation appointed **Jeremie Caillet** as senior v-p of regional operations in Europe, the Middle East and Africa (EMEA). Caillet has 15 years of aerospace industry experience and has held a number of roles since joining Jet Aviation in 2008, including within engineering, account management, project management, operations, and most recently as v-p of VIP completions.

Vertis Aviation appointed **Daniella Dawson** to the newly created position of head of sales as well as opened an office in Paris led by **Margaux Laplaine** and in Ljubljana, Slovenia led by **Karmen Bukvic**.



DANIELLA DAWSON

Dawson has served with Vertis for more than four years and previously has held roles with VistaJet, World Fuel Services, and Ocean Sky. Laplaine formerly was with iXAir Business Jets and also has served with Helipass and British Airways, among others. Bukvic, meanwhile, joined Vertis from Elit’Avia where she had worked since 2012.

F/List named **Mélanie Prince** as head of innovation. Prince has served with interior parts manufacturer F/List for 12 years, working in advanced research, engineering, certification, and systems engineering.

Airbus Helicopters named **Christian Venzal** managing director in Australia and New Zealand.

continues on page 62 >



AWARDS AND HONORS

NBAA president and CEO Ed Bolen and former Gulfstream and Bombardier executive Bryan Moss are among the *International Air & Space Hall of Fame Class of 2021* honorees. Joining them in this year's slate are: the Commemorative Air Force; Eileen Collins, the first female commander of the space shuttle and the first person to fly the shuttle to two different space stations; Apollo 16 lunar module pilot Charlie Duke, who became the youngest to walk on the surface of the moon on April 16, 1972; FedEx; and Dee O'Hara, who was the first aerospace nurse assigned to NASA's first seven astronauts in 1959 and then participated in every launch in the Mercury, Gemini, and Apollo programs.

The Wichita Aero Club (WAC) selected Ryan International founder and long-time corporate pilot Ron Ryan as the 11th recipient of its annual honor, the Wichita Aero Club Trophy. Ryan is being recognized for serving the global and local aviation community with "creative leadership, vision, and generosity."

Bombardier named Nick Verdea, director of aviation and corporate travel for The Williams Company in Tulsa, Oklahoma, as the 2021 recipient of the Safety Stand-down Award. A certified aviation manager, Verdea is a long-time Safety Standdown supporter and "has demonstrated exceptional safety leadership throughout his 25-year aviation career," Bombardier said.

MedAire founder and chair Joan Sullivan Garrett was enshrined into the National Aviation Hall of Fame during NBAA-BACE. Garrett was recognized as a visionary who pioneered telemedicine and founded the aviation industry's first global remote medical emergency response company, MedAire, in 1985. She also called for higher standards for first responder training and onboard medical supplies.

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LEARN MORE

nbaa.org/2022hpn

Bombardier Safety Standdown celebrates 25th anniversary

BY STUART "KIPP" LAU

The Bombardier Safety Standdown celebrated its 25th anniversary last fall in Wichita, Kansas. Over the past quarter-century, the event has become one of the most comprehensive and respected human-factors conferences in the aviation industry.

The mantra of “learn, apply, share” serves as the cornerstone of the Safety Standdown, during which industry professionals come together for two days of safety training. Bombardier plays a key role in organizing and sponsoring the conference.

Over the years, more than 10,000 aviation professionals from all sectors and many disciplines have attended Safety Standdown during live events; many more have experienced the conference through webcasts. In 2021, nearly 200 people visited Wichita to participate in the conference, while another 1,100 from more than 20 countries joined the event via a webcast. The event typically draws 400 or more attendees but Covid restrictions limited last year’s in-person registrations.

Former Safety Standdown award winner and long-time safety advocate Mike Ott called the Bombardier Safety Standdown “the ultimate act of corporate citizenship.” Ott is a high-time Learjet and Gulfstream pilot flying worldwide missions for Phoenix Air Group, where he acts as the director of government contracting. In addition, Ott is a member of the Safety Standdown Advisory Council, IS-BAO Standards Board, and NBAA Safety Committee.

Bombardier started the Safety Standdown in 1996 as a safety training event for its Learjet flight demonstration team in Wichita. After three years of success and growth, Bombardier opened the event to



New Safety Standdown leader Chris Milligan (far left); Ed Coleman, Standdown council member; Standdown award winner Nick Verdea; and outgoing leader of the program, Andy Nureddin.

all corporate pilots and flight crews, not just to Bombardier customers. There has never been a fee charged to attend, and the list of attendees is diverse; the roles vary from flight crew to maintenance to other supporting employees such as flight dispatchers and schedulers.

PERSONAL DISCIPLINE

The goal of each Standdown is to promote knowledge-based pilot safety training along with personal discipline and responsibility as essential elements of aviation safety and professionalism. This is accomplished each year by recruiting industry thought leaders to facilitate general session presentations as well as workshops. Last year’s two-day event included six presentations in the general

session and more than 12 workshops.

In 2021, Bombardier passed leadership of the event to Chris Milligan, Bombardier v-p certified preowned aircraft services, flight operations.

Milligan succeeds Andy Nureddin, a long-time Bombardier executive and past steward of the program. Nureddin has led the event for 25 years and said, “Safety Standdown is one of the most comprehensive human factors safety conferences in the industry...We at Bombardier are exceptionally proud to be sharing critical strategies to improve safety awareness, processes, procedures, and structures in all aspects of our operations.” Nureddin is currently the Global 7500 program lead and plans to retire in late 2022.

Milligan said, “It is an honor to be taking over as the leader of this invaluable industry event, one my colleague Andy Nureddin has been so effectively leading for many years. Bombardier champions this important event because it enables us to take on current threats to aviation safety, as well as develop opportunities to create a culture of safety and leadership. This event also presents an outstanding opportunity for industry leaders to share tools and solutions to address the challenges we all face.”

The Safety Standdown is more than an annual conference. The complete program consists of an Advisory Council, several subcommittees, an internal Bombardier ambassador program, a safety award program, and a website that has resources in its knowledge center.

The Safety Standdown Advisory Council consists of a diverse group of 12 professionals from aviation and other industries. Council members provide advice and recommendations for the content and direction of the Safety Standdown programs.

Beginning this year, the Federal Bureau of Investigation’s digital transformation advisor, Dr. Amy Grubb, takes over as the Safety Standdown advisory chair. Grubb is the first non-aviation-based chair and the first woman to hold this position. She has been a member of the Advisory Council since 2018 and is an industrial-organizational psychologist who provides insight regarding leadership, organizational culture, and change management, all areas that are relevant to aviation safety.

“I’m excited for the future of Bombardier Safety Standdown,” Grubb said. “The past few years have set the stage for the future: to be more than a single event that happens once a year.” It is, she said, a community “with top-notch resources and year-round offerings to keep safety at

the forefront of aviation operations. Bringing in additional perspectives from cabin crews and flight operations and maintenance—and even other industries and disciplines—has really enhanced how to be safe in aviation, and I look forward to that trend continuing.”

Grubb follows Ed Coleman into the role of Safety Standdown Advisory Council chair. Coleman has been a Council member since 2015 and was instrumental in navigating the event through a global pandemic. In 2020, the Safety Standdown was held virtually through a series of webcasts and the launch of the “Safety Talk” series of videos; and that concept that is planned

“The ‘Learn, Apply, Share’ motto is something I’ve experienced multiple times. Standdown really is one of the best-kept secrets in aviation safety, and the fact that it costs nothing to attend is a testament to Bombardier and the sponsors who help us put it on every year.”

to continue. Coleman, a former Safety Award winner, is the manager of aviation at Midwest Transplant Network and flies a Cessna Citation CJ3.

He has great memories of the Safety Standdown and said, “In the 25 years that Safety Standdown has been meeting, the audience has grown from a few dozen pilots at Learjet and now includes attendees from the entire aviation community. In the past few years, we have had award winners that represent pilots, government, support organizations, and maintenance. The Advisory Council has grown as well and now includes representatives from business aircraft operators, maintenance operations, airport managers, and dispatchers.

“I was pleasantly surprised when I asked how many were attending for the first time and nearly a third of the room raised their hands,” Coleman continued. “We have reached operators from every corner of the world and our recordings are used in a multitude of settings, from universities to flight schools to small department meetings...The ‘Learn, Apply, Share’ motto is something I’ve experienced multiple times. Standdown really is one of the best-kept secrets in aviation safety, and the fact that it costs nothing to attend is a testament to Bombardier and the sponsors who help us put it on every year.”

Each year, the Safety Standdown Advisory Council culls through nominations for its annual Safety Award. The award goes to aviation professionals who demonstrate a commitment to the promotion of safety. The award winners live the principles of the Safety Standdown by following the “learn, apply, share” model in their flight departments and beyond. The 2021 Safety Award was presented to Williams Company director of aviation and travel Nick Verdea, a longtime supporter and advocate of the Safety Standdown. Based in Tulsa, Oklahoma, Verdea is a Certified Aviation Manager and Global Leadership Professional. In addition to managing a team of 13 professionals, he has accumulated over 13,000 accident-free hours.

The future looks bright for the Safety Standdown. New leadership plans to build on the event’s past successes while adding a few new elements such as experts from outside of aviation, to bring fresh perspectives. Plans are underway for the 26th Safety Standdown in the fall of 2022. ■

Pilot, safety expert, consultant, and aviation journalist, Kipp Lau writes about flight safety and airmanship for AIN. He can be reached at stuart.lau3@gmail.com

► People continued from page 58

A 30-year aerospace industry veteran, Venzal moves to the region from the company's headquarters in Marignane, France, where he was v-p of transversal coordination and business development and has had experience in general management, strategy, sales, customer relations, and procurement.

Jet Linx promoted **Jay Vidlak** to the newly created position of senior v-p aircraft. Vidlak, who began his career with Mayo Aviation, joined *Jet Linx* in 2002 as a flight scheduling coordinator and has held positions of increasing responsibility since, most recently as senior v-p.

Jet East hired **David Grup** to serve as v-p of sales. Grup, a former member of the U.S. Navy search and rescue team, has held maintenance roles with companies including Stevens Aviation and Textron Aviation and most recently was regional sales director for Constant Aviation.

ACC Aviation appointed **Andreas Pericleous** v-p of business development. Pericleous brings 10 years of international aviation experience to *ACC Aviation*, previously spending five years leading business development for international brokerage and charter firm Cyprus.

Jeffrey Miller was named executive director for *Chicago Executive Airport*. Miller has more than a decade of airport management experience, most recently the airport director at Laredo International Airport in Laredo, Texas.

The *International Business Aviation Council* (IBAC) has selected **Steven Abreu-Hill** as its new International Standard for Business Aircraft Handling (IS-BAH) audit manager. Abreu-Hill, who has 16 years of combined experience in emergency response, safety, security, environmental, and safety management system program development, helped coordinate and develop comprehensive emergency management programs for Houston Hobby Airport (HOU) and George Bush International Airport (IAH). ■



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