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In this issue



32

Higher Plane: Special Olympics Airlift, a lasting legacy at Textron Aviation



42

Remembering a solemn anniversary: The Amazon midair



6

Dassault confirms 2029 service entry for Falcon 10X

4

Solairus to acquire Clay Lacy air charter/management business

8

Textron Aviation's CJ3 Gen3 takes to the skies

10

HondaJet Elite II notches ANAC nod, first Brazil delivery

12

Thinking on the fly: Steve Brown recalls unprecedented times of 9/11

16

AIN Product Support Survey, Avionics

28

Farnborough International Airshow 2026

34

AIN Roundtable: Ready for potential jamming and spoofing

DEPARTMENTS

46 On the Ground | 48 MRO | 50 Accidents

52 Compliance | 54 People in Aviation

On the cover: Garmin Axis flight displays

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News Briefs

BOMBARDIER RESULTS LIFTED BY GLOBALS, SERVICES

Bombardier's continued scaling of services revenue to a record \$674 million in the second quarter, and a stronger mix of business jet deliveries, offset its overall four-unit drop in shipments to 32. The Montreal-based manufacturer handed over seven fewer Challengers in the quarter for a total of 14. Meanwhile, it delivered 18 Globals, three more than a year ago. It ended the quarter with a \$21.8 billion backlog, up from \$17.5 billion at the end of 2025, driven by a book-to-bill of 1.5:1.

GULFSTREAM BIZJET SALES, DELIVERIES SOAR

General Dynamics' aerospace division, which comprises Gulfstream Aerospace and Jet Aviation, saw revenue jump 15.1% year over year (YOY) in the second quarter to \$3.525 billion, while profit rose 26.6% to \$510 million. In the first half, revenue and profit totaled \$6.8 billion (+11.8% YOY) and \$1 billion (+20.1%), respectively. Gulfstream delivered 41 jets (six super-midsize G280s and 35 large-cabins) in the quarter versus 38 (six G280s, 32 large-cabins) a year ago. Its book-to-bill in the quarter was 1.5:1, and aerospace backlog is now \$25.15 billion, nearly \$2 billion higher than at the end of March.

IBAC OFFERS IS-BAH SELF-DECLARATION OPTION

The International Business Aviation Council (IBAC) introduced a self-declaration option for its International Standard for Business

Aircraft Handling (IS-BAH), a safety management system-based program for ground handlers. The option "simply allows organizations to use the globally recognized industry standard as a tool internally" to gauge their own performance, said IS-BAH program director Terry Yeomans. He added that it could help handlers meet their safety and regulatory oversight obligations.



Solairus founder and CEO Dan Drohan said the acquisition would solidify the company's position as "the leading pure-play aircraft management company in the world."

Solairus acquiring Clay Lacy's charter/management business

BY AMY WILDER

Solairus Aviation is acquiring Clay Lacy Aviation's aircraft management and charter divisions, which would push the former's managed fleet beyond 500 aircraft. According to Solairus, this deal—announced in early August and set to close in September—will make it the world's largest business aircraft management provider.

Brian Kirkdoffer, chair of Clay Lacy's board, said the deal will allow Clay Lacy to sharpen its focus on its remaining FBO, maintenance, and real estate operations. The deal is subject to regulatory approval and other customary closing conditions. Financial terms were not disclosed.

"With this transaction, Solairus solidifies its position as the leading pure-play aircraft management company in the world," said Solairus founder and CEO Dan Drohan. "It is about people,

relationships, trust, and service." The combined company will be "better equipped to enhance the client experience while maintaining the high-touch, personalized management services that have been the hallmark of Solairus and Clay Lacy," he added.

The deal stemmed from overlapping values between the two companies around safety and culture, Kirkdoffer said. "We know that we're putting our valued clients in good hands with Solairus."

Solairus currently manages roughly 360 aircraft from more than 100 bases across North America, while Clay Lacy manages about 140 aircraft.

Once the deal closes, Solairus will run the combined operation out of its Petaluma, California headquarters, as well as offices in Los Angeles and New York. ■

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News Briefs

DASSAULT 1H REVENUE NEARS €4.2B, FALCON SALES REBOUND

Dassault Aviation's first-half 2026 revenue rose 46% year over year (YOY) to €4.157 billion (\$4.74 billion), while net Falcon orders nearly tripled to 23 airplanes. The French OEM delivered 13 Falcons in the first half, one more than a year ago, generating revenue of €1.2 billion, up \$100 million YOY. Falcon orders in the first six months added €1.9 billion to backlog, compared with eight Falcons worth €900 million last year. Falcon backlog grew to 83 aircraft worth €5.4 billion as of June 30, from 73 aircraft worth €4.7 billion at year-end 2025. Dassault attributed the rebound in part to a lift in Asian demand.

EMBRAER RACKS UP RECORD PERFORMANCES IN Q2

Embraer reported record second-quarter revenue of \$2.2 billion and reached its largest-ever backlog of \$34.5 billion. At its executive aviation division, revenue climbed 32%, to \$725 million. The division delivered 45 business jets (24 Phenoms and 21 Praetors), up from 38 (21 Phenoms and 17 Praetors) in second-quarter 2025. Backlog is up 16% YOY overall, with the Embraer Executive Jets division's backlog rising 5%, to \$7.8 billion. The business jet segment has maintained a book-to-bill above 1:1 as demand remains strong, Embraer said.

ROBINSON HELICOPTER TAPS PIPER FOR R88 SHEET METAL

Piper Industrial Manufacturing Co. (PIMCO) will help Robinson Helicopter with sheet-metal manufacturing for the in-development R88 helicopter. PIMCO is helping the helicopter manufacturer with sheet-metal forming, tooling design, and assembly processes. Both companies are also sharing best practices in aircraft design, manufacturing processes, and quality control systems, according to Piper Aircraft.



The Falcon 10X certification campaign is now expected to stretch into late 2028 or early 2029.

Dassault Falcon 10X service entry slips from 2027 to 2029

BY AMY WILDER

Dassault Aviation has pushed service entry of its flagship Falcon 10X to 2029, two years later than the target cited when the aircraft achieved first flight in June. Speaking during the company's half-year financial results press conference, chairman and CEO Éric Trappier attributed the extended timeline to a more stringent regulatory environment that took effect in 2023 in the wake of the Boeing 737 Max crashes.

"Ever since the Boeing accidents, certification has become a more complicated matter," Trappier said. "Here we have a completely new aircraft. There are new rules, new certification rules that did not apply on the 6X, for instance, and so we expect the process to take longer."

The 10X made its first flight on June 19 at Bordeaux-Mérignac Airport (LFBD). Test pilots Sébastien Dupont de Dinechin and Fabrice Dougnac conducted an initial evaluation of the aircraft's handling qualities at 15,000 feet before retracting the landing gear and movable surfaces and climbing to 40,000 feet. They accelerated to Mach 0.82 during the two-and-a-half-hour flight.

In June, right after the first flight, Dassault apparently was still hoping for type certification in 2027. Trappier's latest comments indicate the certification campaign will now extend at least until late 2028 or early 2029.

Meanwhile, the test campaign is expanding. A second flight-test 10X is nearing completion at Mérignac. A third example fitted with a full cabin interior will be used primarily for evaluating aircraft systems and cabin functionality. Airfield pavements at Dassault's Istres flight-test center are being renovated to accommodate the 10X, which is heavier than its Falcon predecessors.

Despite the schedule revision, Trappier expressed confidence in the program's trajectory. "A lot of engineering and certification to come," he said, "but the bulk of the work is behind us." He noted that Dassault is the only OEM to have flown an entirely new aircraft of this size in 2026.

The 10X is powered by two Rolls-Royce Pearl 10X turboprops delivering more than 18,000 pounds of thrust, and features the NeXus avionics suite developed with Honeywell. The wide-cabin, ultra-long-range jet offers a range of 7,500 nm and a top speed of Mach 0.925. ■

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News Briefs

AW09'S ARRIEL 2K ENGINE WINS EASA NOD

Leonardo's AW09 is a step closer to entry into service after EASA granted type certification for the Safran Helicopter Engine's Arriel 2K that powers the light-single helicopter. The 1,000-shp-class engine has dual-channel Fadc and an engine auxiliary control box that reduces pilot workload. Bench testing of the Arriel 2K started in 2022, and it first flew on the AW09 in March 2023, logging more than 4,100 test hours and 600 in flight.

AUTOLAND MAKES NEW PHENOM 300EV PHENOMENAL

Embraer Executive Jets announced its third aircraft refresh this year with the Phenom 300EV, adding Garmin Autoland, autobrake, a rudder-by-wire system, and other improvements to the light jet, after February's Praetor 500E and 600E launches. The 300EV has completed flight testing and is expected to receive FAA, EASA, and ANAC approvals by year-end, Embraer said, with first deliveries set for late 2028. Avionics upgrades cover runway/taxiway awareness, FANS 1/A+, and RNP AR 0.3. Performance updates include 45 nm more range, to 2,055 nm, and a 430-pound payload increase, to 3,066 pounds. Inside, the new Phenom gets a vacuum toilet, redesigned galley, and optional, factory-installed Gogo Galileo.

EBAA WEEK COMBINES EVENTS FOR BIZAV INDUSTRY

The European Business Aviation Association (EBAA) will hold a new three-day event, EBAA Week, in Brussels from November 16 to 18. It will bring Europe's business aviation community together for discussions covering operations, safety, policy dialogue, and industry engagement, with different events running in tandem. Participants are expected to include aircraft operators, service providers, policymakers, and regulators.



The Cessna Citation CJ3 Gen3 joins the CJ4 Gen3 and M2 Gen3 in the flight-test program.

Textron Aviation's CJ3 Gen3 achieves first flight

BY KERRY LYNCH

Textron Aviation's latest member of its Gen3 portfolio, the Cessna Citation CJ3 Gen3, took a step toward certification with its first flight on July 29. With the flight, the twinjet joins the CJ4 Gen3 and M2 Gen3, which have entered flight testing as Textron Aviation continues to refresh its light-jet models.

"This achievement continues the forward momentum of the CJ3 Gen3 program and reflects the discipline, innovation, and commitment of this team," said Chris Hearne, senior v-p of engineering and programs. "Comprehensive flight testing will now begin for this aircraft with rigorous validation of its performance as we continue to work toward FAA certification and entry into service."

Piloted by Steve Helmer and Dave Welbrock, the aircraft took off from Wichita Dwight D. Eisenhower National Airport on a nearly two-hour-long flight, reaching 41,000 feet and 278 kias. The pilots

tested software functionality in the cockpit during the mission.

"From takeoff to landing, the aircraft demonstrated the handling qualities and system performance we expected," Helmer said. "This first flight validated months of preparation and provided a strong foundation as we expand testing and continue the certification program."

The CJ3 Gen3 adds Garmin Emergency Autoland to the model's Garmin G3000 suite. It can seat up to 10 people and has a range of 2,040 nm, maximum payload of 2,135 pounds, and 1,000-pound baggage capacity. Textron Aviation is targeting market entry in 2027.

"The Citation CJ3 Gen3 builds on everything customers value about the CJ3 family while incorporating technology they've asked for to make flying even more intuitive and confidence-inspiring," said Lannie O'Bannion, senior v-p of global sales and marketing. ■



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HondaJet Elite II lands in Brazil with ANAC nod

BY MATT THURBER

@ LABACE 2026

Honda Aircraft has delivered the first HondaJet Elite II to a customer in Brazil, after the country's National Civil Aviation Agency (ANAC) granted type validation for the very light jet. The announcement came as HondaJet-authorized sales representative Lider Aviação displayed the Elite II during LABACE 2026 in August at São Paulo Campo de Marte Airport (SBMT).

Featuring Garmin's Emergency Autoland, the Elite II is equipped with autothrottles that ease pilot workload in busy airspace and Garmin G3000 avionics. Ground spoilers improve takeoff and landing performance, and Honda Aircraft increased the jet's four-passenger

NBAA IFR range to 1,547 nm. The Elite II was unveiled in October 2022.

The HondaJet's over-the-wing-engine-mount design allows for a larger cabin while maximizing high-speed cruise efficiency. With an enclosed lavatory and seats for up to eight occupants, the Elite II can cruise at up to 422 knots.

"This delivery underscores Honda Aircraft Company's commitment to building a global fleet presence while delivering meaningful value to customers worldwide," said Amod Kelkar, senior v-p and chief commercial officer of Honda Aircraft. "The enhanced features of the Elite II will enable customers in Brazil and across South America to travel farther, more efficiently, and with an elevated level of comfort." ■



HondaJet-authorized sales representative Lider Aviação displayed the Elite II at LABACE 2026.

News Briefs

GARMIN LAUNCHES AXIS AND G2000 PRIME AVIONICS

Garmin has unveiled two new integrated avionics suites: Axis and G2000 Prime.

Axis is a refresh of the G3X Touch system, adopting features from the G3000 and G5000 Prime flight decks and introducing a potential upgrade path for older systems on lighter general aviation aircraft. It replaces the traditional center stack of individual avionics with larger, touchscreen-based displays. Meanwhile, G2000 Prime brings business jet avionics features to smaller aircraft. G2000 Prime features Garmin's Autonomi suite of safety technologies, including Autoland, Smart Glide, Smart Rudder Bias, Electronic Stability Protection, Emergency Descent Mode, and Autothrottle.

TEXTRON AVIATION'S BIZJET DELIVERIES DIP, T-PROPS CLIMB

Textron Aviation delivered 40 Cessna Citations in the second quarter, down from 49 in the same period last year, though a stronger opening quarter left the OEM just three business jets behind its first-half 2025 pace. Commercial turboprop deliveries climbed to 44 from 34 a year ago. The Wichita-based Textron subsidiary posted revenue of \$1.5 billion, up 1% year over year, while its \$165 million profit of \$165 million was down \$5 million from a year earlier. "Demand across jets and turboprops continued to be robust during the quarter, supporting a backlog of \$8 billion," said Textron Inc. CEO Lisa Atherton.

GULFSTREAM G500, G600 FLEET TOPS 400 DELIVERIES

With the completion of a G600 at the company's St. Louis facility for a customer in the Asia-Pacific region, Gulfstream's combined G500 and G600 fleet has surpassed 400 customer deliveries. Since entering service in 2018 and 2019, the G500 and G600 fleets have logged more than 519,000 flight hours and 200,000 landings.



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Thinking on the fly: Unprecedented times, leadership during 9/11

BY JEREMY KARIUKI



NBAA's Robert Lamond (pictured here) ran the general aviation desk with then new hire Jo Damato at the FAA Command Center as the skies emptied on 9/11. Steve Brown, who helped orchestrate that massive undertaking in his role at the FAA, would later join the association.

Like many others, Steve Brown started his workday on the morning of Sept. 11, 2001, as usual. By the early afternoon, Americans across the nation picked their kids up from school, retreating to the unassured safety of their homes. Brown's responsibilities, however, prevented such a luxury. As the FAA's associate administrator for air traffic services, Brown—and his team—were met with the monumental task of securing the safety of the National Airspace System (NAS). This was two years before Brown was to join the NBAA and ultimately become COO there.

The typical workday began with direct reports from management teams regarding daily operations. A cacophony of beeping pagers interrupted this routine, signaling the beginning of a national emergency for which no protocol was prepared.

The first strike was met with widespread confusion—perhaps an accident or medical emergency was to blame. Once the second tower was hit, the threat became exceedingly apparent.

"It was at that point that I, the administrator, and the deputy administrator went

into a secured room called a SCIF," Brown said. "We were on a video teleconference, a secure link, with Vice President [Dick] Cheney at the White House, [Transportation] Secretary [Norm] Mineta, and all of the other cabinet agencies."

On that call, Brown's team was tasked with securing the airborne inventory—every single aircraft currently in flight within the NAS.

"The operating assumption at the time was that there were additional attackers on additional aircraft," he said. "We



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didn't know how many, but we made the assumption that there could be many. So, the idea was to get aircraft on the ground to mitigate the risk to the public and to the transportation system of the nation."

As Brown recalls, the entire airborne inventory was grounded within roughly two and a half hours, including a healthy share of aircraft flying over the Atlantic and Pacific Oceans. For one of the world's largest national airspaces, this was exceptionally fast. Considering the multitude of diverted international flights, communication between nations became critical. According to Brown, that cooperation should be remembered as heroic.

"We have an air traffic control system that, in many ways, is interoperable with the Canadians as our closest and largest neighbor," he said. "That's because of international agreements, but it's also because of the close, bilateral cooperation between Canada and the United States. So, the commonality made teamwork, in a crisis at the moment, much smoother and much more predictable."

By around 11:30 a.m., the airborne inventory was grounded, and the likelihood of subsequent attacks had reduced dramatically, but there was no way to determine if the attack had concluded, Brown said. By that time, only he and Secretary of Defense Donald Rumsfeld remained on the secure teleconference call.

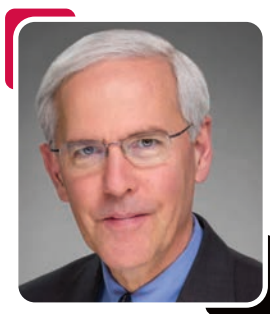
"Once we got there, both he and I felt a sense of relief over that, but we didn't know about potential people who had not been activated."

Brown's objective to ground the airborne inventory was completed, but thousands of travelers were now stranded in cities across North America.

"All of a sudden, Halifax Airport had 12,000 people sitting on airplanes on the runways and the taxiways," Brown said. "They found out toward the end of the day

that they had no idea how long they were going to be there—the airplanes, or the crews, or the passengers."

The city of Halifax, like several other municipalities across the continent, urged the public to help shelter stranded travelers who couldn't return home.



STEVE BROWN

RET. NBAA COO / FAA ASSOCIATE ADMINISTRATOR

“We have an air traffic control system that, in many ways, is interoperable with the Canadians as our closest and largest neighbor.”

"A lot of passengers went to the closest rental car place at the airport and rented a car to drive home," he said. "But there weren't enough rental cars for everybody. So, citizens were taking care of citizens."

Over the next three days, Brown's priority shifted to screening airport infrastructure, aircraft, passengers, and their luggage. Under direction from the White House, the National Guard was deployed to airports across the U.S. to help with this process. Simultaneously, flights that had been diverted to other countries underwent similar security procedures, carried out by their respective law enforcement entities.

In the weeks that followed, the normalcy of public transit did not return. The

general public in the U.S. and abroad now possessed a pervasive anxiety around air travel, and the FAA's goal involved restoring the public's faith in the country's ability to keep travelers safe.

"You understand the human reticence to reengage and travel in the same old way. The entire industry was involved in both establishing new methods and building up the confidence that we travel in public," Brown said. "The reality is that our national economy and the economy of the world are dependent upon people moving around doing business. And even if you set aside the economy, the well-being of humans, in a significant way, is dependent upon connecting with other people."

Given the unprecedented nature of the attacks, there was no preexisting protocol for shutting down the air traffic control system. According to Brown, the U.S. government never contemplated the need to close it, but for him, that was the easy part.

The hard part, Brown said, was determining how to reopen it. So, Brown became the lead advocate for reopening the system, proposing a restart as early as the morning after the attacks. The solution Brown and his team proposed came in the form of an incremental strategy.

"Given all the resources we had and how quickly we could work on it, I'm proud of the fact that we had it substantially restarted that week. But to me, that week felt like a month, because it took a lot of argumentation and a lot of presentations," he said.

Brown's audience included the National Security Council, FBI, CIA, and Department of Defense. The proposal started with IFR-capable aircraft, according to Brown, which covered commercial and business aviation flights. However, there was an immediate need for certain VFR flights to resume.

Of all the proposals Brown made to the National Security Council, one of the first was to restart organ transplant flights,

completed with a wide variety of aircraft.

Additionally, Brown proposed the restart of flights in rural Alaska, particularly for women in the final months of their pregnancy, to fly to regional clinics to safely give birth, given that many rural villages lacked the appropriate medical facilities.

“Those were pretty low-threat flights from a terrorist point of view,” he said. “And the benefit far exceeded the risk, obviously to the mothers and the newborns.”

As the days passed, the need for cargo and commercial flights to resume heightened significantly.

“Pretty soon, if that’s not happening, your manufacturing plants are closing down, and people are getting laid off,” he said. “There’s a whole structure of transportation that supports our economy. That isn’t necessarily top of mind, but if it’s not happening for a couple of days, it’s a real problem.”

By the eighth day after the attacks, Brown’s confidence in the safety of the NAS had returned to a high level, thanks in large part to the National Guard’s assistance with enhanced security measures at airports across the country. Within months, the Department of Homeland Security and the TSA would assume that role across the nation.

After 25 years, the work has continued and has evidently ensured the safety of millions of passengers, pilots, and crew. While some travelers may deem the sometimes arduous procedure of TSA screenings as “security theater,” Brown acknowledges that discontent and posits a rebuttal.

“I’d say: ‘Well, I guess you don’t think there’s a threat.’ Clearly, the vast majority of people still think there’s a threat that we need to be cognizant of and do something appropriate to determine,” he said. “I hope people would agree and accept the fact

that over 25 years, it’s evolved. We’re using technology more than ever before to detect things, and we certainly have developed ways to pre-qualify people and expedite screening in ways that weren’t occurring immediately after 9/11.

“I’m retired now [Brown retired from NBAA in 2022], but my successors, all across the aviation industry, are as committed as they ever were to improving the system every day. Making it stronger, safer, and more secure. That is the ethic that pervades the system, and nobody’s resting on their success, I assure you. They’re alert and focused every day and building a more robust system every day.” ■

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AIN 2026 Product Support Survey: Avionics

AIN readers rate avionics, cabin management, and airborne connectivity manufacturers.

BY CURT EPSTEIN



Part two of AIN's annual product support survey covers internal aircraft systems including flight deck avionics, cabin management systems (CMS)/in-flight entertainment (IFE) systems, and airborne connectivity hardware.

Some of the OEMs, such as Honeywell Aerospace, Collins Aerospace, and Garmin, have offerings in multiple arenas, while others, including Lufthansa Technik and Gogo, focus solely on one segment. Gulfstream is included in the survey due to its in-house-developed CMS solutions.

In the flight deck avionics segment, while Garmin's overall score (8.71) slipped slightly from last year's results (8.83),

it was still good enough for the Olathe, Kansas-based company to maintain its long hold on the top spot of the segment and earn the highest position in the majority of the survey categories.

Among the manufacturers of CMS/IFE, Lufthansa Technik and its Nice system landed on top this year with an overall score of 7.88, a slight improvement over last year's 7.73, enabling it to surpass last year's best-in-category, Gulfstream (7.78). The Germany-based manufacturer scored highest in several survey categories such as parts availability and parts cost.

Lastly, in the airborne connectivity category, which now includes Starlink, Collins

Aerospace this year unseated Garmin at the top slot with its overall score this year (8.63) up a quarter point from 2025's survey results (8.38).

The aircraft electronics segment continues to face some headwinds, according to the company executives AIN spoke with for this report.

"The most significant issue facing the avionics industry today is the availability of skilled labor," said Lee Moore, director of avionics product support at Garmin. "As experienced technicians and avionics managers retire, the industry must replace that vital expertise with a sufficiently trained and qualified workforce. Addressing this

gap remains critical to sustaining growth and maintaining high levels of safety, service, and support for the global aviation industry.”

While he agreed with that assessment, Brian Barta, Collins Aerospace’s v-p and general manager for aftermarket avionics, added that another significant concern for the industry is “keeping pace with rising avionics complexity while continuing to deliver fast, reliable, and efficient support for operators. As fleets modernize at varying rates, customers are managing a wider mix of platforms, systems, and support requirements.”

As the industry looks to supply its customers, supply-chain issues are still a concern, according to Hinnerk Noelker,

Lufthansa Technik’s head of OEM engineering and operations. He said the global electronics and semiconductor market continues to face “severe supply shortages and extended lead times due to increasing global demand competition,” particularly from the AI segment.

“While many of the supply-chain and parts production constraints that impacted the industry at the start of the decade have improved, some areas of pressure remain across the broader aerospace supply base,” Collins’ Barta explained. “Electronic components and specialized platform parts continue to require close management across the industry.”

With SpaceX’s Starlink now joining the airborne connectivity providers in AIN’s

annual survey, a crowded field has become even more complex with the number of connectivity options available. “Operators are presented with multiple technologies, networks, service providers, and performance claims, making it increasingly difficult to determine which solution is genuinely the best fit for their aircraft and operational mission,” said Michael Skov Christensen, Gogo’s chief commercial officer, adding that the fastest solution is not always the right solution. “Factors such as mission profile, aircraft type, coverage requirements, reliability, regulatory considerations, cybersecurity, data privacy, future upgrade pathways, and total cost of ownership all need to be considered alongside bandwidth and speed.”

Category & Overall Average Ratings for Avionics Systems	Overall Average 2026	Cost per Hour Programs	Parts Availability	Cost of Parts	AOG Response	Warranty Fulfillment	Technical Manuals	Technical Reps	Overall Avionics Reliability
Flight Deck Avionics									
Garmin	8.71	8.67	8.89	7.73	8.73	8.77	8.42	8.71	9.25
Collins Aerospace	8.40	8.19	8.22	7.35	8.32	8.78	8.53	8.66	8.91
Honeywell	7.48	7.24	7.29	6.14	7.36	8.23	8.11	7.28	8.30
Cabin Management Systems									
Lufthansa Technik -nice	7.88	7.68	7.99	7.11	7.73	8.45	7.77	8.21	7.92
Collins Aerospace -Venue	7.79	7.00	7.55	7.07	7.64	7.82	8.15	8.30	8.22
Gulfstream CMS	7.78	7.31	7.63	6.68	8.13	8.23	7.83	8.67	7.71
Honeywell Aerospace -Ovation*	7.70	7.81	6.57	7.05	7.89	8.27	8.11	8.14	7.96
Airborne Connectivity									
Collins Aerospace	8.63	8.44	8.67	7.86	8.64	9.13	8.71	9.01	8.60
Garmin	8.58	8.65	8.53	7.69	8.38	8.50	8.75	8.88	8.88
Starlink	8.40	7.87	8.32	7.99	8.27	8.43	8.33	8.17	9.34
Gogo (Includes Satcom Direct)	8.14	7.15	8.37	7.15	8.48	8.50	8.16	9.01	8.05
Honeywell	7.92	7.43	8.02	7.06	8.05	7.95	8.27	8.12	8.14
Viasat	7.67	7.27	8.16	8.25	8.16	7.47	7.35	8.51	6.85

SURVEY RULES AND METHODOLOGY

AIN's annual Product Support Survey aims to quantify and rate through statistical analysis the product support functions of aircraft manufacturers over the past year. The survey, whose respondents include operators of business jets, pressurized turboprops, and turbine-powered helicopters, endeavors to encourage continuous improvement in aircraft product support throughout the industry.

SURVEY TOOL

For the fourth year, AIN conducted the survey via a questionnaire developed in partnership with Rolland Vincent Associates, a Texas-based consultancy focused on aviation market research, strategy, and forecasting. Designed to provide improved ease of use and to encourage more

participants to complete the entire questionnaire, the English-language survey tool includes clear language and imagery around the categories and evaluation scale. The survey asks respondents to evaluate one full aircraft at a time, including airframe, engines, avionics, and cabin management systems/in-flight entertainment systems, as well as airborne connectivity systems.

METHODOLOGY

AIN emailed qualified readers from its list of subscribers a link to the password-protected survey website active from late February to May 31, 2026. It asked respondents to rate individual aircraft and provide the tail number, aircraft age, primary region of service, and whether they used factory-owned or authorized service centers, or both. The survey's avionics section also asked respondents to rate, on a scale from 1 to

10, the quality of service they received during the previous 12 months in the following categories: Cost Per Hour Program; Parts Availability; Cost of Parts; AOG Response; Warranty Fulfillment; Technical Manuals; Technical Reps; and Overall Avionics Reliability.

THE RESULT

In total, 710 unique respondents representing 1,152 aircraft from 62 countries completed the survey. AIN did not receive enough ratings to verifiably report results on several of the individual categories for Honeywell Ovation, Garmin airborne connectivity, and Viasat. However, we included those ratings as an indication of reader feedback since these companies met the overall threshold for ratings. Rolland Vincent Associates reviewed and analyzed the Product Support Survey data to ensure accuracy.

AVIONICS

GARMIN

Garmin once again reigned in AIN's Product Support Survey for flight deck avionics, continuing a streak that has lasted throughout the category, this year with an overall 8.71 score that was about three-tenths higher than the next closest company (Collins Aerospace). Backing this up were leading scores in six categories in the flight deck

avionics segment—reliability (9.25), parts availability (8.89), AOG response (8.73), tech representatives (8.71), cost-per-hour programs (8.67), and cost of parts (7.73).

In airborne connectivity, Garmin's overall average of 8.58 was down from last year but still solid, placing the company just behind Collins Aerospace. Garmin also

posted a strong 8.88 score in reliability, second only to Starlink.

While Garmin led in many of the flight deck areas, the company continues to invest in "self-service" capabilities to provide even more access to support, said Garmin's Moore. This includes expanding the company's knowledge base and video resources.

The avionics manufacturer previously had introduced automatic database subscription renewal, simplifying account management and minimizing the need for support, Moore added.

In tandem, Garmin has focused on targeted improvements of its database functions, such as refining Database Concierge to ensure that it provides faster and more reliable distribution and Garmin Aviation Database Manager to streamline updates and overall usability. In addition, the company has enabled fully automatic monthly database updates with its GDL 60 datalink.

Beyond its online and automation support, Garmin is investing in a range of



Support for Garmin's avionics products gained high ratings from AIN readers.

training initiatives to support both customers and industry partners.

This includes expanding the curriculum to build on the Garmin Aviation Training Academy and integrating it with Garmin's learning management system to improve accessibility and tracking of pilot and technician training.

Digital and virtual training options were increased to cast a wider net for technicians. Garmin has added eLearning modules, full-length videos, virtual training classes, webinars, and other short, targeted content.

"The objective is to continue expanding dealer-focused training to ensure installers, technicians, and operators are well prepared to support increasingly complex systems," Moore said, an effort that showed up in a strong tech representativeness score of 8.71.

But in a continuous improvement effort, Garmin in the past year began to upgrade its core support platform to make case management more efficient and improve knowledge sharing across support teams. Further, it has been integrating artificial intelligence tools to bolster support.

Associates have access to Microsoft Copilot, which improves the speed and accuracy of information retrieval across internal systems, he said.

"These efforts are designed to create greater consistency and visibility across our global support organization, while improving the speed and quality of issue resolution," Moore said. "Collectively, these improvements strengthen the overall support infrastructure and contribute to a more consistent and efficient experience for both customers and dealers worldwide."

COLLINS AEROSPACE

With entries in all three segments of the avionics portion of AIN's Product Support Survey, Collins Aerospace provides global support for its broad portfolio of flight deck avionics, cabin man-

agement, and aircraft connectivity systems.

Over the past year, the RTX subsidiary has continued to strengthen its customer support ecosystem by expanding predictive maintenance capabilities and

integrating aircraft health data into diagnostic systems; improving turnaround times for key repairs through capacity and parts routing optimization; and enhancing its digital customer portal to provide

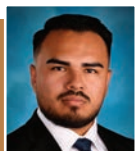


One Installation Two Aircraft Upgrades

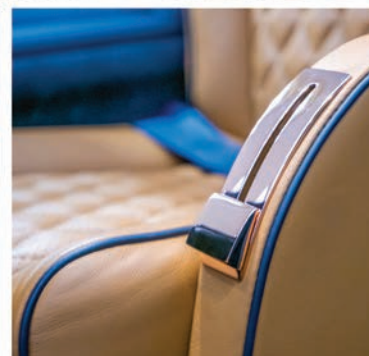
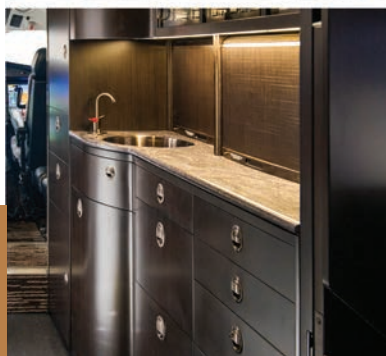
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clearer visibility into repair status, parts availability, and technical support material.

In the field of airborne connectivity providers, Collins' Satcom and ArincDirect Aircraft Connectivity services earned a top score of 8.63, improving from last year's survey by a quarter point. It rated highest in the parts availability category (8.67), as well as AOG response (8.64) and technical representatives (9.01).

"These systems are supported by Collins' 24/7 Customer Support Center, which provides rapid aircraft-on-ground assistance, real-time troubleshooting, and access to multidisciplinary specialists across the avionics portfolio," said Collins' Barta.

In the avionics segment, the OEM's Pro Line and Fusion systems improved on their overall support score from last year by nearly a quarter of a point to receive an 8.40 score from **AIN**'s readers. While it trailed frontrunner Garmin in most of the individual categories, it scored highest in warranty fulfillment (8.78) and technical manuals (8.53).

The manufacturer ranked second (7.79) overall in the cabin management



Collins Aerospace's flight deck avionics saw a significant jump over last year's ratings.

systems segment, with a slight decline from last year's score. Its Venue system did earn the highest score in the overall reliability category (8.22). Collins scored a 7.55 in terms of parts availability, which placed it near the bottom of a category in which none of the manufacturers scored 8 or above.

"We continue to work proactively with our suppliers and customers to improve planning, optimize parts routing, and prioritize support for critical operational needs," Barta told **AIN**. "Our focus remains on improving predictability, reducing turnaround times, and helping customers maintain fleet readiness."

HONEYWELL AEROSPACE

Honeywell Aerospace completed its spinoff from parent company Honeywell at the end of June. The new company

noted that it now has a "purpose-built" management rather than what previously came from a corporate holding



Honeywell Aerospace is now an independent company with "purpose-built" management.

company. "This milestone has enabled us to redesign our organization and operating model with a singular focus: delivering exceptional outcomes for our customers," said Todd Owens, v-p of customer experience, adding that one of its most important initiatives has been the restructuring of the customer support organization to align directly with business segments. "This has improved accountability, accelerated decision-making, and enabled closer collaboration between customer support, engineering, manufacturing, and supply-chain teams."

Honeywell is another triple threat in the cabin electronics portion of **AIN**'s annual Product Support Survey with entries in the avionics, cabin management, and airborne connectivity segments. This year,

the company earned its highest score in the latter group, tallying a 7.92 overall, an increase of nearly half a point from last year's results. Its multi-network JetWave X Ka-band satcom solution earned the company's highest score in the technical manuals category (8.27).

"Our ongoing customer portal enhancements are focused on simplifying website navigation, improving content discoverability, and organizing information around customer workflows and job functions rather than internal product structures," explained Owens. "This customer-centric approach makes it easier for operators, maintenance technicians, and support personnel to find the information and services they need."

While AIN's readers gave Honeywell's JetWave X an 8.02 for parts availability, those parts came dearly, earning it the lowest score for cost (7.06).

In the cabin management segment, Honeywell's Ovation system trailed the other OEMs, with a score of 7.70. That did represent an increase of 0.80 over last year's results. As with the company's connectivity system, survey respondents downgraded the Ovation system's parts availability, giving the manufacturer the lowest score for the category among CMS producers (6.57). "The aerospace industry continues to face supply-chain challenges, and Honeywell Aerospace has remained focused on improving resilience, reliability, and customer responsiveness," Owens noted.

Lastly, in the cockpit avionics segment, Honeywell lagged behind Garmin and Collins, with its Primus Epic, Apex, and legacy SPZ support receiving an overall 7.48 score, a quarter-point increase from its 2025 results. It notched its highest category score of 8.30 in overall avionics reliability

but was once again dragged by the cost of parts, which received the lowest score (6.14) in this section of the survey.

In 2024, the company announced an investment of \$84 million to expand its avionics manufacturing facility in Kansas, a move it said will enable the development of a strong and resilient domestic supply chain for next-generation avionics and printed circuit board assemblies, as it continues to improve its technologies.

"Another example of our continued innovation is the expansion of Honeywell's [FMS] Guided Visual [approach] capability," Owens told AIN, describing one recent example as the publication of the Aspen Runway 33 FMS Guided Visual procedure, which helps improve operational flexibility. "We now offer more than 110 Guided Visual procedures across 12 countries, with expansion planned into South America."

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UNIVERSAL AVIONICS

Universal Avionics did not receive enough ratings for inclusion in this year's **AIN** Product Support Survey—Avionics rankings.

The Tucson, Arizona-based avionics manufacturer has focused its product support improvements over the past year on expanding its digital presence and remote support capabilities, according to CEO Dror Yahav.

A new customer portal now centralizes database subscriptions, documentation, service bulletins, case tracking, and technical resources in one location, while a redesigned website offers improved search for STC offerings and dealer information, along with quick links to customer support and frequently asked questions.

Universal has also implemented HoloLens mixed-reality technology to provide remote technical support to field technicians. The system allows Universal's engineers to see what a technician on an aircraft is seeing and walk them through procedures in real time, shortening troubleshooting and reducing the need for onsite visits, Yahav said.

On the data side, Universal has rolled out cloud-based applications including the UA FlightPartner tablet app, which connects to Wi-Fi to enable automated database updates and reporting through an iPad or web tools.

The company said this allows information to be analyzed across integrated systems,

including its flight management systems, flight data recorders, and cockpit displays, streamlining previously manual workflows to support fleet management and proactive maintenance efforts.

Universal has also introduced AI tools in its manufacturing and repair operations. Yahav said an AI assistant trained on the company's products and configurations allows an entry-level technician to accomplish work that would otherwise require three experienced technicians, analyzing components to flag potential issues and guide repair steps. This approach helps address technician shortages while speeding turnaround for customers, the company added.

Yahav said congested and increasingly complex airspace is the biggest challenge facing the industry today, along with the difficulty of making large volumes of data—particularly visual information—accessible and actionable for pilots.

He also agreed that supply-chain issues persist, particularly around component obsolescence and longer lead times for certain components, though the company has begun using AI tools to forecast demand and flag potential component shortages before they become critical.



Artificial intelligence tools are helping Universal Avionics improve manufacturing efficiency.

CABIN MANAGEMENT SYSTEMS

LUFTHANSA TECHNIK

Among aircraft CMS manufacturers, Lufthansa Technik led this year's survey results with an overall score of 7.88, tallying top scores in half of the eight categories: cost-per-hour programs (7.68), parts availability (7.99), cost of parts (7.11), and warranty fulfillment (8.45).

"Over the past year, Lufthansa Technik has made significant investments to further enhance the support and value delivered to owners and operators of our Nice cabin management systems," said Hinnerk

Noelker, the company's head of OEM engineering and operations.

A major focus for the German manufacturer over the past year has been the introduction of next-generation cabin systems in new business jet platforms, Noelker told **AIN**. In 2026, it launched its latest Nice IFE/CMS for the Embraer Praetor 500E and Praetor 600E, which incorporates advanced technologies such as a first-of-its-kind OLED display—a 42-inch curved touchscreen integrated directly into the sidewall.

"With access to three external cameras, it's able to function as a window to the outside via fully integrated IFE and CMS," Noelker explained. "In addition, the Omni-Fi speakers (which earned a Red Dot Design Award) deliver a fully immersive sound experience for various installation positions to the cabin." The manufacturer launched an IFE/CMS solution with OCD55 and 4K monitors, delivering higher system performance and improved user experience.

Beyond product innovation, it has

substantially strengthened its ability to support customers through internal operational improvements, added Noelker. “This includes a notable increase in production capacity at Avionic Design, Lufthansa Technik’s wholly owned production subsidiary. At the same time, Lufthansa Technik has streamlined its production value chain, spanning manufacturing, acceptance testing and certification, and logistic processes.

“One of the biggest challenges is balancing passengers’ high expectations for cutting-edge cabin innovation with the rapidly shrinking life cycles of chips and semiconductors, which makes obsolescence management a constant battle,” Noelker explained. “This hurdle is heavily compounded by ongoing availability and delivery issues across



Embraer’s Praetor 500E and 600E will feature Lufthansa Technik’s latest Nice IFE/CMS.

the global electronics supply chain.”

To tackle this, Lufthansa Technik is actively designing highly flexible, future-proof system architectures that allow for easier component substitution. Additionally,

it reactivated well-proven instruments from the semiconductor crisis two years ago, focusing on proactive “just-in-case” procurement strategies in order to ensure a reliable material supply chain.

GULFSTREAM AEROSPACE

While the Savannah, Georgia-based company led the category last year with a score of 7.98, Gulfstream Aerospace’s score in this year’s survey declined slightly (7.78), allowing Lufthansa Technik and Collins Aerospace to edge ahead.

“We continue to explore opportunities and advanced technologies to enhance and expand on the Gulfstream Cabin Management System,” said Lor Izzard, the airframer’s senior v-p for customer support.

Introduced in 2012, the Gulfstream-designed system streamlines cabin control options. “Developed with our customers in mind, the system integrates modern technology, advanced components, and intuitive controls to provide added convenience,” he added.

While the General Dynamics subsidiary earned the top scores for AOG response (8.13) category, and for its technical representatives (8.67), it was downgraded for cost of parts, receiving the lowest score (6.68) among the cabin management system manufacturers in this year’s survey. As well, **AIN**’s readers suggested the company could improve on its overall CMS reliability, giving it a score of 7.71, also trailing the others in the category.

“Connectivity remains an increasingly important part of the overall aircraft ownership experience, and Gulfstream is committed to ensuring our customers are equipped with the advanced options available, both today and in the years ahead,” Izzard told **AIN**. “This past year, we prioritized a customer-first and collaborative approach to delivering custom solutions. These efforts helped support each operator’s unique needs while ensuring a seamless in-flight experience.”

As part of those efforts, over the past year,

Gulfstream earned additional supplemental type certifications for Starlink installations, and its team has completed more than 350 of them to date.

“In response to the strong customer demand we’ve seen for this service, we also added hangar space at our Mesa service center exclusively dedicated to Starlink,” Izzard said.

With a dedicated team and tools, that added focus is expected to reduce installation time and increase this service availability for its operators.



Gulfstream employs a customer-first and collaborative approach to deliver custom solutions.

STARLINK

With SpaceX's Starlink low-Earth-orbit satcom system growing in popularity, the company appears for the first time in the AIN Product Support Survey rankings, scoring an 8.40 overall average and tallying the highest overall reliability of any of the OEMs in this survey at 9.34.

Starlink burst onto the aviation scene rapidly, spurred by business jet owners who have Starlink at home or at the office and have urged their flight department managers to get the system installed on their airplanes.

When Starlink for aviation was first introduced at the October 2022 NBAA-BACE, before any supplemental type certificates (STCs) had been approved for installations, the system price was quoted as \$150,000 (plus about \$150,000 to \$200,000 for installation). Service plans were to be \$12,500 to



The Starlink electronically steered antenna mounts on the top of the fuselage.

\$25,000 per month, and those costs apparently didn't scare anyone away.

Since then, the number of Starlink dealers, STCs, and installations has skyrocketed, offering hefty competition to other

airborne connectivity providers. That SpaceX lowered those projected prices to \$2,000 per month for 20 GB and \$10,000 for unlimited further shook up the industry, especially considering some satcom services were typically billing customers tens of thousands per month.

More recently, SpaceX revised those service plan numbers and, in July of this year, told Starlink Aviation customers that the \$10,000 unlimited plan was doubling to \$20,000 per month, for global unlimited service starting on August 7. A new "single continental region" plan costs \$12,500 per month for unlimited service, and it can be used only in the designated region.

The former \$2,000/month plan now costs \$4,000 per month and includes 25 GB, with additional data costing \$250 per GB, and it is limited to a single continental region.

GOGO (INCLUDING SATCOM DIRECT)

Gogo has solidified its position as a provider of multiple airborne connectivity systems, from its foundation as an air-to-ground (ATG) developer to high-orbit satcom with its PlaneSimple antenna systems and launching the Galileo satcom service

on Eutelsat's low-Earth-orbit network. This gives customers more choices when it comes to the most cost-effective system that matches where they fly, and also a competitive advantage compared to companies with only a single solution.

In AIN's 2026 Product Support Survey, Gogo—which includes Satcom Direct following the acquisition in 2024—scored an overall average of 8.14, down nearly three-tenths of a point from its 2025 score.

Where Gogo shined in the ratings was for technical reps, matching Collins' 9.01, an indication of the importance AIN readers attach to personal support from people who are quickly available by telephone or in person. Gogo's lower score for overall reliability may be a reflection of the upcoming end of classic ATG and that system's lack of performance compared to more modern products.

To meet customer needs, over the past year Gogo has focused on expanding its support network and the dealers that install and maintain Gogo products. This includes new dealers in India, according to Gogo's Christensen, reflecting Gogo's work to make technical expertise and support available locally, "reducing downtime and improving the



Gogo has expanded local support capabilities to support customers worldwide.

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overall ownership experience,” he explained.

Now that Gogo is offering Galileo satcom and its newest ATG products, upgrades for many more aircraft are available, including for smaller airplanes—such as Pilatus PC-12s, Cessna Citations, and Embraer Phenom 300s—to be fitted with Galileo systems. Common hardware designs are also helping customers future-proof their

investments—for example, enabling use of the same router for all of the available Gogo connectivity systems. Aircraft equipped with Avance ATG systems can also take advantage of commonality opportunities.

When it comes to the supply-chain issues that still affect aviation, Gogo “has consistently taken a proactive approach to supply chain management,” according to

Christensen. “By planning well in advance and maintaining inventory, we have been able to minimize or remove lead times and ensure products remain readily available for our customers.

“We remain well-positioned to meet customer demand through pre-provisioned inventory, streamlined logistics, and strong supplier relationships.”

VIASAT

Viasat, which did not receive enough user responses to be ranked last year, received an overall average score of 7.67 from AIN’s readers in this year’s survey, although still not enough ratings in some categories. It spent the past year adding network capacity behind its business aviation connectivity service and working through a trio of resellers to support operators in the field.

“Ensuring customers receive exceptional support throughout the entire life cycle of their connectivity service remains a key focus for Viasat,” said Jim MacDougall, head of product management for business aviation. Over the past year, he said, the company invested in its products and in “the support ecosystem that helps customers maximize the value of those services,” while building out its ViaSat-3 constellation. The third and final satellite in that constellation launched in April and is due to enter service later this year. Viasat said the constellation will unlock up to 2 Tbps of additional network capacity.

Product work has centered on JetXP, the brand under which Viasat consolidated its business aviation connectivity offerings. MacDougall said enhancements introduced over the past year target performance, reliability, and the passenger experience, backed by network investments intended to keep pace with rising demand.

Support is delivered by Viasat together with its value-added resellers in business aviation—Honeywell Aerospace, Gogo, and Collins Aerospace—which assist customers “from installation and entry into service to ongoing technical assistance and operational



Viasat’s network has expanded with the addition of the final ViaSat-3 satellite.

support,” MacDougall said. Between them, they provide around-the-clock coverage for operators worldwide. “We believe that direct access to knowledgeable support teams remains essential to delivering the high level of service our customers expect,” he added.

The company has also announced an In-flight Quality of Experience (iQe) initiative that will weigh a broader set of performance indicators than speed alone. The iQe program “will use AI and advanced analytics to provide deeper insight into how passengers are actually experiencing connectivity onboard,” MacDougall said, letting Viasat and its resellers spot patterns and intervene before an operator notices a problem. From 2027, the company plans to use iQe as the basis for measuring performance commitments under its service-level agreements. Viasat is separately examining how AI could speed troubleshooting of airborne equipment.

Human support remains central, MacDougall told AIN, because “business aviation is a highly personalized industry, and customers expect direct access to experienced support teams when they need assistance.” Viasat’s technical reps earned the company its highest category score (8.51) this year.

Viasat pointed to evolving customer expectations, and the difficulty of meeting them consistently worldwide, as one of the industry’s biggest challenges. In recent company research, business aviation principals and industry professionals identified reliability, coverage, and consistency as the most important attributes of an in-flight connectivity service, with reliability ranking ahead of speed. MacDougall said that operators and passengers will increasingly judge providers “not by peak speed claims, but by the overall quality and consistency of the experience they deliver.”

—AIN staff contributed to this report.



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The 2026 Farnborough International Airshow vividly reflected the state of flux in which the global aerospace and defense industries find themselves. The event in late July saw a 41% increase in visitors to 141,580 and a boost in the amount of exhibitor floor space occupied.

The flow of new airliner orders announced at the show was relatively moderate, perhaps a sign of the long backlogs that OEMs are already struggling to clear due to stubborn supply chain bottlenecks. But there was a fascinating array of news highlighting key trends such as the proliferation of autonomous flight technology and demand for new uncrewed platforms, particularly in the military domain.

Business aviation had a small but notable profile at Farnborough this year, with some significant new deals and partnerships confirmed. However, so much of the news revolved around the historic levels of investment being made in new technology across all sectors represented at the show.

Airbus, Boeing begin FIA with orders

BY KERRY LYNCH

@ Farnborough Airshow 2026

The 2026 edition of the Farnborough International Airshow opened with a bonanza of orders on day one as both Airbus and Boeing staged signings and announced orders for hundreds of narrowbody and widebody airliners.

Financier SMBC Aviation Capital padded out its portfolio, with contracts for 200 aircraft in total from Airbus and Boeing, while new Saudi Arabian national carrier Riyadh Air took steps to shore up its nascent fleet through orders and the exercise of options that amounted to 34 aircraft. Meanwhile, Philippine Airlines committed to order up to 20 more aircraft. In sum, these deals could combine for a potential value of upwards of \$40 billion, based on publicly available list prices.

SMBC BUILDS UP AIRBUS, BOEING FLEET

SMBC Aviation Capital signed a deal late on the first day of the show for another 100 Airbus narrowbody aircraft, including 65 Airbus A321s and 35 A320s.

Meanwhile, the lessor signed a deal for 100 Boeing 737 Max airplanes, calling for 60 of the Max 10 variant and 40 of the Max 8 single-aisles. The order marks the aviation financier's first for the Max 10, the highest-capacity variant of the Max family at 230 seats.



Riyadh Air ordered six Airbus A350-1000s and exercised options for 28 Boeing 787s.

Overall, the deal brings SMBC Aviation Capital's fleet of owned, managed, and committed Boeing Max airliners to 450.

RIYADH'S GROWING FLEETS

Also on the opening day, Riyadh Air exercised options for 28 more Boeing 787 widebodies, including converting 20 for the larger 787-10 variant, and placed new orders for six additional Airbus A350-1000s.

The Boeing announcement included a previously unidentified purchase of 11 of the 787. Under the latest commitments and including existing orders, Riyadh Air's 787 fleet is set to grow to 67.

The Airbus order, meanwhile, increases Riyadh Air's commitment for the

A350-1000 to 31 aircraft and is part of a 2025 agreement for up to 50.

"The firm-up of these additional aircraft reflects Riyadh Air's continued confidence in its growth trajectory and in the future of Saudi Arabia's aviation sector," said Riyadh Air CEO Tony Douglas.

PHILIPPINE BETS BIG ON DREAMLINERS

Boeing continued to expand its 787 Dreamliner orderbook under a deal with Philippine Airlines for up to 20 aircraft. That deal includes a firm order for fifteen 787-10s and options for another five as the airline modernizes and expands its fleet.



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Airbus validated early WoT concepts via digital simulation and has conducted wind-tunnel testing.

WoT? Airbus set to trial experimental elongated wings

BY CHARLOTTE BAILEY

@ Farnborough Airshow 2026

Airbus has launched the next phase of its Wing of Tomorrow (WoT) development program, kicking off a three-year effort to assess the benefits and challenges of extended-length wingspans. With the first experimental folding wings due to commence assembly imminently, Airbus hopes to start testing the concept in flight on an Airbus A321neo testbed around the second half of next year.

Wing efficiency is “one of the biggest levers we have to improve the performance of our aircraft,” said Airbus technology project lead Richard MacPherson, adding that WoT “has the potential to give the same, if not more, efficiency gains than next generation engines.” This program phase will analyze the performance benefits and aerodynamic qualities of longer wings, helping inform future narrowbody design decisions.

Airbus has already started building various multi-meter-long devices intended to replace the upward-curving Sharklet wingtips that are standard on the A320 family. These will be built at Airbus’ Wing Technology Development Centre in Filton, UK,

before being flight-tested on its A321neo testbed in Toulouse, France.

“In the air, these extension devices are going to replicate a folding wing that is latched and fully locked in its fully extended flight position,” MacPherson said. Separate ongoing ground-based demonstrations are exploring the mechanism by which a future wing might fold.

Airbus validated early concepts through digital simulation, and MacPherson said the company has “performed intensive wind tunnel testing to really evaluate and optimize” different variants. Building on WoT concepts that pair a 17-meter (56-foot) main wing box with a five-meter folding section, he expects the extension devices “to be in that order of magnitude.”

While WoT lead Sue Partridge acknowledged that folding wings are nothing new—including within military applications—this technology has never been applied to a high-rate single-aisle commercial aircraft before.

This phase comes as Airbus completes assembly of its first three ground-based wing demonstrators, which combine more than 100 technologies from 40 partners. ■

SAUDI ARABIA’S THC PLANS BOMBARDIER JET FLEET

@ Farnborough Airshow 2026

Saudi Arabian commercial helicopter operator The Helicopter Company (THC) is planning its first foray into business jet services. An agreement inked with Bombardier at the Farnborough International Airshow will see THC work toward acquiring 12 aircraft—including five Challenger 3500s, five Global 5500s, and two Global 8000s—plus options for a further 48. The deal could be potentially worth \$2.9 billion, based on publically listed prices.

THC CEO Arnaud Martinez said the potential purchase will “deliver the customer experience the Kingdom needs, that the Kingdom deserves.” He added that “as a portfolio of companies, THC was always poised to expand beyond rotary-wing aviation into fixed-wing operations.” THC, a Public Investment Fund company, was founded in 2018 and currently operates a fleet of more than 60 Airbus and Leonardo helicopters.



Bombardier and THC leaders signed a deal for 12 aircraft at FIA.

Bombardier president and CEO Éric Martel described the letter of intent as “a powerful symbol of our companies’ shared customer-centric DNA and vision for economic growth in the region.”

A potential fleet of up to 60 jets makes the venture “a very significant undertaking.” he added. C.B.

BAE unveils Brontanax collab combat aircraft

BY DAVID DONALD

@ Farnborough Airshow 2026

BAE Systems has lifted the lid on its hitherto secret Brontanax collaborative combat aircraft (CCA) program. A full-scale model was unveiled for the first time at Farnborough by the UK's newly appointed defense secretary, Wes Streeting, along with BAE Systems group CEO Charles Woodburn and chief of the air staff Harv Smyth.

In recent years, it has become clear that large CCAs will be a vital element of future air forces, adding combat mass and persistence at around 25% of the cost of a crewed fighter, and at far less risk to aircrew. Air chiefs are clamoring for the capability as soon as it can be fielded, and in the UK, the Royal Air Force requires a CCA capability to partner Typhoons and F-35s by the end of this decade.

BAE has worked behind closed doors on its own CCA program since 2022, starting with 18 months of operational analysis. The company has funded the project with £300 million (about \$401 million) of internal



DAVID MCINTOSH

The Brontanax is aimed at the UK MOD's Storm Fighter program of record for a collaborative combat aircraft.

investment to date, and the design draws in part on BAE's long involvement in autonomous systems, including the Taranis stealthy uncrewed combat air vehicle. The company has enlisted around 100 UK companies, adding innovative technology and pace to development and production.

Brontanax is aimed squarely at the UK's Storm Fighter CCA acquisition program and will act as an operational concept demonstrator. However, BAE has designed the Brontanax as a production-ready vehicle, and the first example has been

built on production-standard tooling.

Driven by the aggressive initial operating capability target, the development roadmap will see the essentially complete first aircraft powered up for the first time in the third quarter of this year, leading to ground trials in the first half of 2027. Flight trials are slated to get underway in the second half of 2027. Later that year, the Brontanax is due to take part in NATO's Steadfast Defender exercise to prove its ability to operate with the Typhoon and augment the crewed fighter's ability to defend airspace. ■

ARCHER AND ANDURIL JOIN HYBRID DEFENSE DRONE CHASE

@ Farnborough Airshow 2026

Archer Aviation and autonomous system specialist Anduril rolled out their plans for a family of hybrid-electric VTOL aircraft at the Farnborough International Airshow, unveiling a mockup of a Group 5 model called Thunder, an autonomous attack rotorcraft.

The program joins similar initiatives from other eVTOL aircraft developers chasing the spike in defense spending on autonomous platforms to supplement piloted warplanes. These include rivals Joby Aviation, Vertical Aerospace, and Beta Technologies,

which exhibited the MV250 hybrid-electric autonomous derivative of its CX300 electric aircraft.

Archer and Anduril's tiltrotor VTOL also are offering a variant for commercial applications called Halo.

According to the company, Thunder and the other variants such as Halo are "designed for the operations that need to move heavy payloads over long distances, into places without a runway, at a lower cost than traditional platforms."

Anduril (which is leading the defense missionization work) and Archer declined

to detail anticipated speed, range, and payload specifications on the basis that they are actively competing for military contracts.

The partners expect to begin test flights of the Thunder prototype in 2027, but have not said when they will begin deliveries.

Based on the powertrain Archer developed for its four-passenger Midnight eVTOL air taxi, the series' hybrid-electric powertrain drives the rotors directly from electric motors and features a turbogenerator.

In the UK, Vertical is working on a hybrid-electric adaptation of its six-seater Valo eVTOL that it aims to start flying in 2027. C.A.

Special Olympics Airlift: A lasting legacy at Textron Aviation

BY AMY WILDER

Chris Barnes had never before been on an airplane. As a Kansas athlete heading to the 2026 Special Olympics USA Games, he boarded Dove 17, a Textron Aviation Cessna Citation CJ3, for a flight that would carry him not just to Minnesota, but into a memory he'll keep for the rest of his life.

For hundreds of athletes like Barnes, the Special Olympics Airlift isn't simply transportation. It's often their first experience of flight, arriving at the most important competition of their lives already feeling like champions.

That experience—the wonder and sense of being celebrated before ever stepping onto a field—traces back nearly 40 years to a call remembered in Textron Aviation lore. In 1985, Russ Meyer Jr., then-chairman and CEO of Cessna Aircraft, answered a request

from Kansas Special Olympics to help transport 12 athletes to the Winter Games in Salt Lake City. Commercial travel would have meant cumbersome connections.

Meyer later met with Special Olympics president Sargent Shriver, husband of founder Eunice Kennedy Shriver, and learned how often athletes from small towns faced long, exhausting, and expensive journeys just to compete. He began imagining how business aircraft owners and operators could help.

By 1987, that idea became reality with what was then called the Citation Special Olympics Airlift. At the Summer Games in South Bend, Indiana, more than a hundred aircraft arrived and departed carrying participants for the games. Volunteers greeted each athlete as they passed through a

flower-decked archway, a touch that has seeded Airlift traditions.

At its largest, the event has seen 340 aircraft participate in a single day, with close to 12 hours of coordinated arrivals and departures. Now, athletes receive literal red-carpet treatment, with loud cheers, snacks, music, entertainment, and a lounge area at the FBO. Logistics for everything from luggage to flight times are staggeringly well thought out.

Meyer died earlier this year, but his legacy and the mission he conceived continues to grow. Now organized by Textron Aviation and held every four years alongside the Special Olympics USA Games, the Airlift has transported more than 10,000 athletes and coaches since its founding. And volunteers tend to tear up when they talk about why they love helping.



ALL PHOTOS: AMY WILDER

Around 130 Beechcraft, Cessna Citation, and Hawker aircraft brought participants to the Special Olympics USA Games in Minnesota's Twin Cities.

THE MINNEAPOLIS ORCHESTRATION

This year's ninth edition on June 19 and 27 coordinated flights to and from St. Paul Downtown Airport (KSTP) for the 2026 USA Games, held June 20 to 26 across Minnesota's Twin Cities. Approximately 130 Cessna, Beechcraft, and Hawker aircraft, each flying under the call sign "Dove," carried roughly 800 athletes and coaches.

Aircraft launched from 26 cities nationwide, including Grand Rapids, Houston, Nashville, Orlando, Phoenix, and Washington, D.C., many hosting sendoff celebrations before their delegations departed for Minnesota. Total round-trip mileage approached 300,000 nm. At St. Paul, air traffic controllers and ground teams kept arrivals on a tight three-to-four-minute rhythm all day.

Dove 1 for arrival day was a Cessna Citation Latitude operated by Prent Corporation. "This is one of the most meaningful missions we fly," said pilot Chris Clawson. "The Airlift brings together aviation and purpose in a way that creates unforgettable experiences for these athletes and reminds all of us we're part of something much bigger than ourselves."

For the return flight on June 27, Dove 1 belonged to Omani and Jeanie Carson, who donated the use of their Cessna Citation to fly athletes back home.

Patrick Tageder and Chris Suhs piloted Dove 1 on departure weekend. For Tageder, it marked his second Special Olympics Airlift. For Suhs, it was a first experience. Both described being struck by the atmosphere awaiting them. "The energy was great when we walked through," Suhs said. "We thought—athletes had shown up cheering, and I'm like, 'Man, I felt pretty special.'" He added that the event's logistics were "top notch."

Tageder echoed the sentiment. "It's just a great honor to be a part of something that means so much to these kids," he told **AIN**. "They put in 100%. It's a big thing for them." Asked what draws him back, he pointed to the volunteers themselves. "I think it's seeing people really shine, the good of the people, the volunteer work



Dove 17, a Citation CJ3, carried a group of athletes from Kansas to Minnesota and back.

that they're doing," he said. "Everyone is giving 110% to make it special for the athletes."

COMPANY COMMITMENT

That volunteer commitment extends deep into Textron Aviation's workforce, with employees vying for the chance to help out. Ron Draper, president and CEO of Textron Aviation, has now taken part in three Airlifts. This year, he said, close to 200 company employees worked across the two weekends.

"We're going to work 12 hours today, and not one personal complaint," Draper said on departure day. "At the end of the day, everybody's thrilled they got to be a part of it." He noted that employees often thank him for the chance to participate and, just as often, ask to do it again in four years.

For Draper, the mission reflects something core to the company's culture. "It feels good as a human to do stuff for other people, especially people that may not necessarily be able to do something back for you," he said.

Draper was also quick to correct a possible misconception about the event: none of it is free to those who make it happen. "This is all donated," he said. "These athletes aren't paying anything. It's free transportation," thanks to owners who donate flight time and pay for their own fuel.

This year's Airlift included an unusual addition. The Arizona Cardinals owner, who typically flies his own Citation and has participated in past Airlifts, offered something bigger this time: the NFL football team's Boeing 777, operated in partnership with Gridiron Air. The aircraft carried the entire Arizona and New Mexico delegations on a single flight. "We've never let Boeing fly with us before," Draper said, "but it was a chance to help the athletes."

The Airlift's growing profile has also attracted high-profile supporters. Former NFL quarterback Peyton Manning serves as honorary chair. Country music artist Dierks Bentley, serving as an ambassador for the event, said, "These athletes have trained so hard for this, so it's pretty special to see the aviation community come together to help them get there."

Nearly four decades after Russ Meyer answered a phone call about 12 athletes needing a ride to Salt Lake City, the conviction that aviation could do more than move people from one place to another has carried thousands of athletes toward their moment to shine. This year, it carried Chris Barnes on his first-ever flight, along with three other athletes and a coach, and put an entire state delegation aboard an NFL team's Boeing 777. The aircraft may change. The mission does not. ■

Readying for potential jamming and spoofing

BY KERRY LYNCH AND MATT THURBER

GPS spoofing and jamming—and more broadly, interference with global navigation satellite systems (GNSS)—remain a security and safety concern for operators worldwide. While technology companies are looking at a range of solutions in the flight deck, regulators and industry experts are looking at operational guidance to arm pilots for these encounters. **AIN** convened a panel of experts to discuss the problems that continue to plague operators and fixes on the horizon. Honeywell Aerospace sponsored this roundtable.

AIN ROUNDTABLE



BEN MOHR



JIRI MAROUSEK



SERGE CHRISTIAANS



RICHARD BOLL

THE PARTICIPANTS:

► **BEN MOHR—OFFERING DIRECTOR FOR ALTERNATIVE NAVIGATION PRODUCTS FOR HONEYWELL AEROSPACE**

Mohr's experience with Honeywell Aerospace spans 22 years, holding different roles from research scientist to manager in the navigation field. In his current capacity, he is overseeing product lines to work in GPS-denied or -degraded environments for the aerospace giant that recently spun off into its own company. Honeywell Aerospace produces a range of navigation and sensor systems for the business aviation, commercial, defense, and space sectors.

► **JIRI MAROUSEK—PRESIDENT AND CEO OF AIRTERA**

Marousek brings more than two decades of experience building, acquiring, integrating, and scaling technology across aviation, defense, compliance, biometrics, and enterprise SaaS. Formerly NATA Compliance Services, AirTera has brought together technology companies in the safety and security arena to offer services from SMS, data feeds for flight risk assessment tools, identity monitoring, and other programs.

► **SERGE CHRISTIAANS—AVIATION CYBER-HYBRID DEFENSE SPECIALIST FOR DYAMI SECURITY**

Christiaans, an Airbus A320 captain and military veteran, also provides cyber-hybrid defense expertise for Dyami Security, a global security firm. A former chief information security officer for the Asia-Pacific region, he founded the Aviation Cyber Academy in Singapore two years ago to train commercial pilots to recognize and manage cyber and hybrid threats in flight.

► **RICHARD BOLL—CHAIR OF THE NBAA DOMESTIC OPERATIONS COMMITTEE'S AIRSPACE, AIR TRAFFIC, AND FLIGHT TECHNOLOGIES SUBCOMMITTEE AND RETIRED CORPORATE PILOT**

Richard Boll recently retired as a corporate pilot who flew Bombardier Learjet 75s and Challenger 300s and 350s for more than 40 years. Working with NBAA for the past 20 years, he remains active with the association, chairing the airspace, air traffic, and flight technologies subcommittee of the Domestic Operations Committee. He also represents NBAA on various FAA and industry forums, including the Performance-Based Operations Aviation Rulemaking Committee (PARC), the Navigation Working Group, and the GPS Disruption Action Team.

THE DISCUSSION

ON EXPLAINING GNSS JAMMING AND SPOOFING

BEN MOHR ▶ We talk mostly about GPS, but these threats certainly apply to other GNSS signals as well.

Jamming is a deliberate attack against GPS. It overpowers the signal with a lot of noise and essentially denies operation of a GPS receiver.

Spoofing is a little bit different. It's a more sophisticated attack, where someone actually fakes a GPS signal and transmits it, and that can provide misleading information. It's in some ways more dangerous than jamming because you don't necessarily know that you have a problem. From the receiver's point of view, you're receiving a signal, you know where you are, except that it's misleading information.

ON THE EXTENT OF THE PROBLEM

SERGE CHRISTIAANS ▶ [I've encountered GPS jamming and spoofing] quite often, actually, especially flying in the eastern part of Europe or flying through Europe diagonally from left to right. We have quite a few areas where there's jamming and spoofing in combination. A spoof normally starts with a jam, especially with the L2 band, and then it ends up as a spoof.

RICHARD BOLL ▶ Fortunately, in the United States, where most of my flying has been, we have not experienced the GPS spoofing events that Serge is mentioning. But we are experiencing more GPS jamming events. These are not so much nefarious events, but accidental events. And yes, I have experienced GPS jamming.

JIRI MAROUSEK ▶ Whether getting worse or better, it really doesn't matter, I think, as long as we address the right problem. In my head, we're just trying to make

it boring. We're not going to make it go away. There will be jamming, intentional or unintentional. If it's domestic [U.S.], a lot of it is predictable, and it can actually be briefed for the air op. It doesn't have to be nefarious.

There are clearly nefarious issues that need to be addressed with procedures and new tech, probably both. But, especially domestically, we can just brief it. A lot of times the data exists, and it's just not used.

ON INTERNATIONAL HANDLING

SERGE CHRISTIAANS ▶ ICAO [the International Civil Aviation Organization] is supposed to be leading in this. But I see them lagging, as any large organization does that creates regulation. They were extremely late in even mentioning cybersecurity in their Annex 17. In one and a half years, there's one paragraph that says you need to take care of your cyber safety. But they don't really understand yet how complicated this is.

Most airlines want to be compliant with ICAO. With [Annex] 17, if it's not in there, we're not going to do it. The aviation business is highly stressful with small margins, and we don't have time for that.

I still remember the initial GPS jamming on the Iraq-Iran border in September 2023. Nobody had any clue what was happening. Well, we figured it out, and we have procedures now, but we don't have alternatives yet. I'm happy Ben is working on some great alternatives for that.

We know what's going on, but we still do not handle gracefully anything other than a [single] technical failure. Pilots are very good at taking out a checklist and handling a single technical failure. We quite often do not train for double or triple technical failures. And why don't we do that? Because statistically, if you calculate the risk, it's very small.

But now we also have military threat actors who work in the cyber domain who are knowingly and willingly creating chaos. That is something aviation cannot handle yet. The risk formula that we're using at

the moment does not cover that. It covers only things that have happened before.

In the military and in cybersecurity, we use different risk formulas. Aviation looks back at what happened and how can we prevent it. In cybersecurity, cyber defense, and cyber warfare, we look forward. We talk about threat actors, we talk about intent, we talk about capability. We need to change this thinking, and it needs to start on the top, preferably at ICAO. It never works from the bottom.

ON TECHNOLOGIES IN THE WORKS

BEN MOHR ▶ Honeywell Aerospace has been working on technologies to address these types of issues for 10 years, at least. We have a number of different technologies, both inertially based and then other sensors.

We have the capability now to detect adverse GPS conditions with some of our products and allow the user to just use an inertial-only solution, for example, that can address the problem. Obviously, you don't have the accuracy you would with the GPS-aided solution.

Longer-term, we have things like using alternative sources of information. We have a vision navigation system, for example, that compares a camera image to a map and can figure out where you are based on that, replacing the GPS input into the navigation system. Similarly, we can use radar systems and other types of sensors to help solve that problem.

The adoption there will be probably first on the defense side. But longer-term, I think those things will make their way into the commercial side.

ON OBTAINING INFORMATION SURROUNDING JAMMING AND SPOOFING INCIDENTS

JIRI MAROUSEK ▶ That's where FRATs [flight risk assessment tools] come in—where running the right FRAT up front

makes the most sense, whether a safety management system or whatever flight risk assessment tool the operator uses. It should be a point of parity that they all ingest that information and present it to the pilot in a high-priority format.

RICHARD BOLL ▶ That's part of getting information to the pilot through notams. I've read the preliminary [on the May 14 accident involving a King Air in New Mexico, where there was a U.S. military jamming exercise]. I don't want to get into specifics because the NTSB is still investigating, but I have some thoughts on it.

We noticed the dissemination of GPS notams comes through the ARTCC [Air Route Traffic Control Center] system. In other words, they're not associated with an airport. They're associated with an air traffic control center. If you've ever read the ARTCC notams, you get a whole slew of things. You get restricted areas, windmills, lights that are out of service, MEA [minimum en route altitude] changes. You can get 30 pages of notams, pilots' eyes start glossing over when they see them, and they start pushing them to one side.

In the GDAT [GPS Disruption Action Team], we are working to address that, and so is the FAA. The FAA is working on something called a Navigation Operational and Planning Agility Suite, or NOPAS. It's a tool that's being developed by Mitre. It's going to give the FAA Command Center the ability in real time to track unplanned GPS interference events and [other] inadvertent unplanned events where we have GNSS interference that we've identified through pilot reports or other information.

There are also plans to make a front-facing tool, web-based, that will allow pilots, like we have the TFR maps here today, in real time, to pull up areas where GNSS interference may be occurring.

We're also looking at ways of tying in conventional ground-based navaid outages into that tool there. So, a pilot could quickly look and see if they're experiencing



Honeywell Aerospace's magnetic-anomaly-aided navigation is complementary to other technologies.

or may experience GNSS interference and whether ground-based navigation aids may be able to help them overcome it.

SERGE CHRISTIAANS ▶ Notams don't work for pilots. Like Rich just said, often you have 20 pages, 30 pages—it's just a line of frequencies, a line of coordinates. I don't have time to go through all those.

Notams are a compliance thing. It's not an operational thing. It's not going to work when there's multiple areas that are jamming or spoofing sensitive. Quite often, it is not being spoofed intentionally, but somebody is trying to protect their critical infrastructure against drones. So, we are collateral damage.

But we can find out. A Swiss university, the Zurich University of Applied Sciences, built a GPS-wise website that I use every day before every briefing, before every flight, to look where actual jamming and spoofing is going on.

I'm not so worried about jamming, but I'm worried about spoofing because that cascades down through my Arinc bus and through other systems that I may not be able to predict. That's where the problem exists. If you look at just a single technical issue, we can solve that. We have procedures for that. But everything that cascades down, that gets dangerous.

One of the best examples that I keep using is Azerbaijan Airlines that got shot

down on a flight from Baku to Grozny on Christmas two years ago. That was a multiple failure in a gray area that nobody saw coming because nobody understood what was happening, [and the aircraft] crashed somewhere after being shot by Russians.

About the New Mexico King Air, [jamming] might not be the actual primary reason this accident happened, but it certainly contributed. It could have been prevented, maybe, if the testing of GPS was coordinated better. It's all about communication and coordination.

In cybersecurity, we call this a threat surface. You have your GNSS; it is a system, it can be jammed, it can be spoofed, and it has serious consequences. It's a threat surface, and you need to cover it.

JIRI MAROUSEK ▶ Notams are a data source, not the actual solution. In civil aviation, we spend all our time briefing weather, none of our time briefing things like electronic warfare. GPS outages don't matter. We need to add it to the briefing like we brief weather.

When I have a FedEx feeder operation in California taking off, they run a FRAT and look at a visual depiction of the weather. They need to be able to look at a visual depiction of risk points for interference on a signal and then add [that] into procedures, giving it in a prioritized format.

RESILIENT. RELIABLE. FUTURE READY.

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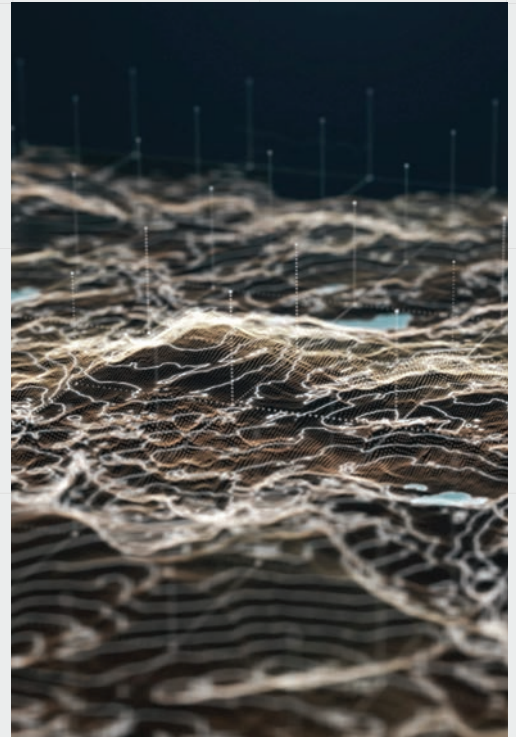
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It's about packaging the information on a timely basis. That cannot solve it all, but it gets us quite far ahead as we get some of the hardware in place to get a redundant source of data or an alternate way of looking at altitude when we know GPS is being spoofed or being interfered with.

SERGE CHRISTIAANS ▶ Electronic flight bags almost all have options to add a GPS jamming or spoofing layer on your routing. You can have an overlay now on potential turbulence or icing. There's another tab that shows you the latest data on jamming and spoofing. It's very helpful.

ON VISION-BASED TECHNOLOGY

BEN MOHR ▶ There are several different ways to do it, but the one that Honeywell Aerospace focuses on has a downward-looking camera. You compare what that camera sees to a database of satellite imagery. You can use that to figure out where you are. That's typically accurate to around 10 meters, although it can be a little bit better at lower altitudes.

The challenge with vision-based nav is it doesn't work over the ocean. It doesn't work in thick clouds. It can work in light cloud cover. If you have a break in the clouds or partial visibility through, it's pretty good at matching those sorts of things. But if you truly can't see anything, then it won't work.

You're not going to find one single solution. There's no silver bullet here. It's going to be a combination of different sensors that you have to combine to meet the particular needs of your application. Vision can combine with one of the radio-based approaches, [and, for example, Iridium].

We're also looking into magnetic-anomaly navigation. This looks at local variations in the Earth's magnetic field. It's caused by things like iron ore deposits in the crust. That actually works pretty well. It's not as accurate as vision nav, but it works over oceans; it works through clouds. There are complementary technologies like that that you could combine to produce a full solution.

ON BACKUP TECHNOLOGIES SUCH AS LORAN SYSTEMS

BEN MOHR ▶ Regarding Loran, I always advocate for more signals, and it would be great if we still had that capability.

In terms of other technologies, there are other space-based technologies, low-Earth-orbit satellites. These are essentially private GPS constellations. Iridium provides a signal like that. Some others are coming online that provide signals like that. The premise there is that they're higher-power, and so they're harder to jam.

Ultimately, however, they are jammable. I think you'll find that they're part of the

solution. They decrease the area in which jamming is a problem, but I don't think there'll be a whole solution. You're going to see other technologies, things like celestial-vision nav, radar-based nav approaches. All these things are going to play a part.

This will come on the defense side. The civil side will be fairly far behind because of the certification requirements.

What you'll see ultimately is hybrid systems that employ multiple different sources of position information. Fuse those, and that provides you with some integrity capability. You can compare those things and figure out what you really trust.

RICHARD BOLL ▶ Alternate position navigation and timing solutions have been something that the PARC [Performance-Based Operations Aviation Rulemaking Committee] and the Navigation Working Group have been closely working on and monitoring over the last 10 years or so. If you go back to the 2010/2011 timeframe, when Ligado proposed putting 5G networks in major metropolitan areas, oh my God, we were going to lose GPS, and we weren't going to be able to fly our airplanes there anymore. That was kind of the first eye-opening point where we realized that GNSS can be interfered with.

At least domestically—now, we can't cover the world—we're looking at alternate position navigation and timing solutions. We've instituted the VOR MON [Minimum Operational Network] program to provide the backup VOR in case GPS goes down. We've also taken action to increase the DMEs [distance measuring equipment].

We're not there yet, but we're looking to get en-route coverage down to 5,000 feet agl, and terminal coverage at the core of 30 airports down to 1,500 feet.

What we are looking down the road is, can we bring that even lower? Can we do RNP approach down to RNP 0.3 accuracy? This would give us basic LNAV and LNAV/VNAV approaches without GPS.



Honeywell Aerospace's Anthem avionics take cybersecurity features to a new level of safety.

That's where the FAA is starting to look, and there is a lot of energy behind doing that. Is it going to cover every place in the United States? Probably not, but is it going to cover the major airports? The answer hopefully is going to be yes.

ON TRAINING AND PREPARATION

RICHARD BOLL ▶ I don't think we've emphasized [GNSS threats] enough in our training. We've been emphasizing GPS, at least in the United States. Serge flies in an environment where we have nefarious and protective GPS jamming and spoofing. In the United States, we don't have that. In the United States, we have basically military-planned GPS jamming events, and they are fairly coordinated.

There is always direct communication between the ARTCC and the military facility that's doing the jamming, and there was a phone call that was made, and within six and a half minutes, the GPS jamming was stopped in New Mexico. I agree that GPS interference did play a part in this, because it kind of discombobulated everything, and it led them to try to do a visual approach. I'll leave it at that.

But the other issue is when we get GPS jamming events that we cannot trace. For about three hours in 2022 in the Denver area, we had a GPS jamming event that we couldn't figure out.

It happened the day after we rolled out the big 5G radar altimeter interference deal. Everybody thought that was tied to that. It wasn't until the Denver Metro found out that their wheel brake monitoring system wasn't reporting on the rail cars that we [realized] the only input [for that] was GPS. We figured: "Hey, this is GPS interference."

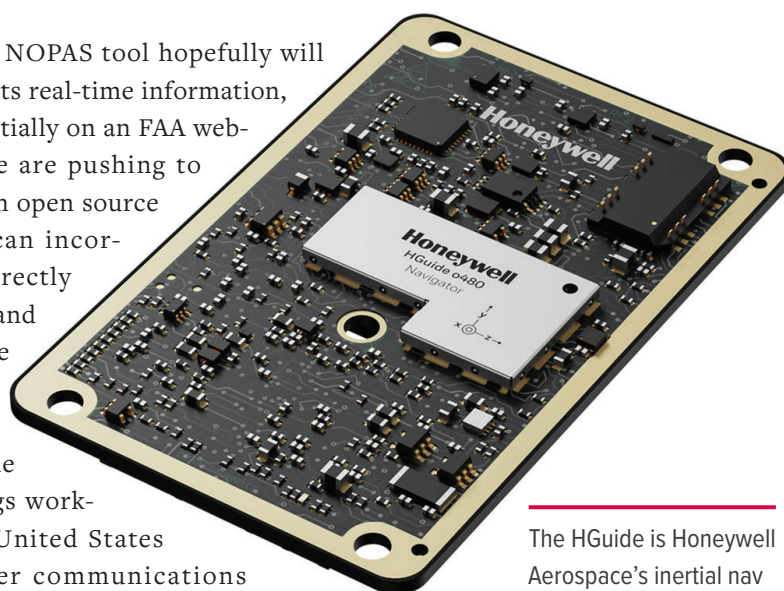
A month later, for about 48 hours, we had intermittent, widespread GPS jamming in Dallas. We don't really have a real explanation of what caused that. We have no way to communicate that information to pilots through notams, other than the ARTCC.

This new NOPAS tool hopefully will provide pilots real-time information, probably initially on an FAA website, but we are pushing to make this an open source where we can incorporate it directly into EFBs, and you can see where the big picture radar is. One of the things working in the United States is for better communications between the air carriers and the air carrier operations center and the Air Traffic Control System Command Center, so that we pick up faster, quicker potential GPS jamming events.

One of the things we pick up on GPS jamming is what happens to ADS-B Out. In the Dallas event, that was the first indication [of jamming] because airplanes that were supposed to be in the DFW terminal area were showing up over Oklahoma. It's that type of information we want to collect and feed into the Air Traffic Control System Command Center. I can tell you there is a Men in Black organization that, in the U.S., monitors this stuff very closely. If they start detecting any type of GNSS interference, they are deploying to the location to try to find it.

JIRI MAROUSEK ▶ We touched on the first line of defense, better procedures and training with the information we have. The information we have is not used as well as it should. It's not briefed as well as it should, and it's just not brought into the cockpit in a way that's actionable for the pilot. That will address a lot of the at least non-nefarious issues.

When it comes to nefarious issues, then we shouldn't rely on a single source of data. We all know that, and we are. When it comes to GPS, there's longer-range hardware that Ben and teams like his are going to have to deliver. But what's in the cockpit



The HGuide is Honeywell Aerospace's inertial nav solution for GNSS jamming.

now, or what's in the hardware now, that can start becoming a decision versus reliance [and let] the crew know it's happening, they have a misaligned piece of data, and they need to make a decision on what they trust.

That'll get better over time. There are companies like Cyviation and others that are doing the in-flight cybersecurity on top of monitoring for soundness of signals. Software is going to be ahead of hardware because certification and retrofitting are not cheap and take time.

EFBs are probably the place where that information is going to have to come in, where the algorithms—call it AI—need to better inform the air crew because they can't have too much information.

As an industry, training and preparation are the things that we need to do. It doesn't have to be regulatory. In private aviation, Part 135, 91, et cetera, it might be driven by insurance, [based on] liability and risk, which is a lot quicker to respond than regulations.

ON AIRLINE ACTION

SERGE CHRISTIAANS ▶ [Before airlines retrofit technologies], they should be available on the market first. I guess that's what we're waiting for. Ben is talking

about some beautiful, promising projects. There's a lot coming.

But it's not there yet. And until then, we're compliant. And that's it. Airplanes have a long life cycle. A lot of airplanes fly around 20 years old, 25 years old. They were built before the words cybersecurity, cyberwarfare, cyber defense, or electronic warfare existed.

We knew that the GNSS was a big threat surface, but there was nobody abusing it. But now it's a single point of failure. So, we need to do defense in layers. And that means, like Ben says, diversification.

BEN MOHR ▶ Some of these products do exist. The challenge on the civil side is regulatory. You can buy a vision nav system today. You can use it on a UAV. They're common in Ukraine.

But you can't buy one that has civil certification. There are no [minimum operational performance standards]. That's an area of challenge for the adoption on the civil side.

SERGE CHRISTIAANS ▶ Then the airplanes are flying with old Arinc 429 buses, and it all has to fit. It all has to talk to each other, digitally fit. That is more challenging than it looks.

BEN MOHR ▶ If you were to describe the adoption curve, the first place you'll see it, where you've already seen it, is on the defense side, and specifically the UAVs. Then you'll slowly see it move up to defense aircraft, crewed aircraft. And then I think you'll start to see it on the civil side. Probably, commercial aviation is going to be the last. You'll see the general aviation and other business aviation applications pick those things up sooner.

ON USE OF QUANTUM

BEN MOHR ▶ At Honeywell Aerospace, we're looking at two different quantum navigation approaches. We define quantum

navigation as navigation that's using quantum sensors.

There are two major ones. Magnetic anomaly navigation does use quantum-based magnetometers. That's what we fly in our development flights. Those are not science fiction. You can buy them today. They're not cheap, but you can order one.

There are also, a little bit farther behind, quantum inertial sensors. These are similar to gyros and accelerometers, similar to what is in a traditional INS [inertial navigation system]—for example, our ADIRU [air data inertial reference unit] or Laseref products. Except, they operate on different principles, on quantum principles that allow them to be much more accurate. Those hold a lot of promise for operating in these types of environments.

One of the immediate things a pilot can do now is just switch from their hybrid GPS INS solution to their INS-only solution. What will happen in the future when we have quantum-based inertial navigation systems is that the INS-only solution will be much more accurate. The difference between the hybrid and the INS-only will be smaller.

On the magnetometer side, quantum is actually quite small already and feasible to deploy on aircraft. Quantum inertial sensors are still large and not suitable for aircraft use yet. Although Honeywell Aerospace's done some test flights with those types of sensors. They're coming, but we're a long way out.

There's a lot of government investment going into that area, so that helps push that technology forward.

ON PILOT ADVICE

RICHARD BOLL ▶ [NBAA doesn't] publish directly any advice. We refer operators to existing guidance. First and foremost, if you have any OEM guidance, such as aircraft flight manual supplements, or operational guidance in the FCOM [flight crew operating manual], that should

be your primary source for anything on GNSS interference.

The FAA just published its GNSS interference guide. If you do not have anything from your aircraft manufacturer—for example, you are flying a lighter GA airplane or your company doesn't have robust procedures like you would see in a 121 carrier—this guide will help you develop the SOPs [standard operating procedures] or develop the background information on the differences between GPS jamming or spoofing.

We would like operators to download this. It's on the [FAA] Flight Standards website: FAA GPS Interference Guide. We're working with the FAA to keep that updated.

JIRI MAROUSEK ▶ This needs to be part of the nomenclature of primary training. [Also], you can turn on your EFB as a layer. For all of us that provide safety and security data into the cockpit during training, prior to flight, briefing the flight, we're part of the solution.

Many providers present information to crews. And this has to be part of the nomenclature, part of the product design, and part of how we present the information. It has to be normalized just like weather.

RICHARD BOLL ▶ It's also important that we, as pilots, prepare ourselves for operating in a non-GPS environment. For a lot of airplanes, like what Serge flies, you can revert to an IRU [inertial reference unit].

But there are a lot of airplanes out there [that] if GPS goes away, your RNAV system is gone. They don't have a DME/DME backup. I'm seeing way too many pilots starting to disregard VOR navigation. They think, "I don't need to have to fly a VOR approach. I don't need to know how to do a conventional ILS to a missed approach because I've always got the missed approach in the FMS." When was the last time you went to a 141 or 142 school, or



AirTera's flight-risk assessment tool can help with potential GNSS interference.

training center, flew an ILS approach with a conventional missed [approach]?

The one time that you might have to do that may be the one time the GPS is not available, and you might have to go 100 miles from your planned destination airport that only had RNAV GPS approaches.

SERGE CHRISTIAANS ▶ I agree. It's skills that we lost because we rely on the cheap and accurate GNSS.

It's about training and keeping your skills up. We have airports in Finland in remote areas that only have RNP approaches or LNAV approaches. Once the Russians start jamming because they have a 1,300-km border with these guys, you have to close the airport. There are no alternatives. Communities are being shut off, isolated.

[It is easy to revert to VOR navigation] but your GPS primary is gone, and you will lose accuracy, which is fine when you're en route, when you have 10 miles left and right. But, once you start descending into the terminal or into an approach, that might be a problem, and you need to be aware of that.

We're just talking about jamming, which is actually an easy scenario. Spoofing is

where the real [problems] start. It's where the cascading down happens. What is it doing with the rest of the hardware in my airplane?

[Regarding] the Azerbaijan accident, these guys did not know that there was spoofing, and they lost their ADS-B.

The Russian air defense was on the ground defending the airport and did not see an identification friend or foe on this airplane. So, they started shooting. The pilots knew the GPS was [messed] up, but they had no clue that it was spoofing and that the ADS-B wasn't working. Still, they were dispatched into a city heavily protected by AAA [anti-aircraft artillery]. It was a perfect storm.

This is Azerbaijan. They had permission for that flight. But, the city was protected, which means there is jamming going on, and in this case, spoofing as well. The anti-aircraft battery guys on the ground simply had no positive identification and started shooting.

In cybersecurity, we talk about technology, people, and process. The process going back, these guys should never have been dispatched in the first place. But this is where commercial pressure comes in and also diplomatic pressure: You cannot

stop flying between our two countries because then somebody is not happy. It's quite complex.

RICHARD BOLL ▶ The accident that Serge is talking about has been a topic of great discussion in the GDAT. We talked about [how] the crew tried to communicate that they had lost their GPS. But the controllers were still trying to clear them for an RNP approach—basically an RNAV GPS approach. They didn't understand that [they] didn't have the equipment necessary to fly that approach. So, there's a lot of moving parts here that need to be addressed.

SERGE CHRISTIAANS ▶ They made two tries. They made it go around in the first. And there was also weather involved, so this crew was under heavy strain. And then they got shot. The airplane was still controllable, but only half, and they limped away outside of Russian airspace. At the end, they couldn't land it normally. So, he made a crash landing, and people died, but people survived as well, which is a miracle.

ON FUTURE TECHNOLOGIES

BEN MOHR ▶ We talked about vision, magnetic anomaly, [and] low-Earth-orbit satellites. Celestial is another one on the horizon, using stars [for position information]. You can now also use satellites, space debris, anything that reflects enough light to see with your telescope. It can give you increased accuracy. So that's an area of work for us.

There are others as well. You can model the vehicle dynamics, use that as a constraint on your inertial [solution]. That's probably for lower-end platforms, not so much for crewed aircraft.

There are many different techniques, radar-based techniques. As I said before, I don't think there's really one silver bullet. I think what you're going to see is a hybrid system that combines multiple sources. ■

Remembering a solemn anniversary: The Amazon midair collision

BY CURT EPSTEIN



Twenty years ago, Joe Sharkey boarded a business jet that collided with a commercial airliner; the smaller airplane survived.

While September often is a reminder of the 9/11 terrorist attacks, it also represents another tragic anniversary for aviation. It was two decades ago, on September 29, when a business jet on its delivery flight to the U.S. collided with a commercial airliner over the Amazon rainforest in Brazil.

“I have to say honestly that the memories are as vivid today as they were 20 years ago,” said industry veteran David Rimmer, then senior v-p of aircraft charter and management provider ExcelAire, who was aboard the business jet at the time. “I still do think about my survival every day.”

The Long Island, New York-based company had purchased the Embraer Legacy 600, and several of its executives had

flown to the manufacturer’s headquarters in São José dos Campos, Brazil, for the occasion. To ExcelAire, this wasn’t just any airplane delivery; the twinjet represented a milestone—its first new, wholly company-owned jet purchase. To mark the occasion, Rimmer had invited New York Times travel writer and *AIN* contributor Joe Sharkey along to cover the delivery flight back to ExcelAire’s Long Island MacArthur Airport (KISP) base.

The ExcelAire crew planned a tech stop in Manaus on the way to the U.S. along with some local tourism activities. “First of all, the airplane didn’t have the range to get back to New York without it, and we wanted a well-rested crew,” explained Rimmer. “We

wanted to fly during daylight, and so Manaus was the logical choice, and then we decided to tack some personal time onto that.”

Brazil native Daniel Bachmann, a marketing executive with Embraer, had been asked to support Sharkey’s visit to cover the delivery process for the jet, and had accompanied him on one of the acceptance flights, which was required to test the aircraft’s systems. “When we heard of [ExcelAire’s] plans to be out and about in Manaus, I was asked by my leadership to join the team and serve as an interpreter, especially since I had been born in that city,” he told *AIN*. On short notice, Bachmann’s wife quickly packed him a suitcase for the impromptu weekend trip.

The delivery flight took off just before 3 p.m. from São José dos Campos-Professor Urbano Ernesto Stumpf Airport (SBSJ). Aboard were the two pilots, Joseph Lepore and Jan Paladino; Bachmann and Embraer sales director Henry Yandle; Rimmer and Ralph Michielli, ExcelAire's v-p and director of maintenance; and Sharkey, who was on assignment for *AIN* sister publication Business Jet Traveler (BJT).

Half an hour later, in Manaus, a Boeing 737-800 belonging to Gol Transportes Aéreos departed from Eduardo Gomes International Airport (SBEG) heading to Rio de Janeiro, via Brasília.

None could have predicted their fateful rendezvous less than two hours later. In daylight, at an altitude of 37,000 feet over the Brazilian state of Mato Grosso, at a closing speed of approximately 1,000 knots, the two jets collided, with the smaller airplane's left winglet slicing off approximately half of the 737-800's left wing. The airliner lost control and crashed into the heavily forested Amazon rainforest, claiming all 154 lives on board.

"We felt the impact; it was unmistakable," said Rimmer, ExcelAire's senior executive on the trip.

"I was sitting at the front of the plane facing the back," recalled Bachmann. "I felt a hard impact that resonated from the front to the back of the cabin. Immediately, the cockpit alarms went off, and we all looked around, perplexed."

Seated next to him, Bachmann's colleague Yandle looked out the cabin window and reported the jagged edge of the business jet's wing. "We've been hit!" he stated.

Sharkey—who passed away in 2023—wrote in an article for BJT soon after the accident: "I was closest to the impact on the left wing. Suddenly, I was startled by a loud metallic bang, the kind a car makes when it hits a pothole at, say, 30 miles an hour. There was a sharp, concussive jolt. And then nothing. The Legacy flew on steadily."

"We all proceeded to the galley and informed the pilots that the winglet was missing," said Bachmann. "We had no clue what that impact was."

"The shorn winglet was not the biggest problem," wrote Sharkey. "A foot-long piece inboard of the winglet stub and aft of the leading edge was now coming off. Rivets had popped. Some fuel was leaking closer inboard. We all knew that we were going down, one way or the other, in the middle of the Amazon, in a damaged airplane with a limited time left to fly."

The flight crew declared an emergency, but with no response from air traffic control, they wrestled the controls of the stricken business jet for 25 minutes until they spotted an obscure military air base called Campo de Provas Brigadeiro Veloso, carved out of the dense jungle near Cachimbo, approximately 90 nm from the point of impact. The pilots eased the jet into a wide, gentle turn and brought it down in a hard landing.

"It took two courageous, skilled pilots to land that damaged airplane safely," wrote Sharkey. "When we came to a stop, there was abrupt silence. And then we cheered."

"We were greeted by Brazilian Air Force officers, who inspected the aircraft, inside and out. Only then we realized the tail [of the] fuselage was warped and the horizontal stabilizer fairing had been sheared off, maybe half an inch from its mechanism," explained Bachmann. "We also noticed that the winglet was sheared, and the wing was bent back and upwards, causing the fuselage at the root of the wing to be warped. It also impeded functionality of the ailerons, which is why we could only turn right on descent."

"The feeling was utter shock at seeing that the damage was far greater than just the winglet," Rimmer told *AIN* in a recent interview. "At that moment it just felt like an incredible, inexplicable gift of survival...not knowing the tragedy that was unfolding."

Sharkey noted that there was no sign of hostility from the Brazilian military as their passports were checked. They were assigned clean bunks in a barracks.

"We were in a vacuum," said Rimmer. "There was no cell service, so we couldn't



The midair collision took place at 37,000 feet, and the damaged 737 lost control and crashed.

access information on our phones or computers, and there were no cable news channels on the TVs. Not even a crawl on the bottom of the screen with news.” The passengers and crew speculated about what had happened, with the consensus being they had either clipped a small military jet and the other pilot had ejected, or an aircraft had broken up at a higher altitude, and they had flown through the descending debris.

Later that night, they got their first clue as to what had actually happened. “We were being served dinner,” explained Rimmer, “and [Bachmann] came back to the table. He had stepped away, and he said, ‘Guys, I have terrible news. There’s an airliner missing,’ and that’s when it started to sink in.”

The next day, reality further set in. “What was otherwise a pretty quiet base was full of activity, and we became aware that there was a search-and-rescue or search-and-recovery mission going on,” Rimmer added. “It became obvious that the airliner was nearby, and that they were using the base to muster troops to find it.”

He remembered being questioned by a number of unidentified individuals on the base that day before the entire group was loaded onto a Brazilian military aircraft and flown to Cuiabá, the capital of Mato Grosso. There they were taken to the federal police station for individual questioning. “One of the officers needed help with translation of the deposition into Portuguese, so I did that for several passengers and the pilots,” Bachmann told *AIN*. “The air was tense, and the questions were insistent about everyone’s behavior and actions onboard.”

While all on board the business jet were shaken by the tragedy, it literally struck closest to home for Bachmann, who eventually learned that family friends and acquaintances from his home city were aboard the doomed Gol airliner.

The questioning went on for more than 12 hours. “They separated us into different rooms,” said Rimmer. “The U.S. Air Force attaché was in my room, along with



SANTIAGO MENDEZ NORIEGA

The former ExcelAire Embraer Legacy 600 airplane today.

a police interrogator, an interpreter, and a representative of the manufacturer. We were not represented by counsel. At the end of the conversation, I was presented with a document that was purportedly an accounting of what I said in Portuguese, and they wanted me to sign it.”

Unsurprisingly, a catastrophe of that magnitude quickly became a media storm. “Outside the police precinct in Cuiabá, were journalists and photographers that followed us from the airport,” recalled Bachmann. They spent the night there, and someone managed to get photos of documents from inside the precinct. The next morning, these documents were being shared on the internet, with home addresses and phone numbers. “My wife started getting calls soon after, and we also received death threats in the mail.”

Following that, they were released. While everyone else went their separate ways, Rimmer elected to stay with the pilots, whose passports were seized. A week later, he was advised by company ownership to return to the U.S. before his passport was taken as well. “I left feeling guilty, because I would have stayed,” said Rimmer. “It was my desire to stay with the pilots, but I did leave at the behest of the company and our attorneys and consultants.”

The pilots ended up spending approximately two months in Brazil. “One of the

police investigators said that he was intent on throwing them in jail,” Rimmer said. “So we knew that that was sort of the direction they were heading in, but we fought for the release of their passports in court, all the way up to the Brazilian Supreme Court, where we won a ruling that said there’s nothing in Brazilian law that provides for taking their passports away for this accident.”

Despite the wave of anti-American sentiment stirred up by the accident, the pilots’ passports were eventually returned, and the Brazilian Federal Police questioned them one last time before they were allowed to step on board a chartered jet and go home.

Among the factors leading to the collision were the Legacy’s transponder not transmitting for an undetermined reason, disabling the TCAS, and a series of failures by Brazil’s military-run ATC. Several controllers were found guilty by criminal and military courts.

The American pilots were eventually convicted and sentenced in absentia by Brazil’s court to three years and three months of alternative penalty for failing to observe the “TCAS Off” message. But the NTSB disagreed with the safety investigation’s conclusions, and the specific charge—placing an aircraft in danger—has no equivalent in the U.S., making the crime non-extraditable.

continues on page 56 ►

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Velocity FBO Network Plants Flag in Lone Star State

Growing FBO chain Velocity FBO has expanded its footprint in Texas with the acquisition of SkyPlace FBO, one of three service providers at San Antonio International Airport (KSAT). The 4,000-sq-ft terminal there is adjacent to a U.S. Customs and Border Protection facility and features a recently renovated lounge and lobby, an eight-seat conference room, and a covered entrance for weather protection.

In addition, the AEG Fuels-branded complex includes a pair of 30,000-sq-ft hangars, with 40-foot-high doors and a tail door adding another eight feet of clearance, each capable of housing a Boeing BBJ or Airbus ACJ bizliner.

For Velocity, this acquisition marks its sixth location, with three added since the core trio of Odyssey Aviation North America FBOs was acquired and rebranded last year.

New FBO To Land at Puerto Rico's San Juan Airport

BlueSky San Juan, a \$54 million FBO project, has broken ground at Puerto Rico's San Juan Luis Muñoz Marín International Airport (TJSJ).

The facility—scheduled for completion in third-quarter 2028 as the third service provider on the field—will feature an 8,000-sq-ft terminal, with executive and pilot lounges, conference and flight-planning rooms, and concierge services. An onsite U.S. Customs and Border Protection inspection facility will allow international arrivals to clear U.S. customs directly at TJSJ before continuing to the U.S. mainland.

Also included will be a trio of 20,000-sq-ft hangars with 30-foot-high doors, capable of sheltering the latest ultra-long-range business jets, and a privately financed ramp to accommodate the largest commercial passenger aircraft.

Jet Aviation Inaugurates Miami-Opa Locka FBO

Jet Aviation has officially opened its newest FBO: a 27-acre complex at Miami-Opa Locka Executive Airport (KOPF). The General Dynamics subsidiary began operations from a temporary facility at the location in November, making it the fifth service provider at KOPF.

Built to LEED environmental standards, the FBO features an airy 8,500-sq-ft terminal with an open layout and floor-to-ceiling windows offering unobstructed views of the ramp and runway. Amenities include passenger and pilot lounges, office space, and a conference room.

The adjoining 40,000-sq-ft hangar has 30-foot-high doors to handle the latest ultra-long-range business jets, and the 12.4-acre ramp offers two taxiway connectors and customer vehicle access via a private gate. On-site U.S. Customs and Border Protection is scheduled to open later this year.

Oklahoma Mx Provider Adds FBO at Wiley Post

Following its acquisition of the lease of the former infrastructure assets of aircraft operator and defense contractor Metrea at Oklahoma's Wiley Post Airport (KPWA), aircraft maintenance provider AvionAero has added an FBO to its operation, making it a full-service shop for operators and bringing the number of service providers on the field to three.

The company recently held the grand opening of its 17,000-sq-ft terminal and offices, which underwent a half-million-dollar renovation. Open daily from 6 a.m. until 10 p.m., the facility includes two conference rooms; a canteen; a pilot lounge with snooze room and showers. Three crew cars are also available.

The Phillips 66-branded facility offers 75,000 sq ft of hangars capable of sheltering up to a super-midsize jet, and AvionAero waives ramp fees on quick turns or with a minimum fuel purchase.





Blackbushe Invests in Alternative South England Bizav Gateway

The private owners of Blackbushe Airport (EGLK) are investing around \$20 million to offer business aircraft operators alternative access to London and south England. By year-end, a pair of four-bay hangars are slated to open, with two more planned in 2027 along with a new general aviation terminal building.

Blackbushe is located about five miles north of Farnborough Airport, offering a similar drive time into central London. Business operations director Rebecca Cornthwaite told **AIN** that the facility is providing light business jets with an alternative to capacity-constrained London-area airports.

Currently, general aviation activity—including a flight school owned by the airport—accounts for around 95% of activity at Blackbushe. The airport's management team has stressed that it is not looking to replace the general aviation community, but pointed out that, even at 5% of total traffic, business aviation already generates around 20% of its income. The site also continues to see demand from helicopter operators.

Blackbushe's single Runway 7/25 is 4,215 feet long and 151 feet wide, and is equipped for visual approaches with high-intensity edge lighting and PAPIs. For private operations, the airport can accommodate jets up to the size of Dassault Falcon 8Xs and Gulfstream G550s, but it has wider appeal for commercial flights with aircraft such as the Pilatus PC-24 and PC-12, as well as Beechcraft King Airs.

No Movement Constraints

Unlike its Farnborough neighbor, Blackbushe Airport is not constrained by a cap on annual movements. According to airport managing director Chris Gazzard, Blackbushe is drawing interest from operators seeking workarounds to



New hangars and a terminal are part of a \$20 million modernization project at EGLK.

weekend restrictions at Farnborough and other locations.

Despite their proximity, or perhaps because of it, Gazzard views the two airports as complementary, rather than being in direct competition, with each serving somewhat different market segments. In his view, light jets in particular will now find a warmer welcome at Blackbushe, where the new hangars will eventually have space for around two dozen aircraft of this size.

Standard daily operating hours at Blackbushe are from 7 a.m. to 6 p.m. local time, with extensions available until 10 p.m. subject to a supplementary landing fee that also applies on public holidays. The airport, which is closed only on December 25, offers taxi times to and from the runway of just two minutes.

Landing fees (excluding 20% VAT) range from around £225 (\$301) for a King Air to £600 for a Falcon 8X or G550, with these charges reduced by £100 for based operators. Overnight aircraft parking costs between £37.50 and £250, with no charge for same-day visits.

Farnborough Airport offers a 6,800-foot ILS-equipped runway with significantly greater operational flexibility, as well as extensive hangar and apron space and a purpose-built terminal. It does not publish

its landing and parking fees, but they are understood to be substantially more than those at Blackbushe.

Gazzard said the availability of hangars will make Blackbushe more “weather resilient” for business aircraft operators. He said around 150 prospective clients have already put themselves on a waiting list for hangar space, and he expects the new terminal to be popular, especially with air charter operators.

According to Cornthwaite, Blackbushe has the potential to attract a wide array of support companies as the operator base expands. In particular, the airport is keen to attract maintenance, repair, and overhaul providers.

Blackbushe's owners—British IT entrepreneur Peter Ogden and his family—have shown patience and commitment in pursuing what they see as the airport's full potential. Development work was stalled for years by local planning approval processes that are now resolved.

A country park now provides a public space and a noise buffer to local residential areas. According to the management team, noise complaints are minimal, and the most recent public consultations about the airport's future attracted around 500 letters of support and only about 30 in opposition. **C.A.**



California MRO Spreads to Colorado with Company Buy

Fourth Front Aviation, an aircraft maintenance and modification provider based at Los Angeles-area Santa Monica Airport, has acquired D&J Aviation, an FAA Part 145 service center at Colorado Springs Airport (KCOS). D&J's leadership and staff will remain at the KCOS facility, which will be rebranded as Fourth Front Colorado.

The facility, which serves a wide range of business aircraft operators, will provide full-spectrum avionics installations and support, scheduled and unscheduled maintenance, aircraft modifications and equipment installations, aircraft pre-purchase inspections, and fleet support. Fourth Front's purchase establishes it as a growing national provider of aviation maintenance and modification services, and gives it a strong operational presence in the Rocky Mountain region.

Gulfstream Opens Customer Support Office in Singapore

Gulfstream Aerospace has reinforced its reach in Asia-Pacific with an onsite customer support team in Singapore. Located at the facility of sister company Jet Aviation—one of six Gulfstream factory-authorized service centers—the customer support office is the company's first in Singapore and will provide immediate access to Gulfstream personnel, expertise, and support. It is staffed with eight Gulfstream employees, including customer technical managers, materials and quality team members, a field service representative, and a regional sales manager. The new office builds on the airframer's broader customer support presence in Asia-Pacific, including nine field service representatives, three Gulfstream Field and Airborne Support Teams, and a Singapore-based 5,000-sq-ft distribution center. In addition, Gulfstream has named 10 authorized warranty facilities worldwide.

Skyservice Brings Bombardier ASF Network to Vancouver

Skyservice Business Aviation's Vancouver facility has been designated a Bombardier authorized service facility (ASF). The designation extends Bombardier's ASF coverage to Canada's west coast and adds certified technicians, mobile repair teams, and rapid-response maintenance support in a region that Skyservice noted as a key gateway for trans-Pacific traffic. The facility, located at Vancouver International Airport (CYVR) in Richmond, British Columbia, joins Skyservice's existing ASF locations in Toronto (CYYZ) and Montréal (CYUL), giving the company three Bombardier-authorized sites across Canada. The Vancouver facility supports maintenance, repair, and overhaul capability for Bombardier Globals and Challengers. The ASF designation also supports Skyservice's aircraft management clients, providing regional access to hangar space and Bombardier maintenance expertise.

Steiner Aviation Expands Facility for Midsize Jet Mx

Steiner Aviation International expanded its facility at Akron-Canton Regional Airport (KCAK) in Ohio with a 12,000-sq-ft hangar initially dedicated to servicing Embraer ERJ-135s and ERJ-145s, which includes Legacy 600/650 business jets.

The company provides avionics service, installations, and repair, as well as aircraft maintenance services. Steiner Aviation has invested in specialized tools and has added an experienced Embraer technical team. The new facility, now operational, focuses on heavy maintenance, scheduled maintenance, and inspections for ERJ-135/145s, as well as other super-midsize business jets and regional jets.





The Art and Business of Interior Designs at Yingling Aviation

When Angie Saggerson joined Yingling Aviation more than 22 years ago, the Wichita-based MRO did not have an interior shop, associated equipment, or a dedicated team. The company, which is celebrating its 80th anniversary, had been a longtime Cessna-authorized facility and brought Saggerson on board to manage a Caravan project that evolved into the Oasis interior.

Since then, she has grown the department into a multimillion-dollar program that manages an array of business aircraft, according to the company. And she stresses that most of the furnishings are developed in-house.

"When I started, we did not have a sewing machine. We did not have any employees [in the interior shop]," she told **AIN**. Saggerson, who is senior director of interior completions at Yingling, had brought over design experience from Cessna, beginning her career as an interior design coordinator at Cessna Aircraft. But that was just the start of a learning curve.

She and her growing department had to learn the art of obtaining supplemental type certificates for fitting interiors and engineering them in general. The team also learned how to obtain parts manufacturer approval for building their own furnishings. Basically, she said, they learned the "big picture" of how things fit together.

While developing novel interior concepts is always a welcome challenge, Saggerson said her favorite completions projects tend to center around the customer. That holds true with the Caravan Oasis. That project "will always be near and dear to me," with more than 300 delivered to date, Saggerson said, adding that she has worked with "lots of amazing customers through the years that I'm still in touch with today."

The interior refreshes the cabin for an aircraft long known as an industry workhorse



Yingling's hangars are filling with large-cabin projects, along with its small-cabin work.

with higher-end finishings and elevated seating with a selection of leather, fabric, and cabinetry finishings based around a handful of color schemes. Layouts can be configured for up to 11 places, including crew, and options for club seating and a divan.

While that project has been ongoing for a few decades, a relatively newer project for her department is the Eagle program that Yingling has worked on in concert with CitationPartners. This involves a complete overhaul of the Cessna Citation 560, including full interior, paint, and an upgrade to Garmin G5000 avionics.

"We would take a worn-out aircraft and give it new life," Saggerson said. "It was great to see our customers' excitement on delivery day."

A highlight of this program was working with the late Russ Meyer, the former Cessna Aircraft chief who had long championed industry causes and is enshrined in the National Aviation Hall of Fame. Meyer helped launch CitationPartners.

In 2024, Yingling spread its wings once more and grew into large cabins with refurbishments already completed on the

Gulfstream G550, along with Bombardier Challengers and Globals. The flat floors and larger cabins provide more room for additional design features and creativity on interiors, mixing in different patterns and textures, she said. This is particularly true with the carpets. "I like to start with the carpets," Saggerson said.

The more than two decades of design experience equipped the Yingling design team for the jump to larger cabins. But this new foray has quickly snowballed, she said, noting that over the holidays, Yingling had three Gulfstreams in-house simultaneously. That has continued, driven in part by aircraft coming in for inflight connectivity upgrades and seeking refurbishments at the same time. "Right now our interiors department is on-fire busy."

As for her favorite work, Saggerson said that it really isn't about the project itself. "The absolute best part of any project is the customer. It doesn't matter if we are working on a Cessna 182 or a Gulfstream; the customer sets the tone for the project," she said. "I still get excited when a project is complete, and the customer gets to see their vision come to life."

K.L.

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

Vectoring Delay Preceded Double Flameout

Textron Aviation Cessna 680A Citation Latitude,
June 16, 2026, Laredo, Texas

After declaring an emergency in response to a cascading series of equipment failures, the crew of a NetJets flight from San Jose del Cabo, Mexico, to Austin, Texas, requested a visual approach with a five-mile final to Runway 36L at Laredo International Airport (KLRD). Believing the jet's altitude made that infeasible, the Houston Center controllers instead vectored the airplane through a right 270-degree turn to set up a 14-mile final to the same runway.

One passenger was killed, the pilot was seriously injured, and the first officer and the other three passengers all suffered minor injuries after both engines flamed out on short final, forcing the crew to attempt an emergency landing in the northbound lanes of the Bob Bullock Loop. The airplane sheared off several light poles and struck a vehicle, causing minor injuries to an occupant, and rolled onto its right side about one mile southeast of the airport. Footage from security and doorbell cameras showed fire flaring around the airplane twice prior to touchdown.

The first abnormal indication was "a low frequency vibration and humming noise" that was steady during the initial climb and became intermittent afterward. As the crew discussed it with the company's flight operations duty manager and a maintenance controller, the crew alerting system (CAS) showed a "BOTH ON ADC1" message referring to the airplane's air data computers, leading the maintenance controller to suggest that the vibration might have come from an avionics cooling fan in the forward instrument panel. No abnormal indications appeared on the system synoptics pages,

and after the crew cleared the CAS message, it was jointly concluded that the flight could safely continue to Austin.

However, as the aircraft approached the U.S.-Mexico border, the CAS displayed five warnings over the course of 15 minutes, including "FUEL BOOST PUMP ON R," "FUEL PRESS LOW R," and finally "FUEL LEVEL LOW R." The crew declared an emergency and were handed off to the Houston ARTCC, which provided radar vectors to KLRD.

The jet eventually came to rest "straddling the right-hand side of an overpass." With the assistance of motorists, the surviving occupants evacuated the wreckage through the main cabin door. Investigators subsequently found screws missing from the outer housing of the right engine's starter/generator, which had been operated for 1,142.8 hours of its 1,200-hour overhaul schedule; on disassembly, its shaft was found bent, the cooling fan was fractured, and fan blades and bearing balls were found inside. The right engine's fuel pressure switch was separated from the fuel tube, which was fractured adjacent to the weld for the pressure switch attachment tube.

Engine Failure Followed Extended 'Uncoordinated Flight'

Daher-Socata TBM 850,
June 26, 2026, Erickson, Manitoba, Canada

During an IFR flight from The Pas Airport (CYQD) to Brandon Municipal Airport (CYBR), both in Manitoba, the single-engine turboprop suffered a complete loss of engine power while descending through 13,000 feet. After unsuccessfully trying to restart it, the pilot attempted to glide to Erickson Municipal Aerodrome (CKQ6) but was forced to make an emergency landing on Provincial Trunk Highway 45. One of the three passengers was taken to a local hospital with minor

injuries after the airplane departed from the paved road and came to rest in a ditch.

The Transportation Safety Board's (TSB) initial review of flight data suggested that "the aircraft was flying uncoordinated for an extended duration prior to the engine failure." The TBM 850's flight manual warns against uncoordinated flight lasting longer than 30 seconds, which has been known to cause fuel starvation due to unporting of the fuel pickups. The TSB's preliminary report did not cite any possible explanations for the uncoordinated flight.

Evidence of Bird Strike in Sightseeing Helicopter Break-up

Bell 206L-4, April 11, 2025,
Hudson River/Jersey City, New Jersey

A detailed report from the Feather Identification Lab of the Smithsonian Institution's National Museum of Natural History describes definitive traces of three large bird species that were found on fragments of the wreckage, corroborating surveillance camera and witness accounts of flocks of birds in the vicinity at the time of the accident.

The pilot and all five passengers were killed when the aircraft broke up over the Hudson River during the 790-hour commercial pilot's eighth sightseeing flight of the day. Surveillance camera recordings supported witness statements describing both the main rotor and tail boom separating from the fuselage.

The report released as part of the NTSB's investigation docket states that material from Brant and Canada geese was identified on the left side of the helicopter, including one rotor blade and both horizontal and vertical stabilizers. Only Canada goose remains were identified on the right horizontal stabilizer. Genetic analysis showed that both male and female individuals struck the left side, while only female DNA was obtained

from the Canada goose remains on the right. Wreckage from the left side also included traces of one or more female great black-backed gulls. Large populations of all three species were documented around the Hudson River in April 2025.

Taken together with the known habits of these species, the distribution of the biological material led the Smithsonian's expert to suggest that a mixed flock of Brant and Canada geese struck the main rotor and horizontal stabilizer, while the gull was hit by flying debris from the helicopter's tail.

Final Reports

Control Interference Ruled Out in Fatal Autorotation Accident

Bell 505 Jet Ranger X, July 30, 2024,
near Killucan, County Westmeath, Ireland

Earlier instances in which a headset control box restricted movement of Bell 505 cyclic controls led the Air Accident Investigation Unit (AAIU) to evaluate the possibility that it contributed to the loss of control in the sixth of a series of practice autorotations conducted during type-rating training for the helicopter's new owner. The 105-hour student, who had passed the practical test for his private pilot license five days earlier, and the 5,253-hour contract instructor were both killed after the helicopter rebounded from a farm field and crashed into an agricultural building. However, examination of the site found no evidence of damage to either a headset control box or either cyclic lever, and data downloaded from the Garmin avionics was consistent with free movement of the flight controls.

Downloaded flight data indicated that roughly 45 seconds into the sixth autorotation, following what appeared to be a series of S-turns, the helicopter began yawing to the left at about 700 feet. Main rotor rpm and airspeed remained stable at 102% and 70 knots, respectively, while its descent rate increased to 2,500 fpm with the collective

fully down. The rate of yaw reached 30 degrees per second before the helicopter rolled right and entered a low-g condition, descending at 3,200 fpm, which increased to 3,900 fpm during a series of increasingly rapid and extreme attitude excursions and a right bank of 95 degrees. The AAIU ultimately attributed the accident to the instructor's failure to intervene before the helicopter's attitude became unrecoverable.

'Extreme' Rainfall Cited in Landing Excursion

Gulfstream G600, May 27, 2026,
Birmingham, Alabama

A loss of forward visibility in heavy rain during the landing flare led to the twin-engine business jet drifting off the right side of the runway onto the grass. "The pilots applied left control inputs," causing the airplane to pivot 70 degrees and come to

rest on the runway "oriented nearly perpendicular to their approach path." The right wing sustained substantial damage, but there were no injuries to either pilot or any of the 12 passengers.

The Part 91 corporate flight from Kerry, Ireland (EIKY), flew the ILS approach to Runway 24 at Birmingham-Shuttlesworth International Airport (KBHM) in conditions that included three-quarters-of-a-mile visibility in heavy rain, thunderstorms, and mist. A heavy rain cell had been reported over the runway, and the pilots had observed the precipitation echoes on the ship's weather radar. The captain subsequently said, "We didn't like the looks of the radar return; however, there were no indications of shear and the two aircraft ahead of us reported no issues." The two airline transport pilots had more than 21,140 combined hours of flight experience, including more than 1,200 total hours in type. ■

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How many Gulfstream G650s are in service today, and which operators run the largest fleets?

Ask things Like: **WHICH CITATION CJ35 FLEW THE MOST HOURS LAST QUARTER?**

Which Gulfstream G450s have been the most active in the last 90 days in Texas?

Icons: A group of colorful dots, a green phone icon, a blue person icon with a 'T', a colorful cube, and an orange starburst.

JUST AROUND THE CORNER

Oct. 1, 2026

France: Passenger Information Requirements

France has introduced new advance passenger information and passenger name record (API/PNR) reporting requirements for business aircraft charter operations. These regulations apply to commercial flights arriving in or departing from any French territory, except those operated entirely within mainland France. International business flight information specialist OpsGroup summed up the new requirements: strict enforcement starts on Oct. 1, 2026. “Getting it wrong could result in a fine (up to €50,000).” Passenger data must be sent twice: once 48 hours before departure, and again at the time of departure, “using the final and accurate passenger manifest.” The API/PNR mandate does not replace customs or immigration requirements. There is no regulatory change for private flights.

Sept. 8, 2026

U.S.: Future of Midway Atoll Airport

The FAA requests comments regarding the importance of Midway Atoll Airport/Henderson Airfield (PMDY) for trans-Pacific Ocean aviation operations. Specifically, PMDY is required for airline routes over the Pacific Ocean involving extended range operations with two-engines (ETOPS). The airport is also available for emergency diversions by business jets. However, the FAA says PMDY’s infrastructure is “deteriorating and will require significant financial investments and rehabilitation within the next three to five years” to maintain its operational capability and compliance with airport certification and ETOPS requirements. The FAA is requesting responses to questions contained in this notice in order to better understand the potential impacts if PMDY were no longer available. Comments must be received by Sept. 8, 2026.

Sept. 9, 2026

Canada: UAS Remote ID Proposed

To address the continued growth and proliferation of uncrewed aircraft systems (UAS), scaling of new, more complex operations, continued integration within Canadian airspace, and preparation for UAS traffic management, Transport Canada (TC) is proposing: remote ID requirements for UAS; new airspace tools for TC

to better respond to UAS-specific needs that would ensure that the agency is able to quickly put in place airspace restrictions and constraints; and regulatory changes specific to recreational UAS organizations. A “community-based organization” model could allow recreational UAS organizations to apply to TC to operate under different requirements, including their own safety procedures when flying in fixed geographical areas. Additionally, TC is considering requiring “geo-awareness” functions on compatible UAS. Comments are due by Sept. 9, 2026.

Sept. 22, 2026

UK: Equipment Requirements Below FL100

All civil aircraft—including UAS and foreign-registered aircraft—operating in the UK below 10,000 feet not required to be equipped with ADS-B Out will be mandated to have “electronic conspicuity” (EC) equipment that can detect and identify each other, under proposed rulemaking from the UK Civil Aviation Authority. The objective of an EC mandate would be to reduce midair-collision risk in the UK’s lower airspace. After an adequate transition period once the EC requirement is adopted, the UK said a single start date would better support the safety objectives of the mandate than a phased approach. Comments on the proposal are due by Sept. 22, 2026.

Sept. 24, 2026

U.S.: Part 25 Regulations Update

The FAA proposes to amend various airworthiness regulations of certain certification standards for Part 25 transport category airplanes and propulsion systems by reducing the number of exemptions, special conditions, and equivalent level of safety findings required during the certification process. The agency expects that this proposal would reduce certification costs and time to certify new and changed products without compromising safety. Special Federal Aviation Regulation (SFAR) No. 109 would be removed from Part 25 and its requirements relocated. Finally, this action would address industry and NTSB recommendations while also harmonizing FAA’s regulations with international standards. Comments are due by Sept. 24, 2026.

Sept. 30, 2026

Canada: Aeronautical Data Processing

Before the end of September 2026, Nav Canada will begin the transition to a new and updated aeronautical data processing system (ADPS), resulting in lengthy but temporary reduced capacity to process regulatory, advisory, and operations aeronautical data submissions. The most significant constraints are anticipated during the April 15, 2027 and June 10, 2027 aeronautical information regulation and control

(AIRAC) 56-day cycles. Capacity will gradually increase cycle by cycle until normal operations resume by third quarter 2027, with full capacity expected for the March 16, 2028 AIRAC cycle. During the transition period regulatory and safety-critical updates will be prioritized. Non-essential changes may be deferred to later AIRAC cycles. The format, content, and scheduled release of all cyclic publications—including AIRAC, Canada Flight Supplement, Canada Air Pilot, and en route charts—will remain unchanged throughout this transition. This modernization is necessary to support evolving regulatory requirements and international data exchange standards.

Oct. 1, 2026

U.S.: Organization Designation Authorization

The FAA has published FAA Order 8100.15C expanding its organization designation authorization (ODA) program and revising procedures for administering and rewarding ODA approval to individual and company designees. This order, which canceled 16 previous orders, addresses how FAA personnel evaluate, appoint, and oversee the ODA program. It also provides guidance to current and prospective Parts 91, 135, 121, and 141 ODA holders on applications, procedures manual contents, and roles and responsibilities. The National Air Transportation Association noted that changes to Part 135 operators are limited to four specific tasks: conducting pilot airmen certification tasks; conducting air carrier check pilot evaluations; conducting advanced qualification program initial qualification checks; and conducting airman certificate qualification reviews. The order contains some revisions suggested by comments to a notice of proposed rulemaking issued late last year. This new order, effective on Oct. 1, 2025, requires that current ODA holders submit revised procedures manuals for FAA approval by Oct. 1, 2026.

For the most current compliance status, see: ainonline.com/compliance



What began as a white Citation CJ3+ with factory stripes became a 46-color, full-scale piece of flying art and the most intricate paint scheme Duncan Aviation has ever completed. As a Duncan family-owned aircraft, N1RD carried a deeply personal vision inspired by Robert and Karen Duncan's love of art, travel, color, and creative risk. The aircraft features bold graphics, hand-laid details, eyes, flies, flowers, stencils, and layered design elements that make it impossible to ignore.

DuncanAviation.aero/refurbishment/outrageous



BY JESSICA REED



MICHEL DENIS

Michel Denis was named CEO of *Daher*, effective July 1. He joined the company from Manitou Group, where he had served as CEO for more than 12 years. Before that, he worked for Fraikin Group, where he also rose to the position of CEO.

Chris Rocheleau stepped down as FAA deputy administrator to return to his role as COO at NBAA. Rocheleau spent nearly 17 years with the FAA before joining NBAA in 2022. But he moved back to the agency at the request of the Trump transition team. His return to NBAA comes as the association hired JetAviva CEO **Emily Deaton** as senior v-p of product development and sales, tasked with creating new offerings and experiences for NBAA members and forging strategic partnerships. It also follows the announcement that **Doug Carr**, NBAA senior v-p for safety, security, sustainability, and international operations, had planned to retire in August after 28 years with the association.



DOUG CARR

Following *Flexjet's* acquisition of London-based business aircraft brokerage The Jet Business, **Steve Varsano**—industry leader and founder of The Jet Business—was named president of Flexjet, focusing on international product innovation and global expansion.

AIN Media Group appointed **Howard Hardee** as editor of its *Leeham News and Analysis* (LNA) platform. He started the new role on July 1 with overall responsibility for LNA's in-depth and independent coverage of the aerospace and airline sectors. Hardee is taking the reins at LNA from its co-founder and editor, Scott Hamilton, who is transitioning toward retirement in 2027 and will contribute articles in his new role as editor-at-large. Co-founder **Bjorn Fehrm**—a highly experienced aerospace engineer by background—is continuing in his role as aeronautical and economic analyst, covering technical topics. Since August 2022, Hardee has worked as Americas aviation reporter for *FlightGlobal*, covering airlines and future technology. With 15 years of experience

in journalism, he has previously covered a variety of topics, including science and politics, having started his career with his hometown newspaper in Chico, California.

Aero Asset hired **Céline Marchal** as v-p of sales for the Asia-Pacific region. Marchal, based in Singapore, has 25 years of experience in the helicopter industry.

Andrew Giacini was selected as staff director for the *U.S. Transportation and Infrastructure Committee's* aviation subcommittee. Most recently, Giacini worked on the transportation, housing, and urban development subcommittee of the House Appropriations Committee, and he has also served as special assistant to Todd Inman, board member of the NTSB.

Zach Ungerleider joined *Mente Group* as director of technical services. Ungerleider has an FAA A&P certificate and a private pilot certificate and was previously director of maintenance for several Cessna Citations. His 15-plus years of experience in aviation include managing ProAdvantage Programs, maintenance, and aftermarket modifications at Textron Aviation and overseeing the maintenance service plan portfolio for HTF7000, TFE731, and CFE738 engines at Honeywell Aerospace.

Vertical Aviation International (VAI) announced five new hires and five promotions as part of its five-year strategic plan. **Raffaele Vitelli**, who has 20-plus years of association experience in program growth and non-dues revenue development, was named v-p of business development.

VAI appointed **Jim McClay** senior director of regulatory affairs. McClay most recently was at AOPA. **Katia Veraza** was promoted to director of state government affairs and regional relations after almost four years at the association. Promoted to technical director is VAI veteran **Jay Clark**, who will lead the association's data project. **Tanya Kirchner** moved into the role of senior director of conventions, in which she will lead events including Verticon, Air Tour Safety



ZACH UNGERLEIDER



KATIA VERAZA

Conference, and Aerial Work Safety Conference. Nine-year VAI veteran **Emily Monahan** was chosen for the position of assistant director of exhibits and experience. Meanwhile, **Alyssa Vasquez** was promoted from the conventions department to executive assistant to the chief of staff. VAI hired **Shawna Kerns** as creative director; she will manage marketing for events and membership and oversee social media. Joining the safety and data operations team is **Safae Assli**. Additionally, **Ubaid Tariq** is now VAI's database administration manager.



JEFF MESSMER

Jeff Messmer was promoted to manager of technical sales at *West Star Aviation*, supporting operations at the regional airport in Perryville, Missouri. Messmer, who began his aviation career as an aircraft structural technician in the U.S. Army, has worked at West Star for almost 15 years.

DAS Aviation promoted **Josh Collins** to general manager of its Cedar Hill facility. He has been with the company since *DAS Aviation* acquired FAA-certified Part 145 repair station and aerospace engineering firm AQRD (Aerospace Quality Research and Development) towards the end of last year. Collins' previous experience includes roles such as chief inspector, quality manager, production manager, accountable manager, operations manager, and director of operations.



BRENO CORREA

Business aircraft brokerage *Integrity Jets* appointed **Breno Correa** as managing partner. Correa joined the firm after 20 years with Embraer, most recently serving as senior v-p of asset management, where he led the company's global preowned aircraft sales organization.

Guardian Jet promoted three of its employees to sales directors. Previously director of operations, Connecticut-based **Dan Gardner** now focuses on midsize and large jet sales and acquisitions across New England. **Zach Conover**, based in Chicago, joined *Guardian Jet* as a consultant in 2022 and is now focused on owners and operators in the Midwest. **William Smith**, also based in Connecticut, joined the company in 2021 and now works with clients in the mid-Atlantic and Southeast regions. Conover and Smith are

both part of *Guardian Jet's* light jet and turbo-prop division.

James McNeill, formerly regional v-p of real estate for Sheltair, has joined *Infinity Aviation Group* as regional v-p of operations, overseeing the company's expanding network of FBOs. In his 35-plus years in aviation, McNeill has also worked at Signature Flight Support and at Landmark Aviation.

Butler National Corp. CEO **Christopher Reedy** retired due to health concerns but continues to serve in an advisory capacity. CFO **Adam Sefchick** has stepped in as interim CEO.

Jeremy Foster, previously charter coordinator at *Cutter Aviation*, was promoted to shared ownership sales manager. He joined the company as a customer service representative several years ago.



ADAM SEFCHICK



AWARDS AND HONORS

The *National Aeronautic Association* named **Robert Sumwalt** the 2026 recipient of the Wright Brothers Memorial Trophy. Former chairman of the NTSB, Sumwalt spent 24 years as an airline pilot and is now executive director of Embry-Riddle Aeronautical University's Boeing Center for Aviation and Aerospace Safety.

Sam Graves, chairman of the *House Transportation and Infrastructure Committee*, was chosen for the Air Traffic Control Association's Glen A. Gilbert Memorial Award. He will be presented with the award at an event in September at the Smithsonian National Air and Space Museum in Washington, D.C. The award is given to those in aviation who show a lifelong commitment to safety in the industry and whose achievements go beyond a single aviation discipline. Graves, who plans to retire after the end of this term, has made important efforts to advance policies that strengthen the aviation system and support workforce development.

Julie McCallister, a recent graduate of the *Colorado Northwestern Community College (CNCC)* aviation program, was recognized for her achievements as part of the college's National Intercollegiate Flight Association (NIFA) team. McCallister, a first-generation college student, earned her associate's degree in applied science in aviation flight, along with several certifications. She plans to become a certified flight instructor at CNCC and is continuing work on her multi-engine rating.

► continued from page 44

It wasn't until 2024 that a Brazilian federal judge finally dismissed the charges against the two Legacy pilots, ruling that too much time had passed for a sentence to be imposed.

The judge blamed the "lack of cooperation from the United States" for the lapse of time, which means that under Brazilian law, the sentence can no longer be enforced. In extinguishing the penalty, the judge canceled warrants and also ordered the federal police to have the pilots' names removed from the Interpol red list, where they had been since 2017.

AIN reached out to the two pilots in preparation for this article, but while both remain active, neither responded.

In 2011, even Sharkey was convicted by a Brazilian appeals court, with his continued reporting of the incident causing what he described as a "bewildering array of charges that fall under the rubric of causing 'dishonor' to that nation." He was fined \$50,000 in damages and ordered to print a retraction in every publication where his alleged offensive comments appeared. Sharkey ignored the charges, including the one that insinuated that he was aboard the Legacy as part of a plot to "show that the aerial space [over the central Amazon] is a no-man's land," and that he somehow persuaded the business jet's pilots to turn off its transponder.

There is one last survivor from this tragedy. After spending a year and a half in the Amazon as evidence, the Legacy 600, —which had less than 20 flight hours on its airframe—was written off and sold by ExcelAire's insurance company. It was repaired enough to be ferried, first to Manaus, and then to Constant Aviation in the U.S., where it underwent a full repair and refurbishment, including a new wing, avionics replacement, and overhaul of its Rolls-Royce engines by an authorized service center. It returned to service five years after the accident and has served uneventfully ever since as one of several Legacys in the fleet of a Mexican charter operator. ■

— Richard Pedicini contributed to this article.



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CONTRIBUTORS – Julie Boatman, David Donald – U.K., Jennifer Leach English, Gordon Gilbert, David Hughes, David Jack Kenny – Safety, Stuart "Kipp" Lau, Robert P. Mark, Jennifer Meszaros – Southeast Asia, Richard Pedicini, Dale Smith, James Wynbrandt

PRODUCTION MANAGER – Martha Jercinovich

GRAPHIC DESIGNER – Grzegorz Rzekos

DIRECTOR OF VIDEO – Ian Whelan

SENIOR DEVELOPER – Cameron MacPherson

FRONT END DEVELOPER – David Lohmeyer

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ADVERTISING SALES

Victoria Tod – Northeastern U.S./Eastern Canada/United Kingdom, +1 (203) 733-4184

Michelle James – Western U.S./Western Canada, +1 (520) 343-0236

Joe Rosone – Midwestern U.S., Southeastern U.S./Caribbean/Brazil, +1 (301) 693-4687

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U.S. HEADQUARTERS

214 Franklin Ave., Midland Park, NJ 07432, +1 (201) 444-5075

Advertising Inquiries: +1 (201) 345-0085, sales@ainonline.com

Circulation Inquiries: +1 (201) 345-0085, subscriptions@ainonline.com

WASHINGTON, D.C. EDITORIAL OFFICE:

Kerry Lynch: klynch@ainonline.com, Tel: +1 (703) 969-9195

EUROPEAN EDITORIAL OFFICE:

Charles Alcock: calcock@ainonline.com, Tel: +44 7799 907595

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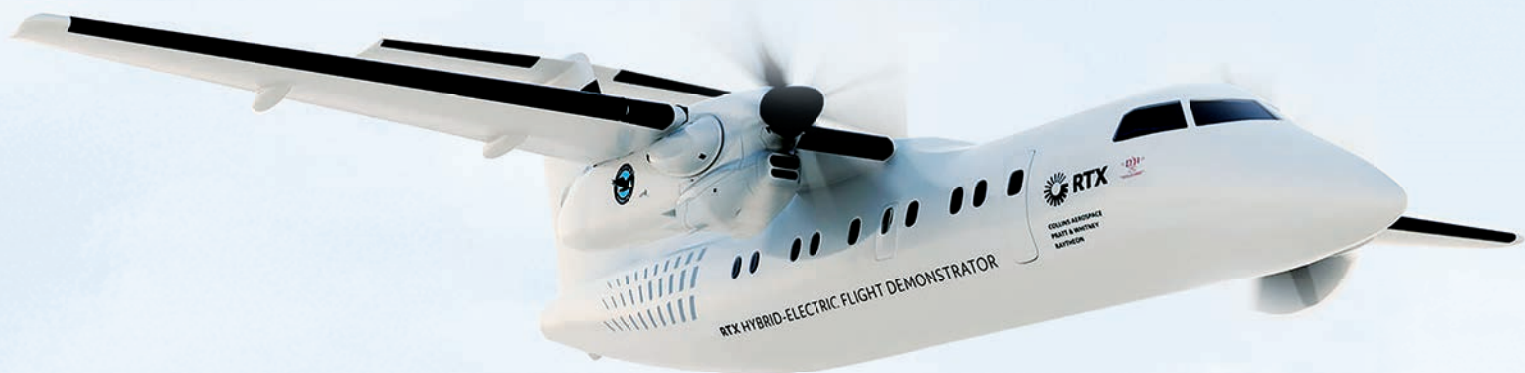
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