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DAVID MCINTOSH

Embraer marked the best third-quarter delivery performance in the company's history.

As deliveries soar, Embraer hands over first Praetor 600E

BY CURT EPSTEIN

Embraer delivered the first Praetor 600E to launch customer Flexjet, the aircraft manufacturer reported in September. The super-midsize jet was part of a $7 billion order placed by Flexjet last year—the largest in the operator's history.

The delivery occurred as Embraer racked up near record-breaking third-quarter shipment totals.

The Praetor 600E, which received a trio of certifications in April, offers a suite of passenger experience enhancements. These include newly designed seating, an advanced cabin management system, and the Embraer-exclusive Smart Window, a 42-inch OLED touchscreen that enables videoconferencing, high-resolution video streaming, and real-time views from three externally mounted cameras.

Timing of this handover comes as a surprise because the airframer said in February, when announcing the Praetor family upgrade, that first deliveries would begin in early 2029. That timeline will still apply only to non-Flexjet customers.

The smaller Praetor 500E—which received FAA, EASA, and ANAC certification in June—will make its debut with launch customer Flexjet by year-end, also years ahead of original plans.

In all, Embraer delivered 41 business jets in the third quarter, according to the Brazilian airframer. Its 66 total aircraft deliveries in the quarter—including commercial and military aircraft—marked the best third-quarter delivery performance in the company's history.

The business jet mix included 22 light jets (two Phenom 100s and 20 Phenom 300s) and 19 Praetors (nine midsize Model 500s and 10 super-midsize Model 600s).

According to the company, the 41 executive jet deliveries—unchanged from third-quarter 2025—reflect the progress of its production-leveling program instituted over the past two years, which has gradually reduced the concentration of deliveries in the second half of the year. In years past, the manufacturer would concentrate its annual deliveries in the fourth quarter.

The third-quarter total also brings the OEM's executive jet division to 115 deliveries year to date, well on its way towards meeting its 160- to 170-aircraft forecast.

"Our consistent third-quarter delivery performance reflects continued growth in the business aviation market and strong execution of our strategy," Embraer Executive Jets president and CEO Michael Amalfitano told **AIN**, adding global demand remains strong for its products across customer bases.

News Briefs

FAA PROPOSES LETTING PILOTS FORGO OXYGEN MASKS

An FAA proposed rule would simplify oxygen-mask regulations for Parts 91 and 135 operations, raising the altitude at which one pilot would have to wear a mask and eliminating the requirement to wear a mask at any altitude for Part 91 pilots. It comes with a stipulation that quick-donning oxygen masks be available in case of an emergency. Current FAA Part 135 rules require one pilot in a two-pilot cockpit to wear a mask at and above FL350, which would change to FL410. The FAA's proposed rule also calls for Part 135 pilots to wear a mask when they are the only pilot on the flight deck at FL350 and above, up from FL250.

FRENCH FLIGHT TAX HITS CHARTER OPERATORS HARD

A report from the French parliament's finance committee has revealed a steep decline in activity by French-registered business jets in the wake of the "solidarity tax" applied to charter flights. Philippe Juvin, who leads oversight of government finances for the National Assembly, said French charter aircraft movements since last October have dipped by up to 20%, while flights by foreign charters into French airports increased by about 4%. The French EBAA chapter said the tax can amount to up to €2,100 (about $2,400) per passenger.

PHOENIX AIRPORTS STUDYING GROUND ALERT TECH

Honeywell Aerospace and the Phoenix Aviation Department are testing Surface Alert (SURF-A) on ground vehicles at Phoenix Sky Harbor International (KPHX), Goodyear (KGYR), and Deer Valley (KDVT) airports. With the ability to send aural and visual alerts for potential aircraft collisions, SURF-A, combined with a digital airport map, will "bolster operators' real-time situational awareness," Honeywell said. Testing should wrap up by year-end.

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NBAA names interim COO as Bolen focuses on health

BY CURT EPSTEIN

Following news that NBAA president and CEO Ed Bolen has been sidelined because of cancer treatment, the organization's board of directors has named senior v-p of communications Dan Hubbard as interim chief operating officer (COO).

"We are wishing Ed a full recovery as he takes the time he needs to focus on his health," said association chairman John Witzig. "Dan has a strong strategic view of NBAA's mission and all its initiatives. As NBAA's interim COO, he will oversee day-to-day operations during Ed's absence, including at NBAA-BACE, with support from a leadership team with decades of experience and a proven track record of serving the business aviation community with excellence."



DAN HUBBARD
INTERIM COO, NBAA

> "...the one thing I know for sure is that Ed Bolen wants for me and for the NBAA team to continue the work."

Chris Rocheleau, who had returned to NBAA as COO in August, left the association to take the role of president and CEO of Airports Council International-North America (ACI-NA), effective October 5. He succeeded Kevin Burke, who will remain CEO emeritus through year-end.

A 22-year veteran of NBAA, Hubbard was named senior v-p of communications in 2008. In addition to that role, he has been deeply involved with NBAA's external affairs, partnerships, and advocacy initiatives in the U.S. and globally, including BACE conventions on four continents.

Hubbard noted that the association is well positioned to continue operating seamlessly and serving its members strategically and effectively.

"I'm honored that the board has given me this assignment. That having been said, I never could have conceived that it would happen in this moment or under these circumstances. But nevertheless, the one thing I know for sure is that Ed Bolen wants for me and for the NBAA team to continue the work. It is of paramount importance to him," he said. "The team that is in place collectively has decades of experience at NBAA or in the industry or both and is the most knowledgeable and capable assembly of people we could put together [to] continue to deliver on what people expect of NBAA."

To that end, the association also promoted Heidi Williams from v-p of air traffic services and infrastructure to senior v-p of operations, succeeding Doug Carr, who retired in August. Williams oversees the association's policies and coordination with the FAA and other government and industry stakeholders, as well as leads the association's emerging technologies initiatives and airspace and air traffic modernization efforts.

News Briefs

TEXTRON AVIATION MARKS ROLLOUT OF 500TH LATITUDE

Textron Aviation in late September celebrated the rollout of the 500th Cessna Citation Latitude, a milestone reached about a decade after the aircraft entered service. A staple in fleets such as NetJets, the midsize aircraft became Textron Aviation's fastest-selling business jet, reaching the 240th-delivery mark within five years of its August 2015 service entry and then following with the 400th production rollout by 2024. The airframer marked the latest Citation Latitude milestone with production workers at its Wichita factory.

GAO: U.S. AIRSPACE COMMS VULNERABLE TO SPOOFING

The FAA lacks real-time tools to detect and combat spectrum-based cyberattacks such as interference, spoofing, and jamming against aircraft communications in the National Airspace System, according to a Government Accountability Office report. Without real-time tools, the FAA can investigate attacks only after they are reported. Notably, the GAO found vulnerabilities in the text-based aircraft communications addressing and reporting system (ACARS) and controller-pilot data link communications. The GAO made nine recommendations to address vulnerabilities.

GARMIN AUTOLAND OK FOR PILATUS PC-12 PRO, EPIC E1000 AX

EASA and the FAA have both certified Garmin's Autoland on the Pilatus PC-12 PRO. The Swiss OEM said the emergency safety feature is now part of the standard fit for the turboprop single. The FAA also gave its nod for the emergency system on the Epic Aircraft E1000 AX turboprop. During an emergency such as a pilot medical issue, Autoland activates via a push button or automatically when the avionics detect pilot inactivity. When activated, it then selects the most suitable airport, makes radio calls during the approach, lands the airplane, and shuts down the engine.

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DAVID MCINTOSH

Business jet transactions could total $247 billion from 2026 to 2030, Global Jet Capital forecasts.

Global Jet Capital projects steady bizjet growth to 2030

BY **AMY WILDER**

Business jet transactions grew 15.5% year over year in 2025, according to Global Jet Capital's sixth annual Business Jet Market Forecast, which projects $247 billion in combined new and preowned transaction volume between 2026 and 2030. This year's outlook is more optimistic than the company's forecast a year ago, with 2025's actual results outperforming what Global Jet Capital had projected at the time.

The 2026 forecast calls for a 3.6% climb in transactions this year, to 3,725 business jets—853 new and 2,872 preowned—worth $45.6 billion, up 5.5% year over year. Global Jet Capital expects the market to grow at a 2.8% average annual rate over the next five years, reaching 4,122 aircraft—928 new and 3,194 preowned—worth $52.8 billion in 2030. "Demand for business jets has strengthened alongside rising flight activity," said chief marketing officer Andrew Farrant.

OEM order backlogs climbed to $66.8 billion by the second quarter this year. According to the report, "The growth in orders results from many users planning ahead for their aircraft acquisition/replacement and OEMs maintaining a measured approach to production."

Heavy jets are expected to see the fastest growth among new deliveries, at an average annual rate of 3.3%, while preowned heavy-jet volume is forecast to grow 4.9%—second only to preowned very light jets at 5.3%—driven by buyer demand for range and cabin capacity.

North America is projected to remain the largest business jet market through 2030, accounting for 73.9% of global transactions. According to the report, this region "has the largest installed base of business jets, strong market maturity, and aviation infrastructure that we expect to support continued strength in the market." Latin America is forecast to be the second-largest market, at 12.1% of global transactions, driven largely by preowned demand.

The Asia Pacific and Middle East/Africa regions are also cited as growth opportunities, with the report noting that "sustained wealth creation over the last 25 years has resulted in a growing user base that appreciates the value proposition of business aircraft" in those markets.

Global Jet Capital's outlook follows a similarly upbeat assessment the company gave **AIN** last year, when CEO Vivek Kaushal described the market as "good and balanced" and said he expected total transactional volume to push past $40 billion in 2026 or 2027.

News Briefs

BROKER ONEFLIGHT PAUSES CHARTER SALES ACTIVITY

Charter broker ONEflight, which presells lift through jet cards, in mid-September paused charter activity "for the next 30 days, or until further notice" to conduct a comprehensive evaluation of its operations, according to a note on its website. According to Private Jet Card Comparisons (PJCC), ONEflight earned $232 million in revenue last year. "Based on sales volume, over $150 million in prepaid flights could be at stake. In a bankruptcy, clients with prepaid charter and jet card flights are unsecured creditors," PJCC said.

CANADA LOOKS TO EXTEND 100% EXPENSING TO AIRCRAFT

The Canadian government has proposed expanding its 100% expensing to eligible business aircraft acquired on or after September 15 under a "productivity mega deduction" measure. Initially, the 100% depreciation effort covered about 15% of assets, but under the supersized deduction that would expand to about 65%, including aircraft. Eligible aircraft must be ready to fly for the business to deduct this year; if it is still being completed/refurbished at year-end, the deduction will roll over to the year it is ready to use, according to the Canadian Business Aviation Association.

UNIVERSAL AVIATION OFFERING HANGAR SPACE IN COSTA RICA

Universal Aviation now offers hangar space at Costa Rica's Juan Santamaría International Airport (MROC). GAT SJO, the consortium of Universal Aviation Costa Rica and local partners that manages the airport's general aviation terminal (GAT), has won the use of the 10,000-sq-ft hangar, following a competitive process conducted by airport operator Aeris. The addition gives Universal the only hangar space on the field for general aviation use. The hangar can accommodate aircraft up to super-midsize business jets overnight or longer.


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The Encore+ is among the Citation models affected by the FAA's single-pilot exemption rescission.

Industry pushes back on FAA's single-pilot Citation ruling

BY MATT THURBER

Following the FAA's decision to rescind all single-pilot exemptions for certain legacy Cessna Citation twinjets, AOPA, NBAA, and the Citation Jet Pilots Association (CJP) are asking the agency to pause the decision. The exemptions allowed operators to fly Part 25-certified CE-500 jets with one pilot instead of the two normally required for Part 25 airplanes.

The ruling, effective September 29, applies to exemptions covering the Model 500 (Citation and Citation I); Model 550 (Citation II); Model S550 (Citation S/II); Model 552 (Navy T-47A); Model 560 (Citation V and Citation Ultra); Model 550 (Bravo); Model 560 (Encore); and Model 560 (Encore+).

The three associations are asking the FAA to reverse its blanket removal of all single-pilot exemptions and focus on those where operators aren't complying with the minimum standards in their exemptions.

"NBAA supports the FAA's responsibility to examine safety concerns and to take appropriate action as supported by the evidence," said NBAA senior v-p of operations Heidi Williams. "At the same time, the FAA's decision to rescind these exemptions in full, effective immediately upon publication in the Federal Register and without direct notice to affected operators, raises serious questions."

In its notice rescinding the exemptions, the FAA cited widespread noncompliance and said a review of CE-500 accidents over the past 18 years indicates that single-pilot Part 25 CE-500s are involved in accidents at about twice the rate of single-pilot Part 23 CE-500, 510, and 525 airplanes, "even with conservative assumptions about crew configuration."

CJP has submitted a Freedom of Information Act request for the data the FAA used in its review of the CE-500 single-pilot exemption program. "Our goal is to understand the facts and analysis behind the FAA's actions so we can assess their impact on our members and respond constructively," said CJP CEO Rob Balzano.

"While AOPA supports the agency's authority to take appropriate action as required by the FAA's safety management system and its aviation safety mandate,

News Briefs

FLEXJET OPENS TERMINAL AT FARNBOROUGH AIRPORT

Flexjet has opened a $34 million facility at Farnborough Airport (EGLF) near London, marking its first private terminal outside North America. Besides passenger amenities, the 22,583-sq-ft building also serves as Flexjet's international training center for flight attendants and as an operational hub. It provides discreet airside access to flights across the ramp from Farnborough's main terminal, with security and immigration screening onsite. The interior features a Gulfstream G700 cabin mockup, an owner's bar, a lounge, and private meeting rooms.

TEXTRON, MERLIN PLAN UNCREWED SKYCOURIER

Textron Aviation and Merlin have unveiled a concept for an autonomous cargo airplane based on the Cessna SkyCourier, proposing to replace the cockpit with a nose cargo door. Dubbed Cessna SkyCourier UX, it exists solely as a design study, and the companies have not named a customer or set a timeline for building one. Boston-based Merlin would supply Merlin Pilot, the autonomous flight system it has flown on Cessna Caravans and Beechcraft King Airs. Textron Aviation would supply the airframe.

HONDA AIRCRAFT FINISHES ECHELON WING

Honda Aircraft has completed the first wing structure for the HondaJet Echelon at its Greensboro, North Carolina headquarters. Previously scheduled for first flight in 2026 and type certification in 2028, the light jet is now planned to fly in 2028, with type certification and deliveries in 2031. Construction of the first Echelon wing began in February 2025. Five major components for the first Echelon are in the manufacturing process, with 70% of the parts needed for first assembly now on hand. Honda Aircraft expects to assemble the first example early next year.

AOPA recommends the agency pause its decision to rescind Citation jet single-pilot exemptions in an all-or-nothing manner," AOPA v-p for regulatory affairs David Boulter wrote to the FAA. "It makes no sense to punish compliant and safe operators with this order."

"The goal of modern safety systems is to monitor operations and use the data collected to continuously improve safety," Boulter wrote. "Any deficiencies in operations under this exemption should have been identified and corrected long before such drastic action, without industry collaboration, was taken."

Textron Aviation said it was aware of the notice and that it "supports the FAA's commitment to aviation safety and stands ready and available to support customers."

AIN asked the FAA, "If there is such a concern with safety of the relatively few pilots operating Part 25 jets under single-pilot exemptions, why hasn't the FAA required type ratings for Part 23 turboprops that are far more complex to operate and that have worse safety records?"

The FAA responded: "Part 23 turboprops are certified for single-pilot operations by design, whereas operating a CE-500 with one pilot required an exemption because it was certified for a two-pilot crew. The FAA rescinded the CE-500 exemptions due to widespread noncompliance with exemption conditions and clear safety risks. Changing Part 23 standards would require formal rulemaking."

One accident the FAA cited, the Dec. 18, 2025, crash of a Citation II in Statesville, North Carolina, killed all seven people on board, among them Nascar driver Greg Biffle, his wife, and two children. The pilot in command held a CE-500 type rating, but it carried a limitation: "CE-500 second in command required." The right-seat pilot held neither a multi-engine rating nor a CE-500 second-in-command type rating and "was not qualified to perform second-in-command duties per Title 14 CFR part 61.55," according to the NTSB preliminary report.



Pilot training: A snapshot of accidents and issues

BY MATT THURBER



Accidents and safety concerns are driving discussion among experts about their causes, potential solutions, and where pilot training plays a role.

Since the Colgan Air accident near Buffalo, New York, on Feb. 12, 2009—which had its own part to play in today's pilot training milieu—the aviation industry has witnessed accident after accident where training, or lack thereof, was a significant factor.

That training works is not in doubt. The rise of sophisticated full-motion flight simulators, spurred by an insurance industry tired of paying out for the many accidents that were occurring, is one piece of incontrovertible data about the benefits of training. Another data point is what happened to members of the Citation Jet Pilots (CJP) Association after it implemented a program to improve training and reduce accidents that were common in the light-jet arena.

At the recent CJP annual event, the association revealed that members who participate in the Gold Standard program of frequent recurrent training and other training events have had zero accidents and incidents in the nine years since the program launched. Members who participate in CJP's flight operational quality assurance program, in place for five years, have also not had any accidents or incidents. CJP's Safe to Land initiative contributed to that success and gave pilots a comprehensive set of tools to help prevent runway excursions.

Even with the availability of such tools, however, runway excursions seem to be taking place at a significantly high rate recently.

RECENT EVENTS

On Sept. 1, 2026, a Cessna 560XL overran 5,960-foot Runway 12 at Porterville Municipal Airport (KPTV) in California. According to the NTSB preliminary report, "On about a 1 nm final approach, the airplane's altitude was about 1,000 ft msl and the groundspeed was about 245 knots. The last data point, about 1,800 ft from the runway threshold, showed the airplane at about

600 ft msl, with a groundspeed of about 234 knots."

A typical approach reference speed (Vref) for the 560XL is 100 to 115 knots. "On the visual straight-in approach, the airplane was estimated to cross the runway threshold between 225-250 knots and floated about a third to halfway down the runway," according to the NTSB. The two pilots and four passengers were not injured in this accident.

On September 6, a 21 Air Boeing 767 overran Runway 30 at Miami International Airport (KMIA) after arriving over the runway threshold at 200 feet msl, 180 knots groundspeed, and a descent rate of 1,536 fpm, according to flight tracking data. A typical Vref for this airplane is 130 to 145 knots. Near the end of the runway, at 120 knots and 15 seconds before the cockpit voice recording ended, one crewmember called for a go-around; then the brakes were released, and power was added. They then retarded power and stepped on the brakes again near the end of the runway. Five seconds after the go-around call, the 767 went off the end of the runway, killing five people in a vehicle.

Another business jet runway excursion took place on September 21 in Libya. Three crewmembers survived the accident and resulting fire after the Citation Latitude veered off Misrata International Airport's Runway 15 around 4,600 feet from the threshold before crossing the runway shoulder and then catching on fire. It is not known how fast the Latitude was flying during the approach and landing because its tracking information is blocked.

While runway excursions comprise a high number of accidents, according to NTSB data analyzed by upset recovery and prevention training provider Aviation Performance Solutions (APS), loss of control in-flight (LOC-I) still is the leading cause of accident fatalities in business aviation Part 91 operations. During the study period from 2016 through 2025, there were two LOC-I accidents, one of which was fatal, with six killed.

Runway excursions tallied six accidents, with one fatality in one of the accidents. "Its lower fatality count does not diminish its operational relevance, but it represents a different consequence pattern from loss of control in-flight," according to APS.

WARNINGS AHEAD OF LOC-I

LOC-I certainly has taken its toll on airline and business aviation operations. Harbingers of such events have surfaced during training.

After an Atlas Air 767 crashed out of control near Houston on Feb. 23, 2019, killing both pilots and a third in the jumpseat, the NTSB final report cited as contributing factors deficiencies in the selection of the first officer (FO) and measurement of his performance, "which failed to address the first officer's aptitude-related deficiencies and maladaptive stress response."

In the report, the NTSB outlined problems with the FO's past experience, including checkride failures and the need for remedial training to pass the oral examination for his 767 type rating, as well as remedial fixed-base simulator training before starting full-flight simulator training.

The FO failed his type rating checkride "due to unsatisfactory performance in CRM [crew resource management], threat and error management, non-precision approaches, steep turns, and judgment," the NTSB said.

"During a post-accident interview, the Atlas check airman who was the FO's examiner said the FO was very nervous, had 'very low' situational awareness, overcontrolled the airplane, did not work well with the other pilot, omitted an emergency checklist during an abnormal event, and exceeded a flap speed. The examiner said the FO was not thinking ahead, and, when he realized that he needed to do something, he often did something inappropriate, like push the wrong button. The examiner said the FO's performance was so poor that he worried that the FO would be unable to 'mentally recover' enough to complete the course."

There was information about the FO's previous airline jobs, but Atlas never received it, even though those details related to "lack of progress in training," an incomplete FO training event, failed oral and practical tests during his airline transport pilot (ATP) checkride, an



The crew of this 21 Air Boeing 767 tried to go around 5 seconds before the jet left the runway.

unsatisfactory grade during a line check, and an unsuccessful captain upgrade.

Instructors interviewed by the NTSB reported that "when presented with something unexpected in the simulator, the FO would get extremely flustered and could not respond appropriately to the situation. She [one of the instructors] said that when the FO did not know what to do, he became extremely anxious and would start pushing a lot of buttons without thinking about what he was pushing, just to be doing something. She noted that the FO lacked an understanding of how unsafe his actions were, and he could not see why he should not be upgraded to a captain."

The Safety Board pointed to similar notes logged by others, including at the FO's former employers Mesa Airlines and Air Wisconsin Airlines. "Another check airman at Mesa said the FO's stick and rudder skills were weak, and he also struggled with basic flight management system tasks. This check airman described the FO's piloting performance as among the worst he had ever seen and noted that the FO tended to have an excuse for each of his poor performances, such as blaming his simulator partner, his instructor, or the hotel."

The NTSB report continued with reports from yet another check airman at Mesa, who said that the FO "had weak situational awareness, did not realize what was going on with the airplane at times, and had difficulty staying ahead of the airplane. She said the FO was completely unaware that he lacked skills, unwilling to accept feedback, and unhappy with her about his failure to upgrade to captain.

"An instructor who taught cockpit procedures on the flight training devices at Air Wisconsin Airlines recalled that during one emergency procedures training scenario, the FO made abrupt control inputs that triggered the stick shaker and overspeed alerts. The instructor said that instead of staying engaged in the scenario and addressing the problem with his training partner, the FO just stopped what he was doing and turned around and looked at the instructor. The instructor found this reaction highly unusual."



The crash of a Colgan Air-operated Q400 led to the FAA's controversial 1,500-hour rule.

ORIGINS OF THE 1,500-HOUR RULE

The NTSB's Colgan Air accident final report identified significant issues with the training background of the flight's captain. However, the backlash to that accident had a focus on pilot hours.

The victims' families promoted a legislative effort that resulted in forcing the FAA to change the minimum flight time requirement for Part 121 airline first officers to 1,500 hours, up from 250 hours, despite the fact that both pilots in that accident had logged more than 1,500 hours. The so-called 1,500-hour rule includes provisions allowing less flight time for college graduates and military pilots.

Detractors of the rule say it has created an environment where prospective airline pilots are focused on quantity of hours over quality of training and have pushed for relief for those who receive simulator training. However, that continues to meet stiff opposition on Capitol Hill.

As for the Colgan accident, the NTSB stated, "The probable cause of this accident was the captain's inappropriate response to the activation of the stick shaker, which led to an aerodynamic stall from which the airplane did not recover." The NTSB didn't address training deficiencies specifically as a contributing cause. When the Bombardier Q400's stick shaker activated after an autopilot level-off with no subsequent addition of power, "the captain's subsequent control inputs were also not appropriate because he pulled back on the column rather than pushed forward to reduce AOA [angle of attack]."

In the final report, the NTSB identified remedial training and stall training as safety issues. "The NTSB concludes that the captain had not established a good foundation of attitude instrument flying skills early in his career and that his continued weaknesses in basic aircraft control and instrument flying were not identified and adequately addressed."

This was evident throughout the pilot's career. He failed his first instrument checkride. He failed his first commercial single-engine land checkride, and he failed his first commercial multi-engine land checkride.

While the FAA, in a response to an NTSB safety recommendation, pointed out "that multiple checkride failures showed no correlation with pilots' accident and incident records...the captain's established pattern of first-attempt failures might have indicated that he was slow to absorb information, develop skills, and gain mastery or that the training he received was not adequate."

In 2004 and 2005, the captain logged second-in-command multi-engine turbine time with Gulfstream Training Academy, which was known for its "pay for right-seat time" program at Gulfstream International Airlines (GIA). During his initial training at GIA, training records "revealed his continuing difficulties with aircraft control. During two simulator periods, he was graded unsatisfactory in 'approach to stall-landing configuration.' During a later simulator period, he demonstrated unacceptable altitude and airspeed control. During the final planned simulator session, the instructor noted basic attitude flying problems and repeated deviations."

The captain attended Gulfstream Training Academy from August 2004 to April 2005 and completed initial training at GIA (which was directly associated with the academy) in December 2004.

When he was hired at Colgan Air, he met the airline's minimums of 600 hours total time and 100 hours multi-engine time, having logged 290 hours with GIA and a total of 618 hours. (Editor's note: perhaps this is part of the reason the Colgan families derived the 1,500-hour requirement.)

In his application for employment, he was asked whether he had ever failed any proficiency check, FAA checkride, IOE [initial operating experience], or line check. He left out any mention of his multiple failures except for the instrument rating checkride failure.

"At the public hearing for this accident," according to the NTSB, "the company's vice president of administration stated that, if the captain's incomplete answer had previously been known, it would have resulted in his dismissal from the company."

Although he didn't fail the initial proficiency check for a first officer position on the airline's Saab 340, he was required to obtain additional training on normal and abnormal procedures. During his first recurrent proficiency check in the Saab 340, "the captain received an unsatisfactory grade" for rejected takeoffs, general judgment, landings from a circling approach, oral exam, and nonprecision approach. He had to stop the recurrent training and conduct requalification proficiency training. "However," the NTSB report said, "no evidence showed that Colgan considered the captain's performance (as a Saab 340 first officer) to be a concern, even with the

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STRUCTURES
COMPOSITES
COMPONENT REPAIR
COMPONENT OVERHAUL
PARTS EXCHANGE
PARTS SALES
RENTALS



problems he demonstrated during the initial and recurrent proficiency checks."

When it came time for upgrade training in the Saab 340, the pilot failed his checkride, which was for the ATP certificate and Saab 340 type rating. The failure was because "the captain's airspeed was too slow on a second missed approach while attempting to complete a single-engine ILS approach." He did pass the recheck three days later.

"Even though the captain had demonstrated problems with the three checkrides he had performed, Colgan was not proactively addressing his training and proficiency issues," the NTSB noted.

Having completed recurrent training and a line check, the captain was approved to upgrade to the Q400 and "satisfactorily completed his line-oriented flight training, IOE, line check, and type rating." Yet, according to the NTSB, "Interviews with Colgan instructors revealed that, even though the captain had progressed significantly in terms of his confidence, crew management, and execution of procedures, some of his problems with aircraft control remained. For example, the Q400 simulator instructor stated that, during unusual attitude training, the captain was 'very rough' on the controls and had somewhat overcontrolled the roll axis."

When the accident happened, the captain had been flying the Q400 for a bit over two months "and thus was still new to the airplane," the NTSB report noted.

More recently, another accident occurred when the pilot pulled the yoke full aft, but this time in a Hawker 900XP. On Feb. 7, 2024, the pilots were conducting a post-maintenance stall flight test because of work done on the wings.

Flight data captured by the jet revealed that after the jet stalled, it rolled quickly to the right, and the crew then input full left wing-down aileron, full power, and then pulled the yoke full aft, which was exactly the opposite of the way the elevator control needed to move. They needed to reduce AOA, not increase it. The result was an out-of-control spin and impact with the ground.

TRAINING ISSUES

The above accidents are cited because they all either had training issues documented in accident reports or appear to be related to training. While final reports are not complete on some of these accidents, the fact that some involved excessive speeds on final approach or mistaken fundamentals—like pulling instead of pushing the elevator controls during a stall—raises questions about not only how individual pilots were trained to fly but also how they were trained to operate as a crew, with adherence to standard operating procedures and CRM protocols. Another factor to consider in the high-speed overruns is why these crews did not initiate a go-around from such wildly unstable approaches and whether their training included go-around criteria and practice.

LACK OF EXPERIENCE

The problems that the industry is seeing with poor-quality flying come down to the lack of experience among the flight instructors who are teaching low-time pilots to be instructors, according to Pat Cannon, a longtime designated pilot examiner (DPE) and MU-2 expert. New pilots are transitioning too quickly through the system, he said.

As a DPE, he sees two trends: flight instructor candidates who still don't know how to use the rudder and poor understanding of short- and soft-field landings.

One multi-engine instructor candidate was clearly struggling to hold rudder pressure during a single-engine ILS approach, although he was able to pass the checkride. Afterward, Cannon asked the candidate why he didn't use rudder trim, and the response was that his instructor had told him never to use it. "If we don't learn it, we don't teach it," Cannon said.

He is seeing pilots try to gentle the airplane down to the ground for a soft arrival when asked to perform a soft-field landing, but not touch down until halfway down the runway. Or they are zooming up to the aim point close to the ground for a short-field landing, then smashing the landing gear onto the runway.



PAT CANNON
PILOT EXAMINER

Although DPEs can't teach during a checkride, when he sees problems, Cannon offers to go to the flight school and help educate the instructors.

A DECENT WAGE

Pay is also a factor, according to Katherine Odland, who is founder and CEO of Myotis Aviation, a unique flight-training concept that upends the traditional approach, at least on the Part 61 side of the training industry that comprises smaller flight schools as well as independent instructors. Part 141 schools are FAA-approved pilot schools, featuring college and university programs and large flight academies focused on training career pilots.

Most flight schools charge a significant amount for flight instructor time and give a small fraction of that amount to the instructor. It is well understood that many instructors are teaching to log the flight time to reach the magic 1,500-hour level. This way of logging flight time is a result

of strong airline hiring, which has encouraged people to pursue piloting careers, and the lack of job opportunities for low-time commercial pilots. There just aren't that many parachute jumping, banner towing, aerial surveying, cargo carrying, or other non-airline opportunities for low-time pilots. Charter operations do offer some opportunities, but insurance requirements often are far higher than FAA minimums. The result is that many pilots aspiring to business aviation or airline jobs teach to gain hours, and they are willing to do this for very low pay.

Odland doesn't think this is a good way to develop high-quality, dedicated master instructors, so she has set up Myotis Aviation in a completely different structure. "The values I want are that you're learning from a master," she said, "and they love what they do. It's not a means to an end [type of] job. The CFI job should not be the McDonald's fast-food worker of the aviation industry. We're also on a mission to make the most hirable pilots anywhere."

Instead of buying or leasing a fleet of airplanes and hiring instructors on the cheap, she created Myotis as a network of training locations. If Myotis sees demand at an airport somewhere in the U.S., Odland will find an airplane—perhaps leasing it from a local owner—and a qualified CFI, who gets all of the money charged for flight instruction (many are making more than $100,000 a year), and then make training available at that airport. So far, Myotis has airplanes and instructors in 41 states, she said. And because of the simple structure, the local Myotis operation can provide quality training at about one-third to half the cost of competitors while compensating instructors properly. "We've removed the lobby overhead," she said. "We don't need a lobby; we need somebody who knows what they're doing."

Odland is careful not to hire instructors who just want to build flight time, and she is wary of those who come from Part 141 schools.



Flight instructors should be encouraged to develop master-level teaching skills and be paid well.

From banning Myotis airplanes from flying to certain airports that are clogged with large-school students to vetting instructors to find those who truly want to teach, Odland is determined to help people learn to manage risk and not be afraid to fly to a new airport, fly safely when the wind is gusting, log time at night beyond the FAA minimums, and expand their skills by flying in challenging locales such as Denver.

As Odland sees it, not only is Myotis providing high-quality instruction, it is also helping underused airports gain flying activity. "I'm passionate about rebuilding the general aviation community. It's dying, and we need to save it. I'm helping rebuild that and make it more accessible."

SHORTAGE OF QUALIFIED PILOTS

Nick Sanderson is trying to fix the many problems that face aviation, including those surrounding training, and founded Unrestricted Airspace to tackle some of the industry's biggest issues. These include "the FAA medical certification process and the growing mistrust surrounding deferrals; the 1,500-hour rule and whether it meaningfully improves safety or simply restricts access; insurance requirements quietly shaping hiring decisions and operational limits; the gap between training environments and real-world flying; and the economics of simply trying to operate in today's system."

The 1,500-hour rule's effect has been a renewed focus on teaching to gain flight hours, but this means that future professional pilots are "in a training bubble," he explained. At these schools, he argued, "there is not a lot of room for them to fly in negligible weather or take risks." The students and instructors fly to the same specific airports with tightly controlled minimums for weather and crosswinds. "How do you learn to fly in crosswinds if you can't land in crosswinds?" he asked. "Nobody talks about it, but the first time they see hard IMC [instrument meteorological conditions] is in an airliner."

From Sanderson's perspective, "We don't have a shortage of pilots; we have a shortage of qualified pilots."

For new pilots to gain the experience they need, Sanderson has pitched the idea of "135 lite." This would be a simpler way for people to start a small charter

operation without the burdensome regulations and FAA approval delays that make the process extremely costly. This concept would put more fresh commercial pilots to work and enable underutilized airplanes and airports to thrive. "This would get general aviation airplanes flying, and people in and out of rural areas," he said.

Sanderson isn't arguing for eliminating FAA oversight and regulation, just common-sense rules that would allow any commercial pilot to fly someone somewhere in good weather in a properly maintained airplane. The fact that light aircraft flight-sharing operations in Europe work safely supports the 135 lite concept, he said. "Airplanes [there] aren't falling out of the sky."

Such flight experience would do far more to prepare pilots for professional pilot jobs, he explained. Under the current scheme, "They don't learn go/no-go decision-making until they get to the airlines. Decisions are always made for them; there are hard limits at the academies, imposed by insurance companies."

This lack of experience shows in airline new-hire washout rates, where the candidate fails to make it through the training process. "Airline washout rates are through the roof," he said.

AIRLINE-ORIENTED SAFETY

ATP Flight School, probably the largest training academy, with 85 locations in the U.S. and 658 aircraft that fly more than 600,000 hours a year, graduates more than 2,000 pilots per year from its professional pilot training program.

The company disagrees with critics who claim that low-experience instructors are just passing on their lack of knowledge to new pilots. In response to questions from **AIN**, ATP said, "Each ATP instructor must successfully complete an intensive instructor indoc program and evaluation, where they must demonstrate professionalism, proficiency, adherence to standard operating procedures, and uncompromising attention to safety-focused decision-making at all times. ATP graduates more CFIs than any other school in the nation and only hires those who meet the standards required to train the next generation of airline pilots."

According to ATP, 25% of all regional airline new-hire pilots are ATP graduates. "Further, ATP is the only school with formal agreements in place with all three major airlines—American, Delta, and United—meaning these airlines have independently vetted the quality of ATP's training and instruction."

As for the issue of new commercial pilots gaining experience toward the 1,500 hours (or fewer, for a restricted ATP) needed for Part 121 jobs, "ATP partners with corporate and cargo carriers to provide alternate career opportunities and paths to the airlines. For the vast majority of graduates, however, flying as a flight instructor with ATP allows them to retain a high level of proficiency and a strong knowledge base in a structured, airline-oriented environment, while opening opportunities to participate in airline cadet programs."

The training academy's flight operations are supported by "an airline-oriented safety management system, real-time ADS-B monitoring, data-driven safety enhancements, and 26 Tech Ops aircraft maintenance bases," the company said.

Part of the 1,500-hour rule requires that candidates take the ATP certification training program (ATP CTP) before the multi-engine ATP written exam. ATP's ATP JETS division offers ATP CTP training and recently lowered the price to $2,995. The



ATP's training fleet of 658 aircraft, based at 85 locations, logs more than 600,000 hours per year.





Like many training academies, Spartan College of Aeronautics works with airlines to help students prepare for professional pilot careers.

training must include advanced aerodynamics, meteorology, air carrier operations, and crew resource management, as well as time in a full-flight simulator.

"Beyond the CTP course, ATP works directly with airline partners to develop specialized jet transition training programs," the company said. "Leveraging the capabilities and full-motion simulators at ATP's Part 142 airline training center, ATP JETS, these tailored, airline-specific courses transition pilots from general aviation flying to airline operations.

"Further, ATP's career services team works closely with airline partners to provide a continuous feedback loop with ATP's flight standards team, incorporating airline feedback and areas of emphasis directly into students' training."

HIGHER EDUCATION

At Spartan College of Aeronautics and Technology, teaching new pilots is not just about stick-and-rudder skills, according to Spartan Education Group CEO Rob Polston, but about preparing them for leadership roles. "We come from higher education," he said, "and we're applying those principles to the training of pilots, which nobody else does. We're training people to be leaders in the cockpit."

To help prevent washout at the airline training level, Spartan partners with airlines such as Allegiant Air, which helps the school with student assessment, development of personal skills and leadership training, and invites students to interact with the airline's management and flight operations personnel and spend time in its Airbus A320 simulators. "When you get your first job as a first officer in an A320, you'll be more acclimated to that environment," he said.

Recently, Spartan and the airline announced the Allegiant Altitude Pilot Pathway, which expands "access to a structured pathway connecting flight training with potential professional pilot opportunities at Allegiant Air."

Spartan doesn't have a quality problem with low-experience instructors, according to Polston. "That's a problem that maybe affects smaller schools," he said. "We have hundreds of graduates going through the program every year and becoming CFIs. That's part of the journey: to go on to the airlines. We have the ability to have the best because we're producing more CFIs than required for our classes." This allows Spartan to hire instructors who are able to give their students the best training experience that meets Spartan's standards.

"If they're not living up to that expectation, they don't have a job at the school," he said. "We're also giving continuous feedback, and we're watching their performance."

The Spartan student experience is enhanced with the application of technology, including further integration of Pilotbase's flight operations and safety software platform. Pilotbase started as Flight Schedule Pro, which acquired LogTen logbook software company Coradine in 2022.

Now Pilotbase helps Spartan students during their entire journey, from student loans to career matching, ensuring accurate flight time logging, and helping with resume preparation and job searching. On the operations side, Pilotbase provides safety features, visibility on aircraft availability, and real-time discrepancy reporting and management, according to Pilotbase CEO Nick Wegner.

"AI has facilitated a lot of this," he said. "We've integrated maintenance software with safety management systems and flight data monitoring. This allows us to create a whole picture from before the flight when the student is checking weather, filling out the flight-risk assessment, checking aircraft statuses, and doing the weight and balance. It's all integrated into the flight operations system, and they're getting a

complete view of what's going on from the weather to the mental and personal and aircraft perspective."

Instructors also get visibility into the student's decision process and can intervene, if needed. Data recorded during the flight is analyzed in Pilotbase's postflight debriefing tool, which provides 3D visualizations of maneuvers and shows exceedances of specified criteria—for example, generating an alert if a student lands two-thirds of the way along the runway.

This isn't meant to be a negative experience, Wegner emphasized, but an opportunity to teach the student how to improve. "It's a big safety loop that continuously cranks," he said.

"This is about eliminating the friction of information to make real-time and postflight decisions. This puts together an information picture so we can enhance training."

COMPETENCY-BASED TRAINING

Training organizations are moving into more modern protocols with the implementation of competency-based training and assessment (CBTA). Boeing has adopted CBTA, and recently the Civil Aviation Authority of Thailand became the first regulator to implement Boeing's CBTA learning library in its national flight training system. According to Boeing, "CBTA focuses on observable, measurable competencies that reflect real-world performance." Boeing has implemented CBTA in its initial and recurrent training programs.

California Aeronautical University (CAU) is the first U.S. flight training organization to deploy Boeing's CBTA learning library. According to CAU, "The Boeing CBTA learning library provides aviation students with access to learning resources designed to strengthen key pilot competencies, including decision-making, communication, leadership and teamwork, situational awareness, workload management, and threat-and-error management."

CAE—which operates ab initio flight academies, manufactures flight simulators, and provides simulator training—has also made a large investment in CBTA. The process is integrated into initial pilot training at CAE's academies and in type rating and recurrent training at CAE simulator centers.

"Today, CBTA is embedded across multiple phases of pilot development, helping ensure training is aligned with operational needs and focused on enhancing aviation safety," according to the company. "CAE was also the first approved training organization to introduce a fully CBTA-based initial type rating program for the Embraer E2."

An example of the practical application of CBTA at CAE is its continuously optimized recurrent (CORe) training: "transforming recurrent training from an event-focused exercise into a competency-focused learning experience," according to CAE. "CORe training goes beyond standard compliance; it identifies real-world risk factors and equips pilots with the skills needed to handle them effectively."

This includes using realistic scenarios to help pilots learn how "to manage a wide range of situations, including problem solving, situational awareness, communication, and workload management. By exposing pilots to relevant and contemporary operational scenarios before simulator training, CORe strengthens the link between classroom learning and operational performance, creating a more engaging and effective training experience."

This approach is very different from the traditional focus on task completion, which has long been a complaint of business aviation pilots undergoing recurrent training that is repetitive and merely a





CAE's continuously optimized recurrent training is replacing the traditional box-checking exercises that have plagued simulator training.

"box-checking" exercise. CAE explained, "This gives instructors deeper insight into performance trends and allows training to be tailored to individual needs. The result is a more personalized learning experience that strengthens both technical skills and the non-technical competencies critical to safe and effective flight operations."

What this means for business aviation clients is "a more meaningful and operational training experience," CAE said. "When combined with CAE's CORe methodology and realistic scenario-based training, operators increasingly see recurrent training as an opportunity to strengthen pilot capabilities and enhance safety, rather than simply meet regulatory requirements."

CAE continues to develop CBTA and CORe. "The next phase of CBTA will focus on improving the consistency and value of competency assessments across training organizations. A key priority is ensuring instructors apply competency standards consistently while exercising appropriate professional judgment. As more competency data becomes available, organizations will be able to use analytics to identify trends, support instructor calibration, and continuously improve training.

"Looking ahead, the combination of competency data, analytics, and emerging technologies will enable more personalized training, advancing CBTA toward a truly data-driven approach to pilot development."

IS TRAINING WORKING?

Jessica Webster, a corporate pilot who flies the latest fly-by-wire Gulfstreams, is a behavioral scientist and founder of Hera Aviation Group, which helps women and primary caregivers with job retention issues in business aviation. Much of Hera's work involves helping companies retain valuable personnel by helping them manage employees' family and life issues that frequently lead to people leaving jobs. The same problems affect student pilots, and she worries that the industry is losing excellent candidates because no one is helping them.

"I think what's wrong with flight training is that we often put all our attention on whether the student meets the standard and too little on whether the training system is working," she said. "The standard must remain high. But we should measure where students stall or leave, develop instructors as teachers, make feedback and evaluation consistent, and intervene before a student disappears from the pipeline.



JESSICA WEBSTER
FOUNDER, HERA AVIATION GROUP

"Women are an important test of that system," she added. "In the FAA's 2025 snapshot, women were nearly 16% of student pilots but only about 9% of private pilots and 5.5% of ATPs. Those figures are not a graduation-rate calculation, but they should make us ask better questions. Hera's own research found that barriers accumulate from initial training through the workplace. If we improve the experience and progression of people who face those barriers, we will build a stronger training system for everyone."

MANAGING ENERGY

The topic of energy management was a key part of the Sept. 22, 2026 Sporty's Pilot's Discretion podcast featuring aerobatic champion and airshow pilot Mike Goulian. What he discussed with podcast host John Zimmerman seemed to close the loop on the aforementioned accidents, especially those involving excessively high speed on final approach.

"I feel like we have lost the understanding of pitch, power, and performance," Goulian said. "What we do see in all facets of general aviation is this energy management problem…it's when all of the electronic protection is gone near the runway: takeoffs, landings, go-arounds.

"For me, that all goes back to an understanding of pitch, power, and performance. So, where is my nose? What is my power setting? What is the desired result? How do I get there? And an understanding of all of those things. I think we just have lost that relationship.

"We see airplanes running off the sides of runways, and overruns. I fly with a lot of people [who think] that if a little speed on final is good, more speed is better. Like, no, it's not."

Goulian believes that training must start with the basics, especially understanding stalls, or as he puts it, "How much energy is left in the wing? And understanding the pitch of the airplane, the power that's applied, the attitude that the airplane has, the position of the stick. How close am I to a stall? How much can I ask of this airplane in a turn, in a stall, in some bad weather, in anything that we might have? We've lost that."



MIKE GOULIAN
AEROBATIC CHAMPION AND AIRSHOW PILOT

Mike Goulian Aviation teaches aerobatics and tailwheel flying in Aviat Husky two-seat utility airplanes, showing pilots who have learned in modern, technologically advanced airplanes that they can fly with the airspeed indicator covered and with the stall horn blaring all the way to touchdown.

"[We're going to] try to land this airplane in 400 feet and understand how does my sink rate work. What is my pitch attitude?

What does the backside of the power curve look like, and how do we control that? All of these little things that I think we have just forgotten. Today we're probably a generation or two into people who never learned it properly in the first place.

"It's a great reminder that what gets passed down today becomes the flight instructors two years down the road, and before long, it's easy for new habits and norms to get established, and you don't realize it's happened until it's too late.

"We've created a couple of generations of pilots that stare inside the airplane all the time, and I get it. But when we really need our skills, they're not there."

At the same time, Goulian recognizes that people want to use their high-performance airplanes to travel, and the company also teaches in Cirrus airplanes, incorporating longer trips and the necessary risk management.

"Traditional flight training, it's about the ACS [airman certification standards], it's about the checkride, it's about maneuvers and stalls and steep turns and landings," he said. "But once you get past that, you actually have to go out and use an airplane to go somewhere.

"This is scenario-based training done in a real-world environment. The biggest difference for us is we try to implement decision-making skills from the very beginning, because they are going to go fly through a weather system if they're gonna go 500 miles to the west or up north... We're trying to give them the tools to make the right decision when they don't have an instructor sitting next to them."

Europe's MPL provides a different pathway for pilots

BY CHARLOTTE BAILEY

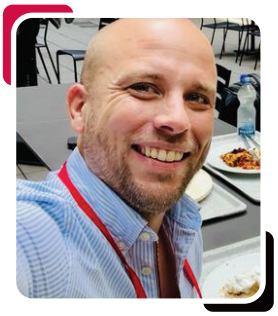
For two decades now, European flight training candidates have been able to take advantage of a distinctly different route to the cockpit than that of their U.S.-based counterparts. The multi-crew pilot license (MPL) was created by the International Civil Aviation Organization (ICAO) in 2006, and EASA integrated it into its regulatory framework under EU Part-FCL.

However, while FAA oversight mandates a traditional hour-building path, the ab initio European MPL is unique in that it follows a competency-based approach: one that, crucially, can be conducted with as few as six "real-world" takeoffs and landings.

EASA states that "the MPL integrated course aims to train pilots to the level of proficiency necessary to enable them to operate as co-pilot of a multi-engine multi-pilot turbine-powered air transport aeroplane under VFR and IFR" conditions. Specifically, the training—which EASA defines as "competency-based and conducted in a multi-crew operational environment"—must include at least 750 hours of instruction for knowledge alone, combined with at least 240 hours of flight (both actual and simulated). This is conducted through "one continuous course of training at an ATO." In comparison, an unrestricted FAA-issued airline transport pilot (ATP) certificate requires 1,500 flight hours.

According to Maxime Wauters, senior manager of safety and regulatory affairs at the European Business Aviation Association, the MPL concept is still a positive pathway despite remaining "relatively niche" within Europe.

"You bring the training organization, the airline, and the authority much closer from the beginning," he suggested, highlighting that "MPL came at a time when people were starting to question whether pilot training should still be measured mainly in terms of hours flown and exercises completed, or whether we should look much more at actual competence."



MAXIME WAUTERS

SENIOR MANAGER OF SAFETY AND REGULATORY AFFAIRS AT THE EUROPEAN BUSINESS AVIATION ASSOCIATION

Wauters suggested that Europe "actually has quite a flexible system in that respect." Student pilots can follow a modular path, pursue an integrated course, enter an airline cadet program, or do the MPL: routes reflective of the different ways people enter aviation.

However, with cost and complexity creating recruitment challenges regardless of regulatory jurisdiction, "uncertainty about employment, license portability,

changing authority, [or] converting privileges" can create additional barriers. Although an MPL holder can upgrade to a standard airline transport pilot license (ATPL) without having to convert the former into a commercial pilot license (CPL), they do nevertheless have to meet the ATPL requirements, including 1,500 minimum hours.

Wauters believes that despite the unique advantages of the MPL, the traditional integrated or modular CPL/IR route remains "much more common," largely due to the flexibility this pathway provides. While an MPL candidate is not legally tied to the airline that originally sponsored the program—something which was more restrictive in the early days of the system—in practical terms, the MPL is still much more closely connected to a specific airline pathway. This potential vulnerability in the MPL model was highlighted by the collapse of regional airline Flybe, with some students left close to license completion.

While Wauters acknowledges that possibly the "biggest debate" about the MPL is the comparatively higher percentage of simulator hours, he argued that modern training devices can be a huge force for good. With full-flight simulators able to train for multiple complex scenarios including inclement weather, system failures, complex threats, or multiple simultaneous problems, "from that perspective, simulator training is probably much more useful than flying around for another 50 hours in good weather just for the sake of increasing a number in a logbook," he said.

Meanwhile, he maintained that "actual flying gives people experience, judgment, and sometimes quite basic airmanship, which are harder to manufacture artificially. The difficult bit is finding the balance."

Christian Theuermann, executive board member of Austria-based Axis Flight Simulation, also pointed out that an evolution



CHRISTIAN THEUERMANN
EXECUTIVE BOARD MEMBER
AXIS FLIGHT SIMULATION

> "Further adoption of mixed- or virtual-reality devices (replacing Level D full-flight simulators for specific learning objectives) will also benefit multi-crew training."

in acceptable EASA training devices will further augment the opportunities offered to students within Europe. Specifically, the introduction of a new regulatory framework (EASA CS-FSTD Issue 1) from April 2028 will, EASA maintains, mark "the most significant evolution of flight simulation qualification in Europe in decades."

In certain circumstances, training providers will now be able to "select the most appropriate simulation device for specific training objectives," something EASA pledges will provide "greater flexibility in the design of training programs while maintaining high safety standards."

According to Theuermann, further adoption of mixed- or virtual-reality devices (replacing Level D full-flight simulators for specific learning objectives) will also benefit multi-crew training. Candidates could either train in a virtual cockpit alongside an avatar, or with two human pilots in remote locations training together via a digital connection. Although Theuermann notes that tools such as virtual reality (VR) aren't commonplace in aviation training, he believes EASA is "opening their mindset" to expanding the range of certified training devices available and the flexibility they offer. The FAA has an expert group discussing the upcoming role of technologies such as VR, and how certified systems could slot into future training pathways.

Theuermann and Wauters agree that within EASA, a growing focus on evidence-based training is here to stay. Within the last decade, "probably the biggest trend I've seen is the move towards competency rather than simply counting hours and exercises, and MPL was an early part of that," Wauters said.

Upset recovery training has, he argued, also become more important, while CRM and threat and error management are introduced earlier.

However, Wauters cautioned that Europe "adds another layer of complexity" to licensing, with individual licenses administered by national authorities. Transfers between authorities, license conversions, medical records, and unusual training histories can all too often create administrative headaches between national regulators, sometimes leading to pilots being grounded for weeks.

"So Europe has achieved a lot of regulatory harmonization, but I'm not sure we can always say the same about administrative simplicity," he suggested.

He concluded that Europe should continue working toward more competency-based training, better simulation, and more operationally relevant training—"but keep enough real flying and enough portability in the system that we are still producing pilots, rather than people who are extremely well-trained for one very specific seat in one very specific operation."

Expert Opinion: Does pilot flight time equate to competency?

BY STUART "KIPP" LAU



Total flight hours don't necessarily equate to a more competent pilot who exercises judgment and resilience under pressure.

The Royal Aeronautical Society recently published "The Competency Conundrum," a thought-provoking piece by Russell Patterson. In this paper, he poses a question: "If not all flight hours are created equal, does this mean there are varying levels of competency?"

That's a great question. Reading Patterson's submission led me to one conclusion: we got it wrong. For decades, the aviation industry has used an ineffective measurement—total flight hours—to judge pilot competency.

It's an easy argument: experience equates to a more competent pilot. It seems intuitively obvious, but that's not always the case.

This is troubling to Patterson: "We are not asking what hours actually measure. By treating flight time as a universal proxy for competence, judgement, and resilience under pressure, we have compressed a complex, multidimensional reality into accumulated total time. In doing so, it has created a measurement problem that affects how we train, how we assess, and how we ultimately think about safety."

Patterson cautions that "this is not an argument against experience, but rather an exploration into understanding what experience actually is."

Measuring pilot competency is complex. There is a link between higher flight time and some competencies such as pattern recognition, procedural fluency, and systems knowledge. However, not all flight hours are created equal.

As an example, an 8,000-hour total time long-haul airline pilot and a 3,000-hour regional airline pilot will develop different capabilities. Neither profile is superior—they are simply operating in different cognitive training grounds.

Using total flight hours as a single metric is an assumption that the higher-time pilot has more experience. According to Patterson, "What we are actually measuring is time exposed to aviation environments, not the depth or variety of cognitive challenges encountered, nor their development across functional domains."

Swedish psychologist Anders Ericsson is cited and provides some perspective: "Expertise requires deliberate practice, not only accumulated hours of participation."

Research in aviation psychology, human factors, and cognitive science breaks experience into eight domains. But only one scales directly with flight hours—the others relate to operational diversity and/or require entirely different development mechanisms that may not be adopted in current aviation training programs.

Only technical competence relates directly to flight hours. Technical competence includes handling, the execution of procedures, and the smoothness of flows and automation of callouts and cross-checks.

Contextual variety develops through operational diversity rather than accumulated time. Each pilot develops a different contextual library based on breadth of exposure, not total flight time. The contextual library of a pilot becomes highly specialized and varied, such as multi-crew operations, mountain flying, aerobatics, international flying, etc.

The other domains largely involve soft skills such as cognitive adaptability, stress regulation, sense-making, relational coordination, judgment maturity, and self-awareness.

According to Patterson, "This eight-domain framework reveals why flight hours feel insufficient as a measurement of capability. Hours develop technical competence reliably and contextual variety through operational diversity but look at the remaining six."

He added, "Cognitive adaptability requires exposure to ambiguity, not routine. Stress regulation needs conscious practice, not passive accumulation. Sense-making demands active hypothesis testing. Relational coordination depends on interpersonal awareness. Judgment maturity emerges from analyzing trade-offs under uncertainty. Self-awareness requires an ability to make sense of ourselves and our impact on others."

Patterson identifies a paradox that pilots develop some of these capabilities outside of aviation training, but rather through "broader work of becoming an attentive, self-aware person."

He noted, "The pilot who engages fully cognizant of their influence on team dynamics, who has practiced self-monitoring and stress management, who has anticipated decision-making under uncertainty, who has worked on emotional intelligence and relational skills is developing cognitive adaptability, stress regulation, sense-making, and self-awareness—even if they have never heard these terms in an aviation context."

Patterson cautioned, "These eight domains are not equally weighted, nor should they be. Technical competence is foundational—without it, nothing else matters. You cannot compensate for the inability to fly the aircraft through exceptional self-awareness. In this sense, technical competence is necessary but insufficient."

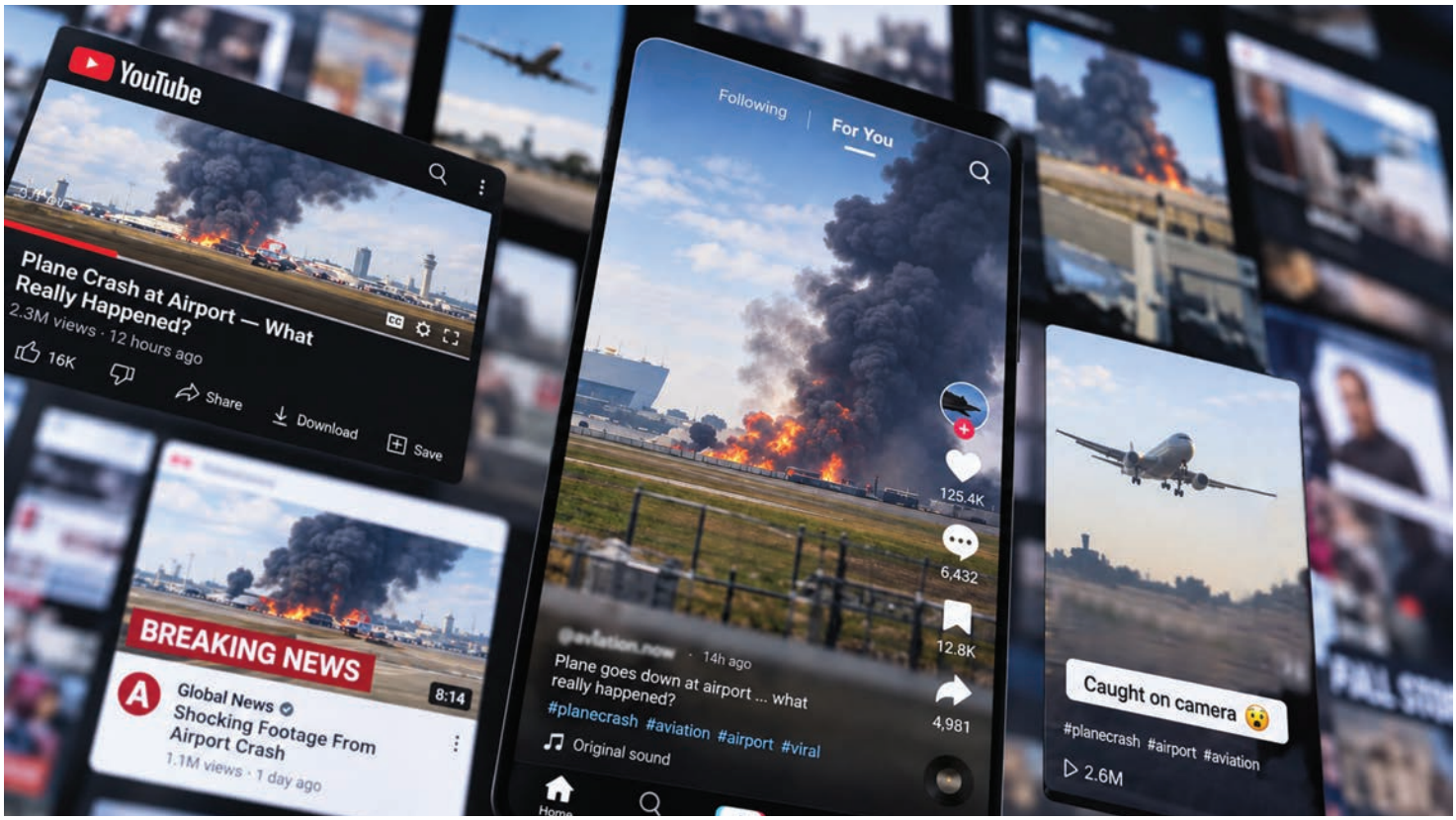
But the question remains: does flight time equate to competency? That is still a valid question but requires deeper thought and exploration. The current aviation systems rely on arbitrary flight hours to define many things such as regulatory requirements, training programs, hiring minimums, and insurance premiums.

The paper, when read in its entirety, provides pilots and training organizations an opportunity for self-discovery. An inventory of those eight domains, looking for gaps, will provide a roadmap to improve overall pilot capabilities and safety—not only those technical competencies, but other domains that are often overlooked in aviation training programs.



A narrow window: Aviation crisis response in the social media age

BY AMY WILDER



In the social media age, business aviation operators have limited time to shape how a crisis is perceived.

When things go wrong in the age of social media, business aviation operators face a narrow window to shape how a crisis is understood before others step in with their own narratives. What a company does with that critical window has less to do with finding the right words in the moment than with decisions made long before anything happens.

That's the philosophy Gina Shealy—director of emergency operations for Delaware-based emergency response firm Fireside—brings to her work with aviation brands, treating communication, especially on social media platforms, not as an afterthought but as a trained discipline, built the same way as emergency procedures. That means staffed with backups, rehearsed in advance, and governed by deliberate rules about where a company spends its attention.

And, don't try to bury the news, said Air Charter Safety Foundation (ACSF) chair and Flexjet chief safety officer Kent Stauffer. He warned attendees at the 2026 ACSF Safety Summit in Daytona Beach, Florida, that organizations can no longer hide after a mishap, hoping it will remain quiet.

"It used to be for a lot of us, back many years ago, if you have an event, you try to see how you can suppress the knowledge of that event," Stauffer said. "What's the first thing you do when you have an accident, and you have pictures being taken at the accident scene? You cover the tail number. Wasn't that the adage?"

Also speaking at the ACSF Safety Summit, Shealy was blunt about why that instinct no longer works. "By the time you get the paint bucket out, there's already 37 things out on X and a whole recreation on TikTok," she said. "That is the opposite of what you should do today."

Stauffer agreed, "Anytime an airplane diverts, there's [someone]...who's watching it, who's already posted it on YouTube." Most companies don't ever anticipate this unless they have experienced it, he added.

Shealy offered an approach drawn straight from the cockpit. "Think about

those three rules: aviate, navigate, then communicate," she told **AIN**. "Communicate is the last one."

Applied to social media crisis response, "aviating" and "navigating" represent the planning and training that happen long before anything goes wrong. Communicating—the public-facing part everyone thinks of first—is the last piece of the puzzle, productive only if the framework is in place.

WHO SPEAKS AND WHAT THEY SAY

Shealy treats crisis communications the way a flight department treats any other operational function: something that has to be planned, staffed, and rehearsed, not assembled after the fact.

She said the most common failure point isn't a bad message—it's an unprepared spokesperson or, worse, no spokesperson at all. "You need to have a bench," Shealy emphasized. "You need to have multiple faces of the company to be able to step in at any time."

That bench matters, especially when leadership itself is involved in an unthinkable event. Training has to be ongoing, she added, because the media landscape keeps shifting: aviation YouTubers and podcasters have increasingly become the first voices the public turns to after an accident or incident—a role once held by cable news analysts.

Speed is useful only if the substance behind it has already been settled. Shealy recommends pre-drafted, pre-vetted holding statements—reviewed in advance by attorneys, insurers, and leadership—so a company can respond within minutes of an event rather than delaying while negotiating language in real time.

"Have something short and sweet," she said. "Such as: 'We are aware of reported events...we're waiting to get further details from the authorities.'"

What goes into that statement matters as much as how fast it goes out. Shealy is direct about the discipline required in the early hours: "We are confirming facts only in the beginning. So if you don't know a whole lot, you don't know a whole lot."

She is equally direct about language that can undercut an otherwise sincere message. Shealy described a multi-agency briefing where nearly every organization independently reached for the same phrase—"thoughts and prayers"—and how the repetition drained it of meaning.

"As much as that sentiment may be very, very true—that you really are thinking and praying—it has very much become tone-deaf," she said. "At the end of the day, do the families or the victims really care about your thoughts and prayers? Yes, you want to be a kind, caring, compassionate organization, but that sentiment is reflected more in what you are doing for the people involved in the response."



GINA SHEALY
FIRESIDE DIRECTOR OF EMERGENCY OPERATIONS

That distinction extends to one of the more legally fraught words in a crisis: "sorry." Shealy separates expressing regret from admitting fault: "You can be sorry that something happened. You can be sorry that this event occurred, or someone's injured. That doesn't necessarily mean admitting fault. A lot of times, working with victims and survivors, we hear, 'I just wish somebody would have said they're sorry.'"

HOW TO SUSTAIN THE RESPONSE

Neither Stauffer nor Shealy argues for engaging every critical voice online. Shealy frames it as a resource question: "Where's your time, effort, and energy going? What's your [return on investment] on that?" Companies that get pulled into refuting every rumor, she said, lose sight of where their energy actually belongs: supporting the response itself, not fighting for the last word.

Stauffer put it more bluntly, joking that operators no longer need the NTSB "because we've got plenty of internet sleuths that'll solve this problem." The instinct to fight back against speculation, both suggested, is usually a losing proposition.

That doesn't mean going quiet after the first statement, they said. Shealy warned that companies often lose ground not in the first hours but in the days after an aviation accident or crisis event, when adrenaline fades and attention scatters. "If you've put out an initial statement and you've never gone back to update it after 24 hours, 48 hours, that's not great either," she noted.

According to Shealy, messaging should also be tailored by channel: making LinkedIn more business-focused; "reaching the public first" on X (née Twitter); and issuing press releases and holding press conferences that are more formal in scope. And, she said, this has to run in both directions internally, so frontline employees are informed early enough that they aren't blindsided, and so no one inadvertently posts something on their personal social media that undercuts the company message.

None of it is instinctive, Shealy said, adding that crisis response has to be built and practiced before it's needed—the same way pilots drill for emergencies they hope never to face. "The first mistake is thinking it could never happen to you," she concluded.

In her experience, the companies that come through a crisis intact aren't the ones that avoid every misstep. She said they're the ones that already worked to aviate and navigate before the moment came to communicate.

Under pressure: Building a lighter aircraft tire

BY HANNEKE WEITERING

When French airframer Dassault Aviation's Falcon 10X lifted off from Bordeaux-Mérignac Airport (LFBD) for its first flight on June 19, it rode on tires that Michelin says weigh 10% to 20% less than their predecessors and last 10% to 20% longer. Clermont-Ferrand, France-based Michelin began developing the tire, called Air X Sky Light, with Dassault in 2019. So far, the tire comes in only one size, built for the ultra-long-range business jet.

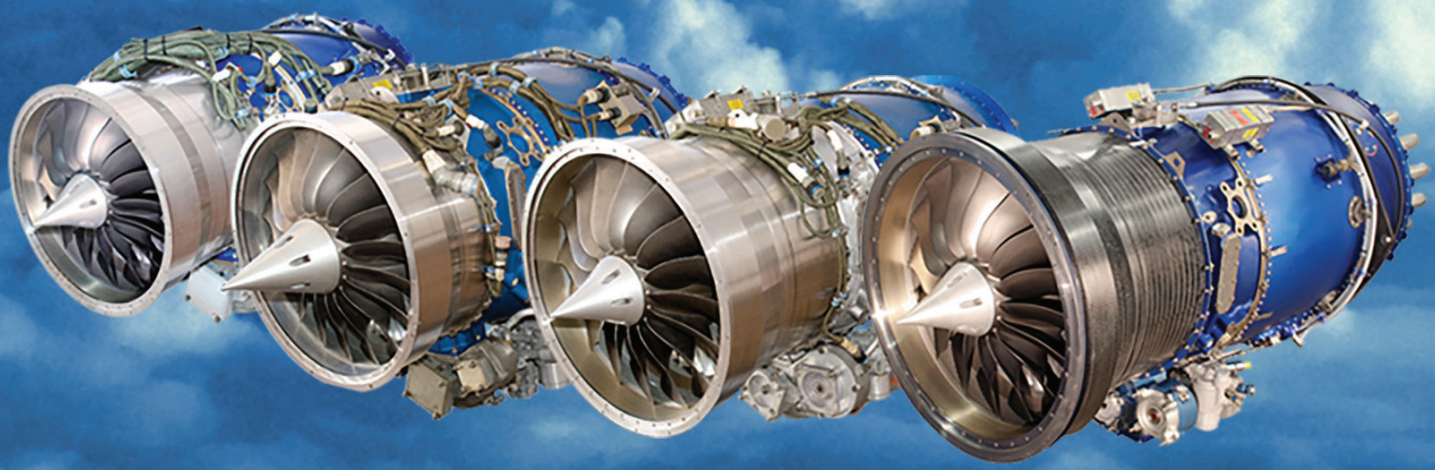
Gains of up to 20% sound modest, but they are hard-won. Every ounce removed has to come out of a part that works under severe loads, speeds, and temperatures, and the lighter tire still has to pass the same certification tests as its heavier predecessors.

An aircraft tire is a pressure vessel, a suspension component, and a heat sink all at once: it holds high-pressure gas, cushions every touchdown, and absorbs brake heat. It must do all of this hundreds of times before replacement. Each of those jobs limits how much material engineers can remove, and regulators test for every one of them. Certification rules show how punishing an aircraft tire's working life is. Under the FAA's technical standard order for aircraft tires, TSO-C62e, manufacturers must show that tire materials survive 24 hours at minus 40 deg F and another 24 hours at 160 degrees without degrading.

The rubber must also tolerate an hour against a wheel rim heated to at least 300 degrees, the kind of heat that brakes push into the wheel. A finished tire must also withstand four times its rated inflation pressure for three seconds without bursting.



Michelin designed the Air X Sky Light tires for Dassault's Falcon 10X.



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Heat is a constant adversary. Every landing, taxi, and braking event puts energy into the casing, and that energy has to go somewhere. How well a tire copes with it depends partly on how that casing is built.

The modern era of casing design began in 1981, when Michelin introduced the world's first radial aircraft tire on a Dassault Mirage III fighter. Forty-five years later, the same two companies are refining the idea on a business jet.

What set the radial apart from earlier bias-ply tires was the direction of its cords. Every aircraft tire is anchored to its wheel by two beads, or wire-reinforced rubber hoops that also seal it against the rim. Between them, layers of rubber-coated cord called plies form the casing, topped by the tread, the grooved rubber that meets the runway. A bias tire's plies run diagonally from bead to bead, crisscrossing at alternating angles. A radial's plies run straight across, at roughly 90 degrees to the direction of travel, held in shape by a belt that barely stretches.

Michelin says its Air X radials typically weigh 20% to 30% less than comparable bias tires and run cooler. It also credits what it calls Near Zero Growth technology with up to 50% better resistance to foreign object damage than bias tires. That technology relies on a high-strength composite cord that stretches less than nylon, so a tire needs fewer plies to reach the same strength.

Air X Sky Light changes three zones at once, according to Michelin: a reworked tread area with an optimized footprint that leaves more rubber available to wear, a redesigned bead that the company credits with making the tire much lighter, and a reworked sidewall. Michelin says hybrid cords and fabrics in the bead and sidewall are both stronger and lighter than earlier ones.

Competitors are attacking the same problem from other angles. Goodyear's Flight Radial pairs a lightweight aluminum core bead with cord that combines Kevlar and nylon. Bridgestone developed its Revolutionarily Reinforced Radial after the July 2000 Concorde crash. That design prioritizes casing integrity and limits the scatter of fragments when a tire fails. On Concorde, tire fragments ruptured a wing fuel tank, starting a fatal fire.



The Air X Sky Light is 50% more resistant to foreign object damage.

WHY LIGHTER IS HARDER

Because the switch from bias to radial banked a 20% to 30% weight cut decades ago, today's gains come from much thinner margins. Durability, measured in landings per tread, matters as much as weight. A lighter casing saves fuel on every flight, but it also has to last.

Operators often get several treads out of one casing through retreading: when the tread wears out, a repair station inspects the casing, buffs off the old rubber, and bonds on a fresh tread.

Whether a lighter tire can last is tested long before it reaches an airplane. TSO-C62e requires a single test tire to survive 61 cycles on a dynamometer, a large spinning flywheel: 50 simulated takeoffs, eight taxi runs at rated load, two more at 1.2 times rated load, and one takeoff that starts at 1.5 times rated load.

Each simulated takeoff covers 6,500 to 11,500 feet depending on the tire's speed rating, and each taxi run covers 25,000 to 35,000 feet, or roughly 5 to 7 miles. The tire never gets a cool start: most takeoff cycles must begin with the tire at 105 degrees or hotter, and most taxi runs at 120 degrees. After all 61 cycles, the tire must still hold its pressure within 10% for 24 hours.

Retreads run the same sequence under the FAA's retread guidance, AC 145-4A, though a retreaded tire needs only to survive three times its rated pressure in a burst test, compared with four times for one fresh from the factory.

The TSO-C62e test sequence has remained largely unchanged for decades. Its core structure dates to at least 1990, and the 2006 revision added only minor refinements. The European Union Aviation Safety Agency adopts the FAA standard by reference, so tires face the same test on both sides of the Atlantic.

Every tire model must pass all 61 cycles to earn approval, and so must any change to an approved design that could affect its performance, such as a different cord material or tread compound. Once a change has passed in five representative sizes, though, a manufacturer can extend it to its other sizes by similarity rather than retesting each one. Michelin says developing and certifying a tire size takes two to three years, which helps explain why a technology unveiled at the 2023 Paris Air Show is only now flying, on one airplane.

WHERE TIRES FAIL

A tire that passes every lab test still has to survive the way it's maintained, and the FAA's guidance points first at pressure. The agency's tire maintenance circular, AC 20-97B, calls pressure upkeep "the single most effective task" in preventive tire maintenance. SAFO 11001, a 2011 FAA safety alert for operators on tire inflation, illustrates the stakes with two fatal accidents.

In 1991, a DC-8 departing King Abdulaziz International Airport (OEJN) in Jeddah, Saudi Arabia, crashed and killed all 261 aboard after an underinflated tire overheated and failed, starting a fire. In 2008, a Learjet 60 overran the runway at Columbia Metropolitan Airport (KCAE) in South Carolina when multiple severely underinflated tires failed on the takeoff roll, killing both pilots and two passengers.

Margins are thinner than they look. Research cited in SAFO 11001 shows transport-category tires can lose up to 5% of their pressure per day in normal service, right at the limit TSO-C62e allows in its 24-hour lab retention test.

Michelin's care and service manual sets hard thresholds for pressure loss. A tire at 95% to 99% of its service pressure gets topped off. At 90% to 94%, technicians reinflate it and recheck it a day later; below 90%, it comes off. Below 80%, its axlemate comes off too, and a tire that goes flat while rolling goes to scrap with its mate, no inspection offered.

Even careful technicians can be misled. FAA and Michelin guidance says pressure readings mean little until a tire has cooled for two to three hours, and Michelin notes that ambient temperature alone shifts pressure about 1% for every 5 degrees, so an overnight cold snap can look like a leak.

Pressure isn't the only culprit: the FAA names foreign object damage as the most common cause of premature tire removals. Stray bolts, stones, and metal scraps on ramps and runways can cut or puncture a tread, and as Concorde showed, a single strip of metal can set off a catastrophe.

WHAT COMES NEXT

Michelin's answer to the pressure problem is a tire that reports its own pressure. PresSense, developed by Michelin and Paris-based Safran, pairs a Safran pressure sensor with a Michelin tire. A technician holds an RFID reader up to the tire, and the reading appears on a smartphone app and flows into a maintenance database. The companies say that allows a check about 45 minutes after landing, versus at least three hours for a manual gauge reading.

Like Air X Sky Light, PresSense took years to reach customers. The partners unveiled it at the 2017 Paris Air Show and flight-tested it on a Dassault Falcon 2000S in 2019, aiming for service around 2020. The first airline selection came in 2023, when Brazil's Azul chose it for 110 Airbus and Embraer jets.

Air X Sky Light was designed to work with the system, though Michelin hasn't said whether 10X operators will get it at entry into service. Given what actually fails tires, making pressure easier to check may matter more than shaving the next few pounds.

Michelin plans to extend Air X Sky Light to commercial aircraft, on future programs and as retrofits, and aims to make all its tires from renewable and recycled materials by 2050.

When the Falcon 10X enters service in 2029, as Dassault plans, Air X Sky Light will begin collecting what no dynamometer can supply: real landings, in real weather, checked by real crews. That is the test that will show whether Sky Light delivers on Michelin's claims.



Bose celebrates 40th anniversary, history of ANR headset

BY MATT THURBER



Jeana Yeager and Dick Rutan after a Voyager test flight with the Bose noise-canceling headsets.

As Bose, a manufacturer of high-fidelity audio products, celebrates the 40th anniversary of its active noise-reduction (ANR) headsets, **AIN** caught up with retired distinguished engineer Dan Gauger to learn more about the company's history and technology.

In 1978, Amar Bose, founder of Bose Corp. and then-professor at his alma mater (Massachusetts Institute of Technology), was on a Swissair jet flying to Boston from Switzerland. "He was excited" to try out the new electrodynamic headphones that airlines were implementing, Gauger said. "He thought, 'Oh, it'll sound good. I'll be able to enjoy music for the first time on a plane.'"

As it turned out, these headphones did nothing to block external noise, and airliners were much louder then. "So he was frustrated," Gauger said. "He started thinking about the problem." This led to the path of ANR headsets.

"Sound is very, very tiny variations in air pressure from atmospheric pressure," Gauger explained. "It alternates between a little slightly higher pressure, and I'm talking about tiny—millionths of an atmosphere in pressure—and so you get slight increases and slight decreases, alternating around whatever the local atmospheric pressure is."

Bose had already developed feedback control as a core technology, he noted. In considering the problem of outside noise, Amar Bose "imagined on his own the idea of using feedback control to regulate [and] control the sound pressure to be what you wanted to hear—the music or communication—and try to cancel a lot of the noise."

Although the Bose team wasn't aware of it at the time, there were patents from the 1930s describing something similar to noise-canceling, followed by some Air Force research in the 1950s, according to Gauger. "We independently invented it."

Essentially, active noise canceling or noise reduction uses a microphone inside the ear cup, near the ear canal, that senses noise or sound pressure going into the ear. Then it compares that noise to the audio that the user wants to hear—for example, a voice on the intercom or a call from ATC. "The difference is the noise you don't want to hear and also maybe some distortion effects," Gauger said. "We take that difference, we process it, we amplify it, we shape it in frequency, and play it back through a speaker to provide a correction."

To put that description into a visual analogy, he explained, "When the microphone realizes that the sound pressure is a little bit too high, it moves the speaker back to make more room for the air, lowering the pressure." It does this several thousand times per second, at the speed of—naturally—sound.

While some might question whether an ANR headset actually lowers the noise a pilot's ears experience, Gauger explained that this is indeed the case. The way that Bose tests this, in accordance with Acoustical Society of America standards, is to put a tiny microphone in the subject's ear canal and measure the sound it picks up in a room with a lot of noise, without the headset on. Then the subject puts on the headset or earbuds, and the measurement is done again. "So objectively, that microphone is measuring the reduction in the sound pressure in your ear canal," he said.

By the early 1980s, Gauger and his colleague Roman Sapiejewski had developed prototypes of an ANR headset, and they were trying to figure out the market opportunity. To start with, they brought the technology to Air Force and Navy test pilots at Edwards Air Force Base in California and Naval Air Station Patuxent River in Maryland, and debriefed the pilots after they flew with the prototypes.

"It won some increasingly significant contracts that we thought were going to be our path to creating our first product," Gauger said. "It was part of a larger digital audio intercom program that all three services were looking at for aviation, and that program got canceled in early '86 because of some issues with the cost of the overall program. Digital audio was a bleeding-edge thing in those days, and Roman and I were left with trying to figure out what we do with this."

Casting about for another potential market, the pair looked outside of Bose's primary market back then: the automotive sound system business. "Bose had no prior experience developing headsets, so we were left on our own to try to figure out a path," Gauger said. Because of the work they had done with military pilots, "General aviation obviously seemed like a good fit. We'd flown in small aircraft, and we were trying to figure out how to make a go of it. We needed something to jumpstart it."



Dan Gauger (left) demonstrating the Bose noise-canceling headset at the Oshkosh airshow in 1990.

That something turned out to be the biggest story of the mid-1980s—the ambitious attempt by Jeana Yeager and Dick Rutan to fly around the world nonstop without refueling. Their aircraft was the ungainly yet quintessential Burt Rutan design, called Voyager. Burt and Dick are brothers (Dick passed away in 2024).

A cover story published in a magazine in July 1986 was what caught their attention. The article described a four-day test flight north and south along the West Coast, and it mentioned that when Yeager climbed out of the diminutive cockpit, she had bruises around both ears from wearing traditional passive headsets. These headsets cut noise by clamping the ear cups to the head, and the higher the clamping pressure, the greater the passive noise reduction.

"Roman and I looked at each other and said we think we can help," Gauger recalled. In August 1986, they paid a cold-call visit to the Voyager hangar at Mojave Airport (KMHV) in California's Mojave Desert. It was just months before the planned takeoff, and they carried with them the latest Bose ANR headset technology from the military testing.

As it turned out, Yeager and Rutan were most interested in the new headset. At that point, Gauger said, "The level of performance, the noise cancellation, was pretty comparable to what we were shipping with the first-generation product in '89."

What the Bose engineers showed the two pilots was the latest version, which not only focused on active noise cancellation but incorporated a more comfortable passive blocking fit. This was a direct result of the military pilot feedback.

"It was that more comfortable headset that Dick and Jeana wanted. They're going to be wearing this headset conceivably for nine days straight, and so that's what we had to build. The units that they flew were only the third and fourth copies of that new generation…we ever made."

However, these were still prototypes, and there were challenges. "We initially had lots of problems with RF interference from the radios," Gauger recalled. "I spent about five weeks in Mojave trying to debug that. Once I figured out how to get the RF performance in line with what they needed, I begged Dick to let me bring the prototypes back to Bose to…have a proper electronics technician rebuild them with the modifications they'd come up with, so that they'd

have clean headsets for use in their flight.

"I am a lousy electronics technician. I can design circuits, but I'm not good at building. But once they were working well enough… he wouldn't let them out of his hands. He kept them under his desk when they weren't flying, and so that's what they took on the flight when they departed Edwards.

"The reality is that about two or three days into the flight, they started hearing this continuous sort of staticky sound from the headsets. My understanding is that they could shut the cancellation off and still get communication and passive blocking, and so they intermittently used the cancellation for the rest of the flight.

"That static problem happened because they'd been wearing these headsets nonstop for a couple of days, and the humidity inside the ear cups from their perspiration had corroded some of my bad solder joints. We proved that when we got our hands back on the headsets. So the headsets did not actually perform as well as they should have during the flight. We had done a lot of work on the comfort of the headsets, and they still had good passive attenuation."

Nevertheless, the successful Voyager flight—which took 9 days, 3 minutes, and 44 seconds and averaged about 116 mph—generated a lot of interest among pilots. Gauger said, "The subsequent attention we got created the impetus for the company to say, 'Well, I guess we found a market here.' The number of pilots who contacted us asking when they could buy what Dick and Jeana had used on the flight was a little overwhelming, so the company said, 'I guess we have to do this.'"

That turned out to be a fairly heavy lift for Bose, which had never made a headset. "There's a special art in knowing how to engineer these things mechanically to fit heads, fit ears, and so on," he said. "We had to figure that all out from scratch for production in the span of a couple of years."

This included figuring out how to manufacture the cables that connect the ear cups to the microphone and plugs. "We did what anybody does as an engineer working on a design," he said. "You look at well-designed products from competing companies, and you try to learn from them."



Bose's Mark Dinsmore working on the noise-canceling headset for the Voyager pilots.

What this meant was Gauger needed to see inside a competitor's cable, but taking it apart wasn't possible because it would destroy the mechanism and not provide any useful information.

So he went to a local medical facility and said, "I have something that needs to be X-rayed." The nurse asked if he had broken something, and he showed her the cable and said, "I'm just trying to figure out what's inside." After joking that she might be contributing to industrial espionage, she ran the cable through the X-ray machine in exchange for $100, and Gauger got the information he needed.

The week before the 1989 EAA International Fly-In Convention (now EAA AirVenture Oshkosh) that started on July 28, Bose held a press conference at its Framingham, Massachusetts headquarters, hiring a helicopter to give reporters a firsthand experience of the new ANR headset. A few days later, the Bose team packed up the nearly 200 headsets that the company had manufactured thus far and brought them to Oshkosh, selling out before the end of the show. The introductory price was $795, which went to $995 after the show.

Before the public reveal, Bose had been approached by major headset manufacturers looking for a partnership. "We chose to go on our own," Gauger said, "much to their disappointment and anger. One of those conversations ended with somebody saying that they would bury us. I won't say who. And it wasn't long after we started selling headsets before… others had product on the market."

Since then, Bose has continuously iterated the design of the original headset, with the latest generations being the A30 ear cup version and the ProFlight Series 2 with earbuds (for quieter cockpits). Major upgrades come on a roughly 10-year cycle, which seems slow but fits with Bose's efforts to make unique products that, in the words of Amar Bose, "are different and better."

While noise-canceling technology is pushing the limits of technology and major breakthroughs aren't likely, there are pathways that will be useful to pursue.

"This is not something where you throw in this year's hot new chip, and you get much more performance," Gauger said. "We're up against physics here, and we are at about the physical limits. There are things we could do to eke out a little bit more improvement…for using noise cancellation in a more effective way to make the experience of operating the aircraft better. So there are still interesting opportunities for improvement."

AIN Media Group

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Aery Aviation wins fight against $15.7M FAA proposed civil penalty

BY MATT THURBER



Aery Aviation conducts flights for the U.S. Navy and other customers in a fleet of modified Learjets.

The FAA has withdrawn a civil penalty letter issued to Aery Aviation on Dec. 22, 2025, and will not pursue one of the highest-ever proposed penalties for a non-airline operator: $15,744,352.50 covering 431 flights between July 2021 and April 2022 that the agency alleged were flown with unairworthy airplanes.

"After full consideration of the above-referenced case and the evidence presented, we have determined that it is not in the interest of justice to pursue this matter," the agency's College Park, Georgia, Aviation Litigation Division, southern team, wrote to Newport News, Virginia-based Aery Aviation on September 14.

The allegations related to banner- and target-towing flights in Learjets for the U.S. Navy "without performing the required maintenance or maintaining the required documentation," according to the FAA. "The equipment installation required the aircraft to be placed in a restricted category under which they could not be flown over densely populated areas, in congested airways, or near airports that serve passengers without an FAA waiver. Additionally, Aery was required to document that maintenance personnel had approved the aircraft for return to service following the installations and placement into the restricted category."

Because most of these flights were near the Class D airspace surrounding Newport News-Williamsburg Airport (KPHF) in Virginia, the FAA accused Aery of careless or reckless operations "so as to endanger lives or property of others."

The FAA's notice gave the operator 30 days to respond to the proposed civil penalty, which Aery did, and it followed this with an informal conference with the FAA on April 7.

What struck Aery president Scott Beale as strange was that in 2022 the FAA had raised questions about some Aery flights for a possible enforcement action. According to Aery, it responded to the 2022 issues,

and believed these were resolved because the FAA told the company that it didn't need any more information. There was no further communication from the FAA, according to Beale.

However, 38 months later, without any warning, the FAA decided to file the $15.74 million proposed penalty. Surprisingly, Beale only found out about the penalty when **AIN** asked Aery Aviation about it.

JUNK MAIL SUSPECTED

"I thought this must be a phishing attempt or a joke," he explained. "I hit delete, and I got rid of it. About an hour later, I thought, 'Wait a minute, that was very specific.' So I went into my delete box, and I looked at the email address, and sure enough, it was a real email address. So then I called and said, 'Where did you hear this or find this?' And they led me to a link, and that link was the FAA website where I saw the proposed civil penalty letter for the very first time.

"I hadn't heard from [the FAA] in 38 months. You can imagine, three days before Christmas, we're a small business, a $15.7 million proposed penalty, the largest ever that I've seen on record for a charter company. It took another four months for Aery—after spending lots of dollars in legal [fees] and other things—to even get a conference scheduled."

In a May 26, 2026, letter to Transportation Secretary Sean Duffy, Aery asked for some reforms at the FAA. "During this extended period of silence, Aery had no notice that enforcement action was either pending or imminent, no opportunity to address developing concerns (because it was of the belief that FAA had no outstanding, unaddressed concerns), and no ability to mitigate the harm that would flow from the eventual issuance of a $15 million penalty notice.

"The consequences of this delay have been severe and tangible. The [civil penalty], once issued, became a matter of record. Prospective clients and contracting parties, including companies that had been evaluating Aery for substantial service contracts, learned of the enforcement action and determined that Aery presented an unacceptable regulatory risk. Those contracts were lost. That business did not return. The harm to Aery's reputation and commercial relationships resulting from this action is real, documented, and ongoing.



SCOTT BEALE
AERY PRESIDENT

> "Timely enforcement serves both the agency and the regulated community. An FAA that goes silent for more than three years and then issues a $15 million penalty based on significant errors of fact and law needs immediate reform."

"Timely enforcement serves both the agency and the regulated community. An FAA that goes silent for more than three years and then issues a $15 million penalty based on significant errors of fact and law needs immediate reform."

During the April meeting, Aery offered information that it believes made the FAA's civil penalty case unenforceable. It summarized this information in the letter to Duffy, arguing that it had shown the public aircraft operations (PAO) designation letter from the U.S. Navy to the FAA in 2021.

According to Aery, "Flights conducted as PAO under the authority and jurisdiction of the U.S. Navy are not subject to FAA certification and regulatory oversight in the manner the agency has sought to apply here. Accordingly, those flights should never have been included in the [civil penalty's] penalty calculation."

"The fleet of Learjet aircraft referenced in the proposed civil penalty letter only had one mission, and that was a government contract," Beale explained, and that's how the Learjets were operated. Aery did not fly the Learjets under Part 135 charter operations, and it has a letter from the U.S. Navy, he added, "saying that all flights, for the purposes of the special operations that we're doing for the Navy are categorized under public aircraft operations and, in that case, the FAA has no jurisdiction."

The FAA claims that when Aery was flying the Learjets under Part 91 civilian operations, for example, for training or positioning flights, they carried modifications such as hard points to mount Navy equipment that required the aircraft to have restricted-category airworthiness certificates. But during the informal conference, Aery showed the FAA "the aircraft configuration logs establishing that the aircraft operated by Aery during the relevant period did not have the modifications that the FAA alleged," according to the Duffy letter. "No underwing pods. No stores during civilian operations and under the FAA jurisdiction. No configuration changes requiring restricted certification."

"It felt like a lifetime," Beale told **AIN**, when nothing happened after Aery Aviation met with the FAA in April. That meeting was intended as an informal settlement conference. However, Aery had made no effort to negotiate a lower penalty,

and Beale believes that this took the FAA by surprise.

After the meeting, Aery tried calling FAA officials, and no one would return those calls. "When they wouldn't return a phone call, we started going to the top and working our way down with Duffy and the [FAA] Administrator and our congressmen, and finally, apparently we reached enough people that they decided to make a decision."

Aery not only wrote letters and contacted legislators but also dug through thousands of pages of documents in response to a Freedom of Information Act request. "We did a very deep dive, and we proved [it]," he said. "We stood by our review and provided them all the facts."

STEEP COSTS IN AFTERMATH

However, this sequence of events cost Aery a significant amount of time and money. "First and foremost, our brand, our reputation, our integrity," Beale said. Since the FAA publicized the proposed $15.7 million penalty, the story spread that Aery was having safety issues.

"That cost us a lot of time and energy," he said. "I can't tell you how many hours of explanation, of emails, of just trying to recover from that headline. It's been very tough. Now, that's just not me. That's the whole company…to every employee who is trying to defend the company that they go to work for every day." Some potential employees exited the recruitment process because they had heard the news about Aery.

In dollar terms, Beale calculated that the FAA action cost the company more than $500,000 in legal, communication, and other fees. "We took it very seriously, and we knew that this could potentially, if not handled right, have been not just significant, but potentially a company-ending finish. And we've had some customers that have turned down our services."

This amounts to further millions of dollars, he said, and none of that is recoverable. The only recourse could be a procedure to expunge Aery's FAA record through the Administrative Procedure Act. "But there's no damages allowed, so you spend a lot of additional legal money, many tens of thousands of dollars, to process that, and in the end, it gets expunged, but you don't get any of the damages back." In any case, the news has already spread, "so it's a fruitless sort of process," he added.

Not only was the cost to Aery for this FAA action significant, but so too was the amount of taxpayer money spent on a fruitless pursuit over five years. And if Aery was flouting the regulations, Beale asked, "Why did it take roughly 38 months to issue the proposed penalty? Why does the FAA not apologize to Aery (and the industry) for the damage it has done to Aery or provide something more than a two-sentence letter after five years of work?

"From the beginning, Aery maintained that it did nothing wrong," Beale concluded. "We stood behind our people, our operations, and the evidence we presented. We appreciate the FAA's consideration of the case and evidence, and we respect the agency's important aviation-safety mission."

Besides removal of what Aery believes is an unjustified civil penalty, Beale hopes this case will result in some changes at the FAA, including improving the response time when questions are raised and answered and when promises appear to have been made. "The FAA is supposed to be incentivized to operate quickly," Beale said. "It's not supposed to put companies out of business.

"This is a frequent complaint: the FAA advertises this penalty, puts this big number out, and when you look at some old GAO [Government Accountability Office] reports, most of those get negotiated down to pennies on the dollar. But you get this reputational damage in the meantime, and the settlement's always quiet and private, and there doesn't seem to be any accountability for the agency or any changes being made. We're very interested in not only resolving Aery's case in an administrative fashion, but making sure that there are some reforms to the process because it does seem backwards." ▮



An Aery Aviation Learjet with hardpoints on the wings.

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Bombardier Safety Standdown: 30 years of evolution, legacy

BY KERRY LYNCH



Safety Standdown is celebrating its 30th anniversary in November.

Born as a small gathering among the Learjet flight demonstration teams in 1996, the Bombardier Safety Standdown will mark its 30th anniversary this year with more than 400 anticipated in attendance and thousands more online. Scheduled from November 9 to 12 in Wichita, Kansas, the four-day event is themed "Evolution Fueled by Legacy" in recognition of not only the history and foundations of Safety Standdown, but also how safety and the culture surrounding it have progressed through the years.

"It is a milestone event," said Chris Milligan, v-p of preowned aircraft services, who takes the lead on Safety Standdown. "It started the same year that I came in [to Bombardier]. I just happen to be fortunate to be in the position that I am right now. The journey that this event's had with Bombardier is incredible."

Safety Standdown began in Wichita as an aviation safety training event that brought together Bombardier's Learjet demo teams both locally and in Hartford, Connecticut. The event was so positively received that it continued, and by 1999, it had opened to others in the industry and morphed into what it is today. With safety, Milligan said, "We don't see competition. It's an industry event."

Held for free annually primarily at the Wichita Hyatt Regency, the event soon reached a capacity of just over 400. So, in 2010, Bombardier began streaming the program and extended it to thousands around the world. Bombardier has also expanded its content beyond that presented during Safety Standdown, posting different material periodically "to try to make it a year-round event." This provides access to organizations even when they don't attend Safety Standdown in person.

Over the years, Safety Standdown has become one of the hallmark safety events in business aviation, attracting a range of attendees. Initially geared toward pilots, the event now draws attendees from management, maintenance, and even human resources. Officials from NBAA, the Air Charter Safety Foundation, Citation Jet Pilots Association, and many others regularly attend. But it has gone beyond the industry, garnering interest from the automotive community, among others.

Milligan said this growth "really speaks to the fundamentals of our advisory board." Bombardier has assembled an advisory board that represents a cross-section of industry and safety experts. That board begins planning the next event the day Bombardier finishes the current event, he noted. "They are the ones that come up

with all the great topics," he said. Not only do they understand the emerging safety issues, "they know the speakers that are in the industry that are up and coming."

By having a cross-section of leaders, they can bring ideas to the table for pilots, maintenance personnel, directors of aviation, and, more recently, recruiting. Human resources was an important addition because people in this discipline could explore "how do we create the culture; how do we create [safety] from your hiring," Milligan explained. "It is end to end. It's organizational. It's not just pilots or directors of aviation; it's manufacturing of the airplane, how you service the airplane, and everything from A to Z. Over the years, it's become more inclusive, and that I think is one of its strengths. There are no borders to who can be involved and who's responsible for safety."

Important to Bombardier is that attendees bring back the lessons shared and encourage other colleagues to attend. In fact, about 45% of attendees in a given year are there for the first time. Milligan said he's been told: "I got so much out of it, I want to send somebody new. I really want to include my organization."

And on the workforce development front, a few years ago Bombardier formed a sponsorship fund to bring in three people, whether students or those new to the industry, to attend Safety Standdown. The fund will contribute to their travel expenses so they can attend. Those interested can apply and submit an essay for evaluation. Once at the event, leaders, including the members of the advisory board, will sit with them during lunchtime to share their experiences both in safety and in the industry. "The amount of questions they ask is incredible," Milligan noted.

Speakers over the years have ranged from National Transportation Safety Board members and association leaders to experts in medical fields and safety science, sleep researchers, and those involved in operations—from single-pilot to large fleets. They have appeared to share personal stories of tragedies, probe key accidents, inform, and challenge the audience.

A perennial favorite returning this year is Tony Kern, director of aviation for Alaskan operations for Hilcorp, former CEO of safety organization Convergent Performance, podcaster, author, and widely renowned as one of the preeminent aviation safety experts. Kern often kicks off Safety Standdown dressed in a costume reflecting the topic du jour. Last year's costume was a pirate for his talk: "Under the Black Flag: Lessons on Performance and Culture from Men Without a Country." This year's discussion, "John Boyd, Chaos Theory, Artificial Intelligence, and Polar Bears: The Sublime Art of Living in the Yellow," leaves open all sorts of possibilities.

Also on tap this year during the general sessions is Ivan Pupulidy of the University of Alabama at Birmingham and author of *Human & Organization Potential*, speaking on "Risk: The Untold Story." Jermaine Cadogan, a retired U.S. Marine major, is presenting "Building a Culture of Excellence & Proactive Compliance." Tim Wade, corporate director of environmental, health, and safety for Flexjet, is discussing "What You Lead, You Leave." Attendees will also hear discussions on safety under pressure, crew resource management, workforce challenges, emotional intelligence, medical updates, and compliance.

Other luminaries will lead the workshops on a host of topics in the afternoon. Attendees will be able to pick a couple each day from as many as 11 offerings.

While not a scheduled speaker in the general session this year, Amy Grubb—who specializes in change management and is serving as a digital transformation advisor for the FBI—has made frequent appearances before attendees and chairs the Safety Standdown advisory board.

Opening the event on November 9 with a reception, Bombardier will also host a dinner banquet where it presents a safety award.

From the outset, Safety Standdown was held with the objective "to improve aviation safety standards and sustain positive changes within the industry." While that objective hasn't changed, the scope of the event has broadened. In planning the 30th edition, Milligan said, "We were talking about how safety has evolved as a topic. How comprehensive it is now versus 10, 15, or 20 years ago."

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The always-engaging Tony Kern dresses up in a costume related to the times and his presentation.

Summer camp flights give wider view to Angel Flight West pilots

BY AMY WILDER

For Angel Flight West (AFW) volunteer pilots, summer camp missions offer a different sort of operation from the usual medical flights. On camp day, airplanes line up outside the FBO while a swarm of youngsters hauls sleeping bags, pillows, and duffels toward the aircraft that will carry them to camp or home again.

"You see kids moving from the FBO to the different airplanes, and there's 20, 25 kids on the ramp, all dragging their gear along in various states of chaos, but they're all there for the same reason," volunteer pilot Eric Chadwick said in an interview with **AIN**.

On one return trip, Chadwick watched a camper roll "the largest suitcase I've ever seen" across the floor. She wasn't his passenger, but he thought about whoever was flying her. "That pilot is not going to be happy about that," he recalled thinking, with a chuckle.

According to AFW, its volunteer pilots fly hundreds of flights each year carrying children with life-threatening or life-altering medical conditions to specialized recreational camps across the western U.S. Most AFW flying is a solitary exercise, getting perhaps one patient to medical care. Camp missions are different, both for the kids aboard and for the pilots who fly them.

"A lot of Angel Flight West is so individual," Chadwick said. "We pick up a mission, we pick up a passenger, we fly it. We don't ever see other pilots." Camp flights, by contrast, arrive at and depart from the same location in a concentrated period. "You really get to see the broader impact of the Angel Flight organization and how many people they're moving at once."

Unlike AFW's medical-transport missions, camp flights don't take passengers to treatment. Chadwick described them as



Eric Chadwick enjoys flying Angel Flight West missions, especially trips to take kids to special camps.

a chance for kids to spend time with others who face similar hardships, whether at burn camps, deaf camps, or camps for children with serious illnesses.

"It's one thing to have your physical needs cared for in the hospital, but it's another to care for your soul and mental health journey after something as life-changing as a burn injury," said Erika Mendoza, camps and recreation manager at the Alisa Ann Ruch Burn Foundation in Fresno, California. AFW has flown young burn survivors to the foundation's Champ Camp for more than 30 years.

At burn camps, Chadwick said, "Sometimes you see the kids, and you can't even tell what their injuries are, and then other times it's very obvious: hands, face." He marvels at the perseverance it takes campers to put themselves out in the world. Flying them is the easy part, Chadwick said.

"You generally hear a lot less complaining out of kids than you do adults when you get into medical situations like that," he added.



A volunteer pilot takes a moment to pose with campers on one of the Angel Flight Camp missions.

BURN SURVIVOR

One of those campers is Susy, now 16, who has traveled to Champ Camp since 2019, according to AFW. "As a burn survivor, Susy has walked a path that requires courage every single day," said her mother, Viviana. "The trips didn't just take her to camp; they lifted her confidence, her independence, and her sense of possibility."

For pilots, camp passengers bring planning puzzles. "There's always surprises when you pick up an Angel Flight passenger, especially from camp," Chadwick said. Most of the gear is soft and stows easily, and in his six-seat turboprop, total weight is rarely the constraint. "For me, it's more fore and aft," he said. "If you stuff it all in the back, all of a sudden you're pretty heavy on the aft end."

Because camp legs tend to be shorter than other AFW missions, he has flexibility. "Fuel is usually your relief valve. So I rarely add fuel until I know what I'm getting."

Outbound and return legs typically fall three days to a week apart. Chadwick works full time and flies mostly on weekends, so return legs, which often fall on Sundays, suit his schedule. With few pilots flying both legs, "it really does take a lot of coordination and a lot of different pilots volunteering their time," he said.

Chadwick learned about AFW early in his pilot training and quickly concluded that flights with no particular destination, the proverbial $100-hamburger runs, should become "missions that you can do some good." He tries not to let his airplane sit more than two weeks and aims for 20 to 25 missions a year. His wife often rides along when weight and balance allow, serving as an extra set of hands. "Somebody needs to be monitoring what's going on," he said. "It's also been a nice thing for the two of us to do together."

Andy Coy of San Diego began pursuing his pilot certificate in 2020. He has since logged 1,100 flight hours and 38 AFW flights, including Susy's most recent trip home. "Camp flights are especially important to me," Coy said. "Those kids have been through tough experiences, and I love seeing the camaraderie between the campers and counselors—laughing together, supporting one another, and being part of the group."

Once airborne, campers are typical kids. Chadwick has packed five—ranging from grade schoolers to 18-year-olds—into his airplane for a flight between Fresno and Las Vegas. "Some of them can't stop looking out the window, amazed at what you're doing, and others are sleeping by the time you're in the air," he said.

One camper who rode up front was fascinated by everything, so Chadwick explained things throughout the flight, air traffic control calls included. Another, an older teen, "sat in the front right seat and slept the entire way." Pointing to programs such as EAA's Young Eagles, he encourages pilots to offer that seat when conditions permit, as a way to introduce a new generation to aviation. "If you've got a beautiful day to fly and they're old enough to sit up there, I would always encourage that if you can."

After all, flying them is the easy part.

Ciconia C&CAS demonstrates coordination and collision avoidance capability

BY MATT THURBER

During a recent demonstration by the San Bernardino County Fire Protection District, a Ponderosa FireSparrow Mk10 drone and two Robinson R44 helicopters equipped with Ciconia's vehicle-to-vehicle Coordination & Collision Avoidance System (C&CAS) flew in close proximity. The demonstration in California at the Glen Helen North Training Center was intended to answer a critical question as drones proliferate in airspace heretofore reserved for larger and crewed aircraft.

That question is: instead of trying to restrict operations of certain types of aerial vehicles and arguing about which has the right of way, why not figure out how to allow them to work together (coordination) as well as avoid each other (collision avoidance)?

According to Ciconia, this is exactly what its software and associated hardware, developed with partners such as Sagetech Avionics and Qualcomm, are designed to accomplish, and the demonstration on August 12 showed that it works. Using Ponderosa's FireSparrow Mk10 Heavy-Lift drone and R44 helicopters provided by HeliStream, the demonstration was one of a series and follows flights that began in Israel at the Israel Air Force Test Center in 2023.

C&CAS is designed to permit what Ciconia calls "safe and dense aerial operations." It does this with lightweight equipment that relies on vehicle-to-vehicle (V2V) communications and software that acts much like an advanced airborne collision avoidance system (ACAS). Like ACAS X, which isn't yet fielded in a certified application, C&CAS will provide much more sophisticated resolution advisory instructions to piloted aircraft while at the same time enabling injection of steering commands into a uncrewed or remotely piloted vehicle, not only to prevent collisions but to facilitate cooperative operations. An example of this would be aerial firefighters coordinating with drones that are being used to enhance data gathering while not putting humans at risk.

The key to making this work is that the hardware must be light and small. Sagetech Avionics has been developing ACAS for military helicopter applications, drones, and autonomous flight programs such as Reliable Robotics and has worked with Ciconia for the past five years.



MATT THURBER

The Ponderosa FireSparrow Mk10 drone can drop 10 gallons of liquid onto a fire.

"Our role is to make the hardware," said Sagetech CEO Tom Furey. "We've been talking about doing a demonstration here because we know San Bernardino County Fire is very interested in being able to get more aircraft and more people on targeted fires.

"We need to have manned aircraft and unmanned aircraft working the same area at the same time, and we can do that with C&CAS, because C&CAS relies on a close-coordination vehicle-to-vehicle link. It doesn't rely on ADS-B with excess latency, and it doesn't rely on UTM [UAS traffic management]. You can have aircraft fly in much more tactical formations [and] operate in the same airspace and still not swap paint and keep firefighters' lives safe."

To ensure robust communication between the C&CAS-equipped vehicles, Ciconia tapped Qualcomm to make the V2V radio system.

"We're here today because we are trying to address a very practical challenge during wildfires," said Leslie Barnes, Qualcomm senior director, government affairs. "Crewed aircraft and drones need to coexist in the same shared airspace to improve firefighting operations. This is where Ciconia's collision avoidance system comes in…by providing a direct communications lane…enabling nearby aircraft to exchange in real time safety-critical information such as location, altitude, speed, trajectory, et cetera. This communications link is completely off-network, so it doesn't require connection to the cellular network or a satellite connection to provide that real-time collision avoidance. The great thing about this technology is that we are developing it through Ciconia and our partners in San Bernardino to make sure it meets the needs of public safety. This is what our Technology for Good program is all about, testing real-world technologies with public safety professionals who both know the mission and are deeply committed to the mission."

Present for the demonstration were representatives from a variety of law enforcement and firefighting agencies. These also included leaders and UAS team members from the Los Angeles County Fire Department, Cal Fire, Los Angeles Fire Department, Ventura County Fire Department, the U.S. Wildland Fire Service, and other agencies as well as local politicians.


MATT THURBER

Ciconia CEO Moshe Cohen provided a play-by-play account during the C&CAS demonstration.

"I think they have a cutting-edge technology that can save lives," said former San Diego chief of air operations Chuck Macfarland, who is now an industry consultant. "We look at this technology…how we [can] deflect and detect with the UAS operating in our airspace. But think how this technology can work when we have two or three helicopters working in that airspace. Even though we have TCAS and ADS-B, this can be a simple technology that saves lives. And as we get more and more UAS incursions into our fire traffic area, it's technologies like this that are going to make a big difference."

SOLVING THE BIG PROBLEM

"The problem we are trying to solve is that low-altitude aircraft separation today depends on procedures and on your judgment," said Ciconia CEO Moshe Cohen. Because people sometimes don't follow procedures and misjudge separation, safety buffers have to be added to prevent collisions. "The result is most of the skies are safety buffers," he said.

Sometimes the buffers don't work, or people don't adhere to them—for example, drones flying illegally during fire operations. During the January 2025 Palisades fire in Southern California, a drone collided with a Canadair CL-415 Super Scooper, damaging the aircraft's wing and causing a disruption in firefighting operations and the grounding of beneficial aircraft and drones.

"When drones were mostly needed, when the firefighters on the ground need to see whether or not they're being burnt over, they had to land their drones because there is lack of trust in the current situation," he said.

"A few months later, in Texas [during a] rescue operation, a helicopter hit a drone." On July 10, a Super Scooper ran into the cable supporting a water-carrying bucket hoisted by a Super Puma, but luckily both aircraft were able to land safely with no injuries to the occupants. Then there was the August 2 midair collision of two firefighting Bell 214s in Athens, killing the crew on one of the helicopters.

"The solution is a decentralized system," Cohen said. "We call it V2V or A2A, aircraft-to-aircraft C&CAS. The A or V means that aircraft are sharing the information among themselves. They're using a very light radio, a very little amount of data,

[over a] very short range. With the C&CAS, there will be significantly less midair collisions, crewed and uncrewed [aircraft] can share the skies, and pilot judgment will be protected from misjudgment [and] against human error."

HOW C&CAS WORKS

Each aircraft must be equipped with the C&CAS equipment, including the Qualcomm V2V radio, so it can transmit its location and ID information.

"The C&CAS on board each one… receives the location of its neighbors," Cohen explained. "It creates a map of the sky around itself and analyzes the level of risk with each of the elements around itself. If there is no risk, it will [say] nothing. It will be totally transparent to the pilot. I know that pilots are concerned with loading them with more instruments. The C&CAS is designed by pilots for pilots. It will not disturb you. It is like a good team member, where it keeps silent all the time. It won't be insulted if you won't look at it, until there is a high risk. When there is a high risk, it indicates the risk and it tells you what to do. I guess when there is a high risk, you would love to hear what the C&CAS has to say."

Conflicts can also occur, however, between equipped and non-equipped vehicles. For example, an aircraft might carry ADS-B Out equipment, and in this case, the C&CAS-equipped aircraft will be able to avoid the ADS-B aircraft but not work closely together because the ADS-B aircraft cannot be aware of the C&CAS aircraft.

With more drones in the U.S. required to be equipped with Remote ID, C&CAS can detect these drones and allow closer and safe maneuvers. "The C&CAS issues no alert, [even] though they are very close, it is safe to maneuver," he said. "We are very proud of this one…it's a collision avoidance system that can function with such close or dense aerial traffic."

C&CAS can't detect every target, however. If a drone or aircraft isn't transmitting any signals—for example, a hostile vehicle—then C&CAS won't be able to see it. In some cases, a drone may generate other data that C&CAS can use, "and we can incorporate this information," he said.

DEMO FLYING

For the first demonstration, both of the HeliStream pilots flew five runs, always staying in visual contact with each other in case there was a problem with the C&CAS system. To show how C&CAS helps prevent the risk of a midair collision, the two pilots flew their R44s closer and closer to each other until C&CAS notified them to split up. In another run, one of the helicopters turned toward the other, and C&CAS told each of the pilots which way to fly to resolve the conflict.

The third run was to show how two helicopters can fly cooperatively during water-bucket operations over a simulated fire. One helicopter flew over to make the water drop, while the other approached to make its dip, both near each other, with no C&CAS warnings necessary nor provided.

However, on the next run, the rear helicopter got closer while the front helicopter was dropping its simulated load. The pilot in the rear helicopter could not see the helicopter in front because it was positioned to be out of sight below the front pilot's view. "In Israel, we had, many years ago, a collision between two CH-53s where one landed on the other one, exactly such a scenario," Cohen said. "The C&CAS will identify and prevent it from happening.

"Firefighter pilots are very busy watching for obstacles, looking for the fire, making sure that they don't hit any trees. The C&CAS will identify…this scenario, and we could tell the pilots what to do."

What the pilots see in a C&CAS-equipped aircraft is either a dedicated display or symbology on avionics displays with information about conflicting or collaborative traffic. "We define the risk level," he said, as a level of alert (LOA). LOA 0 is no risk, and 4 is the highest. LOAs 1 through 3 are there to give the pilot an indication of increasing risk. The two helicopters flying collaboratively, for example, showed LOA 2, so the pilots know they are close together but not having to change anything. LOA 4 is the only level with an audible warning, and it will tell the pilots to turn and/or climb and display arrows to show where to fly to prevent a collision. The idea is that the C&CAS software would run in the background on an



MATT THURBER

C&CAS provides pilots with a level of alert, and the highest tells the helicopter pilot to turn away.

equipped aircraft and show the LOA only when necessary.

In a demonstration of LOA 4, one of the helicopters turned toward the other, and the result was a LOA 4 conflict. "The system tells them to turn right and climb," Cohen said. "That means that the pilot just provides an input, tilts his helicopter a little bit to the right. The other one makes it a little bit to the left, and the conflict is easily resolved. It's nothing dramatic.

"It doesn't issue alerts when it does not need to, and when it is needed, it issues alerts right on time. And when the alert comes on time, [it's a] very small input, and the conflict is resolved, and the midair collision is avoided."

DRONE AVOIDANCE

For C&CAS to be effective with drones, both the drone and aircraft can be C&CAS-equipped, or the aircraft can use C&CAS to steer clear of a drone with Remote ID or ADS-B Out. But the real value comes when both carry C&CAS, because then C&CAS can take control of the drone and keep it away from the aircraft so the aircraft's crew can continue their work uninterrupted.

For the drone demo, the Ponderosa Fire-Sparrow Mk10 was flown inside a virtual geofenced area to ensure safety.

For the first demonstration, the helicopter approached the drone's location, and the operator tried to take off, but C&CAS wouldn't allow the drone to lift off. This scenario replicates when a drone operator needs to fly the drone but doesn't see that there are aircraft approaching.

In the second round, the helicopter and drone were both flying, and the helicopter pilot saw that there was a drone at his 12 o'clock position and could maneuver slightly so they could both continue their missions. "The helicopter and the drone can fly together in the same airspace, serving firefighters absolutely safely," Cohen said. "There is no need to land one of them or to prevent one of them to access the skies."

In the third demo, the helicopter pilot ignored the C&CAS warning about the drone and continued flying towards it. This time, the C&CAS gave steering commands to the drone operator. While the operator could have moved the drone, for this test, he ignored the command and C&CAS stepped up the LOA then took control of the drone and moved it out of the way of the helicopter. If the helicopter moves unexpectedly and C&CAS doesn't have time to move the drone, C&CAS will go to LOA 4 and tell the helicopter pilot which way to move to avoid a collision.

> "The helicopter and the drone can fly together in the same airspace, serving firefighters absolutely safely. There is no need to land one of them or to prevent one of them to access the skies."
>
> — Moshe Cohen, Ciconia CEO

"This is a pretty amazing technology," said HeliStream co-owner Rod Anderson, who flew one of the R44s for the demo. "Visual separation has some limitations and some weaknesses. We do a lot of training with law enforcement agencies, other public service agencies, and…the exchange between air traffic control and pilots quite often is misinterpreted. The controller will tell a pilot…'You have traffic at 2 o'clock, opposite direction, same altitude.' I look over at the pilot, and he's looking in [the wrong] direction, which is 10 o'clock. So he's not going to see the traffic. The other thing that happens is they think they see the right one, but they're not looking at the right one. So when they respond, 'We have the traffic in sight,' air traffic control passes the responsibility to the pilot to maintain visual separation. I'm sure everybody knows about the tragic accident that happened in Washington, D.C., with a helicopter and an airliner. The controller that he was talking to pointed out his traffic, and he said he has the traffic in sight, and then he ran into the airliner. So clearly, he didn't have it in sight. There are some real limitations that go along with visual separation."

Anderson continued that his own company was involved in a midair collision in San Diego about four years ago. "One of our Black Hawk helicopters had a collision with a Navy Seahawk helicopter. No injuries, no fatalities, thank goodness. But it was an accident that happened in the traffic pattern at a tower-controlled airport, and we teach our students…that most midair collisions occur at tower-controlled airports. Just because there's a control tower doesn't mean you're safe.

"Even when you think you're safe under air traffic control, having a device like the C&CAS system is going to be a whole game-changer. We perform firefighting services on contract with the Forest Service and also with Cal Fire. And again, the incidence of close calls in the fire traffic area is just surprising," he added.

Recently, a couple of firefighting helicopters collided in Greece, Anderson further noted. "The C&CAS system would have prevented that accident. This is a device we need; the technology is there, and we need to take advantage of it."

C&CAS is still in development, and Cohen believes that the Ciconia product could be as small as a pack of cigarettes, weighing 200 to 300 grams. For the drone application, C&CAS would be a software solution or, if necessary, a small 20- to 25-gram processor.

As for cost, Ciconia plans to offer C&CAS for a monthly fee, so there is no big investment for the system.



Gama Opens London FBO at RAF Northolt Base

Gama Aviation is now providing handling and other FBO services at the RAF Northolt (EGWU) air base in London. The company started operations there on September 1, adding to its FBO network that also includes facilities at Glasgow, Scotland; Jersey in the Channel Islands; and Sharjah, UAE.

According to Gama, it will invest in improvements to the existing FBO, previously operated by Universal Aviation and known as the Northolt Jet Centre. These will include refurbishment of passenger lounges and dedicated crew areas.

The airfield, which is 6 miles north of London Heathrow Airport (EGLL) and 15 miles west of the center of the UK capital, has a 5,552-foot runway with an instrument approach.

New FBO Operator Ocean Aviation Acquires First Facility

Ocean Aviation, a new name in the FBO arena, has made a splash in the South Florida area with the acquisition of National Jets, one of four service providers at Fort Lauderdale-Hollywood International Airport (KFLL).

In operation for nearly 80 years, National Jets has an 8,000-sq-ft terminal and 22,000 sq ft of hangar space. In 2024, the company announced a $70 million expansion project that would add 150,000 sq ft of hangars and a new terminal. The FBO's new ownership plans to start that development immediately.

Founded last year and backed by Kennedy Lewis Investment Management, Ocean Aviation was also awarded a 40-year lease to build a new FBO at Miami Executive Airport (KTMB). This planned $67 million complex will include a terminal, fuel farm, and up to 400,000 sq ft of community and private hangars, and it will provide a new home for the Wings Over Miami Air Museum. Construction began in September.

Signature Expands at KVNY with Castle & Cooke FBO Buy

Signature Aviation has expanded its footprint at California business aviation hub Van Nuys Airport (KVNY) with the purchase of the Castle & Cooke Aviation FBO.

Signature operated two FBOs at KVNY before the transaction, which included rebranding the former Castle & Cooke facility as Signature VNY North. The facility has a 1,500-sq-ft passenger lounge, 21,000 sq ft of offices, and 4,236 sq ft of shop space. It also provides 117,360 sq ft of hangar space, which brings Signature to 483,000 sq ft of aircraft shelter at the Los Angeles-area gateway.

The transaction did not include Castle & Cooke's remaining FBO at Daniel K. Inouye International Airport (PHNL) in Honolulu.

Aircraft Specialists Buys Out FBO Rival at KLZU

Aircraft Specialists, an FBO and maintenance services provider, has become the sole FBO at Georgia's Gwinnett County Airport-Briscoe Field (KLZU) after acquiring the Sheltair FBO on the field.

Sheltair won an RFP to take over the former Gwinnett Aero facility in 2023, and as part of the 40-year lease deal it had agreed to develop a new terminal/restaurant/office building. As it assumes the remainder of Sheltair's lease at KLZU, Aircraft Specialists will build a 9,300-sq-ft FBO terminal, with groundbreaking slated for early next year. Situated on the north side of the field, it will include passenger and pilot lounges, snooze room, showers, conference room, management offices, catering kitchen, and employee training rooms.

That new facility will nearly triple the size of the existing Jet Center terminal, which will be retained as a satellite while the existing Sheltair terminal will be rented out to tenants.



ExecuJet Middle East Focus Is on Quality Over Quantity

When it formally opened at the end of 2024, ExecuJet's FBO at Dubai's Al Maktoum International (OMDW) was intended by the global chain to make a "be-all and end-all" statement, unrivaled by regional—and possibly even global—standards for size and luxury.

At a total of 15,000 sq m (161,500 sq ft), including the 7,000-sq-m (75,000-sq-ft) hangar, the three-story complex dwarfs those of its regional rivals.

It offers VIP, diplomatic, and corporate flight coordination, passenger lounges, a crew lounge with an upstairs rest area, and premium shower facilities, plus a bar and restaurant.

The ExecuSpa offers massage treatments, sauna, and wellness facilities, while a cocktail and cigar lounge complements the signature Majlis Lounge and the Al Samaa Suite.



ExecuJet's FBO at OMDW boasts flight coordination, lounges, shower facilities, a bar and restaurant, and even a spa with massage treatments, sauna, and wellness facilities.

"We've got different types of profiles of flights from head-of-state and VIP to larger groups, football teams, to very small—two or three people on a flight," Dumani Ndebele, ExecuJet's regional FBO director, Dubai, told **AIN**. "A facility has to be able to accommodate all of those profiles. During COP28, we had four heads of state traveling at the same time. There is no other FBO [in Dubai] able to accommodate that with each of them feeling that they have private space."

On the day **AIN** visited, a Gulfstream G550, two G650s, a G700, a Bombardier Global 6000, a Challenger 605, and a Dassault Falcon 8X were parked in the hangar, evoking a complex game of Tetris.

Over the past several years, the Jetex FBO has seen the lion's share of movements at OMDW, claiming almost a 75% share in 2022, but ExecuJet claims its new facility offers gravitas and opulence that its rivals on the field cannot match.

"While there are other very good FBOs on the airport, we offer something unique, and I don't see in that sense that we do have a competitor," Ndebele said.

Ndebele believes the migration from Dubai International (OMDB), where ExecuJet has had operations since 2007, has quickened in the past two years, from a 60-40 split to approaching 80-20 today, reflecting slot competition at the old location.

After operating a temporary facility at OMDW from 2016, ExecuJet had a soft opening of its FBO in late 2023. Ndebele said initial market share of around 12% to 15% "wasn't great."

"At OMDW, we've had an over-150% increase in market share since November 2023," he said. "Since we built this facility, we have had significant growth. We've seen an…increase to now just over 35% [market share] for OMDW. If you look at the picture covering both airports, we have 40% of the total movements into Dubai."

ExecuJet serves UAE owners, but many clients either based at OMDW or within the region have also chosen it to manage aircraft on their behalf. "We've got aircraft owners in Africa, but their fleet is managed from here," he said.

Ndebele is hard-pressed to detect challenges to Dubai's status as the natural regional business aviation hub. "I don't see it right now, given the scale of the ecosystem within Al Maktoum International, in particular. I don't see anything in the next 10 years that will come close to what exists in Dubai."

He is unfazed by the threat of ongoing regional conflict. "As of now, I feel everything is moving in the direction of growth, and I don't see any type of hindrances to that continuing."

The OMDW evolution has been spurred by Dassault-owned ExecuJet MRO Services Middle East's co-location at the site, but the decision to build the permanent terminal was already part of ExecuJet's long-term OMDW strategy.

"There were a lot of ideas, a lot of revisions, but I think centrally it was more about understanding our clients and the requirements that we've faced over the last couple of years," he said. "The idea of this facility was to be able to frankly say yes to whatever clients need." P.S.S.

COMPILED BY CURT EPSTEIN



BARRY AMBROSE

Stevens Aerospace Joins Epic Aircraft Service Network

Epic Aircraft has appointed Stevens Aerospace and Defense Systems as an authorized service center for the Epic E1000 turboprop single. Stevens Aerospace's maintenance facility at Denver Centennial Airport (KAPA) will support Epic owners with inspections, structural and component repairs, and factory-approved warranty services.

The new authorization takes advantage of Stevens Aerospace's long experience with turboprop and jet maintenance, as well as its service center designations for the E1000's Pratt & Whitney Canada engine, Hartzell propeller, and Garmin avionics. The company augments the MRO services at KAPA with a large mobile service network and paint and interior refurbishment at its Greenville, South Carolina facility.

FAA Approves STC for CitationJet Garmin Retrofit

CitationJet owners can now upgrade their flight decks under an FAA supplemental type certificate (STC) issued to Garmin. The STC applies to CitationJet serial numbers 525-0001 through -0359 and is similar to Garmin's CJ1 and CJ2 upgrades.

Featuring two G600 TXi touchscreen displays, the upgrade includes Garmin's synthetic vision technology (SVT) and HSI map on the primary flight display (PFD). One GI 275 standby flight instrument is included on the pilot's side and a second is optional. Garmin added pilot-side PFD and GI 275 availability when the aircraft's emergency electrical bus is being used.

Original engine instruments are replaced with Garmin's TXi engine indication system (EIS), which includes EIS-generated or user-selected N1 targets for takeoff, go-around, and max continuous thrust settings.

CitationJet-specific situational awareness features include stabilized approach monitoring and aural V-speed alerting during takeoff.

With this upgrade, pilots can use FAA Data Comm, enabling pre-departure clearances—as well as en-route clearances, frequency changes, and other instructions—via text-based messaging.

West Star Aviation Introduces Online AOG Tech Map

As demand for aircraft on ground (AOG) services rises, MRO provider West Star Aviation has introduced a live AOG Technician Map. The map gives aircraft operators access to the company's AOG support network.

West Star, which provides round-the-clock mobile maintenance support for operators requiring immediate service away from their home base, said the interactive map includes each technician's call sign, skills, and assigned region.

Supporting the AOG network is a dedicated control center providing around-the-clock coordination and dispatch support.

According to the Illinois-based company, the launch of the technician map reflects its continued investment in its AOG capabilities, including expanded technician staff and increased resources to support grounded aircraft.

Alabama Airport Stands Up Bizav Maintenance Shop

The Pryor Field Airport Authority, which operates the lone FBO at Pryor Field Regional Airport (KDCU) in Decatur, Alabama, has added a maintenance operation for general and business aviation aircraft. The new division has employees with more than 75 years of combined aviation maintenance experience providing a range of services, including scheduled and unscheduled maintenance; inspections; avionics installations, upgrades, service, and repair; and AOG and emergency maintenance support for business jets and turboprops, as well as piston airplanes.



Aero Star Aviation Builds Legacy on Embraer Bizjets

With a little bit of cash on hand and a credit card with a 0% interest rate, Aero Star Aviation founder and president Christopher Grinnell embarked on building a maintenance, repair, and overhaul shop specializing in Embraer business jets in a rented hangar at Dallas Executive Airport (KRBD).

Just a little more than a decade later, Grinnell's business has moved to a rapidly expanding footprint at Dallas Love Field (KDAL), with four hangars formerly occupied by companies including Gulfstream Aerospace and Elliott Aviation and that span more than 100,000 sq ft. Aero Star employs nearly 100 people, runs four shifts around the clock, and has a backlog of work from NetJets and Wheels Up, among others.



Aero Star Aviation has built its MRO business with a specialty in Embraer business jets.

This was a business largely built by word of mouth and through relationships. "What I love about aviation is how it is really camaraderie and relationship driven. There are not many industries that are like aviation," he said. "And the biggest thing is service." His vision is to serve as a partner in a customer's flight operations.

Grinnell formed Aero Star Aviation in 2014 but really didn't begin operations until 2015. "I started a company because I had in mind that I wanted to do it," he told **AIN**. "And then I didn't really get the nerve until a year later to actually quit my job. I was very nervous about doing it, and then I just woke up one day, and I said, 'I'm 27. If I'm going to do it, now's the time.'"

He quickly learned the expense of such a business; Grinnell had about $23,000 saved up, opened a credit card with an $18,000 line, and immediately was overextended on the first client.

"We were doing a big inspection, and I didn't want the customer to feel like he was taking a risk on us. So, I never asked for a deposit. I financed it all myself. And then, I even gave him terms," he said, doing all this because he understood, "It's really risky for people to take a chance."

Grinnell had rented a hangar for a month, doing the majority of the work himself with a few contractors. After that first inspection, he rented an office at Love Field in a Signature terminal and the risk paid off.

Because he had Embraer experience, he connected with JetSuite, which was operating Phenoms. And Aero Star became an approved vendor for NetJets as well as a support provider for Airshare.

Grinnell brought a strong background in the Phenom lines. While formerly with West Star Aviation, he was assigned to the first Phenom that was delivered, a 100 purchased by Jim and Betsy Frost. As such, he learned support of the still-nascent line while Embraer also gained experience on the very light jet. It provided Grinnell insight that few had.

Aero Star moved into its current facility, formerly a Gulfstream Aerospace and then RBR location, in 2023, then took over a hangar vacated by Elliott Aviation. This provided hangar space adjacent to Runway 13L/31R at KDAL. Grinnell ultimately was able to take over four hangars and some 60,000 sq ft of office space.

Grinnell stressed the importance of making Aero Star an attractive place to work, especially given the competitive workforce environment in the Dallas/Fort Worth area. Many of the new hires come in with military experience, and then Aero Star helps sponsor them to obtain an A&P certificate.

To capture institutional knowledge that Aero Star has been building, Grinnell has introduced an AI tool, Ava (Aero Star virtual assistant), which combines data in its Corridor MRO management software system. Technicians have the ability to access that information as they work on their projects.

The FAA Part 145 and Mexican AFAC-approved repair station has expanded its portfolio, is beginning to develop its component repair specs, is building on parts manufacturer approvals and is adding Citations to the maintenance capabilities. In addition, Aero Star offers prebuy inspections.

Despite this growth, Grinnell still likes to take time to get involved in the maintenance. "I still try to work on airplanes when I can," he said. "I enjoy it because it is something I know." 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

One Killed, Two Hurt in Airport Collision

Bell 407 and Cessna 150H, Aug. 19, 2026, Carlisle, Pennsylvania

The solo pilot of the Cessna was killed, and both helicopter pilots suffered serious injuries, when the Cessna struck the helicopter from behind during a landing attempt at Carlisle Airport (N94). The helicopter, operated by the Pennsylvania State Police, had arrived from Harrisburg's Capital City Airport (KCXY) on a training flight and conducted a straight-in approach to Runway 28, then decelerated to a hover taxi. The airplane crossed over the field to the northeast, then turned to enter a left crosswind for the runway. A witness monitoring the airport's common traffic advisory frequency heard one of the helicopter pilots advise the Cessna pilot to extend his downwind leg, which he acknowledged.

Security footage showed that the helicopter was still over the runway when the Cessna crossed the threshold but moved off it and into a hover about 50 feet to the north. The airplane flew down the runway with flaps extended but did not touch down, then pitched up sharply. Its right wing dropped, and it veered right, leveling the wings just before flying into the helicopter's tail rotor and then its main rotor. The Cessna was described as "shredded." The helicopter fuselage came to rest on its left side after the tailboom and main rotor separated.

Alaska Approach Accident Claims Eight

Cessna 441, Aug. 20, 2026, Cape Newenham Airport, Alaska

Both pilots and all six passengers were killed when the twin-engine Conquest II crashed half a mile short of the runway on its second instrument approach to Cape Newenham LRRS Airport (PAEH). During the charter flight from Ted Stevens Anchorage International Airport (PANC), weather at PAEH deteriorated from 10 miles visibility under 800-foot ceilings to ¼-mile visibility under a 300-foot overcast. Visibility improved to 3 miles under a broken ceiling as the crew held at the initial approach fix for the RNAV approach to Runway 15. The pilots requested and received clearance for the approach, but after descending to 425 feet on the final segment, reported going missed and requested vectors for another attempt.

The last ADS-B data point showed the airplane on the final approach course at 600 feet. The wreckage was found at an elevation of 610 feet in rising terrain half a mile north of the Runway 15 threshold. The approach procedure gives a minimum descent altitude of 1,320 feet, specifies minimum visibility of 3 miles, and notes that: "Successful go-around improbable if initiated past the MAP," located about 2.2 miles north of the threshold. A technician stationed at PAEH said that by the time the aircraft began its second approach, he could no longer see the runway from the weather building.

Interim Report

Main Rotor Blades Strike Cliff Face

Airbus AS350B3, May 17, 2026, Mt. Aspiring National Park, South Island, New Zealand

Evidence, including witness marks on rocks and tussock grass, showed the helicopter's main rotor blades struck the cliff face as it hovered, destroying the rotor. The pilot and a hunting guide, the aircraft's only other occupant, were killed when the craft fell some 30 meters (100 feet) down the mountainside, coming to rest at an elevation of about 5,700 feet.

The accident occurred during an aerial-assisted trophy hunting trip in which two helicopters tracked game animals, and a hunter and guide would then disembark to shoot. After a chamois shot by one of the hunters fell into a ravine on the north face of Mercury Peak, the accident pilot moved the hunter and passengers to a flat area nearby and returned to the ravine to recover the carcass. The pilot brought the helicopter to a hover next to a rocky ledge, and the rotor blades hit the rocks as the guide tried to climb out through the left front cabin door.

Final Reports

Cause of In-flight Fire Remains Undetermined

Cessna Citation X, Aug. 5, 2024, Jamestown, New York

Investigators were unable to pinpoint the origin of an apparent electrical fire that began shortly after takeoff and caused a cascade of crew alerts and warnings, intermittent losses of radio communications, and increasing difficulty controlling the aircraft during an attempted emergency landing. Fire subsequently consumed most of the fuselage and the inboard portions of both wings after the airplane touched down short of Runway 25 at Jamestown Airport (KJHW), causing serious injuries to the pilot and minor injuries to the copilot. No passengers were on board for the Part 91 business flight, which was intended to bring a mechanic and parts for another company aircraft from Florida's Fort Lauderdale Executive Airport (KFXE) to their base at Chautauqua County Dunkirk Airport (KDKK) in Dunkirk, New York.

Within two minutes of takeoff, the copilot

reported a smell of smoke that initially dissipated but then became unmistakable. Crew alerting system (CAS) messages began immediately afterward, and the pilots diverted to KJHW. The flight instruments showed "red Xs" as the CAS displayed increasing numbers of warnings regarding the electrical system; trim control was compromised as the jet descended through 10,000 feet.

The copilot recalled hearing the pitch trim "clacker" as the jet trimmed nose-down and accelerated to "well over 250 knots." After a 270-degree turn to align with the runway, the pilot could not fully extend the flaps and had difficulty slowing the airplane, which "dropped" short of the runway and hit the ground hard. The last ADS-B report showed a ground speed of 150 knots at an altitude of 1,650 feet. Neither witnesses nor surveillance cameras saw any smoke from the airplane.

The airplane was not equipped with a flight data recorder. Investigators found "heavy thermal damage" in the engine control system wiring harnesses, but the lack of "engine controllability issues" suggested this was unlikely to be the source of the fire. Likewise, there was "heavy thermal damage" in the area of the number two battery, but evidence indicated arcing had begun outside the battery case. Investigators concluded that "the fire likely originated in the lower portion of the airplane, aft of the rear pressure bulkhead" but were unable to determine the exact location.

King Air Damaged in 'Misaligned Takeoff'

Beech B200C, Feb. 24, 2026, Brisbane West Wellcamp Airport, Queensland, Australia

After making a 180-degree turn at the end of Runway 12 in the darkness, the pilot of the Royal Flying Doctor Service King Air mistakenly aligned the airplane with the runway edge lights instead of the centerline before beginning the takeoff roll. The nose gear struck a turn pad edge light, and fragments damaged both propellers and dented the fuselage. The pilot aborted the takeoff and returned to the ramp after hearing a bang and recognizing the misalignment. There were no injuries.

The accident occurred three minutes after midnight on a night described as "dark with little moonlight [and] low cloud, but otherwise good visibility."

One doctor and one nurse were on board for the planned flight to Bundaberg. The 9,794-hour commercial pilot reported having mistaken the runway edge lights for centerline lights, a feature the Wellcamp Airport does not have. The Queensland Section of the Royal Flying Doctor Service revised its operations manual in response.

Snow-coated, Overweight Citation V Rejects Takeoff Too Late

Cessna Citation V, Dec. 27, 2024, Pagosa Springs, Colorado

Inadequate preflight planning, a cursory inspection, and an attempt to take off above the Citation V's mtow with snow-contaminated wings kept the airplane from rotating at its calculated speed, the NTSB determined in a final report on the Dec. 27, 2024 runway overrun at Stevens Field Airport (KPSO) in Pagosa Springs, Colorado. By the time the pilot rejected the takeoff, the airplane had already passed decision speed.

The light jet ran off the end of Runway 1 and damaged both wings in the grass beyond the pavement. The two pilots and eight passengers were not injured.

The pilot held a type rating that required a qualified second-in-command, but the copilot did not hold an SIC rating and, by his own account, did not meet the requirements to serve in that role. The pilot told investigators she knew he lacked type experience but assumed he was properly trained because of his job with a flight-simulator training provider.

The lease agreement for the airplane required the lessee, a passenger aboard the flight, to hire "professionally trained and qualified" pilots. But according to the lessee, the management company that operated the airplane, Metroplex Flight Services, arranged the pilots itself and asked only for a passenger count—never passenger or baggage weights.

The pilot calculated weight using ForeFlight's standard average passenger weights for the five men, four women, and one child aboard, plus an estimated 130 pounds of baggage in the rear compartment and 110 pounds in the nose—arriving at a calculated payload of 1,285 pounds. Bag weights were determined by "heaviness," not scales, according to the NTSB.

The pilot told investigators the airplane's takeoff weight was about 15,900 pounds, equal to mtow. After the accident, investigators calculated the airplane's actual takeoff weight at about 16,502 pounds, with the center of gravity likely outside the operating envelope.

The pilot said her preflight inspection found only liquid water on the wings, with no ice or other contamination. But airport surveillance video showed snow already accumulating as the pilots walked out to the airplane and continuing to fall as passengers boarded. One passenger said FBO personnel, working with a handheld brush because the airport lacked deicing capability, cleared the wings three times over about 11 minutes.

The copilot said the pilot performed a tactile check of the wings after boarding was complete, but video showed no such check on the right wing—the only one visible on camera—after the final snow removal.

Contamination remained visible on the wings as the airplane taxied, the ramp pavement was wet, and the snowfall rate appeared to increase once the airplane left the ramp. About 20 minutes elapsed between the last snow removal and the start of the takeoff roll.

A post-accident examination found no evidence of pre-accident flight-control or engine anomalies that would have precluded normal operation.

—Amy Wilder contributed to this report

Compliance Countdown

BY GORDON GILBERT

JUST AROUND THE CORNER

Nov. 23, 2026

U.S.: Oxygen Mask Requirements

The FAA proposes to raise the altitude from the current FL350 to FL410 at which at least one pilot is required to don an oxygen mask for commuter and on-demand charter operations, and revise the pilot oxygen mask requirements applicable to general aviation operations in pressurized aircraft. "FAA found that at higher altitudes, pressurization events in modern business aircraft are rare," said the agency. The current FL250 for single pilots to wear an oxygen mask in Part 135 operations will be changed to FL350, if a quick-donning mask is available. Part 91 pilots would not be required to wear an oxygen mask at any altitude, as long as a quick-donning mask is available. Comments on the proposal are due by Nov. 23, 2026.

Nov. 18, 2026

UK: Obstacle Lighting and Marking

The UK CAA is asking for feedback on proposed amendments to the process by which crane and tall equipment users notify aviation authorities under obstacle lighting and marking requirements. The proposed changes seek to introduce a more effective, proportionate, and practical framework for safeguarding airport operations and managing obstacle-related risks. Comments are due by Nov. 18, 2026.

Dec. 2, 2026

Australia: SMS Transition

By Dec. 2, 2026, all Australia-registered Part 119 (air transport) and some Part 138 (aerial work) operators must have in place a safety management system; a safety manager accepted by the Civil Aviation Safety Authority; a human factors and nontechnical skills training program for Part 119 operators; and a flight data analysis program for certain operators. Existing operators had the option to defer implementation under transitional exemptions, which end in December 2026.

Dec. 7, 2026

Europe: EASA Part CS-25 Updates

An EASA notice of proposed amendments (NPA) makes updates to the certification specifications and acceptable means of compliance for large airplanes (CS-25). The proposed amendments reflect the state of the art and best practices of the industry, and address several safety recommendations. In all, 20 specific regulations are addressed. "The proposed regulatory material is intended to deliver a safety benefit, has no social or environmental impacts, and delivers some economic benefits by streamlining the certification process," said EASA. "It will also increase the harmonization with FAA regulations in certain areas." Comments on the NPA are due by Dec. 7, 2026.

Jan. 1, 2027

Singapore: SAF Fee

The Civil Aviation Authority of Singapore (CAAS) will introduce a sustainable aviation fuel (SAF) levy for all private, business, and commercial aircraft departing the country starting Jan. 1, 2027. "This isn't a fuel mandate in the traditional sense," according to international flight services organization OpsGroup. "Operators are not required to physically uplift SAF. Instead, the government will buy SAF centrally and recover the cost through the levy applied to every flight." The fee varies based on the distance traveled into four geographical bands. For flights with multiple stops, the cost is based on the immediate next destination after departing Singapore. The airlines will add the levy to passenger ticket prices. But, in addition to distance, the fee for GA flights will also be based on the aircraft size as measured by wingspan. Under this formula, levies would range from as little as S$40 for a small turbine airplane flying a relatively short distance to S$6,500 for an ultra-large business jet on a long flight.

Jan. 1, 2027

U.S.: New York Bill To Limit Use of ADS-B

New York lawmakers are considering a bill that would prohibit government agencies, private companies, and corporations from using ADS-B data to calculate, generate, or collect fees from aircraft owners and operators. Senate Bill S10490 would apply only to Part 91 aircraft weighing 12,500 pounds or less. According to the bill text, no covered entity could use information broadcast or collected by ADS-B "as a means for calculating, generating, and collecting fees from aircraft owners or operators who operate aircraft within the geographic boundaries of the state." If passed, the measure would take effect Jan. 1, 2027. Other states are considering or have introduced similar bills, and federal legislation was introduced by Congress in 2025.

Feb. 28, 2027

U.S.: Mobile Departure Clearances

An ongoing operational evaluation of a mobile clearance tool for general and

business aviation is scheduled to end early in 2027, with a final product to start deployment in February at some 300 airports across the country. This digital tool allows pilots to request and receive IFR departure clearances using ForeFlight or Garmin Pilot apps. Some facilities receiving mobile clearance will include FAA Tracons. Mobile clearance will also work at non-tower airports, although IFR releases won't initially be available without a tower to manage that process.

April 1, 2027

UK: Air Passenger Duty Tax

The UK government will expand its higher rate of the commercial air passenger duty tax to business jets with mtow of 5.7 tonnes and heavier (12,566 pounds or heavier) starting April 1, 2027. Currently, only a small number of private jets pay the higher rate because most trips do not meet the criteria for the higher rate, and as such, they pay the same rates as airline passengers. "Extending the scope of the higher rate ensures the tax is applied consistently and that those who can afford to fly privately make a fair contribution alongside commercial air passengers," said the government's budget policy document.

May 28, 2027

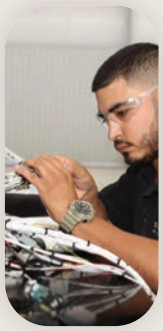
U.S.: Part 135 SMS

May 28, 2027, is the deadline for on-demand, passenger-carrying Part 135 operators, certain Part 91 air tour operators, and some type certificate and production certificate holders under Part 21 to provide the FAA a declaration of compliance for their safety management systems (SMS). The final rule was published on April 26, 2024, and the declaration of compliance is the end of the SMS development process and essentially the beginning of the implementation process. Less restrictive provisions apply to single-pilot organizations.

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









Duncan Aviation is an authorized dealer for most major flight deck and cabin avionics equipment. Our avionics and engineering expertise, combined with our strong relationships with manufacturers, have established Duncan Aviation as the premier provider of avionics systems for business aircraft.

DUNCAN AVIATION

www.DuncanAviation.aero/avionics

People in Aviation

BY JESSICA REED



SHAWN BLACK

Eaton named **Shawn Black** president of its global aerospace group. Black most recently served as president of defense at GKN Aerospace and previously was president and CEO of Cobham Advanced Electronic Solutions. His more than two decades in aerospace and defense also include nearly 16 years at DRS Technologies.

Wheels Up chief sales officer **Mark Briffa** stepped down at the end of August; chief digital officer **David Godsman** is now leading global sales on an interim basis. Briffa's more than 30 years in aviation include four-plus years at Wheels Up and 26 at Air Partner. Godsman, who retains his chief digital officer duties, spent the past year helping design and implement the company's new sales and service model. Wheels Up also hired **Mike Bowman** as executive v-p of global corporate sales. Bowman comes to the company from Delta Air Lines, where he spent 18 years, most recently leading the airline's corporate sales partnership with Wheels Up.



MICHAEL GRAHAM

NTSB vice chairman **Michael Graham** retired on October 2 after serving with the Board since 2020. The announcement of Graham's retirement came less than four months after the U.S. Senate confirmed him for another term through the end of 2030. It also followed, by less than five months, the announcement that he was appointed to fill the vice chairman's role. Revered within the industry, Graham came to the Board with a substantial military, business aviation, and safety background. He joined the agency after serving as director of flight operations safety, security, and standardization at Textron Aviation.

West Star Aviation hired **Jason Taylor** as chief information officer and brought on **Joey Flaum** as project manager at its facility in East Alton, Illinois. **Nicholas Watkins** joined the company as master sheet metal technician in Chattanooga, Tennessee, and **Carmen Breckenridge** was named master aircraft maintenance technician in East Alton. **Jason Jenkins** was promoted to the role of operations support manager in Millville, New Jersey, and **Craig Gidick** became service hub strategy and planning manager at the Dulles service hub. The company also promoted **Josh Ernst** and **Darin Walker** to shift manager at its West Palm Beach service hub, along with **Larry Amos** to regional safety manager in Statesville, North Carolina. **Tom Braun** was promoted to master sheet metal technician in East Alton and **Jordan Schissell** to master aircraft maintenance technician in Grand Junction, Colorado. West Star subsidiary *DAS Aviation* promoted **Matthew Reider** to v-p of finance and **Zoey Semidey** to accounting manager. **Wayne Childress** was also elevated to continuous improvement manager. In a separate announcement, West Star hired **Bryan Dunn** as director of Gulfstream business development. Dunn began his career at Gulfstream Aerospace and has nearly 30 years of experience in business aviation; he has held positions with multiple companies, including Leading Edge Aviation Solutions, StandardAero, Hawker Beechcraft Services, and Gulfstream Westfield.



BRYAN DUNN

Vista promoted **Daniele Deiana** to president for the UK and Ireland; he will guide commercial strategy and market development across the region, including corporate hubs outside London such as Manchester, Cambridge, and Liverpool. Deiana began his aviation career nearly 20 years ago in finance, and he joined Vista in 2020 as executive v-p for the UK and Ireland.

Cutter Aviation named **Will D. Cutter** v-p of PHX FBO operations, transferring him from Georgetown Executive Airport in Texas to the company's headquarters in Phoenix. Cutter joined the company in 2010 and most recently served as general manager of its Georgetown FBO; before that, he worked in marketing and sales at Piper Aircraft.



WILL D. CUTTER

Yingling Aviation named **Kerry Heiss** v-p of sales and marketing, reporting to CEO **Gregg Fahrenbruch**, who took that post in April. Heiss joins Yingling after more than nine years as

director of MRO sales and marketing at Western Aircraft in Boise, Idaho, and his 24 years in aviation also include early work at GE Aircraft Engines and roles at StandardAero and BendixKing Avionics.


MARC MELOCHE

Marc Meloche was named chief operating officer of *Jetcraft Commercial*, the commercial division of the global aircraft trading firm Jetcraft. Meloche, whose aviation experience spans more than three decades, moved up in the company from his previous role as managing director of aviation finance. **Rory McQueen** was also announced as Jetcraft Commercial's v-p of aircraft finance. McQueen's experience includes senior leadership roles at VistaJet, Bombardier, and Chorus Aviation.

Robert Medina was named v-p and general manager of *Western Aircraft*, succeeding **Austin Shontz**, who plans to retire once the leadership transition is complete. Medina has 39 years of industry experience and most recently served as senior director and general manager of Gulfstream Aerospace's Mesa Service Center. Shontz joined Western Aircraft as v-p and general manager in September 2015.

Jack Pelton, chairman and CEO of the Experimental Aircraft Association (EAA), has joined the board of directors for the *Corporate Angel Network* (CAN). Pelton has served as EAA's leader since 2012; before that, he was chairman, president, and CEO of Cessna Aircraft.


SAM JACKSON

King Aerospace named **Sam Jackson** chief operations officer. Jackson has more than 20 years of experience in the MRO sector, most recently as general manager and v-p of operations at Airborne Maintenance & Engineering Services, and he previously served as v-p of maintenance at Flightstar Aircraft Services.

Gama Aviation has appointed **Ceri Schunmann** to the new role of chief of staff. Schunmann was previously the company's director of rotary, and his prior experience includes service in the Royal Navy followed by a career in commercial rotary aviation. Gama Aviation has appointed **Colm Langton** as FBO manager at its Glasgow operation, where he will also oversee safety and compliance across the company's wider FBO network. Langton brings more than 28 years of aviation experience spanning operational leadership, safety, and team performance, most recently leading training and leadership development across a major aviation network.

Zachariah Service was named technical sales manager for avionics at *Pro Star Aviation*. Service began his career as an avionics technician at Bombardier in Hartford, Connecticut, while earning his A&P certificate, and joined Satcom Direct in 2021, advancing from technical support to product support engineer and continuing in that work after Gogo acquired the company in 2024.

FINAL FLIGHT

Nancy Kassebaum, Architect of GA Liability Reform, Dies

Nancy Landon Kassebaum, the former Republican U.S. senator from Kansas who shepherded through one of the most monumental pieces of legislation for the general aviation industry, died on August 21 in Manhattan, Kansas. She was 94.

Born in Topeka, Kassebaum served in the U.S. Senate from 1978 to 1997. Many in Wichita remember her mostly for her advocacy for the General Aviation Revitalization Act of 1994 (GARA), which established an 18-year statute of repose that eliminated the long liability tail of general aviation aircraft.

Known as a consummate dealmaker who could work across the aisle, she was able to push the measure through the Senate with the agreement of some of the most ardent opponents to product liability reform.

NBAA president and CEO Ed Bolen, who served as the legislative director for Kassebaum at the time, had noted the respect she garnered on Capitol Hill even as she navigated controversial issues. "She was tough. She was thoughtful. She was prepared, and people liked her. And she was tenacious," Bolen told **AIN** when recalling her work on GARA.

Following her passing, Bolen, who considered Kassebaum a friend and mentor, honored her contributions. "GARA would not have survived were it not for Sen. Kassebaum's persistence and commitment to working in a bipartisan fashion to accomplish important things," he said.

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Milligan said the approach has changed from "tasks that we do each day to be safer to a culture that we create for our organization. It starts at the top from the standpoint of the culture you try to create and everything that you do." This culture aims to provide transparency and openness toward disclosure so an organization can be more proactive.

"We all have an opportunity to leave a legacy," he said.

While Safety Standdown is held almost every year in Wichita, Bombardier did experiment with another location in Fort Worth, Texas, to provide more space. But it returned to Wichita. "With Wichita being the aviation capital of the U.S., it's our home for defense, our service center, and our flight test organization; it really is the nucleus for us," he said. That doesn't mean at some point in the future the company won't explore another location. But for the time being, it will be in Wichita.

Safety Standdown has also resulted in a spinoff of sorts: Bombardier's Flight Attendant Safety Summit. Held annually in Montreal in August, that event has spread to summits in Europe and Asia. Milligan noted that Bombardier continues to discuss international Safety Standdowns as well—especially given attendees who tune in around the world—but sees it initially being folded into its various maintenance and operator meetings. But nothing on that front is concrete just yet.

He noted that many people have played an important role in how the event has evolved from the first group of pilots to the many supporters over the years. "We want to really pay tribute to those that have supported the evolution and the legacy of it."

At the same time, Bombardier discussed how the event can continue to evolve, he said, "and continue to fuel the evolution that we've seen over the last 30 years."

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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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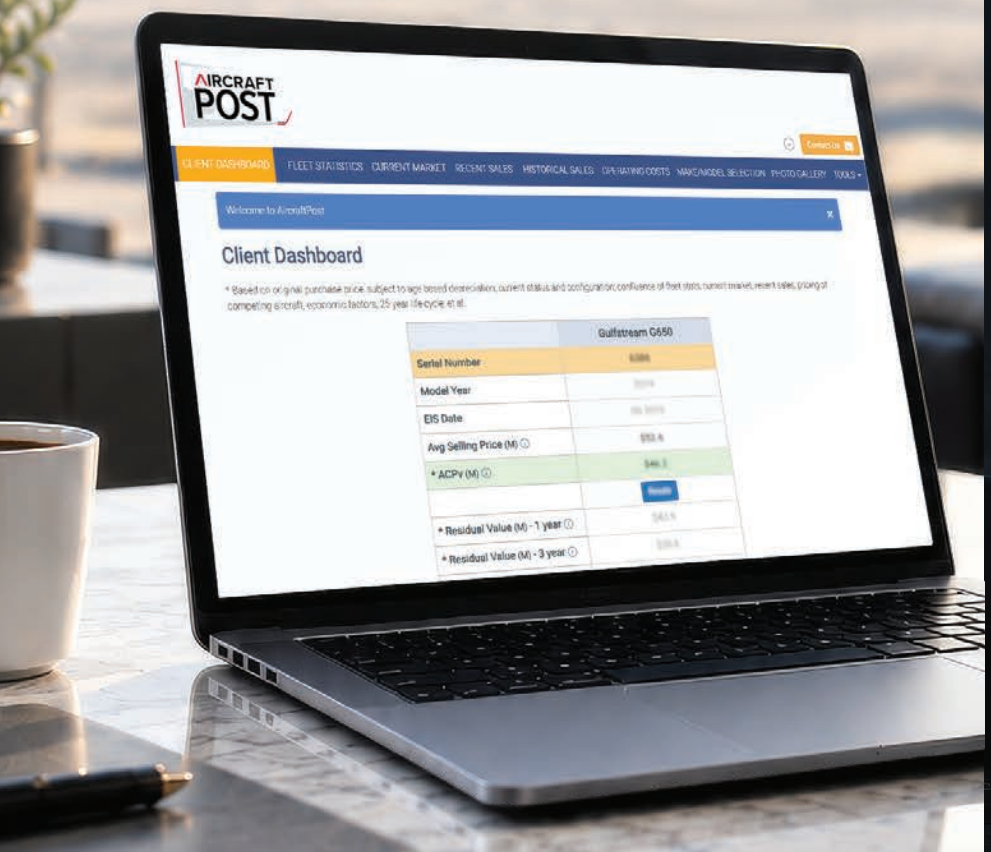
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