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Daher acquires Florida aerostructures plant

BY CHAD TRAUTVETTER

News Briefs

GULFSTREAM G800 MAKES FIRST FLIGHT

The first Gulfstream G800—registered as N800G—completed its inaugural flight on June 28, launching the flight-test program for the 8,000-nm twinjet. N800G made a two-hour first flight from Gulfstream Aerospace's headquarters at Georgia's Savannah/Hilton Head International Airport using a blend of sustainable aviation fuel. Launched in October, the G800 is powered by a pair of Rolls-Royce Pearl 700 engines and features the company's Symmetry Flight Deck, dual head-up displays with combined vision system, and fly-by-wire with active control sticks. Gulfstream expects that the G800 will enter service in the third quarter of next year.

FLIGHTSAFETY, HONDA EXTEND TRAINING AGREEMENT

Honda Aircraft and FlightSafety International have extended their 15-year training agreement by another 25 years to 2047. Along with the extension, the companies announced that a new HondaJet level-D full-flight simulator manufactured by FlightSafety has been added to its Greensboro, North Carolina learning center, bringing the number of HondaJet simulators there to two, with another at FlightSafety's Farnborough, UK location. With the additional simulator, FlightSafety will be able to double its training capacity for Honda Aircraft.

NYC AREA RECEIVES FIRST PIPELINE SAF DELIVERY

In late June, the New York City area received its first shipment of sustainable aviation fuel (SAF) via pipeline. The Neste fuel, a blend of SAF and jet-A, was loaded into the Colonial Pipeline and traveled nearly 1,500 miles through 11 states before entering the Buckeye system for delivery to New York LaGuardia Airport. This delivery demonstrates the ability to transport the fuel in an existing pipeline carrying jet-A.



Daher executives celebrate the acquisition of the now-former Triumph metallic and composite aerostructures assembly facility in Stuart, Florida.

Daher celebrated its acquisition of the now-former Triumph metallic and composite aerostructures assembly facility in Stuart, Florida, on July 6. The move marks a major expansion of Daher's U.S. industrial presence and reinforces the company's position as a Tier 1 aerospace supplier. Daher is retaining all 400 employees and management at the Florida division.

"With the Stuart facility, Daher has reached a critical size that is essential in the aerostructures business, while also marking an important expansion of our overall industrial footprint in North America," said Daher CEO Didier Kayat. "This represents a crucial element in Daher's long-term strategic plan, and further strengthens our ability to meet supply chain demands as the aviation sector continues its rebound."

At the event in Stuart, Kayat said the facility will be key to doubling the

company's U.S. revenues to about \$1 billion annually, matching that of its European operations. Because the Stuart facility manufactures large aerostructures for the Boeing 767 and 777, the move also helps to balance Daher's work between Boeing and Airbus. In addition, the acquisition brings more Gulfstream work to Daher, adding G650 flap manufacturing at the Florida plant to its existing G700 winglet work in Europe.

Daher's established North and South American activities include the production of Kodiak turboprops in Sandpoint, Idaho; a TBM services site in Pompano Beach, Florida; a logistics operation that supports Airbus's commercial aircraft assembly lines in Mobile, Alabama; logistics and assembly activities in Canada; composite parts manufacturing in Nogales, Mexico; and an aerostructures logistics and services facility in Querétaro, Mexico, that supplies Airbus. ■

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News Briefs

METAL MASTER PREPS TO FLY 2ND FLARIS LAR-1

Polish engineering firm Metal Master is preparing its second production-conforming Flaris LAR-1 aircraft for its first flight as the company set its sights on securing Polish certification for the five-seat, personal jet in the first half of 2023. “We are conducting ground tests now and hope to get the aircraft airborne in the coming weeks,” said Metal Master co-founder Rafal Ladzinski. The first carbon-fiber LAR-1 prototype has logged more than 220 sorties since the flight-test campaign began in April 2019 from the company’s test center in Zielona Gora Airport in western Poland.

R-R LAUNCHES TURBOGENERATORS FOR HYBRID AIRCRAFT

Rolls-Royce has announced plans to develop new-generation turbogenerator technology that will be the basis for small engines to power hybrid-electric aircraft. The turbogenerator technology Rolls-Royce is working on will be scalable to serve power requirements of between 500 and 1,200 kW. Its turbogenerators can be used either to recharge batteries after takeoff or to power propellers directly. The company is already working with Italy’s Tecnam on an all-electric version of its P2012 commuter called the P-Volt and has also partnered with Embraer and Norwegian airline Wideroe to develop plans for an electric regional airliner.

WHITE HOUSE SELECTS DENVER AIRPORT CEO TO LEAD FAA

The Biden Administration is nominating Denver International Airport CEO Phillip Washington to be the next FAA administrator. Washington brings a lengthy background in the management of large transportation organizations. He previously was CEO of the Los Angeles County Metropolitan Transportation Authority and also has been CEO of the Denver Regional Transportation District.



Southern Sky Aviation’s new FBO at Northwest Florida Beaches International Airport, set to open late next year, will include an 8,000-sq-ft terminal, 73,000 sq ft of hangar space, and 10 acres of ramp space.

Southern Sky Aviation lands FBO deal at NW Florida field

BY CHAD TRAUTVETTER

Southern Sky Aviation has signed a 30-year lease agreement with the Panama City-Bay County Airport and Industrial District to develop an FBO at Northwest Florida Beaches International Airport (KECP) in Panama City. The facility will add a competing aircraft services provider at the airport and also marks Southern Sky Aviation’s second FBO following the purchase of its Trent Lott International Airport location in southeast Mississippi.

Slated to open in late 2023, the \$25-million development will include an 8,800-sq-ft FBO terminal with more than 73,000 sq ft of hangar space, and 10 acres of ramp space. Among the FBO terminal amenities

will be a conference room, pilot and passenger lounges, showers, a flight-planning area, and a refreshment center. The customer parking area will also have electric car recharging stations.

Southern Sky Aviation CEO Bo Andrews said the project has been in the works for two years. Company president Donald Howell added that the Northwest Florida region “has experienced significant growth over the last several years. Southern Sky Aviation is proud to join this growth and be another gateway for economic development in this community.”

In addition, Southern Sky Aviation offers aircraft maintenance, charter/management, and sales services. ■

NEWS note

An Airbus H225 recently performed the first-ever helicopter flight using 100 percent sustainable aviation fuel (SAF) in both of its Safran Makila 2 engines. This flight, which follows an H225 flight with one engine burning neat SAF in November, is part of Airbus Helicopters’ test campaign aimed at understanding the impact of SAF use on the helicopter’s systems.

Over the next two years, tests are expected to continue on other Airbus helicopter types with different fuel and engine architectures. The aim is to certify the use of 100 percent SAF in Airbus airplanes and rotorcraft by 2030, the company said.



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Zero fatalities from U.S. bizjet accidents in first half

BY GORDON GILBERT

No fatal accidents involving U.S.-registered business jets were recorded in the first six months of 2022. In the same period last year, three fatal accidents claimed nine lives. Additionally, there were three fewer nonfatal accidents of U.S.-registered business jets in the first half versus the same

period last year, according to preliminary statistics gathered by AIN. There was one fatal accident involving a non-U.S.-registered business jet that killed six in the first half, compared with a single accident that killed one in the same time frame last year.

continues on page 60 >

News Briefs

DAHER BEGINS U.S. DELIVERIES OF TBM 960 TURBOPROP

Daher began deliveries of its new TBM 960 to the U.S. in late June, following FAA approval on June 24. The first-ever TBM 960 was handed over in late April to a German customer. The initial two TBM 960s for U.S. customers departed June 25 from Daher's aircraft division headquarters in Tarbes, France, and flew to TBM-authorized distributors Elliott Jets in Minneapolis and Avex at California's Camarillo Airport for delivery to their owners. At press time, the company had delivered 10 TBM 960s to U.S. customers and expected to double that number by the end of July.

SULLENBERGER ABRUPTLY RESIGNS AS ICAO AMBASSADOR

C.B. "Sully" Sullenberger, the pilot who successfully dead-sticked an Airbus A320 to a safe landing on New York's Hudson River in 2009 after hitting a flock of geese, stepped down as U.S. envoy to the Montreal-based International Civil Aviation Organization (ICAO) as of July 1. Sullenberger, who was confirmed in December as U.S. ambassador to ICAO, said "relinquishing my role" was not an easy decision. He did not offer a reason for his resignation.

HELO GROUPS LAUNCH NOISE REPORTING IN D.C.

The Eastern Region Helicopter Council (ERHC) and Helicopter Association International (HAI) have partnered with consultancy PlaneNoise to launch a helicopter noise complaint system in the Washington, D.C. region. The initiative focuses on airport and aircraft noise complaint management solutions. ERHC and HAI seek to work with the D.C. community to process noise complaints and use this data to help mitigate helicopter noise. Using available flight-tracking data, the system will identify likely aircraft generating concerns and all associated data.

ACCIDENTS/INCIDENTS WORLDWIDE (FIRST HALF 2022 VS FIRST HALF 2021)

U.S.-registered Business Jets and Turboprops

Business jets	Total		Part 91		Part 91K		Part 135		Public/Gov't		Mfg	
	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021
Total accidents	8	11	5	10	0	0	3	1	0	0	0	0
Nonfatal accidents	8	8	5	7	0	0	3	1	0	0	0	0
Fatal accidents	0	3	0	3	0	0	0	0	0	0	0	0
Fatalities	0	9	0	9	0	0	0	0	0	0	0	0
Incidents	39	34	24	18	0	0	8	15	0	0	0	1

Business turboprops	Total		Part 91		Part 91K		Part 135		Public/Gov't		Mfg	
	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021
Total accidents	15	11	11	8	0	0	4	3	0	0	0	0
Nonfatal accidents	11	8	7	5	0	0	4	3	0	0	0	0
Fatal accidents	4	3	4	3	0	0	0	0	0	0	0	0
Fatalities	13	7	13	7	0	0	0	0	0	0	0	0
Incidents	31	39	21	24	0	0	9	14	1	1	0	0

ACCIDENTS/INCIDENTS WORLDWIDE (FIRST HALF 2022 VS FIRST HALF 2021)

Non-U.S.-registered Business Jets and Turboprops

Business jets	Total		Private		Charter		Other*		Unknown	
	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021
Total accidents	2	4	0	1	1	2	0	1	1	0
Nonfatal accidents	1	3	0	1	0	2	0	0	1	0
Fatal accidents	1	1	0	0	1	0	0	1	0	0
Fatalities	6	1	0	0	6	0	0	1	0	0
Incidents	12	10	5	0	5	5	2	2	0	3

Business turboprops	Total		Private		Charter		Other*		Unknown	
	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021
Total accidents	22	10	3	2	12	1	3	7	4	0
Nonfatal accidents	17	6	2	2	11	0	2	4	2	0
Fatal accidents	5	4	1	0	1	1	1	3	2	0
Fatalities	17	19	1	0	11	10	1	9	4	0
Incidents	10	14	5	2	3	9	1	3	1	0

All Data Preliminary. * For example: air ambulance, aerial survey, ferry, training, testing, manufacturer, government (non-military).

Sources: FAA, NTSB, Aviation Safety Network, AIN research

AIN tables show "incidents" as well as "accidents" to distinguish mishaps based on their degree of severity. Investigators often draw fine distinctions between the two events, but, typically, incidents result in minor or no damage and their investigations are sometimes delegated to local officials. Accidents are events that range from minor damage to destruction and/or injuries. Also, some incidents ultimately get upgraded to accident status during the investigative process.

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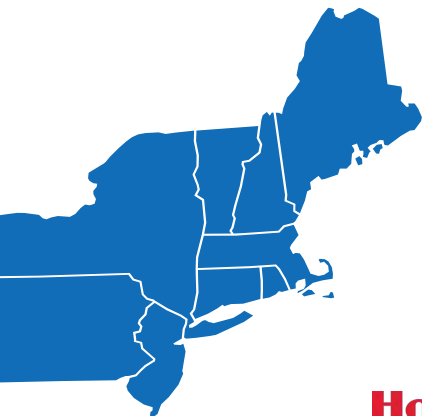
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Avfuel commits to 1B gallons of SAF from Alder Fuels

BY KERRY LYNCH

News Briefs

STUDY: SAF MARKET TO REACH \$14B BY 2030

The global sustainable aviation fuel (SAF) market is expected to increase from \$216 million today to more than \$14 billion by 2030, according to a new report by market research firm The Brainy Insights. It notes that the growth of the market is being sustained by increasing private and governmental support, along with international concern about carbon emissions caused by aviation. The study also found that the 30 to 50 percent SAF blend segment led the market with a 41 percent share in 2021. North America is currently the largest user of SAF, consuming nearly half the amount produced.

REVV AVIATION ADDS SEVENTH FBO

Revv Aviation expanded to seven locations with the addition of the sole FBO at South Dakota's Huron Regional Airport (KHON).

The city had acquired the FBO assets at KHON from Fly Jet Center and then asked Revv, which is growing throughout the Midwest, to manage the facility. The Avfuel-branded FBO includes a terminal with a passenger lobby, pilot lounge, and conference room. Its 11,000-sq-ft heated hangar can shelter jets up to a Falcon 900.

COLLINS TO BRING SPACECHILLER TO BIZAV CABINS

Collins Aerospace will bring its new multifunctional SpaceChiller thermoelectric aircraft cooling system to the business aviation market, the company told **AIN**. Modular, compact, lightweight, and requiring no refrigerant, SpaceChiller's heat exchange technology is well suited for use in aircraft cabins, "particularly for smaller aircraft," Collins said. "It can provide compact and convenient chilling capacity to areas where it was previously limited." Possible applications include in-seat mini bars and chilled snack bars.



In a deal to purchase one billion gallons of SAF over the next 20 years, Avfuel's ATIC subsidiary will also invest in Alder Fuels to help scale production.

In the largest such arrangement of its kind involving the business aviation sector, Avfuel has struck a deal to purchase one billion gallons of sustainable aviation fuel (SAF) from biocrude specialist Alder Fuels over the next 20 years, the companies announced. In addition, the Ann Arbor, Michigan-based company will provide logistics support and expertise, and its Avfuel Technology Initiatives Corp. (ATIC) subsidiary further has agreed to invest millions into Alder Fuels to help the company scale production.

Alder Fuels is developing production facilities that will convert abundant biomass, such as forest and crop residue, into a low-carbon replacement fuel that will meet jet-A specifications once refined. The refined fuel is in the process of being certified as a 100 percent drop-in replacement for petroleum-based jet-A and is anticipated to become available in early 2024.

"Our fuel is indicating from the testing we've done and the initial work we're doing with ASTM that this fuel will meet

the full specification of jet-A 100 percent neat, meaning we're not going to need to blend it with petroleum fuel," Alder Fuels CEO and founder Bryan Sherbacow told **AIN**. Unlike earlier versions of SAF, the Alder fuel has properties that eliminate the need for aromatics that require a petroleum blend.

Avfuel will supply the SAF to its business and commercial aviation customers globally.

"Avfuel is committed to providing sustainable solutions for its customers, including business aviation, fixed-based operators, and airlines," said Avfuel executive v-p C.R. Sincock. "This transformative agreement builds upon our commitment to lead its adoption."

Sincock added that the ATIC investment is designed to ensure SAF will be available for the industry. While calling the agreement an "important milestone in business aviation's SAF adoption story," he stressed the need for a collective effort to reach the industry's net-zero targets. ■

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Promising future expected for thermoplastic composites

BY CHRIS KJELGAARD

@ Farnborough Airshow 2022

Long reliant on thermoset carbon-fiber materials for making very strong composite structural parts for aircraft, aerospace OEMs are now embracing another class of carbon-fiber material as technological advances promise automated manufacture of new non-thermoset parts at higher volume, lower cost, and lighter weight.

While thermoplastic carbon-fiber composite materials “have been around a long time,” only recently could aerospace manufacturers consider their widespread use in making aircraft parts, including primary structural components, said Stephane Dion, v-p engineering at Collins Aerospace’s Advanced Structures unit.

Thermoplastic carbon-fiber composites potentially offer aerospace OEMs several advantages over thermoset composites, but until recently manufacturers could not make parts out of thermoplastic composites at high rates and at low cost, he said.

In the past five years, OEMs have begun to look beyond making parts from thermoset materials as the state of carbon-fiber composite part manufacturing science developed, first to use resin infusion and resin transfer molding (RTM) techniques to make aircraft parts, and then to employ thermoplastic composites.

GKN Aerospace has invested heavily in developing its resin-infusion and RTM technology for the manufacture of large aircraft structural components affordably and at high rates. GKN now makes a 17-meter-long, single-piece composite wing spar using resin infusion manufacturing, according to Max Brown, v-p of technology for GKN Aerospace’s Horizon 3 advanced-technologies initiative.



GKN manufactures empennages with thermoplastic rudders and elevators at its factory in Papendrecht, the Netherlands.

OEMs’ heavy composite-manufacturing investments in the past few years have also included spending strategically on developing capabilities to allow high-volume manufacturing of thermoplastic parts, according to Dion.

The most notable difference between thermoset and thermoplastic materials is that thermoset materials must be kept in cold storage before being shaped into parts, and once shaped, a thermoset part must undergo curing for many hours in an autoclave. The processes require a great deal of energy and time, and so production costs of thermoset parts tend to remain high.

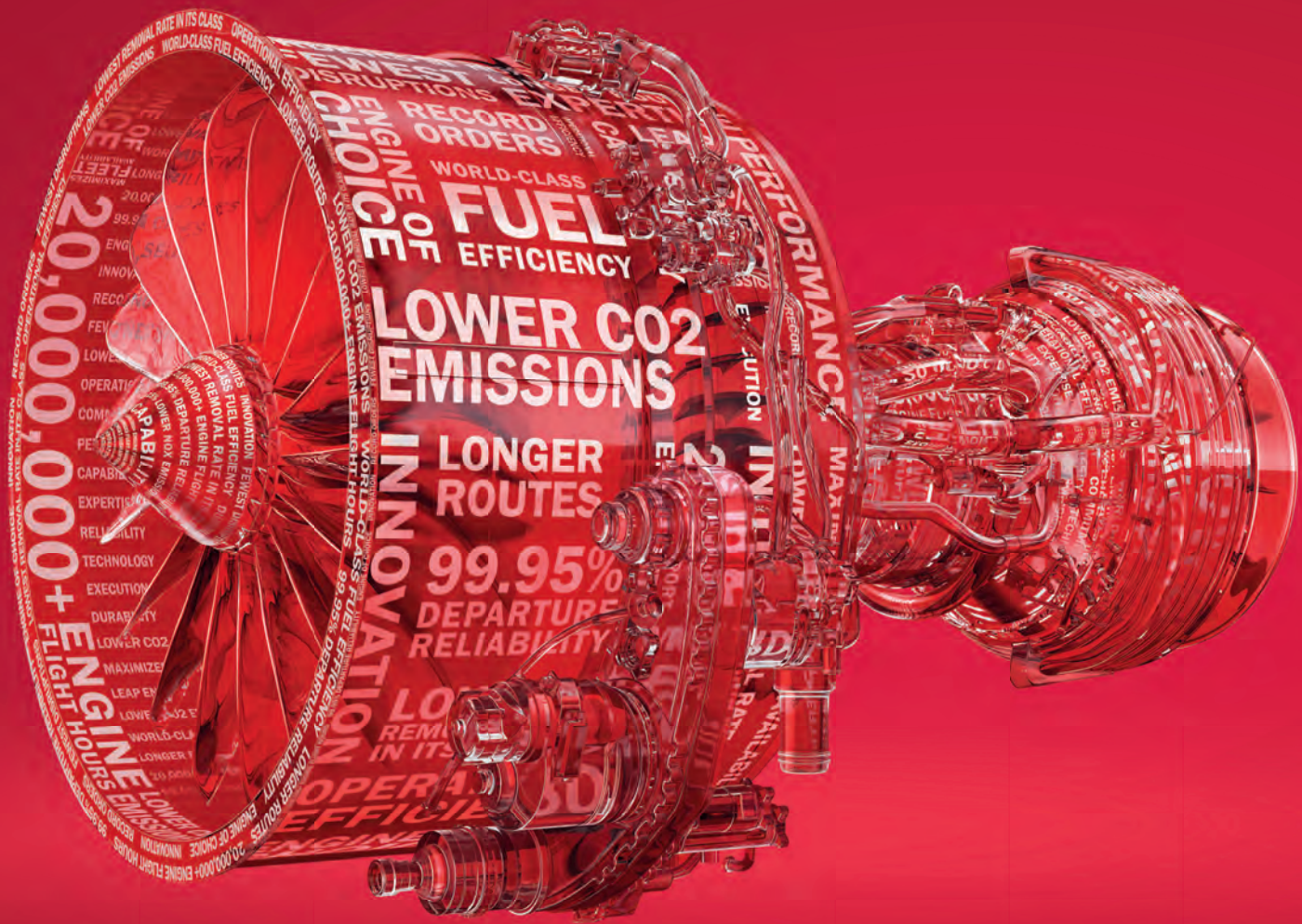
Curing alters the molecular structure of a thermoset composite irreversibly, giving the part its strength. However, at the current stage of technological development, curing also renders the material in the part unsuitable for re-use in primary structure.

In contrast, thermoplastic materials don’t require cold storage or baking when made into parts, according to Dion. They

can be stamped into the final shape of a simple part—every bracket for the fuselage frames in the Airbus A350 is a thermoplastic composite part—or into an intermediate stage of a more complex component.

Thermoplastic materials can be welded together in various ways, allowing complex, highly shaped parts to be made from simple sub-structures. Today, induction welding is mainly used, which only allows flat, constant-thickness parts to be made from sub-parts, according to Dion. However, Collins is developing vibration and friction welding techniques for joining thermoplastic parts, which once certified it expects will eventually allow it to produce “truly advanced complex structures,” he said.

The ability to weld together thermoplastic materials allows manufacturers to do away with the metal screws, fasteners, and hinges required by thermoset parts for joining and folding, thereby creating a weight-reduction benefit of about 10 percent, Brown estimated. ■



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Digital copilot approach cuts pilot workload, say OEMs

BY CHRIS KJELGAARD

@ Farnborough Airshow 2022

Major avionics companies see cockpit automation playing an increasing role in reducing pilot workload in commercial and general aviation aircraft. Less pilot workload should—and will—remain the focus of flight deck automation in the near term, they say.

“Simplifying pilot workload during the most critical and complex phases of flight should remain the focus of cockpit technology automation,” said Troy Brunk, president of Collins Aerospace’s avionics business. “Removing the constant, redundant, and remedial tasks allow the human pilot to focus where they excel—adapting to the unexpected variable.”

Automating various functions of the traditional “aviate, navigate, communicate” activities every pilot must perform when flying an aircraft enhances flight safety, according to Alex Bennett, director of aviation OEM and defense sales for Garmin International.

Providing automated functions such as autopilot, autothrottle control, electronic stability protection, and smart rudder bias enhances safety. The automation ensures the aircraft remains under control and within its performance envelope and this simplifies the pilot’s job.

The assisting process—often known as “simplified vehicle operation”—enables the pilot to focus on the aircraft’s position and inflight situation, said Bennett. So, in helping manage the pilot’s workload and enhancing pilot situational awareness, automated systems operating as a “digital copilot make sense.”

Over the past decade, Garmin has pioneered a series of automated control- and



Automation has reached a high level with Garmin’s Autoland system in the Piper M600 SLS.

envelope-protecting avionics tools for general aviation aircraft, culminating in its Emergency Descent Mode, Smart Glide, Smart Rudder Bias, and Autoland functions. They activate in response to triggers sensed by the avionics—and also pilot manual input—and ensure an aircraft experiencing loss of pressurization or in distress descends or lands safely, even if all on board have become incapacitated.

Fully autonomous piloting of passenger aircraft in crewed airspace remains many years away—“beyond 2030,” according to Bennett. Regulators will not easily approve fully autonomous operation of a passenger-carrying aircraft without a pilot on board in highly trafficked airspace and over densely populated areas, particularly in the absence of a long history of safe semi-autonomously piloted operations first.

Fully autonomously piloted operations of aircraft carrying only cargo and operating only in remote terrestrial or over-water areas might happen first, before 2030, according to Bennett. But before regulators allow for that, aviation will need

to build an extensive, years-long record of safe one-pilot operation of aircraft in which automated control and monitoring functions serve as digital copilots.

Matthew George, CEO of autonomous-piloting start-up Merlin Labs, said regulatory conservatism prompted his company to build its business approach on achieving certification first for single-pilot, digital copilot-assisted operation of commercial cargo flights by small freighters. “We’re using a crawl, walk, run approach to get there,” to eventual certification for fully autonomous flight, he explained.

The company has flown five different aircraft types from its Mojave test base on both a semi- and fully autonomous piloted basis but with a pilot on board to monitor the systems and take control if unplanned events occur. Aircraft it has flown autonomously include the Cessna Caravan and the Beechcraft King Air 90, both popular as small freighters. Merlin expects to gain its first STC for an autonomous flight-converted aircraft in time for it to enter commercial service by the end of 2023. ■

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AIN's 50th anniversary look back: August

BY CURT EPSTEIN

AIN is celebrating its golden anniversary by highlighting select news from the archives over the past half-century.

STRIKE: Corporates cope with ATC disruption



(ACN Sept 1, 1981 p.1)

Then: PATCO's nationwide strike—which has thrown airline schedules into a tizzy, forcing passenger delays and flight cancellations—surprisingly has not wreaked its expected devastating effect on corporate aviation despite its fourth priority ranking by FAA.

A telephone survey by the editors of *Aviation Convention News* just before this issue went to press found that while confusion and doubt reigned in corporate flight departments for the first day or two following the walkout of 12,000 controllers, the situation quickly returned to near normal. Save for occasional pockets of delays, the corporates are not unduly suffering as a result of their priority ranking behind military, emergency flights, trunk airlines, commuters, and air taxis. The under 12,500-pound segment of corporate aviation did receive a setback for the first couple of weeks of the strike when, by FAA edict they were prohibited from filing IFR.

After an avalanche of protests, the aviation agency lifted that ban on August 17 and the under 12,500-pound airplanes joined their heavier corporate fleet brethren on the airways.

Now: On August 3, 1981, the majority of unionized professional air traffic controllers (PATCO) members went on strike seeking shorter hours, improved pay, and a better retirement package, and in the process, breaking a 1955 law that banned government employees from striking. President Ronald Reagan declared the work stoppage a “peril to national safety” and ordered the striking controllers to return to work within 48 hours.

Two days later, after the arrest of a group of PATCO's leadership and the cancellation of thousands of airline flights, Reagan fired the union members who remained on strike and banned them from being rehired. He then proceeded to have them replaced with a combination of supervisors, non-striking air traffic controllers, and military controllers. While the FAA then began rebuilding its ATC ranks with new controller applicants, it would be years until the agency replenished its pool of controllers. In 1987 a new union, the National Air Traffic Controllers Association was certified and its leadership promised never to condone an illegal strike.

In 1993, President Clinton officially rescinded the ban on rehiring the fired controllers.

Sale of Jet Aviation marks end of an era



(AIN September 2005 p.1)

Then: On August 11 European private equity group Permira said it would buy a majority stake in Zurich, Switzerland-based aviation services company Jet Aviation for an undisclosed amount. With a formal closing expected later this month, the sale will end the uncertainty about the fate of the Hirschmann-family-controlled enterprise since it was first put up for sale in 2002.

Founded in 1967 by entrepreneur Carl Hirshmann Sr., Jet Aviation grew into a worldwide corporate aviation services company with interests in aircraft maintenance, completions, management, and charter. After Hirshmann's death in April 1995, family battles to control the company led to changes of management and headquarters. Until April 2003 Jet Aviation was led by son Thomas Hirshmann, who had moved the headquarters to West Palm Beach, Florida in the 1990s. Those headquarters returned to Zurich last summer, about a year after Thomas Hirschmann resigned as chairman and CEO.



A Great Future Built on a Historic Past



How many companies can you name that have celebrated their 90th anniversary? Not many. And when you're talking about business and private aviation, and FBOs in particular, the list gets a lot shorter. Why? Well, companies, like people, don't always handle longevity skillfully. But it's as much a part of aviation as lift, drag, thrust, and weight.

For example, back in 1932, when world-renowned aerobatic pilot Bevo Howard started the business that would become Hawthorne Global Aviation Services, "heavy iron" meant a Staggerwing Beech or Spartan Executive. Today, it's Globals, Gulfstreams, and BBJs.

While Howard and each of the hundreds of professionals who have been part of the company's history have seen business aviation reinvent itself time and time again, one thing has remained constant—the involvement of the Harton family.

"My grandfather started there as a line jockey in 1945 and bought the company in 1972," explains Hawthorne Global Aviation Services' Executive Vice President, Corporate Development, Will

Harton. "Knowing that general aviation FBO services were in our family DNA, that's where he concentrated his efforts.

"In the late 1970s, my father, Dean, signed on as a flight instructor, then progressed into aircraft sales and played a key role in expanding the company's FBO footprint," he says. "In 1989, he and my mother and uncle bought the company from my grandfather. That was the beginning of Hawthorne Aviation."

“World-class customer service will always be a defining factor at all our locations. That’s what our new owners want.”

The next three-plus decades saw the company continually evolve. The name changed and changed again. People came, went, and came back. The business added locations and services. But through it all, the heart and soul of the Hawthorne Global Aviation Services brand remained steady.

THE MORE THINGS CHANGE...

The biggest change came in March of 2022 when the joint venture investment team of NOVA Capital Partners and Wafra, Inc. acquired Hawthorne Global Aviation Services.

"NOVA and Wafra are global investment managers that understand the value not only found in Hawthorne Global Aviation Services' real estate holdings but also in what our brand means to business and private aviation aircraft owners," Harton says. "Our investors clearly see that the Hawthorne name is one that our customers trust.

"They want to capitalize on that value and the service, safety, quality, and attention to detail it represents and use their financing and real estate expertise to expand our services throughout the country," he continues. "It's an aggressive plan, but we're looking to build or acquire over 20 new FBOs in five to seven years."

Harton adds that from an FBO operator's perspective, the timing of the company's sale could not have been more advantageous for everyone involved. Change requires capital.



“With our background in all aspects of aircraft ownership and operation, we can be that turnkey solution for whatever customers need from the day they buy to the day they sell.”

“We’ve seen the trajectory of private flight change over the past few decades. Larger aircraft have required us to upgrade our equipment and facilities, including building much larger hangars,” he says. “Another change has been the rapid ‘democratization’ of private aviation. These new customers bring new expectations about what they want from an FBO.

“With the funding through NOVA and Wafra, we are in a fantastic position to accelerate our plans to expand our services offerings to every one of our facilities,” Harton continues. “For example, we currently offer the maintenance services of our Part 145 certificate and our Part 135 charter/aircraft management services at select locations. Our directive is to expand both offerings to all locations.

“In the past 12 months, we’ve seen a lot of first-time aircraft owners,” Harton adds. “They don’t know aviation and are

looking for a one-stop solution for all their needs. With our background in all aspects of aircraft ownership and operation, we can be that turnkey solution for whatever they need from the day they buy to the day they sell.”

...THE MORE THEY STAY THE SAME.

While it’s true that 90 percent of the private and business aviation industry has changed, it’s important to remember that the remaining 10 percent will always be critical to any FBO’s success.

“The need to provide traditional and exceptional customer service will never change,” states Dave Kucko, Vice President, FBO Operations, for Hawthorne Global Aircraft Services. “That commitment has led us to develop our tagline, ‘Building Customer Loyalty One Experience at a Time.’ That’s not an empty promise.

World-class customer service will always be a defining factor at all our locations. That’s what our new owners want.”

Kucko explains that impressing a customer is harder today than ever. “Passengers on private aircraft expect the best service but are often wowed by the little things,” he says. “Anticipating their requests and fulfilling them before you are asked is one of those things. We can often do that because we take the time to get to know our customers.

“We preach that to all of our people,” Kucko continues. “You just have to pay attention to each customer’s individual desires. We have 90 years of experience meeting pilots’, owners’, and passengers’ expectations. A lot has changed, but safety, courtesy, and personalized care are still paramount to what we do.

“We currently have locations in the top three Metropolitan Strategic Areas (MSAs) in the midwestern and eastern regions of the country,” he says. “We complement these with FBOs in strategic locations that serve both established and growing markets.”

Kucko says that while all six FBOs have been the beneficiaries of the recent





private travel boom, the team at Atlanta Cobb County (KRYY) has shined particularly brightly under the spotlight.

“The 2019 Super Bowl was really a breakthrough event for Hawthorne’s Cobb County location,” he states. “It allowed us to showcase this gem that has quickly risen to become the new choice for business aviation travelers in the Atlanta area. To meet customers’ demands, we will soon be breaking ground on new hangar facilities.”

In addition to the expansion at Cobb County, the company is building a 30,000-square-foot hangar at its FBO at Chicago Executive Airport (KPWK).

“Chicago Executive is one of the top 10 general aviation airports in the country,” Harton says. “This hangar is just one example of the aggressive way our new ownership group is looking at having the facilities and services available to our customers where and when they need them.”

WE MAINTAIN IT LIKE WE OWN IT.

As Hawthorne Global Aviation Services President Chuck Kegley explains, the company’s nearly century-old commitment to caring for its customers’ high-value airborne assets doesn’t stop at the ramp.

“If it’s here for any maintenance, we ‘own’ it. Every aircraft that comes in here is treated like one of our own and serviced by the same technicians that handle our Part 135 fleet,” he says. “Our [Part] 135 charter fleet is growing, and every time we add an aircraft to our

certificate, our maintenance technicians receive factory training on that type.

“For a long time, we maintained only our charter airplanes, but now we’re providing that capability to outside customers,” he says. “It’s been instrumental in enabling us to meet the needs resulting from today’s resurgence in private aircraft use.”

“We have been an authorized Embraer Service Center for a while, so we work on all their executive aircraft models,” adds Chris Zarzano, Vice President, MRO Operations, Hawthorne Global Aviation Services. “Our other focus is on an array of legacy aircraft types. We do a lot with Gulfstream IVs and Vs. Our team takes great pride in delivering Gulfstream-factory-type services to the owner/operators of these popular aircraft.

“We greatly benefit from having employees who spent their earlier careers working at aircraft OEMs and now work at our primary maintenance facility in Islip [KISP, in New York],” he continues. “It’s a broad and impressive set of skills that our customers have come to rely on and trust when it’s time for any inspections, maintenance, or upgrades to their aircraft.”

Says Kegley: “Trust and relationships are huge. Pilots and owners know the mechanics who work on their aircraft here. What that means can’t be overstated...” We are totally committed to supporting and building on those strong relationships as we expand our MRO services into other markets.”

Ready for the next 90 years.

So, with 90 years behind it, what does Hawthorne Global Aviation Services’ future look like?

“Our industry is changing—again,” Global Aviation Services’ Executive Vice President, Corporate Development, Will Harton explains. “We are embracing sustainable fuels and, in the future, eVTOLs. As a service provider, we have to be ready. We are working with our supplier to introduce SAF where we can. Our customers want it. Next comes electric. We’ll need solutions for charging, handling, and disposing of batteries. We will be ready.

“We’re looking to continue an aggressive expansion, and much of that will come through acquiring existing FBOs in our target markets,” he adds. “If there are FBO operators out there looking to sell that aren’t happy with what other large operators are offering, we’d love to hear from them. They can rest assured that their legacy will be in good hands with Hawthorne Global Aviation Services.”

HAWTHORNE
GLOBAL AVIATION SERVICES

hawthorne.aero

Now: Permira would hold on to Jet Aviation for just three years before General Dynamics agreed to acquire it for approximately \$2.25 billion as a stablemate to airframer Gulfstream Aerospace.

Jet Aviation, which evolved from a two-hangar maintenance facility in Basel, Switzerland, celebrates its 55th anniversary this year. It now operates more than 30 FBOs around the world. The worldwide staff of more than 4,000 offers MRO, completions, and aircraft charter and management services throughout Europe, the Middle East, Asia Pacific, North America and the Caribbean.

Business aviation brings help and comfort to Katrina victims



(AIN October 2005 p.1)

Then: When Hurricane Katrina ravaged the Gulf Coast, the business aviation community swung into action to help those affected by the natural disaster. Not long after the hurricane made landfall on the morning of August 29, many aircraft operators called the Red Cross and offered to airlift in supplies or do humanitarian transports. Their offers were rebuffed; instead the relief agency simply asked for donations.

Wanting to go beyond merely donating money, this close-knit community was determined to use its resources—aircraft or otherwise—to help those affected by the hurricane. Central to this effort was NBAA’s Air Mail list server, which became an important communi-

cations tool for facilitating airlift efforts.

The first messages offering help came on September 1, with several people opening their homes to evacuees. Within several hours members began asking how they could use their business aircraft to fly in supplies or evacuate refugees from the hardest-hit areas in Louisiana and Mississippi.

Now: One of the most destructive storms to strike the U.S., Category 5 Katrina claimed some 1,800 lives and caused more than \$125 billion in damage. New Orleans was hit hard from the hurricane, and due to the failures in its levee system, saw 80 percent of the city inundated with water, and widespread disruptions to transportation and communications throughout the region. More than one million people were displaced as a result of the storm, causing the largest domestic migration in the history of the U.S.

New Orleans Lakefront Airport, on the shores of Lake Ponchartrain, suffered massive damage, which—in addition to the flooding to the city proper—caused the relocation of NBAA’s annual convention that had been scheduled to take place there in October. The organization pushed back the event by one month and rescheduled it in Orlando. New Orleans has not hosted the annual convention since.

Santulli resigns from NetJets; changes ahead at fractional

Then: In a major management shake-up at fractional provider NetJets, company founder, chairman, and CEO Richard Santulli on August 4 unexpectedly resigned, effective immediately. Credited as the “father of the fractional aircraft industry,” Santulli said he plans to remain with NetJets as a consultant for at least a year.

Santulli acquired Columbus, Ohio-based Executive Jet Aviation in 1986 as a platform upon which to launch NetJets, which



(AIN September 2009 p.1)

initially struggled but grew substantially by the mid-1990’s. Berkshire Hathaway chairman and billionaire Warren Buffett, a NetJets shareholder, was so impressed with Santulli’s NetJets that he bought the firm in 1998 for \$725 million, and per Buffett’s custom, kept the company management in place.

“After 25 years of working with the most talented group of people I could even have imagined, who helped build the premier aviation company in the world, I have decided to step down...to spend some more time with my young family and pursue other interests” Santulli said in a statement.

Now: Following his NetJets departure, Santulli did not remain idle for long. A year later he co-founded Dublin-based aircraft leasing company Milestone Aviation and remained there until 2016, resigning at the age of 72. At the time, the company had one of the world’s largest helicopter fleets, worth \$3.7 billion and had orders and options for new aircraft worth \$3.2 billion.

NetJets weathered the global economic downturn to emerge stronger than ever as the world’s largest private aviation company. Its fleet today numbers more than 800 jets ranging from the Embraer Phenom 300 to the Bombardier Global 7500. It expects to bolster that total, adding 80 new aircraft this year alone, with scores more on order.

Watch AIN@50 videos on [youtube.com/AINtvonline](https://www.youtube.com/AINtvonline)



Flying Dassault's Falcon 6X

BY MATT THURBER

Flight test activity on the Falcon 6X fleet has reached the stage where it's now a matter of proving the jet's reliability and assuring the cabin features meet the demanding requirements of a \$55 million jet.

In the meantime, the 6X has matured to the point where Dassault invited *AIN* to sample its flying qualities and performance ahead of certification and entry into service early next year. Per the usual process, I traveled to Dassault's Istres Flight Test Center near Marseille, France, to fly the 6X.

The first step was a briefing with test pilots Bruno Ferry and Tom Valette, and flight test engineer Flora Corsia at Istres. We would be flying the first 6X, serial number 1, the same airplane in which Ferry and Valette flew on March 10, 2021, marking the beginning of the 6X flight test program. As the original prototype, this 6X is not equipped with a production interior and carries a cabin full of test equipment including water tanks used to quickly adjust weight and balance.

In preparation for that first flight, Ferry, Valette, and other Dassault test pilots

spent time learning about the new jet's systems and operating characteristics in the systems integration test station (SITS) simulator, which is located at Istres. This also was my introduction to the 6X. The SITS doesn't exactly replicate the 6X as it isn't a full-motion simulator and it doesn't have flight control actuators, which the bench test facility at Dassault's headquarters in Paris does. But the SITS does duplicate the 6X's systems and avionics, which is now the EASy IV suite based on Honeywell Primus Epic avionics.

Each new Falcon jet improves upon the last, and the 6X is no exception. Now the largest Falcon with the widest and tallest cabin of any purpose-built business jet, the 6X incorporates unique design features that should appeal to owner and pilot alike.

Originally launched as the 5X, the 6X came about after the 5X was canceled because of insurmountable problems during the development of the 5X's Safran Silvercrest engine. A fuselage stretch matched the airframe to larger engines—Pratt & Whitney PW812Ds—and the result

was serendipitous, a longer-range, wide- and large-cabin jet that probably was a better fit for the market shift toward ultra-long-range and large-cabin business jets.

With years of experience designing and manufacturing digital flight control systems in-house, Dassault engineers have maximum flexibility when it comes to expanding its franchise in the large-cabin market. Dassault's fighter jets were its first aircraft to feature fly-by-wire flight controls, then the Falcon 7X business jet was so equipped, entering service in 2007. The 7X and 8X proved that it is possible to make large Falcon business jets with the pleasant handling characteristics of their conventionally controlled predecessors. The 6X continues that philosophy, but with full digital control of all flight control surfaces. This includes integration of flaperons, giving designers even broader options for fine-tuning the flight controls to optimize performance and handling. Another addition to the 6X's flight control system is integrated digital control of nosewheel steering, which makes steering on the

ground more precise. Flaps in the 6X are now electrically powered, not hydraulically as on previous models.

SYSTEMS CHANGES

Dassault aims to make it easy for pilots to transition between models, and the 6X has just two operating techniques that are different from the 8X, according to Ferry. “For us,” he explained, “it’s important that the family of Falcons, especially for normal procedures, has to be the same.”

But that doesn’t mean that Dassault engineers didn’t take the opportunity when designing the 6X to make it even easier to operate compared to the 8X.

Preparing for engine start is much faster with a redesigned overhead control panel (OCP) that has many fewer buttons and a dark-cockpit philosophy. A dark button now signifies what Ferry said is called “dark auto,” and this means that the system could be on or off. What each button indicates, according to Ferry, is “not the status of the system, it is the status of the command. In the procedures, when you have to check a specific position of a button, we say: ‘dark auto’ because the system chooses between off or on; and a lighted [button] is on or off depending on the status of the command.”

Bringing the 6X to life starts with one switch moved to the “on” position, then the aircraft runs through an automatic systems initialization process. Once that is done, the APU is started so bleeds can be switched on for engine start. Another 6X change is that both engines are started with one knob; just move the power levers to the idle position, turn the knob to “start,” and first engine 2 starts followed by engine 1, with no pilot action required other than monitoring the engine gauges. “The less actions, the better,” said flight test engineer Corsia.

The 6X’s parking brake is a pull-and-turn switch that electrically locks the brakes, with no need to step on the brake pedals. It isn’t used for emergency braking.

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AIN Product Support Survey

Embraer moves to top ranking in 2022

BY JERRY SIEBENMARK



Embraer Executive Jets

Embraer Executive Jets assumed the top spot for business jets while Pilatus retained its top position among turboprop airplanes in the annual AIN Product Support Survey. Embraer recorded the highest rating among six business aircraft OEMs with a Combined Overall Average Ratings of Newer and Older Aircraft score of 8.0, unseating Dassault Aviation. Pilatus scored an Overall Average of 8.6 among turboprops, based on the results of AIN's

survey of turbine aircraft operators, pilots, and maintainers.

Embraer's ranking was followed by Gulfstream Aerospace, with an Overall Average of 7.9, Textron Aviation at 7.8, Bombardier at 7.6, and Dassault at 7.5. Interestingly, all of this year's fixed-wing OEMs saw their Overall Average ratings lower than in last year's survey.

In comments to AIN regarding improvements to product support over the past

year, a number of OEMs cited the effects of supply chain disruptions, although none reported significant interruptions in providing service and support to their customers.

For this year's survey, there were 674 respondents who rated 1,793 aircraft broken down into 141 models. The minimum number of ratings required to include a manufacturer's aircraft in the final results is 20. (For more details, see *Survey Rules and Methodology sidebar on facing page.*)

Combined Overall Average Ratings of Newer and Older Aircraft	Overall Average 2022	Overall Average 2021	Rating Change from 2021 to 2022	Factory Owned Service Centers	Authorized Service Centers	Cost per Hour Programs	Parts Availability	Cost of Parts	AOG Response	Warranty Fulfillment	Technical Manuals	Technical Reps	Overall Aircraft Reliability
Business Jets													
Embraer (Legacy, Phenom, Praetor)	8.0	8.4	(0.4)	8.0	8.7	7.5	6.7	7.4	7.8	8.6	8.5	8.6	8.5
Gulfstream (Mid-Cabin and Large-Cabin)	7.9	8.3	(0.4)	7.8	8.5	7.5	7.6	6.3	8.0	8.6	8.0	8.3	8.6
Textron Aviation (Citation, Beechjet, Hawker)	7.8	8.1	(0.3)	7.7	8.2	7.4	7.4	6.6	7.5	8.3	8.2	8.5	8.7
Bombardier (Challenger, Global, Learjet)	7.6	7.9	(0.3)	7.6	8.3	7.3	6.8	6.1	7.2	7.9	8.0	8.2	8.7
Dassault (Falcon)	7.5	8.7	(1.2)	7.5	8.7	6.5	5.8	6.1	6.5	8.5	8.1	8.8	8.6
Turboprops													
Pilatus (PC-12)	8.6	8.8	(0.2)	9.1	8.1	7.7	8.3	7.2	8.6	8.9	8.8	9.2	9.3
Textron Aviation (King Air)	7.9	8.2	(0.3)	8.3	8.4	8.2	7.8	5.8	7.3	8.1	8.6	8.3	8.6
Rotorcraft													
Leonardo	8.6	8.3	0.3	8.8	8.8	8.1	8.4	7.8	8.9	9.1	8.9	9.0	8.6
Airbus Helicopters	7.3	7.6	(0.3)	7.4	8.8	7.0	6.7	5.8	6.7	7.1	8.2	7.6	8.5

Bell and Sikorsky did not receive enough responses to be rated in this year's survey results.

SURVEY RULES AND METHODOLOGY

The objective of the annual Product Support Survey is to obtain from the users of business jets, pressurized turboprops, and turbine-powered helicopters statistically valid information about the product support provided by aircraft manufacturers over the last year. The goal is to encourage continuous improvement in aircraft product support throughout the industry.

SURVEY TOOL

For the second year, the survey was conducted via a questionnaire developed in partnership with Rolland Vincent Associates, a Texas-based consultancy focused on aviation market research, strategy, and forecasting. The survey was created to provide improved ease of use and to encourage more participants to complete the entire survey. The survey tool:

» Included Spanish and Portuguese versions.

- » Asked respondents to evaluate one full aircraft at a time including airframe, engines, and avionics.
- » Included clearer language and imagery around the individual categories and the evaluation scale.

METHODOLOGY

AIN emailed qualified readers a link to the password-protected survey website, which was open from April 25 to June 10. Respondents were asked to rate individual aircraft and provide the tail number, aircraft age, primary region of service, and whether they used factory-owned or -authorized service centers, or both. Respondents were also asked to rate, on a scale from 1 to 10, the quality of service they received during the previous 12 months in the following categories: Factory-owned Service Centers; Cost Per Hour Program; Parts Availability; Cost of Parts; AOG Response; Warranty Fulfillment; Technical Manuals; Technical Reps; Overall Product Reliability.

THE RESULTS

In total, 674 unique participants from 58 countries completed the survey, representing 1,793 aircraft and 141 aircraft models. **AIN** noticed a decent decrease across the board in survey responses after an increase last year. We specifically saw a decrease in the Rotorcraft segment and were not able to report on scores for Bell. Rolland Vincent Associates reviewed the data to ensure accurate and valid responses. They also compiled the final survey results in close coordination with **AIN**. In consultation with Rolland Vincent Associates, one change was made this year:

- » The report combines OEM models into a single grouping. In years past **AIN** broke out the different model series into their own reporting lines. Much of this separation was a result of acquisitions over time. We believe grouping at the OEM level gives a more complete view of operator feedback with the OEM.

continues on next page >

Respondents were also asked to recognize individuals who have provided them with exceptional product support and service. Select individuals are highlighted in this report.

RESULTS ANALYSIS

In analyzing the results of this survey, this year's scores were generally lower than last year and even slightly lower than 2019 scores. Our thoughts on this are:

- » The survey period last year asked about May 2020 to May 2021, when certain business aviation segments flew considerably less than usual. The May 2021 to May 2022 survey period was almost the exact opposite, with all business aviation segments flying more than pre-pandemic years. More flying leads to more unscheduled maintenance and demand on support teams.
- » Supply chain issues most likely created challenges in getting parts in a timely fashion to

keep aircraft flying.

- » The post-pandemic time has seen an influx of new aircraft owners and operators that may have different service expectations.

COMING NEXT

The 2022 **AIN** Product Support Survey results for aircraft are published in this issue; avionics, cabin electronics, and connectivity will be featured next month; and engines will follow in October.

EMBRAER EXECUTIVE JETS

THE RESULTS

Embraer Executive Jets ascended to the top spot in the 2022 **AIN** Product Support Survey with a score of 8.0 in the Overall Average Ratings of Newer and Older Aircraft, after coming in third place with an Overall Average score of 8.4 in 2021. The Brazilian airframer also saw its scores improve in six of 10 categories: 8.0 in Factory Owned Service Centers, 8.7 in Authorized Service Centers, 7.5 in Cost per Hour Programs, 7.4 in Cost of Parts, 8.6 in Warranty Fulfillment, and 8.5 in Technical Manuals.

THE IMPROVEMENTS

Marsha Woelber, Embraer Service & Support v-p of worldwide executive jets customer support and aftermarket sales, told **AIN** that the strength of the company's business jet sales "has provided us with an undeniable need to expand our service network."

Specifically, Embraer's plans to increase the number of its field service representatives in the U.S. by 50 percent are nearly complete. "This relationship is an important part of our customers' experience, and we are responding to their requests for more support," she said. At its customer care center in Brazil, Embraer recently doubled the size of its front-line staff to improve the frequency and quality of communication from the team, Woelber added.

In response to demand for training on its Phenom 100 and 300 light jets, Embraer plans to add a new full-flight simulator in Las Vegas through its joint venture with CAE, Embraer-CAE Training Services. It also plans for a new Praetor simulator to be in place at one of its FlightSafety training locations in the first half of 2023. "We are also actively working with regulators to expand some of the



remote training alternatives that were developed during the pandemic," Woelber said.

MRO services are also high on Embraer's customer support to-do list. Earlier this year, the company opened an expanded MRO facility in Sorocaba, Brazil, that doubled its size to 40,000 sq m (430,556 sq ft) in response to a growing installed base in Embraer's home country. In all, the company has six owned service centers in the U.S., France, Portugal, and Brazil, as well as 67 authorized service centers. Woelber said the company is growing that business through shift expansion but also plans to add more service centers. "Our customers like to return to the OEM for service, and we will grow our owned network to meet this demand," she explained.

To overcome any potential interruptions in the supply chain, "Embraer is investing in a level of inventory that outpaces the growth of the fleet," Woelber said. That way, the OEM can "mitigate the difficult external environment and have more buffer stock available for our customers."

GULFSTREAM AEROSPACE

THE RESULTS

Gulfstream Aerospace ranked second in the survey's Combined Overall Average Ratings of Newer and Older Aircraft with a score of 7.9, which was down from last year's Overall Average rating of 8.3 for the large-cabin models. The Savannah, Georgia-based manufacturer of mid- and large-cabin jets improved its scores in four categories including 7.5 in Cost per Hour Programs, 7.6 in Parts Availability, 8.0 in AOG Response, and 8.6 in Warranty Fulfillment.

THE IMPROVEMENTS

A boost in Gulfstream's AOG Response rating is just what Lor Izzard is looking for as v-p of field support for Gulfstream Customer Support. As leader of the unit that includes Gulfstream's field and airborne support teams (FAST), part of Izzard's focus in the past year has been growing the company's FAST teams. That includes expanding existing teams as well as adding new FAST team bases in cities such as Orlando, Florida,



and Las Vegas. "We're expanding the teams where we already have embedded teams but we've also decided...we're going to explore more locations," Izzard told **AIN**. "We are now exploring locations that we haven't before and are going to do so at a much higher rate."

SHIFT EXPECTATIONS

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› Gulfstream Aerospace continued

In addition to looking at permanent FAST bases, Gulfstream also experimented with establishing a long-term temporary FAST base in Bozeman, Montana. It's during the winter that Bozeman proves a popular location for its customers to go snow skiing. So, last November the company fully staffed a FAST base there for almost five months and brought along FAST One, Gulfstream's tractor-trailer "service center on wheels."

"This idea of setting up shop for several months with this full-time capability was a bit of a test for us," Izzard explained. "We've had a lot of really positive feedback." The Bozeman experience could lead Gulfstream to repeating it at other locations that are seasonally popular with its customers, he added.

Along with expanding FAST, the company is also looking at its current fleet of G150s that support FAST. Izzard said an aircraft with more range and capability to move large parts would be ideal. "There's a reason for us to explore a more capable airborne customer support fleet, and we're deep in the planning stages of that right now and trying to understand what

that next version is going to look like for us," he said. "As we leaped from G100 to G150 in the history of FAST, so far I think this next leap is going to be far more significant."

Other measures that the field support organization has undertaken in the past year include adding staff at the FAST command center who can expedite the moving of parts to customers in AOG situations. Around-the-clock service engineering is now available. Field service representatives have been added in Spain, Brazil, and Mexico, bringing their ranks to more than 40 around the world, according to Izzard.

Activity has also been robust at Gulfstream's MRO operations, with the company opening a 160,000-sq-ft service center at Fort Worth Alliance Airport in Texas and a 225,000-sq-ft service center in Mesa, Arizona in mid-2023. Joe Rivera, Gulfstream Customer Support's v-p of service center operations, told **AIN** that the OEM has already hired 65 employees for the new Mesa center and opened a temporary facility there in leased hangar space. "The idea is it allows us to build the trained staff," Rivera explained. "It also allows us to start positioning equipment."

TEXTRON AVIATION

THE RESULTS

At third in this year's survey was Textron Aviation, which saw a Combined Overall Average Ratings of Newer and Older Aircraft rating of 7.8 compared with an Overall Average of 8.1 in the prior year's survey for the Citation models. The manufacturer of Beechcraft and Cessna aircraft improved its rating in Overall Aircraft Reliability with a score of 8.7.

Among turboprops, the Wichita airframer's Beechcraft King Air received an Overall Average rating of 7.9, down from 8.2 in the 2021 survey. The twin-engine model series did see improvement in two categories: Authorized Service Centers, 8.4; and Cost per Hour Programs, 8.2.

THE IMPROVEMENTS

Brian Rohloff, Textron Aviation senior v-p of customer support, told **AIN** the company has largely been focused on hiring technicians across its service center network, considering that it's been a busy past year. "Our biggest accomplishment today is that we've added technicians,"



he said, acknowledging that it "is a challenge for all of us that are supporting GA aircraft. There's a high demand for A&Ps."

During the past year, Rohloff's organization has worked on a couple of new initiatives, including a revamping of its customer service app. While Rohloff said the app was

► Textron Aviation continued

“functional,” it needed improvement. With input from customers, the OEM pulled together a team of employees and set about changing the app. “The team did just a wonderful job redesigning that app to give our customers, at their fingertips, on their phone, the ability to approve work, defer work, see what was coming due next, and interact with their CSM,” he explained.

Another initiative involved a reorganization that involved creating a product support team specific to the company’s flagship Citation Longitude with its own leader and dedicated field representatives. “That’s been a wonderful reorganizational structure we made, and our customers are extremely appreciative of that level of support,” Rohloff said. “I think that’s made the Longitude service experience very positive.”

On the parts support side of Textron Aviation, senior v-p of parts and programs Kriya Shortt told AIN that the organization has been working hard to avoid any problems from supply chain disruptions. “The supply chain is somewhat constrained, and what I would say from a standpoint of being able to ensure our customers have what they need, our team have done a great job to go out and proactively bolster our on-order inventory,” she said. “So, I feel like Textron Aviation did a nice job getting out in front of that demand cycle.”

While “spot challenges” continue to arise in the supply

chain, “we’re having real conversations with our suppliers to ensure if or when a shortage occurs, we’re doing everything we can to minimize that to our customers and proactively communicating to our customers what we’re doing,” Shortt added. “And a lot of that is leaning into the strong agreements we have with suppliers.”

Shortt also noted that the company continues to monitor its parts distribution network and make adjustments based on customer needs. That included finding an extra 4,000 sq ft of existing space at its European distribution center in Dusseldorf, Germany, to expand the OEM’s parts inventory there.

Textron Aviation also continues to look at parts pricing and in cases

where a customer thinks “something is not priced correctly in the system, we want to hear from them and we want to make those adjustments so that we can earn their business,” she explained. “And I would say consistently about 55 percent of the time when a customer solicits us with that information, we’re moving that price in their favor.”

This past year, the company also held off raising rates on its ProAdvantage cost-per-hour program. Instead, Textron Aviation reduced rates by 3 percent. “We want to make sure that as you’re banking your spend with us, you feel there’s a strong value proposition for you in that Pro Advantage program,” Shortt said.

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THE RESULTS

Bombardier's Combined Overall Average Ratings of Newer and Older Aircraft edged lower in this year's survey to 7.6 from an Overall Average of 7.9 a year ago for the Challenger models. Improvement was noted in the Canadian OEM's Overall Aircraft Reliability with a rating of 8.7.

THE IMPROVEMENTS

Bombardier has been on a whirlwind of customer support activity in the past year through the development and opening of new and expanded service centers in Singapore; London Biggin Hill; Melbourne, Australia; and Miami-Opa Locka, Florida.

But that's only part of the activity the Montreal-based manufacturer of Learjet, Challenger, and Global jets has undertaken in customer support in the past year, according to v-p of customer service Anthony Cox. Cox told **AIN** that in addition to the service center activity as well as the opening earlier this year of a line maintenance station at Paris Le Bourget Airport, the company is beefing up its customer service center (CSC) operations by adding a third at its expanded Singapore service center. Its two other CSCs are housed in Wichita and Montreal.

"Between the three CSCs, with the added knowledge and virtual connections we have today, we'll be able to enhance that international support, which really helps us out because there's a great volume of widebody aircraft selling into the international region and it'll be a much nicer transition as opposed to the night shift in Montreal, where we're covering the world during the daytime," Cox explained.

Along with the enhanced AOG support provided by the CSCs, Bombardier also has established new mobile response teams in Orlando, Florida; Washington, D.C.; and Tulsa, Oklahoma. And at each of its company-owned service centers, the OEM has added "unscheduled response teams" who are available for drop-in aircraft service and provide additional AOG support in the geographic area surrounding those centers.

Parts has been another area of focus for Cox's organization. Early investment in parts inventory paid off for the company, he said. Beginning in March 2020, the company looked at utilization and made the decision to invest in additional parts from suppliers while demand



was low. "We did it at a risk, in fairness," Cox explained.

In all, he said the company invested \$150 million in inventory, about \$100 million of which went toward line replaceable units, or rotables, "to help us get through some of the supply chain difficulties that we knew the industry would face." The remaining \$50 million was largely spent on expendables, such as O-rings and filters. "So, the off-the-shelf ratios have been maintained at an extremely high level," Cox said. "It's been difficult for all OEMs, but I think that our early investment in rotables and expendables, gathered up with some increase in staffing to cope with the high utilization, has put us in a really good spot relative to some of the industry issues."

Bombardier has also met its reliability targets from both aircraft dispatch availability and mean time between unscheduled removal. "We're seeing this amazing performance from the products, and our operators—the large fleets—are operating the aircraft in excess of 1,000 hours a year," he said. "For corporate aircraft five years ago, most would have said that's unheard of, but I've seen it across all the fleets." That has provided the OEM with some "amazing data," Cox added, which in turn has allowed Bombardier to optimize maintenance programs for its aircraft, such as expanding intervals between maintenance checks and shortening aircraft downtimes for maintenance.

DASSAULT AVIATION

THE RESULTS

Dassault Aviation saw its Combined Overall Average Ratings of Newer and Older Aircraft score fall 1.2 points to 7.5 after a rating of 8.7 last year. The French airframer received high ratings for Authorized Service Centers, 8.7; and Technical Reps, 8.8.

THE IMPROVEMENTS

Following its 2019 acquisition of Tag Maintenance Services and ExecuJet MRO, Dassault is investing in upgrades and expansions at a number of facilities. They include Dubai, where the new facility will open by the end of this year, Kuala Lumpur, and Reno, Nevada. Additionally, the OEM has opened a new line maintenance station in Basel, Switzerland. The company closed its service center in Wilmington, Delaware, but continues to evaluate further expansion in the U.S.

Jean Kayanakis, senior v-p of worldwide Falcon customer service and service center network, told **AIN** that the company has also added field service technicians in growth markets, including Vietnam. “It has become a hot market, and we now have tech reps in Hanoi helping flight departments who are new to business aviation and are coming up the learning curve quickly,” he said.

During the past year, Dassault completed a customer service reorganization that included the transfer of all its technical support teams to its Bordeaux-Mérignac facility, where



they can collaborate with Falcon engineering, production, and maintenance.

On the parts front, Dassault has increased its inventory to support the entry into service of the Falcon 6X next year. Already, spares for the 6X are flowing to the field, Kayanakis said.

He also noted that in the past year Dassault has transitioned to a new inventory management system. “Doing so amidst Covid staffing and supply chain issues didn’t make this any easier, but it was important for the long term to have modern tracking systems,” Kayanakis explained. “Over time, customers will see the benefits.”

PILATUS AIRCRAFT

THE RESULTS

Once again, Pilatus Aircraft was tops in the survey’s turbo-props category with a Combined Overall Average Ratings of Newer and Older Aircraft score of 8.6. That compares with 8.8 in the 2021 survey. The Swiss airframer received high marks for Factory Owned Service Centers, 9.1; Parts Availability, 8.3; Cost of Parts, 7.2; AOG Response, 8.6; Warranty Fulfillment, 8.9; Technical Manuals, 8.8; Technical Reps, 9.2; and Overall Aircraft Reliability, 9.3.

THE IMPROVEMENTS

Pilatus has continued its traditional activities to support its venerable PC-12 single-engine turboprop, now in its third



► Pilatus Aircraft continued

iteration as the NGX, such as hosting annual conferences for individual, utility and fleet, and government and special missions operators. But the bulk of the organization's focus has been on supporting its newer PC-24 business jet, v-p of customer support Piotr Wolak and v-p of marketing Tom Aniello told **AIN**. This past year was the first year that Pilatus was able to hold its first in-person PC-24 operator conferences, beginning last December. "By the time we got enough in-service experience [with the PC-24] pretty much Covid hit," Wolak said. "We had all good intentions of doing this earlier but unfortunately with everything going on in the world, we just weren't able to travel. It was, I would say, probably a couple of years overdue but we couldn't have done it any earlier in person, anyway."

Also in the past year, the company has activated a technical support call center in Australia, giving Pilatus "true 24/7

coverage around the world," Wolak said. Broomfield, Colorado, and Stans, Switzerland, are the two sites where the company's other call centers are located.

Wolak said a top priority is improving the company's supply chain distribution system. "Getting things from Europe to us back in the good old days, just a couple of years ago, was an overnight proposition," he explained. "Not so much anymore. Everybody's struggling with this. The company invested quite a bit of money in spare parts. The next trick is to figure out how to efficiently move them close to the aircraft."

Part of that improvement has involved expanding Pilatus's supply chain customer support team in Stans. Broomfield and Australia are next, he said. "When you have to tell [a customer] the part is stuck at Charles de Gaulle for a week with an AOG sticker on it, which believe it or not does happen, it's terrible."

LEONARDO

THE RESULTS

Leonardo scored highest among rotorcraft OEMs in this year's survey with an 8.6 in Combined Overall Average Ratings of Newer and Older Aircraft, which was up from 8.3 in 2021. The Italian manufacturer also improved scores in every service and support category of the survey: 8.8 for Factory Owned Service Centers and Authorized Service Centers, 8.1 for Cost per Hour Programs, 8.4 for Parts Availability, 7.8 for Cost of Parts, 8.9 for AOG Response, 9.1 for Warranty Fulfillment, 8.9 for Technical Manuals, 9.0 for Technical Reps, and 8.6 for Overall Aircraft Reliability.

THE IMPROVEMENTS

Maurizio D'Angelo, v-p of customer support services and training, told **AIN** that the company continued its path begun in 2020 to re-evaluate and improve its procedures, processes, and investments. That included opening a 2,000-sq-m (21,528-sq-ft) customer support and service center at Paris Le Bourget Airport, unveiling its Philadelphia training academy, and opening an FAA-approved maintenance facility outside Pensacola, Florida.



The OEM also carried on its investment in spare parts distribution with a worldwide distribution availability valued at \$1 billion. Leonardo maintained fixed prices from 2020 until April 2022, D'Angelo said, "only adding gradual increases when our customers were back to operating at more sustained business levels and flight activity."

AIRBUS HELICOPTERS

THE RESULTS

Airbus Helicopters recorded a Combined Overall Average Ratings of Newer and Older Aircraft score of 7.3 in this year's survey, edging lower from the Overall Average of 7.6 in last year's survey but with a high rating of 8.8 for Authorized Service Centers.

THE IMPROVEMENTS

A big focus at Airbus Helicopters was the unveiling of an HCare customer support program that was revamped to be more flexible and customizable, executive v-p of customer support and services Christoph Zammert told *AIN*. The refreshed HCare program now includes different packages and more options for customers, he said, and is designed to "accompany the customer based on where he or she is in the lifecycle of the product and the kind of relationships he or she has with Airbus Helicopters. It seems like the feedback we have received since launching this new HCare offering is quite positive. Our customers say that it's more



understandable, and it indeed answers more to their needs."

The European airframer also changed the way it manages AOG by extending out-of-office hours support for customers needing engine resources, he said.

Airbus introduced a VRM mobile flight training device for the H125 helicopter that Zammert said will make training affordable and improve safety. "We feel that this is making a step-change, especially from an aviation safety point of view."

BELL

THE RESULTS

Bell did not garner enough survey responses to be rated in this year's survey.

THE IMPROVEMENTS

Chad Nimrick, director of Bell support and service, told *AIN* that Bell's customer support activities have been focused in part on adding line/field maintenance stations, called aircraft maintenance centers, in Asia, Africa, and Europe. "We're really just basically following where our installed fleet is being deployed," he said.

Asia has been one area where Bell has seen a "pretty good mix of demand" for its 407, 412, and 429 helicopters, which he attributes to growth in helicopter pilot training in China and operators figuring out how to use those aircraft for more types of missions.

Bell also has implemented an AOG call center at its Fort Worth, Texas headquarters that provides 24/7 global support, he added. "Now we have a centralized organization [and] that's all they do is work on AOG solutions across the globe."



As with other OEMs, parts availability remains a challenge, but for Bell, "We have implemented over the past several years some very strong global ordering agreements with our suppliers," he said. "Our suppliers have actually done a pretty decent job of holding true to that. We're starting to see a little bit of a challenge right now as the GOAs [global outline agreements] become due and we're renegotiating the GOAs, but in general, I think through the pandemic we actually did relatively well."

ABOVE & BEYOND

OEMs

Paul Van Kley (Bombardier)

He is the most responsive and knowledgeable technician that we interact with on aircraft. He is never too busy or not willing to assist on aircraft issues.

Daniel Prairie (Bell)

He is always available when we need him and he tries his best to get our requests resolved.

Rick Best (Textron Aviation)

Rick has been critical for us in solving both parts and the occasional maintenance issues with our CJ2+ and another CJ2 that is operated by a different owner. His service is priceless!!!

Brian Ray (Dassault)

Brian recently moved into our area. He's been really active at building customer relations and has helped us multiple times even though our aircraft is not one of the models he's specifically assigned to cover. He is always willing to help where he can.

Lucas Otterstetter (Gulfstream)

Always has precise answers to complex technical problems.

Doug Taylor (Embraer)

Best FSR I have ever worked with. If I have an issue, he owns it until it is resolved. He is my go-to guy for issues and help in understanding the plane.

Andrea Amodeo Giovanni (Leonardo)

Keen to be transparent and listens to customer/operator challenges to improve overall services.

Service Centers

Ryan Oestmann (Duncan)

The best project manager I have ever worked with.

Thomas Bartolomeo (Aero Star Aviation)

Tommy is one of the few you can call all hours of the day and he answers. Not only does he answer, he can walk you through troubleshooting and have parts ordered before he arrives.

Mike Ditmeyer (West Star Aviation)

Mike is excellent to work with and keeps projects rolling along on time and on budget. Always a pleasure to work with. I was a customer of his at his previous employer, and when he moved I followed.

Lee Miles (Western Aircraft)

Stellar support and industry service knowledge and ethics.

Gabriele Ghilardi (Tag Maintenance Services Lugano)

Mr. Ghilardi treats every customer as if they were his most important. Fantastic support in every regard.

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100 years of air traffic control

BY AIMEE TURNER



During the 1920s, airplanes like this Airco DH.4 bomber, designed by Geoffrey de Havilland, were pressed into airline service, in this case for flights between London Croydon Airport to Paris. At that time, air traffic control consisted of red and green lights for takeoff.

Advances in aviation safety often happen only as a result of significant accidents. Air traffic control (ATC) offers a case in point.

International air traffic rules were drawn up in 1919 by the Commission Internationale de Navigation Aérienne (CINA). However, those rules were not actually ratified by 10 countries until 1922, when the first midair collision between commercial aircraft occurred. That accident, over Normandy in France, prompted countries such as the United Kingdom, France, Belgium, and the Netherlands to put the framework into action.

Philippe Domogala, an air traffic controller who is heading the 100th-anniversary celebrations for the International Federation of Air Traffic Controllers' Associations (IFATCA), said that over the years, many improvements to ATC have resulted from collisions and other accidents.

Domogala—who together with IFATCA colleague Philip Marien plans to publish a

comprehensive history of air traffic control later this year—believes that the air traffic control field has tended to react to events rather than be proactive.

Interestingly, while the first midair collision in 1922 undoubtedly accelerated the move to systematically regulate air operations, air traffic control's year of birth is a hotly contested issue. Countries such as the UK were swiftly developing their own domestic aviation economies and argue that it actually occurred several years earlier.

Certainly, before the advent of the commercial aviation industry, there was no serious effort to help pilots navigate their aircraft with anything but the most basic methods of communication involving ground crew.

During World War I, German airships were the first to apply goniometry—measuring the angle to the target radio source by performing direction-finding—as well as to employ

a system of complex visual signals on land. Generally, however, onboard radio equipment was deemed too cumbersome for the small and arguably fragile aircraft of the day.

Most pilots of early aircraft would instead look for bonfires, lighthouses, and painted concrete arrow signals en route and, when approaching their destination airport, would watch for flares and other bespoke methods of visual signaling.

WORLD WAR I BROUGHT ATC CHANGES

All that changed with the end of World War I when thousands of air force pilots were able to fly the surplus military aircraft that had been quickly converted to civilian use. And so the first small commercial airlines were launched, operating from emerging aviation hubs throughout Europe in cities such as London, Paris, Brussels, Amsterdam, and Berlin.

With the birth of passenger air travel, it was becoming critical to know where aircraft were, where they were headed, and approximately when they would arrive at their destinations—information that is at the heart of air traffic control.

Since that watershed year of 1922, aircraft have been monitored using a wide array of tracking systems—employing everything from paper, wooden markers on a map, and light dots on a glass plate to radio direction finding, radar displays, and recent space-based technologies that feature satellite ADS-B surveillance.

CINA's first international rules of the air soon made radio communication mandatory on all passenger-carrying aircraft. These aircraft—mostly biplanes carrying 12 passengers—still needed visual signaling for takeoff as radios would not work on the ground. It was not until the aircraft was airborne and when the pilot could unfurl the radio's antenna that periodic updates on positioning could be made via either voice or Morse code.

“The departure aerodrome would meanwhile communicate with the destination, confirming takeoff time, passenger numbers, cargo, and the aircraft registration,” explains CANSO, the Civil Air Navigation Services Organisation. “Weather quickly became a staple of these conversations, too. While pilots could not communicate with each other, communication with the ground was on an open frequency and there were rules of the road, such as keeping to the left of a particular landscape feature or notable landmark.”

Rules governing vertical separation between aircraft were also established at this time (300 meters when possible, 150 meters in some cases)—rules that were overseen by the first European regulatory bodies for aviation. The U.S. followed suit in 1926 when it passed the Air Commerce Act, which saw the establishment of aviation regulation at the federal level as well as pilot licensing a year later. It would, however, take another two years for the first U.S.

air traffic controller, Archie League, to be employed privately by St. Louis Airport to direct landings and takeoffs using flags.

A REVOLUTIONARY PACKAGE

The first instrument navigation package was to be used by U.S. Army Lieutenant James Doolittle in September 1929. Research at the Full Flight Laboratory, established by Harry Guggenheim, helped develop an extremely accurate barometer, a radio direction beacon to help land, and a Sperry artificial horizon and gyroscope. This equipment allowed Doolittle to fly 15 miles without having to look outside his cockpit once, which according to the founders of the Century-of-Flight.net website was revolutionary.

Since the watershed year of 1922, aircraft have been monitored through tracking systems ranging from paper, wooden markers on a map, and light dots on a glass plate to radio direction finding, radar displays, and space-based technologies.

In the 1930s, air traffic control was developing fast. By 1933, the airspace around important aerodromes was mostly fully controlled, with pilots needing permission to enter by booking a slot before they folded up their antennas and made final preparations to land. This led to the separation of the tower control from the en route control function with specific officers in charge of managing aircraft that had yet to enter the terminal airspace.

The 1930s also saw the first use of radio

beacons, which began to be sited along major routes such as the East and West Coasts of the U.S., and across Europe and North Africa, reflecting the increasing range of passenger aircraft that was driving the proliferation of intercontinental routes. It was, however, the advent of the Douglas DC-3 that revolutionized air travel. Fast and with a good range, it was more reliable and carried passengers from New York to Los Angeles in 18 hours with only three stops. That maturing of aircraft technology required the simultaneous development of air traffic control, and so the centralization of ATC facilities in the U.S. was a logical next step.

Meanwhile, in Europe, the start of World War II saw a significant leap in modern radar technology. In Britain, the Royal Air Force (RAF) continued to build the Chain Home network of 40 coastal early-warning radar stations to detect and track aircraft. In Germany, the Lorenz beam blind-landing radio navigation system had been deployed at many airfields by the Luftwaffe, which also equipped most of its bombers with the radio equipment needed to use it. This was the forerunner of the modern instrument landing system, which provides horizontal and vertical positioning and distance information.

The end of World War II saw the establishment of the United Nations specialist agency the International Civil Aviation Organisation (ICAO), whose signatory states signed up to the foundational Chicago Convention. This featured specific annexes laying down the global rules for air traffic control, including phraseology and control methods such as night and bad weather landings. This framework would prove essential as—similar to what happened at the end of World War I—the large fleet of now-redundant military aircraft laid the foundation for a much bolder airline renaissance.

In 1951, 15 years after the groundbreaking DC-3 entered the stage, the Lockheed Constellation debuted. A year later, the

first jet transport aircraft, the de Havilland Comet—which operated at much higher altitudes and was much faster—joined the global fleet. The superior range of both aircraft allowed airlines to be more adventurous in terms of route network and made trans-oceanic operations a reality, which in turn resulted in the development of the first oceanic control centers.

ESTABLISHING RADAR-CONTROLLED AIRSPACE

It was in 1956—more than three decades after the formative midair collision in France—that U.S. authorities moved to establish radar-controlled airspace en route after a United Airlines DC-7 struck a Trans World Airlines L-1049 Super Constellation over Grand Canyon National Park in Arizona, killing all 128 people on board. The collision took place in uncontrolled airspace, where it was the pilots' responsibility to maintain separation using the "see and be seen" principle. The tragedy highlighted the antiquated state of air traffic control on both sides of the Atlantic, and the U.S. and Western European countries saw the need to make major aviation reforms. The development of faster aircraft in the late 1950s also underlined the need for additional separation margins—600 meters or 2,000 feet above FL290—in an effort to split these faster jets from slower air traffic.

By the 1960s, most congested air regions had become radar-controlled, and with more secondary aviation economies ramping up operations, regions soon identified the need for a far more harmonized approach to managing the airspace and procedures. This led to the formation of the pan-national air navigation agencies such as Eurocontrol in Europe and ASECNA covering much of Africa.

In 1969, the development of the Boeing 747 led to special wake turbulence separations and the arrival of the supersonic era, with the Concorde and the Tupolev 144, forced authorities to develop specific

During the latter part of the 1970s, a major collision was occurring every year, and, combined with hijackings, they put air traffic control in the spotlight.

procedures and assign designated tracks and routes for these aircraft.

The 1970s saw the continued growth of air traffic, which led to the recruitment of a huge controller workforce, although poor conditions and pay led to major strikes.

The largest strike occurred in France in 1973, Domogala recalled, when the government of the day locked out the striking civilian workforce and replaced it with military controllers. Soon after, in March 1973, an Iberia McDonnell Douglas DC-9 and a Spantax Convair 990 traveling to London Heathrow airport collided over Nantes, France. All 68 people on the DC-9 were killed.

During the latter part of the decade, a major collision was occurring every year—for example, in 1976 in what is now Croatia (176 victims), in 1977 in Tenerife in the Canary Islands (583 victims), and in 1978 in San Diego (144 victims). These disasters, combined with numerous hijacking incidents to put air traffic control in the spotlight.

The last major strike led by the PATCO air traffic controller union in the U.S. in 1981 resulted in the firing of 11,350 controllers and their replacement by military personnel. This sent a shockwave through the industry, leading to many ATC organizations reviewing working conditions and pay and launching equipment upgrades in a bid to head off similar industrial action in their own countries.

A SHOCK TO THE SYSTEM

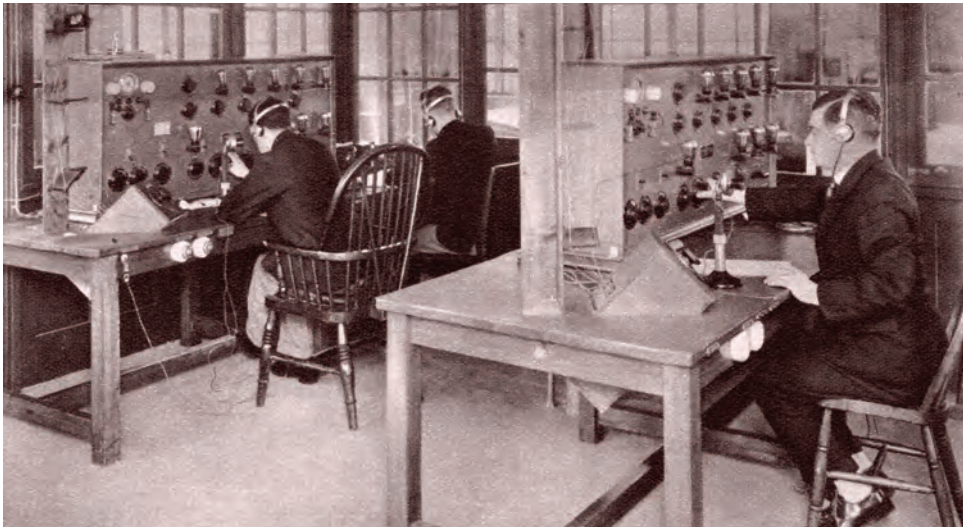
Fortunately, this system shock coincided with increased digitalization, which the industry employed to automate the many routine ATC tasks, which while improving safety also reduced controller workload.

The 1990s were characterized by even more technological advances, such as electronic flight plan processing and automated data exchange between facilities, which started to make obsolete the traditional telephone technology that was used to communicate on the ground internally and between ATC facilities. Onboard TCAS and short-term conflict alert systems were also introduced as were the first examples of simulators for training.

By the 2000s, these technological advances were being steadily consolidated. Global positioning systems (GPS) were starting to replace ground-based navigation infrastructure, enabling free route airspace operations. Controller pilot data-link communications (CPDLC) were fielded while extended-range twin-engine operational performance standards (ETOPS) opened up a new range of routes and reduced vertical separation minimums (RVSM) at 1,000 feet above FL290 saw a doubling of capacity in highly congested airspace.

Tragedy struck again, however, in 2002 when a Russian-operated Tu154 collided at night over Uberlingen, Switzerland, with a cargo Boeing 757-200, killing 71 passengers, most of them children. The collision occurred after an ATC control lapse led to a conflict that generated a series of resolution advisories that the Boeing aircraft followed but the other airplane—which received a conflicting ATC instruction—did not.

Only one air traffic controller at the Zurich-area control center was controlling the airspace through which the aircraft were flying. The other controller on duty was resting, which was against regulations. Maintenance work was being carried out on the main radar image-processing



The NATS tower radio room in 1928.

system, which meant that the controllers were forced to use a fallback system while a ground-based optical collision warning system—which would have alerted the controller to the pending accident about two and a half minutes before it happened—had also been switched off for maintenance.

The tragedy led to major upgrades to both TCAS and improved ATC procedures. However, a subsequent murder of the air traffic controller on duty at the time of

the air crash by the father of one of the victims sent another shock wave through the profession.

The next decade witnessed several technology breakthroughs with the digitalization of air traffic control, remote tower technology, and even the launch of remote control centers supported by increasing levels of automation. The focus of the industry started to move from safe separation of aircraft and preventing collisions—which was now a given—to optimizing the

flow of traffic to reduce airline delays.

Here, Domogala cautioned that the famous “keeping the human in the loop” paradigm often used by engineers when developing systems has always been the professional ethos. “Humans have always been there and are in fact the real definition of air traffic control,” he said. “Most large multinational projects to achieve more automation have failed and it still is us, the human controllers, with better tools than before, of course, providing separation and control of traffic in an efficient and safe manner.”

RECOVERING FROM THE PANDEMIC

Now, as the industry recovers from the global pandemic, which saw a drastic drop in air traffic, the priority is on trimming the costs of air traffic control for the airlines in addition to reducing aviation’s carbon footprint.

Duncan Auld, who is president of the IFATCA, argued that as the recovery commences, fundamental questions about the way air traffic control is funded need to be asked. “We hear from all sides that aviation is at a crossroads. While we do have

NATS CELEBRATES CENTENNIAL

It might be a little unusual to celebrate a centenary over two years, but the leading UK air traffic control organization, NATS, said in 2020 that it hoped its followers would permit a little creative ambiguity when it came to starting the celebrations.

“Major developments in early air traffic control occurred between 1920 and 1922, such that we think of this period as its inception point,” says NATS’s Paul Beauchamp. “Of course, it didn’t emerge fully formed, but the intent to aid the safety and efficiency of aircraft was clearly there among those early pioneers.”

While a dozen flights a day took off in 1920, now 2.6 million aircraft are controlled every year by NATS. But the blueprint laid down in

places like Croydon Airport in the 1920s—where the first control tower was built—remains recognizable. “It is only now, 100 years later, that things like digital towers and satellite surveillance are rewriting that blueprint and ushering in a new era,” said Beauchamp.

As demand grew for air travel, it became clear that a more organized way of safely managing aircraft was essential, and so the development of a system of air traffic control began. It was an iterative process and nowhere was that more the case than at the UK’s designated primary “air port” in Croydon.

On Feb. 25, 1920, the UK Air Ministry gave approval for the construction of an “aerodrome

control tower” at Croydon, to be “erected 15 feet above ground level” and with “large windows to be placed on all four walls”—a design that today remains recognizable. Croydon Airport opened in March 1920, taking over from Hounslow as London’s main airport, and the control tower was operational later that year.

The first controllers—known as civil aviation traffic officers or CATOs—and the radio officers who worked alongside them provided traffic and weather information to pilots over the radio or via a system of flags or lamps. Croydon also had what were called “direction finding” services beginning in 1920—using radio

continues on facing page ►



London's Croydon Airport in 1925, where air traffic control was first implemented in the UK. Controllers gave light signals for takeoff and received position reports via radio.



James "Jimmy" Jeffs (left), considered the "father of air traffic control," at London Croydon Airport around 1928. The photo on the right shows the first air traffic control tower, at Croydon.

an opportunity to look at airspace design, optimizations, or conduct the refresher training that has been postponed over the past years due to staff shortages, etcetera... we have been at this very same crossroads before. Every time, the way the system is set up forces it to take the easy road, the most obvious path of stopping training, not replacing staff, and hoping that, against better judgment, technology will come and save the day when it is needed."

Auld urged that air navigation service providers—and those that fund them—take this opportunity to make substantial improvements, using the expertise that has been freed up until traffic returns. "This is an investment into the future of the industry," he said, "but we need a system that is willing to make this commitment and to ensure consistent funding for air navigation service providers under all circumstances."

For Domogala, it is equally important not to forget that people, not machines, interpret the data and determine what is needed to separate aircraft to ensure the safety of air transport. "All the advantages and working conditions we currently enjoy have been fiercely fought for," he said. "The fatigue issues leading to reduction of hours in working continuously at the position, the early retirements, the remunerations, the legal protection after an incident or an accident, etcetera—all these things that some might take for granted today have had to be fought for by our colleagues."

100 years of Air Traffic Control (1922-2022)—History, Stories, and Anecdotes by Philippe Domogala and Philip Marien will be published by IFATCA in October 2022 to coincide with the International Day of the Controller. ■

► NATS Celebrates Centennial continued

signals to find an aircraft's bearing from the airport—and also perfected the more sophisticated system of wireless position fixing, which allowed the CATOs to triangulate the location of aircraft via the bearings from three radio receivers. The bearings were passed to Croydon where the aircraft's position was manually calculated and passed back to the pilot.

Among the British ATC pioneers was James "Jimmy" Jeffs, a civil aviation traffic officer at London Croydon airport, who was one of the innovators in developing the discipline of air traffic control. Holder of the first-ever air traffic control license, Jeffs helped develop many of the systems and procedures that were approved by the UK Air Ministry. After establishing over 25 ATC units and the first controller training college, he led the establishment of the North Atlantic Airspace and the "track" system, which is only now becoming obsolete thanks to real-time satellite surveillance.

Another British pioneer was Fred "Stanley" Mockford. Moving from Morse code to radio telephony introduced the need for a new way to use language to ensure messages were clearly understood. A railway telegrapher, Mockford served in the Royal Flying Corps during World War I as part of a team developing ground-to-aircraft communication.

Mockford used that experience to help develop Croydon's system of wireless position fixing. In 1923, Mockford conceived the distress phrase "Mayday, Mayday, Mayday" (based on the French word "m'aidez," meaning "help me"), which was adopted as the international standard distress phrase in 1927.

The redevelopment of Croydon in the 1920s saw the construction of a second tower in 1923 and a third and final tower in 1928. The iconic square white tower—alongside the new terminal building—remained in operation until the airport closed in 1959. **A.T.**

► Dassault Falcon 6X continued

With dual FalconEye combined vision system head-up displays, both of the 6X's sidestick controls have switches to turn on and off HUD imagery.

EASy IV avionics improvements include 2D and 3D airport moving maps, ADS-B In display of airborne and surface traffic, SiriusXM weather, and runway overrun awareness and alerting system.

The 6X's takeoff/go-around button is more accessible, on the side of the power levers instead of on the back of the levers like the 8X. "This one is more natural when you want to go around," said Ferry.

ELECTRICAL IMPROVEMENTS

Breaking new ground in Falcon design, the 6X's electrical system is an AC-based design, unlike previous models' DC heritage. "In the 6X," Ferry said, "we've got some DC busses and AC busses. It's more complicated for the crew to configure or reconfigure the systems, so in this aircraft, in maybe 95 percent of the failures the reconfiguration is completely automatic."

A ram-air turbine (RAT) provides backup power in case of engine- and APU-driven generator failure.

Modifying and simplifying the 6X's hydraulic system was a key goal and gives pilots a more automatic backup system with greater redundancy. "There is a huge difference between the 6X and 8X," said Ferry. There are two electrically-driven hydraulic power packs (HPP), one for each hydraulic circuit, he explained. "It's a system which gives some robustness to the most principal [control] surfaces of the aircraft in case of hydraulic failure."

The 6X carries 33,790 pounds of fuel, giving it a maximum range of 5,500 nm at Mach .80 carrying eight passengers and three crew. At Mach .85, range drops to 5,100 nm. Maximum speed is Mach .90.

A new landing gear feature is a brake heater, which is switched on after gear retraction and during the initial descent to clear any frozen water. When the parking brake is set, it automatically is switched to a higher pressure when the power is advanced from idle. Because the 6X's parking brake is electric, it can't be used

for emergency braking as on the 8X, so an alternate braking switch is available. This provides half the hydraulic braking pressure but no anti-skid. Autobrakes will be certified after entry into service.

FLIGHT CONTROLS

A significant new feature in the 6X is the flight control system, which incorporates a flaperon (flaps that double as ailerons) on each wing, eliminating the spoilers used on the 8X and 7X. The flaperons move in the same direction as ailerons to enhance roll control. "It's very precise," said Ferry. "All the pilots say that it's a huge difference between the 8X and the 6X."

Four airbrakes (two on each wing) increase drag, but only at the maximum setting AB-2. In the AB-1 setting, flaperons move down to increase drag. This configuration reduces vibration for both airbrake settings, to a significant degree compared to the spoiler-equipped 8X.

Roll control is still fully available because the opposite side aileron can move down. "Because the airbrake position for aileron/flaperon is like a new reference or new zero [point]," Corsia said, "and if you control through all the roll, it will come off the new zero position." While this all sounds complicated, she acknowledged, "It's easy to use."

Flaperons serve one more purpose, and that is aiding in pitch control in case of an elevator control failure.

Flying a steep approach will be slightly different in the 6X. For airports like London City with its 5.5-degree path, pilots will use the AB-1 setting at Vref. This increases drag but doesn't change the angle-of-attack (AOA) so the view from the flight deck will look like a normal landing, according to Ferry. For 6 degrees or steeper, AB-2 will be required at Vref +5. This is because above 6 degrees at AB-1 or AB-0, the 6X would accelerate, he said, "even if you are in the landing configuration."



Final assembly of the 6X at Dassault's Bordeaux-Mérignac factory in France.

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ATLANTIC

For 6X pilots, Ferry said, “The aircraft is very easy to land. You’ve got sufficient precision of the touchdown.” Airfield performance is close to that of the 8X, but the new flight-control system results in much smoother touchdowns, a “kiss landing” every time, he said.

FLYING THE 6X

In the SITS, we went through the start-up procedure and then some of the profiles and maneuvers that I would be flying in the real 6X.

On the day we flew, the wind at Istres Air Base was nearly calm and the temperature 68 degrees F, with a few wispy high clouds in an almost clear sky. Takeoff weight was 57,900 pounds with 12,040 pounds of fuel, well under the 77,460-pound mtow. For our flight, Vr and V1 were 115 knots and V2 120 knots. Ferry was in the right seat and I was in the left seat, while Valette flew in the jump seat. Corsia kept tabs on us from the salle d’ecoute, the telemetry monitoring center at Istres, where she maintained direct radio contact with us during the flight.

After waking up the 6X and starting the APU, I twisted the start knob and watched engine 2 and then 1 run through their start-up process. We would be staying in the vicinity of Istres and Marseille, so no complicated flight planning was necessary.

I released the parking brake and started taxiing toward Runway 15, which is 12,303 feet long. At first, I overcontrolled the nosewheel steering; it is somewhat sensitive but as I soon figured out, precise and easy to operate smoothly.

With slats/flaps set at SF2, Ferry had me hold the brakes on the runway and then apply full power before releasing the brakes.

Takeoff didn’t feel too different from the 8X in terms of handling, but we did get a hefty push from the two 13,500-pound thrust PW812D engines, which easily exceed the total 20,175 pounds from the 8X’s three PW307Ds. I gave



Briefing for the 6X demo flight in the systems integration test station simulator.

“ All the pilots say that it’s a huge difference between the 8X and the 6X. ”

the sidestick a gentle nudge at Vr and the 6X launched smoothly into the air.

When flying a fly-by-wire Falcon, I enjoy the simplicity of the flight control system, at least in terms of pilot interface, and the 6X is no exception, needing just a tiny nudge of the sidestick to set the climb flight path to 10 degrees. We soon sped up to 250 knots for the climb to 15,000 feet.

Flying out of Istres is a pleasure because there is hardly any other traffic, perhaps another Falcon doing flight test work or some Dassault Rafale fighters in the traffic pattern. But we pretty much have the airport to ourselves, along with a dedicated controller and Corsia in the salle d’ecoute.

The 6X felt tight, responding instantly to my control inputs and flying precisely as I wished. Dassault’s flight path-stable fly-by-wire design is familiar enough by now that I found it natural to select the desired flight path and then barely touch the sidestick until I needed to change the flight path.

On the way to 15,000 feet, I turned while climbing to try out the controls, then

once leveled off, flew some 30-degree then 60-degree banked turns. This 6X has only one HUD for the left-seater, and I took full advantage of it, putting the flight path marker on the zero-pitch line to maintain altitude during the turns.

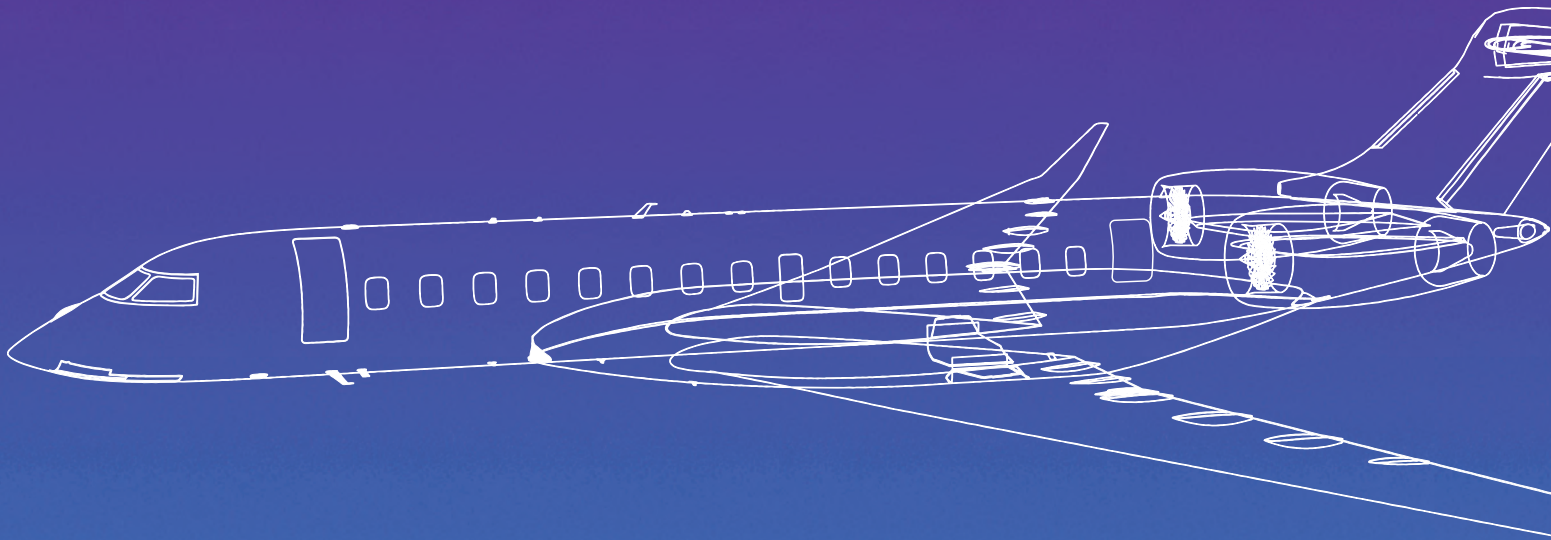
I pulled the power back to idle for a Vmin demonstration and watched on the HUD and PFD as an AOA symbol moved down toward the flight path vector, indicating that we were nearing a stall. Before that could happen, however, the flight control protections lowered the AOA to prevent the stall, which would have happened at 120 knots. With the landing gear up but slats/flaps 2 selected, I held the sidestick all the way back and we slowed to 110 knots while I banked from side to side. There was quite a bit of pressure on the stick while I pulled it back, but that is the protection trying to counter the pilot’s action and prevent a stall.

After cleaning up the airplane, I moved the power levers to the maximum climb power detent and headed for FL400 at 260 knots and then Mach .78. Climbing



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through FL300, rate of climb was 2,400 fpm and at FL350 1,700 fpm.

At FL400, I replicated the 30-degree turns and slow flight that I had just done at 15,000 feet, and the flight control system faithfully gave me the same experience. I didn't have to change the way I flew the airplane just because we were higher and closer to corners of the flight envelope where you have to be more careful. The 6X behaved admirably and just as responsively as at the lower altitude.

After pulling the power to idle, I pushed the nose down to descend, remaining within a flight test limitation of Mach .90 or 350 knots. I reached to the center console to apply AB-1 and then -2 to feel the reduction in vibration compared to the 8X. With AB-2, there was a gentle rumble but other than the faster descent rate, hardly any feeling that the airbrakes were deployed.

Leveling off below FL150, I did some maneuvering with various airbrake settings then a Vmin demo with SF3 and landing gear down so I could feel the handling in landing configuration. Again, I pulled the sidestick to the aft stop and held it there and the 6X got quite slow, not too much above 100 knots, while banked from side to side.

One of the flight control system's degraded modes is direct law, and Ferry switched to that so I could feel how the handling changes. In this mode, there are no protections and the controls feel more like a conventional non-fly-by-wire airplane. I tried various maneuvers, using gentle control inputs, then Ferry reset the controls back to normal.

For our first landing with SF3 set, I set up an approach to Runway 15 at Istres, and on final, Ferry had me align the 6X with the taxiway and then at 500 feet agl slide over to line up with the runway, so I could assess controllability while close to the ground. The 6X handled like a much lighter



After our 6X flight with Bruno Ferry (left) and Tom Valette (right).

airplane, and it was easy to point the nose exactly where I wanted while the autothrottle helped keep the 6X on speed.

At 200 feet, Ferry called for a go-around and I pushed the TOGA button on the side of the power lever. The autothrottles quickly advanced while I pulled back on the sidestick to set a climb attitude, then I pulled the power back to level off at 1,500 feet in the right-hand traffic pattern. The second approach, also with SF3, was to a normal landing, although I got a bit low on the right base and I could feel the autothrottles advancing when I held the nose up to keep from getting even lower. After turning final, speed and altitude were on target, and I proceeded to my first 6X landing, which as Ferry had predicted was a "kiss landing." The view on final gives the pilot plenty of visibility and the nose attitude is relatively low, making it look as if it will be necessary to pull the nose up in the flare to make sure the main wheels touch first. But I resisted that feeling and after making sure the power levers were at idle descending through 50 feet, I made some small corrections with the rudders to align with the centerline and just barely pulled

back on the sidestick, then the 6X was rolling on the main wheels with absolutely no firmness to the arrival. I let the nose drop then deployed the thrust reversers briefly, needing no braking to slow down.

We taxied back to Runway 15 for another takeoff. This time, as we passed Vr, Ferry pulled the right engine to idle and I continued the takeoff without needing any abnormal moves other than a small amount of left rudder to keep on heading. I maintained V2 + 10 then accelerated to 160 knots briefly until it was time to level off at 1,500 feet for the right downwind.

This landing was with the "good" left engine still producing power, and trying to avoid getting too low on base, I held altitude too long and ended up too high and too fast on final. The 6X made me look good, however, and easily adjusted to my errors. When I stopped trying to work so hard, the 6X settled down and the rest of the approach started to look more normal, albeit at a slightly higher Vref due to the one engine out. The result was another perfectly smooth landing. ■

A longer version of this article is available at ainonline.com/aviation-news/pilot-reports

CAE enhanced recurrent training brings human factors-based scenarios to bizav

BY STUART "KIPP" LAU



CAE has introduced an enhanced recurrent training option for business aviation that leverages modern competency and evidence-based training philosophies. The program includes human-factors-based scenarios and uses data to reduce risk by continuously evolving recurrent training sessions to improve pilot competency and resilience. Best of all, this program satisfies all required proficiency checks and provides an alternative to the traditional “box-checking” events.

Current-day training programs that are maneuvers-based are the bane of

most business aviation pilots and industry safety advocates. For over a decade, the NBAA safety committee has recommended ditching these cookie-cutter training and checking events in favor of scenario-based training sessions tailored to meet the specific needs of a business aviation operation.

Scenario-based Enhanced Recurrent (SER) training, as CAE calls it, shares the positive attributes of an airline-style Advanced Qualification Program (AQP). Like AQP, CAE’s SER provides a

data-driven approach to target critical tasks during pilot training while focusing on crew performance and CRM through scenario-based simulations. AQP has been employed by most airlines in North America since 2005. Another benefit of SER and AQP is the ability to adapt training to not only be more realistic but to allow for the creation of innovative training scenarios.

For the pilot, gone are the days of flying the same approaches, stalls, steep turns, and engine failures at V1 maneuvers year after year. Now, with SER training, pilots

will fly, for example, a line-oriented segment (point-to-point) with a malfunction, and a potential diversion to an alternate with an approach to a landing at the end of the session.

The beauty of SER training is that each year it introduces a different scenario—one year, it could involve a circling approach at Teterboro, New Jersey; the next year, a challenging approach at Eagle, Colorado; and the year after that, a steep approach at London City Airport in the UK. These new scenarios cover the prescribed requirements but add in more decision-making, crew coordination, and problem-solving. This is impactful since these are the issues that show up in the accident reports.

CAE's SER training delivers value to the business aviation community by providing data-based program development and adopting industry best practices that are more efficient and effective than traditional training. This change in training philosophies is due to CAE's commitment to dedicate resources—technology, personnel, and funds—to change the status quo.

“Civil Aviation has benefited from data-based training programs like AQP over the past 20 to 30 years [in the U.S.] and more recently, evidence-based training [EBT, in Asia and Europe],” said Tim Schoenauer, CAE director of global training solutions for business aviation training. “The shift to data-based training is a commitment made by the operator and pilot. Many business aviation flight departments have evolved to more scenario-based training in the recent past, but adoption of such programs has not gone mainstream primarily due to the time [required for] programming and coordination.

“Given CAE's training footprint globally,” he added, “we have chosen to support and offer data- and scenario-based training, which we call Scenario-based Enhanced Recurrent, for customers electing to participate. These programs are available in many aircraft types and will evolve as



TIM SCHOENAUER

CAE DIRECTOR GLOBAL TRAINING SOLUTIONS

“A challenge in developing an enhanced recurrent training program for business aviation was to create an adaptive learning environment and improve the learning experience for the student without adding days to the training schedule or footprint.”

customers seek a different way to train while still meeting the baseline regulatory requirements in the same training time.”

A challenge in developing an enhanced recurrent training program for business aviation was to create an adaptive learning environment and improve the learning experience for the student without adding days to the training schedule or footprint. Schoenauer said, “CAE developed enhanced recurrent in the most popular five-day recurrent footprint [two days of ground school, three days in the simulator]. The standardized plans of action are developed using modern ICAO advanced training program development

recommendations and industry best practices by using safety and flight data as well as assuring compliance mapping of FAA regulations applicable to the curriculum. This pragmatic process is also collaborative with the customer where we can include items called Special Procedure Operations Training [SPOT] elements applicable to their operational environment or requested training items normally outside a traditional recurrent event. Enhanced recurrent should give a more standardized delivery by our amazing team of instructors while accomplishing compulsory FAA elements facilitated in a more operationally realistic standardized manner.”

EARLY PARTICIPATION

An early adopter of the CAE SER training program was the Embraer Executive Jets flight department. Based in Melbourne, Florida, Embraer's flight department supports a large fleet of demonstration aircraft at three primary locations around the globe. In addition to supporting Embraer's sales and marketing activities, the company pilots provide customer acceptance and delivery flights when needed.

A primary motive for Embraer to participate in CAE's enhanced recurrent program, according to Bradley McKeage, v-p of flight operations for Embraer Executive Jets, is “to be a great example of a flight operation to our customers.” He added, “As a professional flight department, it is our mission to be a role model to our customers in order to promote safe operations, and we have embraced various safety programs to uphold this commitment. These programs include a formal SMS, FDM/FOQA program, ASAP, e-learning program, as well as a fatigue management program.” In addition, McKeage says, “We are very proud of our flight operations manual and the procedures that have been specifically tailored to our OEM operation. We are a Stage III IS-BAO-accredited organization and seek continual improvement to retain this standard.”

One of the greatest benefits, as envisioned by Embraer, is the ability to add a level of realism to the training environment. Sessions are conducted as if they were actual flights with trip sheets, flight plans, and other tools that support the flight department's missions. Likewise, the training scenarios will be based on real data, including FOQA events and internal hazard reports.

According to Embraer, "Leading the way in the industry is our passion, and this also applies to the training environment. A well-trained crew is vital to safe operations. As an engineering company, we see the benefits of big data in helping refine the training approach to be better suited for individual operators. Using real-world data and experience from our operation to help develop training scenarios will ultimately better prepare our crews for what we will see daily. We are keen to help lead this training evolution and hopefully set a gold standard for our customers."

SUPPORTED BY DATA

CAE uses several sources of data to tailor training scenarios. According to Schoenauer, "Advanced training program curriculums rely on data sources such as flight data analysis [operational flight data], safety management system data including pilot safety reports and safety trend information, line oriented safety audits [LOSA], and now with CAE Rise [which stands for real-time insights, standard evaluations] training data.

"CAE is deploying Rise, which allows CAE customers to include training data into the advancement of the training curriculum," he said. "In addition to the benefit of incorporating training data into the curriculum, Rise will allow pilots to view their performance against [that of] other pilots from the same aircraft type globally."

To ensure that training program curriculums satisfy all requirements, CAE analyzes and maps this data to determine



CAE's enhanced recurrent training incorporates real events from FOQA and sources such as training data into scenario-based training that depicts a variety of popular bizav airports.

how it relates to competency and [evidence-based training] philosophies. "ICAO introduced pilot competencies to groups and organized pilot performance into eight standard competencies," Schoenauer explained. "These competencies comprise the core skill set of an aviator, which facilitates assessment into groups.

"By identifying performance in pilot competencies, curriculum developers can create scenarios where analytical trends have identified opportunities for improvement. Coupled with operational and flight data, scenario-enhanced training programs can mitigate operational threats, evolving pilot training beyond traditional qualification-based training and checking."

When asked what value SER training adds for the customer, Schoenauer said, "The primary reason is safety. Data-based training programs have statistically reduced incidents and accidents in civil aviation over the past 30 years. By incorporating SMS, operational, and training data and evolving the training topics, a more practical, relevant, and meaningful training experience is the result."

Schoenauer also suggested that this new program complements an operator's SMS and is cost-neutral or may even provide financial incentives. "Scenario-enhanced recurrent allows an operator to incorporate requests of their own to mitigate operational threats which may have been identified in their SMS or based on their operational profile in special procedure operations training events," he said. "Aviation insurance and assurance companies value data-based training programs, which have resulted in financial benefits or operational flexibility when participating in such enhanced programs."

Advancing flight training in business aviation is long overdue. CAE's SER training program provides an alternative to traditional programs and makes training more effective and efficient. This initiative is based on the best practices of airlines and other operators that have embraced the philosophies of competency and EBT programs. This shift from maneuvers-based to modern training programs using real-life data can significantly improve safety and the training experiences of business aviation flight crews. ■

Sikorsky stresses flexibility of Raider X

BY MARK HUBER



The Raider X will be powered by GE's T901 engine, and its rigid, four-bladed contrarotating main rotors and rear thruster enable a cruise speed of more than 200 knots and improved maneuvering capability.

The assembly of Sikorsky's Raider X competitive prototype for the Army's Future Attack Reconnaissance Aircraft (FARA) program is now 90 percent complete. The compound coaxial helicopter with fly-by-wire flight controls is a semi-finalist in the FARA competition. It is 20 percent larger than the 11,000-pound S-97 proof of concept vehicle Sikorsky first flew in 2015. Sikorsky recently displayed the Raider X during a media briefing at its West Palm Beach, Florida test center.

The company said the use of additive manufacturing, also known as 3D printing, digital tools, and other advanced processes has reduced lead-time for aircraft components by more than 50 percent. The maturation of this technology across Sikorsky parent Lockheed Martin and its supplier base for both metal and composite materials is producing schedule, cost, and weight savings across systems.

However, flight testing of both the Raider X and its competitor, the Bell 360

Invictus, has been delayed until October 2023 (the start of Fiscal Year 2024) at the earliest due to delays with the GE T901 improved turbine engine selected by the Army. GE attributed the delay to Covid-induced supply chain disruptions.

The T901 is designed to be used in FARA aircraft as well as being retrofittable into the existing Black Hawk and Apache fleets. GE claims that it delivers 50 percent more power, 25 percent better fuel economy, and 20 percent greater engine life than the T700 engine it will replace. The design combines the single spool architecture of its current T700 with ceramic composites found on GE's new generation commercial jet engine models, including the CFM LEAP, in a way that lowers weight and increases performance and efficiency. The engine is being provided to Sikorsky and Bell directly by the Army.

While Bell is fielding a conventional-looking design reminiscent of the RAH-66 Comanche program, Sikorsky is offering

one based on its X2 technology that features a pair of rigid, four-bladed contrarotating main rotors assisted by an aft-mounted thruster.

Key members of the Raider X team maintain that the Sikorsky design provides superior stealth, speed, maneuverability, survivability, flexibility, and potential for mission growth over a conventional helicopter. In addition to the 20mm nose cannon, modular weapons launchers mounted behind the side-by-side-sitting pilots can be removed, making way for the transport of up to six troops.

While FARA requirements are for an aircraft with a sustained cruise speed of 180 knots and a dash speed of 205 knots, Sikorsky believes it can greatly exceed this goal while at the same time adhering to overall program budget constraints. "We really feel that this will deliver transformational capability to the Army," said Jay Macklin, Sikorsky business director for Army programs and innovations.

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“The reason that we chose this design is that it is really about operational flexibility for the commander,” said Macklin. “The [pilot] side-by-side configuration we chose allows you to have a very large weapons bay.” Despite the aircraft’s width, he said that the overall design is a “very smooth, streamlined aircraft with very little drag. No wings or bumps or anything like that that will actually slow you down.”

Using the S-97, Sikorsky has demonstrated a variety of maneuvers that cannot be accomplished with a traditional helicopter including high agility at low speeds, level body acceleration and deceleration, a turn distance that is half that of conventional helicopters, a cruise speed of better than 200 knots, reverse propulsor to slow descent, nose-down hover for more time on target and precise weapons delivery, and disengaging the propulsor for “whisper mode” to sneak up on targets or reduce noise in cruise flight.

Macklin said Sikorsky is continuing to expand the flight envelope of the S-97

and incorporate useful data into Raider X. To date, the S-97 has flown 180 hours at speeds up to 205 knots. The aircraft also has accumulated 503 ground hours and 2,850 software integration lab hours. “We look at Raider as risk reduction for us. Every hour we fly it, some piece of data comes off of it that feeds into the design and answers a question as we build the [Raider X] competitive prototype [CP].”

Flying the S-97, “We can get answers to our questions today without having to wait a year to fly the CP,” said Pete Germanowski, Sikorsky FARA chief engineer. “It allows us to make more informed decisions earlier in the [design] process.”

The S-97, Raider X, and larger Defiant X being developed for the Army’s Future Long Range Assault Aircraft competition feature Sikorsky’s X2 technology that first flew on a technology demonstrator in 2008 and would go on to achieve 250 knots forward speed. “We wanted something that was fast, but we also wanted something that is quiet,” Macklin said. “When [the

propulsor] is cut it becomes very quiet, quieter than a Black Hawk.”

Macklin also noted that Sikorsky has a “full gamut” of autonomous technology, from partial to full, including its Matrix system, that can be incorporated into the aircraft to reduce pilot workload. “The Army is going to decide what level of autonomy they want to settle on. It’s part of this whole digital network with advanced UAVs and drones to achieve that [desired] level of standoff.”

He also said the aircraft’s rigid main rotor system was designed for ease of maintenance. “There’s about half the number of parts on this rotor head than there is on a Black Hawk. We don’t have blade dampeners on an X2 aircraft,” which is the top maintenance driver on a Black Hawk. The design also eliminates one of the gearboxes required to drive the tail rotor. The propulsor itself is not critical to either forward flight or takeoff or landing. Should it fail or be shot off, the aircraft can still achieve a forward speed of 160 knots. ■

GARMIN INSTRUMENTS APPROVED FOR LEGACY PISTON ROBINSONS

Garmin has received FAA supplemental type certificate approval for the installation of its GI 275 electronic flight instrument to replace analog displays in Robinson R22 and R44 helicopters.

The GI 275 is a direct, 3.125-inch replacement for a variety of legacy primary flight instruments in the cockpit, including the attitude indicator, course deviation indicator (CDI), horizontal situation indicator (HSI), or multifunction displays (MFD). The design reduces installation time, preserves the existing instrument panel, and offers a high-resolution display and wide viewing angle for readability in the cockpit, a touchscreen interface, and a dual concentric knob that allows pilots to access a variety of key functions.



When installed as a primary attitude indicator, the GI 275 offers improved reliability, potential weight savings, and reduced maintenance compared to less reliable, vacuum-driven attitude indicators. It can also be optioned with Garmin’s helicopter synthetic vision technology. Additional features include the display of outside

air temperature, groundspeed, true airspeed, and wind information on the attitude indicator. The GI 275, when installed as a CDI or HSI, is designed to accept a variety of GPS and navigation inputs. With an optional magnetometer, it is also capable of providing magnetic-based HSI guidance.

When replacing an older mechanical CDI or HSI, the GI 275 adds MFD capabilities such as a moving map, weather, traffic, obstacles, WireAware power lines, SafeTaxi airport diagrams, and five-color terrain shading. Helicopter terrain awareness and warning system is available on the GI 275, which can also be paired with Garmin’s GRA 55 or GRA 5500 radar altimeters or third-party products. **M.H.**



The Q-Alpha low-air-speed alerting system at the corners of the glareshield is designed to capture a pilot's attention—even when the pilot is focusing elsewhere—with a bright visual alert and audible warnings.

Simulator tests show value of Q-Alpha

BY MATT THURBER

As the Gulfstream G200 simulator edged closer and closer to flying too slowly, below landing reference speed (V_{ref}), the pilot at the controls feigned inattentiveness and allowed the airspeed to continue to deteriorate. Before the stick-shaker began its vibratory dance to let the pilot know that the speed was too low and to do something about it right away, a bright ring of green lights in the pilot's peripheral view started flashing amber. The pilot didn't react but maintained the same pitch angle and didn't add power, and the flashing amber lights turned steady. The airspeed slowed even further, and it wasn't until the light ring flashed and then turned red that he finally started a recovery, just moments before the G200 stalled.

We had gathered inside the G200 simulator at CAE's Morristown, New Jersey, training facility, to see how Skov Aero's Q-Alpha Flight Energy Awareness Display, also known as a low-air-speed alerting system (LAAS), might work in a typical business jet. The group included Skov Aero founder and chief engineer Andrew Skow

and his son Geoff, a CAE technician, and four business aviation pilots.

The fundamental idea of Q-Alpha is simple. Until 2010, FAA regulations required that transport category (Part 25) airplanes be equipped with stall warning and mitigation systems, which in many jets consist of a stick shaker (warning) then a stick pusher (mitigation). In airplanes where pilots simply can't feel a stall, which includes many jet types, the shaker should help catch their attention. If the stall characteristics are such that handling is severely compromised after a stall or the aircraft is likely to enter a deep stall, the stick pusher is designed to prevent the stall before it gets any worse. But these devices don't always work to prevent an accident, because they don't give enough warning to pilots. After 2010, newly type certificated airplanes had to be equipped with a LAAS, but there was no retrofit requirement for older jets.

Andrew Skow's solution is Q-Alpha, a relatively simple LAAS that gives pilots plenty of advance warning prior to the stall

and that is easily retrofittable to those aircraft for which a LAAS is not mandated.

Skow first became aware of the opportunity to develop a stall-alerting system after the Air France Flight 447 accident on June 1, 2009, where the crew stalled the Airbus A330 and held it in a stalled condition for more than four minutes until it impacted the ocean, killing all on board. The February 12, 2009, Colgan Flight 3409 crash was another example of a deadly stall but this time during approach to landing. Skow realized that a significant number of accidents could be prevented with a stall-alerting system, and he partnered with his long-time friend, former Bombardier v-p of flight test Pete Reynolds, to explore the problem of poor energy management. The result was the Q-Alpha Flight Energy Awareness Display.

Modern jets have amber and red bands on the primary flight display speed tape along with audible warnings as the speed decreases to those levels. That type of warning system, Skow said, "is flat ineffective. The Asiana 777 at San Francisco had

an amber band on the airspeed tape and aural alerts—quad chimes—intended to cause the pilots to look at the PFD. They came on 11 seconds before the crash.”

Whether or not the amber and red bands are supposed to be a LAAS, it didn't help in that particular accident. “People are defending the amber band ridiculously,” he said. And in any case, retrofitting an older business jet or airliner with a display and the color bands could be prohibitively expensive, if that were the only reason for the upgrade. “We wanted to focus on low-cost, low-tech solutions,” he said. “Our value proposition is simple: it's unambiguous, you don't have to look, but it's in your scan. It's monitoring you, [telling you], ‘you might want to pick up some knots.’ Without knots, you got nothing.”

A recent accident illustrates the problem: the July 26, 2021, Challenger 605 crash in Truckee, California. While maneuvering in the traffic pattern, the pilots lost control of the Challenger in a turn and despite the stick shaker and pusher both activating, the jet stalled and crashed.

In a YouTube video, test pilot Bill Scott, who was also bureau chief for Aviation Week & Space Technology, described the stall characteristics of the early Challenger 600 series. During the certification program for the Challenger 600, Scott was a test pilot exploring the new jet's stall characteristics. During one sortie, the jet entered an unrecoverable deep stall and he and the other pilot—Norman Ronaasen—had to bail out. Ronaasen didn't survive.

“The natural aerodynamic stall on the Challenger was pretty unpredictable,” he explained in the video. “You get quick roll-offs, but the big danger was the deep stall on that supercritical wing and that T-tail design. And as a result, we lost the first test aircraft—Challenger 1—when it crashed when we got into a deep stall. Eventually, the Challenger was, of course, certified by the FAA with a stick shaker

system that warns of an impending stall and then at a little higher angle of attack, the stick pusher activates to force the nose down and break the stall before the aircraft reaches the actual aerodynamic stall.”

Nevertheless, Scott raises the question of whether such systems give pilots enough time to react and recover. “Having personally experienced at least 1,200 stalls during this development test program, I've seen how rapidly the angle of attack can build, especially when maneuvering...turning approach to stall.



ANDREW SKOW
ENGINEER AND Q-ALPHA INVENTOR

“I personally believe that all transport category aircraft would definitely benefit from being equipped with a stall-alerting system of some kind that provides a distinct warning to the pilot—before you approach that shaker and pusher angle of attack—that gives pilots a little more time to take corrective action. Especially when you're doing this high bank angle maneuvering like we saw in the 605 accident and clear back when we were doing the testing on Challenger 1; if we had had some kind of an independent stall-alerting system it might have given us enough time to avoid getting into the deep stall and the chain of events that led to the fatal accident and loss of the airplane. We definitely could have used it back then, and if we had had it, Norm Ronaasen would be alive today.”

ATTENTION!

Q-Alpha's main attribute is that it commands attention, day or night. The current design is a ring or donut shape of LED lights mounted at the corner where the glare-shield meets the instrument panel, one on each side of the flight deck. Of course, the donut/ring design is just a suggestion; LED lights can be configured in almost any layout, and there may be better options than a ring. Whatever the placement, it's critical that the lights be easily visible in the pilot's peripheral vision, and our demo in the G200 simulator showed that the corner glareshield placement worked well.

There are three main operational modes for the Q-Alpha device: it works as a stable approach monitor for approach, landing, and go-around; provides low-speed alerting in climb, cruise, and descent; and can provide a backup in case of loss of airspeed indication.

By using dynamic pressure and angle-of-attack to set the alerting thresholds, the thresholds “can be set at higher airspeeds than existing low airspeed alerting systems,” according to Skov Aero. “This allows pilots more time to take corrective action. The ‘industry standard’ low-air-speed alerting system, the so-called ‘amber band,’ uses only angle-of-attack.”

When flying at slower speeds on approach and in the airport environment in the G200, Q-Alpha's thresholds are set as follows: it lights up green for $V_{ref} +10/-5$ knots, so it would be green during most of the final approach and landing. The next threshold is flashing amber at $V_{ref} -5$ to -15 or 25 percent above stall speed, accompanied by an audible “airspeed” every two seconds. When Q-Alpha turns solid amber, speed is $V_{ref} -15$ to -25 (18 percent above stall) and the audible warning says “airspeed low.” Flashing red corresponds with the stick shaker speed (7 percent above stall) and solid red with the stick pusher speed (1 percent above stall), accompanied by the audible word “stall.”

“The problem we’re trying to fix is an inattentive pilot who for some reason decided not to monitor the energy state of the aircraft,” Skow said. “Maybe they’re tired, bored, or task saturated. There are a lot of accidents where energy management is the root cause, and task saturation is the biggest [factor]. Everybody else is working this by putting more information on the PFD or adding an angle-of-attack display. But what if the pilot is looking out the window?”

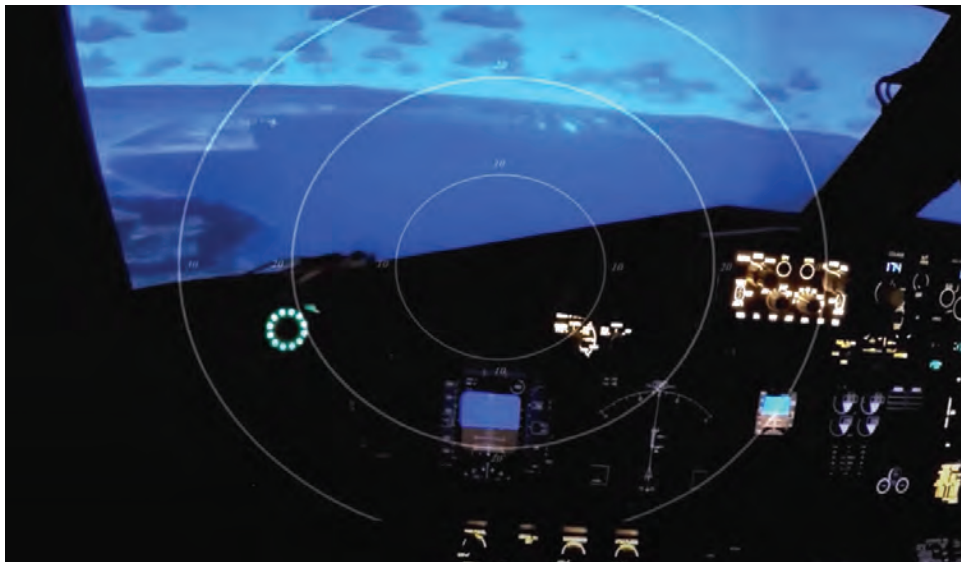
Q-ALPHA DEMO

Skov Aero held the demonstrations of the Q-Alpha stall alerting system in the G200 simulator on April 21 and 23 at CAE’s training center in Morristown, New Jersey. Participants during the session that I observed included Bob Wilson, experimental test pilot at Gulfstream Aerospace; and Joe Chignarella, a pilot for a Gulfstream operator and member of the Teterboro Users Group. We couldn’t all fit into the simulator at the same time, even with motion off, so participants took turns trying out the Q-Alpha device. Tom Huff, Gulfstream aviation safety officer, took his turn later, along with his brother Scott, a Falcon pilot.

Chignarella was first to test the Q-Alpha device in the G200 simulator. The test started with straight-ahead stalls, then turning stalls at a 20-degree bank, followed by landings on Runway 4L at Kennedy International Airport in New York City, then the ILS Runway 6 approach to Teterboro ending in a circling maneuver to line up with Runway 1. The latter was the same scenario in which two pilots were killed turning too steeply in a Learjet 35 while trying to line up with Runway 1 on May 15, 2017.

During his time at the controls, Chignarella clearly saw the Q-Alpha device light up and, he said, “I knew I had to add power.”

Wilson ran through the same scenario, but during one of the Teterboro approaches, the simulator technician “blocked” the left pitot tube, shutting off air



Rings show useful field of view, while Q-Alpha (left) remains visible in the peripheral view.

data to the captain’s instruments. While he still had an airspeed indication via the copilot’s air data computer, the yellow and red low-speed bands disappeared. He was easily able to back up the airspeed tape’s lack of warning information using Q-Alpha and reported that in that scenario, it was invaluable for continuing the approach. “It was a lifesaver,” he said. “It’s impossible to miss. If you have any kind of an airspeed failure, it’s wonderful.”

Wilson did have a criticism, that during a normal landing flare, Q-Alpha flashes amber. Although pilots can safely ignore it at that point, he worries that this would be negative learning. Overall, he said, “I think it’s a good system and has a lot of advantages.”

Huff did the next series of tests, and he agreed that the transition from solid to flashing and color changes weren’t optimal. Skow said that optimizing the color transition and other interface factors are easy to fix.

“Leading up to the sim evaluation,” Huff said, “I thought Q-Alpha was an elegant solution for a systemic problem and one that still remains to be satisfactorily addressed out of the NTSB recommendation for low-speed awareness cueing. Recognizing the limitations for this evaluation—principally, no unique tuning

for the G200, suppression of audio alerts, and no prior human factor assessment of the mounting location, the evaluation still showed—in my view—the exceptional utility and potential for this capability.

“During my session, we attempted to stress the system with circling approaches, immediate return-to-land, airspeed miscompare, and single-engine approach/go-around scenarios. Q-Alpha provided enhanced situational awareness and subjectively would be hard to ignore. Of course, this is a key enhancing trait of Q-Alpha...to overcome a distracted or ‘cognitively unavailable’ pilot experiencing insufficient speed conditions or undetected airspeed decay.

“I think additional experimentation and human factors evaluation is warranted to resolve those minor observations and truly optimize the salience and discernibility of the status lights.

“I believe Andy [Skow] is to be commended for his determination to address this well-documented contributor to loss-of-control accidents and his eagerness to have abundant feedback on the efficacy of the system. In my view, a cost-affordable and easily-integratable solution is a must, and certainly a strong point for Q-Alpha, particularly for legacy platforms that rarely see avionics upgrades.” ■



Aero Center Opens Second FBO at KILM

North Carolina's Wilmington International Airport (KILM) now has two FBOs with the opening of Aero Center Wilmington. Located north of the Taxiway Alpha and Hotel intersection, near the U.S. Customs facility, the newly-constructed facility includes an 11,000-sq-ft terminal, 15,000-sq-ft and 10,000-sq-ft hangars capable of sheltering the latest ultra-long-range business jets, 50,000-gallon capacity fuel farm, and more than two acres of ramp.

Aero Center's KILM facility will also provide maintenance for both piston and turbine aircraft, as well as 24/7 AOG maintenance support services for both general aviation and airline customers. The new FBO, the growing chain's second location, will also provide airline fueling services at the airport.

Modern Aviation Wraps Development Project on Seattle FBO

FBO operator Modern Aviation has completed a major expansion and renovation of its facility at Seattle Boeing Field/King County International Airport (KBFI). The first phase of the \$25 million project consisted of the construction of a 40,000-sq-ft hangar, which was then followed by the addition of a new 24,500-sq-ft hangar with an adjoining 7,000 sq ft of office space. In total, the FBO—one of three service providers on the field—now has 115,000 sq ft of hangar space.

Concurrent with the hangar development, the company, which acquired the Seattle location in 2018, also performed a renovation on its 5,000-sq-ft terminal that expanded its conference rooms and introduced a new pilot lounge. Sustainable features were also adopted such as LED lighting, water-saving measures, use of compostable materials and recycling, landscaping with drought-resistant plants, installing special materials in hangar roofs to reduce the "heat island" effect, acquiring electric ground handling equipment, and adding electric vehicle charging stations.

Carver Aero Is Now Revv Aviation

Illinois-based aviation services provider Carver Aero has rebranded itself as Revv Aviation, a move the company describes as a reflection of its rapid growth. Early in 2020, CL Enterprises acquired Carver Aero, which at the time consisted of the FBOs at Iowa's Davenport Municipal and Muscatine Municipal Airports, a Part 135 charter operation, and a Part 145 repair station at Davenport.

Since then, it has gone on to add the Advanced Air FBO, flight school, charter operation, and maintenance shop at Council Bluffs Municipal Airport in Iowa; Janesville Jet Center, the lone service provider at Southern Wisconsin Regional Airport; and LumanAir Aviation Services, an FBO at Aurora Municipal Airport near Chicago, along with aircraft maintenance and servicing company ATS Illinois. It also was recently awarded a five-year lease to take over as the sole service provider at Schaumburg Regional Airport in Illinois.

Hangar Developer Buys SoCal FBO

CloudNine, the company currently building a 100,000-sq-ft private hangar complex at Los Angeles-area Camarillo Airport (KCMA), has now acquired Channel Islands Aviation (CIA), one of the four service providers on the field. The CloudNine facility, when completed in the second quarter of 2023, will consist of four 25,000-sq-ft hangars, each with its own office space.

The CIA FBO, which opened in 1976, had been operated since then by the same married couple; its new owners plan on leaving the facility's name intact.

Capable of sheltering aircraft up to a Falcon 8X in its own 62,000 sq ft of hangar space, the FBO also includes an 8,500-sq-ft terminal with pilot lounge, conference room, flight-planning room, gourmet coffee bar, and a multi-rating flight school. Its FAA Part 145 repair station is a factory-authorized service center for Cessna and Cirrus aircraft.





Sky Bright, Laconia Municipal Airport

For New Hampshire, Lake Winnepesaukee, the largest lake in the state covering 72 square miles, has always been a source of outdoor recreation and relaxation but during the past two years of the pandemic, the area has also become a refuge for private aviation passengers looking to escape high population areas.

According to Lee Avery, the owner of Sky Bright—one of two service providers at Laconia Municipal Airport (KLCI) located less than a mile from the shores of Winnepesaukee—traffic to the airport has increased by 30 percent over pre-Covid levels. He told **AIN** that for 2021 that airport activity totaled more than 45,000 operations, 5,000 of them from turbine-powered aircraft.

Sky Bright began 34 years ago at the non-towered airport with its 5,890-foot runway and has since grown to become the dominant FBO on the field, claiming nearly three-quarters of the business. Summer is the peak season for the airport, which serves the bustling resort and summer home community. Avery noted that his company earns 75 percent of its annual business between July and September.

The company currently occupies 5,000 sq ft in the 6,500-sq-ft former commercial terminal which it shares with the airport authority offices and the smaller FBO. The building, renovated in 2014 with an Adirondack-styled interior, offers a passenger lounge, concierge service, a pilot lounge, refreshments, business center, 12-seat conference room, a quartet of crew cars, and onsite car rental. Catering can be procured from an locally-renowned events caterer, usually with 24-hours notice.

The location is home to a small flock of Cirrus Vision Jets and has 37,000 sq ft of aircraft shelter that can handle up to mid-size business jets, including a recently purchased 8,000-sq-ft hangar that is currently



Aircraft traffic is up over pre-Covid levels at the Sky Bright FBO in New Hampshire.

undergoing renovation. Once that project is completed by the end of the summer, Avery will relocate the company's maintenance operations there, freeing up space in its larger 12,000-sq-ft hangar to make more room for aircraft storage as well as a new Redbird FMX simulator for Sky Bright's flight school.

Plans call for the start of construction on a large hangar capable of handling the latest large cabin, ultra-long-range business jets within the next year or so. Avery told **AIN** that he initially planned for the structure to be 12,000 feet, driven by his desire to avoid the installation of a costly foam suppression system, but with the recent revisions to NFPA 409 Standard on fire protection for aviation hangars, he is planning on having a discussion with his local fire marshal to possibly enlarge that design. Another stumbling block he noted was the supply-constrained price of construction material. "Number one, I want the steel prices to come back down," he said. "In order for this stuff to work you have to get some reasonable pricing." A second phase of construction could add a 5,000-sq-ft and a 7,000-sq-ft hangar within two years, essentially doubling the facility's aircraft indoor storage space, in addition to its more than 12 acres of ramp.

The Phillips 66-branded location is supplied by World Fuel Services and is open daily from 7 a.m. to 7 p.m., with after-hours callout service available for a fee. Its staff of 11 is trained under NATA's Safety 1st program, supplemented by World Fuel's online training course. The line staff is known for their unofficial uniform, which has become a sort of trademark. "People don't necessarily always remember our name, but they want to go to the FBO with the red shirts," said Avery.

The FBO's tank farm consists of a pair of 12,000-gallon storage tanks, one each for jet-A and avgas. They are served by a 5,000-gallon and two 3,000-gallon refuelers (in the peak months, Avery leases a third 3,000-gallon truck); and a 2,000-gallon 100LL tanker, a vestige from the days when the company's flight school was more active. "I didn't want to be at the [fuel] farm every day, so we had a bigger truck, and I just kept it," said Avery. "I don't need that big a truck today, but it works and it's mine."

Remote-payment-processing equipment on all the trucks allows customers to pay on the ramp, and self-serve avgas is also available 24/7. Last year, the company pumped more than 400,000 gallons of fuel, setting a new flowage record. **C.E.**

BY JERRY SIEBENMARK



Embraer Doubles Footprint of Sorocaba MRO

Embraer's services and support unit opened its expanded MRO facility in Sorocaba, Brazil, mostly in response to a growing business jet fleet in its home country. The Sorocaba expansion doubles the airframer's facility footprint there from 20,000 sq m (215,278 sq ft) to 40,000 sq m. The site now boasts four hangars, three of which are dedicated to aircraft and component MRO, with the fourth supporting the company's FBO there.

Besides maintenance, Sorocaba's capabilities include interior refurbishment through a partnership with F/List and aircraft modifications, such as the conversion of Legacy 450s into Praetor 500 jets. The site currently employs 150 workers. Over the next three years, Embraer expects to add 100 more employees at Sorocaba.

StandardAero Marks Honeywell Engine Milestone

StandardAero's business aviation unit inducted its 1,000th Honeywell HTF7000-series engine into its Augusta, Georgia facility, making it the first company to achieve this milestone in support of the engine series. The company also is the industry's first and only OEM-authorized independent, heavy MRO provider for the engine model and claims to have performed more major events with the HTF7000 than any other company in the industry.

The engine powers several active business jet types, including the Bombardier Challenger 300/350; Embraer Legacy 450/500 and Praetor 500/600; Gulfstream G280; and Cessna Citation Longitude.

NIAR Werx Adds More Freighter Conversion Work

The National Institute for Aviation Research's (NIAR) Werx MRO program has reached an agreement on Airbus and

Boeing passenger-to-freighter (P2F) conversions for Precision Aircraft Solutions and conversions and maintenance for its sister company, Erickson Aero Tanker. Based on those agreements and its previously announced 777-300ERCF P2F conversion program, the Werx program expects to add nearly 1,500 more jobs over the next five years at its primary Kansas facilities in Wichita, as well as at sites in Topeka and Salina.

The organization's Wichita site, housed in several former Boeing Wichita hangars, employs 425 program managers, engineers, contractors, technicians, and paid applied-learning students. Under the new agreement with Precision, Wichita State University's NIAR Werx will take delivery of two new aircraft for P2F conversions, with the expectation of eventually performing 12 to 24 of these conversions each year.

Constant Aviation Expands into Rotorcraft MRO

Constant Aviation is expanding its MRO services to include helicopters, drones, and other commercial unmanned aircraft systems, which positions the Cleveland-based business jet maintenance and repair provider to serve the emerging eVTOL market. The expansion follows the recent launch of a private helicopter division by sister-company and fractional-jet-share provider Flexjet. Directional Aviation is the parent company of Flexjet and Constant.

As part of the expansion, Constant's Orlando, Florida facility is refurbishing the interiors of the new division's Sikorsky S-76 helicopters, including refinishing their veneers and restoring their seats, carpets, and sidewalls with new materials. As well, the company is repainting the helicopters to mimic the liveries of Flexjet's fixed-wing aircraft to feature a chameleon paint with a carbon fiber accent on the upper cowling and leading edge on the vertical tail.

Constant is already supporting drones after becoming an authorized UAS service center in 2017.





ACI Jet notes upswing in MRO activity

California-based ACI Jet has seen a robust business in the past few years as an FBO, including the construction of an \$85 million FBO terminal and hangars at John Wayne Airport (KSNA) in Orange County, and a \$20 million, 28,000-sq-ft terminal and an adjacent 25,000-sq-ft maintenance hangar at its headquarters at San Luis Obispo Regional Airport (KSLO). The company's MRO business employs 60.

But the FBO isn't the only growing segment of its business—so is maintenance. "Prior to what the industry has been experiencing recently with growth, pre-pandemic, our goal was to be a larger supporter for Bombardier in California. We saw that as an opportunity as both a management company and as an MRO to step into that field," ACI Jet senior v-p of aircraft maintenance Dave Jensen told *AIN*. "So, I think a lot of that was just building that reputation, getting the Bombardier ASF [authorization], really just building all our capabilities to be comparable to an OEM type facility or a larger facility like a Duncan or a West Star."

The company recently marked its third year as a Bombardier authorized service facility (ASF) at KSLO, where its maintenance footprint encompasses 60,000 sq ft of hangars: one of which is 35,000 sq ft and the other 25,000 sq ft. Its Bombardier authorization extends to the Challenger 300 and 600 series, as well as Global jets up to the 6500. On those aircraft, it can perform select heavy maintenance, inspections, warranty, and AOG support. The company also plans to seek authorization for heavy maintenance on the 7500 once the fleet reaches a size that makes sense for ACI Jet to invest in the capabilities to work on Bombardier's flagship—and largest—aircraft.

Additionally, ACI Jet serves as a parts depot for Bombardier, giving it off-the-shelf



ACI Jet focuses its maintenance activity primarily on Bombardier Challenger and Global jets as well as Cessna Citations.

access to needed parts. But its MRO activity isn't exclusive to Bombardier. It also serves as a Part 145 repair station for Cessna Citation jets, including the 500, 525, 560XL, 680, and 750 series. "For our scheduled, heavier maintenance we do limit ourselves to Citation and Bombardier aircraft," Jensen added. "The reasoning behind that, we didn't want to be a jack-of-all-trades. We wanted to be experts on the frames we do best. And our history began with Citations. That's where the company began from a charter and management standpoint. It's where our maintenance, tooling, and expertise was built up."

Jensen noted, however, that ACI's AOG teams can support "pretty much any business aircraft out there." Its AOG teams consist of four trucks deployed throughout Northern and Southern California, with a

fifth truck expected to come online soon. With the additional AOG truck, three trucks are based at KSNA with eight technicians and the other two will be based out of KSLO with four technicians.

Jensen said one of ACI's biggest challenges is one familiar to nearly all MROs: finding enough technicians. Even though ACI was "incredibly lucky" in hiring 11 technicians in the first few months of the year, Jensen knows that recruitment is only going to get tougher. It's why ACI signed on as an industry partner to help nearby Cuesta College develop an airframe and powerplant technician program, the first class of which will launch in January. "The demand is outpacing the ability to bring talent on board," he said. "As we're all fighting for talent, that's going to help our personal situation here in San Luis Obispo." **J.S.**

BY DAVID JACK KENNY

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

Preliminary Reports

Twenty-Two Perish in Nepali Airline Disaster

De Havilland DHC-6-300 Twin Otter,
May 29, 2022, Sanosware, Nepal

All three crew members and 19 passengers were killed when Tara Air Flight 197 struck a mountainside about 15 minutes into a scheduled 20-minute flight from Pokhara to Jomsom. Originally scheduled for 06:15, the flight was delayed nearly four hours due to cloud cover obscuring Lete Pass. It eventually departed at 09:55 following two of another operator's aircraft. Contact with air traffic control was lost 12 minutes later.

Continued low weather and failing light hampered search efforts, which required some 20 hours to locate the wreckage at an elevation of 14,500 feet on a steep, rocky slope accessible only by one helicopter at a time. The smell of fuel helped villagers searching for yarsagumba fungus find the site. Press accounts indicate that 16 of the victims, including the crew, were Nepali nationals; four were from India, and two from Germany.

Six Survive Crash into Lava Field

Bell 407, June 8, 2022, Kalea, Hawaii

The pilot and two passengers suffered serious injuries when the air tour helicopter crashed into a lava field after an apparent loss of yaw control. The remaining three passengers escaped with minor injuries. The accident occurred about 25 minutes after departure from the operator's base at Ellison Onizuka Kona International Airport. ADS-B track data showed that the aircraft proceeded southeasterly at altitudes of 500-600 feet and airspeed between 122 and 127 knots before abruptly slowing and

entering a rapid descent. The pilot recalled that the flight progressed normally until "the helicopter experienced a violent upset, followed by an uncontrolled spin (yaw) to the right." The passenger in the left front seat reported that "she observed something fall off the helicopter; however, she was not able to identify a specific part." A passenger reported the accident by telephone after the ship spun down into "an area of rough, uneven, lava-covered terrain" and rolled onto its left side.

NTSB investigators found the tail boom 762 feet northeast of the main wreckage, having separated from the fuselage at the tail boom attach point. The upper left attachment fitting and its fastener were missing. The fasteners for the other three attachment fittings were present, but the lower left fitting was fractured and showed fatigue signatures. The tail boom had been installed on August 23, 2009 and had not been removed since, accumulating more than 17,000 flight hours. The most recent torque check of the attachment fasteners was carried out on May 4, 2022, 114.2 flight hours before the accident, and no subsequent maintenance was performed on the attachment location.

No Survivors in Learjet Approach Accident

Learjet 55C, June 22, 2022,
3.8 nm SSE of Charallave-Oscar
Machado Zuloaga Airport, Venezuela

Two pilots and four passengers were killed when the twin-engine jet crashed while turning from base to final on its second approach to Runway 10. The flight from Puerto Cabello to Caracas appeared routine until the pilots aborted their initial approach and declared an emergency, citing a problem with the thrust reversers.

After initiating a new traffic pattern for the same runway, the airplane initially turned to a heading of 110 degrees to align with the runway, then turned right to a southerly heading while continuing to descend into a forested hillside.

Final Reports

Low-Altitude Stall Claimed Experimental Turboprop

Epic LT, March 31, 2019,
near Frankfurt-Egelsbach, Germany

The pilot's attempt to reverse course at low altitude rather than flying a standard traffic pattern triggered an unrecoverable stall, resulting in his death and those of both passengers. The final report of Germany's Bundesstelle für Flugunfalluntersuchung (BFU) also called attention to the pilot's non-standard arrival to airspace tightly constrained by that of the adjacent Frankfurt-Main international airport and the lack of any stall-warning equipment in the airplane, originally certified in the U.S. amateur-experimental category in 2008 and exported to Russia in 2014.

The accident flight originated at Cannes, France at 13:57 local time on an IFR flight plan with a filed altitude of FL 260. At 15:19 the pilot contacted Langen Radar to report descending to 6,000 feet, was given the local altimeter setting, advised to expect Runway 08, and cleared to descend to 4,000 feet on a direct course to the DELTA waypoint. Two minutes later the pilot cancelled IFR. The airplane was 16 nm south of the airport at 5,000 feet and a groundspeed of 240 knots.

At 15:22, the flight was handed off to the controller coordinating Egelsbach traffic, who provided runway information and an

altimeter setting the pilot acknowledged and a new transponder code he neither read back nor set. Radar track data showed that twice during the descent the Epic penetrated the Class C airspace of the Frankfurt-Main airport. Rather than following the traffic pattern's base leg parallel to the Bundesautobahn A5 highway, the pilot turned right on a diagonal toward the threshold at the pattern altitude of 1,300 feet and 140 knots groundspeed. Responding to the controller, the pilot acknowledged "not yet" having the airport in site and was advised, "I suggest to reduce, you are now on right base."

The airplane began descending at a rate that reached 1,400 fpm before turning left and crossing the runway northbound "at very low altitude," the pilot requesting, "...may I...make an orbit?" He was directed to circle left and avoid overflying the highway westbound. Witnesses, including three in the airport tower and two in a Piper PA-28 trailing its approach, saw the Epic initiate a left turn below 400 feet at a bank angle estimated at 30-45 degrees. Halfway through the turn, it abruptly pitched down and crashed into an asparagus field in a near-vertical attitude, igniting a fire that consumed virtually all of the aircraft and leaving a scar of 20 meters (63 feet) in diameter.

The 53-year-old pilot held a Russian airline transport pilot license with type ratings for the Boeing 737CL and 737NG and the Gulfstream G550 as well as a single-engine airplane instructor's certificate. His 11,425 hours of flight experience included 676 as pilot-in-command of the Epic LT.

Autopilot Likely Engaged During Fatal Upset

Robinson R66, Jan. 9, 2020,
Mechanicsburg, Pennsylvania

Detailed analysis of attitude and engine data recorded during the flight led the NTSB to conclude that the helicopter was probably operating on autopilot when it encountered

moderate to severe turbulence in the vicinity of the accident site. After about 20 seconds of "slight pitch and roll oscillations," the helicopter rolled left into an inverted attitude during which the main rotor struck the tail boom. The pilot and only passenger were killed in the resulting break-up at 2,300 feet.

The VFR flight departed from Martin State Airport in Baltimore, Maryland, at 19:57 local time, requesting traffic advisories to New York's Buffalo Niagara International Airport at a planned altitude of 3,000 feet. Two minutes after takeoff Martin State tower transferred the flight to Potomac Approach Control, which in turn handed it off to Harrisburg Approach Control at 20:23. The pilot acknowledged and followed instructions to fly a heading of 310 degrees, tracking northwesterly at 107 knots at an altitude of 2,300 feet. Radar contact was lost six minutes later.

No significant attitude excursions were recorded until the last 30 seconds of the flight. Pitch oscillations began between 20:28:46 and 20:29:05, and a left roll reached 10 degrees as the normal acceleration parameter dropped to -1 G and indicated airspeed fell from 107 knots to zero in a single second. Over the next four seconds, the left roll continued through fully inverted to a right bank of 114 degrees, and the engine's power turbine speed (N2) spiked at 128 percent while torque dropped to 1 percent. The suppression of pitch and roll excursions until the final sequence led NTSB investigators to conclude that the helicopter's two-axis stability augmentation system autopilot was "likely" in control of the aircraft until its final upset.

Robinson Helicopters' Safety Notice 11 warns that low-G flight maneuvers are extremely dangerous, and the R66 rotorcraft flight manual recommends limiting airspeed to 60-70 knots during "significant" turbulence. The NTSB's weather study indicated 27-knot winds from 190 degrees at 2,300 feet, creating an 87 percent probability of moderate to severe turbulence. Pilot

reports confirmed strong to severe wind-shear and moderate-to-severe turbulence between 2,300 and 3,000 feet at the time of the accident. The 58-year-old private pilot had completed a company R66 safety course in February 2019, shortly after his company acquired the helicopter, and had logged 167 hours in type.

Electrical Anomalies Traced to Water Ingress

MD 900, July 25, 2021, London, UK

Inadequate sealant around the right engine's igniter cables allowed water to seep from the engine bay into the rear fuselage compartment where it reached the symbol generator and the right engine's electronic engine control unit (EEC).

The air ambulance flight was returning from Royal London Hospital to RAF Northolt Airport after several hours parked on the hospital helipad in heavy rain, and first the commander's electronic horizontal situation indicator blanked, followed shortly by his electronic attitude indicator. The copilot's conventional flight instruments were unaffected. The right engine's EEC then indicated a critical fault while the left indicated a non-critical failure, allowing it to continue under automatic control while the pilot had to switch the right engine to manual control using the twist throttle.

The crew landed safely at RAF Northolt, where maintenance personnel found partial blockage of the drain holes in the rear baggage compartment and visible moisture on the symbol generator and right EEC. Those units were returned to their manufacturers for evaluation, and the EEC was found to have failed permanently due to a moisture-induced short circuit in its power board. ■

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BY GORDON GILBERT

JUST AROUND THE CORNER

Aug. 8, 2022

Europe: Remote Airport Air Traffic Services

This notice of proposed amendment (NPA) from EASA addresses the evolving technological, procedural, and operational aspects of remote airport air traffic services (ATS), with the aim of facilitating its safe and uniform implementation by EASA member states and promoting the development and deployment of new digital technologies. Remote provision of air traffic services, referred to as digital towers, enables ATS from airports where direct visual observation is not available. Instead, the view of the entire airport is through digital technology. Comments on the NPA are due Aug. 8, 2022.

Within 12 Months

Aug. 11, 2022

Europe: Rotorcraft Health Monitoring

An EASA notice of proposed amendment is intended to improve the ability to integrate the use of vibration health monitoring (VHM) systems for the rotor and rotor drive components in Part 29 large helicopters. Current acceptable means of compliance requirements are not sufficient to ensure that VHM systems can be used to optimize alerts when maintenance is required on those components. Comments are due by Aug. 11, 2022.

Aug. 15, 2022

U.S.: Fuel Efficiency Requirements

This action proposes established FAR Part 38, fuel efficiency metric requirements for certification of certain subsonic jet and turboprop airplanes. Depending on the dates of an airplane's original type certification application and issuance of its first certificate of airworthiness, as well as its in-production dates, Part 38 would apply to jet models with an mtow greater than 12,566 pounds and turboprop models with an mtow of greater than 19,000 pounds. In-service aircraft models that are no longer in production are exempt under the proposed rules. Comments are due Aug. 15, 2022.

Sept. 16, 2022 and Sept. 16, 2023

U.S.: UAS Remote ID

New FAR Part 89 requires that after Sept. 16, 2022, no unmanned aircraft system can be produced without FAA-approved remote ID capability. After Sept. 16, 2023, no unmanned aircraft can be operated unless it is equipped with remote ID capability as described in new Part 89 or is transmitting ADS-B Out under Part 91.

Sept. 30, 2022

Europe: Passenger Entry Requirements

Scheduled to start at the end of September, new passenger reporting requirements by the European Union Aviation Safety Agency apply to entry into European Union countries of non-EASA charter flights and professional-piloted Part 91 operations. The requirements do not apply to individuals who own and pilot their own aircraft into the EU.

Oct. 31, 2022

Europe: Reduced Fuel Loads

The European Union Aviation Safety Agency has published rules that permit operators to reduce the amount of contingency fuel normally required to be carried, thereby reducing the CO₂ emissions and the overall environmental impact of the flight. While the rules recognize that extra fuel needs to be carried to account for unexpected situations that delay or

prevent landing at the original destination, EASA said, "The amount of additional fuel required can be optimized, while continuing to ensure high safety levels, due to improved risk assessment, calculations based on better data, and better decision making." The new rules are scheduled to go into effect on Oct. 31, 2022.

Nov. 13, 2022

Australia: Airport Certification

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

Dec. 12, 2022

Canada: Duty/Rest Regulations

Revisions to duty time and rest regulations for Canadian-registered commuter and air taxi operators of turbine and non-turbine aircraft (CAR Parts 704 and 703) go into effect on Dec. 12, 2022. Transport Canada said the changes include: prescribed flight and duty time limits that respect modern scientific research and international standards to limit the amount of time a crew-member can be on the job, and fatigue risk-management systems that will require operators to demonstrate that any variance to

the prescribed flight and duty time limits will not adversely affect the level of flight crew fatigue or alertness.

Dec. 31, 2022

New Zealand: ADS-B Out Mandate

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

Dec. 31, 2022

Mexico: CVRs and FDRs

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

Feb. 23, 2023

Canada: ADS-B Out Mandate

Compliance with ADS-B Out equipment and operating requirements are planned to become mandatory in the country's Class A and B airspace above 12,500 feet beginning Feb. 23, 2023. Aircraft must be equipped with an appropriate transponder with ADS-B out capabilities and have antenna capability for broadcast toward space-based ADS-B receivers emitting 1090 MHz extended squitter. This latter requirement can be met either through antenna diversity (top and bottom antennas) or with a single antenna that is capable of transmitting both towards the ground and up towards satellites.

For the most current compliance status, see:

ainonline.com/cc

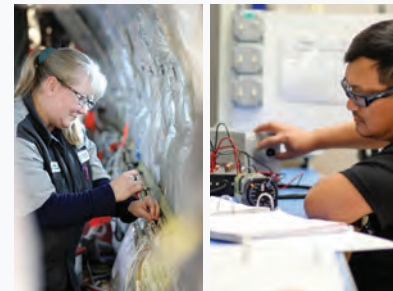
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People in Aviation

BY KAIT WILSON

Ken Karklin has assumed the role of CEO at *Opener Aero* and will also serve on the company's board of directors after *Opener Aero* founder **Marcus Leng** stepped down from the position. Karklin comes to the company after previously holding a variety of leadership positions with drone manufacturer AeroVironment.



DAVID KAHL

David Kahl has been appointed as COO of *FL Technics's* wheels and brakes business in Hannover, Germany. Kahl previously worked at Lufthansa Technik and has spent nearly eight years in the aviation industry, with experience in the wheels and brakes segment.

Jianwei Zhang has been promoted to chairman of *Bombardier China*. Zhang has more than 26 years of experience in the aerospace and transport industries, previously holding various roles at Bombardier and on the company's management team.

Alex Vlielander was appointed by *Liebherr-Aerospace and Transportation* to assume the new position of chief customer officer after previously holding the position of chief services officer with the company. In this new role, Vlielander will also assume the duties held by the former chief commercial officer. Additionally, **Gerd Heinzelmann** has joined the management board of Liebherr-Aerospace Lindenberg in Germany and **Sami Blal** has joined the management board in Toulouse, France.



BILL WHITE

Atlantic Aviation has named **Bill White** as executive v-p and CFO. White has nearly 20 years of experience in the CFO role across several industries, having most recently been the executive v-p and CFO at Prime-Source Brands, a leading distributor

of building materials in North America.

Doug Washburn succeeds **Bruce Hanke** as v-p at *Hartzell Propeller* following the retirement of Hanke after 20 years with the company. Washburn recently joined Hartzell after working at GE Aviation for the past 21 years, where he held numerous engineering management

roles with skills in mechanical design, analysis and testing, organizational leadership, project management, fiber-optic systems, and team building.

Guardian Jet appointed **Chris Hancock** as v-p of business development. Hancock has more than a decade of aircraft sales experience, including serving with Hawker Beechcraft and Dassault Falcon.



FRED POWELL

Portside tapped **Fred Powell** as v-p of product. Powell has 20 years of business aviation technology experience, previously serving at the software company his father founded, Computing Technologies for Aviation, and later with Collins after CTA was sold to the avionics and electronics company, and then for Stellar Labs.

John Vance was named assistant director of operations for *Metro Aviation* at its headquarters in Shreveport, Louisiana. Vance, a former pilot in the U.S. Army, has served with Metro for 15 years, most recently as regional aviation manager in the U.S. southern region.

ACASS appointed **Steve Tedeschi** as worldwide sales director of aircraft management. Tedeschi has spent 10 years with ACASS, functioning as sales director of flight crew staffing, as well as sales director of aircraft sales in the Southeast U.S. and South America.



STEVE TEDESCHI

Ed Monaghan III has been promoted by *Pro Star Aviation* to director of maintenance. Monaghan began his aviation maintenance career at American Eagle Airlines and joined Pro Star in 2005 as an aircraft maintenance technician. He most recently held the position of chief inspector.

Rusada appointed **Larry Strykowski** as director of business development. Strykowski brings an aviation software background to his new role, including as director of technology for MRO and supply chain systems for Continental Airlines and United Airlines, and director of technology for Bristow Helicopter Group.

Duncan Aviation has hired **Bruno Mazzani** as business development coordinator for the company's satellite network. Mazzani holds a degree in mechanical engineering and a master's degree in business marketing. In this new position, Mazzani will manage satellite-specific diversification and growth and continuous improvement initiatives throughout the company's satellite network.



KIMBERLY HERRELL

The *National Air Transportation Association* (NATA) appointed three new members to its board of directors. **Kimberly Herrell**, owner and CEO of Schubach Aviation; **Jessica Naor**, president of GrandView Aviation;

and **Chad Farischon**, v-p of strategic development of West Star Aviation, were newly elected to serve the organization at large. Additionally, **Clive Lowe**, executive v-p of Atlantic Aviation Services, was re-elected to serve an additional one-year term as NATA board chairman. **Curt Castagna**, president and CEO of Aeroplex Group Partners, will continue to serve an additional one-year term as immediate past chair on NATA's executive committee. **Jeff Ross**, president and CEO of Ross Aviation, was named director emeritus, while **Marc Drobny** of StandardAero, Geoff Heck of Signature Flight Support, **Mike Magni** of Monaco Air Duluth, **Chris Rozansky** of Naples Airport Authority, and **Megan Wolf** of Flexjet were re-elected to serve additional three-year terms. **Ken Thompson** has also joined NATA's regulatory team as a senior advisor, specializing in business aviation maintenance issues. Thompson brings more than 48 years of aviation experience to the NATA regulatory team, including nearly three decades as an FAA aviation safety inspector.

West Star Aviation promoted **Andy Pitstick** to program manager and **Connor Mottice** to technical sales manager at its facility in Chattanooga, Tennessee. Pitstick joined West Star in 2017, holding positions at its Grand Junction, Colorado facility, in addition to Chattanooga. Mottice has been with the company for seven years and has served at the location

since its doors opened in 2016, most recently holding the position of quality control manager. West Star further named **Sean Fields** material control manager at its East Alton, Illinois, facility. Fields previously spent 22 years with Boeing in supply chain and operations roles and has flown both airplanes and helicopters.

Bryant Elliott was appointed by *Cutter Aviation* as regional sales manager for Texas Piper. Having held various positions with Piper Aircraft over the past 12 years, he has an intricate understanding of its products.



BRYANT ELLIOTT

Western Aircraft promoted **Heather Aldred** to turboprop regional sales manager and hired **Peter Chabay** as a quoter. Aldred, an A&P mechanic, co-owned a maintenance company in Scappoose, Oregon, and worked as a line mechanic in Hawaii, before joining Western Aircraft in 2016.



AWARDS AND HONORS

The *International Business Aviation Council* (IBAC) has awarded **Leo Knaapen** with the first François Chavatte Award for Lifetime Service to Business Aviation. The award recognizes Knaapen's contributions and "persistent advocacy and promotion of the international business aviation industry," according to IBAC.

The *National Business Aviation Association* presented its American Spirit Award to **Rep. Peter DeFazio** (D-Oregon), the chairman of the House Transportation and Infrastructure (T&I) Committee who is retiring at the end of his term after serving in Congress for 36 years. The longest-serving House member from Oregon, DeFazio has served on T&I throughout his congressional career.

Maintenance quality and safety manager for Jet Access and Eagle Creek Aviation **Mike Grabbe** was awarded the *FAA FAAS-Team's* Charles Taylor Master Mechanic Award in recognition of his 50 years of service as an FAA-certified aircraft mechanic, with more than 20 of those years at Jet Access and Eagle Creek.

► Bizjet accidents continued from page 8

The one non-U.S.-registered business jet fatal accident reported in the first half of this year involved a Venezuelan-registered Bombardier Learjet 55 on a charter flight that crashed into a hillside during an approach, killing the two pilots and four passengers. The crew had declared an emergency, reporting issues with the reversers.

Investigations are ongoing into the three fatal bizjet accidents in the first six months of 2021. On Jan. 9, 2021, the pilot and sole person on board a Cessna Citation V on a Part 91 personal flight died after the twinjet spiraled down to the ground from FL310. Preliminary NTSB information reported that FAA records did not indicate that the pilot held a type rating for the Citation 560.

An N-numbered Gulfstream GIV-SP crashed in the Dominican Republic on May 4, 2021, killing the pilot. Unconfirmed reports say that the pilot was the sole occupant, but the circumstances of the accident remain murky. On May 29, 2021, the pilot and six passengers were killed when their N-numbered Citation I/SP on a Part 91 flight plunged into a lake shortly after takeoff.

Fatalities from U.S.-registered business turboprops nearly doubled in the first half of this year, however. Thirteen people lost their lives in four crashes versus seven people in three crashes in the first six months of last year. On Feb. 13, 2022, the pilot and sole occupant died in the take-off crash of a Piper Meridian. On the same date, a pilot, his son, and six other passengers died when their Pilatus PC-12 crashed into the Atlantic Ocean off North Carolina.

Three occupants perished in the crash of their N-numbered Beechcraft King Air C90 in Mexico on March 28, 2022. On June 3, a Cessna C208B crashed during a landing approach, killing the pilot. Meanwhile, investigations continue into all seven of the fatal accidents of U.S.-registered turboprops that occurred in the first halves of 2021 and 2022. ■



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