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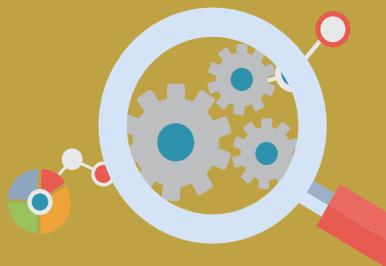
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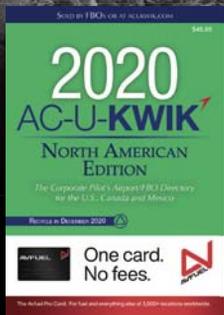
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DESPITE THE JANUARY 2020 COVER DATE ON OUR PRINTED MAGAZINE, the truth is that most of the material within appears on our website throughout December. With that in mind, it seems appropriate to close out business aviation's 2019 with praise for those worthy — as noted in this space last month — and to now recognize those for things otherwise.

Accordingly, I proffer an assortment of symbolic gifts (but should any recipients want the actual physical thing, they need only contact our publisher, a fellow pilot, who will happily provide, but shipping's extra).

To begin:

► **A Big Wormy Apple to:** U.S. Reps. Jerrold Nadler, Carolyn Maloney and Nydia Velazquez, all Democrats from New York, for their proposed ban of “non-essential” helicopter flights over the Big Apple. Their legislation, “The Improving Helicopter Safety Act of 2019,” would do just that, as would a ban on automobiles reduce auto accidents.

The bill was announced soon after Uber Copter launched its first aerial ride-sharing service connecting Manhattan and JFK International and Prime Jet put a Sikorsky S-76 in service shuttling passengers between Republic Airport and the city.

Meanwhile, an Airbus-sponsored survey revealed that nearly one out of two respondents welcomed urban air mobility and were keen to use it — though not in America's most populous city, if Nadler, Maloney and Velazquez prevail.

► **Mad Max Unwelcome Mat to:** Broward County, Florida, Mayor Mark Bogen for insisting Boeing's updates on the 737 MAX contain a list of repairs, including a way for pilots to turn off the model's maneuvering characteristics augmentation system, or he'll use his “power to seek that plane from not landing at the airport here in Fort Lauderdale.”

Meanwhile, the FAA noted it alone determines whether an aircraft is safe and where it can fly.

► **A Spoiled Pot of Spotted Dick Pudding to:** Labour Party members of Parliament who support a proposal that would ultimately ban access to airports in Britain by business aircraft using traditional fossil fuels rather than sustainable aviation fuels (SAF).

Said Kurt Edwards, the head of the International Business Aviation Council, the British people and environment would be better served if those pols “focus on efforts to make SAF more widely available in the UK through positive incentive policies to encourage production and use.”

► **A Box of Stale SMOres to:** The FAA legal eagles who OK'd the City of Santa Monica's using airport revenue to haul away the rubble created by its shortening of the runway at Santa Monica Airport. Now aircraft operators pay for the destruction of construction that benefits them not at all, thanks to a decision by the agency that helped build the place and is related to an agreement it made in secret. The determination had Mayor Gleam Davis gleaming. The city plans to close the airport for keeps in 2029.

► **Another Box of Stale SMOres to:** The Santa Clara County, California, officials who want to shutter San Jose's Reid-Hillview Airport once its grant agreement with the FAA expires in 2031. According to the county, rising costs, declining revenues and growing maintenance problems only compound the need to shut down the general aviation facility, despite the fact

that doing so could add to the congestion at nearby Mineta San Jose International.

► **Cuddly Pink Crying Towel to:** The pilot, known but unnamed here, who stalled and crashed his AT602 agplane after dumping 350 gal. of pink water, intended as the highlight of a gender reveal party in the Texas town of Turkey. While the 14,000-hr. commercial pilot walked away unscathed, his passenger — yes, a second person in a single-place agplane — was taken to a local hospital to treat the minor injuries she sustained. The seven-year-old, PT6-powered airplane transformed into a pile of yellow rubble with a blue stripe along its crumpled fuselage.

► **1,000 Words for:** Garuda, the Indonesian airline, for its ban on passengers taking photos or videos in flight. The motivation wasn't one of safety, but rather to prevent passengers from posting images

that might prove embarrassing to the flag carrier for lousy service. *The Guardian* newspaper said the ban followed a posting by a business-class passenger of a handwritten meal menu and the revelation that the airline was serving meals from a fast-food chain. The photo ban was lifted after generating an online uproar.

► **Finally, a Big Business Aviation Thank You to:** The airlines, which in 2019, according to CarTrawler, a business technology platform, will have collected nearly \$110 billion by charging their customers for extra legroom, early boarding, extra bags and similar “ancillary revenue” items. It's all part of their “customer first” corruption that makes our anytime/anywhere and welcome aboard alternative so attractive.

Despite much of the forgoing, may we all enjoy a productive, rewarding, safe and satisfying 2020. **BCA**

The airlines, which in 2019, according to CarTrawler, a business technology platform, will have collected nearly \$110 billion ... part of their “customer first” corruption

Readers' Feedback

Thanks, Dick

Thanks, Dick, for all your remarkable work. I know the skies are safer due to your efforts. Be well.

malgormley@gmail.com

Comments From the Web

Comments regarding "Connected Cockpit" by James Albright, December 2020

I can appreciate how the question of flight-deck connectivity is a tough call. There are pros and cons for each point of the discussion on whether or not to allow flight crew connectivity. I think that this will be only a short-term problem, since, in the very near future, human pilots will no longer be needed in any category of aircraft. I'll admit that this comment is somewhat tongue-in-cheek; however . . .

capngrog@bellsouth

Good article with some interesting points. Personally, I think that there should be in-cockpit internet connectivity but the question becomes what is appropriate and when? To me, the idea of on duty pilots watching entertainment is going a bit too far, but getting weather information, checking work email/texts and even making calls during cruise seems appropriate and reasonable.

The big issue here is "SOP." I would feel a lot better if the flight department for the aircraft I was flying in had Standard Operating Practices that stated what was appropriate in terms of internet use along with an explanation of how safe flight is maintained.

I would like to see the ICAO and NBAA (maybe ALPA) set out example SOPs that flight departments can use (or modify). Doing a quick check, I couldn't find any information online. (Yes, I recognize that there's something ironic about looking for SOPs/presentations/policy statements regarding inflight internet usage and safety using the internet).

myke.predko@gmail

There are some interesting issues here, but I think the author is missing an important point. When you are piloting an aircraft, whether for an airline or for a private customer, you are an employee and you are being paid (sometimes by the hour) to fly and manage the airplane, not for watching video games, browsing the Web for private interests, or extensive private emails. I can think of no employer that would think those activities were appropriate when "on the job." Do the job for which you are paid.

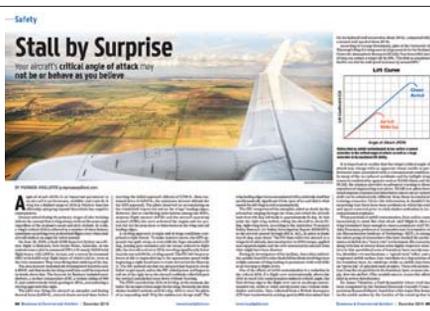
thepaulmason@hotmail

Comment regarding "Stall by Surprise" by Patrick Veillette, December 2020

Very insightful, quite alarming and most provocative. The unalerted and nearly instantaneous onset of a stall close to the ground has already had many tragic outcomes, and with the order of stall AOA degradation in this article, unfortunately there will be many more to catch out the unwary.

chashunt900@yahoo.com

Comments regarding "Alone, Dependent and Confused" by Richard N. Aarons, December 2020



The regulations have changed much since those older general aviation airplanes were certified. Requirement now states: "The means by which stall warning will be provided to the pilot for flight in icing conditions and non-icing conditions will be the same." And a lot more work is being done to

ensure air data probe work properly, even with ice crystals . . .

marioasselin@gmail.com

Whether you're an Asian airline copilot or a private pilot, you're leaning on a very shaky banister if you NEED the autopilot to complete a flight.

sledogpilot@gmail.com

Reading the type of verbiage the pilot used makes me wonder if he suffered a stroke or something, because if not, he definitely did not belong in a cockpit solo, or maybe at all. Or possibly age-related deterioration of cognitive abilities?

sjohnson@arcondevelopment.com

Think about it: This pilot had probably flown here and there and to and from without any trouble with ATC until a simple ATC request caused him to have a seriously confusing problem. From reading the report, I'd say that the pilot sounded like he was, indeed, having some kind of medical issue such as hypoxia, since the problems started at high altitude.

Other than that he would have been wise to take a copilot as insurance. At the very least, get fully versed in the workings of the onboard electronics from a reputable flight school.

Finola

NOTAMS in the News

"Ending NOTAM Nonsense" (November 2010) was well written and very thorough. I have long believed the NOTAM system was an archaic hodgepodge of information and have personally filed and flown one of our Gulfstreams to an airport only to be surprised by the big yellow X on the threshold.

I intend to share this article with my team and look forward to reading more of David Esler's features.

Rich Arrington, CAM
Chief Pilot
Dillard's Inc.
Little Rock, Arkansas

If you would like to submit a comment on an article in BCA, or voice your opinion on an aviation related topic, send an email to jessica.salerno@informa.com or william.garvey@ainforma.com

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NEWS / ANALYSIS / TRENDS / ISSUES

▶ **AFTER A SUDDEN, BUT SHORT-LIVED, COMPANY-WIDE FURLOUGH** in mid-November, Mooney International workers returned to their jobs in Kerrville, Texas, and the plane-maker announced it's likely changing ownership. Again. According to a cryptic statement, the company is negotiating with a group of investors interested in acquiring the manufacturer of



high-performance single-engine aircraft. It went on to state that the investors "have experience in aviation" and, if successful, intend to reestablish the organization as "a viable production and support company for the Mooney brand of aircraft." **Officials would not disclose details or the identity of the interested parties until a transaction is completed.** Mooney has been owned by Chinese investors since 2013 and has

struggled much of that time. Founded by brothers Albert and Arthur Mooney in 1929, the manufacturer has gone through multiple bankruptcies, production starts and stops, and leadership and ownership changes. In the first nine months of 2019, the company delivered eight aircraft — two M20U Ovation Ultras and six M20v Acclaim Ultras — with billings of \$6,479,800, according to the General Aviation Manufacturers Association.

▶ **TEXTRON AVIATION ANNOUNCED IN DECEMBER THAT IT IS REDUCING** its salaried workforce in Wichita and Independence, Kansas, as it continues "to operate with efficiency." The Wichita site employs 10,000 workers. Most of the layoffs are taking place at its Wichita headquarters and primarily affect engineering staff, according to the company. Some business support functions are also being reduced. It noted, however, that the "reduction does not impact the company's direct workforce." The company declined to say how many positions are being reduced. Textron Aviation recently offered employees a Voluntary Retirement Program with limited eligibility for salaried exempt employees. The cuts are taking place in its business aircraft and defense businesses. On a third-quarter conference call with analysts, Scott Donnelly, CEO of Textron, Textron Aviation's parent company, said the company is experiencing "some softness" in the market. "It's not a horrible market," Donnelly said on the call. But in the



latter parts of the second and the third quarters, the company saw "just uncertainty in the end market," Donnelly said at the time. Some customers wanting to buy new aircraft are now debating the timing, saying "do I do it now; do I wait?" The reductions in engineering and support come at a time when the company has experienced changes in

recent development programs. **Its newest model, the Citation Longitude, has now entered service and work on the new, larger Citation Hemisphere program has been frozen** as a result of problems with the Safran Silvercrest engine, which caused Textron to cancel its supply contract with the French engine maker in July. The company is also in the midst of developing two turboprops. While work is progressing, first flight of the single-engine Denali has been delayed, but Textron says it now expects to receive delivery of GE Aviation's new Catalyst engine sometime in 2020. The company had earlier expected first flight by the end of 2019. It is also making progress on the Sky Courier twin turboprop. First flight is now expected in early 2020. Textron Aviation is the second business aircraft manufacturer to reduce employment during the fourth quarter of 2019. In mid-October, Gulfstream Aerospace cut 446 positions, primarily in business support and administrative functions, as it realigns its business, the company said at the time.

Jet-A and Avgas Per-Gallon Fuel Prices December 2019

Jet-A			
Region	High	Low	Average
Eastern	\$8.74	\$4.45	\$6.19
New England	\$7.85	\$3.86	\$5.22
Great Lakes	\$8.13	\$3.37	\$5.51
Central	\$7.51	\$3.37	\$4.92
Southern	\$8.19	\$4.30	\$5.98
Southwest	\$6.83	\$3.31	\$5.30
NW Mountain	\$7.98	\$3.60	\$5.40
Western Pacific	\$8.05	\$4.20	\$6.15
Nationwide	\$7.91	\$3.81	\$5.58

Avgas			
Region	High	Low	Average
Eastern	\$8.44	\$4.48	\$6.48
New England	\$7.45	\$5.04	\$5.89
Great Lakes	\$8.59	\$4.59	\$6.07
Central	\$7.59	\$4.51	\$5.47
Southern	\$9.24	\$4.30	\$6.29
Southwest	\$7.19	\$4.12	\$5.71
NW Mountain	\$8.46	\$4.74	\$5.87
Western Pacific	\$8.52	\$5.29	\$6.42
Nationwide	\$8.18	\$4.63	\$6.02

The tables above show results of a fuel price survey of U.S. fuel suppliers performed in December 2019. This survey was conducted by Aviation Research Group/U.S. and reflects prices reported from over 200 FBOs located within the 48 contiguous United States. Prices are full retail and include all taxes and fees.

For additional information, contact Aviation Research/U.S. Inc. at (513) 852-5110 or on the internet at www.aviationresearch.com

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Gulfstream Delivers 400th G650



In December, Gulfstream Aerospace delivered its 400th G650. The aircraft, a G650ER, will be operated by an unnamed customer and based in the U.S. Deliveries of the long-range model began in December 2012. The G650 has a 7,000-nm range at a long-range cruise of Mach 0.85, and the ER version has an additional 500 nm at that speed. High-speed cruise is Mach 0.90, MMO is Mach 0.925 and maximum operating altitude is 51,000 ft.

Pilatus Delivers 1,700th PC-12 to Jetfly Aviation



In late November, Pilatus delivered its 1,700th PC-12 to Jetfly Aviation, a European fractional aircraft operator whose 40 aircraft constitute the world's largest fleet of the Swiss-made single-engine turboprop. At the time of the handover, Maxime Bouchard, Jetfly's managing director, said his company's success "would not have been possible without this ecological, safe, economic and high-performance aircraft." Pilatus said it expected to close out 2019 having delivered 80 PC-12s.

► **CHICAGO EXECUTIVE AIRPORT HAS LAUNCHED A RESIDENTIAL** sound-insulation program to reduce aircraft noise for nearby residents. Under the program, insulating materials are provided at no cost to owners of eligible homes, with the FAA funding 90% of the cost and the remainder coming from the airport. The work will begin this year and is expected to extend into 2021 and beyond. **"Our mission is not just to be the best general aviation airport in the country,** it's also to be a great neighbor to our surrounding community," said Jamie Abbott, the airport executive director, describing the undertaking as "huge but worthwhile." The program launch marks the culmination of mitigation strategies that the airport said have reduced overall noise by 30% since 1986. According to Abbott, to launch the program, the airport received an initial FAA grant totaling \$2.3 million, adding that the airport's directors are comfortable with the facility investing about \$200,000 a year into the



program. The airport must apply for grants each year and the amount received will depend on how much the airport is able to contribute. Although the Chicago airport is not the first to implement the program, it is uncommon for business and general aviation airports. The airport held a public information meeting to introduce the program to nearby residents, Abbott said.

About 150 people attended. Located 18 mi. northwest of Chicago in Wheeling, Illinois, Chicago Executive is the top reliever airport for Chicago O'Hare International Airport. It accepts 80,000 corporate, charter and recreational aircraft a year. According to AirNav.com, in 2017, the airport averaged 212 operations a day and had 176 aircraft based at the field.

► **FLIGHTSAFETY INTERNATIONAL HAS PARTNERED WITH IBM** to develop FlightSmart, an integrated pilot performance evaluation and training tool. FlightSmart uses artificial intelligence (AI) and objective training to increase effectiveness and enhance safety. "FlightSmart will set a new, higher standard for personalized, highly effective pilot training," FlightSafety President and CEO David Davenport said. The training uses artificial intelligence and machine learning to evaluate pilots' abilities while they perform critical tasks and maneuvers through all phases of flight, FlightSafety said. FlightSmart then creates a customized corrective action path to address any deficiencies identified in the training. The U.S. Air Force Air Education and Training Command (AETC) has signed a contract with FlightSafety for FlightSmart, which will be used on 16



T-6A training devices, including initial and operational flight trainers, at Columbus Air Force Base in Columbus, Mississippi. The contract also includes options to expand to other AETC bases that operate T-6 aircraft. Instructors, through FlightSmart, will gain a comprehensive understanding of a pilot's strengths and weaknesses using

real-time data to measure performance, FlightSafety said. This is accomplished using advanced analytics and data collection from any training medium, according to FlightSafety. Instructors can then focus on areas that need improving rather than use repetitive actions that are rooted in a fixed syllabus, it said. In the future, FlightSmart will expand to include aircraft maintenance technicians, operators of unmanned systems and others.

► **FUEL DISTRIBUTOR SHELL AVIATION IS TO SUPPORT DEVELOPMENT** of Europe's first dedicated sustainable aviation fuel (SAF) production plant, planned to be built in the Netherlands by SkyNRG. Shell will contribute technical and commercial expertise to development of the plant, which is to be commissioned in 2022. **Once in operation, the facility will produce 100,000 metric tons a year of HEFA (hydro-processed esters and fatty acids) aviation biofuel sourced from waste and residue feedstocks such as used cooking oil.** The plant will also produce 15,000 metric tons of bio-derived liquid petroleum gas annually as a byproduct. Through its participation, Shell will secure the option to purchase SAF from the plant. Notably, last May, KLM committed to purchase 75,000 metric tons of SAF a year for 10 years from the facility. SkyNRG is planning five more SAF plants. In May 2018, SkyNRG and Shell Aviation announced a long-term collaboration to develop and promote the use of SAF, and that December they began supplying the fuel to KLM, SAS and Finnair at San Francisco International Airport. The HEFA fuel is produced from used cooking oil by World Energy at the only operational SAF plant, which is located in Paramount, California.

► **BOEING AND STARTUP KITTY HAWK HAVE UNVEILED** a joint venture called Wisk that is developing the Cora two-seat electric vertical-takeoff-and-landing (eVTOL) autonomous air taxi. The companies announced a strategic partnership on urban air mobility (UAM) in June. Formed in July and headquartered in Mountain View, California, Wisk



is led by CEO Gary Gysin, former president and CEO of Liquid Robotics, the maritime autonomous robot developer acquired by Boeing in 2016. Two other eVTOL vehicles also under development remain with Kitty Hawk, which was founded in 2010 and is backed by Google co-founder Larry Page. Testing in New Zealand began in October 2017, with full-scale prototypes complet-

ing their 1,000th flight in March 2019. In October, Cora was announced as the first industry partner in a program to define a passenger-transport-focused trial under a New Zealand government initiative to accelerate airspace integration for advanced pilotless aircraft. Wisk plans to begin passenger flights in New Zealand, but "we are not putting time frames around when services will begin," according to the company's website. "We are working constructively with regulatory authorities." The battery-powered Cora has 12 lift rotors mounted in fore-aft pairs on booms under the wing and a pusher propeller on the aft fuselage for propulsion in forward flight. According to Wisk, **flight tests have shown the failure of one rotor can be "automatically handled with no discernible change in the flightpath."** Again, according to the company, the aircraft can also handle the failure of one of its triple-redundant flight control computers, and is equipped with a recovery parachute in case of a complete power failure.

► **AVIATION WEEK NETWORK RECENTLY ANNOUNCED THE WINNERS** of its 63rd annual Laureate Awards, honoring achievements in global aerospace. In the Business Aviation category, the winners and their respective categories are: Robotic Skies — Maintenance, Repair and Overhaul; Rega Swiss Air-Rescue — Operations; Gulfstream G500/G600 — Platform; Pratt & Whitney PT6E — Propulsion; Garmin Autoland — Safety; and Wing Aviation — Technology & Innovation. Winners in all categories will be recognized at the 2020 Laureate Awards to be held March 12, 2020, at the National Building Museum in Washington, D.C. At that time, a Grand Laureate will be named from among the categories as well.

Bombardier Montreal Receives First SAF Shipment



Bombardier's Montreal facilities recently received their first shipment of sustainable aviation fuel (SAF) from Avfuel Corp. It is the first step in Bombardier's plan to secure long-term partnerships with fuel suppliers to deploy SAF to all of its facilities as supplies become readily available. The company says it has used SAF for demonstration purposes globally since 2017.

BAA Training Expands Ab Initio Flight School



BAA Training, an independent aviation training center, has expanded its ab initio flight school in Europe — adding one more flight base in Spain. The company, currently operating in Lithuania and Spain, has been providing ab initio training since 2009 and has collaborated with major airlines for cadet training programs since 2016. It opened its first flight base in Spain last year in order to train year-round and plans to add a second. More than 300 students are currently attending the academy.

France Adds Falcon 8Xs to Military Intell Fleet



France's military is replacing its two Transall C-160 signal intelligence aircraft with three modified Falcon 8Xs. The program's goal is to renew France's capability in electromagnetic signal intelligence, notably the interception of voice radio communications and radar waves. The French air force expects the program will bring greater accuracy, higher speeds and better agility compared to the earlier equipment. The first modified Falcon 8X will be delivered around 2025.

CAE to Be Carbon Neutral by This Summer



Aviation training provider CAE recently promised to be a carbon-neutral company by summer 2020 and will look to electric training aircraft as part of its green push, but named no particular aircraft or date for employing them. In the meantime, the Canadian company said, it will achieve its goal by offsetting carbon emissions from the fuel used for all training flights of its academies, from energy consumption in its locations worldwide, and from the business travel of all its employees. CAE also will take other steps, including making its full-flight simulators more energy efficient.

► **BOMBARDIER HAS SIGNED A LONG-TERM LEASE AGREEMENT** with the Greater Toronto Airports Authority to build a 1 million-sq.-ft. manufacturing center, where it will relocate Global aircraft final assembly. The center will be located at Toronto Pearson International Airport and is expected to open in 2023. Bombardier said it will provide financial details later. "I'm very excited to announce the relocation of our Global aircraft family production activities to a new, cutting-edge manufacturing facility," Alain Bellemare, Bombardier president and CEO, said Dec. 4. "This is a strategic move for Bombardier and a strong commitment to Ontario's aerospace industry." As part of its restructuring plan, Bombardier sold its manufacturing site in the Downsview area of Toronto to the Public Sector Pension Investment Board in June 2018. The deal included a lease agreement allowing



Bombardier to continue operations there for up to three years after completion of the sale plus two additional one-year options. **The Downsview site currently employs 3,000 workers and a spokesperson said no jobs will be lost in the move to the new facility.** Bombardier also confirmed Dec. 4 that it will continue to support the Downsview site with a multimillion-dollar contribution to the Downsview Aerospace Innovation and Research Consortium to develop an aerospace hub for academic research and training. The contribution includes \$2.5 million in capital funding to refurbish the historic Moth Building, where wartime Mosquito fighter bombers and Tiger Moth trainers were manufactured.

► **CHARTER BROKER PARAMOUNT BUSINESS JETS HAS INTRODUCED** a carbon offset system for passengers hoping to neutralize the CO₂ and other pollutants generated by their flight. It works by calculating the carbon generated and listing offset organizations that can directly accept offset donations. While such programs have been available for some time for commercial airline flights, the Leesburg, Virginia, broker says its is the first "digital end-to-end system for everyone in the private aviation industry." To use the system, passengers enter their flight time and the type of aircraft, and the tool computes the flight's total emissions. It then offers a choice of eight carbon-offset providers from which the client may choose to pay for carbon credits of their flights. "Our industry has always strived to be environmentally responsible, and these efforts have taken on even greater importance as we've seen a growing list of international movements targeting private aviation," said Paramount founder and CEO Richard Zaher. "This tool helps to fight back against climate change and global warming."

► **BAE SYSTEMS HAS RECEIVED CERTIFICATION OF ITS** active inceptors for Gulfstream's G500 and G600 business jets, the company announced. The approvals include FAA certification for the G600 and European Aviation Safety Agency (EASA) certification for the G500. They are the second series of certifications for the company's active sidesticks in civil applications, which were first certified on the G500 last year, BAE says. The active inceptors, part of the controls pilots use to fly the aircraft, include electronically controlled actuators that send tactile feedback to the pilot through the stick. The feedback can warn pilots of impending structural or aerodynamic operating limits. The pilot and copilot controls can be linked so each can see and feel the other's inputs. The military version of the technology was first developed for the Joint Strike Fighter program in the 1990s. Today, they have been included on 12 different commercial and military aircraft and have logged more than 200,000 flight hr.



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HondaJet Elite Deliveries To China Begin



Honda Aircraft has begun deliveries of its HondaJet Elite light jet to China. The first HondaJet was delivered at the company's headquarters in Greensboro, North Carolina, to Hon-san General Aviation Co., its exclusive dealer in China. The delivery to China is being financed by Mitsubishi UFJ Lease & Finance Co., a leasing company based in Japan, the company says. The HondaJet received certification from the Civil Aviation Administration of China in August.

Jet Aviation Redesigns Riyadh Facility



Jet Aviation has redesigned its facility within the shared FBO terminal at Riyadh's King Khalid International Airport. The company expects it to be operational at the end of the first quarter of this year. Amenities include a refreshment pantry and buffet, customer lounge, VIP lounges, a snooze room, duty-free shop, prayer room, weather and flight planning facilities. The facility also features an office located airside for handling and line crew. Jet Aviation celebrated its 40th anniversary in Saudi Arabia last year.

▶ **CANADIAN SEAPLANE AIRLINE HARBOUR AIR HAS FLOWN** a de Havilland Canada DHC-2 Beaver converted to electric propulsion and powered by a 540-kW (750-hp) motor developed by MagniX. The aircraft made a 4-min. flight on Dec. 10, 2019, from the airline's seaplane terminal on the Fraser River at Vancouver International Airport. Harbour Air, North America's largest seaplane airline, describes the flight as the world's first for an all-electric commercial aircraft. Previous flights have involved general-aviation aircraft converted to hybrid-electric propulsion. "Today, we made history," says Greg McDougall, CEO and founder of Harbour Air, who piloted the electric Beaver on its first flight. The 63-year-old Beaver's Pratt & Whitney radial piston engine was replaced with MagniX's magni500 motor under Harbour Air's ePlane project to electrify its commercial seaplane fleet, which includes



de Havilland Canada DHC-3T Turbo Otters and DHC-6 Twin Otters. The motor was derated to 450 hp to match the Beaver's original engine, but Harbour Air's longer-term focus is on re-powering its workhorse, the larger Otter, which has a Pratt & Whitney Canada PT6A turboprop and will use the full 750 hp of the

MagniX motor. The batteries used in the flight are not the ones that Harbour Air and MagniX plan to use in operation, says McDougall in an interview with Canada's Skies magazine. The electric-powered Otter is expected to have at least 30 min. of flight time — enough for most Harbour Air routes — plus a 30-min. reserve. A 30-min. flight is expected to require 30 min. of battery recharging, which fits within the airline's turnaround times.

▶ **DAVID PADDOCK OF JET AVIATION WILL SERVE AS CHAIRMAN** of the General Aviation Manufacturers Association (GAMA) and **Nicolas Chabbert of Daher** will serve as vice chair in 2020. GAMA also recently announced the creation of a European Leaders Steering committee. David Van Den Langenbergh of Luxaviation will lead this new effort, which is to provide guidance for the association's work with European institutions and stakeholders. The new committee will comprise senior executives from GAMA's European member companies. In addition, named as chairmen and their respective committees are: StandardAero's Marc Drobny — Airworthiness and Maintenance Policy; Michael Amalfitano of Embraer — Communications; Bell's Michael Thacker and Eric Allison of Uber Elevate — Electric Propulsion and Innovation; David Coleal of Bombardier — Environment; ForeFlight's Tyson Weihs — Flight Operations Policy; Eric Hinson of Simcom — Safety and Accident Investigation; Greenwich Aero-Group's Jim Ziegler — Security Issues; and Jeff Trang of Airbus Helicopters — Technical Policy. Meanwhile, Mark Burns of Gulfstream will serve on GAMA's Executive Committee as immediate past chairman.

▶ **AIR BP HAS ADDED ITS DIGITAL AIRFIELD AUTOMATION** technology at Emirates Flight Training Academy at Al Maktoum International Airport. The cloud-based platform aims to prevent misfueling and enhance safety, reliability and compliance in airport fueling operations through an engineering barrier. The platform consolidates the data related to airport fueling operations and works via an app on a handheld device in the fueling vehicles. The "**safe2go**" app captures fuel volume readings and provides fuel grade checks. Air BP expects the technology to be fully operational at about 350 locations by the end of 2020.

▶ **A FLYOVER OF SOME 100 WORLD WAR II AIRCRAFT IS PLANNED** to take place over the National Mall in Washington, D.C., on **Friday, May 8, 2020, the 75th anniversary of Victory in Europe (VE) Day and the end of that war on European soil.** The flight involving two dozen separate, historically sequenced formations is to be part of a five-day slate of educational and commemorative activities in and around the nation's capital and will coincide with a ceremony for veterans at the National World War II Memorial. **On Sept. 2, there will be a special ceremony aboard the USS Mis-**



souri in Pearl Harbor, Hawaii, to commemorate the 75th anniversary of the end of World War II in the Pacific. It will be part of another five-day schedule of educational programs and ceremonies. The Japanese signed the surrender documents ending World War II on the deck of the "Mighty Mo" in Tokyo Bay. The 75th World War II Commemoration Committee has launched a public fundraising initiative to engage the public's support for the events. "It is our goal to honor

the heroism and sacrifice of our WWII veterans, those serving on the home fronts and those who suffered the horrors of the Holocaust while we still have a precious few left living among us," said Pete Bunce, president of the General Aviation Manufacturers Association and representing the committee. Honorary co-chairs of the 75th WWII Commemoration Committee, Sens. Bob and Elizabeth Dole, will be joined by Linda Hope, who represents the Bob and Dolores Hope Foundation. For more information: www.75thwwiicommemoration.org

▶ **SALES OF AVIONICS FOR BUSINESS AND GENERAL AVIATION** aircraft rose 14.3%, to \$2.29 billion, during the first nine months of 2019 compared to a year ago, the Aircraft Electronics Association (AEA) reports. The business and general aviation avionics industry has now posted an increase in year-over-year sales for 11 consecutive quarters, AEA says. During the period, 52.8% of the sales came from the retrofit market, with the forward-fit market making up the remainder. Third-quarter sales totaled \$780.8 million, up 14.9% from a year ago.

▶ **TEXTRON AVIATION HAS DEVELOPED A NEW UTILITY NOSE** option for the Beechcraft King Air 350 to give the aircraft more capabilities. The option, certified by the FAA, allows for an additional 12 cu. ft. of storage space for up to 250 lb. of additional payload. "This modification is a response to customer interest in optimizing



the flexibility of our King Air 350 platform — equipping the aircraft with additional space for baggage or for special mission applications — and increasing loading configurations," said Bob Gibbs, Textron Aviation vice president, defense & special missions sales. "We remain committed to continuously enhancing the platform to ensure our customers

have the capability to succeed, no matter the mission," he said. The extra storage can accommodate equipment such as cameras and other sensors in surveillance configurations or oxygen bottles and medical equipment for ambulance operations, the company said. The upgrade can be installed on the King Air 350 and its 350C cargo variant and 350ER extended-range aircraft. It is compatible with the Pratt & Whitney Canada PT6A-60A engine or the PT6A-67A engine.

Dubai Airshow Ends With Record Attendance



The Dubai Airshow, which was held Nov. 17-21, 2019, attracted 84,043 attendees, a record number, along with 1,288 exhibitors, including 100 first-time exhibitors, and 161 aircraft on static display. Orders at the show totaled \$54.5 billion by the close of business, organizers say. It also featured conferences, keynote speakers and networking opportunities. The next show will be held Nov. 14-18, 2021.

Ingenio Interior Products Selected for Falcon Fleet



Dassault Falcon Jet has selected Ingenio Aerospace, based in Montreal, to supply interior cabin products for use on in-service Falcon 2000, Falcon 900 and Falcon 7X jets. Dassault and Ingenio have developed cabin receptacles and tablet arms to update and modernize in-service cabins. The products are designed to operate with consumers' technologies. Ingenio's "plug & play" cabin products integrate with inflight entertainment systems to provide USB-driven products for use with personal electronic devices.



Kurt Robinson

President and Chairman
Robinson Helicopter Co.
Torrance, California

After graduating with an economics degree from the University of California-San Diego, Robinson was enticed by his father, Frank, to return to Torrance and work at the family owned company that had just begun deliveries of the R22. After two years working various positions at the plant — putting to good use the hands-on experience he'd gained in after-school jobs at an auto repair shop — the young Robinson headed back south, this time to earn a Master's in business administration and, with his dad's encouragement, a law degree, both from the University of San Diego. Those done, he alighted in Torrance again. The year was 1987, and he's been there ever since serving in a variety of executive positions until moving into the top job when his father retired 10 years ago.



TAP HERE in the digital edition of **BCA** to hear more from this interview or go to aviationweek.com/fastfive

Questions for Kurt Robinson

1 What do you make of the heady predictions for urban air mobility?

Robinson: It's exciting and we're talking about it internally. It's getting closer and closer to reality. Ultimately, we expect to benefit from much of the ongoing developments in reliability, simplification and making things lighter. As you know, our aircraft already operate in urban environments in the U.S. and worldwide.

The biggest concern about lots of additional entrants is safety. Helicopter accidents rivet people's attention. The critical technologies will be further refined autopilot and stability augmentation systems. The machines will have to be IFR-capable all the time. We're working on that for our single-engine helicopters. For UAM to succeed, you can't let fog on one side of the city prevent you from getting to the other. Then too, you have to operate them professionally under FAR Part 135 and along specific routes such as freeways. And you need to expand the infrastructure beyond what already exists in the Los Angeles area. Another major concern is noise. You've got to reduce that.

2 Won't accomplishing all that be expensive?

Robinson: I'm with you on that. An R22 costs \$300,000 and it can only take one passenger. It's quite limited in what it can do and carry. An R44 is better suited for the purpose since it can carry a pilot and three passengers and some luggage, but it costs \$400,000 to \$500,000. Next step up is an R66, which can whisk five over all the ground traffic jams, but it's a \$1 million investment.

3 Do you foresee pilotless UAM aircraft?

Robinson: At some point in time, I'm not going to bet against it. A key to achieving that is further development of autopilot systems whose proper functioning is virtually guaranteed. Ten years ago an autopilot was a \$250,000 to \$300,000 system. The autopilot on our R44 costs under \$60,000 and the aircraft will fly itself with greater reliability. That's the direction pilotless flight is going. Still, I'd want a pilot on board.

4 What of eVTOL, electric vertical takeoff and landing aircraft?

Robinson: The power required for hovering a passenger-carrying aircraft is huge. That's so difficult to achieve with electric power, it's daunting. Endurance is a factor as well. That said, a company in Orange County did a long endurance flight in an R44 with a battery pack, so I'm not going to rule it out. At Robinson, we're engine agnostic. We make piston and turbine models. We've looked at diesel. If there's an electric option, we'll absolutely look at it. Advances in that technology have gone forward significantly, but unless there's some major transformation, I'm not optimistic about it over the next few years.

5 Would your company consider entering the drone business or manufacturing in a lower-cost location?

Robinson: No. We work at making aircraft that carry people. That's our expertise. I love the high volume of the drone segment and the fact that they're not so tied to regulation, which helps drop the costs. But it's a different market, a different category than the one in which we operate. As for building elsewhere, we like to keep everything in house to control quality. That helps with logistics, too. Back in the 90s, lots of folks were outsourcing, but we were just the opposite. And are still. **BCA**

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Dual-Qualified

Multiple ways to **get into trouble**



Staying proficient in multiple types can be harder than you might think.

JAMES ALBRIGHT

BY **JAMES ALBRIGHT** james@code7700.com

There are two competing thoughts about the wisdom of keeping qualified in two aircraft types. In one viewpoint, doing so makes you less proficient and capable in both. The opposing view is that it makes you a better stick and rudder pilot in both aircraft and less susceptible to becoming complacent in either.

Having maintained dual qualification a few times in my career, I endorse the former view since during those periods I had less confidence in piloting both aircraft.

But quite often we don't have a choice and the demands of the job dictate dual qualification. Some operations dictate more than one type, be it because of range, cabin size, operating cost or the aircraft's external dimensions. No matter the motivation, it will please the accountants to have dual-qualified crews because that appears to be cost effective. But at the same time, this arrangement will make the safety officer cringe. And while I sympathize with the bean counters, it is the body count that really concerns me.

The Size of It

If you've never been in the game of maintaining dual qualification, you might think the biggest problem lies with the

sheer size of the airplanes. When I think of "big," I think of the Boeing 747. I was surprised to find it to be one of the easiest landing airplanes I've ever flown because of the cushioning effect of the massive wing and the airplane's inherent stability under virtually all landing

conditions. Of course, I had my streak of bad landings, but I was unable to diagnose why or how I had managed to cure them. After a few years in the 747, it became advantageous for me to qualify in a turbocharged PA-32R Piper Lance. The surprise this time was that



MALCOM NASON



MALCOM NASON

Two aircraft of the author's past that were almost identical but were actually worlds apart.

the Lance forced me to become more methodical about landings.

In the small aircraft the sequence is: “aim point/airspeed until the aimpoint disappears, eyes on the end of the runway, let the airplane sink to touchdown.” In a jumbo it’s: “aim point/airspeed until 50 ft., ensure autothrottles retard, eyes on the end of the runway at 30 ft., let the airplane sink to touchdown.” It turns out my bad streaks were caused by skipping the “eyes on the end of the runway” bit. So, flying such different aircraft cured me of that oversight.

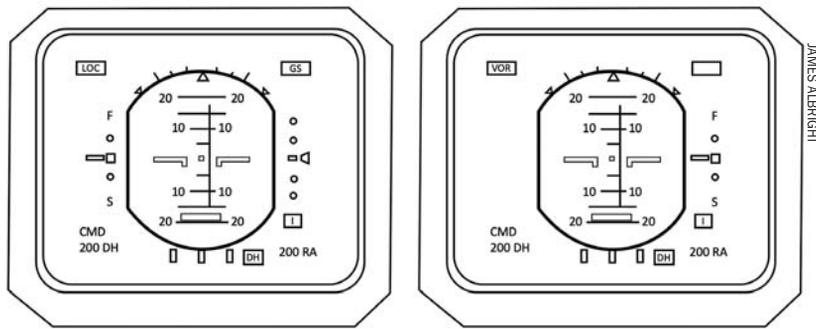
I’ve heard similar stories from many pilots about the stick and rudder aspect being a non-factor. Of course, there are exceptions. Mixing an airplane with ailerons and one without, for example, could be cause for extra caution. In my experience, the real challenges are located inside the cockpit and involve avionics and procedures.

Issue: Avionics

There is an old saying in the Gulfstream world that goes like this: “If you’ve flown one gee three, you’ve flown one gee three.” There are just so many differences among the same model. You can have glass or non-glass cockpits. Some are electrically DC-powered, others are primarily AC-powered. The location of radios, navigation systems, and even basic avionics can differ even on aircraft with sequential serial numbers. Consequently, maintaining qualification on two different GIIIs can be a humbling experience.

While I was a pilot flying for the 89th Airlift Wing at Andrews AFB, Maryland, I primarily flew the C-20B, a Gulfstream III. We had seven “B models” at the time and a little more than half our squadron’s pilots were qualified to fly it. It had what has become known as a “partial glass cockpit” and all seven were identical, inside and out. We racked up a lot of hours and after a while you could reach out and touch any switch without looking and your eyes reflexively knew the placement of every instrument and indicator.

At least that is the way it was for most of our pilots. I was not one of them. A small subset of pilots secretly kept qualification in three other aircraft, C-20Cs, which were also Gulfstream IIIs. While the B and C models were cosmetically similar, their cockpits were drastically different. Looking for the radio control head? Look again, that was where it was on the other airplane. Where is the



Left illustration: A standard EADI showing on glideslope. Right illustration: A non-standard EADI without a valid glideslope signal showing an on-speed indication.

VOR needle? No, not there — again, that was the other airplane. When flying the C model, everyone realized it would take a few hours to acclimatize to the new jet and seeming like an idiot was to be expected. But when we returned to the B model, our peers always had a good laugh at our expense: “What’s with you? I thought you were good.”

Feeling like an idiot seems to be a common thread among dual-qualified pilots. It isn’t a problem, so long as we take the time to reacquaint ourselves from airplane to airplane. But we often revert to our comfort zones when under stress. In those conditions, even what some would consider a minor cockpit difference can become deadly.

To realize just how critical it is to have everything where we expect it, consider the instrument landing system (ILS); there is no more comfortable instrument approach. No matter where in the world you are, having a flight director guide you down to minimums as the raw data remains centered can give any pilot a huge shot of confidence. Even without the flight director, we practice regularly to keep the localizer centered and the airplane on course, as well as the glideslope deviation indicator in the middle and us on a beautifully stable glidepath. Right? Now, without looking, where do you expect to see the glidepath indicator? Will it be on the left or right of the attitude indicator?

The standard layout, as described by Advisory Circular 25-11, is to have the glideslope deviation indicator on the right, provided a valid frequency is tuned and the avionics have a valid signal to display. Otherwise the indicators should disappear. That has been the standard for a while, but there are legacy systems out there. The pilots of Gulfstream III N85VT knew all too well about the non-standard layout of a portion of their fleet of airplanes. Of

the six aircraft they routinely flew, five had the glideslope indicator on the left, non-standard side. Of those, four had an airspeed fast/slow indicator on the right side and the remaining airplane had nothing at all. These highly experienced pilots flew the non-standard layout mostly, but not exclusively.

On Nov. 22, 2004, a crew flying N85VT was repositioning to William P. Hobby Airport, Houston (KHOU) on an IFR day that would demand their best instrument flying skills. The runway visibility was one-eighth statute miles in fog with runway visual range between 1,600 and 2,400 ft. The first officer dialed in the correct ILS frequency in the standby window of the radio’s control panel but forgot to throw the switch that turned it active. Neither pilot followed up with the “identify” step of what every basic instrument pilot has drilled into their heads: Tune, identify, monitor.

The captain turned the airplane to intercept what he thought was the localizer but turned out to be the VOR. He voiced concern that his flight director would not go into the approach mode but proceeded to fly the course line and start a descent along what he seemed to think was the glideslope. Passing about 1,000 ft., the first officer realized the wrong frequency was active and made the switch. He said, “you’re all squared away now.” The captain turned and intercepted the localizer at an altitude of about 900 ft., which was 800 ft. below the glideslope. He continued to descend to his decision altitude of 244 ft., only to impact a light pole at 198 ft. more than 3 mi. short of the runway. All three people on the aircraft were killed.

The NTSB speculates that the pilots believed they were on glideslope because the indicator on the right side of the electronic attitude director indicators (EADIs) was centered. Without the localizer tuned, the glideslope indicator

JAMES ALBRIGHT

on the left would have been absent. They flew the fast/slow indicator believing they were on glideslope. Once the localizer was tuned, it is likely the glideslope indicator would have appeared on the left of their EADI, but by that time they were focused on the fast/slow indicator.

The Ground Proximity Warning System was supposedly operational (no problems documented) but none of the lifesaving calls were made. It is easy to find fault with the pilots, who besides making the tune/identify/monitor errors, failed to make all but one of their required callouts. But who among us hasn't gone into "I'm going to make this work" mode when falling behind the airplane? Today's standardized avionics have made it easier for us, but flying aircraft of two different configurations still complicates matters for dual-qualified pilots.

Issue: Procedures

Consider the mundane task of turning an aircraft's oxygen system on prior to flight. You might have a single switch or two with one switch for the airplane system and the other for the cabin. It is a useful arrangement for the aircraft's initial flights after initial build, but little more than a nuisance once the cabin is outfitted. That is the case in "traditional" Gulfstreams like the G550, as well as the "hybrids" such as the G150. Generations of Gulfstream pilots know that the price of getting the order wrong can be the proverbial "rubber jungle" of oxygen masks deployed by mistake, 10

or 15 min. of stuffing those masks back into their containers, and a case of beer to the mechanic left with that task. For years Gulfstream pilots knew that the aircraft switch is turned on first, followed by the cabin. But that is not true for the hybrids, where the order is reversed.

Dropping oxygen masks in the cabin can be embarrassing to a pilot, but type-specific confusion in some airplanes can cause more serious damage, injury, or even loss of life. The G550 flight management system (FMS), for example, automatically makes many performance entries and even reads the fuel gauges. In the G150 these require manual entries. Pilots who fly both types can forget and end up taking off with invalid data. The larger aircraft requires its outflow valve be closed overnight, but that isn't the case for the smaller Gulfstream. This mistake cost a pilot his life on Jan. 4, 2018, when attempting to open his G150's main entrance door.

The aircraft, OE-GKA, had arrived at Kittilä Airport, Finland (EFKT) two days prior and was planned to fly on a positioning leg to Yekaterinburg, Russia (USSS) without passengers. The captain opened the door and helped the flight attendant with interior duties while the first officer remained outside to brush snow off the aircraft. The captain eventually went into the cockpit to start the auxiliary power unit (APU) and went outside to help the first officer with snow removal. After exiting the airplane, he closed the door, leaving the flight attendant (F/A) alone inside.

A little later the F/A felt a strange pressure in her ears and chest. She went into the cockpit to get the attention of the pilots working outside by knocking on the window. The pilots noticed the knocking and the captain went to open the door. According to the copilot's observations, the captain had an unusually difficult time getting the door to open. Then, he pulled even harder on the door handle at which point the door blew open forcefully, hitting the captain who was standing underneath the door and knocking him to the ground. The copilot, who had been standing approximately 1 meter from the left side of the door, was also knocked down by the pressure wave.

On the face of it, the accident was caused by the pilots failing to check the position of the outflow valve as required by the checklist prior to starting the APU, which automatically introduced pressurized air to the cabin. When he closed the main entrance door, leaving only the cabin attendant inside, the aircraft pressurized. There was no way to shut the APU down from the outside of the airplane and the cabin attendant had not been trained in this procedure. The captain's errors may have technically caused the accident, but the design of the system set him up for the failure. All G150 pilots should be aware of the criticality of ensuring the outflow valve is open prior to starting the APU. Any G150 pilot who also flies other Gulfstream models should realize that the standard procedure of closing the outflow valve after shutdown may not be optimal in all aircraft. There is also a lesson for all other pilots, too. Pilots flying aircraft with even these kinds of minor procedural differences need to pay closer attention to checklists because proper procedures in one airplane can set them up for catastrophe in others.

Dual Qualification: Management's Role

When endorsing dual-qualified among their pilots, managers play a key role in the success or failure of that position. The decision to dual-qualify pilots is primarily an economic one but can also be driven by a desire to keep pilots proficient when the number of hours flown in each type is low. No matter the reasoning, mitigation strategies do not necessarily have to be costly. The most successful techniques that I've seen include the following:



Post-accident view of the aircraft's main entrance door

(1) Select aircraft from the same manufacturer to minimize the biggest differences. Checklists, procedural flows and system designs can be radically different when one aircraft comes from a different airframer.

(2) Choose aircraft that are “sympathetic” in that they share design philosophies. For example, requiring a pilot to be well-versed in Honeywell and in Collins FMS designs is only asking for procedural mistakes. The fact that not all airplanes use landing gear safety pins is another example, since mixing pinned and pin-less types can lead to a takeoff with the pins still inserted.

(3) Assign each pilot a primary and a secondary airplane; it may be advisable to allow the pilot to act as captain only on the primary.

(4) Alternate training events between aircraft and provide for training at least every six months. The least confident dual-qualified pilots I’ve interviewed alternated training with 12 months between recurrences — another recipe for failure.

(5) Require a minimum level of experience in one type before branching out to a second. I recommend pilots have at least 500 hr. and a year in type to learn best practices and solidify the lessons from initial training, and at least one recurrent.

(6) Once dual-qualified, insist on type-specific training at least once a year.

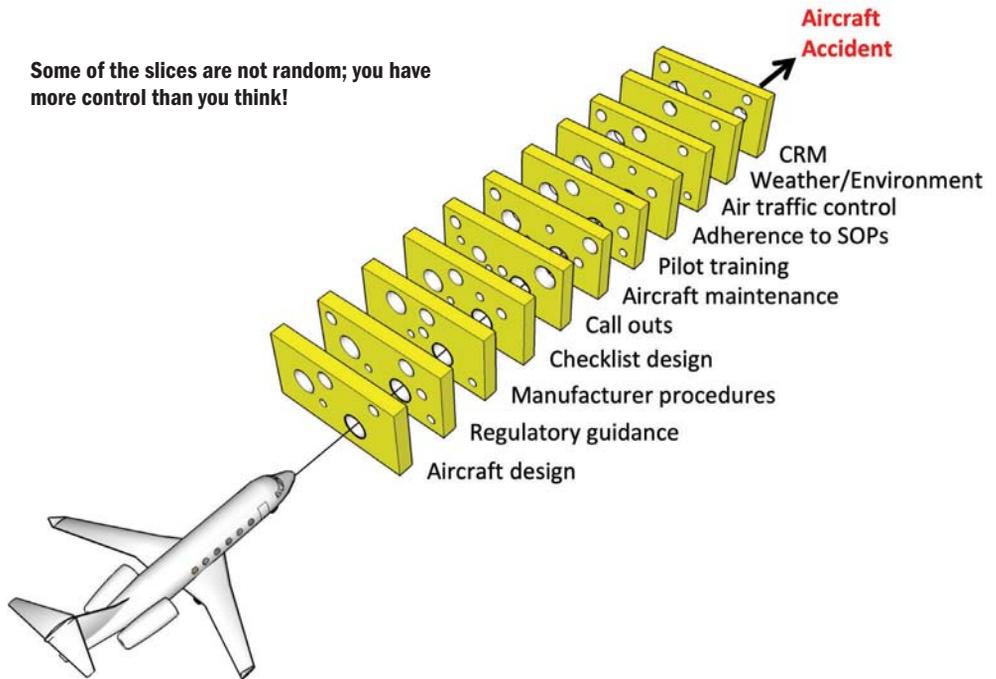
(7) Track type-specific currency in terms of hours per month, trips per month and recency of training to ensure at least one pilot of every assigned crew is truly proficient.

(8) Establish a minimum level of currency in terms of hours and trips per month below which a pilot is no longer considered qualified and must attend recurrent training.

Dual Qualification: A Pilot’s Survival Guide

(1) Encourage cross-platform standardization. You will have varying levels of flexibility when it comes to modifying checklists, callouts and other

Some of the slices are not random; you have more control than you think!



JAMES ALBRIGHT

procedures. To the extent possible, these should be standardized between types. Some aircraft, for example, mark as complete those checklist items the system senses have been addressed. Others require pilots to challenge and respond to each item on the checklist. If you are flying both types, it would be wise to apply the challenge-and-response procedure to all items for both aircraft.

(2) “Chair fly.” The day before flying the type you haven’t operated in a while, it may be wise to sit in the cockpit and practice every step of every normal checklist. You should also visualize the procedures required to start engines, taxi, takeoff, descend, land and shut down.

(3) Keep an honest written log, critiquing yourself. We pilots realize that what we do for a living can be complicated. As egocentric human beings, we also have a tendency to excuse ourselves when things don’t go as well as possible. Keeping a post-flight critique log can help you target your problem areas prior to your next recurrent training session.

(4) Spring-load yourself to the “knock it off” position. Fighter pilots in training reserve the “knock it off” call for when the situation accelerates beyond their mental faculties. If you aren’t as proficient as you want to be, don’t be afraid to set the parking brake prior to launching to reassess. If the airplane gets to the final approach fix before you do, a holding pattern might be in order.

Picking Your Swiss Cheese Slices

Accident investigators are fond of saying that few accidents are caused by a single factor; that most mishaps occur because of a chain of factors. They will tell you that breaking just one link of that chain can prevent the accident. Flight safety officers will add another metaphor to this and talk about Swiss cheese. Imagine a ray of light trying to shine through a stack of several layers of Swiss cheese. Because the holes are random, the chances of the light getting all the way through is minimized. The light is circumstance, each slice of cheese is a different factor and if the light emerges, you have an accident.

It seems that pilots flying multiple types have a more complicated stack of Swiss cheese facing them than their single-type peers, but that doesn’t have to be true. You shouldn’t think of the holes in each layer of cheese as random. You can determine the positions of those holes. Let’s say one layer is the design of the airplane itself, the next is your checklist procedures, the next is your mandatory callouts, and so on. It could be that the callout layer that works for one airplane will fail to catch mistakes in design and checklists in the other. If you can adjust the callouts to work for both aircraft, you can prevent that ray of light from reaching the scene of the accident. **BCA**



TERO VESALAINEN/ISTOCK

LOL: No Laughing Matter

Off duty events **can cost you your license**

BY **PATRICK VEILLETTE** jumprsay@aol.com

Not many professions can be as precipitous as ours. Usually when we contemplate a forced grounding and losing our ability to fly for a living, we associate the license forfeiture with some medical condition. What many don't realize is that actions in a pilot's private life that are seemingly unrelated to aviation can cost one their pilot certificate.

The actual events that follow illustrate just how quickly one's career can spin out of control.

Pilot A, a captain in a large flight department, had recently purchased a nice lakefront property in rural Texas. However, the neighboring property owner took issue with the boundary line and the discussion got heated. The angry neighbor then enlisted a large associate to add physical intimidation to the confrontation, which further deteriorated

into threats of violence. Understandably feeling threatened, the pilot finally brandished his legal concealed-carry handgun for protection and the situation soon ended.

Sometime later, the pilot was flying a trip back from Canada and upon checking with Customs upon re-entry to the U.S., the officer asked, "Captain, is this your proper name?" When the pilot so confirmed, the officer said, "Sir, please put your hands behind your back. There is a warrant for your arrest."

It turned out the angry neighbor was directly related to the county prosecutor.

When he learned of the arrest, the director of operations gave the pilot a leave of absence to deal with the matter, promising, "Once you get this situation resolved, you will have your job back."

Despite exhausting his savings on a vigorous defense, the pilot was

convicted. That result cost him his ATP certificate due to that little-known clause in the FARs about being of "sound moral character." Suddenly unemployed as a pilot, his career was trashed.

Slow forward more than seven years. That's when the small county's prosecutor was found guilty of official misconduct in office and the pilot's conviction was finally overturned. Unfortunately, the director of operations was no longer with the pilot's former company and the officials remaining would not acknowledge the promise to reinstate him. Well, he's back in a flying position, but at a far reduced wage and enduring the financial setback of the whole ugly experience.

Pilot B and his girlfriend went to a professional basketball game to cheer their favorite team. However, their anticipated enjoyment was diminished

by the loud-mouthed fan behind them whose nonstop consumption of alcohol fueled his abusive outbursts and offensive language. Fans sitting nearby asked that he temper his remarks a bit given the mixed audience with children, but that only wound him up further. Stadium security was nowhere to be found.

The pilot's girlfriend shook her head in disgust at another comment, prompting even more diatribe. With that, the pilot turned around in his seat to look directly at the boor, who reacted by throwing a popcorn box at the couple. The pilot stood and the two men were instantly nose-to-nose. The gutter mouth thrust his finger toward the pilot's nose, which he quickly deflected, but his own momentum caused the drunk to fall on to the adjacent stair, and he proceeded to tumble down the entire length of the steep concrete steps. He lay motionless at the bottom of the stairs until the arrival of paramedics who fitted him with a cervical collar, carefully placed him onto a back board then carried it to a waiting ambulance.

Upon diagnosing the fellow with severe physical injuries, emergency room personnel summoned police to take his statement. Later, the prosecutor filed felony charges against the pilot who, if convicted, will lose his ATP. Even if he negotiates a plea bargain down to misdemeanor assault, he'll still be disqualified from obtaining a Security Identification Display Area badge.

Understandably, the pilot has retained an experienced criminal defense attorney at considerable expense to get a favorable resolution that would keep him out of jail and in the cockpit. At this writing, the case has been sitting on the prosecutor's desk for over a year, leaving the pilot in considerable stress about his future.

On to pilot C. He flew for a major air carrier but enjoyed towing gliders and operating his own aircraft when off duty. A former F-15 aviator, he couldn't resist the temptation to fly low over some private residences. One time, however, he conducted his flat-hatting over a neighborhood that was home to several FAA inspectors who worked nearby. Those feds watched the pilot's repeated low-level antics and were soon calling his chief pilot.

As a result, not only was the pilot's certificate suspended — a costly action to him — but his chief pilot strongly suggested that he sell his aircraft and cease any extracurricular flying.

Surprisingly, the airline kept him

on its active roster; others might not since there's potential risk to them if a pilot whose certificate was suspended is then involved in an incident or accident. Lawyers for an injured party will likely claim the airline failed its due diligence by allowing a pilot with a "history of non-compliance" to continue flying the line. The damage control to the company's reputation would be difficult, especially in today's 24/7 news cycle and hyper social media.

Finally, there's the case of Pilot D. Also an air carrier pilot, he enjoyed flying a Stearman on his time off. One day two friends asked to skydive from the biplane. Unfortunately, the Stearman's front seat could not accommodate two people. Not to be denied, the pair of thrill-seekers chose to hold on to the old trainer's wing struts during takeoff — a dangerous idea to which the pilot astoundingly assented.

However, during climb the engine stopped, forcing the pilot to make a dead stick landing. The Stearman made it down OK and none of those aboard were injured. But the FAA subsequently learned about the two skydivers and their unsecured takeoff. That discovery resulted in the pilot's certificate being suspended. And that resulted in his being terminated for failure to meet the position requirements, that is, possessing a valid pilot certificate.

The penalties for violating the FARs deliberately, especially for a profit motive, can result not only in losing one's pilot certificate but one's freedom as well. The aborted takeoff accident involving a Bombardier Challenger 600 at New Jersey's Teterboro Airport (KTEB) in 2005 quickly turned into a criminal investigation by the Department of Transportation's inspector general (DOT IG). His agents began to suspect that Platinum

Repeat Offender

Late in the evening of Aug. 6, 2015, the pilot of a Cessna 182 en route from San Luis Obispo to Carlsbad, California, reported oil problems then vibrations to Point Mugu Approach Control. Smoke then started entering the cabin, blinding the pilot. Presently, contact with the aircraft was lost. At 0430 the next day, Ventura County Sheriff's deputies located the airplane wreckage in mountainous terrain. Both its occupants had been fatally injured.

A review of the FAA airmen medical records revealed that the pilot had been issued a time-limited, special issuance, second-class on March 7, 2015. Seven weeks later, the Aerospace Medical Certification Division issued a general denial of a medical citing the pilot's alcohol dependence and failure to report a 2013 DUI. Further review of FAA records revealed the pilot's singularly cavalier and dangerous aviation history going back decades.

In 1986, he lost his commercial pilot license — the first time — for a year for flying an aircraft without a valid registration and possessing a false medical certificate.

Then the FAA suspended the license several times starting in 2002, when he lost his flight privileges for 30 days for performing aerobatics below 1,500 ft. over a populated area. Flying within 50 ft. of people at the Miramar Marine Corps Air Station in 2004 led to a second revocation. And a 230-day suspension was issued the following year after he flew passengers in a helicopter he knew was damaged.

The next revocation occurred in 2009 for recklessly operating a helicopter he had lent to an adult film company. While at the controls over San Diego, he had been videotaped engaging in sex with a Swedish porn star. It took four years for the evidence to surface. The then 52-year-old pilot appealed his revocation, reportedly telling the NTSB administrative law judge that this wasn't "the brightest thing," but that he'd learned his lesson and should be allowed to fly. But after viewing the video, the judge declared the evidence clearly showed gross reckless conduct.

After the fatal accident, the FAA's Bioaeronautical Sciences Research Laboratory found small amounts of the inactive metabolite of marijuana in the pilot's tissue samples, leading investigators to conclude that the pilot was not likely experiencing significant effects from his marijuana use at the time of the mishap. **BCA**

“... If you are a pilot, a verified positive drug test result for marijuana on a required DOT/FAA test will make you unqualified to hold an FAA-issued medical certificate.”

Jet, the operator, was routinely conducting charter flights without a Part 135 certificate. Investigators subpoenaed Platinum's business and financial records, including banking transactions, and meticulously traced the company's financial transactions.

One agent discovered Platinum had a tankering policy under which its pilots were to top off their aircraft's fuel tanks with discounted Jet-A. This money-saving policy went to the extreme by requiring full fuel tanks even if the fuel was in excess of that required for the trip and caused the aircraft to exceed its maximum forward CG limits. To cover up this dangerous conduct, pilots manually altered the aircraft's weight and balance graphs to create the false impression that they weighed substantially less than actual and were within their CG limits.

It was further discovered that Platinum officials instructed its pilots to falsify logbooks by recording their flights as private flights rather than commercial charter flights. All totaled, Platinum flew in excess of 85 unauthorized commercial charter flights while taking in more than \$1 million.

Those discoveries resulted in a 35-page indictment alleging that Platinum CEO Michael Brassington and Platinum



SEBLOPHOTO/ISTOCK

pilot Francis Vieira lied to NTSB investigators and provided falsified reports in an attempt to conceal the facts that Platinum carried passengers on unauthorized flights and exceeded weight limits.

Just prior to trial in September 2010, Vieira admitted to U.S. District Judge Dennis M. Cavanaugh that he flew dozens of illegal flights for Platinum, many of which were for famous athletes, musicians and other well-known individuals. He also admitted that he falsified logbooks to conceal the flights and that

on more than two dozen occasions he falsified weight and balance reports. He was subsequently sentenced to six months in prison and an additional six months of house arrest. Two months later, a federal jury convicted Brassington on 16 criminal counts including endangering an aircraft, conspiracy and false statements.

Thereupon U.S. Attorney Paul Fishman said, “the defendants chose to commit crimes in pursuit of profits over public safety. A pattern of fraud and deception is not a business plan. Today's verdict confirms that there are consequences when you break the law to boost your bottom line.”

The FAA's compliance philosophy is characterized by a willingness to forgive mistakes but an intolerance for falsification on FAA documents. FAA Order 2150.3B, the FAA Compliance and Enforcement Program, states, “In general, the FAA considers the making of intentionally false or fraudulent statements so serious an offense that it results in revocation of all certificates held by the certificate holder. Falsification has a serious effect on the integrity of the records on which the FAA's safety oversight depends. If the reliability of these records is undermined, the FAA's ability to promote aviation safety is compromised.”

An 18-month investigation in July 2003 by the DOT and the Social Security Administration in Northern California that looked into licensed pilots who were receiving disability payments

No Rocky Mountain High

It is now possible to legally buy a variety of marijuana products in nearly a dozen states. Despite its legality within a state, can a pilot consume marijuana? The FAA has a long-standing clear policy on the matter.

“Aside from any state law pertaining to the use of marijuana within a state, it is important to be aware that the FAA's regulation [14 CFR § 120.33(b)], expressly prohibits you from performing a safety-sensitive function for a certificate holder while having a prohibited drug, which includes marijuana and marijuana metabolites, in your system. If you are a pilot, a verified positive drug test result for marijuana on a required DOT/FAA test will make you unqualified to hold an FAA-issued medical certificate.”

There are cases in which pilots insisted they unknowingly consumed a marijuana product before testing positive on a drug screening exam. Yet, such a finding results in immediate disqualification of a medical certificate. Be prepared for a grueling and lengthy process to prove such incidental exposure.

Furthermore, be advised that if a pilot knowingly flies an aircraft in which a passenger is carrying a drug — even a legal in-state substance such as THC oil — doing so could result in a revocation of the pilot's certificate. **BCA**

from the government but were simultaneously claiming to be medically fit to fly led to charges by federal prosecutors against 46 pilots, including four with ATP certificates; seven held commercial certificates; 28 had private certificates and seven were students. According to court documents, the pilots were charged with either making false statements to a federal official or delivering to a federal official a false written record.

A charge of lying to federal authorities carries a penalty of up to five years in prison and a \$250,000 fine. A charge of falsifying records carries a criminal penalty of up to one year in prison

and a \$100,000 fine, not to mention the likely revocation of a pilot's ratings and certificates.

Charles Lee Jr., an assistant DOT IG, said the reviewers first focused their investigation on pilots who were receiving disability payments for illnesses like paranoid schizophrenia, bipolar disorder and disabling heart conditions. One case even involved someone who exhibited severe suicidal tendencies.

"The fraud and falsification allegedly committed by these individuals is extremely serious and adversely affects the public interest in air safety," said Nicholas Sabatini, who at the time was an associate administrator at the FAA.

The sudden, permanent loss of a dream career along with the income it provided can cause extreme stress for the individuals and their families. The path to a professional flying career involves a considerable commitment in terms of time, study, practice and money. Very few who succeed in achieving such a position are prepared to "start all over" in a different career, particularly since doing so would involve a diminishment in both status and income. To avoid such a daunting fall from grace, carefully manage your personal life as well as your professional activities and maintain a "sound moral character" throughout. **BCA**

Alcohol, Aviating and Outcomes

On June 20, 2014, a 63-year-old Alaska Airlines captain piloted two passenger flights from San Diego to Portland, Oregon, and then back. Upon returning to San Diego, he was randomly selected for drug and alcohol testing by the carrier. The breathalyzer test revealed his blood alcohol concentrations were more than three times the legal limit. He later agreed to a plea deal involving a year in jail and the FAA revoked his pilot certificate. Evidence obtained by the prosecutor revealed that the pilot had been an alcoholic during a substantial portion of his career but had somehow concealed this affliction from both the carrier and the FAA.

Even though the vast majority of pilots properly abide by the FAA's rules on alcohol, when one abuses them and is exposed, the fact can make national news, as did this.

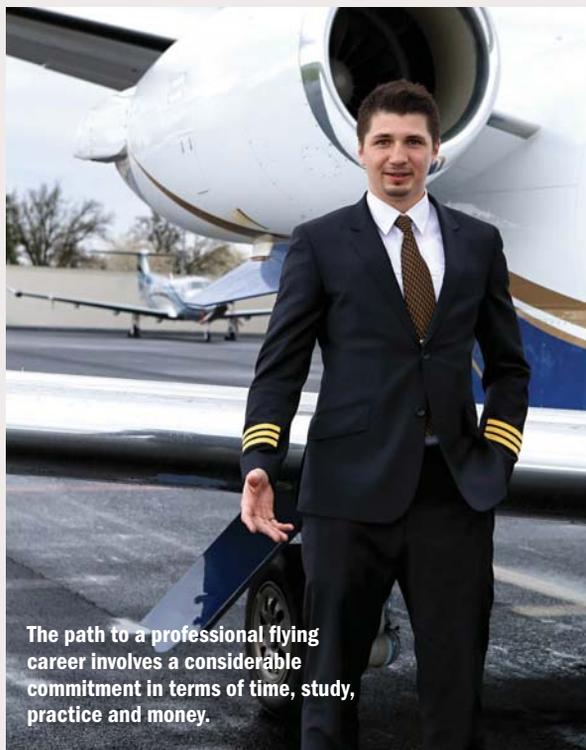
Two of the best phone calls I've had with fellow pilots involved their return to flying duties after receiving treatment for alcoholism. Both of them had self-reported their addiction.

Pilots within the airline and fractional world are likely familiar with the Human Intervention Motivation Study (HIMS) program, which coordinates the identification, treatment and return to the cockpit of impaired aviators. It is an industry-wide effort in which companies, pilot unions and the FAA work to preserve careers and further air safety. HIMS works.

Both of the pilots with whom I spoke said going through the HIMS program was the best thing that ever happened to them. Their willingness to lay bare their faults and destructive decision-making that led them down this path made their recoveries sound more like redemption. And better yet, one of them was later selected by his fractional employer to become an Initial Operating Experience captain. Placing that trust in someone who had overcome

such a hellish affliction is a great endorsement of the HIMS program.

Would one DUI, which you properly report to the FAA on your aeromedical application, restrict your ability to fly? Oh yes, especially if you're bound for Canada, where any alcohol-related offense is regarded very seriously. In fact, as of December 2018, a DUI was categorized as a major crime in that country and if you have ever been arrested or convicted of driving under the influence even more than a decade ago, you may be denied entry. **BCA**



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The path to a professional flying career involves a considerable commitment in terms of time, study, practice and money.

Struggling Through Sand

Unfamiliar conditions and unhelpful SOPs

BY ROSS DETWILER rossdettwiler.com

This is an account of two British Mediterranean Airways pilots who found themselves in some very trying conditions that they attempted to resolve by applying what they thought were their carrier's directives. Their decision to continue an approach on autopilot when the circumstances were confusing and the situation rapidly deteriorating could have ended tragically.

There were so many factors considered by investigators of the March 2005 incident that the final report by the U.K.'s Air Accidents Investigation Branch (AAIB) was not issued until 2014. The details that follow are from that report. We've italicized points that started the incident's chain of events and note what the pilots did after each of them. One can almost feel the pressure increasing on the two as each of these factors came into play. Finally, the crew began an approach in weather not suitable for their selected mode and continued, trying desperately to see the ground, against ever-decreasing odds.

The Airbus A320 crew reported for duty at 2130 local for a scheduled flight from Queen Alia International Airport (OJAI) in Amman, Jordan, to Sudan's Khartoum International Airport (HSSS). The flight departed at 2330 with the captain as pilot in command.

The weather for Khartoum, obtained before departure, reported gusting northerly winds and *reduced visibility in blowing sand*. During cruise and once in Sudanese airspace, the copilot asked ATC for the latest weather report for Khartoum. ATC reported *blowing sand* with a northerly 20-kt. wind and visibility of 1,000 meters.

Although HSSS was not equipped with transmissometers, it was possible, according to the final AAIB report, to provide runway visual range (RVR) information by visual assessment in accordance with Document 9328, "Manual for RVR Assessment," issued by the International Civil Aviation Organization (ICAO). However, before starting their approach, the pilots converted the

reported "assessment" RVR visibility into a reference RVR through use of a conversion factor table in their company's operations manual. This was in accordance with the former airline's procedures.

A company-provided chart said that at night, with high-intensity runway lights, the estimated visibility could be multiplied by a factor of two. Thus, with the stated visibility of 1,000 meters the pilots calculated an RVR of 2,000 meters. They determined that this calculated RVR exceeded the published company minimums for the approach of 1,600 meters RVR. A subsequent weather update from ATC giving an increased visibility of 3,000 meters effectively increased the RVR, as calculated by the pilots, to 6,000 meters.

The 46-year-old captain and 39-year-old copilot held Air Transport Pilot certificates and had logged 7,400 and 4,700 hr. of flight time, respectively, of which 3,700 and 3,200 hr. were in type. However, neither had operated in blowing sand and both were concerned about the possible implications. They later stated that they looked but could find no reference to flying in such conditions in their airline's operations manual. So, instead, they decided to refer to the section on volcanic ash as the closest equivalent source of information. As a result, they discussed various possible actions and the captain chose to select continuous ignition on both engines for the approach.

Not available to the pilots or not in the known considerations of either pilot was the ICAO annex concerning obscuration by particles in the atmosphere: "There are two kinds of airborne particles that can obscure visibility: hydrometeors, which are water particles of varying sizes, and lithometeors, which are solid particles such as haze, smoke, dust, sand and volcanic ash. Of these, the last three can be the most problematic, but sand and dust particles are more frequently encountered than volcanic ash.

"The conventional difference between sand and dust is particle size, dust being much finer than sand, but both originate from dry land surfaces. During a dust

storm or sandstorm smaller particles can be carried high into the atmosphere, sometimes above 10,000 ft.

"Aviation weather forecasts and reports are coded such that dust is represented by the letters DU and sand by the letters SA. These can be modified by descriptors such as DR for drifting and BL for blowing. Thus, blowing sand would be encoded as BLSA and low drifting sand would be coded as DRSA. There are also codes for a dust storm [DS] or a sandstorm [SS]."

According to the AAIB, all of this "brought into consideration the validity of the calculation used by the pilots to convert meteorological visibility into an RVR. The investigation sought to establish whether the conversion took into account the different characteristics of sand and dust, as opposed to water droplets, when the conversion procedure was introduced. No authoritative answer was identified and it seems much of the definitive work in this area was conducted some years ago with few records now being available."

However, the UK's Civil Aviation Authority (CAA) noted that visibility is restricted to some extent by the effect of light being scattered and absorbed by atmospheric particles. The CAA also stated that dense and widespread drifting sand may prevent a pilot from seeing runway lights, even though the reported visibility may suggest that pilots ought to be able to see them.

Khartoum's Runway 36 was in use but its *ILS was out of service*. The captain assessed the weather conditions passed to him by ATC in the updated forecast and *believed they represented VFR and that he was permitted, under his company's ops policy, to carry out a managed non-precision approach (MNPA) to the runway*. This type of approach requires the autopilot to follow an approach path defined by parameters stored in the aircraft's commercially supplied flight management guidance computer (FMGC) navigation database. However, neither reported that visibility actually exceeded the 5,000-meter minimum

Just Fly the Airplane

raw visibility for visual meteorological conditions (VMC) to exist within Class B airspace.

After the captain's briefing to the copilot was complete, the aircraft was cleared by ATC to descend. On passing overhead Khartoum's KTM VOR, the aircraft was cleared for the VOR/DME approach to Runway 36.

The approach chart, which was commercially supplied but from a company other than the one providing navigation data for the FMGC, depicted the final descent point at 5 nm from the threshold of Runway 36. However, the FMGC's nav database had been correctly updated with a recent change to this position published by the Sudanese Civil Aviation Authority, which placed it at 4.4 nm from the threshold. The discrepancy amounted to a difference in descent point of 0.6 nm from the Khartoum VOR/DME beacon, the primary navigation aid for the non-precision approach.

The captain had briefed a GAILY 1 standard arrival for a VOR/DME approach to Runway 36. As stated, he decided to fly the approach with the autopilot engaged, coupled to the FMGS in a configuration of "managed non-precision approach." He believed VMC existed from his interpretation of the information available. The published minimums for the approach, as provided by the chart, were an RVR of 1,600 meters and a minimum descent altitude (MDA) of 1,600 ft. (340 ft. above the runway elevation of 1,260 ft. MSL). Because it was a non-precision approach, the airline's standard procedures required an additional 50 ft. to be added and, accordingly, the pilots entered this revised MDA of 1,650 ft. into the FMGS.

ATC then reported visibility to be between 1,000 and 1,200 meters. *Nevertheless, the MNPA continued.* The captain had programmed the autopilot to intercept and capture the final approach course and to descend in accordance with the final descent path. On the chart the final descent path is shown as beginning at 5 DME from the KTM VOR.

The captain had decided to carry out an MNPA in order to reduce the workload under the prevailing conditions. He had operated MNPA previously and did not consider it would be a problem, despite the fact that the reported visibility was below VFR limits and therefore did not comply with the restrictions imposed by the airline. The copilot's acceptance of this decision, according to the AAIB report, illustrated that *neither pilot appreciated that the reason MNPA was limited to VFR conditions was that*

The details presented in "Struggling Through Sand" bring to the fore a commonly voiced, almost beggingly asked, question: "Why didn't those guys just disconnect the autopilot and fly the airplane?" Time and again we've seen the outcome of pilots fiddling with an autopilot and leading themselves into trouble when the entire solution was available in their hands, their brains, and there to see out the window or on the instrument panel.

The answer may be contained in research seemingly far removed from any flight deck but evident in daily life in these digital times. For example, try getting your children (or grandchildren in my case) to respond to a request made in a normal conversational tone when they are engaged in shooting Martians, ogres, enemy soldiers or whatever on a hand-held electronic device.

If your progeny are like mine, there's likely to be no response. I've even found the same to be true of me when I may be lending my opinion to some recent political post and the wife asks if I know what time we need to leave to join friends at a restaurant. I hear her, I know what she's asking, I even know the answer, but somehow my current engagement outweighs the need to respond.

In the Psychology Today article, "Video Games Can Activate the Brain's Pleasure Circuits," author David J. Linden, Ph.D. cites a 2008 study conducted by Allan Reiss, a professor of psychiatry at Stanford University, and colleagues. In it, 11 male and 11 female students were asked to play a simple but unfamiliar video game.

It turned out that the game play activated a large number of brain regions in all 22 subjects. "While these are not surprising results for this task," Linden wrote, "what was interesting was that key regions of the medial forebrain pleasure circuit were also activated, including the nucleus accumbens, as well as the amygdala and the orbitofrontal cortex. While both men and women showed activation in these regions during games trials, the effect was significantly stronger in men."

Linden, a professor of neuroscience at Johns Hopkins University School of Medicine, went on to write, "The most provocative aspect of these results is the general finding: Video game play, a completely unnatural behavior divorced from intrinsic reward, activated the pleasure circuit to some degree in all subjects" and likened it to "puffing cigarettes" since "the pleasurable moments they provide are brief, but they have rapid onset and are repeated often."

What is the good doctor telling us? He's saying that these games draw our attention into them in an addictive way even with no intrinsic award. Further, these games activate pleasure centers in the brain. In short, it feels better playing the game than being in the immediate reality.

Now, suppose the same thing happens when a pilot is flying a full FMS-controlled approach, including FMS speeds and autothrottle, in a fully glass cockpit. What a satisfying view on the HSI of the PFD and on the split-screen NAV display. Here is a world that can become a reality unto itself as the depicted aircraft comes in over a final approach fix and approaches a line showing the intended descent path. To change any aspect of the picture, flying is not required. The pilot only has to push a button or two. The glidepath comes into view. Waiting for the "plane" to start descending is just pleasurable, like having your neck rubbed. Your brain is committed to the "picture."

But wait, the picture suddenly flickers. The "plane" fails to follow the glidepath but rather continues straight ahead. The pilot's neck is being rubbed with a wire brush. The pilot strives to regain the pleasurable sense by pushing the buttons on his video controller. He is disconnected from the current reality just as I was, pushing the keypad buttons, while my wife was talking to me.

Like my wife's unanswered question, the flying situation at hand is not breaking through the pilot's state of pleasure strongly enough to warrant action. The pilot's brain has been sucked into an alternate universe.

I'm an ATP rather than a Ph.D., so consider the forgoing as experienced speculation. But if this is what occurs during a troubled approach, the question is not so much "Why didn't they just fly the airplane?" but "Why weren't they aware they had to fly the airplane?" **BCA**

.....Cause & Circumstance

not all the necessary safeguards were in place to conduct such approaches safely in instrument meteorological conditions (IMC).

The pilots followed the procedure and later stated that upon reaching the final approach fix (FAF) shown on their chart and identified by the waypoint HASAN at KTM 5 DME, the aircraft was level at 2,900 ft. QNH, fully configured for landing and stabilized at the appropriate airspeed. They also checked (discussed that) the KTM 5 DME means a distance of 5.0 nm from the KTM VOR/DME beacon.

The captain was aware of the descent path shown on the chart and therefore expected to see the autopilot command a descent at KTM 5 DME, but instead the aircraft continued to fly level. He later stated that, at the time, he erroneously thought the flight control unit (FCU) was set to TRK/FPA (this would be a mistake given the definition of an MNPA). *Approximately 4 nm from the threshold he pulled the vertical speed/flight path angle (VS/FPA) knob on the FCU.* This disengaged the managed final descent autopilot mode, in which the rate is controlled by the FMGS, and engaged the selected vertical speed mode, in which the rate is controlled by the VS/FPA.

The captain later stated that as the aircraft passed through KTM 5 DME, he set the autopilot to begin what he believed was a flight path angle of 3.0 deg. down, whereas he later realized that he had commanded a descent at 300 ft./min.

The aircraft began its descent and entered blowing sand with forward visibility reducing rapidly. *The captain described the effect of the sand as similar to watching iron filings flying past the windscreen.* The aircraft continued its descent and the copilot stated that the altitude check at 4 DME revealed the aircraft was about 200 ft. above the published descent profile. And the captain stated that as the aircraft approached 3 DME it became apparent that it was not closing with the vertical profile and so he increased the rate of descent to about 2,000 ft./min.

The aircraft then reached the MDA. Since the cockpit voice recorder was overwritten on later flights, it's unknown what exactly the pilots said at that point, but at some stage late in the approach the captain asked the copilot if he could see the approach lights. The copilot mistook this question to be the captain stating that he could see the lights. As a result, the copilot informed ATC that they could see the approach

lights and requested confirmation that they were cleared to land. Hearing that transmission, the captain took this to mean that the copilot had the approach lights in sight, but he then looked up to see strobes and some other lights in his one o'clock position.

The confusion between the two pilots then became apparent and they quickly realized that the lights seen were not the approach lights. This, combined with the disorientating effect of the aircraft's landing lights reflecting off the blowing sand, caused the captain to order a go-around.

Within 2 sec. of setting TOGA power, the captain pulled his side stick back to 68% of its full rearward travel position. Over the next 2 sec., this side-stick position reduced slightly. Between 3.4 and 5.1 sec. after setting TOGA power, with the aircraft at a radio altitude of approximately 125 ft. AGL, the enhanced ground proximity warning system (EGPWS) sounded, "TERRAIN AHEAD, PULL UP." At this point the captain's side stick was at about 40% rear deflection. The pilot then briefly moved the sidestick to 54% forward deflection before moving it back to 55% rearward deflection.

Those manipulations prompted the following comments in the AAIB final report:

Accidents in Brief

Compiled by Jessica A. Salerno

Selected accidents and incidents in November 2019. The following NTSB information is preliminary.

► **November 23 — About 1244 EST, a** Beech E35 (N3315C) operated by Spaceport Aviation, crashed in a field shortly after takeoff from Okeechobee County Airport (OBE), Okeechobee, Florida. The private pilot was seriously injured and the two passengers received minor injuries. The Beech was destroyed by a post-crash fire. It was operated as a Part 91 personal flight. It was VFR at the time and flight plan information was unknown for the flight that was originating at the time of the accident, and was destined for Marathon, Florida. The pilot's wife advised law enforcement personnel that during takeoff about 100 ft. AGL, the

engine "started to cut out." Her husband attempted to turn for an emergency landing but the engine quit. The airplane started to "nose-dive," crashing into a field. An Okeechobee County Sheriff's Office deputy who was responding to work witnessed smoke from the wreckage and responded to the scene. He rescued the pilot and also assisted the passengers away from the burning wreckage.

► **November 20 — About 0600 CST, a** Beechcraft A36 (N88855) collided with terrain shortly after takeoff from San Marcos Municipal Airport (HYI), San Marcos, Texas. The pilot, sole occupant, was killed and the airplane was destroyed. The Bonanza was registered to and operated by Caroline Aviation, LLC, under Part 91 as a business flight. It was IFR and the flight was operating on an IFR flight plan. The flight was originating at the time of the accident and was destined for Odessa Airport-Schlemeyer Field (ODO), Odessa, Texas. The airplane was observed on radar shortly after departure,

before it disappeared from radar; an ALNOT (alert notification) was issued. A preliminary review of air traffic control services revealed the pilot received his IFR clearance to ODO, with a void departure time. There was no further communication with the pilot, nor was a distress call received. The airplane was wreckage was located about one-half-mile northeast of HYI's Runway 8.

At 0556 the automated weather facility located at HYI, recorded wind from 179 deg. at 4 kt., one-half-mile visibility in fog, an overcast sky at 300 ft.

► **November 18 — About 1625 EST, a** Mooney M20M (N1031M) was substantially damaged during a rejected landing at College Park Airport (CGS), College Park, Maryland. The private pilot was not injured. The personal flight was conducted under Part 91. Visual conditions prevailed, and an IFR flight plan was filed for the flight that departed Morris Municipal Airport (C09), Morris, Illinois, about 1215 CST.

“Omitting to select full back stick promptly and positively was inappropriate and inconsistent with the pilots’ training and the published QRH procedure issued by the aircraft manufacturer. By nature, any EGPWS terrain warning requires prompt and decisive action and the protections built into the aircraft’s flight control system allow for the application and maintenance of full back side-stick until the warning ceases.

“However, the QRH instructs the pilot to ‘pull up to full back stick and maintain.’ This phrase can be interpreted in two ways. The placing of commas is used to illustrate the ambiguity. It could be read as: ‘pull up, to full back stick, and maintain,’ or alternatively, it could be interpreted as: ‘pull, up to full back stick, and maintain.’

“The second interpretation infers that any amount of back stick is acceptable, rather than the full deflection that is intended and taught. The word ‘up’ could be deleted so that the instruction reads ‘pull to full back stick and maintain.’”

In the 4.5 to 5.5 sec. after TOGA power was set, the aircraft lost 80 to 100 ft. in height before the descent was halted, resulting in a minimum recorded terrain clearance of 125 ft. The EGPWS warning ceased on passing about 250 ft.

The pilot reported that during approach to Runway 15 (2,607 ft. by 60 ft., asphalt runway) the winds were variable, but light. The airplane cleared the trees at the approach end and descended to the touchdown point. At that point, the pilot reduced engine power and flared the airplane, but it bounced from what seemed like an unexpected and excessive sink rate. Upon the bounce, the pilot initiated a go-around by applying full engine power and remaining in ground effect. He did not retract the landing gear because he saw no indication of climb and did not engage the flap switch over concern that the flaps would retract past the takeoff setting and reduce lift. After a few seconds in ground effect with no climb and realizing remaining runway was limited, he set the airplane down to the left of the runway. The airplane then struck a perimeter fence with the left wing, then head on, before spinning 90 deg. and resulting in the right wing colliding with the fence before the airplane came rest upright.

AGL in the climb, about 5 to 7 sec. after being triggered.

The report went on to summarize this critical first approach thusly:

The pilots began the approach with the autopilot engaged in managed modes (i.e. the approach profile was being determined by the FMGC rather than by pilot selections). The aircraft did not begin its descent at the point the pilots were expecting. Believing the aircraft was high on the approach, the captain changed the autopilot mode in order to select an increased rate of descent.

The approach became unstable and the aircraft descended through 1,000 ft. AGL at an abnormally high rate. It then passed through its MDA with neither pilot having established the required visual references for landing. Instead, each pilot believed, mistakenly, that the other pilot was in visual contact with the runway approach lights.

When the confusion between the two pilots became apparent, the aircraft had descended to approximately 180 ft. AGL and the captain began a go-around. Between 3.4 and 5.1 sec. later, with the aircraft at approximately 125 ft. AGL, in a position approximately 1.5 nm short of the runway, the EGPWS sounded a “TERRAIN AHEAD, PULL UP”

warning. The correct emergency pull-up procedure was not followed in full, partly because the captain had already initiated a go-around. The minimum recorded terrain clearance achieved during the recovery maneuver was 121 ft.

The crew next tried another non-precision approach to Runway 36 using manually selected autopilot vertical modes but went missed again. Determined, they were setting up for a third approach when they received visibility information from ATC that was below the minimum required for the approach even using the 2x factor. At that point, they diverted to Port Sudan where they landed without further incident.

The AAIB report concluded that the two pilots had a lot going against them and made many attempts to conduct the flight in accordance with what they thought to be their guidelines. When they began the first approach, they were, at best, very concerned about operating in conditions in which they had no previous experience. The decision to change to a different, non-briefed approach procedure, rather than going around, halfway through the first approach all the while remaining coupled to the autopilot, nearly resulted in what would probably have been a major accident. **BCA**

► **November 17 — About 1552 MST, a** Piper PA28R-180 (N3206R) crashed during the takeoff initial climb from Ogden-Hinkley Airport (OGD), Ogden, Utah. The commercial pilot and the student pilot were seriously injured. The airplane’s fuselage was heavily damaged. The Piper was registered to Whitesands INC and operated by the pilot under Part 91 as an instructional flight. It was VFR at the time of the accident and no flight plan was filed for the local flight that was originating from OGD, about 1545.

A video recording taken by a passing motorist on Interstate 15, detailed the airplane striking a billboard then descending to the ground. The airplane came to rest in a flat area adjacent to the freeway. Numerous first responders assisted in extricating the instructor and student pilot, and subsequently transporting them to a local hospital.

► **November 16 — About 1430 MST, a** North American SNJ-4 airplane (N694US) was substantially damaged during landing

at the Heber Valley Airport (HCR), Heber City, Utah. The airline transport pilot and passenger were not injured. The airplane was registered to and operated by Wasatch Flyers LLC under Part 91. It was VFR and no flight plan was filed for the air tour flight. The local flight originated from HCR about 1400.

The pilot reported that prior to entering the airport traffic pattern, he listened to the airports automated weather observing system, noting the wind was from 340 deg. at 9 kt.

The pilot entered the airport traffic pattern for Runway 4, a 6,898 ft. by 75 ft. asphalt runway. Following an uneventful three-point landing in the tailwheel equipped airplane, the pilot let the airplane roll out and decelerate without applying brakes. About 500-700 ft. after touchdown, the airplane veered to the left and despite the pilot’s control inputs, exited the left side of the runway. Subsequently the right main landing gear separated, and the airplane came to rest upright.

Accidents in Brief

► **November 13 — At 0015 MST, a** Cessna 150 (N704QJ,) executed a forced landing following a total loss of engine power shortly after departing the Pinal Airpark (MZJ), Marana, Arizona. The private pilot, sole occupant, was not injured but the airplane sustained heavy damage. The Cessna was registered to and operated by the pilot as a Part 91 personal flight. It was VFR and no flight plan was filed. The flight originated from the Glendale Municipal Airport (GEU) at about 2230, with a touch and go landing at MZJ, and an intended destination of GEU.

The pilot reported that he recently purchased the airplane and the purpose of the flight was to get used to how it handled. The pilot took off from GEU conducted some light maneuvers and conducted an uneventful touch and go landing at MZJ. However, during the initial climb the pilot noticed that the airplane shook when he tried to climb too abruptly. Therefore, he continued a shallow climb and, about 1,500 ft. AGL, the engine quit. He attempted to restart the engine several times, but to no avail. He landed the airplane in a nearby field; during which, it struck an object he could not see because it was dark and it came to rest in a nose low attitude.

► **November 12 — About 2008 MST,** an AgustaWestland A109SP (N271HC) was heavily damaged during cruise flight near Spanish Fork, Utah. The airline transport pilot and flight nurse were not injured. The airplane was registered to and operated by IHC Health Services, Inc., as an unscheduled air medical flight, conducted under Part 135. It was VFR and a company flight plan was filed for the local flight that was destined for an off-airport location in Spanish Fork, Utah.

According to the pilot, the helicopter departed its base in Murray, Utah, about 1952 and was bound for a motor vehicle accident. When the helicopter was about 5 min. from its destination, the flight nurse, seated in the left front

seat, attempted to contact personnel on the ground to coordinate their landing. He attempted to step on the press-to-talk button located on the cabin floor, to activate the radio microphone, but instead he inadvertently stepped on the left anti-torque pedal, which caused a rapid yaw to the left. A flight recorder indicated that the yaw was about 11 deg.; however, the pilot recounted the yaw to be much more severe and violent. He immediately countered the movement and re-established straight and level flight. They landed the helicopter uneventfully and conducted a walk-around inspection in dark night conditions, which did not reveal any anomalies. During a subsequent flight, after they arrived at the company's home base and went off-duty, the oncoming pilot conducted a walk-around inspection in daylight conditions and discovered damage to the tailboom as he approached the helicopter. The helicopter was immediately taken out of service, repaired, and ferried to the company's maintenance facility.

Post-accident photographs provided by the helicopter operator showed substantial damage to the composite tailboom and tail rotor blades.

► **November 10 — About 0920 EST, a** Mooney M20J (N5765H) was heavily damaged during a forced landing in a marsh, while on approach to Northeast Florida Regional Airport (SGJ), St. Augustine, Florida. The airline transport pilot sustained minor injuries and the passenger was seriously injured. The personal flight was conducted under Part 91. It was VFR and no flight plan was filed for the flight that departed Gainesville Regional Airport (GNV), Gainesville, Florida, about 0820.

The pilot reported that while on an extended base leg of the airport traffic pattern for Runway 31, he reduced airspeed from 100 kt. to 95 kt., and then increased engine power to maintain 95 kt. At that point, the engine began to surge for several seconds, followed by a total loss of engine power. The pilot verified that the fuel boost pump was on, the mixture was rich and the fuel selector was positioned to a correct fuel tank. The pilot also checked both magnetos

with no success. He then retracted the landing gear for better glide performance but realized that the airplane would not glide all the way to the runway. The pilot subsequently performed a forced landing to a marsh about 1 mi. prior to the runway threshold.

► **November 9 — At 1024 EST, a** Beechcraft BE55 (N686DR) registered to and operated by the commercial pilot/owner, was heavily damaged during a runway excursion during takeoff at Griffin-Spalding County Airport, (6A2) Griffin, Georgia. The commercial pilot and his four passengers were not injured. The personal flight was conducted under Part 91. It was VFR and no flight plan was filed for the local flight.

The pilot reported that he was flying multiple individuals and families throughout the day during a "customer appreciation event." This was the fifth flight of the morning, which included himself and a family of four; two adults and two minor children. The pilot taxied to Runway 14 and applied full power for takeoff. The pilot reported that everything appeared normal during the takeoff roll, but as the airplane approached 70 kt., about a third of the way down the runway, the landing gear suddenly retracted and the airplane struck the runway, then skidded off the right side of the runway and spun into the grass before coming to rest. After a successful evacuation, the pilot looked at the instrument panel and noticed that the landing gear handle was in the up position; he reported "It either got bumped, or moved on its own."

Airport surveillance video that pointed towards the departure end of Runway 14, captured the airplane taxiing northwest from the hangers; it crossed Runway 14/32, then turned northwest on the Runway 14 parallel taxiway, then taxied to the runway without stopping. After a brief pause of about 5 seconds, the airplane began the takeoff roll and appeared to roll down the runway normally, then about 1,100 ft. into the takeoff roll, it settled onto the runway right wing first, followed by the belly and the left wing. Subsequently, the airplane skidded sideways, exiting the right side of the runway before coming to rest in the grass. **BCA**

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Cirrus SF50 Vision Jet

Top marks for comfort, safety, reliability and product support



BY **FRED GEORGE** fred.george@informa.com

More than 140 Cirrus Vision Jets have been delivered since the model entered service in late 2016. Another 30+ aircraft are in various stages of completion, awaiting their new owners. Operators praise the aircraft for its cabin comfort, outward visibility, handling ease and ergonomic flight deck design. They like its advanced safety features, such as its ballistic Cirrus Airframe Parachute System (CAPS) and upcoming Safe Return emergency autoland function.

“The airplane is so much built for the single pilot,” says a well-known Red Bull Air Race pilot who also flies a Vision Jet for its owner. “Everything on the flight deck is perfectly positioned. Nothing is out of reach. It’s as though it were built just for me.”

Clean-sheet turbine aircraft often are plagued by dozens of teething

pains, but that’s not true for the Vision Jet. Dispatch reliability has been solid. Just as importantly, when something goes amiss, Cirrus Aircraft is earning an excellent reputation for product support. Case in point: In April 2019, the FAA issued an emergency Airworthiness Directive that grounded serial numbers 0005 through 0109 due to possibly defective angle-of-attack (AOA) vane sensors that provide stall warning, stall barrier and low-speed awareness cues. Concurrently, Cirrus issued mandatory Service Bulletin SB5X-34-03 that required exchanging the original AOA sensors with improved units. The company quickly procured the new parts, expedited delivery to authorized repair stations and restored all aircraft to airworthy status within a few to several days, operators say.

“Cirrus worked 24/7 to make things

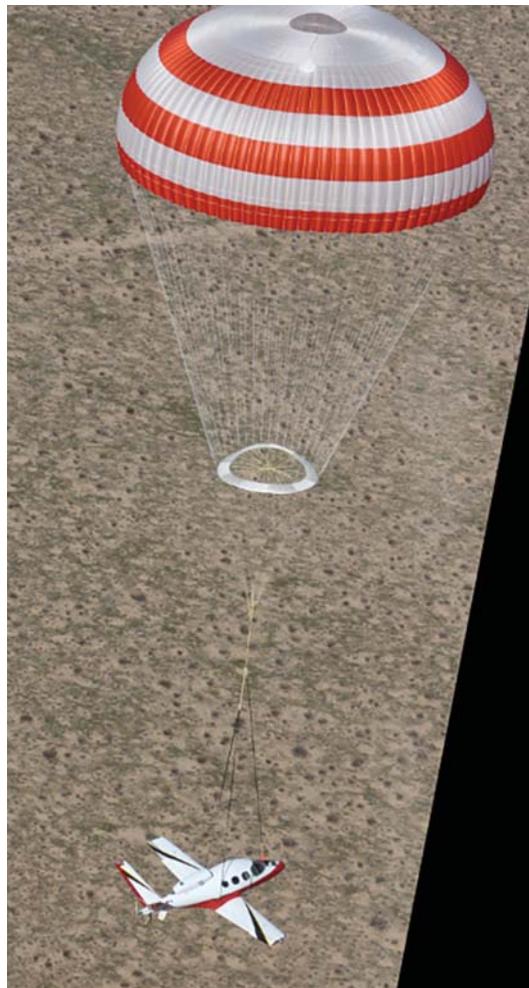
happen,” says Jon Gilbert, who flies s.n. 105 based in San Diego. He’s owned five Eclipse 500s and an Embraer Phenom 100. He still owns a Cessna 414 Chancellor, an airplane he’s had for more than two decades. However, he says it’s getting harder to obtain affordable insurance for the piston twin. That’s not a problem in his single-engine Vision Jet, which, he says, delivers “the most fun I’ve ever had in an airplane.”

A professional pilot who flies a Vision Jet for a firm in Northern California says his owner bought the aircraft because of its safety features, particularly CAPS. He’s looking forward to upgrading to a newer model with Safe Return. Cabin comfort was a major selling point. The owner looked at both the Piper PA46 Meridian and the TBM 940, but he found their cabins too restrictive. He’s much more comfortable



CIRRUS

Vision Jet is earning top marks for handling ease, cabin comfort, and safety features, plus the quality of product support and training provided by Cirrus.



CIRRUS

The SF50 is the only turbine-powered personal aircraft equipped with an airframe parachute system, a safety feature that impresses many operators.

Garmin's Perspective Touch flight deck is highly intuitive. High-end automobiles inspired the simple, clean layout of controls and indicators.



CIRRUS

CIRRUS



Perspective Touch+ is standard equipment in second-generation Vision Jets. Available autothrottle system reduces pilot workload and adds to safety.

in the Vision Jet as it's a full foot wider than competitively priced single-engine pressurized turboprops.

"It's a great first jet. There is nothing easier. It fills a niche. There's nothing like it," says William Robertson, who flies an SF50 for a Georgia-based industrial and service sector construction company.

flight controls, docile low-speed handling characteristics and large windows. The Williams International FJ33-5A turbofan, which produces as much as 1,846 lb. of thrust for takeoff, is equipped with full-authority digital engine controls (FADEC) and offers considerably lower workload for pilots than either the Lycoming or Continental

piston powerplants that propel current production light aircraft or even the Pratt & Whitney Canada PT6A turbo-prop fitted with hydromechanical fuel controls.

The FJ33 offers carefree handling from start-up to shutdown as the FADEC provides over-speed, over-temp and over-thrust limit protections,

Demographics and Buy Decision

More than three-quarters of Vision Jet buyers upgraded from Cirrus piston single-engine aircraft. They say they were quite satisfied with their 170- to 200-KTAS airplanes, especially with the impressive product support provided by Cirrus. But they needed more speed, the ability to climb over weather and the comfort of a pressurized cabin.

Vision Jet represents the easiest entry into a pressurized turbine aircraft for SR20/22 pilots because it incorporates many of the same or similar design features as the piston aircraft, including the Perspective Touch flight deck powered by Garmin, side-stick



Second-generation aircraft can climb to FL 310 and they weigh less than the original models. Range is increased by 100 mi.

CIRRUS

enabling the pilot to spend more time looking out the windshield and less time babysitting the engine. Pilots new to the Vision Jet say this makes it much easier to fly than piston-engine or turboprop aircraft they've previously operated.

The Vision Jet's safety features, including most notably CAPS, were strong purchase incentives. Automatic emergency descent mode, over- and under-speed envelope protections, and stall-warning stick shaker and pusher are among its other standard safety features. Newer models also have standard electronic stability and protection and an automatic wing level function activated by pressing a prominent blue button. Buyers were willing to forego higher-speed competitive jets or more-fuel-miserly turboprops for the Vision Jet's safety features.

Cabin comfort and ease of entry and egress also factored into the purchase decision. The pilot's chair slides forward to provide convenient access to the middle and aft passenger seats, plus a copilot seat occupant. Once the passengers are aboard, the pilot's chair slides aft to provide easy entry for the pilot. From a seated position, the pilot can close the bottom and top halves of the clamshell door, then slide the seat forward onto the flight deck.

Purchase price was another factor. At \$2.25 million to \$2.75 million as typically equipped, the Vision Jet costs about half the price of an entry-level twin-turbofan aircraft and it's less expensive than most competitive single-engine turboprops.

Some Vision Jet operators are trading up from their first-generation aircraft to second-generation models. The block point change was made at s.n. 94, starting in early 2019. The newer aircraft cruise 3,000 ft. higher, have better cabin pressurization, slightly more tanks-full payload and fly about 100 nm farther.

All but four of the 170+ Vision Jets are registered in the U.S. N-registered aircraft, however, are operated in Australia, Brazil and Guernsey, plus Germany, Israel, Italy and the Netherlands, along with South Africa, Switzerland and the U.K. Aircraft based outside the U.S. predominantly are flown by professional crews, typically for air charter, corporate or individual operators. However, within the U.S., owner/operators comprise the large majority.

Operating patterns vary widely, with utilization varying between 100 hr. and



Some operators say the aircraft's stopping performance, especially on contaminated runways, could benefit from ground spoilers and anti-skid brakes.

CIRRUS

more than 300 hr. per year. Average stage length ranges between 250 and 600 nm. Most operators say they're comfortable flying early models as far as 900 nm and second-generation aircraft 1,000 nm. Early models are limited to a maximum cruise altitude of FL 280, while follow-on models can cruise at FL 310. Block speeds for most missions are 300 nm/hr. First-generation aircraft can fly about 3 hr., 15 min. and land with comfortable reserves, while newer models stretch that figure by 15 min.

For short missions, operators say they ballpark fuel flows at 80 gph (536 pph) for the first hour and 70 gph (469 pph) for the second and third hours. As with SR20/22 aircraft, Vision Jet fuel flows are computed in gallons per hour rather than pounds per hour because Cirrus officials say operators buy fuel by the gallon and not by the pound.

Actual fuel flows on longer missions are closer to 75 gal. for the first hour and 60-62 gph at FL 310 for second-gen aircraft and 66-68 gph at FL 280 for

their predecessors. The aircraft will cruise at 305 to 315 KTAS, depending upon OAT.

Operators report that current production aircraft are noticeably quieter inside the cabin than first-gen models. Cirrus installs Mid-Continent True Blue lithium-ion phosphate batteries in the former, affording much greater starting power than the original lead-acid batteries and saving considerable weight. Lithium-ion batteries indeed have triple the power density of lead-acid types. This allows the use of heavier acoustical insulation in aircraft but still results in a slight net empty weight savings. Notably, True Blue lithium-ion batteries use a different chemistry than older lithium-metal batteries that proved problematic aboard the Boeing 787 and Cessna Citation CJ4.

Early Vision Jets have noticeably higher sound interior levels than other entry-level turbofan aircraft, making use of active noise canceling headsets a virtual must. Current models, while



The Vision Jet offers docile handling, with minimum landing approach speeds in the low 70s.

CIRRUS

Cabin may be configured with two to five passenger chairs. Executive seating configuration allows aft chairs to be removed and center console with fold-out work tables, to be installed.

being considerably quieter inside, allow passengers to use conventional headsets or earbuds for inflight entertainment.

Five Best Features

Respondents had various answers for their top-five strong points of their aircraft. All supported the Vision Jet as a safe, simple, comfortable, easy-to-fly aircraft. "It has a great safety record and it's the easiest single-pilot turbine aircraft in production," said one pilot.

Serial number 34 is the only aircraft of the type that's been involved in an incident. It went off the runway and into a snowbank at Nuuk, Greenland, during a delivery flight from the U.S. to Germany in February 2018. The cause was loss of brake fluid to the left wheel brake. Both occupants escaped injury. The aircraft suffered minor damage, which was repaired and then it was returned to service.



CIRRUS

"Avionics provide easy access to the information I need," says Gilbert. "It's just comfortable," says Robertson, adding "the cockpit is like a flying iPhone." The aircraft has three landscape orientation touchscreens mounted immediately below the two large-format display screens. This allows the pilot to select one for flight plan control, another for radio management and a third for access to systems. Many other

touchscreen configurations can be chosen at the discretion of the pilot.

The flight deck and cabin also have the ambiance of a high-end automobile, operators say. The layout is simple, clean and intuitive.

Pilots need an SF50 type rating to fly the aircraft. Cirrus provides initial and recurrent training at its Knoxville, Tennessee, facility. Before arrival, customers are afforded access to a comprehensive, online ground school system. Simulator training incorporates scenarios that challenge customers to make decisions based on real-world conditions. For instance, an engine failure in IFR conditions might involve gliding the aircraft to the nearest suitable VFR divert landing facility. But that requires arriving overhead the airport at 3,000 ft. AGL in VFR conditions to execute a flameout, gliding approach. If the weather deteriorates, or if the aircraft is beyond gliding distance to the divert field, circumstances may dictate gliding to a clear area and deploying the airframe parachute. Recommended speed for CAPS activation is 135 to 145 KIAS at an altitude of 1,000 to 2000 ft. AGL.

Operators say Vision Jet pilot instruction emphasizes train-to-proficiency rather than train-to-cost. Customers who need extra help to attain proficiency are afforded extra sim sessions and briefing periods.

"This is the best training I've ever been to," says the Northern California pilot. "I love the scenario-based training. The online training, including the videos, also was great," says Gilbert. "The Knoxville training was great, but some of the new guys [instructors] were still getting acquainted with the airplane," says Robertson. After initial

Safe Return to Debut in 2020

Cirrus Aircraft's Safe Return emergency automatic landing system, a new function developed in partnership with Garmin, will be added as a standard feature to Vision Jets in 2020, starting at serial number 174.

With it, passengers will be able to press a red button in an overhead panel, thereby immediately transforming the aircraft into an autonomous machine that will fly to the nearest suitable airport, taking into account terrain, weather, and airport winds and runway conditions to assure continued safety of flight. Safe Return will also inform ATC of its intent through a VHF comm radio and transponder. Once it arrives at the divert field, it will land the aircraft and brake it to a complete stop on the runway centerline.

Safe Return uses the aircraft's autothrottle, autopilot, GPS navigation radios and a newly installed radio altimeter to fly it from the point of activation to the divert airport. It ties into the landing gear, wing flaps and wheel brakes to configure the aircraft for landing and bring it to a stop after touchdown.

If the system is inadvertently activated, it may be disarmed by the pilot pressing the autopilot disconnect button on the flight control side-stick.

The upgrade will add approximately \$100,000 to the purchase price of a new Vision Jet. After initial certification for new production aircraft, Cirrus plans to develop a Service Bulletin for older, second-generation Vision Jets equipped with Garmin Perspective Touch+ flight decks — a key element for Safe Return. That upgrade is expected to cost more than \$100,000. First-generation Vision Jets cannot be upgraded with the system because of limitations in their avionics system.

Safe Return is part of Cirrus Aircraft's "total safety solution" that also includes the Cirrus Airframe Parachute System. **BCA**

Cirrus Safe Return emergency automatic landing system becomes standard in 2020. Pressing the red button transforms Vision Jet into an autonomous aircraft that can fly itself to a suitable divert airport, land and brake to a stop on the runway.

type training is complete, customers are assigned a mentor pilot to provide supervised operating experience until they're comfortable flying the Vision Jet alone.

Operators also said the optional autothrottle, executive second-row seating with foldout worktables, plus center storage console, and rear passenger climate controls added safety, comfort and utility to current production models. Owners of second-gen models are especially appreciative of the increased altitude performance, 10% greater range and noticeably quieter cabin. "This is the aircraft they should have built at the start," said one operator who had upgraded from an early model.

Five Worst Features

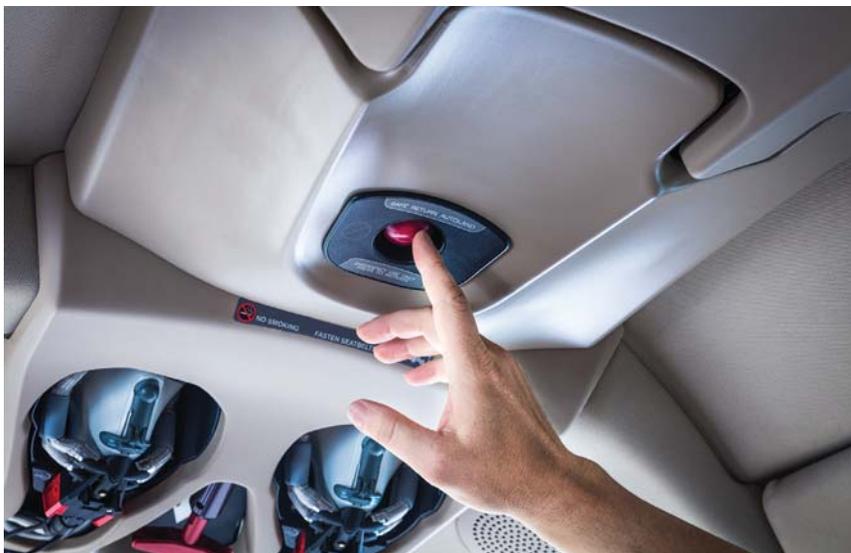
The Vision Jet is comfortable, convenient and safe, but its performance is limited. It lives up to its billing as the lowest, slowest and shortest-range turboprop aircraft. Typically equipped, it can carry a single pilot and one passenger 1,171 nm with full fuel. Fill all the seats and range drops to 461 nm. Average long-range cruise speed on such missions is 233 KTAS, 80+ kt. slower than maximum cruise speed.

But the aircraft can carry a pilot and three passengers 600 nm at high-speed cruise. These missions are just over 2 hr. long and they cover the bulk of the trips flown by most operators.

Contaminated runway performance is not a strong suit for the SF50, even though max VREF is 85 KIAS with full flaps. Sea-level, standard-day landing distance is 3,011 ft. at max landing weight. It takes at least 15% more runway if the surface is wet. Factored landing distance on a wet runway is 5,783 ft. The aircraft lacks ground spoilers and anti-skid brakes, thus it's imperative to land on speed and in the touchdown zone.

Takeoff performance also is modest. The aircraft needs 3,192 ft. of runway when departing a sea-level, standard-day airport at its 6,000-lb. MTOW. When operating from a 5,000-ft. elevation, ISA+20C airport, it needs 5,956 ft. of runway.

Some Vision Jet operators also say that Cirrus has flooded them with 150+



CIRRUS

Service Bulletins, such as a remedy for moisture intrusion into the CAPS bay, perceived shortcomings of the pitch trim system, and others pertaining to brakes, the routing of static lines and possible wheel bearing replacement. Operators who have ready access to authorized Vision Jet service centers say the plethora of bulletins isn't much of an inconvenience, as most are covered under warranty. But people based far from authorized maintenance facilities say it can be a nuisance ferrying their aircraft to and from their home bases.

Other nits include occasional faulty bleed-air pressure regulating and shut-off valves, balky automatic fuel tank switching valves and loose interior trim bits and pieces. Fuel quantity indications may be less than accurate as the first 10 to 20 gal. are consumed, and when the air-conditioner condenser door is open in flight, it causes noticeable rumbling in the cockpit. A few operators also say they wish they could use a GPU to charge weak batteries when the airplane has been sitting idle for several days.

Operators of first-gen models also didn't like the need to use ground power to start the aircraft at temperatures below -18C/0F because of limited performance of lead-acid batteries at cold temperatures. That restriction has been removed on newer aircraft because of the higher performance of its lithium-ion batteries at low temperatures.

On Balance

In little more than three years the Vision Jet has earned high marks for attention to design details, dispatch reliability,

product support and factory-sponsored pilot training. Only 15 months into production, Cirrus introduced the second-generation version, offering stronger cruise performance, more powerful avionics, optional autothrottle and enhanced lithium-ion batteries.

Cirrus also is one of the few entry-level turbine aircraft manufacturers to offer tip-to-tail hourly comprehensive maintenance service programs that cover almost all direct operating costs, including engine reserves. Most operators we contacted have enrolled in one of the Jet Stream service programs. If a block time Jet Stream program is purchased at the time of aircraft delivery, it can cost as little as \$350 per hour on average for people flying 300 hr. per year.

Cirrus has a track record of introducing block point product improvements every year or so. Customers are likely to see subsequent Vision Jet versions offering stronger performance, more range/payload flexibility, upgraded systems and even more capable avionics.

Considering that the SF50 Vision Jet is Cirrus Aircraft's first turbine-powered, retractable landing gear, pressurized aircraft, the favorable marks it's earning with operators is all the more impressive. This is the product of a general aviation manufacturer that understands customer experience involves much more than basic aircraft ownership. Post-delivery product support, top-notch pilot training and regular product improvements are just as essential as aircraft design. The Vision Jet has created a new niche in general aviation, one in which it faces virtually no competition for years to come. **BCA**

Bahamas Bound, Post Dorian

LINDA RIMMOND/STOCK

Yes, there's a **winter tourist season**,
but in the **island chain's south**

BY **DAVID ESLER** david.esler@comcast.net

In late August 2019, meteorologists were monitoring a tropical wave of increasing intensity in the central Atlantic Ocean.

Evolving into a tropical storm, “Dorian” moved rapidly west, achieving hurricane status on Aug. 28 as it passed north of the Greater Antilles. Over the following days, the storm continued to intensify, reaching its peak as a Category 5 hurricane with sustained winds of 185 mph. (For a primer on cyclonic storms, see “Hurricanes and Aviation,”

BCA, June 2019, page 38.) On Sept. 1, Dorian made landfall in the Abaco chain of the northern Bahamas; a few hours later, it enveloped Grand Bahama island, as well. And there, the monster storm stalled for more than 24 hr., unleashing unrelenting rainfall, wind gusts up to 220 mph, and storm surges as high as 20 ft.

Much of the eastern side of Grand Bahama ended up under water. Damage and loss of life were catastrophic. After weakening, Dorian moved north,

brushing the Carolina coast at Cape Hatteras as a Category 1, then continuing to diminish, traveling all the way to Newfoundland and finally dissipating near Greenland. During its rampage, Dorian caused damage in the Antilles, Virgin Islands and Puerto Rico as well. But the devastation wreaked upon Abaco and Grand Bahama rivaled the aftermath of all-out war.

A month after the storm passed, it was estimated that more than a billion pounds of debris remained, the clearing



Hurricane Dorian was a Category 5 cyclonic storm, maximum on the rating scale, that generated wind gusts up to 220 mph, decimating the Abacos and Grand Bahama Island. Note Florida peninsula at upper left in this satellite photo

of it complicated by the lack of personnel since most survivors had been evacuated to islands not affected by Dorian or to the U.S.

And while the official death toll hovered at 60 in mid-October with at least 600 people missing, the actual number of fatalities is unknown and could be far greater.

The 'Bahamas Airlift'

After the brunt of the storm passed, a massive rescue/relief effort commenced by the U.S. Coast Guard and Air Force, several airlines serving the Bahamas and by business and general aviation operators, many of whom were based in South Florida. Their response was spontaneous and largely unorganized. They carried in relief supplies and crisis responders and often carried out survivors to the U.S.

Mark Zee, founder and president of the Ops Group flight information service, described the noncommercial contribution to the relief effort as "phenomenal" and, as it developed over the following days, "overwhelming."

This panoramic photo on Grand Abaco Island shows what destruction a hurricane with sustained winds of 185 mph and gusts up to 220 mph can wreak.

He claimed it was the largest operation of its kind since the Berlin Airlift, prompted by the televised images of utter devastation and the fact that the disaster zone was just 50 mi. east of Florida, "the state with the most aircraft in it, teeming with general aviation, thousands of private aircraft. The response was unprecedented and entirely voluntary."

First on the scene, though, was the USCG. "All the surface infrastructure

was blown out," Zee said, "and so aviation and marine were the only ways to move people out. The Coast Guard played the major role in that regard."

Meanwhile, hundreds of airplanes were arriving, and other than at the Bahamian capital of Nassau on New Providence Island, no formal air traffic control exists in the archipelago. In the Abacos group of islands, all traffic is uncontrolled, and only a common Unicom frequency is available. So, Zee and his Ops Group colleagues assumed an ad hoc coordination role to organize where to go and what to bring, as the local emergency community was swamped. Part of the coordination effort involved liaison with the Bahamian Civil Aviation Authority and Nassau ATC, the FAA and ATC in Florida, and the military services on site. Additionally, they established contact with many of the pilots

The destruction at Marsh Harbor was typical of Abaco and Grand Bahama islands.



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and operators flying into the disaster area to obtain status reports and then issued twice-daily briefings on their website. And when the relief airports reached saturation, they liaised with the Aircraft Owners and Pilots Association and NBAA for assistance in reducing the level of general aviation traffic, as larger aircraft were coming in that could perform the relief mission more efficiently.

In the end, the Bahamas Airlift involved scores of nongovernmental organizations, countless individual aircraft operators conducting relief flights in floatplanes, helicopters, business jets and turboprops, and private lightplanes. In addition to those already cited, organizations helping in the effort included Aerobridge, Operation Airdrop, Banyan Air Service, Bahamian National Emergency Management Agency (NEMA), U.N. Office for the Coordination of Humanitarian Affairs and a number of other FBOs including Odyssey Aviation and Jet Aviation in Nassau. Meanwhile, airlines and the military were utilizing their heavy aircraft to support mass evacuations from Abaco.

Relief Effort Continues

Months after Dorian's passage through the islands, the relief effort continues. Envoy Aviation, a charter/management company based at Melbourne, Florida, participated in the spontaneous airlift immediately after the storm, hauling cargo and first responders to the islands in a Piper Navajo on behalf of two charities and a concerned philanthropist with ties to the Bahamas. "We were running three flights a day, seven days a week, with the Navajo," Envoy's operations director, Ted Morgan told *BCA*. "We did this for a month and a half, transporting volunteers to Treasure Bay and supplies to Freeport and West End. Later, we added our King Air C90 to the effort." As this was being written, Envoy's agreement with its financial supporters



The Bahamas archipelago consists of 29 major islands, 661 cays and 2,387 islets and extends some 500 sm through the North Atlantic east of Florida and Cuba.

was extended through November, and a King Air B200 was added to the operation.

"Stuart Jet Center at Witham Field in Stuart, Florida, gave us an office, reduced our fuel rates, and waived ramp and landing fees," Morgan explained. "Customs at Stuart is a user fee office, but they waived their fees, brought in more agents, and opened early and stayed late, operating seven days a week. They were instrumental in allowing us to operate as many flights as we could — up to five a day. Eight of our pilots operated the relief effort, three of them volunteers. When something broke, our maintenance manager flew parts into the islands in his own plane at his expense."

For a while, an Air Force AWACS aircraft orbited the area, sorting out traffic, Morgan said, "and they ran the advisory frequency and coordinated with Miami ATC, which would hand us

off to them. They also relayed the opening and closing of flight plans. We were flying into Treasure Cay, West End, Freeport and Scotland Cay. Early on, they had just cleared Treasure Cay, and runways were normal, but everything else was devastated. All the buildings on the airport were destroyed. All the trees were snapped off. The destruction was unimaginable.

"There was no ATC to speak of. Freeport and Marsh Harbour normally supply the ATC, but even now [early November], the radar continues to be out at Freeport. At Scotland Cay, a quarter of the runway was under water at high tide — the Navajo was able to land on the remaining runway, and at low tide the C90 could handle it, too."

Business Aviation Solutions, the national charter/management and aviation consulting firm, also participated in the early relief efforts with a Cessna Caravan on floats. Ed White, the company

founder and president, explained that the CE208 had been stationed temporarily at Jet Aviation in Nassau and thus was “one of the first to be involved in the relief effort.”

In assessing the scope of the damage wrought, Envoy Aviation’s Morgan observed, “Abaco may not be able to support a tourist season for five to 10 years, the devastation is that bad. Marsh Harbour is leveled. Currently, there are less than 2,000 people on the island out of 16,000 who were there before Dorian. The government needs funding to rebuild and has no tourism now. Freeport and Grand Bahama did not get hit as hard because they are on the leeward side of the path the storm took. Nassau was untouched; Freeport can be rebuilt in short order. Their challenge will be getting the electrical grid back up.”

In early October, White flew into Nassau in a business jet and said the field appeared to be back to normal. He then made multiple flights to locations in the Exumas Group with the amphibious Caravan. “In the southern part of the archipelago, things look normal. Our experience showed that Nassau was mildly hit and there is no reason not to go there this tourist season. They are open for business and are encouraging people to come back. As most of the Bahamas’ economy is based on tourism, they need the money to sustain the country and rebuild the northern islands. Consequently, they value the U.S. relationship and are very welcoming to visitors.”

Yes, to Winter Beachtime

Indeed, a query to the Bahamas Ministry of Tourism as to whether there would be a winter 2020 tourist season elicited an enthusiastic “Yes!” from a spokeswoman, who noted that 60% of the island nation’s economy is dependent on tourist spending. Hotels in the mid and southern islands are open and welcoming to visitors. And BCA learned that 14 of 16 islands or groups in the south and east of the archipelago remain open for business and life continues undisturbed.

Cruise ships are docking at ports unscathed by Dorian and disembarking the island nation’s most sought-after commodity right now: cash-carrying tourists. On the other hand, a widespread

An Island Nation

The Commonwealth of the Bahamas consists of 29 islands, 661 cays and 2,387 islets. The chain extends some 500 sm in a northwest to southeasterly orientation in the North Atlantic Ocean east of Southern Florida and north of Cuba. It is roughly bisected by the 24th parallel of north latitude. Grand Bahama Island at the northern tip of the archipelago lies only about 60 sm from Florida’s east coast.

Climate is tropical most of the year and semi-temperate in the northern hemisphere winter, thanks largely to cold air blown into the region from North America. The Bahamas’ total land area is 5,400 sq. mi. and population before last September’s destruction by Hurricane Dorian was 330,000. Since the storm, an undetermined number of residents were either evacuated to the U.S. or left of their own accord.

The Bahamas are notable as the first landfall made by Christopher Columbus in 1492. The archipelago became a British Crown Colony in 1718 as a staging point from which to fight piracy in the region. Following the U.S. Revolutionary War, the British welcomed American loyalists who brought their slaves and established plantations on land grants. Slavery was abolished by the British in the islands in 1834 and the Bahamas subsequently became a haven for freed African slaves.

The Bahamas were granted independence in 1973 and remain a part of the British Commonwealth. Measured in terms of per capita gross domestic product, the Bahamas rank as one of the richest countries in the Americas (behind the U.S. and Canada) with an economy based on tourism, agriculture and offshore finance. Tourism, however, dominates, representing about 60% of the Bahamian economy. **BCA**

misunderstanding in the U.S. about the actual extent of the hurricane damage has resulted in trip cancellations to islands that were undamaged by the storm. The Tourism Ministry has been attempting to get the word out that two-thirds of the Bahamas is ready with undamaged first-class hotels, gentle warm sea breezes and white sandy beaches.

According to Guy Gribble, retired American Airlines captain and president of International Flight Resources,

the Bahamas hosts 16 airports with paved runways exceeding 5,000 ft. in length. The three largest — and normally, busiest — are Lynden Pindling International (MYNN) at Nassau, Lenard M. Thompson International (MYAM) at Marsh Harbour and Grand Bahama International (MYGF) at Freeport. Among them, these airports served 500,000 American tourists in 2018, which Gribble believes is significant, given the U.S. State Department has posted a



Older *BCA* readers may recognize this Volpar-modified Beech 18 piston twin, a popular business aircraft of the 1950s and early '60s. This example took part in the Bahamas relief effort.



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long-standing Level 2 travel advisory for the Bahamas due to concern over crime in the country.

Of course, while Nassau Pindling sustained no damage from Dorian and was up and running a day after the hurricane had departed the islands, and

while Freeport at Grand Bahama will probably be fully operational by the time readers see this, Marsh Harbour will take longer before accepting tourist traffic and, as of November, was being used solely for relief flights. As Henry LeDuc, regional operations manager at UAS International Trip Support, pointed out, those two airports lie within areas of search and rescue and humanitarian temporary flight restrictions (TFRs) and require special permits from the Bahamas Civil Aviation Authority (CAA) and NEMA. (Note that for anyone planning a flight into Marsh Harbour no fuel is available, either Jet-A or avgas.)

Gribble added that buried in the NOTAMs for MYNN, MYGF and MYAM are contact names and numbers for obtaining the permits and approval to operate within the TFRs. He also noted that there are specific routes to and from the Bahamas from Southern Florida airports published in the Miami ARTCC NOTAMs.

Air Travel Is the Island Connector

Overall, the Bahamian archipelago lists 64 airports among its islands, including those already noted. Of the total, six are private and three marked as permanently closed. The majority of these fields have single runways ranging between 1,500 and 3,000 ft. in length, and many are gravel strips. Given the nature of the country and how spread out the islands are, air travel competes with marine transportation in connecting them.

Operators of business jets heading for the Bahamas will most likely choose airports with runways 5,000 ft. or longer and that offer appropriate ground support, including parking, Jet-A and on-site customs. This season, the focus is on destinations in the mid and southern parts of the archipelago where airports are generally open from sunrise to sunset.

Cameron Moore, tactical manager at Collins Aerospace ARINC Direct,

A view of the nearly deserted ramp at post-Dorian Grand Abaco Island.

advises that for arrivals after sunset, coordination with Nassau ATC and airport management will be necessary. “Give ATC as much lead time as possible if arriving late,” he said. “Of the available airports, Nassau will be the busiest. Others we recommend are Exuma International Airport [MYEF] and three on Eleuthera: Governor’s Harbour [MYEM], North Eleuthera [MYEF] and Rock Sound International [MYER]. These are the ones we are mostly working with since the hurricane.” (Note that Cape Eleuthera at Freetown is one of the fields that has been permanently closed.)

Another possibility, given the limited choices this year, is Chub Cay (MYBC), north of Nassau in the Berry Islands, which has a popular resort. “It is also accepting traffic,” Moore said, “but has only one runway, a customs shack and no fuel. Fuel is available at the other larger fields, but always check beforehand, as shortages can happen at the height of the tourist season. We always recommend that, if possible, tanker. With two less islands this year, there may be restricted parking, so check that, too, as most fields will not reserve parking, and it is allotted on a first-come, first-served basis.”

Bahamian ATC is rated as very good, and most of the archipelago’s airspace is controlled by Nassau. Customs clearance tends to be straightforward, but don’t expect preclearance. “You have to have a passport to get in,” Moore said, “but U.S. citizens do not require visas. However, you will have to present GenDecs [General Declarations] on arrival.”

Here’s basic information on airports mentioned in this report:

► **Lynden Pindling International Airport (MYNN), Nassau, New Providence Island.** Continuous operation. Runways: 14/32 (closed for maintenance 0001-0515 local), 11,107 x 150 ft., asphalt, PCN 52FCXT; 9/27 (currently closed 24 hr.

Where to Go in the Post-Dorian Bahamas

It is a myth, of course, that Hurricane Dorian decimated the entire Bahamian archipelago, when actually, the Category 5 storm focused its wrath only on the northern Abaco group of islands and islets and Grand Bahama Island. While it may take years before the Abacos recover, the remainder of the Bahamian islands was essentially untouched by the hurricane and is open for business and visitation. Accordingly, the Ministry of Tourism has recommended the following islands as ripe for visitation:

- Acklins and Crooked Island**
- Andros**
- Berry Island**
- Bimini**
- Cat Island**
- Eleuthera and Harbour Island**
- The Exumas**
- Inagua**
- Mayaguana**
- Nassau and Paradise Island**
- Long Island**
- Rum Cay**
- San Salvador**



San Salvador Airport at Cockburn Town was not affected by Hurricane Dorian and features an 8,000-ft. hard-surface runway.

daily for repair and possible reorientation), 8,273 x 150 ft., asphalt, PCN 52FCXT. As of November, PAPI and approach lights were OTS. Field elevation: 16 ft. No published instrument procedures; only RNAV routes available with GPS overlay. FBOs: Odyssey Aviation and Jet Aviation. Fuel: Jet-A, 100LL. POE, full-time customs.

► **Exuma International Airport (MYEF), Moss Town, Great Exuma Island.** Open Monday-Friday, 1400-2200Z; after hours available with Nassau ATC and airport authority approval. Runway: 12/30, 7,000 x 150 ft., asphalt, PCN 30FBXU. Approach lights (1,400 ft.) and REIL. Field elevation: 9 ft. No published instrument procedures. FBO and ground support: Odyssey Aviation. Fuel: Jet-A, 100LL. Customs during operating hours.

► **Rock Sound International Airport (MYER), Eleuthera Island.** Open 1400-2200Z; after hours with airport authority approval. Runway: 9/27, 7,213 x 150 ft., asphalt. Runway edge lighting. Field elevation: 16 ft. No published instrument procedures. Ground support: Odyssey Aviation. Note: no fuel available. Customs during operating hours.

► **Governor's Harbour Airport (MYEM), Eleuthera Island.** Open 1400-2200Z; after hours subject to airport authority approval. Runway: 15/33, 8,035 x 150 ft., asphalt, PCN 30FBXU, Rwy 15 displaced threshold 997 ft. Approach lights (1,400 ft.). Field elevation: 27 ft. No published

instrument procedures. FBO and ground support: Earco Elite, Odyssey Aviation. Fuel: Jet-A, 100LL. Customs during operating hours.

► **North Eleuthera Airport (MYEH), Eleuthera Island.** Open 1400-2200Z; after hours subject to airport authority approval. Runway: 7/25, 6,019 x 100 ft., asphalt, PCN 17FBXU. Approach lights (1,400 ft.). Field elevation: 27 ft. No published instrument procedures. Ground support and fueling: White Crown Aviation. Fuel: Jet-A, 100LL.

► **San Salvador Airport (MYSM), Cockburn Town, San Salvador Island.** Open Monday-Friday, 1400-2200Z; after hours available with Nassau ATC and airport authority approval. Runway: 10/28, 8,000 x 150 ft., asphalt, PCN 52FAXT. Approach lights SALS. Field elevation: 24 ft. No published instrument procedures. FBO: Odyssey Aviation. Fuel: Jet-A. Customs during operating hours.

► **Chub Cay International Airport (MYBC), Frazers Hog Cay, Berry Islands.** Runway: 11/29, 5,000 x 78 ft., bitumen and asphalt mix, oiled. Field elevation: 5 ft. No published instrument procedures. Fuel: no fuel or services. Customs by prearrangement. (Field is privately operated.)

► **Grand Bahama International Airport (MYGF), Freeport, Grand Bahama Island.** During post-Dorian recovery, open only 0600-1800 local, Monday-Friday, for day VFR ops (normally open continuously). Runway: 6/24, 11,018 x 150 ft., asphalt,

PCN 59FAWT. REIL Rwy 6; ODALS Rwy 24. Field elevation: 6.1 ft. No published instrument procedures. Fuel: Jet-A, 100LL. Note: Freeport is inside the post-Dorian SAR and humanitarian TFR. Until reconstruction is completed, permits and approval to operate into MYGF must be obtained from Bahamian CAA and NEMA.

► **Leonard M. Thompson International Airport (MYAN), Marsh Harbour, Abaco Island.** During post-Dorian recovery, open only 0900-0530 local, Monday-Friday (normally 1400-2200Z). Runway: 9/27, 6,100 x 100 ft., asphalt, PCN 17FBXU. Approach lights (1,400 ft.), REIL, Rwy 9. Field elevation: 8 ft. No published instrument procedures. Fuel: no fuel available during Abaco relief effort. Note: Marsh Harbour is inside the post-Dorian SAR and humanitarian TFR. Until reconstruction is completed, permits and approval to operate into MYAN must be obtained from Bahamian CAA and NEMA.

Except for the islands hosting the last two fields described above, the remainder of the Bahamas archipelago escaped serious damage by Hurricane Dorian and is accepting visiting aircraft for the 2020 tourist season. In addition to making generous donations to charities and NGOs supporting the Bahamian recovery, the best contribution readers can make is to take a winter vacation in the islands. And the residents who depend so much on the tourist industry for their livelihoods will likely respond with a big smile and sincere, "Thanks, mon," for doing so. **BCA**

More Than Just a Paint Job

Today, there is nothing **simple about your aircraft's** external livery



While the majority of business jets feature a white base coat, others reflect the owner's wishes for something distinctive.

BY **KIRBY HARRISON** kirbyjh12@hotmail.com

There's nothing simple about the style, substance or support of your aircraft's exterior livery.

First of all, the paint is essentially a shell protecting what's beneath from unfriendly elements. In addition, its colors and design present a personal or corporate statement. And finally, it involves a plethora of environmental and regulatory issues, new technologies, care and maintenance, and more.

In creating a business jet's livery, numerous coatings must be applied, starting with a lightweight anti-corrosive zinc chromate or zinc phosphate primer applied to the bare aluminum skin of the aircraft shortly after it emerges from the production hangar. The common reference to a new aircraft as being "green" originated from the green shades of those anti-corrosive coatings. The phosphate primer is followed by other coatings, from the base coat to final airbrush images.

Considering the rainbow of liveries out there today among air carriers and many business aircraft, it can be hard to appreciate that it really wasn't all that long ago that commercial aircraft and their business brethren sported

polished aluminum — their only colors being black registration numbers applied to tails and underwings, logos and the occasional stripe for high style. The reasons for this were several including the expense of paint and painting, paint's additional weight that spelled a reduction in range or load, aircraft downtime, and the ease an unpainted aircraft allowed for detecting such things as corrosion.

But subsequently the industry adopted painted fuselages, most importantly because exterior paint acts as a protective shell shielding the aircraft from corrosion and erosion caused by the environment in which it operates.

Today, almost all business aircraft are finished in a white base coat, typically Matterhorn or Snow White, both of which are available from a number of paint suppliers. According to Doug Bohac, paint operations director at Duncan Aviation, approximately 80% of business aircraft today are white, with a bit of color trim.

The practical reasons for favoring white are numerous. First, white is the least expensive color, it facilitates spotting corrosion chips and flaking

that require attention, and it weighs less than other paints. But most often, the popularity of white stems from both a personal and corporate desire to present a more conservative public appearance.

In addition, basic white with several colored stripes is considerably less expensive to apply than more complex designs and such exotic paints as mica pearl.

Also, a white base coat tends to slow the process of fading more, according to AN Aviation, an Egypt-based global ground support services provider.

On the more practical side, sunlight is energy and the more light an object absorbs the more energy is converted to heat. Colors, darker colors in particular, absorb all wavelengths of light and reflect none. In fact, white is approximately 12 times more reflective than a color base coat. So it is that a white aircraft, in reflecting all wavelengths of light, absorbs the least heat, resulting in a cooler aircraft interior. There is also an array of paint colors that do not transfer a significant amount of heat to the aircraft's surface. Such paints have high emissivity,

meaning they are effective in emitting energy as thermal radiation.

Still, according to Craig Barnett, founder and CEO of aircraft livery specialist Scheme Designers, “In general, most of our clients prefer a conservative color palette.”

Barnett’s Cresskill, New Jersey, company, in business since 1997, does approximately 500 aircraft designs annually. “We work with more than half of the OEMs, primarily those that do not have an internal design staff, and we’ve done more than 13,000 aircraft designs, from private individuals to heads of state to royalty; even some military aircraft,” he declared.

“Matterhorn and Snow White are the most popular, each of which has a very tiny touch of black toner to reduce the glare,” Barnett explained.

When a client wants an overall metallic silver or mica or something similar, the job will cost more, it will add to the weight of the aircraft, and it will cost more to maintain. And, Barnett notes, aircraft with more complex and personalized liveries are harder to move on the used market. “While the new buyer may not object so much to the price of repainting his aircraft,” he adds, “it may take as much as five to seven weeks from start to finish, and the buyer may not want his aircraft sitting idle for that long.”

The practical duration of a business jet paint job is five to seven years, no matter the color. And Duncan’s Bohac notes, “The first aircraft paint straight from the factory will always last the longest.”

To maintain longevity, paint shops recommend the aircraft be kept hangered to protect it from the environment when not flying, especially in areas of high pollution such as major cities, or near the ocean where the threat of exposure to salt air is high. They also recommend in the case of a new aircraft, adherence to OEM instructions with regular fresh-water cleaning, application of an approved wax or high-end Teflon or ceramic coating, and regular inspections and maintenance.

“A complex design may take days and days to lay out on a large-cabin aircraft, and this adds to the overall time and cost,” said Barnett. “Our client has to understand in the end what he or she actually likes.”

“Among the most difficult clients are those who come in with no idea what they want. And there are those at the



Exterior paint often becomes a work of art, whether simple in design, or incredibly complex.

DUNCAN

other extreme, like movie directors, who want total control,” Barnett continued. Understandably, some jobs present a greater challenge than others. “We’ve done an airplane with extensive air-brushing by an artist creating fine-art reproductions all over the airplane,” he said. “One featured seascapes, and another multiple animals. There was even a Cessna 340 with the image of a giant rubber chicken covering the length of the fuselage.”

An aircraft’s livery needs constant attention. Aside from being stored in a hangar as protection from the elements, an aircraft should receive regular fresh-water washing, especially after an international flight. Also, any small chips or cracks or evidence of corrosion should be repaired and touched up immediately.

The 2016 “Industry Benchmark Forum: Aircraft Paint Expectations” assembled by Duncan Aviation, with contributions from numerous other paint shops and aircraft manufacturers, provides considerable and detailed information on how to take care of a business jet’s paint job.

The seven-page document presents a concise and reasoned explanation of the practical importance to aircraft owners and operators, noting that when an aircraft’s paint, its protective shell, begins to fail, “the aircraft is at risk of corrosion — meaning the structural integrity of the aluminum skin is in jeopardy.”

The document can be accessed at <https://www.duncanaviation.aero/resources/field-guides/industry-benchmark-forum-aircraft-paint-expectations>

Environmental and Safety Regs

There are two U.S. government agencies whose guidelines must be followed by aircraft paint shops.

The Occupational Safety and Health Administration (OSHA) requires paint booths be designed to filter out flammable contaminants and move air currents toward an exhaust for proper ventilation. The ventilation system, which discharges outside the building, must run at all times during, and for some period after, spraying, and exhausted air cannot be recycled back into the spray booth as this can cause contamination.

In addition, the Environmental Protection Agency (EPA) has very specific guidelines regarding spray booth ventilation. For example, filters with at least 98% capture efficiency must be installed.

The accepted approach to safety and environmental guidelines when painting a business jet exterior is followed by most aircraft exterior paint shops.

► Paint booth fans should be installed to facilitate air circulation and exhaustion of contaminants outside of the building. Ventilation fans should be inspected regularly for blockage or malfunction.

► The paint booth should be equipped with intake and exhaust filters. The latter, also known as paint overspray arrestors, capture over-sprayed coatings before they’re exhausted into the environment. In a downdraft booth, they should be installed near the floor. In a cross-draft booth, they should be

located on the opposite side from the intake filters.

► Intake filters are used to clear dirt and contaminants from the air before it enters the paint booth. They are typically located on the ceiling of a downdraft paint booth and in or near the doors of a cross-draft booth.

Volatile organic compounds, or VOCs, are typically found in paints, paint strippers and other solvents and are emitted as gases from certain solids or liquids. They include a variety of chemicals, some of which may have short- and long-term adverse health effects. Duncan's Bohac notes, "In our recently completed paint facility in Provo, Utah, we installed a regenerative thermal oxidizer that is designed to destroy VOCs and other hazardous air pollutants in order to meet environmental requirements."

State-of-the-art paint facilities will often have a two-zone cross-draft and a

one of the best air filtration systems on the market. "The new system ensures that the air released into the atmosphere is more than 92% filtered," she said. "This not only allows Bombardier to greatly decrease its environmental footprint, it also enhances painting efficiency and ensures the safety and well-being of our employees." Also, the paint shop uses a side-draft (cross-draft) system, which forces the air in the same direction as the nose-to-tail aircraft paint application process, thereby diminishing the chance of particles sticking to the paint that has been applied.

In terms of filtration, the paint shop is equipped with several Munters air filtration systems that work through a process of continuous "desorption" (the release of an adsorbed substance from a surface). Large carbon wheels capture particles in the air that then go into a sophisticated incinerator that is heated

D. Buerger, vice president of completions at the manufacturer's Savannah, Georgia, campus. "The paint facilities include the extensive mechanical, electrical and plumbing systems required for the paint process and are also equipped with environmental controls and the latest fire suppression systems."

Gulfstream's paint shops are air-conditioned and heated, divided into cross-draft bays for stripping, sanding and priming, and its downdraft bays are used for painting.

Paint Shop Tech

While existing processes at Bombardier's paint shop remained in place as production began on the new Global 7500, teams at the Dorval facility have had to adapt to the larger size of the aircraft, which measures 111 ft. from the nose to the stabilizer's trailing edge and 104 ft. from wingtip to wingtip.

"Teams designed and built what they call the 'mega platform' to easily access hard-to-reach areas such as the vertical and horizontal stabilizers and the zones around the engines," Colella said.

Some 80% of business jets have a white base coat, typically Matterhorn or Snow White.

The redesigned platform allows the team to properly and safely prepare these hard-to-reach surfaces for priming and painting. The shop also designed and fabricated various pieces of special equipment to paint large areas, such as the top of the wing.

Electrostatic spray painting came on the industry scene about a decade ago. With continued development, it is now the standard. Its application involves the law of attraction between positively and negatively charged particles. Thus, just before exiting the spray nozzle, paint is given a positive charge and the droplets are sprayed through a strong electric field. The negatively charged grounded metal aircraft then attracts the charged droplets to its surface much like a magnet. While the electrical charge is small, it is strong enough to counteract the effects of aerodynamics and gravity. In fact, the force of the attraction is 75% greater than the force of gravity alone. When the particles reach the metal, the force of attraction is great enough to keep them there and the transference rate of paint to surface averages approximately 98%. This means better and more even coverage and much less overspray.

downdraft bay, which are temperature and humidity controlled, as well as a wastewater treatment system. With the two-zone airflow system at Provo, paint teams can perform stripping, sanding, painting and detail work on multiple aircraft simultaneously.

Bombardier's Laurent Beaudoin Completion Center (LBCC), including a 15,380-sq.-ft. paint shop, in Dorval, Quebec, is LEED (Leadership in Energy and Environmental Design) certified for its innovative design favoring the use of natural light and materials, and energy efficiency. The shop is on the cutting edge of environmental technology and, according to spokesperson Cinzia Colella, "We not only respect environmental regulations and targets, we consistently beat them."

In 2017, Bombardier renovated and upgraded the paint shop and invested in

to approximately 1,300 deg.. All the air subsequently emitted from the paint shop is 92% filtered.

In addition, the paint booth is entirely temperature and humidity controlled. This not only ensures an optimal environment for paint application, "it creates a more comfortable work environment for our 100 employees, as the temperature can be lowered during periods of high natural temperatures," explained Colella.

"The temperature controls are integrated into the air filtration and ventilation systems, meaning that air quality is controlled 100% of the time, even when the paint booth is not in operation," she concluded.

Meanwhile, at Gulfstream Aerospace, its "paint processes are compliant with federal, state and local environmental regulations and requirements," said L.

FLYING COLOURS



Black is not a particularly desirable finish as it absorbs heat and is difficult to maintain.

In addition, the paint droplets are pulled toward surfaces in all directions; some particles even change direction sideways toward all angles of a façade. So, when using electrostatic technology, the undersides of substrates are coated and the paint can even reach around to the back of surfaces.

The electrostatic coating will also get into crevasses, making it an ideal technology for coating hard-to-reach areas. In addition, because the paint is so strongly attracted to grounded surfaces, fumes are reduced, making the environment safer than when other painting methods are used.

Envision Aviation might be best described as a one-stop shop for the creation of aircraft exterior paint schemes and vinyl paint-masking applications. “We’re a custom designer and producer of specialized projects for private and commercial jets, helicopters, yachts and more,” Heath Moore, the Savannah company’s founder and owner, explained.

A graphic design graduate of the Savannah College of Art and Design with a master’s degree in 3-D animation and motion graphics, Moore has been involved in graphics production for a number of major motion pictures. Envision’s design and production is done in-house by a full-time staff of two and between 10 and 20 contract employees who travel worldwide with Moore in teams of five to 12 people to the client’s onsite paint shop.

“Using traditional airbrushing, a complex paint job on a business jet might take from four to eight weeks,” said Moore. “With the digital technology at our disposal, it can take as little as five days to have a finished, painted plane.”

At the Savannah facility, the design is finalized and vinyl paint-masking and stenciling is created and cut in large rooms using specially designed materials and equipment. It is typical, said Moore, to make two masks or stencils, “on the off chance that one might be damaged in shipping or possibly during application on the aircraft. So, there is always a lot of planning to make sure everything runs smoothly.”

One of Envision’s more recent productions was a



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carbon-fiber look created in collaboration with O&O European Design of Warsaw, Poland. “At its base level, the final livery of the Gulfstream G650 consists of a quarter of a billion very tiny company logos that when merged together created an intrinsic pattern of carbon-fiber building blocks,” Moore explained. “The final appearance is not unlike pointillism, a style of neo-impressionism developed by painter Georges Seurat using tiny dots of various pure colors that, to the eye, blend together.”

He continued, “The process of the carbon-fiber design begins with application of a single base color upon which millions of tiny logos are installed as the negative stencil paint mask. The process is finalized by applying a second color over the first base color and the negative stencil mask. After removing the stencil, the final look is revealed, producing the perfect carbon-fiber look. Close-up views of the aircraft allow the viewer to see the base level logo of the company that purchased the aircraft, adding a level of subliminal

messages to the overall design.”

Meanwhile, diamonds are adding plenty of sparkle to business jet liveries.

Jean Boule Luxury of Luxembourg and Dutch coatings specialist AkzoNobel have created “the perfect diamond crystals” to transform coatings into sparkling masterpieces, launched as Sun King Diamond Coating.

The product was introduced at the 2017 European Business Aviation Convention and Exhibition (EBACE) as the exterior livery on a Bombardier Global 6000 business jet, painted by STTS of Dubai. The result, said Jean Boule Luxury CEO Bertrand Boule, was the result of “much hard work in both the development and certification process.”

He said Boule Luxury and AkzoNobel worked together to combine the diamonds with Alumigrip clearcoat, creating the aviation-grade coating. And the qualities of the diamonds in the coating mean that Sun King can be applied as a clear coat on top of any color the client desires.

“Each application of Sun King Diamond Coating is tailored to meet the precise requirements agreed to with individual clients,” Boule continued, and then his team works with them along with their designers and advisers “to create exactly the right bespoke coating.”

Paint shop supervisors say that painting an aircraft is a blend of art and expertise.

In addition to its facility in Savannah, Gulfstream completes new aircraft paint at its shops in Long Beach, California, and St. Louis and also offers customer support for livery refurbishment at all three locations.

The planemaker has some



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of the most technologically advanced paint shops in the industry, including an electrostatic paint process that reduces volatile organic compounds and solid waste, while promoting more consistent paint coverage. Moreover, the technology comes into play even before the aircraft rolls off the production line. Gulfstream's Buerger explains that the

Savannah center's 3-D paint projection enables customers to view livery options on the actual aircraft. The software, tailored by Gulfstream engineers, projects a multi-dimensional paint scheme onto the aircraft and defines how the images need to be shaped in order to reflect correctly on the surface. Explains Buerger, "Customers can test and review an

endless amount of different liveries, either directly on an aircraft or virtually applied."

And at Gulfstream sales and design centers in Savannah, Midtown Manhattan, Dallas, Long Beach and London, customers can use the company's virtual paint configurator to explore a wide variety of livery options.

New Aircraft Coatings Unveilings

Today's aircraft coatings today offer numerous advantages to yesterday's, including faster and more efficient stripping and surface preparation; greater transfer efficiency and more uniform film thickness; lower levels of volatile organic compounds; shorter application, drying and curing times; longer lasting; lower costs; and lighter weight.

By emitting a special low-temperature infrared signal to aircraft exterior coatings, Aerowing's patented Rapid Curing Device reduces cure times by more than half. A touch-screen control panel displays information, which facilitates automation on the curing process. The infrared signal fully penetrates the material surface, unlike heat lamps and hot-air curing methods that create trapped bubbles. It cures up to 40-times faster than does ambient light.

AkzoNobel has developed a base coat/clear coat system with a focus on reducing drying times and bringing operational efficiency during the painting process. The time reduction can shorten the paint cycle by up to 30%. The Amsterdam, Netherlands-based company also qualified for the Aerospace Material Specification AMS3095A Direct to Metal Base Coat/Clear Coat, which eliminates the need for any metal pre-treatment or primer.

PPG Aerospace introduced its Aerocron Electrocoat primer last year. The primer — SAW AMS 3144-qualified — is water-based and chrome-free and reduces the wasted paint. Aerocron reportedly has 95% transfer efficiency, compared with typical transfers of 30-70%. The process is promoted as providing a uniform film thickness across the entire aircraft, evens holes, and increases coating weight savings by up to 75%. For example, says PPG, a narrow-body aircraft can realize a 300-650 lb. reduction in coating weight.

Also new from PPG is a "solar heat management coating" that the company says was inspired by the lowly eggplant. It is based on infrared-transparent strainers that allow solar heat to pass through topcoat color pigments to a white primer coat which reflects heat away from the aircraft. The lowly eggplant uses much the same process to prevent its dark outer skin from getting so hot that the white interior would bake long before reaching an oven.

PPG says the skin of an aircraft with the new coating remains as much as 25 deg. cooler, while reducing cabin temperatures by five to seven degrees. So, in addition to energy savings for aircraft running air conditioning, PPG says the technology gives owners greater freedom in choosing aircraft livery colors and provides heat protection for composite parts.

Last April, Sherwin-Williams Aerospace introduced JCX Polyester Urethane, which features faster drying times and comes as a pre-packaged kit. The product meets AMS-3095 performance requirements, provides chemical resistance to Skydrol and other hydraulic fluids, is lead-free, and contains less than 3.5 lb./gal. of volatile organic compounds.

Glair G30 Series, created by 3Chem, was created as a single-stage, high-solid, polyurethane topcoat using Alodie 1200S and P1019 high-solid epoxy primer. The Medley, Florida company says it averages \$535 for a 4-gal. kit, depending on color, and that 3Chem can custom match or develop "endless solid colors or offer up to 400 metallic options." The topcoat was tested to AMS 3095 and offers a curing time of 4. hr., or just 1. hr. with the use of PS40 additive.

Nuvite Chemical Compounds has been manufacturing cleaning and appearance maintenance products for almost 70 years and recently introduced its next-generation drywash product — NPC/3 — which leaves a protective coating to impede oxidation and weather wear. The Central Islip, New York company says NPC/3 conforms to airframe manufacturers' standards and does not interfere with other maintenance functions during application.

Sun King diamond coating was created in 2017 from a partnership of Jean Boule Luxury of Luxembourg and AksoNobel of Amsterdam. The two companies worked together to combine the diamond crystals from Sun King with the Alumigrip basecoat from AksoNobel. The product is designed for application using standard industry coating techniques without any special equipment, and provides the same service life as standard Alumigrip. According to Jean Boule Luxury, the diamond coating can be applied as a clear coat on top of any color. **BCA**

A Growth Industry

To accommodate the expanding fleet of business aircraft, aviation paint shops are expanding as well.

Duncan Aviation's new Provo, operation gives the company the additional capacity to paint up to 225 aircraft per year, including large-cabin models such as the Bombardier Global Express, Dassault Falcon 7X and Gulfstream G650. Indeed, barely two weeks after the official opening last April, the shop rolled out a Global 5000 in eye-catching black-to-gray fade livery. It was a kind of graduation presentation since most of the Provo paint team had been training together for months at the company's main facility in Lincoln, Nebraska.

"Although this project was the first aircraft painted here . . . it didn't feel like it," said Tom Indseth, director of maintenance for the Global 5000 owner. "Everyone working on the project had such confidence, and it really made me comfortable knowing that many of them had come from paint teams at other Duncan Aviation facilities."

"I had sufficient confidence in the team to take on a special request for our first paint job," said Duncan's Bohac. The paint scheme was the creation of Duncan designer Teri Nekuda, who had a long relationship with the Global owner's team, which sat down with her and Duncan 3-D designer Dan Ryba "to develop the perfect scheme."

Indseth looked over numerous designs before deciding to try a fade ranging from metallic black to charcoal after seeing Ryba's 3-D rendering. "The project was a complete team effort," said Nekuda. "All that mattered in the end was that the customer was happy."

Gama Aviation, a West Palm Beach, Florida, business aviation services company, announced early last year the \$10 million trade-and-asset purchase of a 40,000-sq.-ft. paint and interior completion business formerly operated by Lotus Aviation Group at Fort Lauderdale Executive Airport. According to Dennis Richey, president of Gama's U.S. ground division, the purchase, which is part of a \$10 million acquisition plan, provides "paint and completion services that include more than 30 different jet aircraft types."

The paint shop services range from chemical stripping to the final paint application, but prior to painting, its technicians perform corrosion removal and body work or composite repair. When applicable, flight controls are removed,

painted, balanced and then re-installed by qualified A&P mechanics. Radome boots are replaced as part of all paint jobs. The facility is EPA approved and the environmentally controlled paint hangars use a cross-draft system for the rapid removal of paint contaminants and coatings resulting from over-spray.

In December 2018, charter operator LGM Enterprises of Kinston, North Carolina, announced the launch of Jetstream Aviation, a new exterior paint and coating facility at North Carolina Global TransPark, adjacent to Kinston Regional Jetport, which features an 11,500-ft.-long runway.

The 32,000-sq.-ft. Jetstream project includes two hangars and offices. LGM expects it to create 145 jobs over the next several years. Funding comes from a variety of sources, including approximately \$5 million in bank financing and private investment, \$2 million from the North Carolina Department of Transportation Division of Aviation and \$1

The largest aircraft the facility can currently accommodate is the Cessna Citation XLS+ and King Air 350, but Yingling plans to expand further. "We're already getting many requests to do larger aircraft," said Pickett, "and we're in discussions to build another ground-up paint/completions center capable of accommodating aircraft as large as the Bombardier Global 7500 and Gulfstream G650ER."

"And we're also capable of taking a green aircraft from production and do the entire exterior paint," added Walt Krolikowski, paint shop lead.

"We have comprehensive design services, and we will perfectly replicate the livery of a legacy business jet on an owner's new jet," said Chris Short, director of maintenance and administrative manager of paint. "In fact, we're doing one right now."

"There are no beginners at Yingling," said Pickett, noting that Krolikowski has 30 years of experience. And those



This Gulfstream V paint scheme was described by Duncan Aviation as the most complex and most expensive it has ever performed.

million from the TransPark Foundation.

Also in December 2018, Yingling Aviation announced a significant expansion of its Dwight D. Eisenhower National Airport facilities in Wichita with the addition of 50,000 sq. ft. of newly leased space for a paint shop and expanded interiors department.

The company has since spent more than \$600,000 to update the existing 10,000-sq.-ft. paint hangar. The adjacent two 20,000-sq.-ft. hangars and accompanying offices, once leased by Hawker Beechcraft and now taken over by Yingling, will receive over \$2 million in improvements.

"We had customers lined up and waiting for us to get up and running; people who were satisfied customers from our maintenance and interior refurbishment business," said Jerry Pickett, vice president of business development.

who are new will learn quickly as the business jet exterior paint industry continues to grow.

According to the General Aviation Manufacturers Association (GAMA), new aircraft shipments increased 4.7% to 2,443 units in 2018, and worldwide market research leader Jetcraft of Raleigh, North Carolina, forecasts 11,765 pre-owned transactions representing \$61 billion are expected over the next five years. Jetcraft said the pre-owned market, which represents a major segment of aircraft exterior paint activity, "is projected to grow at a proportionally faster rate than new [aircraft] with transactions expected to outpace those of new deliveries four to one by 2023."

As a consequence, the demand for business jet exterior painting projects is likely to react with corresponding growth. **BCA**



Cabin Crew Proficiency

As critical to **mission safety** as a well-trained **flight deck crew**

BY **FRED GEORGE** fred.george@informa.com

Just before 14:00 local time on Saturday, Oct. 29, 1988, the captain of a chartered Challenger 600 taxied back on Runway 15 at Colorado’s Aspen-Pitkin County/Sardy Field in preparation for the standard departure from the southeast end of Runway 33. He executed a 180-deg. turn and commenced the takeoff roll. But the nosewheel steering (NWS) didn’t work correctly, the captain told *BCA* later. As the engines spooled up to full takeoff power, the aircraft started to veer right. He corrected with an opposite NWS input and the aircraft veered left. Then it veered right as the aircraft accelerated down the runway.

Unable to maintain directional control, the pilot initiated a rejected takeoff before the aircraft reached 80 kt., applying maximum brakes and attempting to use reverse thrust. As the aircraft careened off the north side of the runway, the pilot shut down both engines. He couldn’t stop it before it smashed into three parked airplanes, according to the National Transportation Safety Board accident report. The impact punctured one of the Challenger’s wing tanks and fuel started gushing out of the aircraft.

The professional flight attendant shook off the shock of the crash and immediately assessed the situation. She unbuckled from her seat, rushed back into the cabin and opened the right hand emergency exit in preparation for evacuating the cabin. On board the airplane were Sally Field, her husband Alan Greisman, Sam Greisman, their 11-month old son, and Margaret O’Mahoney, her mother, according to contemporaneous news reports. The flight attendant evacuated the four passengers through the emergency exit, guided them down off the trailing edge of the wing and escorted them well clear of the leaking jet. She had all the passengers clear of the airplane in 90 sec., according to the aircraft operator.

While the crash indeed soaked the actress and her family in Jet-A, they suffered little more than a large dry-cleaning bill to

restore their clothing. The aircraft operator hailed the flight attendant as the hero of the day, as she kept her cool during the emergency and executed a well-rehearsed passenger emergency evacuation that resulted in no injuries to the passengers. The flight crew, though, suffered minor injuries as a result of the impact.

Cabin Crew — Virtually Not Required

Unless you’re operating a jetliner configured as a business aircraft, one with 20 or more seats or a maximum payload of 6,000 lb. or more, FAR Part 125 does not require a flight attendant as crew. And for non-commercial operations and missions not associated with fractional ownership operations, FAR Part 91.533 only requires flight attendants if 20 or more passengers are aboard the aircraft.

The largest, purpose-built business aircraft typically are configured for no more than 13 to 16 passengers. Thus, there’s no regulatory need for cabin crew. Yet, without a professional flight attendant aboard, and in the absence of formal emergency procedures training, most business jet travelers are ill-prepared for contingencies, says Christine Musson, a 33-year professional airline and business aircraft flight attendant. The vast majority of passengers have never practiced opening a passenger door or emergency exit on the aircraft in which they usually ride, never been through a ditching drill and crawled into a life raft, never participated in a fire drill in which they had to extinguish flames. Furthermore, they don’t know how to identify ice contamination on wings, and have not received emergency medical training, including CPR and use of an automatic electric defibrillator (AED).

“When I started in Canada [for an air carrier], we underwent four weeks of intensive training, focusing on safety and service aspects. We trained to serve as many as 250 people on the

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airplane. At the end of the program, we had to pass Ministry of Transport [MOT] exams and prove that we could evacuate the entire airplane in two minutes,” Musson says. “Occasionally, we would have MOT plainclothes passengers who would monitor our performance.”

Only a few years into her airline flight attendant career, she made the transition to business aircraft operations. While she’s now much more focused on the needs and desires of a few discerning passengers, she’s just as concerned about her safety and security duties as she was while working for an airline.

Organized, formal cabin crew training is a lot less common among business aviation flight attendants, but it’s just as essential, says Chris Tack, a business aircraft flight attendant for nearly three decades. “There are still [virtually] no formal certification programs,” says Tack. His former career was in the haute cuisine industry. But attending Dr. H. Beau Altman’s FACTS training in the mid 1990s was an eye opener.

“I didn’t realize how much we had missed because we had no safety training,” Tack says. After five days of intensive hands-on instruction, including emergency egress, first aid, attending to minor medical conditions and an introduction to high altitude flight physiology, he felt much better prepared.

Subsequent training courses, provided by other firms, included a ride in an altitude chamber with a rapid decompression exercise, reduced oxygen breathing device training to help recognize the incipient effects of a slow loss of cabin pressure and MedAire training for use of first-aid kits, Tempus medical telemetry devices and coordination with MedAire’s EMS consulting services.

Musson and Tack also have attended aircraft ditching, deep water egress and survival training, food handling safety courses and passenger service classes.

Aircraft Emergencies

Altman, a psychologist, founded FACTS (Flight Attendant and Cockpit Crew Training Seminars) in 1981 and began offering formal courses in 1986. His goal was to provide business aviation flight attendants and flight crews with essential education not available at FAR Part 142 training facilities. In 1987, Dr. Altman introduced the FACTS-I full-size, aircraft simulator, capable of subjecting occupants to jarring motions associated with forced landings or runway excursions, plus smoke, fumes and darkness in the cabin. Participants had to overcome the initial shock of the simulated crash, unbuckle seat and shoulder belts, find their ways to emergency exits and then help others exit from the aircraft.

Successive versions of the FACTS emergency procedures simulators offered more capabilities and more training value, plus they were configured as mobile units that could be moved to training venues through the U.S. and Canada. Simulator training continued to be complemented by comprehensive knowledge-based training in ground school sessions.

In 1998, the FACTS program was purchased by AirCare International and expanded the frequency of training sessions to 60 per year. During the next decade, the program grew to 100 classes per year and several satellite training facilities were opened, says Brian Hayvaz, vice president Operations of AirCare FACTS training. Training now is offered at 10 locations, including at Le Bourget Airport in Paris.

Training includes pertinent sections of Federal Aviation Regulations, how to conduct compelling passenger safety briefings, understanding the authority of the pilot in command,

aircraft familiarization for cabin crews and passengers, emergency APU shutdown, use of galley equipment and location and use of emergency equipment, including fire extinguishers, life vests, supplemental oxygen and operation of cabin doors and emergency exits. AirCare FACTS also offers evacuation practice and water survival courses.

Similar cabin crew and passenger training programs are offered by CAE and FlightSafety International.

“Emergency procedures training is like golf,” says Louisa Fisher, FlightSafety International’s program manager for Cabin Safety and chairperson of the National Business Aviation Association’s Flight Attendants Committee. “You have to practice and practice it, not just once, but regularly.” According to the International Standards for Business Aircraft Operations (IS-BAO) that parallel the flight attendant training and proficiency requirements for FAR Part 121, 125 and 135 operators, that initial cabin crew training should be followed up and reinforced with recurrent training every 12 to 24 months.

Fisher advocates training passengers to be active participants in cabin safety and emergency procedure preparedness as well. She emphasizes that once aboard an aircraft, the passengers cannot afford to just plug in, dream on and tune out. FlightSafety offers an Executive Safe Flight specialty training program that evolved from its flight and cabin crew training courses. The course includes modules on use of portable oxygen equipment, fire extinguishers and aircraft emergency exits, among other subjects.

Executive Safe Flight course’s options include ditching drills with aircraft evacuations in water, use of life vests and the boarding life rafts. She believes that informed and trained passengers will feel empowered by knowing they would be able to assist themselves, family members and other aircraft occupants in the event of an aircraft emergency.

Passenger Medical Emergencies

Cabin mechanical emergencies statistically are rarities in comparison to medical emergencies, which is “an alarming issue” according to Fisher and confirmed by Musson and Tack. Fine honed flight crew skills, active safety management systems with feedback from every flight, operational discipline and top flight aircraft maintenance have reduced cabin accident and incident probability to near zero for IS-BAO Level 3 flight departments.

But humans are much more fragile. Heart attacks, strokes and choking are among the top afflictions that passengers suffer in flight, according to MedAire, the Phoenix, Arizona-based, international medical training, consulting and personal security firm that serves business and commercial aviation, among other markets. Often, a medical emergency is completely unexpected. In other cases, a pre-existing medical condition may erupt into a full-blown physiological emergency. And a third group of travelers might have an allergic reaction to a medication, food or beverage.

As for non-emergency medical conditions, stomach problems and dehydration are among the most common disorders, says Tack. But small maladies may portend some more serious medical event. And with 10- to 12-hr. transoceanic missions becoming more commonplace, suitable divert fields with nearby Level III trauma centers can be few and far between.

Few flight attendants are registered nurses, let alone medical doctors, so top-notch flight departments train their cabin crew members to recognize common medical symptoms. MedAire provides both medical training to cabin crews and

on-the-ground liaison staff to help crews decide how to treat ill passengers and whether and when to divert to an alternate airport near an appropriate medical facility.

Musson and Tack say they've trained on how to use Philips RDT Tempus IC2 medical devices that can monitor blood pressure, the heart's electrical activity, pulse rate, blood oxygen level and body temperature, along with providing video images of the patient. The devices can telemeter data to MedAire for diagnostics, enabling medical experts on the ground to provide guidance to cabin crews and their passengers.

Tacks says he and Musson also have been trained on CPR and use of AEDs, plus the most common first aid procedures. Oftentimes, business aircraft flight attendants may have a head start in treating medical emergencies thanks to their flight departments being provided with discrete briefings on specific passengers' pre-existing medical conditions by top management.

Hazardous Materials/Lithium-Ion Batteries

Dry ice (solid carbon dioxide), therapeutic oxygen systems, flammable liquids, firearms plus ammunition and lithium-ion batteries are among the most common hazardous materials carried aboard business aircraft. Requirements for when and how such materials can be transported in aircraft is contained in 19 CFR §175, a section of federal regulations with which most professionally trained flight attendants are familiar. Dry ice, for instance, is commonly used to keep catered food cold on long missions, but carrying it is restricted to its use as a refrigerant for the contents of packages containing it. Quantity is limited to 5.07-lb. per package and the containers must have "dry ice" or "solid carbon dioxide" labels.

Carriage in aircraft of oxygen in tanks, or equipment used to generate oxygen for therapeutic use is also governed by CFR §175. Specific rules apply to FAR Part 121 and 135 operators, but non-certificated operators are prohibited from carrying it unless they've applied for, and received, an exemption that essentially complies with rules for commercial operators.

There also are specific storage, packing and restricted in-flight access rules for carriage of firearms and ammunition described in CFR §175. The requirements for law enforcement officers, though, are waived provided they have followed the protocols specified in 49 CFR §1544.219.

The proliferation of personal electronic device chargers and power supplies, mobile phones, portable tools, laptop computers and tablet devices, along with electronic flight bags, AEDs and medical telemetry devices that may have lithium-ion batteries poses a major potential hazard for both crews and passengers. Flight attendants need training on the use of thermal protective gloves and containment kits, such as the certified fireproof Hot-Stop "L" packs manufactured by Baker Aviation and similar units from other firms, to confine equipment with lithium-ion batteries experiencing thermal runaways and to contain toxic smokes and gasses.

AirCare also provides non-toxic, aqueous-based Class D fire extinguishers, manufactured by SpectrumFX under the brand name of Firebane. Using an effective fire extinguisher or certified containment vessel for such lithium-ion battery fires can provide critical time for the aircraft to be diverted safely to a suitable alternate.

Food & Beverage Safety

Susan Friedenber, a veteran Philadelphia, Pennsylvania-based business aviation flight attendant trainer and author

with more than three decades of experience, stresses that food handling disciplines, starting at the flight kitchen and finishing at the tray table, are critical to protecting the health of all on board the aircraft.

When preparing foods initially, it's essential to clean raw food thoroughly, separate various items, cook as required and then chill to below 40F/4C. Such procedures are carefully followed by professional flight caterers, such as Air Culinare, Rudy's and Paula Kraft's Tastefully Yours, but often it's tough to keep all food items properly chilled from flight kitchen to aircraft galley, where they're immediately served or heated to 140F/60C to 165F/74C for cooking.

Musson often spends hours on the ground shopping, cleaning, prepping, cooking and proportioning meals for her passengers to attain the highest quality menu items and to save the expense of procuring gourmet foods from top flight business aircraft caterers. Tack says he originally was hired as a business aviation flight attendant because of his executive chef skills and then he had to learn all the other essentials. Both say they're especially careful to abide by food safety disciplines to assure no one gets food poisoning aboard their aircraft.

Cabin service and food safety are the focus of the DaVinci Inflight Training Institute which Kraft opened in Fort Lauderdale, Florida in 2017.

Lead Passenger

If a business aircraft operator cannot afford to hire professional flight attendants, then Fisher and Hayvaz, among others, emphasize the importance of training lead passengers, who frequently travel on business aircraft, to perform the same tasks.

That can be a hard sell in some C suites, says Hayvaz. But a short demo "ride" in one of AirCare FACTS crash simulators can convince the most resistant key passenger of the value of undergoing rigorous training.

Hayvaz remembers one CEO who told him that he just didn't have time go through training but agreed to invest ten minutes out of his busy schedule. Hayvaz belted the executive and a couple of his assistants into seats in the simulator cabin, then activated its jarring motion base, filled the sim with smoke and turned off the cabin lights. When the simulator came to rest, the assistants quickly unfastened their belts, found their way to the emergency exit and crawled out to safety in clear air.

But the CEO remained trapped in the simulator, unable to unbuckle his seat belt, shouting for help and demanding an end to the drill. When the smoke cleared, Hayvaz's instructors entered the sim and found the CEO's seat belt still fastened.

"The CEO attempted to release the buckle by pulling it from right to left. But it actually released by pulling it from left to right. In his panic, he forgot how to unbuckle the belt," Hayvaz says.

The CEO subsequently attended the full FACTS course and required all his top staff members to do the same.

So, while flight attendants are not required for most business aviation flights, it's important to have passengers trained in the same skills and knowledge areas. Popping open a 55-lb. emergency window exit on a Gulfstream is just the beginning of a safe emergency egress. There may be nearly a 4-ft. drop from the bottom edge of the emergency exit to the wing, requiring a passenger to slide out of the cabin feet first in order to land on his or her feet atop the wing. Then, there's the challenge of sliding off the trailing edge of the wing 3 ft. to 6 ft. and alighting on the ground without twisting an ankle. Or sliding off the wing, swimming to a life raft and climbing inside.

Without a flight attendant to assist passengers and proper lead passenger training, lives may hang in the balance. **BCA**



About Accident Investigations

The Safety Board investigates, but doesn't require or enforce

THE NATIONAL TRANSPORTATION SAFETY BOARD (NTSB) IS unique within the massive U.S. federal government organizational chart. One might expect to find it next to the FAA among the “subsidiaries” of the Department of Transportation (DOT). It is not.

The board was originally established in 1967, but in 1974, Congress reestablished the NTSB as a completely separate entity, noting that, “No federal agency can properly perform such (investigatory) functions unless it is totally separate and independent from any other . . . agency of the United States.” And because the DOT has broad operational and regulatory responsibilities that affect the safety, adequacy and efficiency of the transportation system, any accident within that system may suggest regulatory deficiencies. So, Congress determined that the NTSB’s independence was necessary for proper oversight.

However, it also ensured that the Safety Board has no authority to regulate, fund, or be directly involved in the operation of any mode of transportation. Thus unencumbered, it is expected to conduct investigations and make recommendations from an objective viewpoint.

The NTSB investigates accidents in the aviation, highway, marine, railroad and pipeline modes, as well as accidents related to the transportation of hazardous materials. Although the Safety Board cannot regulate, it publishes a Most Wanted List of Transportation Safety Improvements, which highlights safety-critical actions that it believes DOT agencies, the U.S. Coast Guard and others need to take to help prevent accidents.

In 1996, Congress assigned the NTSB the additional responsibility of coordinating federal assistance to families of aviation accident victims. Originally designed to provide assistance following aviation calamities, the program has expanded to provide assistance in all modes of transportation on a case-by-case basis.

In addition, the Safety Board acts as the initial judicial branch for pilots and sailors facing certificate action. Its Administrative Law Judges conduct formal hearings and issue initial decisions on appeals by airmen filed with the Safety Board. Further, the Board serves as the “court of appeals” for any airman, mechanic or mariner whenever such action is taken by the FAA or the Coast Guard, or when the FAA assesses civil penalties. Safety Board decisions are precedent for future decisions of its law judges, and therefore it creates case law that interprets the regulations of the FAA.

By statute, the NTSB investigation of an aviation accident or incident takes priority over other agencies’ investigations. The FAA has acknowledged the intent of Congress to prevent duplication between the respective investigations and to require that the NTSB take the lead role. Accordingly, the FAA participates as a party in NTSB aviation investigations, enabling the latter to obtain safety-critical information in a timely manner from the NTSB’s comprehensive fact-gathering activities. This

FAA role in NTSB investigations can lead to prompt issuance of emergency airworthiness directives.

The NTSB regularly designates other organizations or corporations as parties to an investigation. Other than the FAA, which by law is automatically a designated party, the Safety Board has complete discretion over which organizations it designates. However, only those that can provide expertise are granted party status. Notably, lawyers are typically excluded from investigations. All party members report to the NTSB.

In addition, the Safety Board may delegate the actual investigation of an accident to the FAA and frequently does so. This complicates matters for pilots and operators, because the FAA is performing a dual function: serving as accident investigator for the NTSB and separately, determining whether enforcement action is warranted.

In cases of suspected criminal activity, other agencies may participate in an investigation as well. The Safety Board does not investigate criminal activity; in the past, once it has been established that a transportation tragedy does, in fact, involve a criminal act, the FBI becomes the lead federal investigative body, with the NTSB providing any requested support.

The Sept. 11, 2001, hijacking and intentional crashes of four airliners into the World Trade Center, the Pentagon and a field in Pennsylvania were obviously the result of criminal actions and the U.S. Department of Justice, the FBI’s agency, assumed control of the investigations, with the NTSB providing technical support as requested. According to recent legislation, the NTSB will surrender lead status on a transportation accident investigation only if the federal attorney general, in consultation with the chairman of the Safety Board, determines that circumstances reasonably indicate the accident may have been caused by an intentional criminal act.

Incident/Accident reporting: *49 C.F.R. Part 830* prescribes regulations for “Notification and Reporting of Aircraft Accidents or Incidents and Overdue Aircraft, and Preservation of Aircraft Wreckage, Mail Cargo, and Records.” Definitions matter, because you don’t want an aircraft accident to follow you for the rest of your career: *Aircraft accident* means “an occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage. For purposes of this part, the definition of ‘aircraft accident’ includes ‘unmanned aircraft accident,’ as defined herein.”

In summary, anyone operating an aircraft and encounters trouble in the doing is subject to a variety of notification requirements, and these do not necessarily involve a crash. If you have had a Mayday, or bend anything, it would be your best interest to review those provisions. **BCA**

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Cessna Citation CJ2+

Peppier performance than the original, still **reliable, versatile and economical**

THE CITATION CJ2+, BUILT FROM 2006 TO 2014 AND SPANNING s.n. 300 through 524, is becoming more of a bargain. Selling prices now range from \$2.8 million to \$3.9 million, says Gavin Woodman, co-founder of Aerocor, a jet brokerage firm based in Los Angeles. This is an aircraft that will climb directly to FL 450 in 28 min. and cruise at 375 to 406 KTAS while sipping less than 700 pph.

As with the original CJ2, produced from 2000 to 2006, the CJ2+ fills the niche created in the Citation product line when the Citation I went out of production in the early 1980s. First generation CitationJets, CJs and MIs have shorter cabins, less range and leaner tanks-full payloads than Citation I aircraft, so they're not direct replacements.

As with the CJ2, CJ2+ has a stretched fuselage and longer span wings that the first-generation CJs. Highly flat-rated Williams International 2,490-lb. thrust FJ44-3-24 turbofans replace the CJ2's 2,400-lb. thrust FJ44-2C engines, greatly improving hot-and-high airport and climb performance. CJ2+ also cruises 5 to 8 kt. faster and it offers slightly improved fuel efficiency. FADECs reduced pilot workload and provide engine protection.

FJ44-3-24 engines add 30 lb. to aircraft empty weight because of their larger fans. Typically equipped, single-piloted CJ2+ have 7,925-lb. BOWs compared to 7,840 lb. for CJ2. But, CJ2+'s operating weights are boosted, so it can carry a 770-lb. payload with full fuel — 40 lb. more than CJ2. It'll fly 1,600 nm with the 770-lb. payload or 1,353 nm with six passengers, assuming NBAA 100-nm reserves. Standard day takeoff field length is 3,360 ft. Depart Toluca (MMTO) at MTOW on a 20C day and you'll need 8,425 ft. of pavement.

Up front, the flight deck is substantially upgraded from that of CJ2. It's a full Collins Pro Line 21 suite, including left and right side PFDs, a central MFD, full-function, multi-sensor FMS-3000 and a panel-mount Garmin GPS-500, dual Collins Pro Line 21 CNS radio systems controlled by RTU-4200 radio tuning units, TCAS I, TAWS, dual Collins TDR-94 Mode S transponder, GPS-4000A receiver and solid-state Collins weather radar. An Integrated Flight Information System unit provides enhanced map overlays on the MFD and it supports an optional Jeppesen electronic chart function. XM satellite radio weather also may be displayed on the MFD.

But, the flight deck retains some legacy Citation throwbacks, including a stand-alone annunciator light panel and console-mounted flight guidance system controls.

Starting at s.n. 439 in late 2008, the flight deck is upgraded with enhanced displays, an SBAS GPS-4000S receiver and FMS-3000 LPV approach capability. These aircraft can be upgraded for ADS-B for \$30,000 to \$40,000. Earlier aircraft also can be outfitted for ADS-B for about the same price, but they won't have the LPV approach capability. Woodman says upgrading older aircraft for both LPV and ADS-B costs about \$120,000 for a single

FMS-3000 and \$170,000 to \$200,000 for dual FMS-3000.

Equipping aircraft with the optional DBU-5000 enables operators to upload new databases in 15 minutes or less using a thumb drive. Otherwise, updating the databases requires a laptop and data cable, making the task a 50+ minute chore.

The cabin has essentially the same forward, four-chair club section, with two forward facing chairs in the aft cabin, as CJ2. There's a forward, right side refreshment center with heated beverage container, two-section ice drawer and several storage compartments. The lavatory features a left side, occasional use, belted potty seat and flush toilet. The emergency exit is on the right side of the lavatory. The aft lav is full width, but it's enclosed with a privacy curtain rather than a hard door.

Baggage capacity is a strong suit. There's an easily accessible 50-cu.-ft. aft external baggage compartment, another 20.4-cu.-ft. compartment in the nose and 4.0 cu. ft. of luggage storage in the lavatory area.



TEXTRON AVIATION

Operators say the aircraft has rock-solid reliability and it's well supported. There are nine Textron Aviation factory service centers in the U.S., six in Europe, one in Asia and dozens more authorized maintenance facilities.

The aircraft is easy to fly, especially as the FADECs make possible set-and-forget engine management. The cabin is quiet and comfortable for passengers, reasonably fast for light jets of that era. Trailing link main landing gear make average pilots look like pros on landing touchdown.

Fuel burns average 250 to 275 gph depending upon stage length. Woodman says Textron Aviation's current ProParts rate is \$288 per hour, ProTech maintenance runs \$272 per hour in the US for people flying 250 to 299 hr. per year and Williams TAP Advantage Blue runs \$315.06 per hour for both engines. Minimum rates apply for low utilization operators.

Be careful on the pre-buy inspection to look for corrosion around the lavatory. Blue water spills can cause major airframe damage.

CJ2+ nicely fills the slot between the CE-525 CJ1/1+ and CE-525B CJ3, offering more speed, range and payload than the smaller CE-525, but not quite as much as CJ3.

For its price, CJ2+ provides high value in light jet transportation. It offers excellent airport performance, reasonable block times on typical missions, unbeatable reliability and strong product support from Textron Aviation. **BCA**

News of promotions, appointments and honors involving professionals within the business aviation community

► **Aerion**, Reno, Nevada, hired **Tim Fagan** as its chief of industrial design. Fagan will lead Aerion's team for the interior design of the AS2 supersonic business jet. He joins Aerion from Bombardier, where he most recently led the industrial design of the Bombardier's flagship Global 7500 interior. He also led design activity for the Global 5000, Global 6000 cabin, Bombardier Vision Flight Deck, Bombardier Dash 8 Q400 interior and the 2010 Olympic torch.

► **Airports Council International**, Washington, D.C., announced General Counsel **Tom Devine** will retire from the organization on June 30, 2020. ACI-NA has named **Pablo Nuesch** as its new general counsel effective July 1, 2020.

► **Duncan Aviation**, Lincoln, Nebraska, announced that **Dave Coleman** has earned recognition as an IADA-Certified Aircraft Sales Broker.

► **Elliott Aviation**, Moline, Illinois, has hired **David Fenton** as chief administrative and financial officer at the company's headquarters in Moline. He will oversee all corporate financial and administrative functions including accounting, finance and information technology.

► **FAI (Fédération Aéronautique Internationale)**, Lausanne, Switzerland, announced that **Markus Hagganey** has been appointed acting secretary general of the association following **Susanne Schodel's** departure as secretary general, a position she held for almost six years.

► **FlightSafety International**, La Guardia Airport, New York, announced that **Richard Hallows** has been promoted to assistant manager of the Farnborough Learning Center. **Mike King** has been named president, Flight Safety Services responsible for the aircrew training systems and contractor logistics support provided to government and military agencies worldwide. This includes the delivery of training and advanced technology devices, as well as support for computer-based workstations and simulators at 21 U.S. Military bases.

► **Flying Colours**, St. Louis, Missouri, appointed **Scott Meyer** vice president and general manager of its St. Louis facility. Meyer will report directly to the company's President and CEO, **John Gillespie**.

► **General Aviation Manufacturers Association (GAMA)**, Washington, D.C., announced the 2020 executive leadership and the establishment of a new senior level policy committee. **David Paddock** of Jet Aviation will service as chairman of GAMA in 2020. **David Van Den Langenbergh** of Luxaviation will lead the newly created European Leaders Steering committee. The committee will provide additional strategic guidance for the association's ongoing work with European institutions and stakeholders. **Marc Drobny** of StandardAero will chair the Airworthiness and Maintenance policy committee. **Michael Amalfitano** of Embraer will continue to chair the Communications committee. **Michael Thacker** of Bell and **Eric Allison** of Uber Elevate will continue to co-chair the Electric Propulsion and Innovation committee. **David Cole**



DANIEL SITNAM



KEN SAIN



MIKE KING



MARKUS HAGGENY

of Bombardier Aviation will continue to chair the Environment committee. **Tyson Weihs** of ForeFlight will continue to chair the Flight Operations Policy committee. **Eric Hinson** of SIMCOM will chair the Safety and Accident investigation committee. **Jim Ziegler** of Greenwich AeroGroup will chair the Security Issues committee. **Jeff Trang** of Airbus Helicopters will chair the Technical Policy Committee. **Mark Burins** of Gulfstream Aerospace Corporation will continue his service on GAMA's Executive Committee as immediate past chairman.

► **Guardian Jet**, Guilford, Connecticut, announced that **Casey Crafton** has joined the company's in-house maintenance team, where he will perform on-site aircraft evaluations and oversee aircraft pre-buy inspections.

► **Gulfstream Aerospace Corp.**, Savannah, Georgia, appointed **Julien Nargeot** as regional vice president of Sales for Southeast Asia, Australia and New Zealand. **Brian McCarthy** was promoted to regional sales manager in the region.

► **Helijet International Inc.**, Vancouver International Airport Richmond, BC, announced that President and CEO **Daniel Sitnam**, has been presented with the Helicopter Association of Canada (HAC) 2019 Agar-Stringer Award for his lifetime contribution to the Canadian helicopter industry. HAC President Fred Jones presented the award to Sitnam at the 2019 HAC convention in Vancouver.

► **ICAO Council**, Montréal, Québec, Canada, elected Italian aviation authority **Salvatore Sciacchitano** president for a three-year term beginning Jan. 1, 2020. Sciacchitano will succeed **Olu-muyiwa Benard Aliu** of Nigeria, who has held the position for two consecutive terms since 2014. Sciacchitano's 39-year career in aviation includes positions as general director of the Italian

Awards and Honors

► **Captain Michael Ott** of the Phoenix Air Group, Inc. was named the 2019 Recipient of the prestigious Bombardier Safety Standdown Award recognizing exceptional safety leadership during a wide-ranging 35-year career. This influential award recognizes outstanding efforts to improve aviation safety throughout the business aviation industry.

Airworthiness Authority, deputy general director of the Italian Civil Aviation Authority and executive secretary of the European Civil Aviation Conference. He also has participated in several ICAO assemblies as chief or alternate chief of the Italian delegation and recently was appointed to the Italian delegation to the ICAO Council.



MICHAEL BENTON

► **Metrojet Limited**, Hong Kong, named **Kobus Swart** director of Flight Operations. He will oversee all aspects of the company's flight operations, including the management of flight and cabin crew, flight dispatch and training.

► **Panasonic Avionics Corporation** (McDermott + Bull), Irvine, California, named **Ken Sain** as the chief executive for the company. He succeeds **Hildeo Nakano**, who has served as CEO since 2017. Nakano will serve as special advisor for the company. Sain, who most recently served as vice president of Digital Solutions and Analytics for Boeing Global Services and CEO of Jeppesen.



KOBUS SWART

► **Satcom Direct (SD)**, Melbourne, Florida announced that Manager of Aviation Tax & Financial Report Solutions, **Ryan DeMoor**, has assumed the role of NBAA Tax Committee Secretary. In this role he will continue working with existing committee members to enhance and improve the sector's understanding of Financial Federal Aviation regulations as well as IRS and SEC rules in relation to business aviation.

► **Summit Aviation**, Middletown, Delaware, announced the promotion of **Ben Morgan** to the position of assistant program manager and business development representative for PM Cargo and Fleet Support.



NEIL WATKINS

► **Trenchard Aviation Group**, Crawley, United Kingdom, appointed **Neil Watkins** group sales and marketing director of. He will continue in his current role overseeing Reheat International, part of the Trenchard Aviation Group.

► **VyClimb Consulting LLC**, Highlands Ranch, Colorado, announced that Founder and Managing Director **Michael Benton** received the Jim Carlson Aviation Safety Award from the Association of Air Medical Services (AAMS) Air Medical Transport Conference in Atlanta, Georgia. The award is presented annually to an individual who has made significant contributions promoting aviation safety within the air medical transport community.



RYAN DEMOOR

► **Western Aircraft**, Boise, Idaho, has promoted **Steve Myers** to Jet Service manager responsible for operations with a focus on allocating manpower and driving production to meet customer needs. He has been with the company for 13 years. **Steve Rozbora** was promoted to Western Aircraft's Turboprop Production manager. Before joining Western, he was director of maintenance at Honeywell International. **BCA**



SCOTT MEYER

Aircraft's Turboprop Production manager. Before joining Western, he was director of maintenance at Honeywell International. **BCA**

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Products & Services **Previews**

By Jessica A. Salerno jessica.salerno@informa.com

1. New Aircraft Cabin Comparison Tool

Guardian Jet, an aircraft consulting, brokerage and appraisals company, has launched a new Aircraft Cabin Comparison Tool to its website and Vault client portal. The new tool provides illustrated floor plans that enable viewers to compare more than 80 aircraft models side-by-side. It will allow potential buyers to compare two airplane makes and models, view the size differences, review sample floor plans and compare the layouts and see cabin sizes to gauge and compare an average passengers' height relative to the cabin space among other features.

Guardian Jet

(203) 453-0800

www.guardianjet.com

2. BAA Training Expands Ab Initio Academy in Europe

BAA Training, an independent aviation training center, has expanded its Ab initio flight school in Europe — adding one more flight base in Spain. The company, currently operating in Lithuania and Spain, has been providing Ab initio training since 2009 and has collaborated with major airlines for cadet training programs since 2016. Last year, BBA Training

opened its first flight base at Lleida-Alguaire International Airport in Spain in order to train year-round. It plans to add a second flight base in Spain at Castellon Airport. More than 300 students are currently attending the academy.

BAA Training

www.baatraining.com



3. Falcon Aviation Earns Embraer Approval

Falcon Aviation's facility located at Al Maktoum International Airport in Dubai has been approved as an Embraer Authorized Service Center to support Legacy 600, Legacy 650 and Lineage aircraft in the region. Falcon Aviation provides business aviation services, charter, MRO and aircraft management.

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