February 2017

Aviation International News®

AIN PUBLICATIONS

Vol. 49 No. 2 $9.00

www.ainonline.com

Certification of the Pilatus PC-24 is planned for later this year.

PLANESENSE TAPPED AS PC-24 LAUNCH CUSTOMER

Pilatus has revealed that PlaneSense is the launch customer for the PC-24 twinjet. The Portsmouth, N.H.-based fractional provider, which currently operates 35 PC-12 turboprop singles, will take delivery of the first customer PC-24 in the fourth quarter, following certification. PlaneSense has six of the light jets on order.

"Offering a comprehensive fractional jet program with choices of aircraft type to 'match the mission' is a natural evolution for PlaneSense," said company president and CEO George Antoniadis. "We are pleased to build upon our longstanding relationship with Pilatus by adding jets to our fleet, and we highly anticipate the honor of acquiring the first PC-24 in the world."

To help the transition from all PC-12s to a mixed fleet of turboprop singles and jets, PlaneSense started to add remanufactured Nextant 400XTis to the fleet in July 2015. It has three 400XTis, which it offers to PC-12 share customers on an ad-hoc basis. —*C.T.*

FAA's 'BasicMed' offers 3rd class medical alternative

by Kerry Lynch

Marking a key victory for general aviation advocates in the U.S., the FAA issued a final rule on January 10 that allows certain general aviation pilots to fly without a current third-class medical certificate, effective May 1. The rule codifies a mandate that Congress passed in July as part of the FAA Extension, Safety and Security Act of 2016, but crowns a long industry campaign both at the FAA and on Capitol Hill.

The rule, which the FAA has dubbed "BasicMed," applies to pilots who have a valid driver's license and have held a valid third-class medical certificate within the past 10 years. Accounting for the validity period of a third-class medical, this would apply to pilots 40 or older who have had their examination since July 15, 2004, and to pilots younger than 40 who have had their examination since July 15, 2003.

Continues on page 36 ▶

Gama and BBA charter fleets merged in U.S. under new name

by Curt Epstein

After five months of negotiations, Gama Aviation merged its U.S. aircraft management and charter operation with that of BBA Aviation starting at the beginning of the year.

Signature Flight Support parent BBA acquired its aircraft management arm in last year's purchase of Landmark Aviation, which had been aggressively building the charter/management division, reaching 120 aircraft at the time it was acquired.

The combined business brings 200 aircraft under its banner, making it one of the largest such service providers in the world, Gama claims. According to the companies, BBA's Landmark Aviation fleet is predominantly West Coast-based, while Gama's U.S. fleet resides primarily on the East Coast.

"This agreement marks another milestone for BBA Aviation, creating a leading charter and fleet management company, whose scale will benefit both of us and our customers,"

Continues on page 38 ▶

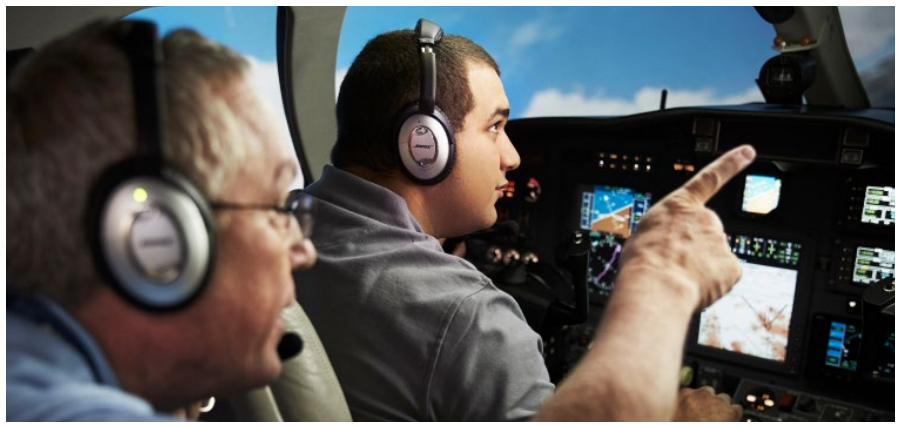
Getting the Stomach for Upsets

We take a day of all-attitude training in a Siai-Marchetti S211 and Douglas TA-4J Skyhawk over the desert. **page 30**

Inside this issue

FLIGHT SIMULATORS

New technology in flight simulation is advancing the quality of training not just for professional pilots but also for those who aspire to join their ranks. **Page 20**



DEPARTMENTS

Aviation International News

James Holahan (1921-2015), Founding Editor
Wilson S. Leach, Managing Director

EDITOR-IN-CHIEF – Charles Alcock
EDITOR - AIN MONTHLY EDITION – Nigel Moll
EDITOR - U.S. SHOW EDITIONS – Matt Thurber
EDITOR - INTERNATIONAL SHOW EDITIONS – Ian Sheppard
NEWS EDITOR - AIN MONTHLY, AINonline – Chad Trautvetter
MANAGING EDITOR - AIN MONTHLY – Annmarie Yannaco
MANAGING EDITOR – Mark Phelps
SENIOR EDITORS – Bill Carey, Curt Epstein, Kerry Lynch
Gregory Polek – Air Transport
CONTRIBUTORS
Gordon Gilbert
John Goglia – Columnist
Mark Huber – Rotorcraft
Amy Laboda – Safety
James Wynbrandt
GROUP PRODUCTION MANAGER – Tom Hurley
PRODUCTION EDITOR – Martha Jercinovich
GRAPHIC DESIGNERS – Mona L. Brown, John A. Manfredo, Grzegorz Rzekos
LEAD WEB DEVELOPER – Michael Giaimo
WEB DEVELOPER – Evan Williams
VIDEO PRODUCER – Ian Whelan
EDITORIAL ASSISTANT – Samantha Cartaino

GROUP PUBLISHER – David M. Leach
PUBLISHER – Anthony T. Romano
ASSOCIATE PUBLISHER – Nancy O'Brien
ADVERTISING SALES - NORTH AMERICA
Melissa Murphy – Midwest +1 (830) 608-9888
Nancy O'Brien – West +1 (530) 241-3534
Anthony T. Romano – East/International
Joe Rosone – East/International/Middle East +1 (301) 834-5251
Victoria Tod – Great Lakes/UK
ADVERTISING SALES - INTERNATIONAL – Daniel Solnica - Paris
MARKETING MANAGER – Zach O'Brien
AUDIENCE DEVELOPMENT MANAGER – Jeff Hartford
MANAGER OF ONSITE LOGISTICS – Philip Scarano III
GROUP BRAND MANAGER – Jennifer Leach English
SALES ASSISTANT – Nadine Timpanaro
ADVERTISING/SALES SECRETARIAL STAFF – Cindy Nesline

DIRECTOR OF FINANCE & HUMAN RESOURCES – Michele Hubert
ACCOUNTING MANAGER – Marylou Moravec
ACCOUNTING/ADMINISTRATION STAFF – Mary Avella
Bobbie Bing

U.S. EDITORIAL OFFICE:
214 Franklin Ave., Midland Park, NJ 07432
Tel: +1 (201) 444-5075
WASHINGTON, D.C. EDITORIAL TEAM:
Bill Carey (air transport and defense)
bcarey@ainonline.com
Tel: +1 (202) 560-5672;
Mobile: +1 (202) 531-7566
Kerry Lynch (business aviation)
klynch@ainonline.com
Tel: +1 (201) 345-0082, +1 (703) 969-9195
BPA WORLDWIDE
EUROPEAN EDITORIAL OFFICE:
Ian Sheppard; isheppard@ainonline.com
Hangar 9, Redhill Aerodrome, Surrey RH1 5JY, UK
Tel: +44 1737 200948 Mobile: +44 7759 455770
U.S. ADVERTISING OFFICE:
81 Kenosia Ave., Danbury, CT 06810
Tel: +1 (203) 798-2400 Fax: +1 (203) 798-2104
EUROPEAN ADVERTISING OFFICES:
Daniel Solnica; dsolnica@solnica.net
78 rue de Richelieu, 75002 Paris, France
Tel: +33-1-42-46-95-71
Italian Representative:
Diana Scogna; dscogna@dsmedia.com.fr
Tel: +33-6-62-52-25-47
RUSSIAN ADVERTISING OFFICE:
Yuri Laskin, Gen. Dir., Laguk Co. Ltd.; ylarm-lml@mtu-net.ru
Russia, 115172, Moscow, Krasnokholmskaya Nab., 11/15 - 132
Tel: +7-05-912-1346, 911-2762 Fax: +7-095-912-1260

THE CONVENTION NEWS COMPANY, INC. – AIN PUBLICATIONS

Aviation International News (ISSN 0887-9877) is published monthly. Periodicals postage paid at Midland Park, N.J., and additional mailing offices. **Postmaster:** Send address changes to Aviation International News, P.O. Box 47628, Plymouth, MN 55447 USA. Allow at least eight weeks for processing. Include old address as well as new, and an address label from a recent issue if possible. Subscription inquiries: +1 (203) 798-2400 or email: subscriptions@ainonline.com.

PUBLICATION MAIL AGREEMENT NO. 40649046 RETURN UNDELIVERABLE CANADIAN ADDRESSES TO: PITNEY BOWES INTERNATIONAL MAIL, STATION A, P.O. BOX 54, WINDSOR, ON, N9A 6J5, returns il@imex.pb.com.

AINonline

IMPOSSIBLE IS JUST A DARE.

At Embraer, we find inspiration in the greatest of challenges. The creation of entirely new aircraft, and categories. And the inclusion of technology previously unavailable in aircraft this size. The better way. The efficient way. The unconventional way. You see, we've never been ones to settle for the status quo. And we're looking for those who share a similar mindset and are willing to act upon it. Because we believe for those who do — doing the impossible is just the beginning.

Rethink Convention.

EMBRAER
Executive Jets

EmbraerExecutiveJets.com/dare

As we go to press

FEDS OUTLINE TFR FOR MAR-A-LAGO

The FAA, along with senior government security officials, has outlined plans for a 30-nm temporary flight restriction (TFR) over the Palm Beach area when President Trump visits his Florida residence, Mar-a-Lago. The compound is just 2.1 nm from Palm Beach International (PBI). When active, the TFR will have a 30-nm outer ring with a 10-nm no-fly-zone inner ring that both extend from the surface up to 17,999 feet. PBI is near the center of that no-fly zone, but the government agencies set up a gateway airport and screening process to enable business aircraft access.

DELIVERIES DOWN, HOPE UP AT ROBINSON

Robinson Helicopter delivered 234 aircraft last year, down from 347 in 2015. The latest mix: 63 R66 turbine singles, 114 R44 Raven IIs, 26 R44 Raven Is, 12 Cadets and 19 R22s. That compares with 117 R66s, 152 R44 Raven IIs, 44 R44 Raven Is and 34 R22s in 2015. While delivery numbers were down, the average unit price was up substantially thanks to customer-specified options, said CEO Kurt Robinson. "Lately, we have seen orders spike a little bit," he noted. "We're doing three [R44s] a week right now and I think by summer we are going to have to increase that to four."

FAA STUDIES JET BAN AT FLORIDA AIRPORT

Concluding that a ban on jets at Palm Beach County Park Airport (LNA) in Lantana, Fla. might violate grant assurance agreements, the FAA has indicated plans to study whether introducing such aircraft would affect the safety and efficiency of LNA and surrounding airspace. The study comes in response to a complaint filed with the Orlando Airports District Office by a retired Eastern Air Lines pilot, Errol Forman, who had received warnings after landing his Cessna Citation I/SP at the airport.

SPIKE PLANS FLIGHT OF PROTOTYPE THIS YEAR

Boston-based Spike Aerospace expects to fly a subsonic prototype of its 18-passenger supersonic business jet (SSBJ) this summer. According to the company, the scale prototype of the S-512 Quiet Supersonic Jet will demonstrate low-speed aerodynamic flight characteristics. It plans to follow this with a series of larger prototypes and a supersonic demonstrator by the end of next year. Spike Aerospace expects to certify a low-boom, Mach 1.6 SSBJ by 2023.

GI AVIATION LAUNCHES PC-12 OPS IN DUBAI

GI Aviation's first Pilatus PC-12NG launched official operations by landing on the sea runway at Sky Dive Dubai on January 22, less than two months after receiving its air operator certificate (AOC) from the UAE's General Civil Aviation Authority. Full operational launch is scheduled for February 26. GI Aviation will take delivery of its second PC-12NG this month.

BIZJET 'CLUB' TO START IN GERMANY

Germany will get its first private aviation membership club with the anticipated launch of the JetEight "all you can fly" service in July, "partnering with leading private aircraft operators" and charging members €2,500 ($2,679) a month. The number eight in its name reflects the expected passenger load per flight. JetEight's initial focus will be on Europe, and the club will use "small private jets from lower-traffic terminals," but also VIP terminals at major airports. It is currently looking at connecting the business centers of Berlin, Zurich and Frankfurt, "with more cities to follow."

GAMA PARTNERS WITH HONG KONG MRO

Gama Aviation's Hong Kong-based joint venture Gama Aviation Hutchinson has launched a partnership with local maintenance provider China Aircraft Services (CASL) to help expand service to business aircraft made by Bombardier, Dassault, Embraer and Gulfstream. CASL holds maintenance approvals from aviation authorities in Hong Kong, the U.S., Europe, Taiwan, South Korea, Bermuda and Mongolia.

NTSB SOUNDS ALARM ON CHEYENNE WIRING

The NTSB called on the FAA to issue an Emergency AD for unsafe wiring on Piper PA-31T Cheyennes that might lead to arcing and fires. The recommendation was triggered by preliminary findings in the investigation of the in-flight breakup of a Cheyenne on July 29 last year. Investigators found evidence of thermal damage near the airplane's main electrical bus circuit breaker panel. The area showed evidence of electrical arcing, and sections of the adjacent hydraulic lines were consumed by fire in an area where these wires and hydraulic lines may have been in contact. A borescope examination of this area in six other Cheyennes noted electrical lines in direct contact with hydraulic lines in all six cases.

AIN will be covering NBAA's Schedulers & Dispatchers show from February 7 to 10. See www.ainonline.com during the show and look for more coverage in the March edition of **AIN**.

One Aviation laid off an unspecified number of employees at its facility in Albuquerque, N.M., last month in response to forecasts for declining light-jet sales. The company manufactures the Eclipse 550 very light jet at this plant.

One Aviation announces layoffs

by Rob Finfrock

Forecasts of declining light-jet sales contributed to the decision last month by One Aviation to lay off an unspecified number of employees at the company's facility in Albuquerque, N.M., company president Ken Ross told **AIN**. "GAMA expects quarterly sales to be down for aircraft deliveries, and we're seeing that throughout our market," he continued. "We have primarily realigned our production, service and engineering capabilities to be more efficient."

Formed in April 2015 with the merger of Eclipse Aerospace and Kestrel Aircraft, One Aviation produces the Eclipse 550 very light jet and is developing the Kestrel K350 turboprop single. The company delivered only 12 new Eclipse 550s from 2015 through last year's third quarter, according to the latest GAMA statistics, in addition to twelve 550s delivered by Eclipse Aerospace in 2014.

One Aviation also handles training and maintenance for the approximately 300 Eclipses in service, and upgrading earlier Eclipse 500s for current operators and for resale as the Eclipse SE. In July, the company announced work on "Project Canada," an upgraded Eclipse variant intended to offer greater range, more powerful engines and Garmin G3000 avionics.

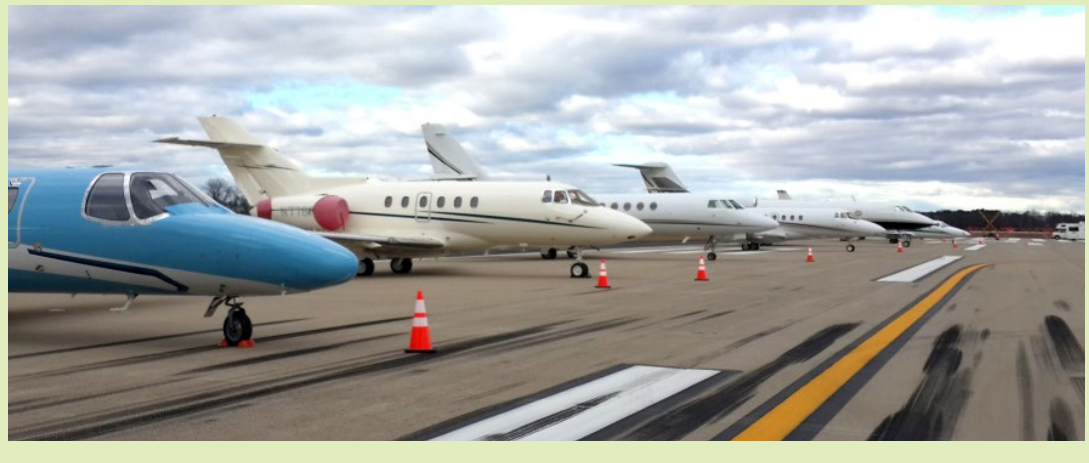
Ross emphasized that the company's focus is on completing Project Canada, and "we'll certainly look to hire folks back" as it nears production. ❑

IAD, HEF TRAFFIC JUMPS, BUT SMOOTH OPS FOR PRESIDENTIAL INAUGURATION

Business aircraft traffic picked up as anticipated during the January 20 U.S. Presidential inauguration, but with departure slots in place for Washington Dulles International Airport (IAD), operations went smoothly, officials in the region reported. Some 300 visiting business aircraft were parked at Dulles during the event and another 100 aircraft were at Manassas Regional Airport (HEF). Flight data suggests the arrivals were double those of the same period a year ago and about double those four years earlier, but, anecdotally, down from the 2009 inauguration.

At IAD, several reserve locations were set up to handle parking. "We were given all of 11,500-foot Runway 19R, which we filled with more than 100 aircraft wingtip to wingtip," said Signature Flight Support general manager Anthony Wright. Signature brought in 22 customer service representatives to handle the traffic. The other FBO on the airport, which had just changed hands from Ross Aviation to Jet Aviation, brought in 15 representatives from its facility in Teterboro, N.J., to help.

At Manassas, many aircraft arrived the day before the inauguration, with APP Jet Center reporting that 70 had landed by 5 p.m. on the 19th. The airport averages 10 operations a day. *—K.L.*



Business aircraft traffic for the inauguration was restricted to three airports. Signature Flight Support at IAD, shown, reported parking some 100 aircraft wingtip to wingtip, whiile HEF reported 70 aircraft on its ramp.

G500

MAX SPEED: MACH 0.925 · MAX RANGE: 5,000 NM · MAX ALTITUDE: 51,000 FT

OPTIMIZED INTEGRATION

Since introducing the world to business aviation in 1958, Gulfstream has been on a technology trajectory that continually advances the state of the art. The all-new Gulfstream G500™ offers the exclusive Gulfstream Symmetry Flight Deck™ with immersive touch-screen avionics, Phase-of-Flight™ integration, Intelligence-by-Wire™, and active control sidesticks, making tomorrow's technology available today.

SCOTT NEAL | +1 912 965 6023 | scott.neal@gulfstream.com | GULFSTREAM.COM/SYMMETRY

Theoretical max range is based on cruise at Mach 0.85 with eight passengers, three crew and NBAA IFR fuel reserves. Actual range will be affected by ATC routing, operating speed, weather, outfitting options and other factors. All performance is based on preliminary data and subject to change.

Gulfstream™
A GENERAL DYNAMICS COMPANY

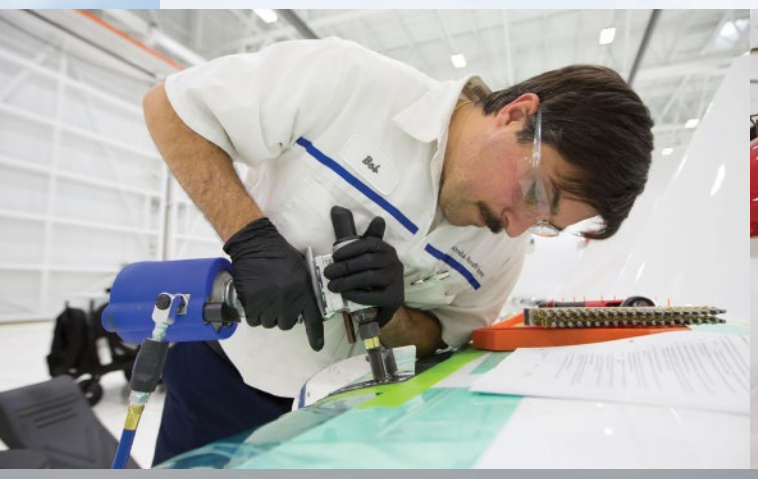
HondaJet

THE ULTIMATE IN SERVICE.

HondaJet service backed by a strong dealer network.

Honda Aircraft Company has established a worldwide dealer network with the technical expertise and experience to support the HondaJet. They offer authorized service, support, aircraft management and pilot services. With seven service locations in North America, HondaJet owners are no more than a 90-minute flight from an authorized service center.

Find your dealer at www.HondaJet.com.



HONDA

Skyservice
HondaJet Canada
Toronto, Canada
Keystone Aviation
HondaJet Northwest
Salt Lake City, Utah
Des Moines Flying Service
HondaJet Midwest
Des Moines, Iowa
Honda Aircraft Company
HondaJet East
Customer Service Facility
Greensboro, North Carolina
Cutter Aviation
HondaJet Southwest
Phoenix, Arizona
Banyan Air Service
HondaJet Southeast
Fort Lauderdale, Florida
Aerolineas Ejecutivas, S.A. de C.V.
HondaJet Mexico
Toluca, Mexico

NEWS BRIEFS Compiled by Chad Trautvetter

Jet Aviation Acquires Dulles FBO

Jet Aviation announced on January 18 that it acquired the Ross Aviation FBO at Washington Dulles International Airport, marking the company's ninth location in the Americas. The move comes just six months after Ross Aviation itself acquired the former Landmark Aviation facility at Dulles from Signature Flight Support, which per the U.S. Department of Justice had to shed six FBOs as part of Signature's absorption of Landmark. The Washington Dulles FBO complex encompasses six hangars, 10 acres of ramp space and a newly renovated terminal that includes on-site customs and immigration services, VIP lounge and on-site car rental.

Honeywell Debunks Bogus CPDLC Message Rumors

Honeywell has debunked fears about bogus CPDLC messages, sparked by an event in December involving a Gulfstream G550 flying in Shanwick Oceanic Control airspace. According to a Flight Service Bureau blog post, the G550 crew received a DESCEND AT MAXIMUM message via CPDLC, but when they checked on voice with ATC, it hadn't come from them. Honeywell said "It was not an uplinked error message [from ATC to the crew], but rather a downlinked error message [from the aircraft to ATC]… We have never [before] seen and have not received other reports of this issue. We are currently still investigating the root cause but believe this is an isolated incident that will not affect other systems…But we can confirm that message was generated by the FMS and that this was not the result of spoofing or hack." The G550 is equipped with a Honeywell FMS.

WingX: European Bizav Flying Fell Short

Business aircraft activity last year in Europe fell 0.3 percent from 2015, with 798,000 flights logged in the region, according to WingX Advance. Its figures for December mirrored that pattern; there were 52,419 business aviation departures in Europe, down 0.6 percent year-over-year. The decline stemmed from weaker business turboprop and piston activity, while business jet flights climbed. Notably, the 12-month trend for business jet flying in Europe is now positive, offset by negative trends in propeller aircraft activity. Intra-European activity was down 1 percent, with a weaker Western Europe bolstered by a stronger Southern Europe. Arrivals into Europe were "well up" from the Middle East and Africa, but down from North America and Russia.

Flight Demos Plastic Waste Jet-A Blend

A diesel-powered Van's RV-9A completed a 500-mile flight in Australia on January 12 using a blend of conventional jet-A1 with 10 percent of fuel manufactured from plastic waste by UK-based Plastic Energy. The flight culminated a four-year effort that involved promoting recycling and reusing of the waste to be blended with jet-A1. The next steps would be to encourage use of the fuel option. The project is aimed at helping slow the dumping of waste into the ocean.

RCA Avionics Completes MRO Buy

RCA Avionics has completed its acquisition of Executive Aircraft Maintenance (EAM) in Scottsdale, Ariz., from Copperstate Turbine Engine (CTec). The deal included the Executive Aircraft name and both the maintenance and avionics operations. EAM is a Class III FAA Part 145 repair station. According to RCA, the acquisition will allow EAM to expand its maintenance and avionics capabilities, which currently include King Air, Twin Commander and Citation inspections and line maintenance and sheet metal repairs/modifications, as well as Raisbeck and Blackhawk modifications.

Far-reaching changes ahead at FAA

by Kerry Lynch

This year will be pivotal for the U.S. FAA as it works with industry and the international aviation community to implement far-reaching regulatory and organizational changes. FAA administrator Michael Huerta noted that changes are afoot at the agency in a speech titled "Redefining Business as Usual" before the Aero Club of Washington last year, saying the agency has taken a step back to evaluate how it has approached its business.

"The fact is, aviation has never stood still. And the pace of change is only going to keep accelerating. That means we need to get comfortable with always being a little uncomfortable," he said, adding, "But as I've challenged our teams at the FAA to think differently, I've seen some promising results."

The FAA's recently released Part 23 rule is a key example of this paradigm shift, moving certification from prescriptive requirements outlined by the agency to a performance-based approach.

The FAA released the rule outlining the new Part 23 last year, and the new requirements will be implemented this year, starting with the release of guidance materials for agency inspectors, education of the industry and coordination with international regulators.

The European Aviation Safety Agency [EASA] has already issued a notice of proposed amendment on the certification changes and is expected to release its final decision implementing the new light aircraft standards early this year. The international community will turn to other regulators that have participated in the rewrite effort—aviation authorities from China, Canada and Australia and New Zealand—to harmonize the new performance-based approach, said Walter Desrosier, v-p of engineering and maintenance for the General Aviation Manufacturers Association.

Performance-based Approach

As the new approach takes root, it is expected to have a ripple effect in future rulemaking covering not only light aircraft but also Parts 25 and 27, which oversee transport-category aircraft and helicopters. A review has long been under way to see how regulators can take a new performance-based approach to other areas of certification

One early implementation may involve standards for business aircraft interiors, Desrosier noted. Part 25 interior requirements were written for and tailored to higher-occupancy air transport aircraft. This has led to a series of special conditions, exemptions and other certification efforts for business jet interiors that do not conform with the standard passenger interior.

The EASA published a notice of proposed amendment a little more than a year ago to accommodate new interior standards for business jets, and a final opinion is anticipated this year. Desrosier noted that the FAA participated in an EASA working group on the new standards and could begin a similar effort this year.

While the FAA work continues in the area of certification, industry leaders are hoping to see progress this year in the area of Part 135 training. The Air Carrier and Contract Training Working Group has developed recommendations that are designed to improve the quality of Part 135 training. The recommendations center on building more flexibility between the training provider and operator into the training curriculum, rather than requiring the operator to adhere strictly to a pre-set standard training program. This would ensure that the operator's specific needs are met.

The recommendations also seek a data-driven approach to ensure the right areas of training are incorporated. Bill Deere, executive v-p of government and external affairs for the National Air Transportation Association, noted that the working group will work with the FAA on implementation of the recommendations.

The FAA is expected to consider implementing some of the recommendations through policy changes to the extent possible, added Doug Carr, vice president of regulatory and international affairs for NBAA, but some changes might require formal rulemaking, he noted.

The FAA has also been working on a proposal to ensure that Part 121 air carrier training programs address mentoring, leadership and professional development. While intended for Part 121 operations—the proposal was congressionally mandated in the aftermath of the 2009 Colgan Air accident—some requirements apply to Part 135 and 91K operators that comply with certain Part 121 training requirements and use two crewmembers.

While the broader 135 and 91 community is not included, the proposal comes as business aviation has intensified its focus on

Continues on page 26 ▶

COURT ISSUES INJUNCTION BARRING EAST HAMPTON CURFEWS

A U.S. District Court, following through on the ruling of a higher court, formally issued a preliminary injunction prohibiting enforcement of curfews and other restrictions at East Hampton Airport (HTO) in New York. The injunction, issued on January 11, came after the U.S. Court of Appeals for the Second Circuit determined on November 4 that the restrictions did not comply with the federal airport noise law, the Airport Noise and Capacity Act (ANCA), and called on the district court to issue the injunction to prevent their enforcement.

In April 2015 East Hampton leaders had imposed an 11 p.m. to 7 a.m. curfew for all aircraft, an 8 p.m. to 9 a.m. curfew for "noisy" aircraft and a limit of two "uses" per week for noisy aircraft between May 1 and October 31. Most business jets and helicopters are deemed "noisy" under East Hampton's definition.

Two months later the District Court struck down the weekly restrictions but permitted the nighttime curfews. East Hampton had begun issuing a series of criminal summonses to Part 135 and 91 operators last fall as part of its enforcement of the restrictions.

"This ruling by the Second Circuit sets an important precedent for all public-use airports nationwide," said Alex Gertsen, NBAA director of airports and ground infrastructure. "Despite the town of East Hampton's stated intent to no longer accept federal Airport Improvement Program grants, the court's decision holds that ANCA—which was specifically adopted by Congress to prevent access restrictions from being imposed piecemeal by airports across the country—continues to apply to HTO."

NBAA warned that the challenges at East Hampton continue, with local officials pledging to take their case to the Supreme Court. Gertsen, however, questioned whether the Supreme Court would agree to review the case. —*K.L.*

EXCEPTIONAL

BY DESIGN

We didn't get here by sheer luck. This was deliberate.
An act of craftsmanship and engineering prowess. Decades in the making.
Meeting at the intersection of art and technology. Defying conventions.
Redefining luxury. So when all is said and done,
we'll know that we achieved something truly extraordinary.

businessaircraft.bombardier.com

BOMBARDIER

NEWS BRIEFS Compiled by Chad Trautvetter

UBS: Bizjet Outlook at Post-crisis Highs

The business jet market's outlook and customer interest are now at post-crisis highs, according to the latest UBS Business Jet Market Index report. Now sitting at 51, the index score is 12 percent higher than that in UBS's previous survey and the fourth consecutive monthly increase. In addition, this is only the fourth month that the index has surpassed 50—above which denotes strengthening market conditions—since mid-2008. Fifty-five percent of survey respondents indicated that customer interest has improved since the U.S. presidential election, up from 47 percent a month ago. Business jet industry professionals told UBS that "some prospective buyers have come off the sidelines since the election."

ACI-NA Files Brief in SMO Grant Issue

The Airports Council International-North America (ACI-NA) filed an amicus brief in support of the city of Santa Monica's efforts to contest an FAA decision affecting Airport Improvement Program grant terms at Santa Monica Airport (SMO). ACI-NA told **AIN** that it is aware of the dispute between the FAA, which is trying to preserve airports, and the city, which is trying to close its airport. "ACI-NA takes no position on that dispute," it said. What the association is trying to do is clarify the grant agreement process so that airport operators don't face arbitrary changes to the rules. The association further noted, "The FAA has departed from existing law in a manner that could set a precedent by which the agency could unilaterally rewrite the terms of a grant agreement long after it has been executed."

Bizav Flying Up in North America

December business aircraft activity inched up 1.4 percent year-over-year in North America, but was hampered by an unexpected downturn in Part 91 flying, according to TraqPak data from Argus International. The Part 135 segment was the only operational category to show a gain, climbing 9.5 percent from a year ago and solely sustaining the overall positive outcome. Fractional flying was unchanged from December 2015, while Part 91 activity took a 3.6-percent hit. Large-cabin jets led in activity by aircraft category, climbing 7.2 percent year-over-year. This was followed by rises in light- and midsize-jet activity of 2.3 percent and 0.8 percent, respectively; turboprop flying fell 1.2 percent from a year ago.

Constant To Acquire StarPort Mx Center

Maintenance, repair and overhaul provider Constant Aviation has agreed to acquire Florida-based MRO and FBO StarPort. The acquisition will provide Constant Aviation with its first paint operation. The deal is expected to close during the first quarter. The company also plans to add a paint facility at its headquarters in Cleveland, Ohio. According to Stephen Maiden, president and CEO of Constant Aviation, Constant's wider goal is to have MRO facilities across key regions in the U.S.

Broker: Used G650 Inventory Declines

The inventory of pre-owned Gulfstream G650s/650ERs has been steadily shrinking since supply peaked at 21 aircraft for sale during the first quarter of last year, according to Gulfstream broker Hagerty Jet Group. Over the past two quarters, supply has tightened to 12 aircraft for sale, representing just 5.4 percent of the fleet. Many of the G650s now for sale are older models with higher time, "and there seems to be a lack of demand in the pre-owned segment," the company said. As a result, older pre-owned G650s are sitting on the market for 314 days, up from 209 days in the third quarter. Asking prices are falling and Hagerty Jet believes those for older G650s will dip to the mid- to upper-$40 million range by May.

Business jet accidents down worldwide last year

by Gordon Gilbert

Accidents and fatalities involving business jets worldwide were down last year compared with 2015, a positive trend since 2014, a year that saw a steep increase in fatalities over previous years. According to preliminary statistics researched by **AIN**, N-numbered business jets were involved in 12 accidents last year compared with 20 in 2015. Eight people perished in two crashes last year compared with 13 who died in 2015, also in two accidents.

In that year, a midair near San Diego between a Sabreliner and a Skyhawk, both flying Part 91, killed all four people in the jet and (not included in these statistics) the sole occupant of the Skyhawk. The other fatal crash in 2015 took nine lives when a Hawker 125-700 on a Part 135 charter crashed on the approach to Akron, Ohio. The two fatal accidents in 2016 befell Part 91 personal flights and involved Cessna 525s, each flown by one pilot.

While accidents involving U.S.-registered turboprops were down slightly last year from 2015, the number of fatalities didn't improve. Preliminary figures show 31 total accidents last year versus 37 in 2015. But 28 people died in nine accidents in 2016, while the same number lost their lives in 10 accidents in 2015. Last year (compared with 2015 in parentheses), there were four fatal crashes under Part 91 (nine); four under Part 135 (one); and one on a civil government flight (none).

Part 91K Record

There were no reportable accidents involving turbine business airplanes flown under the Part 91K fractional rule last year; in 2015 there was one. However, the number of incidents involving Part 91K jets climbed to five last year, up from two in 2015. No accidents or incidents involving Part 91K turboprops were recorded for at least the last three years.

Non-U.S.-registered business jets on private and corporate charter flights also recorded fewer total accidents and fatalities last year than in 2015. Six people perished in two accidents last year compared with 11 fatalities in 2015, also in two accidents. The first of the two fatal accidents last year happened on August 16. Two pilots died in the crash of a private Citation 550 while on climb-out from an airport in Venezuela. On October 13 last year, three passengers and the pilot were killed in the crash of a private Citation 500 on approach to an airport in Canada. There were no accidents to charter business jets last year compared with two in 2015.

Preliminary data show that fatalities involving non-U.S. business turboprops also dropped last year versus 2015. In 2016 there were 27 deaths in eight accidents compared with 43 who died in 12 crashes in 2015. ❑

U.S.-registered Business Jet and Turboprop Accidents/Incidents Worldwide

(2016 vs. 2015)

Business jets	Total		Part 91		Part 91K		Part 135		Public/Gov't		Mfr.	
	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015
Nonfatal accidents	10	18	9	15	0	1	1	1	0	1	0	0
Fatal accidents	2	2	2	1	0	0	0	1	0	0	0	0
Total accidents	**12**	**20**	**11**	**16**	**0**	**1**	**1**	**2**	**0**	**1**	**0**	**0**
Fatalities	8	13	8	4	0	0	0	9	0	0	0	0
Incidents	35	49	28	44	5	2	2	2	0	0	0	1

Business turboprops	Total		Part 91		Part 91K		Part 135		Public/Gov't		Mfr.	
	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015
Nonfatal accidents	22	27	18	23	0	0	4	4	0	0	0	0
Fatal accidents	9	10	4	9	0	0	4	1	1	0	0	0
Total accidents	**31**	**37**	**22**	**32**	**0**	**0**	**8**	**5**	**1**	**0**	**0**	**0**
Fatalities	28	28	14	19	0	0	12	9	2	0	0	0
Incidents	51	32	43	28	0	0	7	4	1	0	0	0

All data preliminary. Sources: FAA, NTSB, Aviation Safety Network, ***AIN*** *research*

Involving Non-U.S.-registered Business Jets/Turboprops

Business jets	Total		Private		Charter		Other*		Unknown	
	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015
Nonfatal accidents	1	8	1	4	0	2	0	1	0	1
Fatal accidents	2	2	2	1	0	0	0	1	0	0
Total accidents	**3**	**10**	**3**	**5**	**0**	**2**	**0**	**2**	**0**	**1**
Fatalities	6	11	6	4	0	0	0	7	0	0
Incidents	20	7	13	4	2	1	5	2	0	0

Business turboprops	Total		Private		Charter		Other*		Unknown	
	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015
Nonfatal accidents	14	12	7	5	5	2	2	4	0	1
Fatal accidents	8	12	3	5	4	1	1	6	0	0
Total accidents	**22**	**24**	**10**	**10**	**9**	**3**	**3**	**10**	**0**	**1**
Fatalities	27	43	11	15	10	1	6	27	0	0
Incidents	13	9	5	6	2	2	6	0	0	1

**For example: air ambulance, aerial survey, ferry, training, testing, government (non-military) and head of state.*

AIN *tables show "incidents" as well as "accidents" to distinguish mishaps based on their degree of severity. Investigators often draw fine distinctions between the two events, but, typically, incidents result in minor or no damage and their investigations are sometimes delegated to local officials.*

Accidents are events that range from minor damage to destruction and/or injuries. Also, some incidents ultimately get upgraded to accident status during the investigative process. ■

EARN FLIGHTSAFETY

MASTER AVIATOR

THE HIGHEST STANDARD IN SAFETY

To the safest pilots, flying is more than just earning ratings or building hours. The best go beyond being merely proficient. They strive to operate their fixed-wing aircraft or helicopter at the highest level of safety. FlightSafety's Master Aviator program is that standard of achievement.

You'll build on your proven flying abilities with Master-level Advanced Training courses that expand your skills and prepare you to react correctly to a broad range of demanding, unexpected situations. You will gain a deeper knowledge of your aircraft and earn the recognition of being a pilot dedicated to enhanced safety who has achieved the highest standard.

BUILT OVER TIME
TRUST
EARNED EVERY DAY

Aviation professionals from around the world trust us to provide the highest quality training and outstanding service. More than 1,800 highly experienced professional instructors deliver aircraft- and mission-specific courses, using our comprehensive training systems and advanced-technology flight simulators designed to enhance safety. Trust your training to FlightSafety. You'll see why so many aviation professionals make the same choice. And have since 1951.

For more information, please contact Steve Gross, Senior Vice President, Commercial
314.785.7815 • sales@flightsafety.com • flightsafety.com • A Berkshire Hathaway company

FlightSafety international

NEWS BRIEFS Compiled by Chad Trautvetter

Falcon Sales, Deliveries Fall in 2016

Net orders for Dassault Falcons stood at 21 aircraft as of the end of last year, down from 25 in 2015 and 67 in 2014. Last year's tally reflects gross orders for 33 aircraft offset by cancellation of orders for 12 Falcon 5Xs—a result Dassault attributes to developmental delays on the Safran Silvercrest engine that caused initial customer deliveries of the new large-cabin business jet to slip to early 2020 from late this year. "The weakness of the order intake reflects a difficult business jet market," the French aircraft manufacturer noted. Deliveries of new Falcons fell by six aircraft year-over-year in 2016, to 49, but the tally was "in line" with Dassault's forecast for shipment of 50 aircraft. Backlog also eroded last year, dipping to 63 Falcons at year-end, compared with 91 as of Dec. 31, 2015.

G650ER Logs More Speed Records

Gulfstream's flagship G650ER recently claimed two more city-pair speed records—from Columbus, Ohio, to Shanghai and Taipei to Scottsdale, Ariz. The 6,750-nm/12,501-km flight from John Glenn Columbus International to Shanghai Pudong International Airport was completed in 14 hours 35 minutes, at an average cruise speed of Mach 0.85. Following that flight, the G650ER flew 6,143 nm/11,377 km back to the U.S. from Taiwan's Taipei Taoyuan International to Scottsdale Airport in 10 hours 57 minutes, cruising at Mach 0.90—just shy of its Mach 0.925 maximum speed—for the entire trip. The G650/650ER holds 60 speed records.

JetSmarter Adds Shuttle Routes

Air charter membership group JetSmarter has expanded its JetShuttle network with routes at Florida's Fort Lauderdale Hollywood International Airport (FLL). JetSmarter is now offering shared shuttle flights between Fort Lauderdale and Orlando on Mondays and Fridays, Tampa on Sundays and Thursdays and the Bahamas on Fridays and Sundays, using Pilatus PC-12s flown by Altius Aviation. "South Florida is an important hub for us, and we are happy to offer options from Orlando, Tampa and the Bahamas," said vice chairman and president of JetSmarter Gennady Barsky. The company also confirmed it will further expand destination offerings and shared flights this year.

China Developing Homegrown Tiltrotor

Chinese state-owned aircraft company Avic is developing two variants of an "ultra fast" 270-knot tiltrotor code-named Blue Whale. Unlike tiltrotors such as the Bell Boeing V-22 Osprey or Leonardo AW609, the Blue Whale is a quad proprotor design. Avic chief helicopter designer Wu Ximing said that the aircraft would be "China's equivalent of the V-22 Osprey" and used for disaster relief, supply airdrop and search-and-rescue operations. A medium variant will have an mtow of 44,090 pounds/20 metric tons and a heavy variant will have twice that mass. Initial targeted range is 1,674 nm/3,100 km. Avic has not yet set a timetable for the program

Supreme Court Declines To Hear Flytenow Case

The U.S. Supreme Court declined to hear Flytenow's appeal of an FAA legal interpretation that effectively shut down its website, which connected pilots with potential passengers who would share expenses on pre-planned Part 91 flights. The FAA had determined that pilots who solicit passengers using the website are "common carriers" and subject to commercial transportation requirements. However, the issue might not yet be fully settled. Rep. Mark Sanford (R-S.C.) has sponsored legislation that would authorize Internet-facilitated cost-sharing of flights.

JetSuiteX to start air service at Santa Monica Airport

by Matt Thurber

JetSuiteX will use Embraer ERJ135s, in addition to Phenom 100s and Cessna Citation CJ3s, for scheduled public charter flights from Santa Monica Airport to Carlsbad and San Jose, Calif., starting this month.

JetSuiteX will begin flying public charter service from Santa Monica Airport (SMO) in Southern California starting on February 6. Scheduled twice daily—in the morning and evening—on Mondays, Tuesdays, Thursdays and Fridays, the flights will connect Santa Monica with McClellan-Palomar Airport in Carlsbad, Calif., near San Diego, and Mineta San Jose International Airport in the San Francisco Bay area. Service to Las Vegas will start February 10, with a Friday departure every week from SMO, returning on Sunday.

JetSuite's Embraer Phenom 100s and Citation CJ3s have been serving charter customers at SMO for seven years, with 5,000 flights to date, and JetSuiteX adds scheduled service in Embraer ERJ135s, as well as the Phenoms and CJ3s. The ERJs seat 30 passengers in a more comfortable configuration than the original airliner layout, with leather-covered business-class seats providing 36-inch pitch. All the jets have power outlets at each seat, and passengers are provided with free entertainment content delivered to their mobile devices, free Gogo Wi-Fi and free drinks and snacks.

"JetSuiteX customers have been asking for Santa Monica service," said JetSuite CEO Alex Wilcox. "It's one of the busiest markets for us for light jets. We think we need to give the city and its residents a reason to use the airport. You don't have to own an airplane. You can walk from your nearby residence to the airport and be [in San Jose] in an hour or less." No membership fee is required for JetSuiteX customers.

Passengers will board at Atlantic Aviation at SMO, although the company plans to work on leasing a dedicated JetSuiteX facility at the airport. While JetSuiteX isn't required to obtain permission from the city of Santa Monica to fly out of SMO, it will have to file for a commercial operation permit to operate from its own facilities, according to Nelson Hernandez, the city's senior advisor of airport affairs.

As an incentive for Santa Monica residents to get more utility from the airport, JetSuiteX will offer 25 percent off all their JetSuiteX flights to and from SMO after they fly one round trip. Introductory one-way fares will be Carlsbad for $29, San Jose for $79 and Las Vegas for $99 (the lowest fares might require advance purchase). JetSuiteX's other routes, launched last April, serve Concord, Burbank and Mammoth Lakes, Calif., and Bozeman, Mont. JetSuiteX started selling tickets for the SMO service on December 14. ❑

GRAVES: FAA BILL LIKELY TO COME UP IN SPRING

House lawmakers are expecting to turn their attention this spring to a comprehensive FAA reauthorization bill that most likely will include another attempt at air traffic control reform and a host of other measures, according to Rep. Sam Graves (R-Mo.).

Graves, co-chair of the House General Aviation Caucus and a member of the House Transportation and Infrastructure (T&I) Committee, told members of the Aero Club of Washington last month that, with the September 30 deadline, "FAA reauthorization is probably coming up in the spring. There is no way we can get to it in February. I don't know if we can get to it in March."

Graves conceded that at this juncture it is too early to tell what the bill might look like, but he anticipates it will include much of what remained from last year's bill, including air traffic control reform. He was unsure what, if any, changes would be made to the proposal to create a user-funded independent organization to run ATC, but said T&I chairman Bill Shuster (R-Pa.), who was the chief architect of the proposal, "wants to start out with an open slate."

Graves anticipates that some of the amendments offered last year to the reform proposal, among them those that altered the make-up of an ATC organization governing board, might be included. But he emphasized that it is still too early to detail the proposal.

The reauthorization bill, he added, would include a number of other priorities: expanding the state block grant program for small airports from the current 10 states to 20; strengthening the airport improvement program; new private hangar regulations; fixes to aircraft regulation issues; airshow regulations; and certification reform that might explore applying to commercial aviation the sort of changes recently applied to general aviation.

But while these efforts continue, Graves noted that lawmakers anticipate they will have a full plate with a "massive" infrastructure package that President Trump is expected to introduce. Shuster, he added, is busy trying to determine elements of that package, but as of last month the details were murky. The package, however, is expected to include aviation.

The committee also will be looking at automation in highways, which Graves said ties into automation and unmanned vehicles in aviation. "We have to be safe," he said. "It is a pretty fine line we have to walk. We want legislation that is adaptable…given how rapidly the technology is evolving." —*K.L.*

COCKPIT B50
THE ULTIMATE **PILOT'S** INSTRUMENT

Aviation enters a new era with a multifunction chronograph delivering unprecedented performance. At the heart of this high-tech feat beats a (COSC) chronometer-certified SuperQuartz™ movement specially developed by Breitling for aviation. Equipped with a sturdy and light titanium case, the Cockpit B50 innovates with its huge range of functions, extreme user friendliness, rechargeable battery and an ultra-legible high-intensity display mode. Reliable, accurate, efficient: the ultimate pilot's instrument.

BREITLING.COM

BREITLING
1884

INSTRUMENTS FOR PROFESSIONALS™

NEWS BRIEFS Compiled by Chad Trautvetter

CAN Celebrates 35 Years

The Corporate Angel Network (CAN), a nonprofit that arranges travel for cancer patients aboard empty seats of business aircraft, celebrated the 35th anniversary of its first patient flight on December 22. Safe Flight Instrument hosted that first flight in 1981, carrying a 22-year-old bone cancer patient home from treatment at Memorial Sloan-Kettering. The patient, Michael Burnett, who had been discharged in time for the holidays, traveled on board the Safe Flight King Air 200 from White Plains, N.Y., to Detroit. In the ensuing 35 years, CAN has surpassed 51,000 cancer patient flights. This achievement comes thanks to the 500 major U.S. corporations that have shared empty seats aboard their aircraft.

Zetta Jet To Acquire Two Firms

Singapore-based Zetta Jet has signed a definitive agreement to merge with fellow Singapore private aviation company Asia Aviation Company, along with Van Nuys, Calif. aircraft management specialist Advanced Air Management. The acquisitions would expand Zetta Jet's international reach, as well as service offerings. Zetta Jet will remain headquartered in Singapore and merge operations with Asia Aviation Company under the core Zetta Jet Pte Ltd. brand. Advanced Air Management will be renamed Zetta Jet USA. Zetta Jet will expand its aircraft management options under Zetta Jet Management. Geoffrey Cassidy will continue to lead Zetta Jet as managing director.

FAA Warns of Accidental Knob Inputs

The FAA is warning that pilots are inadvertently changing selections of concentrically centered knobs with some regularity. Citing reports from manufacturers and pilots, the FAA noted that these errors are occurring particularly when pilots dial in navcom frequencies. Among the common causes: mechanical interference between two concentrically centered knobs; pilots accidentally rotating two knobs at once as a result of finger positioning errors and/or finger slippage; and pilots inadvertently selecting the wrong knob and subsequently failing to make corrections because they did not detect the error.

Jet Linx Fleet Grows in 2016

Omaha, Neb.-based business aviation charter, management and jet card provider Jet Linx Aviation says it experienced steady growth last year, with a 65 percent jump in the size of its fleet and gains in hours flown and client base. Jet Linx added 23 aircraft to its fleet last year, bringing the total to 82. In addition, hours flown were up 20 percent year-over-year from 2015. To accommodate this growth, Jet Linx added base locations in Nashville, Tenn., and Fort Worth, Texas. With the additions, Jet Linx operates from 14 base locations.

Max-Viz EVS Gets DO-160G Approval

The Astronics Max-Viz 1200 enhanced vision system (EVS) for fixed- and rotary-wing aircraft has been certified to DO-160G standards by the Radio Technical Commission for Aeronautics (RTCA). Priced at $9,000, the EVS features a low-power, uncooled thermal camera that can present an enhanced outside view on any display that accepts composite video signals. With thermal imaging, the EVS display enables pilots to see when flying day or night in smoke, haze and light fog. "This level of compliance for our lowest-priced certified EVS further demonstrates the system's reliability in all kinds of weather and flight conditions," said Astronics Max-Viz executive vice president Elliott Troutman. There are 40 STCs for installation of the Max-Viz 1200 in various airplanes and helicopters.

Honeywell developing crowd-sourced wx data

by Curt Epstein

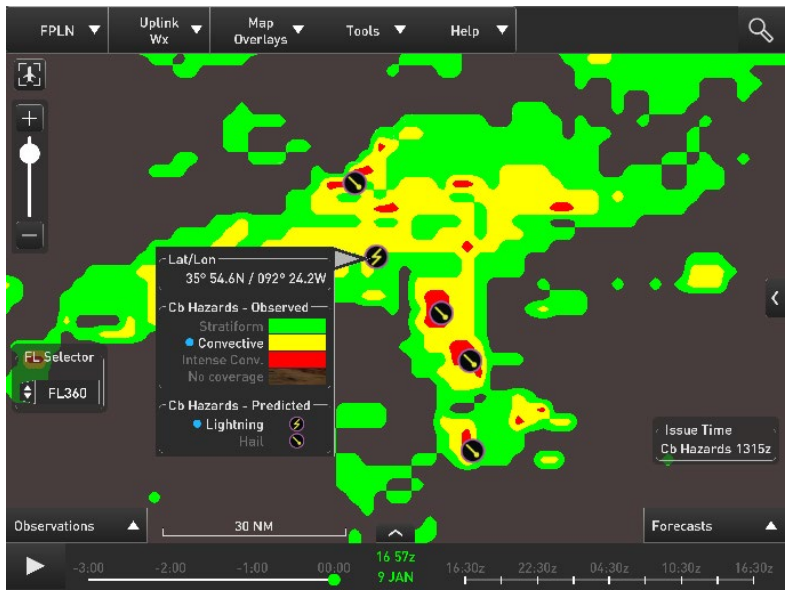
As the transmission rates of airborne connectivity make spectacular jumps, the industry is finding new ways to use those previously unimagined data rates, in many cases taking advantage of information already being collected by aircraft systems.

Honeywell is looking to draw on the weather data compiled by the RDR4000 radar, installed on numerous airliners and standard equipment on the Gulfstream G650, into a crowd-sourced weather network. "We're trying to take advantage of all the data that we already have off our hardware on aircraft, to benefit the pilot and the operator," said Kiah Erlich, director of flight support services for Honeywell's aerospace division. "They can improve efficiency and have a safer, more comfortable route."

Through an STC modification on the radar unit's software, Honeywell can allow the system to downlink real-time weather data from the aircraft to a ground station, where it is compiled into a mosaic allowing pilots to see real-time weather on their flight route, similar to the Waze app that allows drivers to view traffic conditions being experienced by other motorists ahead on the same road.

This new system, which Honeywell anticipates will debut this year, will take the radar image from participating aircraft equipped with the RDR4000, a swath 320 nm wide and vertically from 60,000 feet to the surface. The high data transmission rates currently available allow this information to be sent to a ground station, where it will then be analyzed and relayed to the tablets of pilots who subscribe either to Honeywell's Weather Information Service app or Godirect Flight Bag app.

Tablet-based electronic flight bags (EFBs) have revolutionized the industry by providing many functions without having to go through certification, Erlich noted, and avionics manufacturers are free to infuse an EFB application with the freshest technology while avoiding the hurdles that attend certifying it in a permanently installed display.



Honeywell envisions combining the data from its customers' RDR4000 weather radar to provide users with real-time weather along their flight route, generated by operators currently flying the same route. The company calls the system 'a mini FMS.'

The company has concluded the test phase using its Boeing 757 testbed and is in the process of securing airline partners that will offer their aircraft as "weather balloons. They'll opt into a program with the incentive that, if they are providing data, they are not paying for accessing the weather service," explained Erlich, noting that the plan will be subscription based for customers. "The paying users will be those that are not providing data; they're just benefitting, consuming the data."

She emphasized that aircraft do not have to be equipped with the RDR4000, which can provide 3-D depictions of turbulence and storm severity, to use the information. "What we are trying to do is enable the broader community to benefit from our services and our technology, and they don't necessarily have to have our equipment," Erlich said.

Flights over land can avail themselves of weather information from ground-based radar. Such information is not available over oceanic areas, but a potential fleet of data-transmitting aircraft on busy oceanic routes can fill that gap, according to the Arizona-based company. Likewise in countries such as China, where ground-based radar data is considered military intelligence, shared weather radar such as this could also fill gaps in coverage.

'Virtual Copilot'

Rather than simply providing the weather information to help avoid a bouncy ride, Honeywell couples that with advances in data analytics, which can provide improvements in efficiency as well. "Vertical optimization will be a feature in the Weather Information Service app, and it optimizes the flight plan vertically and takes into account the filed flight plan, the most recent winds and temperatures, and the aircraft performance data straight from the manufacturers themselves," said Erlich. "It's like a mini flight management system. It computes all the different calculations and it tells the pilot that it's more efficient to fly at a different altitude, for example, because the wind is more favorable."

The app will display the filed flight plan in one color, overlaid with the suggested optimized flight plan, which will change in real time as the accumulated weather data changes. "The connectivity pipe is getting bigger and faster, and the bigger and faster it gets, the more data we can pump down through it, and the more information we can spit back up into the cockpit into an EFB app that provides more situational awareness to the pilot," Erlich said. "It's like having a virtual copilot on the ground interpolating all of this data for you and then giving you advisory information back to the cockpit." ❑

News Note

Despite efforts to improve emergency contingency procedures, the Department of Transportation Inspector General contends the FAA still is not completely prepared to handle events that could cause major outages, such as the fire that was deliberately set in the Chicago Air Route Traffic Control Center in September 2014. In a new report, the DOT IG found that the "FAA has taken steps to improve the effectiveness of its operational contingency plans; however, significant work remains to mitigate the impact of air traffic control disruptions."■

UP

IS TAKING ROAD TRIPS, WITHOUT THE ROAD.

Wheels Up is more than the most intelligent way to fly private, it's a private flight club.

- Guaranteed access to our private fleet of King Air 350i and Citation Excel/XLS aircraft with as little as 24 hours' notice
- Exclusive access to Wheels Down, a unique lineup of once in a lifetime events and experiences

WHEELSUP.COM
1-855-FLY-8760

WHEELS UP

UP THE WAY YOU FLY

Europe faces obstacles in SET-IMC ops intro

by Dave Donald

For commercial operators of single-engine turbine aircraft in Europe, it has been a long wait, but SET-IMC is coming. Having agreed in principle to the concept in June last year, the EASA will issue new regulations this year that permit the commercial use of single-engine turboprop aircraft in instrument meteorological conditions (SET-IMC or SETOps). For many, this change will be the culmination of a two-decade wait and the means to expand both business and commercial aviation in Europe, but others remain skeptical as to whether its implementation will have any major effect on the market.

When the EASA issues new regulations that permit the use of single-engine turboprop aircraft for commercial operations in instrument meteorological conditions businesses will be able to use popular models such as the PC-12 without securing a special exemption.

On the face of it, the arrival of commercial SET-IMC in Europe promises to fuel the expansion of an underserved area of the air transport market, in particular air-taxi operations and commercial flights serving city pairs that are currently connected only by ground transportation, which is often unreliable and expensive. SET-IMC costs are higher in Europe than in the U.S., for example, but the single-engine aircraft remains cheaper to operate than a twin, although some aver that the benefits are marginal.

What is certain is that single-engine aircraft can operate from runways that twin turboprops cannot, allowing access to more destinations. The cost of fuel is an additional benefit: jet fuel is less expensive than the avgas used by the piston twins that have served this sector. Commercial SETOps also opens up possibilities for special-mission operations such as the use of floatplanes, as well as freight distribution networks. Commercial SETOps also provides an opportunity to introduce a wider audience to the benefits of using business/commercial aviation as a realistic alternative to ground transportation for short-haul journeys.

Commercial SETOps is not, in fact, new to Europe, as a number of operators have been undertaking such activities for some years under special exemptions, among them Hendell Aviation in Finland and Voldirect in France. At present there are 270 Pilatus PC-12s and 250 TBMs flying in Europe on non-commercial operations, with 1,300 airfields available.

Single-engine turboprop operations were pioneered in Canada and have been conducted in the U.S. and elsewhere for two decades, and the figures regarding the value of this sector are compelling. In the U.S. the sector has shown strong growth

in recent times, using primarily the Pilatus PC-12, Cessna Caravan and Daher TBM. The Pilatus PC-12 alone flies 50,000 departures every quarter, and the safety figures compare well with twin-engine types. There are many types of business model, including fractional, charter and shuttle activities, and the number has grown with the introduction of Uber-style operations.

OEMs have confidence in the wider market for commercial single-engine turbine operations. While the PC-12, Caravan and TBM 900/930 hold the major share, other types have appeared recently, among them the pressurized Cessna Denali, slated to fly next year. This aircraft represents something of a departure as it is to be powered by a new General Electric engine, the H93. The good safety reputation of current SET types is built on the reliability and tractability of Pratt & Whitney Canada's trusty PT6A.

Implementation Issues

Inevitably the introduction of SETOps will bring with it some challenges. Many of the airfields serving this new category of commercial operations will require investment to bring them in line with regulations as they do not have the navaids required for IMC operations. Cat 3 fire and rescue cover is also required. Many of these small regional airfields are already under threat of closure. While SETOps may bring extra business, it is not certain that it would be sufficient to warrant the necessary investment.

Another challenge concerns personnel recruitment. For aircrew the SETOps sector does not offer the attractions of airline work, and it is also difficult to recruit engineers. Training is problematic as there are no simulators available, and OEMs are being encouraged to bolster training support to the sector.

Europe's weather does not help, and neither does the requirement to plan flights to take into account gliding distances to diversion airfields along the route. There are also other considerations, such as the current rule that takeoff must be planned to consume no more than 60 percent of available runway length. There are plans, however, to extend that to the normal commercial stipulation of 80 percent.

Some industry figures suggest that commercial SETOps will not have the impact that its proponents are hoping for. At the heart of this thinking lies the potential customer's perceptions of safety and image. Despite the figures, the single-engine aircraft is perceived as being less safe than a twin, while the propeller carries less "ramp appeal" than a jet.

Raising awareness in the business community is a key challenge to overcome the "not safe, not comfortable" issue. Harnessing digital marketing and social media is seen as a crucial element in this effort. Another issue is the cost-saving for the customer. Having half the number of engines does not equate to half the price, particularly in terms of ground handling fees that in most cases would be similar to those for a twin. ❑

News Note

Astronics Advanced Electronic Systems added two products to the EmPower cabin line. A dual-frequency converter supports up to 10 cabin power outlets and offers 115 VAC/60 Hz or 220 VAC/50 Hz, thus covering most of the power supply requirements for Western Hemisphere, Japan and Taiwan operators and Europe and most other parts of the world. The new converter provides up to 4 kW of clean, continuous power, according to Astronics.

The company also announced the EmPower 1428, a lighter-weight version of its in-seat power supply USB outlet, which runs off 28 VDC power and provides 5 VDC at 2.1 amps to power and charge portable electronic devices. ■

TORQUED Full-throttle opinion from former NTSB member John Goglia

Challenges facing aviation in '17

As last year drew to a close, my thoughts turned to reflecting on the past 12 months and looking forward to the next. While the accident statistics remain enviable in the U.S., we had our share of tragic crashes around the globe. Some—EgyptAir Flight 804—highlighted, among other things, the continuing need for a faster, more efficient way to capture black box data. All 66 passengers and crew were killed in that crash, and key information as to why the Airbus A320 disappeared from radar at 37,000 feet on a routine flight from Paris to Cairo and plunged into the Mediterranean Sea was buried beneath 10,000 feet of water for a month. It remains critically important to get the black box data as soon as possible after a crash to help determine what occurred and what could have been done to prevent it.

And the technology exists to do just that. The crash of Emirates Flight 521, a Boeing 777-300, on landing at Dubai International Airport proved that new technology could make the process of downloading and retrieving critical flight information a matter of minutes. Although the black boxes were removed from the burned wreckage on the day after the accident, the quick access recorder installed on the Emirates 777 had transmitted critical flight data to airline officials within minutes of the crash, according to its Miami-based manufacturer, Avionica.

Imagine if that had been possible on the still-missing Malaysia Airlines Flight MH370. The three-year search for the black boxes and answers for families and investigators might have been reduced to just minutes, saving much heartbreak for the families and millions of dollars for investigators. In March last year, a report from the Malaysia Transport Ministry said that the search price tag had passed $70 million. So one can only imagine how many millions more the cost has gone up now, with hopes for finding the wreckage seeming ever remoter.

A Year of Progress

Looking back over the year, I was glad to see the FAA continue its non-regulatory approach to improving safety in the general aviation community by using data on causes of GA incidents and accidents and partnering with aviation groups to do outreach to the GA community. It's too soon to tell whether those efforts will continue the downward trend in GA's accident rate. But it's a worthy effort. GA pilots and those who fly with them would do well to study the free materials being disseminated as part of the #FlySafe campaign.

Certainly 2016 was a landmark year for the unmanned aviation world with the introduction of the long-awaited commercial drone rules and the FAA certification of unmanned aircraft pilots. As of this writing, there are half a million registered unmanned aircraft and tens of thousands of airmen who now hold a new FAA airman certificate, called a remote pilot certificate with small UAS rating. It was a year for many of us used to the pilot-in-the-aircraft world of aviation to begin adjusting to sharing airspace with remotely piloted machines. Some of the overheated anti-drone rhetoric seems to have died down and the industry continues to enjoy a remarkable safety record. This year should see progress in the FAA's continued incremental opening up of the skies to commercial unmanned aircraft operations. The agency is proposing new rules for operations of small UAS over people; those draft rules are expected to be out early this year and will expand the usefulness of drones in many industries.

Last year also saw the bill to privatize air traffic control proposed and then die without action. That bill would have created a not-for-profit corporation to run the air traffic system. The corporation's board would have been stuffed with major airline members, and GA and other users would have had little input. With the airline lobbying group still pushing for ATC privatization, a resurrection of that bill in some form is likely this year. I don't support privatizing ATC because I think it will put too much power in the hands of those with the biggest lobbying budget. And, at least with this most recent draft legislation, the more powerful lobbying group was the airlines.

Of most concern to me is the growing gap between the industry's need for pilots and mechanics and the numbers of young people being trained and prepared for those positions. The 2016 Boeing forecast predicts an "extraordinary demand for people to fly and maintain" the tens of thousands of airplanes expected to be delivered over the next 20 years. The airframer forecasts a need between now and 2035 for "two million new aviation personnel—617,000 airline pilots, 679,000 maintenance technicians, and 814,000 cabin crew."

Last year, JetBlue began an innovative program to train pilots to work for the airline, accepting applicants with no flight experience and training them to work in the cockpits of airliners. It will be interesting to see how that program develops and the airline's success in getting applicants. The program costs approximately $125,000 and there are no guarantees of a pilot's being hired once the program is completed, although that is the intended outcome. It would be great to see other aviation entities try similarly innovative approaches. ❑

John Goglia
is a safety consultant.
He welcomes your e-mails
at gogliaj@yahoo.com.

Global In-Flight Connectivity for All Ages

Pilots and passengers will appreciate the affordable, global in-flight connectivity provided by AeroWave™ from BendixKing.

Crews will now have in-flight access to global weather services, voice, text, email and their favorite connected aviation apps. Plus passengers will enjoy the ability to send and receive emails, text messages, browse simple web pages, make and receive phone calls and more.

AeroWave's low-cost connectivity service plan is based on prepaid hours of use – not the amount of data used – so there are no billing surprises. Airtime is only **$40 USD per hour** and unlike other services it works at any altitude all over the world. It's that simple.

Don't leave your favorite apps on the ground anymore. Find out how to get globally connected today.

Global Weather | Flight Tracking | Voice | Text | Email | Web

To learn more, call 1.855.250.7027, contact your local BendixKing dealer or visit **aerospace.honeywell.com/AeroWave**

BendixKing®

Technology Advances Flight Training Field

by Matt Thurber

TRU SIMULATION + TRAINING

Flight simulators have advanced rapidly with the advent of improved electronics technology, and now there is a broad base of simulator types available for many types of training. From free and inexpensive desktop computer simulators such as the free open-source FlightGear and low-cost X-Plane and Microsoft Flight Simulator X to inexpensive motion-based training devices from Redbird and full-flight simulators from the big flight-training providers, simulation has had a profound effect on pilot training, and new technology promises even more advances in coming years.

Specific training for business aviation

TRU Simulation + Training, the simulator manufacturing and training company owned by Textron, has adopted many of the pioneering efforts launched by ProFlight, which it purchased in 2014. ProFlight's Citation CJ3 training and now TRU's business jet training revolves around two key devices: a full-flight Level-D simulator and a fixed-based cockpit with full avionics and most systems functionality, using real displays, knobs, buttons and switches. Complementing these tools is TRU's interactive, online recurrent ground school. ProFlight was also the first full flight simulator training provider to offer PilotEdge live ATC services to its customers (*see Training Tools section on facing page*).

TRU's Integra fixed-base cockpits are designed to help students transition into the CJ3 while spending less time in the more expensive Level-D simulator. During an initial CJ3 course, students spend about an hour in the Integra for every two hours in the simulator, according to David Smith, vice president of training centers. Integra devices have visual displays, so the student can practice flying while learning the systems and avionics.

ProFlight developed an interactive online recurrent ground school, which is FAA approved to replace the ground portion of the recurrent event. The ground school covers systems and provides detailed animations of systems operation and freeplay options for students to observe how systems work under varying conditions. Students can sign up for systems questions to be emailed regularly, to help keep their knowledge fresh. "The thing that falls off the most after you go through a training event is systems knowledge," Smith said.

While TRU is adding simulators for Textron Aviation airplanes to the online ground school program, so far the 525B Citations and King Air 350 with Pro Line Fusion avionics are available, with the King Air 250 and 90 series to follow, then more Citations. TRU plans to seek partial approval for online training for initial clients.

All of the TRU training for business jet pilots can be wrapped into its Current365 program, in which "two training events per year bookend a year-long currency model," he explained. This provides year-round access to the Integra devices at TRU's training facilities in Carlsbad, Calif. and Tampa, Fla. and the online ground school.

TRU is adding aircraft types, among them the new Cessna Denali single-engine turboprop and Citation Hemisphere large-cabin jet as well as new Citations currently on the assembly line. "We see some major opportunities that will improve safety dramatically in the coming three to five years," Smith said. "There is a lot of technology coming that we're bringing to bear, a lot of research on how to maximize learning of highly sophisticated processes."

At flight training and simulator manufacturer **FlightSafety International**, technology is a key driver of improvements in simulator and training tool quality to help improve customers' training experiences. The company recently introduced simulator-based upset training, improved simulator ground handling, display system upgrades and training tool development.

FlightSafety was the first training provider to reprogram simulators with enhanced aerodynamics and to offer upset prevention and recovery training (UPRT) in simulators that replicate the full stall regime. The first simulator to be so qualified was the G550, and FlightSafety has added many other models since, offering a one-day advanced course in UPRT taught by specially trained instructors in the qualified simulators. For the G550 qualification, said Dan Littmann, manager of flight dynamics at FlightSafety, "We had a lot of data to sort through to see how the aircraft behaves up and into the aerodynamic stall in a variety of conditions. This allowed us to model the threshold accurately, to the point where it would stall, and the surrounding conditions that would affect it."

A new regulation governing simulators requires improved touchdown dynamics to reflect more accurately what happens during a bounced landing and gusty crosswinds. FlightSafety has developed new ground-reaction modeling software that better replicates ground handling, and this has also improved the feel of taxi operations. Making this possible depended on improving the motion system.

FlightSafety's sim cueing takes the evaluation of simulator motion from a subjective standpoint where a pilot comments on the quality of the motion to a system that measures motion cues in the simulator and compares them precisely against motion in the real aircraft. The result is

How expert management companies can transform the value proposition for aircraft ownership

Duncan Daines
group chief marketing officer,
Gama Aviation Signature

Dan Drohan
CEO,
Solairus Aviation

Don Haloburdo
vice president/general manager,
Jet Aviation Flight Services

Brian Kirkdoffer
CEO,
Clay Lacy Aviation

Bill Papariella
CEO,
Jet Edge International

Andy Priester
president/CEO,
Priester Aviation

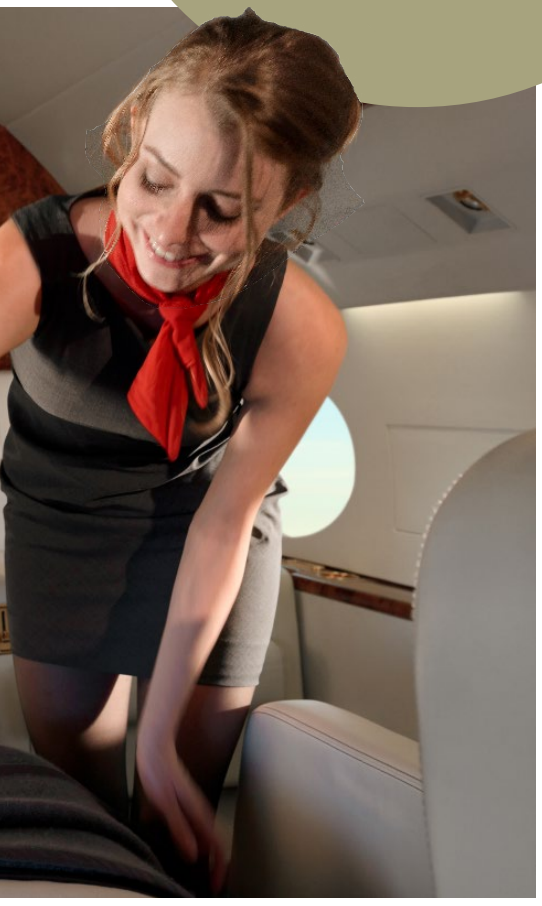
Michael Tamkus
senior v-p, client services
and management sales,
Executive Jet Management (EJM)

Legacy knowledge and scaled operations attract new owners and flight departments

Last year was one of the busiest periods ever for aircraft owners turning to management companies to manage and operate their assets, according to industry executives. New owners, attracted by the drop in aircraft prices and favorable financing rates, have sought out expert support—while more and more corporate flight departments have outsourced management of their fleets.

Read on to explore how experienced management companies can significantly improve the value proposition for private aviation, in part by offsetting operating costs with income from charter flights. Experts from seven leading aircraft management groups provide the inside track on why exactly management makes sense, how to get the right help, and why attention to detail is so important for successful aircraft ownership.

What are the top reasons that it makes sense to have an aircraft managed by a third party?



Jet Aviation (Don Haloburdo)

Aircraft owners want a consistent customer-service experience. They want that single experience, going from A to B, and with related customer service. They do not want to deal with everything that goes with starting an individual flight department. The domestic regulatory environment also makes it harder to be a flight department. Many flight departments do not have the full capabilities for a global operation, with a scheduler available 365 days per year.

Jet Edge (Bill Papariella)

All owners, regardless of how their aircraft is managed, face substantial compliance paperwork, filings, tracking, and reporting. Standard operating procedures and training are tracked and improved on a daily basis. Major audits that assure owners are operating to the industry standards cost thousands of dollars and require months of planning.

The ability to generate revenue on an owner's aircraft can significantly lower fixed costs. A third-party management company helps owners predict operational costs and better manage aircraft profit and loss.

Offsetting fixed costs with revenue is a goal most owners have, and a good third-party manager will have the platform to accomplish those goals.

Clay Lacy (Brian Kirkdoffer)

Safety, service, and value.

EJM (Michael Tamkus)

Cost savings, safe and efficient flight operations, and personnel/finance administration. Regulatory compliance, crewing, and optimized maintenance. Aircraft management is and will continue to be complex. Operators ensure benefits of aircraft ownership while mitigating the risks and hassles of managing a high-performing flight department. The combined procurement power of EJM and NetJets allows us to pass along extensive cost savings and deep discounts on critical expenses such as jet fuel; FBO fees and services; crewmember travel and training; aircraft insurance and maintenance; travel emergency medical services; technical, navigation, and communication subscriptions.

Full-service operators perform 24/7/365 operations with full risk assessments per segment; classroom and simulator training for crewmembers and crew; aircraft scheduling; flight crew travel support; onboard catering and ground transportation; crew communications; dispatching and flight following; international travel services; contingency plans for unplanned maintenance events; and personnel recruitment, payroll, employment taxes, and benefits.

Priester Aviation (Andy Priester)

There are a lot of qualified flight department managers, but at the end of the day, aircraft owners are responsible for having those people report to them. Aviation is too technical and unique, so an owner places that trust in a management company that has scope and depth to manage all the details. Number two is going back to the fact that flight departments have tech people. Pilots need someone to have a cooperative look over their shoulders. This adds a layer of professional scrutiny, making for a safer overall operation. Typically, an operator has scope and depth and resources within its organization that surpass what the flight department offers.

Solairus Aviation (Dan Drohan)

No one wants to get involved in the workload—the operating side of things. And so the biggest reason why people contact us is they have no experience with aircraft management, HR, flight coordination, etc. There are also significant discounts associated with a large aircraft management company. With 120 aircraft, the purchasing power with our fleet is compelling. We buy fuel, Wi-Fi, catering, and insurance much cheaper than owners can on their own. We pass those discounts directly to the client. Finally, the difficulties associated with marketing and selling charter are substantial.

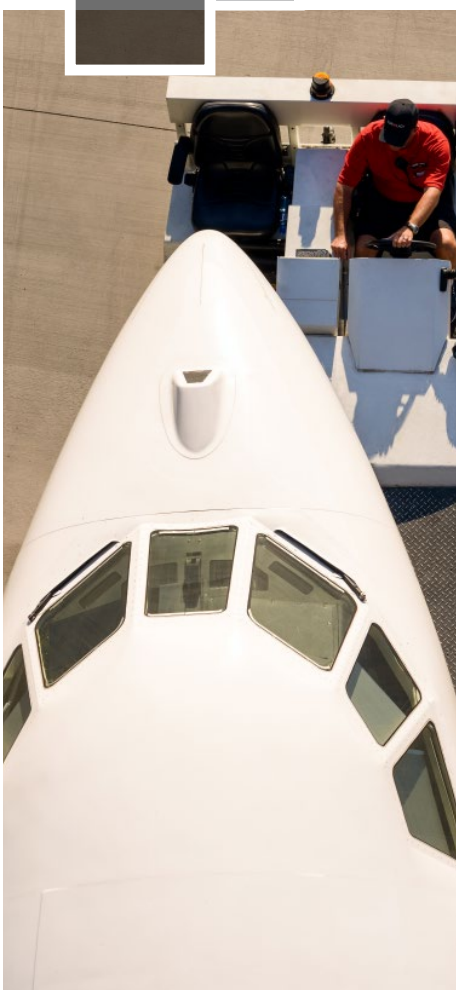
Gama Aviation Signature (Duncan Daines)

Cumulative experience. We have 1,300 employees who have been working with aircraft a lot of their lives.

Depth of knowledge. Geographic breadth as our aircraft fly worldwide. A lot of breadth and scale for pricing and buying fuel, insurance, and other needs. And we have negotiation leverage with maintenance, repair, and overhaul suppliers. Negotiating is germane to management companies, but not to flight departments that look after only a few aircraft.

Safety management systems are in place to protect clients and ensure crews operate at the highest standards.

What is your best advice for new aircraft owners evaluating management companies?



Priester Aviation (Andy Priester)

Look under the hood. On the surface of a big or small management company, everyone represents themselves the same way. The value of a management company comes from the system processes and procedures that they have established and the scope and depth of their operation. Take a good amount of time to look at all those things. Visit the premises and see how they organize their maintenance records. Talk to their logistics people. Ask whether someone answers their phone if something goes wrong. Look at the scope and breadth of their insurance. If there is a good vibe, understand what's powering it.

EJM (Michael Tamkus)

Do not commoditize a management company. They have significant differences and each has specific pros and cons. Develop the relationship beyond the proposal and meet the staff, visit the site(s), and make sure the management company you choose clearly understands your objectives and will work to exceed expectations. Ask: What is the company approach to safety and risk management?

Does each have specific safety management system (SMS) and enterprise resource planning (ERP) in place that are proactively managed? What is their business continuity plan? What is their financial stability and creditability in the marketplace? We also suggest you verify all facts and ask to speak with other clients to obtain opinions from unrelated experts and references. Then ask how their business model is set up and where they make their money. Are expenses marked up from actuals or are they 100 percent pass-through with a high monthly management fee? Are they associated with any other aviation-related businesses that might create a conflict of interest? For example, are they offering fuel, hangar, FBO, or maintenance services to make a margin?

Gama Aviation Signature (Duncan Daines)

Talk to the management company. Understand the capabilities of each management company as they relate to your specific mission and profile. Ask: Do I need a domestic operator? Or international? Compare apples to apples to understand the true cost of operation and cost associated with the proposal. Try to get the management company involved in the aircraft's delivery.

Clay Lacy (Brian Kirkdoffer)

Bring management companies into the process as soon as possible. Each one will say they're the best. Figure out how they are best for you. Will they listen to your mission and goals? Does their expertise and leadership team match yours? Does their culture complement your owners'? Management companies come and go. How did they weather 2008-2010 and the early 1990s? What is their tenure? Who is on their leadership team? Talk to industry experts and get third-party input. Ask to talk to references and anyone who has done business with them. How long have those clients been with the management company?

Jet Aviation (Dan Haloburdo)

Ensure that the management company's solution aligns with what you are seeking to do. Are safety programs in place to mitigate risk? Will you have one point of contact—someone you can speak with every day? What is your total spend on aircraft maintenance and operations? How is your money being spent? Ensure that the company is concerned with providing value for its fee. If you are flying internationally, ensure the company has international services with 24/7/365 coverage.

Jet Edge (Bill Papariella)

First-time owners should get a management company onboard prior to a pre-purchase inspection. If you are merely considering switching management firms or moving from an owner-operated model to a third-party management company, define your needs and communicate them clearly to the management companies you are evaluating. The right company can help make sense of ownership costs, depreciation, tax scenarios, and expectations when deciding how to operate the aircraft moving forward. Identify a management company that operates the same aircraft type you are purchasing or already own and that offers experts in the jet type to save money in the long run. Seek references from experienced owners in the fleet you might join. Finally, hire the right attorney to help finalize the management contract.

Solairus Aviation (Dan Drohan)

This is an asset-management and relationship-management business. Understand who they are and what their background is, how they do business at large, and how well funded they are. You should ask: Do they have a formal safety-management system? Are they actively doing something or are their safety processes merely a binder sitting on the shelf? Do they have full-time staff or only part-timers?

The perfect time to own a jet.

The perfect partner to manage it.

This is the best time in years to own a private jet. Choose Clay Lacy to manage it for you. No one can match our 50 years of experience lowering operating costs, maximizing safety, delivering unparalleled service and value.

800.423.2904 | claylacy.com

WORLD'S MOST EXPERIENCED OPERATOR OF PRIVATE JETS

CLAY LACY

What mistakes do you see made by new aircraft buyers? Do new buyers normally consult with you before the transaction is completed?

EJM (Michael Tamkus)
Not getting enough qualified information from industry experts prior to purchase. Too much emphasis on initial acquisition cost and less regard for post-closing maintenance, needed upgrades, etc. Many times, owners do not fully understand how they will operate the aircraft [i.e. under FAR Part 91 private rules vs. FAR Part 135 commercial rules] and how they should structure its ownership. Given the opportunity, we refer prospective owners to enlist legal and tax professionals and collaborate to build a management agreement that protects their objectives. We will discuss the mission profiles for the owner, and their specific goals for the flight department. We educate owners through forecasted operational budgets with transparent fixed and variable expenses. New owners might not understand the aircraft's range and capabilities; the value of hangar space, which protects against corrosion and weather damage; crew duty restrictions; and aircraft upgrades.

We educate on nice-to-have versus required-to-have upgrades. We coach an owner on the realistic timeline to operating the aircraft after the close of a transaction via Part 91 or Part 135.

Solairus Aviation (Dan Drohan)
Not soliciting help early in the process and unrealistic expectations on timing. Also, they buy the wrong aircraft. You get what you pay for. A lot of people who came into the market in the last year are predatory buyers, looking for deals and hidden gems. We can help facilitate the process and connect the right people to each other when necessary.

Clay Lacy (Brian Kirkdoffer)
They don't bring in the management company early enough in the process. Management companies give good insights—if they have been doing this for a long time—on third-party industry experts.

Priester Aviation (Andy Priester)
Different aircraft owners are motivated by different things. Owners should be sure to balance what they need with what they want. Be educated on different aircraft options. Most of the time, we are brought into a deal after the decision is made to buy, when they start thinking about operational parameters of aircraft.

Jet Edge (Bill Papariella)
Some buyers undergo the aircraft acquisition process without the right advisors with the right experience. Also, there is sometimes a lack of quality oversight throughout the buying process. A management company can have significant experience operating the airplane type it is purchasing. It's interesting when someone buys an airplane with a lawyer, broker, and/or consultant, but not the aircraft's actual operator. A good management company consults on profit and loss and budget early on, helping buyers through the entire purchase and into operation the day after acquisition. That and starting compliance work pre-purchase saves time and money. Those working with an established management company as their pre-buy advisor typically do well.

Gama Aviation Signature (Duncan Daines)
The biggest mistake is not consulting a management company before the transaction. Understand the tech specs of the aircraft, especially if you intend to place aircraft into charter service. Make sure it conforms with charter requirements.

Jet Aviation (Dan Haloburdo)
They wait too long before getting involved with a third party. Engage them as early as possible from a risk and financial perspective. For a mid- to large-sized business aircraft, do your due diligence on the organization to make sure they can pay your aircraft bills. Jet Aviation doesn't buy and sell aircraft, but we are trusted business partners in the industry. If people come to us before pre-purchase inspections and negotiations, it's easier for us to understand the context of any issues. You can make the transition much smoother if you deal with a management company up front.

Revealing the FUTURE

Many Services – One Jet Aviation
Celebrating our 50th Anniversary and Beyond in 2017

MRO, Refurbishment, Completions, FBO, Aircraft Management,
Flight Support, Charter, Staffing.

JET · MANAGEMENT · FBO · JET AVIATION · CHARTER · STAFFING · MAINTENANCE · SINCE 1967 · COMPLETIONS

www.jetaviation.com

JET AVIATION
A GENERAL DYNAMICS COMPANY

What questions should owners ask management companies with respect to safety standards? How does your company ensure proper training for pilots, flight attendants, and maintenance work (either in-house or outsourced)?

Jet Edge (Bill Papariella)

Does the management company meet the highest ratings from all three of the top aviation safety auditing organizations: IS-BAO Stage 3, Argus Platinum, and Wyvern Wingman? This verifies a top-down safety platform and culture that extends to every department of the company, operational procedure, and employee. Ratings from each should be current and verified, and references should be made available by the management company by request. We integrate in-house training programs. The Flight Operations Quality Assurance (FOQA) program uses data recorded from Jet Edge flights to build a training regimen that mitigates issues before they arise. The voluntary reporting of the Aviation Safety Action Program (ASAP) ensures FAA enforcement immunity for crewmembers, maintenance technicians, and flight schedulers. The Aviation Safety Information and Sharing (ASIAS) program uses data from FOQA and ASAP to develop procedures to mitigate risk and promote safety across the industry.

Clay Lacy (Brian Kirkdoffer)

Get third-party references. Look at annual audits of these companies looking from outside in at people, processes, and procedures. Have the right leadership team and right processes and procedures. If they have been doing it for long time, they have a process in place to make sure they are operating with best practices. We do both—in-house and out. All our pilots go through CAE Simuflite.

Priester Aviation (Andy Priester)

Lots of companies put safety monikers on their websites, e.g., from the Air Charter Safety Foundation. That's good, but I suggest owners see safety standards in action. Ask the management company to demonstrate what those standards mean. If they can't do that, they might not be the right operator for them. We outsource all of it to FlightSafety or Simuflite. We have a comprehensive internal portal that makes management and training aware of events expiring or coming due. And we have technology in place that makes crewmembers aware of something that isn't potentially compliant.

Solairus Aviation (Dan Drohan)

Look for a demonstrated desire by the operator to comply with safety programs and have evidence of third-party safety audits. Solairus has an active SMS and a full-time safety officer, and we hold the Platinum rating from Argus and the Wingman certification from Wyvern. And we are one of only 100 operators worldwide to be IS-BAO Stage 3 certified. We do all our training at FlightSafety and CAE [Simuflite]. It's all tracked electronically and administered by our full-time training officer.

Jet Aviation (Don Haloburdo)

How do you manage risk with demonstrated processes and procedures? Ask the management company to show you how they do it. They should be able to walk you through their processes. Are they being audited by other vendors in the marketplace? Which certifications do they have and at which levels? Do they have violations with regulatory authorities? What training is behind their safety programs? Ask to see the training records. If they can't readily produce those records, be suspicious. Are they engaged significantly with training centers, such as SimCom? Is training being provided in a regulatory environment vetted by the FAA? Our training department allows us to internally teach a manufacturer's program and Jet Aviation procedures. Doing training just in the airplane doesn't work anymore.

Gama Aviation Signature (Duncan Daines)

Safety is of primary importance but not a differentiator. Most management companies already operate to high standards. We have a training part to our organization and a selection process for pilots coming in. With initial simulator sessions, we'll get them to fly a different aircraft type than what we are hiring them for. We are looking at airmanship and a pilot's ability to fly an aircraft irrespective of the particular type. High-quality candidates can deal with the depth of aircraft.

EJM (Michael Tamkus)

Ask operators to fully disclose their SMS program and ask whether an ERP is in place. Is the management company truly a 24/7/365 operation? How are flights dispatched and what level of oversight is provided per segment? Which risk-assessment protocols are in place? Is there a proactive approach to SMS? How do they test their ERP? Do they involve managed owners in ERP development and how does the ERP dovetail into the owner's office? They should also check to see what their process is for hiring, recruiting, and training crew, as well as how they mitigate risk and track their safety processes.

We commit to fully developed, inspected, and approved safety programs, including SMS, ERP, QMS, BCP, OSHA Voluntary Protection Program (VPP), and Injury and Illness Prevention Program (IIPP). EJM maintains a full-time safety director, an Employee Safety Policy and Procedures Manual, a Risk Mitigation Team composed of a cross-section of EJM employees, and safety reporting and tracking.

Crewmember training includes aircraft-specific ground and flight training in a full-motion simulator facility twice yearly; EJM operations-specific training yearly; hands-on emergency situation training every two years on subjects such as ditching, high-altitude physiology, and in-flight medical emergencies; a yearly line check in the aircraft for captains by an FAA Check Airman; annual international procedures training; aircraft-specific technology training; and special terminal approach training and authorization as needed. We require all pilots to exceed the training standards set forth by the FAA for charter flights—and to have a minimum of 3,500 flight hours for captains and 2,500 hours for first officers. Both the captain and first officer must hold Airline Transport Pilot and First Class Medical Certificates and receive advanced simulator training twice a year at FlightSafety International, CAE, or Bombardier.

Our annual pilot roundtable and maintenance technician meeting show where we can improve. We have industry experts from the FAA, NTSB, and manufacturers educate our employees on best practices.

SOLAIRUS
AVIATION

Entrusted with over $2 Billion in Aviation Assets.

Ask us how we have earned that trust.

info@solairus.aero - 800.359.7861

Solairus has over forty base locations nationwide, employing more than five hundred flight crew and support personnel to operate a fleet currently numbering over one hundred aircraft. Contact us at any time to discuss your aircraft management needs.

www.solairus.aero/aircraft-management linkedin.com/company/solairus-aviation

PLATINUM RATED ARGUS SINCE 2006

PROUD WYVERN WINGMAN

International Standard for Business Aircraft Operations IS-BAO ibac

Have you seen any increase or decrease in the past year in managed aircraft demand? What factors are driving these changes?

Solairus Aviation (Dan Drohan)
We have seen a significant uptick in corporate flight departments going to management companies. They are getting management off their plate and into the hands of someone who knows how to do it well. Corporate flight departments have realized it's too complex and prefer to focus on their core competencies.

Priester Aviation (Andy Priester)
In 2016 we doubled the number of contracted aircraft we manage. Internally, we had a great sales effort. I wish I could say exactly what the driving economic factors are.

Jet Aviation (Don Haloburdo)
Yes, an increased demand. [Last year was] the busiest year for adding to our fleet. There has been a significant decrease in residual values in the used aircraft marketplace, while others might not have stepped into full ownership because of operation costs. For first-time owners, the mindset is that I need a turnkey solution.

Jet Edge (Bill Papariella)
There's been a significant increase in demand for our services, and increasingly so over the last year. With falling residual values driving the buyers' market—most notably with large-cabin business jets—owners and buyers are cutting their overhead by purchasing used equipment, which is now selling for as low as 75 percent below the original price. Management companies like Jet Edge are in greater demand now than ever before. We assist owners in determining the real value of their equipment, how that value is affected by their flying, and when to take advantage of buying and selling opportunities to stay ahead of the market. Larger, more capable operators simply have more to offer.

Gama Aviation Signature (Duncan Daines)
No change. We are not seeing flight departments lose aircraft. Some people want their own chief pilot managing aircraft. But [this could change because] in Europe there are more requirements for compliance with a smaller fleet, and that might be hard for a chief pilot to get involved in.

EJM (Michael Tamkus)
Within the last year, we have seen some more corporate flight departments look to a management company to leverage the economic values of scale, operational oversight, increased risk management, and the ability to operate Part 135.

Clay Lacy (Brian Kirkdoffer)
There is a huge increase since we started doing this in 1969. The value of the asset has never been better, as we have historically low prices. Manufacturers are giving large rebates and incentives. Fuel prices are low. Aircraft financing is low. Aircraft management offers greater savings today.


JET EDGE
The large-cabin leader in private jet management & charter.
Jet Edge operates the largest fleet of exclusively large-cabin charter jets in the United States. Aircraft owners benefit from a combination of strategic partnerships and a wide sales channel, driving unparalleled demand for their aircraft in the charter marketplace.
Jet Edge boasts one of the industry's most comprehensive safety and security platforms as well, holding ARGUS Platinum, IS-BAO Stage 3, and Wyvern Wingman ratings, in addition to integrating several airline-level safety programs.
ELEVATE YOUR EXPERIENCE
Call today (818) 473-0059
management@flyjetedge.com
flyjetedge.com

Clay Lacy (Brian Kirkdoffer)

This [2016] is one our fastest growth years. Yes, there is an uptick. The industry has matured. The benefits with management are now very big. Corporate flight departments can't replicate or create the scale needed to buy fuel, provide the training experience, and run a back office and flight operations. FAA compliance is hard to create efficiently and effectively. Sometimes they'll turn over the management to us.

Solairus Aviation (Dan Drohan)

Yes. We've had five big flight departments make the transition to us in the last two years. We understand that owning an aircraft is a major investment that comes with considerable responsibilities. When you select Solairus Aviation to support the operation of your aircraft, you gain a full range of services focused on safety, service, and savings. Our focus on the management of your aviation asset allows our clients to simply enjoy the benefits of their investment: flexibility, convenience, and reliability.

Does your organization work with corporate flight departments? Why might it make sense for a company to outsource management of its aircraft to your company?

Jet Edge (Bill Papariella)

We work with several flight departments and provide varying degrees of aircraft and account management—from charter management only through select administrative, maintenance, and operational support to meet specific needs. Key services include schedule optimization with owner flying, charter flying, repositioning, maintenance, and meeting charter budget expectations by driving substantial demand. This partnership also unlocks pricing advantages on the largest owner and operational expenses. Larger companies, like Jet Edge, pass along volume purchasing discounts. We maintain as much or as little of the day-to-day management of their aircraft as desired and permitted for their operation type. Safety management systems, training programs, and operational procedures require time, personnel, and capital. By partnering with a management company, a flight department gains a comprehensive safety and operational platform that can outperform its own ability. Plus this approach elevates demand for their aircraft within the charter market.

Priester Aviation (Andy Priester)

There are vast differences in how corporate flight departments are staffed. There might be eight or two employees. With us, they get scope and depth across all the departments.

EJM (Michael Tamkus)

Workload alleviation. We offer complete freedom from the complexities of day-to-day flight operations and enable peace of mind. We cover all aspects of aircraft ownership and provide vast cost- and time-savings benefits resulting from purchasing power, fleet volume discounts, and operational expertise. We capitalize on the best practices implemented through nearly 40 years of experience and our global operations. We support the risk-management objectives of large corporations, which is of incredible value to our clients. Clients secure full ownership with fractional hours and charter to maximize efficiencies and optimize contingency plans.

Jet Aviation (Don Haloburdo)

Our crew training provides an incentive. Crew training costs for new aircraft can be $100,000. We are able to leverage a large number of pilots to control training costs.

Gama Aviation Signature (Duncan Daines)

Not with management of aircraft but with supplemental lift for their flight departments. They'll contact us to charter, to pick up an aircraft over a mechanical situation. We offer depth of knowledge to managing and maintaining aircraft, geographic breath, and the purchase benefits from being scaled. That's what we describe to corporations.


Ordinary didn't get you here.
Extraordinary will take you there.
San Francisco
Los Angeles
Las Vegas
New York
Palm Beach
London
Geneva
Moscow
Dubai
Hong Kong
Gama Aviation
Charter. Management. Maintenance.
gamaaviation.com
+1 203 337 4600.

Priester Aviation (Andy Priester)
What is convenient? There is a general misconception that charter beats up your aircraft badly. Typically, charter customers are well-heeled, respectful business people. Rarely is there significant wear and tear on aircraft due to a particular charter. If something unacceptable happens, each charter customer must fix it.

What questions should owners be asking themselves while deciding whether to offer their aircraft for charter?

Clay Lacy (Brian Kirkdoffer)
Pilots and aircraft need to fly per month and year. If they fly less than what the crew and aircraft should fly to stay current and lawful, then chartering to add hours can help them to meet their quota. How much is the owner going to fly? Is revenue something they have interest in to reduce cost of flight operation by up to 80 percent?

Jet Aviation (Don Haloburdo)
Ask: What do I want out of this? Is offsetting fixed costs the only benefit? That might not make sense for a limited number of charter hours.

EJM (Michael Tamkus)
What objectives is the aircraft intended to help the owner achieve? Identify goals, then work backwards to determine the correct operational approach. Employ the same philosophy and process used in traditional wealth management. Determine investment goals first, then strategize to accomplish them.

Solairus Aviation (Dan Drohan)
Will this aircraft be adequately available for charter customers? Will I put the time and resources in place to make this charter service truly operational?

Gama Aviation Signature (Duncan Daines)
What is the realistic number of hours the aircraft will be available? Delays in an owner's release of the aircraft could mean losing the charter deal. That happens a lot. Work out the mechanisms for doing that. Charter should be seen as a nice-to-have versus a need-to-have and should not be dependent on medium-to-high charter demand. You should be able to afford to run an aircraft without having to charter.

Jet Edge (Bill Papariella)
What can I reasonably expect for an annual offset if I charter my airplane? To understand and answer this, examine the depreciation schedule for the aircraft over life of ownership, as well as regional and geographic conditions and costs with the aircraft type. Residual loss that can occur from over-flying the aircraft within a given time frame—negatively affecting the value of the asset—must be factored when calculating the true offset that charter hours will deliver. Answering this question without an experienced advisor isn't recommended. Will I save money on sales and use taxes? As an example, the state of California will exempt an aircraft from sales and use taxes for 12 months if it is used more than 50 percent of the time for charter. At 8.25 percent on an $18 million jet, for example, this equates to a potential savings of nearly $1.5 million. Do not attempt to answer this without an experienced aviation attorney or advisor. Each tax situation is unique, so, to avoid costly mistakes, don't go it alone.

Is my aircraft desirable within the charter market? The largest factors that affect the marketability of a charter aircraft are its age, interior refurbishment, exterior paint, cabin configuration, and on-board amenities such as Wi-Fi connectivity and entertainment offerings.

IT'S ALL IN THE DETAILS

EJM has devoted 40 years to perfecting every aspect of private aircraft management and charter services for today's sophisticated aircraft owner, flight department, and flyer. Our customized approach, tailored to your unique needs and serviced by your 24/7/365 team of aviation experts, takes the hassle out of the day-to-day details and lets you truly enjoy the full benefits of private aviation.

As the largest aircraft management and charter company in the world, our infrastructure and experience allow you to take advantage of unmatched industry savings and state-of-the-art technology you won't find anywhere else. But it's our people's focus on the little things that makes your experience with EJM exceptional.

And as we know, **it's all in the details**.

AIRCRAFT MANAGEMENT | PRIVATE JET CHARTER | AVIATION SERVICES

www.ejmjets.com

Our belief is that customization matters. We have both the capability to serve globally and the agility to serve individually. Whether your need is full management, charter management, flight department support or anything in between, we're tailored to you.

Begin your journey with Priester and receive an impeccable introductory offer.

PRIESTERAVIATION

NEW YORK • BANGKOK • DALLAS • CHATTANOOGA • PHILADELPHIA • BOSTON
ST. LOUIS • WEST PALM BEACH • CHICAGO • OKLAHOMA CITY • KANSAS CITY

+1 888 893 7570
priesterav.com

TRU Simulation + Training is adding simulators and modern classroom training tools.

a much improved feel, according to FlightSafety, given the limited amount of motion that is available in the six axes in which a simulator moves. "It's an exercise in the physics and excursions allowed by motion," said director of engineering Dr. Nidal Sammur. "We have six axes, and with that limitation we try to zoom in and give the best performance and cues." Simulators with electric motion systems are best suited for sim cueing, as they offer more frequency response than hydraulic motion systems, he explained.

FlightSafety vice president of simulation John Van Maren, who is a pilot, has flight-tested the new sim cueing system. "From the standpoint of feeling like the aircraft, it's a night and day difference," he said. "This is going to improve the fidelity and quality of training."

The company's Airbus A320 simulator uses sim cueing, as do some of its helicopter simulators, the Phenom 300, Falcon 8X and other newer aircraft types.

On the display side, FlightSafety is adding more glass-mirror technology to visual displays, upgrading from the more traditional mylar-type mirrors, which tend to lose fidelity over time as they accumulate dust and grime. Easily cleanable glass mirrors offer a wider field of view, currently at 240 degrees horizontal by 60 vertical, but they can go up to 300 degrees horizontal. Glass is brighter and delivers better sun- and moonlight attenuation, atmospheric scatter, shadows and runway light glimmer. FlightSafety is adding more realistic scene detail on the ground, with buildings and roadways replicated more accurately. FlightSafety helicopter simulators have

used glass mirrors for five years and now they are being deployed on new fixed-wing simulators.

Pilots at FlightSafety learning centers will find new tools, such as upgraded graphical flightdeck simulators (GFS) and new iFlightDeck training modules available on the iPads that each student receives as part of the training program. The new Gulfstream G500 GFS will replicate the multi-touch features of the real airplane's touchscreen-based cockpit. One of the first iFlightDeck modules available is FlightSafety's CPDLC training software, which replicates the FMS button-pushing needed during a typical Atlantic crossing. "The whole idea is to make sure the transfer of training is specific and timely, so they don't waste a lot of time with the simulator," said Tom Montgomery, director of programs at FlightSafety's Savannah learning center. "We're trying to make advances in interactive publications and where to put training, whether in the simulator, GFS or iFlightDeck."

"Everything is physics-based," concluded Van Maren. "With today's computing power we're not limited like we were 20 years ago. Realism is much greater, and the pilot sees that in more accurate simulation of aircraft."

Simcom Aviation Training recently deployed a new King Air B200 simulator equipped with Garmin G600 displays and GTN 750 com/navigator, "to address glass conversions in the King Air market," according to the company. The next new simulator will be a Daher TBM 930 with Garmin G3000 touchscreen-controlled avionics, supplemented with a standalone desktop G3000 trainer. Simcom has also added a recurrent training format with progressive checking, "with optional training modules designed to allow customers to tailor training to their needs," the company said.

CAE, which also manufactures simulators and provides pilot training, has designed a new training program that uses data collection and analysis to provide what it describes as a more objective approach to training. The Next Generation Training System, which enables instructors to use big data and analytics to evaluate pilots, is currently in the validation phase and will be offered to business aviation customers once the trial phase is completed this year.

Other CAE efforts include retrofitting sims for upset prevention and recovery training and new simulator technology such as the Tropos 6000XR visual system, CAE Airport Clutter Editor for building realistic airport scenarios, True Airport airport updating system and training devices such as the 400XR and 500XR and Simfinity XR for avionics and ground training. ❑

Advanced training in a FlightSafety International Falcon 900EX Easy sim.

Training tools for the present...and the future

Even as long ago as the early 1980s, companies offered desktop simulation devices to help pilots learn and practice IFR procedures, the ATC-610 being a prime example. ATC Flight Simulator is still manufacturing aviation training devices for multi-engine piston and turboprop, helicopter and firefighting simulators.

The advent of more powerful computing has greatly benefitted the pilot community, not only allowing companies such as ATC to improve their products and new companies like Redbird to launch but also encouraging developers to come up with training tools that play on generic computers instead of dedicated devices.

One of the best places to learn about computer-based simulation is the annual FlightSimCon show, held in Bradley, Conn., each June (this year's show is scheduled for June 10 and 11). During the show, visitors can try out all sorts of simulation devices and programs, but the simulator enthusiast group Boston Virtual ARTCC (BVA) setup offers a different way to fly a simulator. Volunteers from BVA set up computers running flight simulators and invite people to learn about flying or hone their skills, explained BVA training administrator Evan Reiter. "We put on a live demo of online flying," he said, with pilots handling the flight controls and nearby volunteer air traffic controllers acting as a live ATC network using the free Virtual Air Traffic Simulation Network (Vatsim).

BVA is a regional member of the worldwide Vatsim network, offering a realistic flying experience for flight simming pilots in the Boston ARTCC encompassing most of New England (but not New York City). Membership in BVA is free, and what makes this organization unique among Vatsim members is that it allows pilots to join as well. (Vatsim's free ATC services, run by volunteers, are accessible worldwide.)

The benefit of working with live controllers while flying a desktop simulator is that it makes for a more realistic experience, Reiter explained. Practicing a maneuver in a simulator is useful, but adding ATC to the mix is even better, because the pilot has to heed controller instructions, warnings about other traffic, obtain clearances and so on. Anyone can join BVA and Vatsim, and BVA provides detailed instructions on how to participate.

For simulator pilots looking for a more formal ATC

Continues on next page ▶

Simulator enthusiasts, including many pilots, flocked to the Boston Virtual ARTCC pavilion at FlightSimCon 2016 to try their hand at flying while interacting with nearby volunteer air traffic controllers on the Vatsim network.

Low costs bring sim tech to wider market

by Curt Epstein

Flight simulators have come a long way since the primitive Link trainer helped the U.S. military churn out tens of thousands of pilots during World War II. The device, a collection of pneumatic tubes and vacuum pumps indicative of its inventor's background as a pipe organ manufacturer, moved a student pilot seated in a miniature airplane, depending on his control inputs. It was used to teach instrument flying, and had an opaque hood that closed over the top, isolating the trainee and forcing him to concentrate on their illuminated instruments, while a linked writing device plotted his course on a nearby map table. Some 10,000 of the "blue boxes" were produced during the war years.

The airlines began using simulators in the 1950s, and the devices have continued expanding in utility and complexity ever since, with an explosion of development over the past decade. As they improve they are becoming a more central tool for training new pilots. "The simulators are better, specifically because they are visual systems; they're more appropriate for ab initio training," said Carl Suttle, joint CEO of simulator manufacturer FlyThisSim. "In the old days when flight simulators didn't have a visual, they were useful only for instrument training."

Today, flight simulators run the gamut of price and complexity, from continually upgraded computer software such as Microsoft's Flight Simulator and X-Plane, to desktop aviation training devices, to larger static systems mounted in aircraft cockpit representations, all the way up to the monolithic Level D full-motion simulators that reside in specially designed buildings and are operated by the likes of training providers such as CAE and FlightSafety.

At approximately $1,000 an hour to operate, they are generally reserved for the most experienced pilots. "The guys who are using those Level D simulators are the guys who need it the least," observed Jerry Gregoire, founder and owner of Texas-based Redbird Flight Simulations. "After you have flown 25,000 hours in airplanes, being in a motion simulator does almost nothing for you, and yet these are the guys that the FAA insists have motion systems. We knew it was important for the primary student."

Today's graphics capability, with the widespread integration of GPS, allows manufacturers to give pilots a geospecific experience such as this Elite AS350 flying over the Las Vegas Strip.

His company was one of the first to bring motion to simulators aimed at new pilots. "We knew that motion was a key factor in training new pilots, and nobody had a motion system that anybody could afford," he told **AIN**. "There were motion systems, but they required a lot of money, and they required special facilities and special rooms and special electricity, so when we began engineering 10 years ago, one of the key design features we needed to accomplish was a motion system that could be carried through a regular size door, set up in a classroom and plugged into a wall outlet, which we did."

Other companies soon followed suit with similar smaller, more manageable training devices. Affordability was also a driving force. While Level D simulators can cost many millions of dollars, the smaller simulators such as those produced by Redbird cost a fraction of that price, topping out at several hundred thousand dollars, making them more attractive to flight schools and university training programs.

"Today we can teach stick-and-rudder skills and a muscle memory built on reacting to motion cues that you could never claim before except in an airplane, so things have gotten a lot better for the primary student," said Gregoire.

Benefits of Video Games

Even the static training devices have made vast strides of late, according to Suttle, who noted that the current level of realism allows them to be used for other forms of training. "It's massive improvement in the visuals, which are both geospecific—meaning you can use them for pilotage—and faster in terms of their refresh rates. The result is more realistic because graphics cards are so mind-bogglingly powerful now."

"When these devices were first approved 10 to 15 years ago, they were used mostly for IFR procedural training and the outside graphics weren't that great," noted John Dixon, president and CEO of Elite Simulation Solutions. "With the much nicer graphics that we can do now for outside visuals, more and more people are seeing the value in ab initio or for entry-level training."

Suttle explained that the visual systems that now accompany flight simulators have been driven by the recent advancements in three-dimensional video game graphics. "Even though that technology itself was born from flight simulation, it's really the gamers who have produced such power, and now that's being fed back into flight simulation," he said.

"Your multimillion-dollar flight simulators are tasked only with having accuracy around the airport environment, so if you flew

Continues on page 24 ▶

Training tools for the present...and the future

▶ *Continued from preceding page*

experience, PilotEdge offers real-time ATC services seven days a week. Controllers are mostly those who have retired from jobs in ATC, and flying while using PilotEdge is extremely realistic; controllers are strict about proper phraseology and procedures.

PilotEdge launched in the Los Angeles ARTCC but has now expanded to the western U.S., covering the Seattle, Oakland, Salt Lake City, Denver and Albuquerque ARTCCs. Unlike the Los Angeles coverage, which treats all airports within the ARTCC normally, the new western coverage offers full ATC services only at seven major airports, and on a two-week rotating basis 10 more airports are available.

Other towered airports within those ARTCCs are treated as non-towered. The idea for the expansion was to offer simulator pilots flying transport-category airplanes longer routes suitable for faster airplanes.

As a commercial operation, PilotEdge is easier to incorporate into existing simulator operations. For example, the Simulator Training Center in Camarillo, Calif., offers PilotEdge during training sessions in a Redbird training device. TRU Training + Simulation offers customers access to PilotEdge during simulator training. To add even more realism to desktop simulation, two pilots can simulate flying the same airplane together as a crew. PilotEdge also offers remote coaching via Skype from an experienced flight instructor.

PilotEdge can even save manufacturers money on certification programs. Gulfstream, for example, used PilotEdge for crew workload and human factors tests on the G650 program, saving hours of hugely expensive real-airplane flight-test time, and it is doing the same for the G500/G600 program.

One area where desktop simulators can help pilots of all stripes is in learning new avionics. In the simulator environment, many actual avionics systems are replicated, although with varying degrees of fidelity. In X-Plane, for example, Garmin's GNS 430/530 com/navigators are fully modeled, while the G1000 system has not yet been given full functionality by any developers in the simulation community. China-based Simionic has accurately replicated the G1000 system on the iPad, a remarkable accomplishment given that this was done without input from Garmin.

Avionics functionality is even better with certain aircraft models and in the Microsoft Flight Simulator X (FSX) environment (currently offered for commercial users by Lockheed Martin as Prepar3D and on Dovetail Games' Steam platform for home users). Flight1Software offers an add-on version of Garmin's GTN 650/750 com/navigator and an Avidyne Entegra panel, both available for Prepar3D/FSX users. Developers Carenado and Alabeo have replicated a huge variety of aircraft, many with stunningly accurate avionics, including FMS. Boeing is among the most progressive of major manufacturers, having licensed its intellectual property for multiple airplane types with a remarkable level of fidelity.

BVA's Reiter, who plans to become an airline pilot, sees a major benefit with the airliner replications that equip pilots, especially light-airplane pilots who have never been exposed to an FMS, to learn how to program the FMS without access to a full flight simulator or real airplane. "I've been in a real 737," he said, "and using only what I knew from the simulator, I was able to program the FMS." —*M. T.*

Sim makers such as Elite attribute the expansion of simulator use to new pilots to improvements in visual displays.

Signature®
FLIGHT SUPPORT
A BBA Aviation company

Visit **signatureflight.com** or **1.888.367.0673**

Low costs bring sims to wider market

▶ *Continued from page 22*

over San Francisco, you would probably see some kind of low-resolution image of the city. Gamers won't put up with that, and if you fly around San Francisco in X-Plane, you'll see a good 3-D representation of the Golden Gate Bridge, the TransAmerica Building, automobiles and trains."

Another big boost to current simulators is the widespread integration of GPS, which has allowed manufacturers to imbue them with extraordinary mapping accuracy. "Add the two together with some clever programmers and we've got awesome geospecific graphic systems for flight simulators," added Suttle.

This accuracy lets users fly approaches at different airports whenever they wish and in all sorts of simulated weather. "You can do 10 approaches in an hour in a simulator. You can do perhaps two in the aircraft, so you get more repetition [in the sim]," explained Suttle. "Because of the extra power we have available in the computers we can now do good representations of the instrument automation, so [the user has] good autopilots, good GPS navigators, moving maps and all of those other things that you need to be able to practice."

Suttle's company builds static simulator devices primarily for the private pilot home market. He saved on manufacturing costs by eschewing real avionics, opting instead for graphic representations of cockpit instrumentation on a touchscreen. He also credits a confluence of technological advances for making the system more affordable. "We've got the computer power now, we've got the graphics power now, we've got the large TV screens at a ridiculously low cost now and we've got touchscreens at low cost."

Training in a Frasca H125 simulator in a congested downtown area.

Speedy Familiarization

Cost is certainly a major concern for the general aviation training market as well, since any expenditures will be passed along to the students. "Let's say you have a flight school with two airplanes sitting on the flight line," said Dixon, whose Florida-based company produces training devices from desktop to six-degree-of-freedom motion simulators ranging in price from $10,000 to $300,000, and caters largely to the flight school market.

For the highest-level simulators, manufacturers must use air data handling packages from the airframers that will verify the simulator's performance. "Since we're not in that category we don't have to have the aircraft manufacturer's data," Dixon told **AIN**. "What we do is rent the aircraft, and we have pilots on staff who go out and take measurements ourselves. It's more the bottom end of the training device [scale], but that doesn't discount the capabilities for training."

The devices Dixon's company makes can use real avionics or digital representations, depending on customer needs, for training devices for aircraft as large as a King Air 200 or as complex as an Airbus Helicopters AS355. "We also use electronic actuators that will give you motion cueing, so that with a high-definition visual system, your brain is interpreting motion through the cueing, and with that motion cueing we can give a good motion-based trainer at an affordable price."

"If you had a good sim that felt and flew the same way as the aircraft and a good visual system, you can kind of go through that familiarization and orientation process in the device, which has a far lower operating cost for you, so that way when you get to the aircraft, essentially all you are doing now is starting to work on becoming proficient," said Randy Gawenda, manager of business development for Frasca, which produces training products up to Level D simulators, starting at $100,000.

Frasca recently introduced a new program to assist new pilots in its simulators, known as SimAssist. "It's almost like an automated stability augmentation system for the sim, so that way when they first get in there, and they're not particularly good with muscle memory, they're needing to learn those things," said Gawenda. "SimAssist can help in much the same way the instructor follows through on the controls. You can either set a particular fix level or it is automatically adaptable, depending on the pilot's control inputs."

Aviation training devices have also found new niches as well. "All kinds of new technologies were designed specifically to teach the primary student the skills that you used to have to burn gas to do," said Gregoire. "These are the skills and muscle memory trainers that get students good at doing something before they actually go out and do it in the airplane." As an example, Redbird produces a generic crosswind landing trainer. "It's a bit of a one-trick pony, said Gregoire, "but it's a really important trick." The company also produced a program called Parrot, which can provide practice on radio skills, a subject Gregoire calls the second hardest to learn in aviation.

"It behaves exactly like ATC. The simulation knows where it is, what radio frequency it should be receiving because we have the entire world's database in this simulator so students coming out of school using Parrot in their Redbirds are already proficient on the radio before they go out and fly around."

Likewise, he believes aviation fuel should not be wasted learning how to use electronic flight bag (EFB) applications such as ForeFlight; therefore, his company developed a software package called Cygnus and integrated it into its products. "If the simulator is sitting in Seattle, ForeFlight is always going to think it's in Seattle, no matter what you are doing with the simulator," Gregoire explained. "Our simulators spoof the location service layer in Apple's operating system so when you climb into one of our simulators, your device thinks it's wherever the simulation is taking place. This is how you use technology for primary training and make it so much safer."

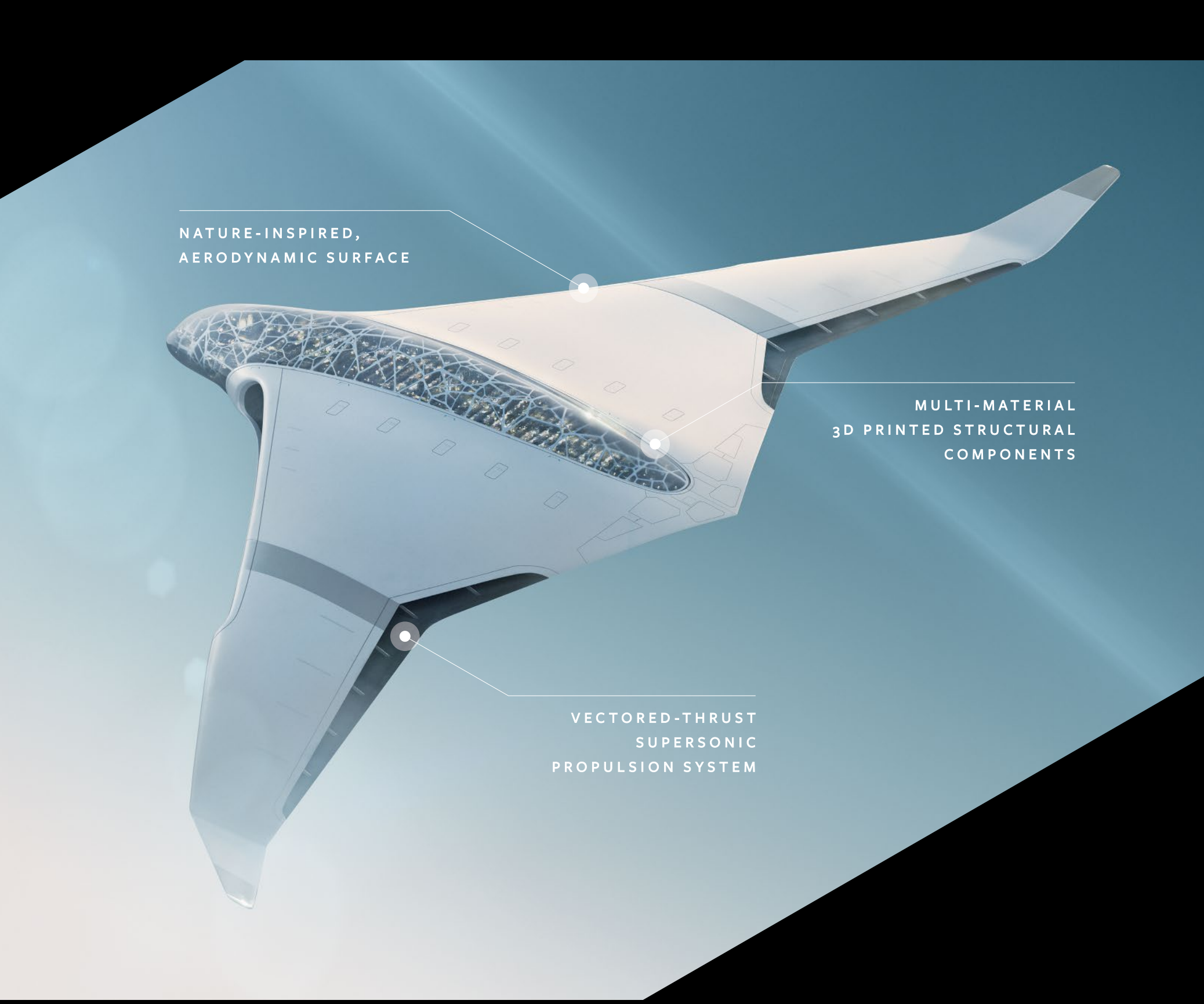
The use of simulators allows students to experience many scenarios that would be too dangerous otherwise. "There are certainly situations and emergencies that I can do in the simulator, but in the aircraft I can only simulate it because I need to make sure we walk away from it and we don't bend any metal," said Gawenda.

Likewise, Dixon recalled how during his student pilot days instructors were not permitted to pull circuit breakers to simulate an emergency in bad weather. "I loved to take checkrides in bad weather because I knew the instructor couldn't screw with me, but in the simulator, the instructors can run these kids through any kind of scenario imaginable, and nobody gets hurt if they mess it up."

For rotorcraft training, autorotation is one of the most challenging skills to teach. Yet Elite offers this ability in its Robinson R22 trainer. "A lot of schools have stopped doing touchdown autorotations because it's a great risk to property damage and it's a very high risk to life, because it's dangerous," said Dixon. "With a simulator we can give the exact same environment and the exact same procedures to do touchdown autorotations, and to me that's a tremendous benefit."

Beyond safety concerns, mastering such skills before entering the cockpit can provide considerable savings to the student. "Even an R22 is going to cost more than $300 an hour to operate," noted Gregoire. "The paybacks are so fast because it costs about $1.50 an hour to run one of our simulators. If you're good at hovering in our simulator, the real helicopter is a non-issue." ❑

Redbird simulators run the gamut from low-cost desktop sims to immersive ATDs (above) and motion-base devices such as the helicopter simulator (below).



ARCONIC
Innovation, engineered.

Where Can't Doesn't Fly

Don't just come with your easy problems. We relish a challenge. Mastering complexity has filled the sky with things we once could have never imagined, like blended wing body planes, hovering jet fighters and reusable spacecraft. When our aerospace customers take on the next big endeavor, our materials and manufacturing innovations help them keep the world looking up, wondering how. **Arconic. Where the future takes shape.**

Changes at FAA

▶ *Continued from page 8*

professionalism and is making a strong push to emphasize compliance and data-sharing.

The FAA has a number of other congressionally mandated rules on its plate this year. The agency has outlined a schedule to release a proposal that would require drug and alcohol testing for certain foreign repair station employees. In the 2012 FAA Modernization and Reform Act, congress mandated the drug and alcohol testing requirements for foreign repair station employees. The agency was under a 2013 deadline to release the proposal, but didn't release the advance notice of proposed rulemaking until 2014. While scheduled for release this year, the proposal might be delayed further.

Flight and duty time limits also remain on the FAA's agenda this year. The agency has long been working on requirements to apply flight and duty requirements for commercial operations to tail-end ferry flights as well. The schedule would publish both a proposed rulemaking for Part 121 operations and an advance notice of proposed rulemaking for Part 135 this year.

With the new Part 107 regulations for small unmanned aerial systems (UAS) released last year, the FAA is expected to turn to large UAS this year, noted Carr. An aviation rulemaking committee is expected to start up early this year, focusing on UAS that weigh more than 55 pounds and operate beyond line of sight.

As the FAA works with the industry on these rulemaking efforts it continues to focus on internal improvements. Two key initiatives to help with its consistency in regulatory interpretation are anticipated to come to fruition this year.

One involves a readily searchable library of all FAA regulations, guidance material and other documents. The central database, which is in prototype stage but is expected to become more functional this year, puts those documents in one location, ensuring that the industry and agency officials are working from the same set of documents.

Dispute Resolution

The second initiative is the development of the Regulatory Consistency Communication Board (RCCB), which provides a central board for industry and the FAA to resolve questions and disputes. The FAA hopes to put out a final order that would formally implement the board's operations this year.

These efforts are a high priority for a cross section of industry. "We will be working to ensure the FAA continues to provide robust support for implementation," said Deere. The FAA has set in motion another major initiative that it calls "AIR Transformation" or the transformation of its aircraft certification service (AIR). This transformation is designed to address long-held concerns about the cumbersome, bureaucratic process that attends certifying products. The transformation involves the use of more risk-based oversight and expanded use of an organization designation authorization program, Desrosier said.

But it will also reorganize the AIR, he added. The FAA's Flight Standards Service is looking to reorganize too, Flight Standards director John Duncan told NATA members last year. But he stressed that a culture shift must accompany all these changes. "Changing the structure and applying the same culture might not have a successful outcome," he said.

The industry is working on other issues this year, such as preservation of airports, in response specifically to efforts to close or restrict activity at airports in Santa Monica, Calif., and East Hampton, N.Y. The fight at both these locations will continue this year. ❑

Revealing the FUTURE

Many Services – One Jet Aviation
Celebrating our 50th Anniversary and Beyond in 2017

MRO, Refurbishment, Completions, FBO, Aircraft Management,
Flight Support, Charter, Staffing.

www.jetaviation.com

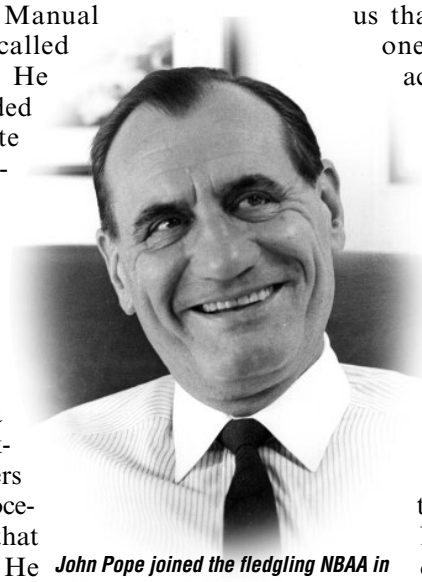
JET AVIATION
A GENERAL DYNAMICS COMPANY

AIN writer, NBAA staffer John Pope dies at age 97

John Pope, one of NBAA's first employees, died on January 8 at the age of 97. In World War II Pope flew B-17s and C-47s and later logged 500 hours flying C-87s and C-109s—B-24 Liberator bombers converted to carry cargo—over the Hump from India to China. After discharge in 1946, he was recalled to serve in the Korean War (1951 to 1953), the Berlin crisis (1961) and again in 1968 to 1969 after North Korea seized the USS *Pueblo*. He retired from the U.S. Air Force in 1975 with the rank of Colonel.

Pope joined NBAA in 1961 as executive assistant, the number-two of three staff, at a time when the fledgling organization had 325 members. He mastered writing, with assignments to publish newsletters and to rewrite, edit and publish the NBAA Recommended Standards Manual and later a series called Management Aids. He organized and founded the NBAA Corporate Aviation Management Committee. In 1966 he took on responsibility for organizing the annual convention.

After a bad bizav accident in the late 1970s, Pope initiated a series of two-day workshops to help members create the written procedures and policies that the NTSB sought. He retired from the association as v-p of membership services at year-end after NBAA 1984 in Atlanta.



John Pope joined the fledgling NBAA in 1961. He worked for the association until 1984, retiring as v-p of membership.

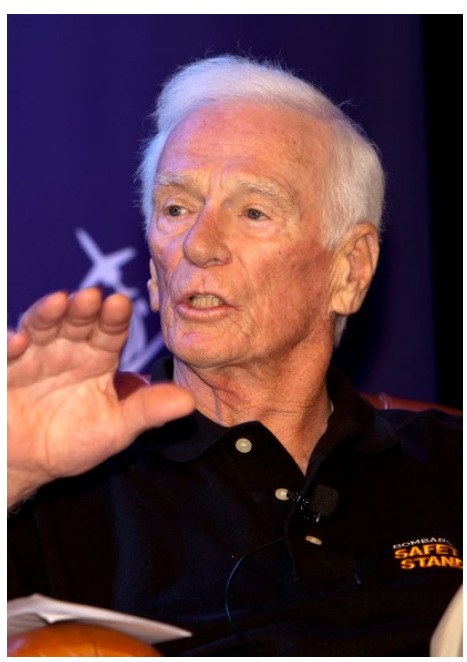
He then established a consultancy for corporate aircraft owners and took up freelance writing for this magazine and *Flight Training*. In the monthly Congressional Observer column that he wrote for **AIN** until hanging up his quill in 2009, Pope kept us all abreast of goings on and delighted in exposing pork and skewering its beneficiaries in government. Kathryn Pope Schmeiser recalls that her father "always told us that writing for **AIN** was one of his greatest career achievements."

Pope John, as he was known to his many friends, was a founder of the Northern Virginia chapter of the Air Force Association and served as president of not only that unit but also of the state unit. He was a member of the Congressional Squadron of the CAP, Order of Daedalians and the QBs. He also led the Northern Virginia chapter of Mended Hearts, a support group for open-heart surgery patients.

Pope is survived by his wife, Wilma; daughters Kathryn of Fairview, N.C., and Victoria Deppensmith of Buchanan, Va.; son Stephen of Herndon, Va.; five grandchildren; and six great-grandchildren. —*N.M.*

Astronaut, safety advocate Gene Cernan passes at age 82

Eugene Andrew (Gene) Cernan, the last person to walk on the Moon, passed away on January 16 at the age of 82. During his 20 years as a Naval aviator, Cernan spent 13 with NASA, leading to three historic space missions: as pilot of Gemini 9, lunar module pilot of Apollo 10 and commander of Apollo 17. The second American to walk in space, he flew to the Moon twice and became the last human to set foot on its surface, in December 1972.



Gene Cernan belonged to an elite club: he flew to the Moon twice and was the last human to walk on its surface, in December 1972.

While known for his space missions, Cernan was an avid pilot who logged 5,000 flight hours and counted the Learjet 45 among his type ratings. He was deeply involved in aviation safety, becoming known as the "public face of Bombardier's Safety Standdown," NBAA said.

Cernan spent a decade on the Safety Standdown Advisory Council and served as the program's ambassador. Bombardier paid tribute to his service in 2015 and created the Eugene Cernan Safety Award in his honor. NBAA honored Cernan with the Meritorious Service to Aviation Award in 2013 at its annual convention, where he regularly attended and often joined other aviation legends in presenting the National Aviation Hall of Fame's annual Combs Gates Award.

Born on March 14, 1934, in Bellwood, Illinois, Cernan became interested in aviation watching newsreels of World War II fighter pilots, the San Diego Air & Space Museum recounts. He graduated from Purdue University in 1956 and entered the U.S. Navy after that. He served as a fighter pilot, and in 1963 received a master's of science in aeronautical engineering from the U.S. Naval Post Graduate School in Monterey, Calif. —*K.L.*

rolls-royce.com

Rolls-Royce

Nobody does it like CorporateCare®

Bringing you the most comprehensive and sought-after business jet engine maintenance program in the world, with industry leading service and expertise provided by the original manufacturer. Regardless of where you travel, CorporateCare will be there to support you. To help maximize your asset's availability, value and liquidity, Rolls-Royce is proud to offer CorporateCare. To find out more contact Steve Friedrich, Vice President – Sales and Marketing, at +1 (703) 834-1700, or email corporate.care@rolls-royce.com.

Trusted to deliver excellence.

Getting the Stomach for Upsets

AIN senior editor spends a day in all-attitude jet upset training at Aviation Performance Solutions.

by Matt Thurber

The view from the rear seat of the Siai-Marchetti S211 over the Arizona desert.

PHOTOS: MATT THURBER

We're at almost 40,000 feet, and I'm pulling back on the beefy stick of a two-seat Douglas TA-4J Skyhawk single-engine jet trainer, about to make the airplane stall. "Keep pulling," says Phillip "OP" Oppenheimer, Aviation Performance Solutions (APS) instructor and Top Aces chief pilot, over the intercom as the airspeed bleeds off and the outside world tilts up further–"pull, pull, pull," just like a pilot might mistakenly try to stay level as airspeed decays during a high-altitude upset. Finally, as the angle-of-attack needle crawls to the maximum AOA (at that altitude) of about 12 to 14 units and the jet's nose points well above the horizon, the airframe shudders and it's time for the recovery procedure: push to reduce AOA, roll wings level, add thrust and… wait, wait, wait.

The flight in the TA-4J was the second sortie during a busy day of jet upset prevention and recovery training (UPRT) at APS headquarters at Arizona's Phoenix-Mesa Gateway Airport in mid-December. APS offers UPRT courses in a variety of aircraft as well as advanced simulators, starting in the Extra 300L aerobatic piston single, then progressing in advanced training to the Siai-Marchetti S211, Dornier Alpha Jet or TA-4J. I had previously flown with APS in the Extra 300L, and this time I was invited for a day of jet upset training in the S211 and TA-4J.

APS has expanded beyond Phoenix and opened a wholly owned UPRT location in Dallas and a joint venture in the Netherlands with the Test and Training Center; it also has licensed training facilities in Riyadh, Saudi Arabia, and Johannesburg, South Africa. In partnership with CAE, APS also contracts with the U.S. Army to provide UPRT in Dothan, Ala., in CAE's fleet of Grob G120TP single-engine all-attitude turboprop trainers and C-12 (King Air 200) full-flight simulators. The APS Advanced Jet Pilot Integrated Upset Training program is part of a four-day course that begins in APS's Extra 300Ls and provides time in an advanced simulator culminating in a day in one of the three jets.

The S211s are owned by APS and the Alpha Jet and TA-4J are owned by Top Aces USA, a U.S. division of Canadian company Discovery Air, which provides air combat training to the U.S. military and allies worldwide. When APS customers are flying in the Alpha Jet or TA-4J, it is always under an APS UPRT program flown with an APS-certified UPRT instructor pilot under contract with Top Aces.

The live jet training adds another dimension to UPRT, expanding APS's all-attitude training envelope into real-world regimes closer to those in which corporate pilots typically fly. While APS does train in advanced full-flight simulators, those sessions are less an exploration of human factors and the limits of jet flight envelopes and more an exercise in upset recognition and crew resource management techniques. UPRT in real airplanes is one of APS's specialties, and it helps customers experience and overcome the all-important startle factor that happens during an upset. More important, learning how to recover from developing upset events, some of them extreme, helps embed the proper recovery techniques in pilots, so that even when put into an upside-down and nose-low but high AOA predicament, the pilot knows that the first move must be—counterintuitively—to push the stick forward and reduce AOA before trying to roll upright.

The APS upset recovery processes are directly aligned with the industry- and ICAO-sanctioned Airplane Upset Recovery Training Aid, which can be downloaded from the Flight Safety Foundation or APS website. According to APS president and CEO Paul "BJ" Ransbury, "As does APS, modern UPRT providers must similarly align with, and integrate, ICAO's 2014 Manual on Aeroplane Upset Prevention and Recovery Training."

The APS All-Attitude Upset Recovery Strategy is seemingly simple and expressed as Push-Roll-Power-Stabilize, he explained, "yet it requires in-depth academic and practical training for pilots to truly be able to integrate it into their skills." However, he added, "As opposed to thinking of it as specific control movements, it's primarily an aid to enhance mental organization and discipline in a crisis: the pilot must manage angle-of-attack, then manage lift vector, make an energy decision then stabilize the flight path divergence while considering secondary flight controls and type-specific considerations."

Loss-of-control in flight remains the cause of the highest number of fatalities in business aviation and airline operations. Ultimately what UPRT does is help pilots not only recognize and prevent an airplane upset but also learn how to handle the recovery, if necessary, in a consistent fashion. This means, he said, "After APS UPRT, pilots have 'been there, seen that,' felt the adrenaline, felt their tendency to lock up from a psycho-physiological standpoint and developed the ability to reliably push through. They have a plan and implemented it. It's the consistency and reliability of these skills more than anything else in a life-threatening crisis that makes APS UPRT unique." Ultimately, he explained, the goal of UPRT "is to get the airplane safely back into the heart of the flight envelope."

Briefing for the S211

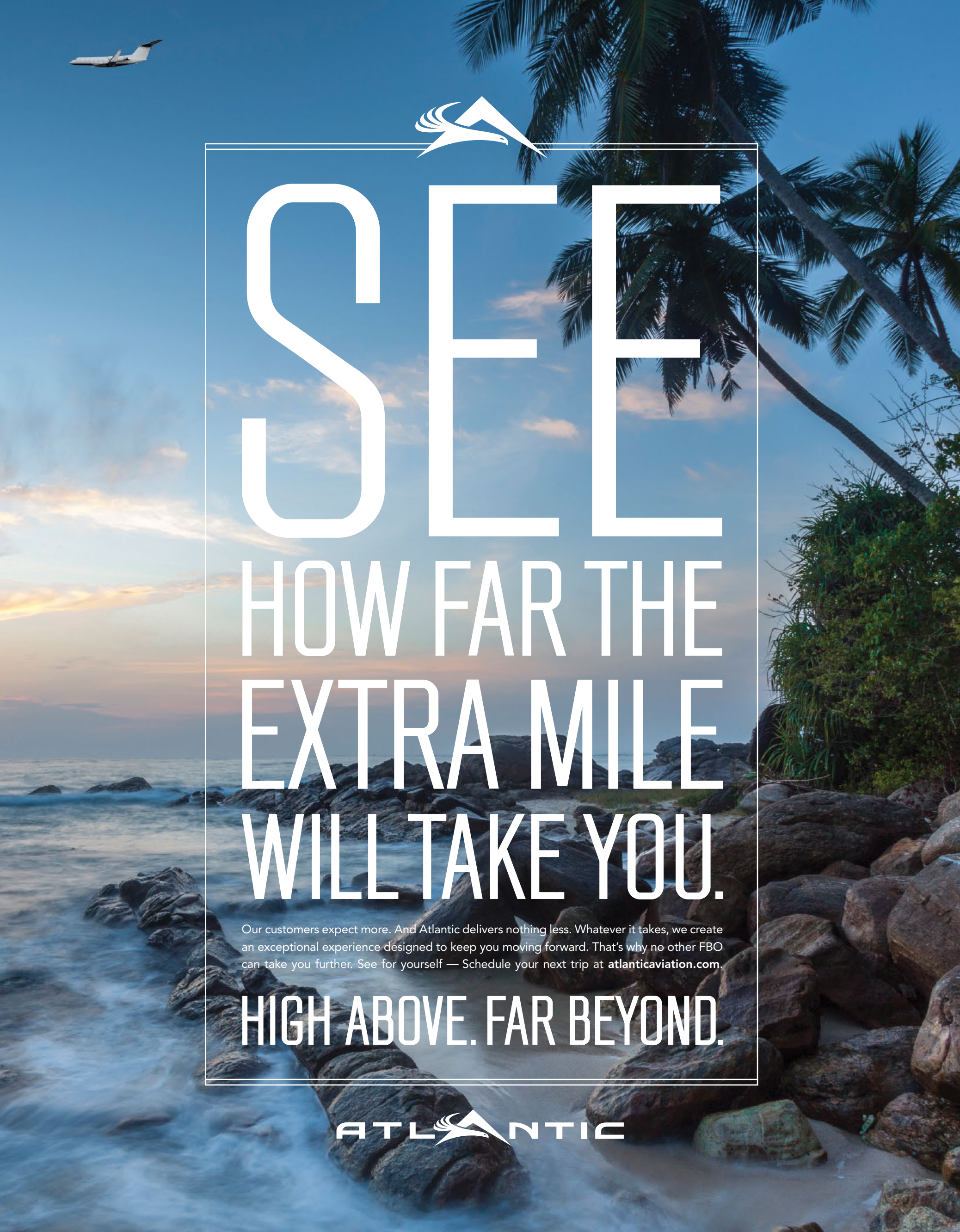
All jet training at APS is conducted by military pilots and, like any such operation, it begins with detailed briefings. My first flight was with Ransbury, a former Canadian Armed Forces F/A-18 Hornet, airline A320 and airshow pilot.

The all-attitude S211 is powered by a single 2,500-pound-thrust Pratt & Whitney Canada JT15D, an engine familiar to many corporate pilots. With a maximum takeoff weight of 6,063 pounds, the jet maxes out at 400 kias (Mach 0.8) and can reach 40,000 feet. Clean stall speed is 90 knots, and it is approved for upright spins. Primary flight controls are mechanical push-pull rods, although the ailerons are boosted hydraulically. While the S211 can be equipped with ejection seats, APS chose to fly this jet with pilots strapped into seat-back parachutes, and thus we briefed the manual bailout technique as well as other emergency procedures and the important positive exchange of controls process.

To make the S211 cockpit a little more familiar for modern corporate pilots flying glass cockpits, APS equipped the S211 with a Garmin GTN 650 com/navigator and G3X touchscreen display with synthetic vision backed up with a Mid-Continent Standby Attitude Module. The G3X also displays AOA right next to the airspeed tape. Although APS does high-altitude training in the S211, it wasn't necessary to fly with oxygen masks in the S211's pressurized cockpit on this particular flight as we weren't going to fly too high. In the TA-4J, however, oxygen masks were mandatory.

What is important to understand when flying the S211 and TA-4J and any jet in an upset is that events happen more slowly: pitch rates at a given load factor are less at higher jet speeds; and because

Continues on page 32 ▶


SEE
HOW FAR THE
EXTRA MILE
WILL TAKE YOU.
Our customers expect more. And Atlantic delivers nothing less. Whatever it takes, we create an exceptional experience designed to keep you moving forward. That's why no other FBO can take you further. See for yourself — Schedule your next trip at atlanticaviation.com.
HIGH ABOVE. FAR BEYOND.
ATLANTIC

Getting the Stomach for Upsets

▶ Continued from page 30

of higher inertia, an unload on the flight controls doesn't instantaneously reduce AOA as it does in the piston trainer. Application of power isn't instantaneous as it is in a piston-powered airplane, especially at high altitudes where air is thinner and turbine engines develop far less power than at lower altitudes. High altitudes also mean that control forces are heavier and stall speeds higher. While both the S211 and TA-4J can be used for low- and high-altitude training, the S211 UPRT profiles top out in the low 30,000s, while the TA-4J UPRT program goes into the high 40,000s.

S211 in Flight

After strapping into the S211 (I sat in the rear seat), we taxied to Mesa's Runway 12R. As is typical in upset training courses, the instructor (in this case Ransbury) did the takeoff. The S211 is relatively light, with a power-to-weight ratio of 0.413:1—about the same as an early Lear—and the low-bypass Pratt gave us a good punch of acceleration during the liftoff.

Ransbury handed me the controls, and I climbed toward the practice area, leveling off at 9,500 feet to remain below a cloud layer; the S211 profiles are typically flown between 10,000 and 18,000 feet. The S211 is responsive and well harmonized, with consistent and not-too-heavy control forces throughout most of the flight envelope.

I started with some steep turns to get a feel for the airplane. Ransbury then demonstrated a power-on stall and the APS baseline UPRT strategy. During the maneuver, he gave a step-by-step description of what he was doing and the indications on the AOA gauge, also underscoring how AOA and pitch are not related. For the stall recovery, he said the strategy out loud—push, roll, power, stabilize—and this helped cement it in my brain. After pointing out the slow power response, he finished the maneuver with the critical final step: stabilize. "Now I bring the nose up, power set, waiting for the positive rate, gear is up, flaps up, speed brakes in, trim set, recovery is complete. Now I can take my brain out of recovery mode and start troubleshooting the situation."

Then it was my turn. I pulled the power back to 65 percent and popped the speedbrakes to slow down, then pulled the nose up into the stall. As the nose tilted up and the speed dropped below 100 knots, we could feel the airframe buffet gently, then the nose dropped and the jet rolled slightly to the left. I unloaded the wings by pushing forward on the stick, rolled back to wings level, added power then stabilized by leveling the pitch attitude first then establishing a positive rate of climb. After retracting the speed brakes and checking that the gear and flaps were up, recovery was complete (although Ransbury had to remind me to say those last words as the final step in the process).

We did the same with more power added, then entered the sustained stall exercise at 10,500 feet. In this exercise, the point is to learn how it's necessary to overcome the swept-wing jet's inertia and keep the forward push on the stick even if the nose is already below the horizon. When the S211 stalled, the nose pulled to the left and dropped 20 to 30 degrees below the horizon, and I had to use right rudder to keep from entering an incipient spin. The sink rate reached 3,000 fpm. I pushed forward, then rolled wings level as the lift returned to the wings, added power, then stabilized back into a climb. "We have to recognize that we have to push," Ransbury said. "The airplane's dynamically unstable; we have to push in a stall even with the nose low."

During cross-control turning stalls in the landing configuration, we lost about 600 feet and the nose rolled sharply to about 90 degrees of bank. Ransbury pointed out that in the real world, the idea is not to stall during a base-to-final turn and recover 50 feet above the ground but to prevent the stall from occurring in the first place. In the cross-control stall, the AOA gauge does not always accurately show the actual stall—the stall in this case can happen suddenly before the gauge goes all the way red—but it still gives warning that a stall is coming. The cross-control stall, with proper training, feels wrong, and should be a strong cue to the pilot to recognize the situation and intervene before entering full stall, he added.

Next was one of the most dramatic exercises, the overbank nose-low recovery, where Ransbury rolled the Marchetti 120 degrees to the left and about 30 degrees nose down, then said, "Recover." Pilots without this training typically tend to pull back in a startling overbank situation

Continues on page 34 ▶

After rolling the S211 nearly upside down, APS president and CEO and instructor BJ Ransbury said, "Recover," and Thurber implemented the baseline APS strategy: push, roll, power, stabilize. The S211 is equipped with Garmin's G3X display with synthetic vision, and angle-of-attack indicator.

Thurber (right) with APS president and CEO BJ Ransbury after the S211 flight.

REDEFINING THE WORLD OF LUXURY PRIVATE FLIGHT

zettajet.com

Zetta Jet

It's about time

Zetta Jet combines the very best in talent, facilities and technology to deliver a revolutionary flight experience.

Contact our 24x7 global concierge desk for a customised flight itinerary to meet your travel desires.

We strive to deliver the ultimate in luxury travel.
Truly personalised, private flight.

Concierge Desk
T (US) +1 888 995 7908
T (SG) +65 6483 8870

NEW YORK | LONDON | LOS ANGELES | BEIJING | SINGAPORE | SHANGHAI

FAA Certificate Number I1DA914J

Getting the Stomach for Upsets

▶ Continued from page 32

because the ground is rushing up quickly and their non-UPRT instincts tell them pulling means up, he explained. Even though the nose was pointed down and we were nearly inverted, I had to push on the stick first to unload the wings, roll back to the right to level the wings, pop the speedbrakes, then try to keep the g load below 2.5, which is a typical maximum load for a business jet and also a key somatosensory feel that APS tries to inculcate in business jet and transport category UPRT customers.

"The concept of 'muscle memory' or 'control feel' in UPRT is generally misapplied as the amount of control column pressure to effectively unload the airplane can vary dramatically as a function of trim, speed and configuration," he had explained during the briefing. "The only truly reliable muscle memory in upset training is the sense of load factor on the seat of your pants."

I ended up pulling 2.4 g, lost about 2,000 feet and sped up to more than 300 kias. After I said I had completed the recovery, Ransbury showed me that I forgot to advance the throttle and that airspeed was dropping as I tried to maintain a positive climb rate. My error highlighted the importance of completing the "stabilize" step properly, by making sure pitch and power were at the desired settings. "You must be just as disciplined with stabilizing the aircraft as you are with pushing to reduce AOA," Ransbury said. "It all matters in ensuring a comprehensive solution to an airplane upset."

We tried the same maneuver with the S211's aileron boost switched off, which makes the roll handling much heavier. This conditions the pilot in training to be ready to use whatever control force is necessary to achieve the desired result. "Just because the controls feel different doesn't change the overall strategy for recovery," he said.

In the nose-high unusual attitude, I had to use bank to get the nose down. With the nose up to 38 degrees, I banked left about 90 degrees, too much as it turned out, then recovered by pulling too hard in pitch, about 1.5 g. The goal should be 45 to no more than 60 degrees to avoid creating a new unusual attitude, if any bank is used at all; also, I didn't unload the wings properly. Ransbury demonstrated a shallower bank and using pitch to about half a g, which helps prevent the onset of the stall, maintains more energy and controllability throughout the maneuver and assists in getting the nose down safely. As Ransbury reminded me, "Airplanes don't stall at zero g and the desired half-g unload is a best compromise between maintaining a margin of safety from the stall and keeping light positive g on the aircraft to ensure fuel and hydraulic operability not to mention the safety of crew and cargo not latched to the floor behind the cockpit."

The wake turbulence encounter was another dramatic event, simulating departing from the airport in clean configuration at 180 kias and nose up about 10 degrees. Ransbury took the controls and by rapidly augmenting the control inputs propelled the swept-wing jet to 150 degrees of bank to induce startle/surprise factor then said, "Recover." I pushed then rolled left and stabilized, losing about 200 feet, but I inappropriately used some rudder, too, which he pointed out can quickly cause unintended consequences in commercial jets. "If we get into a situation where we start dancing on the rudder and guessing what to do haphazardly, especially in a swept-wing airplane, we could really get ourselves into harm's way pretty quickly," he said.

To simulate IMC, APS uses a full curtain system in the rear cockpit of the S211 for glass-cockpit UPRT. "This is very popular with professional jet pilots," he said. During my flight, we tried two unusual attitudes while I wore a view-limiting device over my glasses, to simulate IMC and using the Garmin G3X ADI to recover. One was a 20-degree nose-low left 120-degree roll, and I recovered pulling just 1.5 g. The other was a takeoff-configured stall at 65-percent power, with cross-control rudder and ailerons. At the stall, the nose rolled sharply left to nearly 90 degrees, then I pushed, rolled level and stabilized; we lost 700 feet of altitude.

The training manuevers require a strong stomach. After an upside-down mock wake-turbulence encounter at high altitude, Thurber was feeling the effects. Fortunately, the g loading during the demonstration of a Split S sorted him out and he was ready for more maneuvers.

Phillip "OP" Oppenheimer, APS instructor and Top Aces chief pilot, left, took Thurber through the high-altitude training in the Top Aces Douglas TA-4J. The key, he said, is to keep in mind "slow, smooth and deliberate" is the way to recover from an upset.

After I had flown back to Mesa Gateway and entered downwind for Runway 12R, Ransbury took over and landed the S211. After the flight, customers are given a copy of a video of the UPRT session overlaid with flight data captured with a Garmin VIRB video/audio camera interfaced with the onboard Garmin avionics via Bluetooth.

Fighter-trainer Time

After lunch, Oppenheimer briefed me on the TA-4J. Oppenheimer is a retired Air Force lieutenant colonel who flew the A-10, A/OA-37 and F-16, and served as F-16 squadron commander of the 309th Fighter Squadron. He is also type rated in the Beechjet 400A and has flown as a firefighter in single-engine aircraft and as a corporate pilot in the King Air 200 and Citation Excel and X.

The S211 flight was an excellent introduction to the APS jet UPRT, getting me started with the low-altitude work and prepped for the high-altitude session. The clouds had cleared by the time we were ready to fly the TA-4J, so we'd be able to explore its full envelope.

Before climbing into the Douglas jet, Oppenheimer gave a detailed briefing on our mission and high-altitude upsets, as well as detailed instructions on how to use the Escapac IG-3 zero/zero ejection seat. The source of the material we covered on high-altitude upset training is found in Supplement #1 to the Airplane Upset Recovery Training Aid–Revision 2, and he explained the concepts in an easily understandable and uncomplicated fashion.

The key takeaway differences between low-altitude and high-altitude upsets are the lower air density at high altitudes, reduced available thrust and decreasing stall AOA as Mach increases. The high-altitude upset-training regime is defined as above FL250 and Mach 0.70. "The recovery is the same," he explained, "but because of the environment and what's happening, life is going to get very interesting. The big thing is don't overcontrol. Nothing is a panic mode; slow, smooth and deliberate is the way."

The TA-4J was another step up on the excitement curve, as close as I'll probably ever come to flying a real fighter jet. This was the real deal, ejection seat, oxygen mask, the works. Adding to the enjoyment was the thoroughly professional and military-style environment on the Top Aces ramp, with a dedicated crew chief helping strap me in, as also occurred in the S211, and an entire ground crew helping get the TA-4J's 9,300-pound-thrust Pratt & Whitney J52-P8B started and sending us off to taxi to Runway 12R.

Thrust to weight ratio is about .7:1, and the Skyhawk can fly to 50,000 feet and 600 knots or Mach 1.2 (downhill, said Oppenheimer). The Top Aces TA-4J is mostly original, with no modern avionics or instruments in the back cockpit and a Garmin GNS 530W in the front. Top Aces is outfitting another TA-4J with glass-cockpit avionics.

Oppenheimer did the takeoff, and then he handed over the controls. The TA-4J quickly accelerated to 250 kias, then I let it speed up to 300 kias as we passed 10,000 feet. He had warned me that this jet is "a little bit longitudinally sensitive," and he wasn't kidding. Compared to the S211's, the TA-4J's pitch control is much more touchy, and I had to pay a lot more attention to pitch attitude. As we continued the climb at Mach 0.72 and passed 30,000 feet, Oppenheimer introduced an exercise to re-emphasize the disassociation between pitch angle and AOA. While holding pitch at lift-over-drag (L/D) max as represented by a

Continues on page 60 ▶

Crucial Response

Advanced displays and IFR navigation
for air medical transport.

5-inch FPCDU, UNS-1Fw FMS

UNIVERSAL® AVIONICS SYSTEMS CORPORATION | *Proven Solutions for over 50 aircraft types*

uasc.com/crucialresponse

FAA unveils 'BasicMed' option

▶ *Continued from page 1*

To qualify, pilots must abide by certain operational limitations: the aircraft they fly can weigh no more than 6,000 pounds, carry no more than five passengers and cannot be operated for compensation or hire. BasicMed pilots can operate under VFR or IFR, but must remain within the U.S. below 18,000 feet msl and must not exceed 250 knots. The rule also requires that pilots undergo a medical examination by a state-licensed physician every four years, and the examination must conform with an FAA-set checklist. The pilots also have to take free online educational courses.

FAA Administrator Michael Huerta said BasicMed gives pilots a choice. They can choose BasicMed and comply with the restrictions or they can opt for the traditional route of obtaining a third-class medical without the restrictions.

"The BasicMed rule will keep our pilots safe but will simplify our regulations and keep general aviation flying affordable," Huerta said, adding that the rule is "a win for the general aviation community, and I'm happy that our FAA team has gotten it across the finish line."

The rule was issued without prior notice or a comment period—in fact, the FAA is not offering a comment period at all—because it is a simple implementation of the congressional directive, Huerta said. "This final rule implements, without interpretation, the requirements [of the congressional directive]," the rule said.

"The updated FAA third-class medical rule closely follows Congressional intent, with the comprehensive medical examination written exactly as we laid out in the law," agreed Rep. Todd Rokita (R-Ind.). "We have fought for years against these burdensome regulations, and I am pleased to see a third-class medical reform rule that does away with unnecessary government red tape to keep the skies safe and accessible for all aviators."

Reducing Bureaucracy

"I think it's going to do wonders for aviation," added Rep. Sam Graves (R-Mo.), who leads the House General Aviation Caucus. Noting the May 1 implementation date, he said, "That's the one question I get when I am out talking to aviation groups." Graves, who said the rule will have a wide impact, added, "there were a lot of moving parts to getting that done."

The agency will collaborate with various organizations to develop the online medical course that pilots must take and will work with stakeholders to explain the BasicMed option, Huerta said, citing the strong track record of collaboration between the agency and the industry. General aviation groups have pushed for the pilot medical rule change for years, calling it a necessary step to help bolster the pilot population.

"BasicMed is the best thing to happen to general aviation in decades," said AOPA president and CEO Mark Baker. "By putting medical decisions in the hands of pilots and their doctors, instead of the FAA, these reforms will improve safety while reducing burdensome and ineffective bureaucracy that has thwarted participation in general aviation."

AOPA is launching a series of "Fit to Fly" resources to help pilots take advantage of BasicMed, and plans to offer a free online medical course that will comply with the requirements of the new rule. ❑

WORK.

CONNECT.

STREAM.

UNWIND.

Do More On Board

ViaSat in-flight internet keeps everyone on board productive and entertained, meeting the demands of the most bandwidth-intensive applications.

THE PATH TO GLOBAL HIGH-SPEED BROADBAND

WEB www.viasat.com/business-aviation EMAIL business-aviation@viasat.com PHONE +1 760 476 4755

ViaSat

Gama, BBA merge U.S. charter fleets

▶ *Continued from page 1*

noted BBA CEO Simon Pryce.

Both parent companies are UK-based, so to adhere to U.S. restrictions on foreign management of U.S.-registered aircraft, Gama's U.S. charter management business is operated by its 49-percent-owned associate Gama Aviation LLC, while BBA's Landmark fleet is operated by its air carrier subsidiary Sterling Aviation LLC. Terms of the agreement call for Landmark to contribute 100 percent of its ownership in Sterling Aviation to Gama Aviation LLC, while Gama's parent company will transfer its 49-percent share in its U.S. subsidiary into a new holding company, GB Aviation Holdings LLC, which will be owned equally by the two companies. The combined business will be managed by Gama Aviation LLC, under the brand name Gama Aviation Signature Aircraft Management.

Gama Aviation Signature Aircraft Management, the brand name of the combined BBA Aviation and Gama Aviation fleets, operates 200 aircraft.

"The formation of the new company is to host the foreign ownership," Gama CEO Marwan Khalek told **AIN**, "just as a vehicle to own the 49 percent in the air carrier that Gama and BBA own on a 50-50 basis."

The deal likely represents the last gasp of the Landmark Aviation name. When Signature Flight Support absorbed the Landmark FBOs into its network, BBA retained the name for Landmark's aircraft charter management business.

Partnership Building

The transaction strengthens the existing bond between the two companies, as Signature already serves as Gama's preferred FBO service provider. "The reason we channeled the business to Signature [before] this deal is that we negotiated a good deal with them," explained Khalek. "They have a big network, it was a good deal for our customers, and we see that deal becoming even better in the future because we've got more volume and we've got a relationship."

The transaction does not cover Gama's U.S. maintenance operations, which it will continue to operate separately as Gama Aviation Engineering. Gama is excited by the potential to drive business from the enlarged fleet to its U.S. maintenance services, Khalek added.

"Yes, we will try and cross sell from our maintenance business into the fleet, but…whenever we are procuring anything for a managed aircraft, we always have to act in the best interests of our managed client, the aircraft owner," said Khalek. "If that means doing the maintenance elsewhere, if that means using a different FBO because that suits them, that's their preference, or that's a better deal for them then we will do it. We will never channel that business to the wrong place if it's not the best thing for the customer." ❑

GLOBAL NETWORK OF FBOs

Ross Aviation (KTRM) | Thermal, CA

Visit Ross Aviation TRM, where uniting exceptional customer service and uncompromising safety standards is every staff member's primary focus. Led by Ann Goodwyn, general manager, the team at TRM provides expert services backed by more than 30 years of FBO experience—the same familiar faces under one new, trusted name: Ross. And with its convenient location, Ross Aviation TRM lands you closer to southern California's hottest spots: Joshua Tree National Park, the Salton Sea, Palm Springs, Horses in the Sun, and the Coachella Valley Music and Arts Festival. With full services for general aviation up to a 757, rest assured your aircraft is in the most adept hands at TRM.

rossaviation.com

Powering your flight with more than just fuel.

AVFUEL CONTRACT FUEL • AVTRIP REWARDS • AVPLAN TRIP SUPPORT • AVSURANCE

Saudi economic reform drives fleet growth at charter firm

by Peter Shaw-Smith

Saudia Private Aviation (SPA), the private aircraft charter and management arm of flag carrier Saudi Arabian Airlines (SAA), has expanded its managed fleet to 35 aircraft, with two Boeing Business Jets expected to join the fleet early this year. PrivatAir Saudi Arabia, the local subsidiary of aircraft charter and management group PrivatAir Switzerland, purchased a 30-percent stake in SPA last year, with a mandate to assist with fleet renewal.

SPA's owned fleet remains at 10 aircraft today: four Dassault Falcon 7Xs and six Hawker 400XPs. All 10 owned aircraft are available for charter, as well as three from the 25 aircraft under management. The company also offers a block charter program.

In June, SPA launched the Albayraq all-business-class shuttle service connecting the Saudi capital Riyadh with Jeddah on the country's west coast. This provides six round-trip flights each day in three 24-seat Airbus ACJ319s. According to SPA general manager for flight operations Capt. Hamza Ghouth, the new service is proving to be more successful than previous attempts at similar services since it is able to offer direct online booking for the first time.

"Eighty percent of our operations are domestic, although we do have ultra-long-range aircraft," Ghouth told **AIN** in an interview at the recent MEBAA show in Dubai.

SPA also operates four FBOs at Riyadh, Jeddah, Dammam and Medina. "We operate in all 28 airports in the Kingdom [of Saudi Arabia], including air force bases. We have a presence at 24 regional airports. Most airports have VIP terminals that belong to the civil aviation authority. Management is done by GACA. We gain access when needed," Ghouth said.

The company can also dispatch handling teams to provide ground support at almost any regional airport. Several regional airports are undergoing privatization, with Medinah now privately run. Riyadh Airport is being expanded.

Contrary to some reports that all operators are now expected to operate under Part 135 commercial rules, Ghouth claimed that Part 91 private rules have not been eliminated in Saudi Arabia. He indicated that some larger aircraft are still permitted to remain under Part 91 requirements.

Ghouth was bullish about Saudi's economic prospects despite the low price of oil. "There is a good deal of growth expected in the coming years in line with the development of infrastructure. We cannot expand aviation without having the proper infrastructure to support it—from the economy and safety to airport facilities."

Addressing questions of unfair fuel subsidies received by the Saudi Arabian Airlines group, he said that the size of the company puts it in an advantageous position. "With the amount of fuel we buy, it's natural that we receive a good discount," he said, underlining the large average size of the mostly widebody aircraft in the SAA fleet.

He said that SPA uses its parent company's in-house maintenance, repair and overhaul subsidiary Saudi Arabian Engineering Industries, but added that SPA is "looking into going into the business of maintaining business jets" with an international joint venture partner. He would not elaborate, but said that SPA has an acre of land to develop at Jeddah Airport.

"It's an international, non-OEM partner that we are looking at. Due diligence has been done on the project. We are starting to talk details, but final agreement has not been reached," he said.

Meanwhile, Ghouth said rationalization of the Saudi Arabian business aircraft fleet continues. Aircraft owned or operated by Saudi individuals normally receive annual block landing permits rather than needing case-by-case approval. He argued that forcing Saudi owners to bring aircraft "onshore" could be counterproductive, as they would stay abroad (where many are now registered offshore). "This would cause them to park outside Saudi Arabia. Once the GACA [civil aviation authority] matures, I think more owners will park aircraft inside the Kingdom." ❑

While Saudia Private Aviation (SPA) has expanded its managed fleet to 35 aircraft, the company's owned fleet remains at 10 aircraft, among them four Dassault Falcon 7Xs, one of which was on the MEBAA 2016 static display.

DAVID McINTOSH

Regulatory Shake-up

As part of wide-ranging reforms of the Saudi economy—aimed at making it more competitive and less reliant on oil revenue—Suleiman Al Hamdan, the country's transport minister and head of the civil aviation authority, appears to be shaking up the regulatory structure for the aviation industry. The privately expressed hope of foreign business aviation companies is that this will open more access for operators. "He has a strong will and has already made many changes. But we still have a lot of challenges to meet to reach our targets," said Ghouth.

HAWKER PACIFIC
Aviation's Trusted Choice

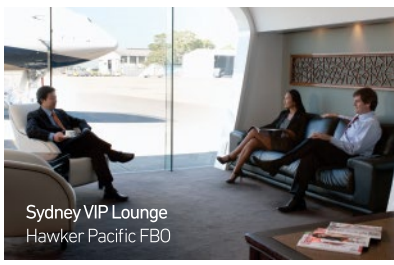
AIRCRAFT CHARTER & MANAGEMENT | AIRCRAFT SALES
AIRCRAFT SUPPLIES | AIRCRAFT SUPPORT
FBO & VIP LOUNGES | FLEET SERVICES


Bell 412 Helicopter Refurbishment
Hawker Pacific MRO

Hawker Pacific - Integrated Aviation Solutions Provider


Cessna Citation Latitude
Hawker Pacific Aircraft Sales


Aeromedical Solutions
Hawker Pacific Special Missions


Sydney VIP Lounge
Hawker Pacific FBO


Beechcraft King Air 350 Mission Equipment
Hawker Pacific Government Business

PEOPLE WHO KNOW AVIATION TRUST **HAWKER PACIFIC**

For over 35 years, Hawker Pacific has been delivering a diverse range of integrated aviation solutions from aircraft sales, product support and flight services throughout Australia, Asia, the Pacific and Middle East.

Hawker Pacific's product support activities include MRO, structural modification and spare parts sales to a wide range of fixed wing aircraft and helicopters for corporate, charter, defence and special mission operators throughout the region. Other services include aircraft and engine maintenance, repair and overhaul, special mission aircraft modifications, design engineering, avionics, plus the provision of spare parts, exchange rotables and equipment sales.

Hawker Pacific is also Asia Pacific's premier fixed base operator (FBO) with a network of facilities in Sydney, Brisbane, Cairns, Perth, Singapore and Shanghai. The company's FBOs offer VIP services and crew facilities 24/7, on demand aircraft charter from a modern aircraft fleet, flight operations and total aircraft management.

Contact us today to discover how we can support you.

Phone: +61 2 9708 8555 Email: enquiries@hawkerpacific.com

HAWKER PACIFIC
Aviation's Trusted Choice

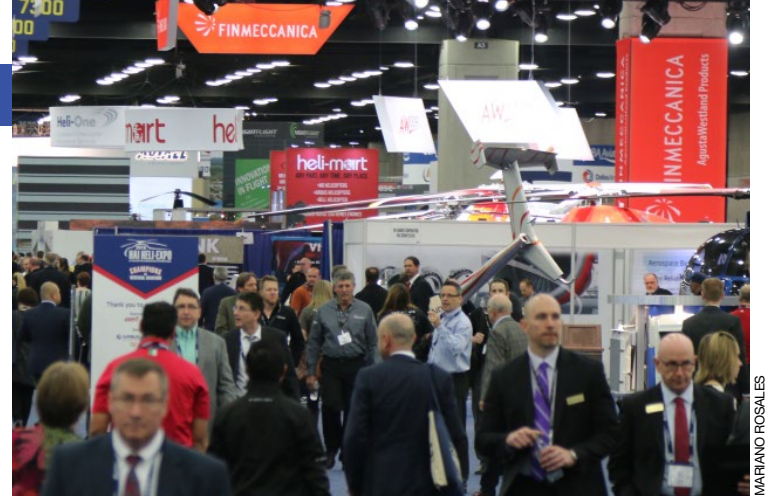
Annual rotor show opens next month in Dallas

by Mark Huber

There's good news for this year's annual Heli-Expo show. As of early last month, 90 percent of the exhibit hall space at the mammoth Kay Bailey Hutchison Convention Center in Dallas, Texas, was sold. The show runs from March 6 through 9, and the exhibit hall is open March 7 to 9.

The Helicopter Association International (HAI) is expecting 20,000 attendees and 700 exhibitors at this year's show as the price of oil rebounds off the basement floor, OEMs recover from some disappointing new helicopter delivery numbers and the stalling/delay of a few high-profile development programs, and some of the industry's largest operators financially restructure.

As always, the show is content rich with 100 education courses, seminars, workshops and forums, with a heavy weighting to safety issues. Attendees will also have the opportunity to renew their inspection authorization certificates, attend the HFI Helicopter Industry Job Fair and network with their fellow rotorcraft travelers.



MARIANO ROSALES

The Kentucky Exposition Center hosted 55 helicopters at last year's event, and organizers of this year's show expect at least 60 in Dallas.

Education Opportunities

There's a ton of new content at this year's show in terms of seminars, workshops and professional education courses (some with required extra fees) across a broad spectrum of constituencies: pilots, mechanics, military, and students. Among the hot-button new offerings: Integrating Human Factors Analysis into Your SMS (Safety Management System), Analysis Techniques for Helicopter Flight Data, and Dynamic Rollover and Vortex Ring State Explained.

The Helicopter Foundation International (HFI) Scholarship Golf Tournament kicks off the fun the day before the show, Sunday March 5, at the Cowboys Golf Club in Grapevine with check-in at 10 a.m. and a 12 p.m. shotgun start. The $230 fee covers 18 holes of golf, cart, lunch, two mulligans, $10 golf shop voucher, dinner and tournament contest awards, and evening transport back to hotels. Humiliation, all for a good cause.

The annual Salute To Excellence dinner will fete outstanding achievers in their respective categories the evening of Wednesday, March 8, and attendees will have the opportunity to grill members of the FAA's Rotorcraft Directorate during the March 9 general morning session "Face To Face" on issues of importance to the industry—always a lively, candid and spirited exchange of views not to be missed. Of particular interest are the details of the anticipated FAA rule on the application of crash-resistant fuel systems to legacy aircraft and the continuing efforts to reform the Parts 27 and 29 certification basis more broadly. ❑

LimousinesWorldwide.com

Global Luxury Transportation

"Excellence is to do a common thing in an uncommon way."

—Booker T. Washington

CALL OR E-MAIL 24/7 FOR RESERVATIONS

DISPATCH@LIMOUSINESWORLDWIDE.COM

UK PHONE: +44.20.3286.3212

US PHONE: +1.914.738.1200

GENUINE & TRUSTED PREMIUM QUALITY

NEWS UPDATE

Third Test AW609 Nearing Launch

After arriving in Philadelphia this fall, the third prototype of the civilian tiltrotor appears to be girding for first flight and has been duly registered as N609PA. The flight-test program for the aircraft has been largely shut down since the fatal crash of AC2 in Italy in October 2015. AC1 resumed limited flight-testing in August in the U.S., and that aircraft is being shipped to Italy for modifications. AC4 is under construction at Philadelphia and is expected to fly later this year. Last year Leonardo said the program was on track for 2018 FAA certification. AC3 was assembled in Italy and revealed in May last year. Shortly after completing ground runs there, it was temporarily impounded by Italian prosecutors investigating the crash of AC2. AC3 is expected to be used in icing trials this winter. Leonardo intends to complete certification with three test aircraft.

Helos Vulnerable to Laser Incidents

According to the FAA, the number of laser strikes on aircraft doubled between 2014 and 2015 and 6,700 were reported during the first 11 months of 2016. Helicopters are particularly vulnerable given their relative low speed, low cruising altitudes and reliance on manual controls. Thanks to a 2012 law, pointing a laser at an aircraft is a federal offense punishable by up to five years in prison and a $250,000 fine. However, few offenders are caught and those that are apprehended often receive lenient sentences. In December a federal judge sentenced a man to eight months for pointing a laser at a news helicopter in San Antonio and in January a Michigan man received a year for lasing a state police helicopter that was investigating the reported lasing of a regional jet near Saginaw, a crime for which he was suspected but not charged.

R66 Turbine Marine Gets EASA Nod

On December 20 last year, the EASA issued final approval for the R66 Turbine Marine pop-out float installation. After tests in July demonstrated that the floats meet Sea State 4 requirements, the EASA officially approved the Marine for emergency-response and commercial operations. The tests were conducted in Spain at a facility capable of simulating the required conditions.

U.S. Army Chinooks Upgraded

The Army plans to keep its tandem-rotor CH-47 Chinooks flying through the 2060s with a series of upgrades designed to improve avionics and performance so the type can meet the benchmark 95 degrees F /6,000 feet requirement for high/hot operations. The Army is in the process of converting its F models with digital cockpits and systems that are easier to replace and service. Those aircraft will then be modified again by 2021 to meet the 95/6000 requirement and boost mtow to 54,000 pounds.

This Bud's On You

Budweiser used an AW109 dispatched from London Biggin Hill to conduct celebratory beer drops on fans of the team that pulled off the biggest underdog achievements in the third round of the Emirates FA Cup in the UK early last month. The winning beers fell on the thirsty fans of Plymouth Argyle who, with the help of Budweiser ground support teams, were the lucky recipients of 10,000 free beers. *—Mark Huber*

A January 10 Alert Service Bulletin requires a special one-time inspection of the S-92's tail-rotor bearing assemblies.

North Sea mishap sparks scrutiny of Sikorsky S-92

by Mark Huber

A recent Sikorsky S-92A accident involving loss of antitorque control is renewing scrutiny of the type's tail rotor bearing system. The December 28 hard landing on a North Sea oil platform prompted the manufacturer to issue an Alert Service Bulletin (ASB 92-64-011) on January 10 that calls for a special one-time inspection of the tail rotor and bearing assemblies and a data check of the aircraft's health usage and monitoring system (Hums). The new ASB mandates an off-the-aircraft check of the tail-rotor pitch change shaft (PCS) bearing. The inspections are to be carried out as soon as aircraft return to base.

The December 28 accident involved an S-92 operated by CHC from Aberdeen that spun through 180 degrees while landing on the Total West Franklin rig, damaging the helideck and the aircraft's landing gear. CHC said the flight crew reported "unexpected control responses" on final approach and executed an emergency landing.

There were no injuries among the two crew and nine passengers.

Sudden Component Failure

Details of the incident are provided in a UK Air Accidents Investigation Branch (AAIB) Bulletin released last month. It describes a sequence of sudden component failures that occurred with very little warning.

As the helicopter lifted off from the Elgin Process Utilities Quarters (PUQ) helideck it "yawed unexpectedly to the right through 45 degrees," according to the AAIB report. "The commander applied full left yaw pedal, checked the rotation and landed back onto the deck. The flight crew discussed the likely cause, which they thought to have been the result of local turbulence or wind effects created by the platform structures which, anecdotally, is not uncommon for this helideck. They decided to continue and during the subsequent lift-off into the hover the commander applied left yaw pedal, the helicopter responded and turned to the left; all control responses appeared normal.

"The commander then climbed to 500 feet for the brief transit to the West Franklin wellhead platform, 3.3 nm to the south. The helicopter made a normal approach and deceleration to the West Franklin and crossed over the helideck. During the descent to land, at four feet above the helideck, it yawed rapidly to the right, reaching a maximum rate of 30 degrees per second. At the same time it rolled 20 degrees to the left, at which point the main landing gear contacted the helideck. It continued to yaw to the right on its left mainwheels and nosewheels before the right mainwheels contacted the surface. The helicopter came to rest on a heading of 041, having rotated through 187 degrees."

Initial post-incident inspection revealed that the tail-rotor servo piston was damaged and the tail-rotor pitch change shaft (TRPCS) double row angular contact bearing was "severely distressed."

The AAIB went on to note, "Further disassembly and examination of the components found signs of severe overheating, with extreme wear on the inner and outer thrust races and barrel-shaped rollers of the bearing. It was found that the roller bearings seized to the inner member. The outer race roller had excessive axial play (half an inch) such that the tail-rotor drive shaft imparted a torsional load to the tail-rotor servo. This torsional load caused the primary piston rod to fracture inside the servo. Failure of the primary piston caused the secondary piston sleeve to separate axially from the primary piston adjacent to the link fitting, with the consequential total loss of control of the tail rotor."

The AAIB notes that the bearing failure was rapid, occurring just 4.5 hours after the first exceedance of the relevant bearing condition indicator had been recorded on the operator's Hums. The operator's Hums was downloaded the night before the accident and the helicopter was released back into service. A detailed analysis of the Hums data conducted after the accident shows that the tail gearbox bearing energy analysis limit had in fact been exceeded on December 27. The AAIB report also notes that there have been previous events involving S-92 TRPCS bearings dating back to 2007 resulting in "reduced" tail-rotor control in flight, immediate landings and subsequent cure by the manufacturer. The AAIB points out that it "is not clear whether this bearing degradation is the result of a new root cause or a previously unidentified failure mode."

Immediately after the accident CHC instituted fleet-wide inspection of all Hums data and conducted new borescope inspections, reduced the time between Hums download and analysis to five hours, and added another assurance check. Sikorsky is encouraging all operators to use the Hums Tail Gearbox Bearing Energy Tool at the ground station, which will detect TRPCS bearing degradation, as often as possible. ❑

BELL 505 WINS TRANSPORT CANADA TYPE CERTIFICATE

Bell Helicopter has received type certificate approval from Transport Canada for the 505 Jet Ranger X five-seat light single, the company announced on December 21. Bell unveiled the 505 in 2013.

The helicopter is powered by a 504-shp Safran Arrius 2R turboshaft with dual channel Fadec (3,000 hour TBO) and features the Garmin G1000H avionics suite.

The 505 has a maximum cruise speed of 125 ktas, a maximum range of 340 nm and a useful load of 1,470 pounds. Initial price of the base aircraft will be set at "around $1 million."

Bell expects first customer deliveries and FAA certification this year. Bell CEO Mitch Snyder said he anticipates Bell to deliver fifty 505s this year, ramping up to an annual production rate of 150 next year. *—M.H.*

STUART JetCenter

VOTE #1 FBO

"Proud Community Sponsor"

Stuart Jet Center, LLC

- Concierge Services
- Aircraft Charter
- Aircraft Maintenance
- Aircraft Sales
- Aircraft Hangars
- Executive Offices

2501 SE Aviation Way, Stuart, FL 34996
Phone: 772-288-6700 • Fax: 772-288-3782 • Toll free: 877-735-9538
www.stuartjet.com

Flying the boundary layer

by Mark Huber

In Louisville at last year's Heli-Expo, the world's largest helicopter trade show, it snowed. Many demonstration flights were canceled. From the dais at the annual awards dinner, industry gentry led the assembled in song, *My Old Kentucky Home*, a melancholic state ballad that can evoke weeping amongst the citizenry. Somehow it all seemed appropriate. Despite the brave public face the industry tried to project to the world last year, it was one of the worst in memory for the commercial helicopter business, fueled mainly by oil prices that sunk to a low of $26 per barrel before beginning a slow climb back to rationality, a domestic air ambulance industry that appears to have reached capacity and the continuing economic uncertainty worldwide.

The perfect storm in many ways has been unprecedented. Bell CEO Mitch Snyder stunned an audience of local Fort Worth business leaders in December when he told them that the worldwide market for commercial helicopters has shrunk by 50 percent since 2013. Bell shelved plans to build the new 505 light single at a purpose-built green-field plant in Lafayette, La., moving production to its commercial plant in Mirabel, Quebec—where there is plenty of excess capacity—as part of sweeping economic moves that put hundreds out of work. Bell suffered a more serious blow when the first prototype of the 525 super-medium twin broke up in flight in July. Flight-testing for that program remains on hold.

At the beginning of last year, Honeywell adjusted its turbine helicopter delivery forecast downward yet again, dinging it another 10 percent, mainly to acknowledge continuing softness in the oil-and-gas market. Safran's helicopter engine deliveries were down 15 percent in 2015 compared to 2014 and the 2016 numbers promise to be worse. Last year the company delayed or shelved several programs in response to market conditions. On the heels of posting a 17-percent decline in earnings this fall, Airbus Helicopters has announced a plan to trim its workforce by 582. For the third quarter, revenue was off 3 percent while earnings slid $219 million from the year-ago period.

The revenue slide was fueled by waning demand for super-medium and heavy helicopters, as well as an overall drop in commercial hours flown. Airbus Helicopters has also been hurt by the worldwide grounding of the H225 Super Puma series in June following a fatal April 29 North Sea crash. While the EASA lifted the grounding in October, it remains in force in the UK and Norway. In addition to trimming its workforce, Airbus said it is continuing "transformation measures and efforts to adapt to market challenges." One of those adaptations could be a delay in the company's marquis 13,000-pound-class H160 medium-twin program. Projected deliveries of that aircraft have slipped to 2019 from 2018, with a third prototype scheduled to join the program early this year.

OEMs Feel the Bite Globally

Reflecting the continued softness in both the military and civil helicopter sectors, Leonardo said that new AgustaWestland helicopter orders fell to €580 million (just over $611 million) for the fall quarter from €624 million (nearly $658 million) from the year-ago period and dropped to €1.538 billion ($1.6 billion) for the first nine months of 2016 from €2.881 billion ($3 billion) from the year-ago period. The helicopter order backlog also dropped, down to €9.669 billion ($10 billion) for the first nine months of last year, from €11.7 billion ($12.3 billion) from the year-ago period. The helicopter earnings margins have also declined, slipping to 9.7 percent for the quarter and 11.1 percent for the year. The much-heralded and long-delayed AW609 civil tiltrotor program was further delayed after the second prototype aircraft crashed in late 2015 in Italy and Italian prosecutors temporarily impounded the third flight-test aircraft last summer as part of the crash investigation.

Russian Helicopters is also feeling the bite, with new civil programs such as the Ka-62 experiencing significant delays. The company reported plummeting income for the first six months of last year, down 24.1 percent from the year-ago period to $156 million.

As bad as things are at the OEMs, some operators have had it even worse. Bankrupt helicopter OGP services company CHC announced a financial restructuring plan on October 11 that will recapitalize the enterprise with $300 million in new capital and leasing lines of $150 million. GE Capital's Milestone Aviation Group and its affiliates are taking the lead on the latter. CHC filed Chapter 11 bankruptcy in the Northern District of Texas on May 5 and subsequently announced plans to shed most of its leased helicopter fleet, reducing its overall fleet size to 75 from 230. At the time of the bankruptcy filing, the company listed debts of $2.19 billion against assets of $2.17 billion as of January 31 last year.

Erickson filed Chapter 11 bankruptcy November 8 in the U.S. Bankruptcy Court Northern District of Dallas, listing $561 million in debt. The move comes after Portland, Ore.-based Erickson missed scheduled November 1 debt interest payments and days after the resignation of former chairman Quinn Morgan from Erickson's board. Companies controlled by Morgan bought Erickson in 2007, took it public in 2012 and engineered its 2013 acquisition of Evergreen Helicopters and Air Amazonia, which burdened Erickson with $355 million in debt at the same time the global oil-and-gas market was collapsing. Erickson subsequently lost major defense support and a critical fire-suppression contract from the U.S. Forest Service, leading it to post large quarterly losses over the last several years. The company is currently operating with $60 million in debtor-in-possession financing from lien holders as it navigates court-supervised reorganization from which it plans to emerge later this year. Erickson employs 700 people worldwide and operates a diverse rotorcraft fleet that includes the S-64 AirCrane, for which it holds the type certificate.

As early as last March, OGP operator Bristow Group hinted for the first time that it might be forced to cancel orders or at least defer some new helicopter deliveries and will turn back some leased helicopters. Through the end of the year, the company continued to post large quarterly losses, and oil-and-gas revenue is down 25 percent from comparable periods in 2015, although company executives believe the market has now bumped bottom.

Not so apparently for the helicopter air ambulance industry in the United States, which faces a two-pronged assault from over-saturation and downward reimbursement pressure from public and private medical insurers. Air Methods, the nation's largest HEMS provider, notes that it collected on only 74 percent of private insurance claims in the first quarter of last year. For the first time since records have been kept, the size of the operational domestic helicopter EMS fleet contracted, and Air Methods noted in a public filing with the U.S. Security and Exchange Commission that it was mulling deferral of some new aircraft deliveries on a 10-year order for 200 new Bell 407GXPs. "During 2016 we began discussions with Bell Helicopter Textron to modify the terms of the purchase agreement, including the total number of aircraft to be delivered under the agreement and application of related deposits," the company noted while later reaffirming its commitment to the model.

Against this backdrop, a case for pessimism would be easy, even logical. Yet there is no shortage of new helicopter programs, while a few albeit on stretched timetables, driven by the omnipresent needs for speed, range and economy from new technology. Even in this market, helicopter leasing companies are still regularly announcing deals: Milestone is expanding into helicopter EMS, LCI is already fully entrenched there and Waypoint continues to do OGP deals.

Among OEMs the consensus appears to be that the market might be getting ready to climb and new products need to be readied for the pipeline when it does. But for now, OEMs are flying an uncomfortable boundary layer: Facing the twin challenges of declining revenue in a down market and an immediate need to continue development funding to remain competitive in the future.

Robinson R44 Cadet

MARIANO ROSALES


Bell 505 Jet Ranger X

MATT THURBER

Cicare Model 12

Enstrom TH180

Piston Singles

Robinson R44 Cadet

Robinson delivered the first R44 Cadets last year. The two-seat Cadet provides greater performance margins than the standard four-seat R44, a 2,400-hour TBO and a (2016) base price of $339,000 or $367,000 with floats. Robinson developed the Cadet specifically for the training market. It retains the same basic airframe, rotor system and Lycoming O-540-F1B5 as the R44 Raven I; however, the rear seats are gone and the aft compartment has been reconfigured for cargo. Maximum takeoff weight is 2,200 pounds, 200 pounds short of the Raven I's. The engine is de-rated to produce 210 hp for takeoff and 185 hp continuous (down from 225/205 hp in the Raven I). The derating provides greater margins at higher altitudes. A newly designed muffler lowers the Cadet's flyover noise by 3 decibels. The Cadet will be available with optional air conditioning, autopilot and avionics packages tailored to VFR or IFR training.

In 2016 the Garmin G500H system became a new option for all R44s, including the Cadet. Previously available only on the R66 turbine single, the G500H is a combination primary and multifunction display, which provides flight instrumentation and moving map navigation on dual screens. The G500H screens are centered in a newly designed instrument panel that also provides traditional instruments. A Garmin GTN 650 or 750 touchscreen navigator is required with the G500H and sits just below the displays within easy reach of either pilot.

Enstrom TH180

Enstrom Helicopter resumed flight-testing the two-seat TH180 in May last year, three months after the first test aircraft was destroyed in a hard off-airport landing. The pilot walked away with only minor injuries. Enstrom plans to add a third flight-test vehicle, which will be fully conforming, to the program and earn certification later this year.

The company announced the TH180 in 2014 and plans to certify the helicopter on the basis of the type certificate and rotor system of the larger three-seat 280FX to speed development. The TH180 is powered by a 210-hp Lycoming HIO-390 and has an engine governor and electric clutch switch; it has a useful load of 700 pounds, a maximum takeoff weight of around 2,250 pounds and a standard fuel capacity of 40 gallons. Target price is less than $400,000. Company officials said the TH180 should post direct operating costs of around $175 per hour and burn less than 12 gallons per hour. Enstrom's modernized production plant in Menominee, Mich. has the capacity to build 100 TH180s per year.

Cicare Model 12

Argentine kit helicopter maker Cicare plans to enter the certified market with a variant of the Model 12 two-seater within "three to four years." The Model 12 kit sells for $189,000. It is powered by a 180-hp Lycoming HIO-360G1A four-cylinder piston engine; empty weight is 948 lbs and mtow is 1,543 pounds; cruise speed is 89 knots, with a Vne of 110 knots. The Model 12 has a two-blade composite main rotor system lifed on condition, monocoque cabin construction and tube skid gear. In the cabin are a T-bar cyclic, bullet-shaped instrument cluster and toggle switches. It is stylistically similar to the smaller 992-pound-mtow, 130-hp, 80-knot Model 8, which has been certified under ULM rules in Europe and Argentina.

Turbine Singles

Bell 505 Jet Ranger X

Bell Helicopter announced on December 21 that it had received type certificate approval from Transport Canada for the five-seat Model 505 Jet Ranger X light single. FAA and EASA approvals and first deliveries are expected early this year. Bell unveiled the 505 in 2013.

The helicopter is powered by a 504-shp Safran Arrius 2R turboshaft with dual-channel Fadec (3,000-hour TBO) and has the Garmin G1000H avionics suite. In March, Safran provided details about plans to offer 505 customers support-by-the-hour maintenance coverage in cooperation with Bell's Customer Advantage Plan, with no minimum annual flight-hour requirement, for $300 per flight hour. Development costs and time on the 505 were reduced by using much of the main rotor system of the 206L4 LongRanger. The 505 has a maximum cruise speed of 125 ktas, a maximum range of 340 nm, a useful load of 1,470 pounds, a wide-opening double door, and an open layout with flat cabin floor and 61 cu ft of rear cabin volume for passengers or cargo. Initial price of the base aircraft will be "around $1 million."

Bell currently holds letters of intent for north of 400 Jet Ranger Xs and is in the process of converting them to firm orders. Bell CEO Mitch Snyder said he anticipates Bell will deliver fifty 505s this year, ramping up to an annual production rate of 150 next year. The company plans to offer kits for the 505 to perform executive, utility and law-enforcement missions, and it says some of the configurations are well along in certification testing.

Mecaer Aviation Group is developing lavish interiors for private aircraft that it says will feature multiple storage consoles and "trim options" to create "an added level of comfort and technology that is unique for each customer." Early last year, United Rotorcraft unveiled an EMS interior for the 505. The simple quick-change design weighs less than 60 pounds and uses existing aircraft hard points.

Leonardo AW009

Leonardo's AW009 light single, the rebranded SW-4, was originally developed by Polish airframer PZL-Swidnik in 1981. The design first flew in 1996 and has undergone several refinements since Leonardo acquired a majority stake in the company in 2009. Among the recent improvements are Genesys avionics, a better hydraulic system and a mass vibration absorber for a smoother ride. The standard 113-knot 009 is powered by the Rolls-Royce 250-C20R/2 and has an mtow of 3,968 pounds. AAL USA in Huntsville, Ala., has been subcontracted to complete the avionics and integration of the powerful Rolls-Royce -C30P engine into the helicopter. FAA certification is expected later this year.

While a firm price for the helicopter has not been announced, Leonardo executives said it will be between $1.2 million and $1.5 million. The aircraft will be built in Poland and shipped to the U.S. for completion and delivery at AAL Huntsville.

Innova/Composite Helicopters C630

U.S.-based Innova Aerospace is looking to fly a fully conforming prototype of the

Continues on next page ▶


Kaman K-Max (K-1200)


Marenco Swisshelicopter SKYe SH09

Avicopter AC311A


Innova/Composite Helicopters C630

NEW ROTORCRAFT

▶ *Continued from preceding page*

Composite Helicopters C630 five-place light single powered by a production Rolls-Royce RR300 turboshaft later this year. The helicopter will be one of two used in a parallel certification program with the New Zealand CAA and the U.S. FAA with the target of achieving full approval in 2018. Innova reported recent progress with the program, citing the completion of all production molds, the initiation of parts manufacture and "final review" of the production gearbox. Privately held Innova said it has access to enough money to see the program through certification and initial production in New Zealand. Innova has not set a price for the helicopter and is not taking orders yet.

Innova acquired the intellectual property rights to the New Zealand-based program in 2015. Preliminary specifications for the carbon-fiber rotorcraft: cruise speed of 125 knots, range of 450 nm (no reserve) and 1,350 pounds of payload. Composite Helicopters debuted the initial design, the KC518, at AirVenture Oshkosh in 2011 with plans to market it initially as a kit before pursuing certified production. Two prototype aircraft crashed in 2013 and 2014. In 2015 those initial development plans changed, with the company announcing that it intended to eschew kit production in favor of three different certified models: the KC630 with a Rolls-Royce 300 in an executive five-seat configuration; the KC650 powered by a Honeywell LTS101 in a utility six-seat configuration; and an intermediate KC640 with a Rolls-Royce 250-C20B.

The company had anticipated certification for the KC630 late this year, followed by the KC650 and KC640 in 2018. Innova has renamed the KC630 simply the C630 and it is the only design the company is currently pursuing. Composite Helicopters claims its rotorcraft is the first with a full monocoque fuselage fabricated entirely from rigid composite materials.

Marenco Swisshelicopter SKYe SH09

Marenco unveiled the $3.5 million SKYe SH09 single-turbine utility helicopter in 2009, but the program has been beset by delays and schedule slippages. The first prototype did not take flight until 2014. Flight-testing was halted while the main rotor head and rotor blades were redesigned and fitted to the second prototype, which then took flight in February last year. Meanwhile, the certification timetable has slipped to 2018 from 2016. A third prototype is currently under construction and is expected to fly this year. Marenco has 150 employees and said it holds letters of intent for 90 helicopters.

In December, company founder and CEO Martin Stucki mutually agreed with the company's board to "retire" immediately and was replaced at the Swiss startup helicopter manufacturer by former Airbus Helicopters senior executive Andreas Loewenstein. Marenco is now largely funded by Russian billionaire Alexander Mamut. His interests on the board are represented by Marina Gronberg.

The SH09 features all-composite construction, a flat-floor cabin and rear clamshell doors. It is a large single designed to carry one pilot and up to seven passengers. Power comes from a Honeywell HTS900-2 turbine with Fadec. The SH09 also will be equipped with Honeywell Hums, enabling operators to monitor mechanical rotating components and subsystems on their helicopters continuously and become aware of potential problems before they occur.

The helicopter has a five-blade bearingless main rotor system and a shrouded tail rotor. Performance targets: 5,842-pound mtow, 140-knot cruise speed and 430 nm range. In August last year the company broke ground on a 43,000-sq-ft (4,000-sq-m) assembly hall at Mollis airfield in the Swiss canton of Glarus. Scheduled for completion by the end of this year, the facility is expected to produce 10 helicopters in its first year of operation.

Avicopter AC311A

China's CAAC certified the two-ton AC311A "Air Wizard" single in August. The six-seater bears a striking resemblance to the Airbus H125/130 minus the shrouded tail rotor. It is a joint project of state-owned Avicopter and the Changhe Aircraft Industry Group. Avicopter says the utility single is designed to excel in high-altitude operations. Power comes from a Safran Arriel 2B1A.

Kaman K-Max (K-1200)

Kaman has resumed production of the single-seat, single-engine K-Max utility external-lift helicopter. Powered by a single Honeywell T53-17 (flat-rated to 1,500 shp) and characterized by its intermeshing, contra-rotating dual main rotors, the K-Max found favor with commercial operators, notably in the logging industry in no small part because it can lift more than its own empty weight (6,000 pounds versus 5,145 pounds). The company had built 38 before shutting the line in 2003. Two unmanned K-Maxes were operated in Afghanistan on an extended trial by the U.S. Marine Corps and Lockheed Martin. That demonstration helped to rekindle interest in the helicopter and two years ago Kaman announced that it would restart production. The first aircraft from the re-opened line is scheduled to be delivered this year.

Twins

Leonardo AW109 Trekker

Leonardo's AW Trekker light twin logged its first flight on March 2 last year at the company's helicopter division in Cascina Costa, Italy. Two prototypes will be used for the flight-test program, and EASA certification is expected this year. The Trekker is a skidded version of the AW109S Grand and features single-pilot IFR Genesys Aerosystems avionics and a pair of Fadec-equipped, 815-shp Pratt & Whitney Canada PW207C turboshafts that deliver a maximum speed of 168 knots. It has a maximum takeoff weight of 7,000 pounds and will have an endurance of four hours, 20 minutes or 445 nm with a modular, five-cell fuel system. Leonardo says it has written orders

for "several dozen" Trekkers to date. The machine is aimed primarily at the EMS and utility markets.

Airbus H135 Helionix

Airbus Helicopters has received EASA type certificate approval in November for the Helionix cockpit in the H135 light twin. The four-axis autopilot will help EMS pilots concentrate on their environment, thanks to a "hover hold" function. Another new feature is flight envelope protection, such as preventing aircraft and engine overspeed. Finally, an electronics bay has been moved, freeing a few cubic feet in the aft cabin. The night vision goggle-compatible Helionix suite is already available on the larger H145 and H175 twins and has three large displays, the four-axis autopilot, first limit indicator, two touchscreen Garmin GTN 750 GPS navcoms and the Avidyne ADS-B-capable TAS620A traffic advisory system. The Avidyne system displays 30 targets and tracks 50 to a range of 21 nm, an ADS-B range of 40 nm and a vertical range of +/-10,000 feet. Deliveries of H135s equipped with Helionix will start this year, with HEMS provider Norsk Luftambulanse and Ascent Flight Training as the launch customers. Ascent was appointed by the Ministry of Defence to provider the UK's Military Flying Training System.

Avicopter AC312e

In July last year the Aviation Industry Corporation of China (Avic) began flight-testing the AC312e light-medium twin helicopter, a derivative of the previous "A" model, itself a descendant of the Harbin Z-9, which was based on the Airbus Helicopters AS365 and manufactured in China under license since the early 1980s and in service since the early 1990s. A substantially upgraded model powered by Arriel 2Cs was introduced in 2002. Avic has produced a couple of hundred Z-9s.

According to Avic, the 312e will offer better high/hot performance thanks to a pair of Safran Arriel 2Es (1,000 shp each) and Rockwell Collins Pro Line 21 avionics to support growth for synthetic vision, helicopter Taws and EFB. Optional are the RTA-4112 MultiScan weather radar and the TTR-4100 Tcas II traffic surveillance system. The 312e will be able to carry nine passengers, have a maximum cruise speed of 165 knots, a maximum takeoff weight of 9,921 pounds (4,500 kg) and a service ceiling of 19,685 feet. Certification is expected later this year.

Russian Helicopters Ka-62

Derived from the Ka-60 military prototype, the 14,800-pound (mtow) Ka-62 was revealed in 2012 and first flew in April last year. Announced launch customers for the $10 million, 12- to 15-passenger twin are Atlas Taxi Aereo in Brazil and Vertical de Aviacion in Colombia. The helicopter is powered by a pair of Safran Ardiden 3Gs (1,680 shp each) but uses Russian Transas avionics.

Harbin Z-20

Basically a Chinese copy of the Sikorsky S-70 that first flew in 2013. The program remains in development.

Avicopter AC352

The AC352, powered by the Chinese-built WZ16, logged its first flight on December 20 in Harbin, China. It is the Chinese-built version of the super-medium Airbus Helicopters H175. Certification of the AC352 has been delayed while the new engine moves through development toward EASA certification, now expected by the end of this year, followed by CAAC approval next year, Safran said. The H175 was developed jointly by Airbus Helicopters and Avicopter, with the latter responsible for manufacturing the fuselage and certain subassemblies. The H175 is powered by a pair of Pratt & Whitney Canada PT6C-67Es and was certified in 2014.

The AC352 can be sold only in China and a small number of countries close to China where Airbus would be unlikely to sell any H175s. The WZ16 is the Chinese variant of the Safran Ardiden 3C. Safran says the new-generation 1,500- to 2,000-shp turboshaft features "compact modular architecture, a best-in-class power-to-weight ratio, low cost of ownership and 10 percent lower fuel consumption than competitive engines." The new engine was a joint development and production project by Safran Helicopter Engines, CAPI and Dongan, parts of the new Aero Engine Corporation of China (AECC) consortium.

Airbus H160

Airbus Helicopters unveiled the all-composite H160 medium twin in 2015. Successor to the AS365/EC155, it is targeted at the market currently served by the Leonardo AW139. Airbus estimates the H160 will have a fuel-burn advantage of 15 to 20 percent over the AW139. The Safran Arrano engines are 10 to 15 percent more efficient than previous-generation engines and have a two-stage centrifugal compressor associated with variable inlet guide vanes for better specific fuel consumption in all phases of flight but particularly in cruise.


Russian Helicopters Ka-62

Bell 525

Airbus H160

The H160's main gearbox is a clean-sheet design with a new approach to lubrication redundancy. Two independent systems run full-time. In the event the main lubrication system fails, the backup provides enough lubrication for about five hours. The backup system, which is entirely internal, has no cooling circuit. To address failure of both systems, run-dry capability of greater than 30 minutes has already been demonstrated.

Two prototypes are currently in flight-test and a third is expected to join the program soon. Certification is expected next year. The H160 has Blue Edge main rotor blades for quieter operation, a canted Fenestron tail rotor for more payload and the house-developed Helionix avionics suite that can be found on other newer Airbus models. The Helionix flight deck is similar to that of the H175, using four six- by eight-inch displays. A major difference is the return of the overhead panel for engine controls. Cursor-control devices are a key pilot interface and for the mission display a touchscreen will be optional. Other innovations include a fully composite airframe, a biplane stabilizer—for improved main rotor efficiency—and electric landing gear.

For the offshore oil-and-gas mission, the H160 will offer class 1 takeoff performance for 12 passengers and a 120-nm

Continues on next page ▶

▶ *Continued from preceding page*

radius of action. Other goals include hover out of ground effect at up to 5,000 feet and range of 450 nm with a 20-minute reserve. The "smooth cruise speed" will be 160 knots, without any counter-vibration system. A de-icing system is not planned yet, although the company has made provisions for it.

The H160 will pioneer a brand new assembly model at Airbus Helicopters that will enable manufacture in just 18 weeks. Each H160 will consist of five major component assemblies that are fully completed and tested before they reach the final assembly line.

Bell 525

Bell will certify the super-medium 525 Relentless using four test aircraft, and a senior company executive maintains the company retains confidence in the super-medium twin's original design. The program has stood down flying since the fatal crash of the first prototype, FTV1, registered as N525TA, on July 6 last year. The NTSB is continuing its investigation into why the main rotor blades struck both the tail boom and the nose during the in-flight breakup sequence, which destroyed the helicopter and killed both test pilots. FTV1 was one of three 525 prototypes in the flight-test program, which at the time was budgeted for five aircraft. FTV1 is believed to have been conducting tests at or near Vne when the main rotor rpm dropped off and the main rotors significantly "departed their normal plane of rotation," according to an NTSB spokesman.

Bell continues to assemble the next two flight-test aircraft and begin construction of the first several customer aircraft. FTV4 is heavily kitted with search-and-rescue equipment and more flight-test instrumentation than originally planned. Bell expects it to be ready to fly early this year. FTV5 will have a lot of the oil and gas mission kits on it. Between those two aircraft, approximately 50 kits will be certified as part of the initial flight-test program. Aircraft six through nine were in structural subassembly late last year.

Leonardo AW609

The 525 is a 20,500-pound super-medium with capacity for up to 20 passengers in high-density configuration, a maximum range of 570 nm (no reserve), a maximum cruise speed of 162 knots and a ceiling of 20,000 feet. The 525 is powered by a pair of GE CT7-2F1s (1,800 shp each) driving an all-composite five-blade main rotor system and a four-blade tail rotor. The airframe is a hybrid of aluminum and composite materials. The aircraft incorporates a triple-redundant fly-by-wire flight control system with a BAE flight control computer and sidesticks in place of conventional cyclics linked to a four-screen Garmin G5000H touchscreen avionics suite with Telligence voice command. Bell has not published a price for the 525 nor has it updated the program schedule since the accident last year. It claims to hold letters of intent for 80 helicopters.

Russian Helicopters Mi-171A2

Russian Helicopters aims to have this upgraded version of the venerable Mi-8/17 certified later this year. The A2 introduces a two-man crew (down from three), a KBO-17 glass-panel avionics suite, a lighter main rotor system that delivers 1,500 pounds more lift, and a 2,200-pound increase in mtow. Power comes from a pair of Klimov VK-2500PS-03s (2,400 shp each for takeoff). The new engines provide 400 more shp than is available in the Mi-8/17, boost cruise and maximum speeds by 16 knots and extend range to 430 nm from 320.

Russian Helicopters Mi-38-2

Airbus Helicopters X6

Airbus Helicopters X6

The replacement for the H225 Super Puma remains in the concept stage. Entry into service is expected in the mid-2020s. Airbus has floated a few clues on the new helicopter. Expect full fly-by-wire digital flight controls, all-weather capability with full de-icing, the extensive use of composites and advanced manufacturing, and two engines. Airbus has also hinted that the X6 will share some commonality, most likely in the avionics, with the H160 and H175.

Russian Helicopters Mi-38-2

The long-delayed replacement for the Mi-8 has been redesigned once again, this time with all-Russian content. The heavy (34,400-pound) twin with seating for up to 30 will now be powered by a pair of Klimov TV7-117V turboshafts (2,800 shp each) and have a cockpit with a Russian-designed IKBO-38 glass avionics suite with five LCDs. Four prototypes have flown so far and Russian Helicopters hopes to have the type ready for customers late this year or early next.

Avicopter AHL

Last year China and Russia entered into a joint venture to develop the AHL (Advanced Heavy Lifter), a scaled-down version of the massive Russian Mi-26 Halo, the world's largest helicopter. Mtow is estimated at 88,000 pounds with seating for up to 60. First flight could come as early as next year. Performance targets are maximum speed of 162 knots, range of 391 nm and ceiling of 18,700 feet. The AHL will require two 8,000-shp engines driving a seven-blade main rotor system and a five-blade tail rotor.

Russian Helicopters Mi-26T2V

The latest upgraded version of Russia's monster ship has advanced navigation and handling systems and a new autopilot as part of the Breo-26 glass cockpit avionics suite, as well as advanced video capabilities to assist in monitoring external loads.

Compound Helicopters

Airbus LifeRCraft

LifeRCraft builds on Airbus's compound X^3 research demonstrator, which debuted in 2010 and has since been retired. The X^3 dashed at 255 knots in level flight in 2013. LifeRCraft is being built as part of the Clean Sky 2 European research program. First flight could happen in 2019 and the design could result in a commercial product by 2030.

Tiltrotors

Avic Blue Whale

Chinese state-owned aircraft company Avic is developing two variants of an "ultra fast" 270-knot tiltrotor code-named Blue Whale, English-language newspaper China Daily reported in December last year. Unlike tiltrotors such as the Bell Boeing V-22 Osprey or Leonardo AW609, the Blue Whale is a quad prop-rotor design. A medium variant is said to have an mtow of 44,090 pounds/20 metric tons and a heavy variant will have twice that capacity. Initial targeted range is 1,674 nm/3,100 km. Avic has not yet set a timetable for the program, with a company official saying only that he expects development to take "a long time."

Leonardo AW609

Flight-testing resumed in August last year following the fatal crash of the second prototype on Oct. 30, 2015. Despite the 10-month delay in the flight-test program, as well as calls for wind-tunnel retesting and redesign of the fly-by-wire flight control system by Italian ANSV aviation investigators, the company insists that the AW609 remains on track for certification next year. The aircraft will be certified initially by the FAA under Parts 23, 25, 29 and a new category called powered lift. Two more prototypes are scheduled to join the test fleet, although neither had flown as of early last month.

Four interior configurations are being developed: a standard two-pilot, nine-passenger layout; a four-passenger luxury cabin; a six- and seven-passenger executive cabin; a two-litter medevac interior; a search-and-rescue design with hoist, basket, litter and four single seats; and a patrol/surveillance variant. A wider and flush-opening cabin door with a retractable hoist is being designed for later models. Pricing remains the subject of much speculation, but sources close to the program suggest it will be less than $30 million in current dollars.

Announced performance: maximum forward speed of 275 knots, a ceiling of 25,000 feet, a hover out of ground effect of 5,000 feet, hover in ground effect of 10,000 feet and a useful load of 2,500 pounds. Short-takeoff capability will be added to the certification basis to raise the helicopter's maximum takeoff weight to 18,000 pounds from 16,800 pounds. The extra weight could be used to boost fuel capacity and range, now estimated at 700 nm but up to 1,100 nm with auxiliary fuel. The AW609 will be assembled in Europe and the U.S.

Leonardo AW CTR

Leonardo is developing a larger commercial tiltrotor expected to seat 25 to 50 passengers. It is partially funded by the European Union's Clean Sky 2 environmental initiative. If the program progresses, the machine could fly in 2020 and enter production in 2025. ❑

Airbus LifeRCraft

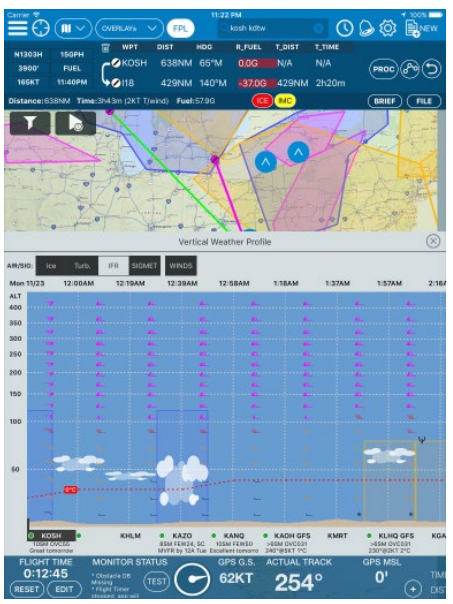
Aviation apps

New features add utility to ubiquitous mobile devices

by Matt Thurber

In just half a decade since Apple introduced the iPad in 2010, tablet computers have become essential pilot tools, and it's rare to see a pilot flying today dragging around a heavy bag of printed charts. From basic chart replacement apps to full-fledged electronic flight bag (EFB) and performance apps, the tablet computer—whether running Apple's iOS, Google's Android or Microsoft's Windows operating system—has found a permanent home in every type of aircraft, from helicopters to light general aviation airplanes, business turboprops and jets and even the largest airliners.

The aviation app environment is maturing, and now we're seeing incremental improvements in many popular apps, rather than major developments. One area where there has been a leap in capability, however, is the adoption by many app developers of vector-based mapping engines. This isn't a new development—Jeppesen's maps have long used this feature, as has Garmin Pilot—but ForeFlight and Aerovie have now adopted vector-based maps, and we expect this will spawn new features and also be the default for EFB apps.



EFB Apps

Aerovie

(iOS; IFR $69.99/year)

Aerovie continues adding features that set it apart from many other EFB apps, and it offers more Apple Watch functionality than any other aviation app. The AeroVector vector-based mapping engine allows Aerovie 4.5 to zoom right into an airport's taxi diagram, so users no longer have to pull up a separate taxi diagram for ground operations.

Aerovie's vertical profile is one of the most detailed available and shows depictions of cloud cover as well as clearly marked airmets, sigmets, icing forecasts and freezing level.

A feature that only Aerovie offers is a quick pilot report button, which allows pilots to submit a pirep directly to Leidos (formerly Lockheed Martin) Flight Service via in-flight connectivity systems.

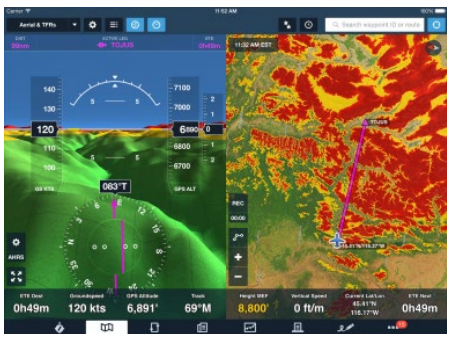
Aerovie's Apple Watch functions provide multiple timers (flight, engine start, takeoff), airport thumbnail with frequencies and runway information, automated landing briefing and checklists, and weather information.

Aerovie also has synthetic vision. The latest version adds a new runway sunset and sunrise awareness feature, which alerts users when conditions might be right for distracting glare during landing. Aerovie's barometric altimeter (available on later-model iPhones and iPads with a baro sensor) can pull information via ADS-B IN receivers and display barometric pressure altitude based on local conditions.

ForeFlight Mobile

(iOS; ProPlus $199.99/year)

ForeFlight remains a top-selling EFB app in the business aviation market, and the company makes it easy for flight operations to add iPad-based EFBs, with a full suite of compliance-management and regulatory approval services, as well as JetFuelX fuel importing from many fuel vendors.



In addition to ForeFlight's data-driven vector-based mapping engine, released last year, the company is developing a flight-planning engine with turbine aircraft profiles that provide much more accurate flight time and fuel burn numbers.

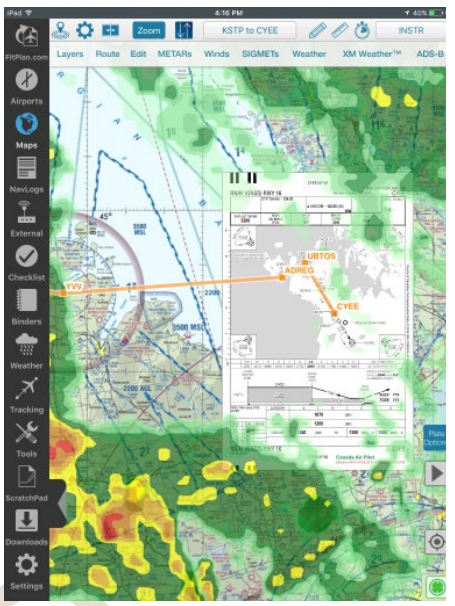
ForeFlight's graphical weather briefing tool walks a user through a detailed briefing in an easily interpreted format. ForeFlight also offers web-based flight planning, which can be shared with the iPad version; the weather briefing is available on ForeFlight web as well.

Synthetic vision and a vertical profile are longtime ForeFlight features (although the vertical profile doesn't depict weather). ForeFlight offers pilot logbook, weight-and-balance, integration with the Appareo Stratus 1S and 2S ADS-B IN receivers and ESG ADS-B OUT transponder and SiriusXM weather when using the SiriusXM Sxar1 portable aviation weather receiver.

FltPlan Go

(iOS, Android, Windows; free)

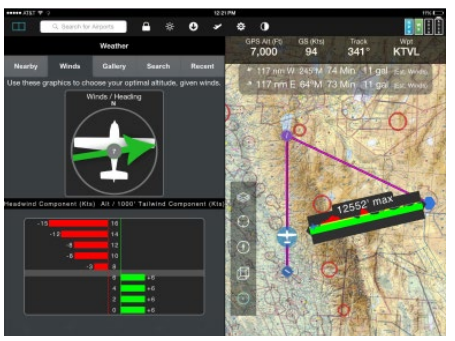
FltPlan's Go app, which runs on various mobile devices, remains one of the most powerful free EFB apps available. It has moving map with geo-referenced approach charts, route fuel prices, in-flight weather via ADS-B IN or SiriusXM Sxar1 weather receiver, weight-and-balance, logbook, pre-departure clearances and checklists. FltPlan Go is fully integrated with the FltPlan web-based flight-planning service (also free). A feature added last year to FltPlan Go is split screen, which can display six-pack flight instruments, airport information (such as procedures), navlogs, checklists, weather, scratchpad and other FltPlan tools.



FlyQ EFB

(iOS; IFR $139/year)

The Seattle Avionics FlyQ EFB app makes extensive use of split screen, with many features available on either screen, among them highway-in-the-sky navigation, synthetic vision, wind



shown in an easy-to-understand graphical format, airport surface wind depiction and scratchpad. In addition to all the now-standard EFB features, FlyQ offers aerial photo views as a map layer.

Garmin Pilot

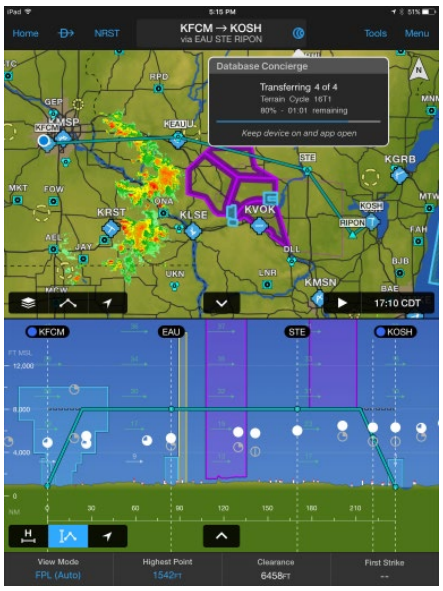
(iOS, Android; IFR $149/year)

Version 8.5 of Garmin Pilot for iOS adds integrated weight-and-balance, new performance tables, freehand flight plan editing and aircraft-specific checklists that can be modified by the user.

In addition to assessing aircraft loading, the weight-and-balance calculator is incorporated into flight plans or saved trips, according to Garmin, "taking into account fuel burn and more for a comprehensive look at weight-and-balance characteristics through an entire flight." The calculator shows the change in loading with fuel burn during the flight, and the integration allows the user to select various fuel loadings that depend on the

payload, such as maximum fuel and 30-, 45- and 60-minute reserve. Performance information, including weight-and-balance data, for various piston aircraft is already baked into Pilot.

When planning a flight, pilots can adjust the power setting and altitude (from a list of altitudes and forecast winds and temperatures aloft) and instantly see the effects on cruise speed and fuel burn. While flying, if it is necessary to recalculate a route around weather, obstacles or airspace restrictions, the pilot can finger swipe a new route on the moving map using the new Freehand feature. Freehand doesn't create new user waypoints but adjusts the route using nearby navaids, intersections and airports and adds them to the flight plan. The pre-populated aircraft in Garmin Pilot 8.5 have interactive checklists.



Some of these features are not available in the Android version of Garmin Pilot.

iFlightPlanner
(iPad; IFR, $139.99/year)

The iFlightPlanner system is focused primarily on web-based flight planning using browsers running on any type of device, and it is integrated with the iFlightPlanner iPad app. The flight planning system provides weight-and-balance, pilot logbook, moving map with flight data recorder, digital instrument panel and instrument approach timer, cockpit voice recorder and split-screen view.

Jeppesen Flitedeck Pro
(iOS, Windows; price based on data subscription)

Subscribers to Jeppesen aeronautical data can use a key code to supply that data to the company's Mobile Flitedeck Pro app, one of the very few that runs on both iOS and Windows devices. Jeppesen has also made its data available (for Jeppesen subscribers only) to other EFB apps such as Garmin Pilot.

Flitedeck Pro was designed for display of vector-based IFR charts (there is a VFR version as well as a VFR en route layer for the IFR version). But now Flitedeck offers flight-planning features as well as the ability to import flight plans from RocketRoute. Weather information is available, as are recently issued cleared routes. Flitedeck shows own-ship position on both en route displays and terminal charts. In December, Jeppesen began releasing improved SID and Star charts with depictions of terrain, color to show important features and true-to-scale chart elements.

WingX Pro7
(iOS, Android: IFR $149.98/year)

Hilton Software has a long history of delivering moving-map functionality on early mobile devices, and its latest version, WingX Pro7, pioneered many of the features that pilots have come to expect as standard in mobile EFB apps: synthetic vision with attitude driven by an external AHRS, vertical situation display, split screen, height-above-terrain/agl, and the ability to draw a route or diversion on the screen for addition to a flight plan. WingX Pro7 also was the first EFB app where pilots could add a SID or Star and instrument approach procedure to a flight plan.

OEM/Training Apps

More avionics manufacturers are using mobile device apps for training and to deliver manuals and performance information to customers. Tablet computers are well suited to this purpose, especially for avionics that are touchscreen controlled, and one of the big benefits of providing training modules on tablets is that a prospective customer can learn all about a product's functionality and performance before buying.

Avidyne IFD
(iOS; free)

Avidyne's free IFD iPad app is a great way to preview the IFD 440/540 com navigators before buying, and then learn how to use them before taking off in the airplane.

The IFD simulator provides live weather information, and two versions of the app are available, one for the U.S. and another with an international database.

Aviation Applications Aspen E1000
(iPad; $11.99)

This just-released avionics trainer replicates the Aspen Evolution EFD 1000 display, although it doesn't have synthetic vision and some functions are not usable. It is to be hoped that the developer will add capability in future versions.

FlightSafety CPDLC
(iOS; price available from FlightSafety)

FlightSafety International's new datalink training module for the Gulfstream G450 and G550 is available on the FlightSafety FlightBag app as an iFlightDeck operational-use trainer, replicating the exact steps needed to fly from London to New York. The program covers digital ATIS, logging on in London, takeoff and departure, requesting altitude and speed changes, oceanic clearances, abnormal and emergency situations, weather deviations, free texting, digital clearance (DCL) and much more.

Pilots can run through the entire CPDLC course to learn how to use the new technology, or take a refresher before a trip. Each subject can be reviewed on its own so it isn't necessary to start at the beginning. For a refresher on digital clearances, for example, the user just clicks on the CPDLC-DCL section.

Within each subject, the training course moves the pilot step-by-step through the datalink process. The user has to select each FMS key to advance, and hints help prompt the right response. Using the app is just like the real thing, and it even provides aural alerts such as a two-chime when ATC responds.

Garmin GTN Trainer
(iPad; free)

Anyone looking at buying a Garmin GTN com navigator should download the free GTN Trainer app. It's easy to set up the Trainer in a specific location, altitude and airspeed then "fly" it just as if it were in a real aircraft. The touchscreen mimics the GTN 650/750 interface, and the app comes with SafeTaxi charts, FliteCharts, high-resolution worldwide terrain and aviation databases, simulated ADS-B and SiriusXM weather interfaces, audio panel and transponder.

Honeywell GoDirect and Pilot Gateway

As part of its GoDirect line, Honeywell has ramped up app development efforts, drawing on the information it generates to deliver some useful apps for pilots. One of Honeywell's most useful apps is the free Pilot Gateway for access to manuals, service information letters and navigation alerts for all of its FMSs, avionics suites and satcom systems.

The Pilot Gateway is an excellent resource, with pilot's guides for all of the airplanes and helicopters for which Honeywell manufactures avionics and engines.

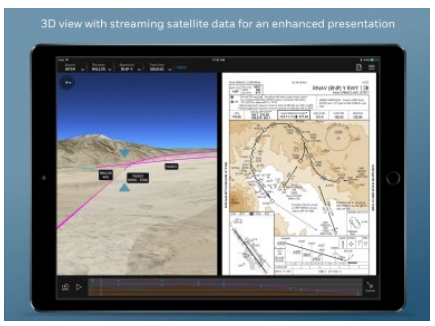
Continues on next page ▶

Aviation apps

▶ *Continued from preceding page*

Flight Preview allows pilots to "pre-fly" instrument approach procedures (currently in the U.S. only, including Alaska and Hawaii) by viewing the approach from a cockpit perspective as flown over a terrestrial map.

The Weather Information Service app allows pilots to view forecast weather for a particular flight plan,



both overlaid on a map of the planned flight and as a vertical situation display graphically illustrating location and altitude of cumulonimbus tops, forecast winds aloft, clear air turbulence, icing and sigmets.

While the Pilot Gateway is free, there are subscription fees for the Flight Preview and Weather Information Service apps.

Universal Avionics Touch CDU

(iPad; free, but requires Windows-based FMS desktop software)

Teaching a pilot unfamiliar with how a flight management system (FMS) works can be challenging without access to a physical FMS trainer or training software at the major simulator training providers. Universal Avionics has simplified the process somewhat with the Touch CDU iPad app, which works with the company's FMS desktop software. The iPad Touch CDU doubles as the control-display unit to operate the Windows-based FMS, allowing the user to learn how to program the FMS without distraction in the comfort of home, instead of waiting for a training event or trying to learn while flying.

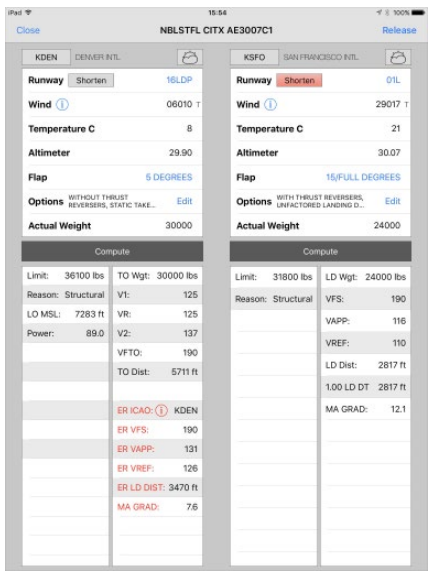
Performance Apps

Many aircraft manufacturers offer their own performance calculation apps, but independent companies such as APG, Cavu, Gyronimo and others have carved out their own niches with tablet-based performance apps.

APG IPreFlight

(iOS; price varies by subscription)

The latest version of Aviation Performance Group's iPreFlight app adds the Max Payload Estimator, which accounts for changes in loading during flight to help operators ensure the aircraft remains within cg



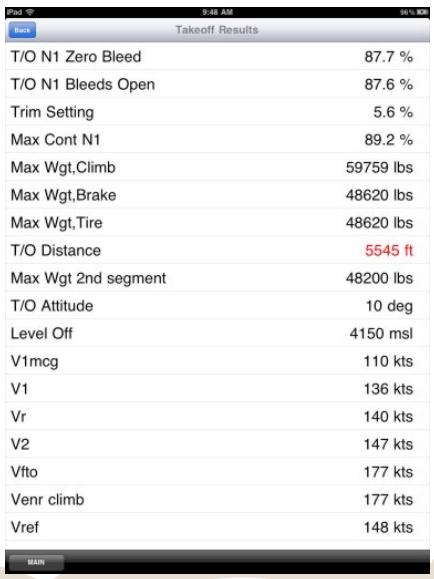
limitations from takeoff to touchdown. APG's runway analysis is widely used by business jet and airline operators to maximize payload at hot-and-high airports, by using APG's custom-designed engine-out procedures. The weight-and-balance feature calculates reserve, alternate and holding fuel and forecast weather conditions for the planned trip. Once the performance is determined, the user can save and send a flight release that shows the runway analysis, weight-and-balance, takeoff and landing distance, notams, flight plan and textual and graphical weather information.

iPreFlight now has a separate cold-weather operations app for determining adjustments to altitudes during instrument approach procedures when temperatures are colder than normal. The user will be able to enter an airport ID and the temperature and quickly see the necessary adjustments without having to run the numbers in the FMS or calculate the restrictions separately, and this feature will work offline too.

Cavu EFB-Pro

(iOS; price varies by subscription)

The EFB-Pro app calculates weight-and-balance and takeoff performance using aircraft manufacturer flight manual data, which provides a "net takeoff flight path profile…used to calculate obstacle clearance weight restrictions," according to Cavu. EFB-Pro can be used either online or offline,



and takeoff and landing performance extends to wet and contaminated runway information when the aircraft manufacturer makes that available. EFB-Pro also offers assistance with fuel tankering and a holdover-time calculator for ground deicing.

Other Useful Apps

Tablet computers have generated a great deal of creativity among app developers, everything from new ways to look at weather to flight debriefing and oxygen/emergency management.

AirDB

(iOS; $19.99/year)

Slobodan Vuckovic's AirDB is a comprehensive database of business airplanes and helicopters that makes comparing performance specs simple and easy. Range ring maps for different models

can be overlaid for a quick comparison of range capability. The business aircraft database covers pistons, turboprops and jets. Newly added information: operating cost per flight hour, cabin volume, payload with full fuel and sea-level cabin altitude. The helicopter database, sold separately but also $19.99/year, covers civil piston and turboshaft rotorcraft.

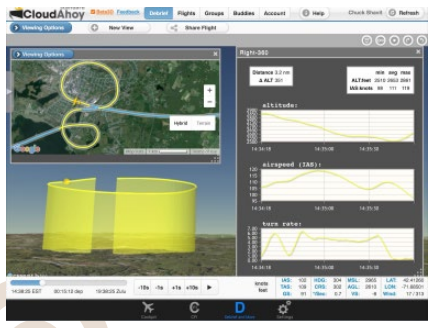
CloudAhoy

(iOS; some features free, standard $45/year)

CloudAhoy remains the gold standard for post-flight debriefing using just recorded GPS data to analyze flight track information, although with additional data the service can provide even better resolution.

CloudAhoy is both a service available on the web and an iOS app for recording flight data, but debriefings can be done using data from GPX, MKL and IGC files, ForeFlight Mobile, portable GPSs and avionics such as GRT, Dynon and Garmin G1000 and G3X products.

Once the flight data is uploaded to the CloudAhoy server, the user can



review flights in 2- or 3-D, as a cockpit view, alongside video of the flight and overlaid with charts and instrument approach procedures.

Ergo 360

(iOS; price varies by subscription)

The Aeronautical Data Systems (ADS) Ergo 360 app allows pilots and flight planners to maximize the benefits of onboard oxygen sup-

plies to minimize the amount of fuel that must be carried. The original Ergo 360 presentation shows two range circles on a map with the aircraft's own position and planned diversion airports. One circle shows the airplane's fuel range (blue), and the other (green) is the airplane's oxygen range during an emergency diversion. If something happens that means the airplane can't reach an airport, such as an engine failure after decompression over the ocean, the flight crew might have to plan to ditch.

The newest version of Ergo 360 adds a vessels tab that shows the location of ships in case a dire emergency requires a water landing. The vessels tab pulls up a near real-time display of all ships that participate in the Automatic Identification System (AIS) vessel-tracking service. Touching any blue vessel symbol pulls up speed, ship type and track.

wx24 pilot

(iOS; $15.99/year)

Pilot Paxton Calvanese never liked the way weather information was disseminated and finally decided to do something about it. The result is the wx24 pilot app, which graphically depicts aviation weather and allows pilots to set go/no-go parameters to help with decision making.

What differentiates wx24 from other weather and EFB apps is its generous use of a graphical display of metars, TAFs, airmets, sigmets and TFRs. The graphical display is a 24-hour circle that color codes the weather and shows elements that might affect the flight; the circle can be set to a 24-, 12- or one-hour period, with an airplane symbol showing the current time so the user can instantly see the effect of upcoming weather.

Users can view the graphical weather for local airports or for an entire route. While the graphical interface is easy to interpret, it does take a little time to learn, and Calvanese urges new users to look at the wx24 screen shots, videos and tutorials. ❑

Garmin's NXi suite enhances G1000 safety and useability

by Matt Thurber

Garmin's G1000 NXi (next-generation) avionics suite, already certified in the King Air 200, adds faster processors, map overlays on the HSI and wireless connectivity to mobile devices via Garmin's Flight Stream 510.

Garmin has released a major upgrade for the G1000 integrated flight deck, the G1000 NXi (next generation), with faster processors, map overlay on the horizontal situation indicator (HSI), Flight Stream 510 capability, improved ADS-B options, new visual approaches in the procedures menu and a two-year display warranty. The G1000 NXi is already STC'd on the King Air 200—the 300/350 will be added shortly—and it saves about 250 pounds when replacing original avionics. Owners of existing G1000 King Air flight decks will be able to upgrade to the NXi system since the displays have the same footprint and connectors.

Hands On

The G1000 flight deck is 14 years old and 16,000 of the systems are flying. While the NXi upgrade doesn't change the pilot interface—no touchscreens or keyboard controller are available in the King Air installation—the system's new displays add LED backlighting and the faster dual-core processors speed initialization time and allow faster map rendering and smoother panning. Boot-up time is almost instantaneous, according to Scott Frye, sales manager for integrated flight deck retrofit programs, and the faster processors and added random-access memory also drive speedier operation. Panning used to require moving in either vertical and horizontal directions; now it can be done in any direction. The LED backlighting reduces power consumption, makes the displays brighter and improves dimming. The new displays support advanced doppler weather radar features such as optional ground clutter suppression and turbulence detection. A new integrated ADAHRS simplifies installations, combining two separate boxes into a single LRU; the King Air installation uses two of the new ADAHRS units.

The new map overlay on the primary flight display (PFD) HSI was a highly requested improvement, according to Frye, and it supports display of Nexrad imagery and animation, weather radar, ADS-B IN weather, SafeTaxi airport diagrams, traffic and terrain. Terrain on the HSI map overlay and multifunction display (MFD) map is now depicted with three-color terrain shading: green for 2,000 feet, yellow for 1,000 feet and red for 100 feet agl. When tuning com frequencies, an ID field shows the station ID and frequency type.

The NXi MFD, which has higher resolution than the original, now shows sectional and IFR low/high en route charts. The MFD will also allow overlay of animated Nexrad weather imagery. On the bottom of the MFD, pilots can switch on a vertical situation display, which has a terrain profile based on the active flight plan and a depiction of winds aloft. The new system can also show a preview of the departure and arrival procedures on the MFD before the pilot loads and activates them. Garmin's SurfaceWatch runway monitoring is optional for NXi installations and upgrades. Softkeys on the bottom of the displays no longer use light gray to indicate selection; a green light underlining the text label on the button now highlights the selection, and this is much easier to interpret.

The new system adds visual approaches to the NXi's procedures menu. This is particularly useful when you're cleared to land at an unfamiliar airport or in reduced visibility but VFR conditions. When selecting the visual approach for a particular runway, the pilot can set customized minimums and vectors or straight-in for the intercept. The visual approach uses a three-degree glideslope, and it can be flown coupled to the autopilot.

The NXi flight deck offers optional installation of Garmin's Flight Stream 510 Connext wireless cockpit connectivity system, which is housed in an SD-sized MMS card that plugs into a slot in the front of the MFD. This eliminates the need to install a separate Flight Stream device elsewhere. Flight Stream 510 supports two-way flight plan transfer and sharing of traffic, weather, GPS information, backup attitude information and so on between the NXi avionics and the Garmin Pilot and ForeFlight Mobile apps. Flight Stream 510 also enables Garmin's Database Concierge for loading avionics databases via Garmin Pilot.

Flying NXi

Frye demonstrated the NXi features in Garmin's King Air 300 during a flight from Hawthorne to San Bernardino, Calif. We chose that route so that we could fly the coupled missed approach, a feature made possible by the Garmin GFC 700 autopilot's optional Electronic Stability and Protection system. ESP helps pilots stay in a safe flight envelope by adding a "nudge" feel to warn of exceeding specified pitch and roll limits when hand flying. When coupled with a compatible angle-of-attack sensor, ESP can also help prevent stalls by lowering the nose. San Bernardino is backed by a steep mountain range, and this would give us an excellent test of the NXi's HSI map.

On the ILS Runway 6 at San Bernardino International Airport, the HSI map clearly depicts surrounding terrain.

Some of the NXi changes are subtle, such as smoother and less blocky and pixelated terrain coloring, larger engine fonts, rounded edges on the waypoints page and a clearer depiction of SafeTaxi charts. Also new is the ability to insert the departure and arrival runway in the flight plan. If the system is equipped with SurfaceWatch, which is the case with this King Air, the correct runway is painted blue on the synthetic vision image on the PFD.

I like the appearance of the new displays and I do like the new HSI map. Perhaps I spend too much time looking at the PFD instead of the big map on the MFD, but I find it easier to get as much information as possible from the PFD. Having all the traffic, terrain and weather on the HSI map seemed to make flying easier. I also like the new information box below the com frequencies; it eliminates some mental burden without adding clutter to the PFD.

During the ILS approach to San Bernardino, the mountains east of the airport were clearly visible on the synthetic vision display, with the blue runway waiting for us at the end of the glideslope. Even with the mountains well outlined on the synthetic vision, having the HSI map right at the bottom of the PFD with its own color-coded terrain added to situational awareness. Even on a clear Southern California day, it was still good to be able to see where we were in relation to the steep topography. The visual situation display adds even more information about the aircraft in relation to the terrain, but this requires looking over at the MFD, something that I do less and less as I get closer to the ground.

Instead of landing we flew the missed approach, which simply requires pushing the go-around button while advancing the power, watching the autopilot pitch up 10 degrees, retracting gear and flaps, then pushing the nav button on the autopilot, which then accurately flies the missed approach procedure. This is a great safety feature, freeing the pilot to concentrate on situational awareness, talking to ATC and deciding what to do next.

On the way back to Hawthorne, we selected the visual approach to Runway 25 from the procedures menu and set the 620-foot localizer approach minimums as the minimum descent altitude (MDA) for the approach. The autopilot can fly a coupled visual approach, and we left the autopilot on for the approach into Hawthorne. Visibility was low in haze, and we were flying into the sun, making it difficult to pick out the runway visually.

The G1000 NXi sets up a final approach fix called STRGHT for the visual approach, then draws a three-degree glidepath. Flying the visual approach procedure in the hazy weather into the sun proved extremely helpful as we didn't see the runway clearly until about a mile from the threshold.

Some 450 King Airs have been upgraded to the G1000 system, and they are prime candidates for the roughly $50,000 NXi upgrade. The G1000 upgrade—all will henceforth be the NXi flavor—isn't yet available for 90-series King Airs, but Garmin expects to certify that later next year.

Meanwhile, aircraft manufacturers have announced their NXi plans. Textron Aviation service centers are offering the G1000 NXi flight deck as a retrofit using the Garmin STC in the King Air 200, 250, 300 and 350. And the NXi system is now standard on new-build Cessna 172s, 182s and T206s and Beech Baron G58s and Bonanza G36s. Daher announced the TBM 900 will also receive the NXi upgrade.

Cirrus just unveiled the G6 SR20 and SR22 with the NXi avionics and other new features. Piper has upgraded the G1000-equipped Seminole and Archer to the NXi standard.

The NXi upgrade adds a lot of new functionality and utility to the G1000, and also makes it easier to use, but in a way that doesn't present a big learning curve for pilots used to flying the Garmin flight deck. ❑

NEWS UPDATE

Qatar Takes Stake in Latam

Qatar Airways has purchased a 10-percent share of Santiago, Chile-based Latam Airlines Group, the carriers announced on December 29. Through its Qatar Airways Investments subsidiary, the Persian Gulf carrier acquired 60.8 million shares in a transaction valued at $608 million.

Latam formed in 2012 through the merger of Chile's LAN Airlines and Brazil's TAM; it reports a combined fleet of 335 aircraft. Latam and Qatar Airways each maintain membership in the Oneworld airline alliance.

Delta Drops 787 Order

Delta Air Lines has canceled an order with Boeing for eighteen 787 Dreamliners stemming from its 2008 merger with Northwest Airlines. In 2010 the carrier had deferred deliveries to 2020 and beyond.

Atlanta-based Delta announced on December 27 that it had reached an agreement with Boeing to cancel the 787 order, valued at $4 billion at list price. The carrier affirmed that it will continue to take delivery of new 737-900ER narrowbodies through 2019, under two orders for 120 jets.

"This business decision is consistent with Delta's fleet strategy to prudently address our widebody aircraft needs," said Greg May, Delta senior vice president for supply chain and fleet management.

As of November, Boeing reported orders for 1,210 Dreamliners. It announced delivery of the 500th, a 787-8, to Colombia's Avianca on December 22.

Sukhoi Addresses Superjet Defect

Sukhoi Civil Aircraft (SCAC) expected to complete work to resolve a tail stabilizer defect discovered in Sukhoi SSJ100s during a December 22 routine inspection by the end of last month, according to the Russian regional jet manufacturer.

As 2016 drew to a close, the Russian civil aviation authority (the Federal Agency of Air Transportation or FATA, known locally as Rosaviatsiya) approved methods suggested by the manufacturer to fix the previously discovered defects related to stabilizer attachment points. The authority issued two Airworthiness Directives on the subject, on December 23 and December 28. The first directive recommended by air safety inspectors, who discovered faulty force bearing elements on several airframes, repairs sticking of attachment points in the upper and lower stiffeners of the horizontal stabilizer. The second directive called for replacement of the attachment stiffeners with new ones.

According to the manufacturer, the defect does not relate to construction material quality or manufacturing methods; however, inspectors have traced the problem to incorrect installation of stiffeners. SCAC further said the defect did not amount to a critical issue because the attachment of the stabilizer incorporates "a multilevel redundancy system and a large amount of excessive strength, twice exceeding loadings observed in flight operation."

Among Russian SSJ100 operators, the largest—Aeroflot—appeared the least affected by the directives, as its Superjets continued flying regular services. Among Western operators, Interjet of Mexico had to temporarily ground half of its 22-strong SSJ100 fleet until it completed checks and rectified defects. *—G.P.*

Irkut revealed the first MC-21 during a rollout ceremony in Irkutsk last June. At the time, officials estimated it might fly this February but official estimates now place the milestone some time during the first half of this year.

First flight in sight for Irkut's MC-21-300

by Vladimir Karnozov

Russian airframer Irkut plans soon to transfer the first MC-21-300 narrowbody to its flight-test station in the Siberian city of Irkutsk as preparations for the maiden flight progress to their advanced stages. The company, which is part of United Aircraft, staged a rollout ceremony last June for Aircraft 0001, and during the second half of last year tested its fuselage for airtightness, installed on-board equipment and calibrated measurement systems.

"The first operable airplane has been switched to electric power at the Irkut Aviation plant; its frequency response testing has commenced," according to Irkut president Oleg Demchenko. "All tests at the factory shall be complete by the end of the first quarter."

In addition to the frequency response testing on Aircraft 0001, he named as the "second largest" near-term task the assembly of Airframe 0002 for static testing at TsAGI, the Central Aerohydrodynamic Institute in Zhukovsky, just outside Moscow. In late December officials showed a group of local journalists Aircraft 0002 in a TsAGI workshop, where mechanics had attached wing section to the fuselage. The airframe was still missing leading and trailing edges, engine pylons and other items necessary for bona fide static testing, however. After they complete final assembly as planned this month, TsAGI specialists will attach weights and sensors on the static airframe before subjecting it to loading. Afterward, "the work at TsAGI will start in earnest," promised Demchenko.

In March the manufacturer plans to submit "the whole package of documentation" to the aviation authorities. Plans then call for inspectors at TsAGI, Gromov's Flight Test and Research Institute and Baranov's Central Institute of Aviation Motors to study the documents and issue their conclusions on readiness of the first operable prototype for flight trials for final consideration by the branch of the national civil aviation authorities assigned to new aircraft types.

Meanwhile, Aircraft 0002 will conduct static and endurance tests. Its wing box arrived at TsAGI in July. Engineers completed mating the main load-bearing members of the wing and fuselage in mid-November, after which it underwent a series of preliminary tests to assess their airworthiness. By the end of that month, they subjected the assembly to 67 percent, then to more than 80 percent of the maximum permitted loading on the wing-box. The assembly went through a series of local testing involving forces on landing gear struts and engine pylons. Following completion of tests in preparation for first flight, Aircraft 0002 will undergo more vigorous tests for endurance and ultimate loading.

Separately, the manufacturer reported completing tests on "hundreds" of individual airframe components and subassemblies to assess their strength. They include vertical tail and horizontal stabilizer load-bearing structures, as well as landing gear struts, elevators, air brakes, rudder, wing trailing and leading edges, flaps, ailerons and the forward fuselage.

During endurance testing, the fuselage section surpassed 47,000 load cycles and the tail section endured 240,000 load cycles, each corresponding to a real flight, according to Irkut.

Irkut reports that 40 percent of the MC-21 airframe consists of composites, mostly in the center fuselage, wing boxes and leading and trailing edges. As part of the initial testing effort, the company built four wing box "prototypes." Testing on the final version of the wing box—a production specimen—continues, as does onboard systems testing using a so-called Iron Bird and Copper Bird.

Irkut has not specified an exact date for the MC-21's first flight, although it promises to reach the milestone in this year's first half. ❑

The first of 46 A320-series jetliners destined for Iran Air, an A321, lands at Toulouse Blagnac Airport.

IRAN AIR TAKES DELIVERY OF ITS FIRST NEW AIRBUS

Iran Air has taken delivery of the first of 100 new Airbus airliners on order, an A321, during a handover ceremony in Toulouse attended by Iran Air chairman and CEO Farhad Parvaresh, Airbus COO Fabrice Bregier and Airbus CEO Tom Enders. The order, placed in December, covers 46 A320 family jets, 38 A330s and 16 A350 XWBs.

"This significant milestone marks the first practical step in Iran Air's ambitious passenger aircraft fleet renewal and its stronger presence in international civil aviation," said Parvaresh.

"Clearly in a country of 80 million people, there is a need for the latest passenger aircraft to meet domestic as well as international demand," added Bregier.

Airbus forecasts that Iran will require some 400 to 500 new aircraft to modernize and expand its existing passenger fleet.

The delivery comes just nine days ahead of the inauguration of a U.S. presidential administration openly critical of the nuclear settlement with Iran that allowed for the resumption of sales of civil aircraft to the Islamic Republic. Although the U.S. Treasury Department's Office of Foreign Assets Control (OFAC) granted licenses for the deal in September and November, as required for any export of aircraft possessing more than 10 percent U.S. technology content, questions surrounding the political environment and its potential effect on the deal remain as President-elect Donald Trump prepares to take office on January 20. The Iran Air A321 is powered by CFM56 turbofans produced by the joint venture between GE Aviation of the U.S. and France's Safran.

In fact, Republican politicians in the U.S. Congress have pledged to block a separate deal between Boeing and Iran Air calling for delivery of fifty 737 Max 8s, fifteen 777-300ERs and fifteen 777-9s valued at $16.6 billion at list prices.

Nevertheless, Airbus stresses that it coordinated closely with regulators in the EU, U.S. and elsewhere to ensure understanding and full compliance with the nuclear settlement with Iran, or Joint Comprehensive Plan Of Action (JCPA). *—G.P.*

Cheap oil drives growth despite falling GDP

by Charles Alcock

Airlines across the world recorded slower growth rates for revenue passenger kilometers last year.

Despite declining growth rates for gross domestic product (GDP) around the world, the International Civil Aviation Organization expects low air fares, driven by suppressed oil prices, to continue to spur more demand for air transport this year. The organization now expects global real GDP growth this year to be 2.4 percent—down from its earlier projection of 2.9 percent.

In preliminary figures for 2016 released last month, ICAO reported that the total number of passengers carried on scheduled services last year reached 3.7 billion, up 6 percent on 2015. The number of departures last year climbed to 35 million and revenue passenger kilometers saw a gain of 6.3 percent (to 7.015 trillion). RPK growth was down from the 7.1 percent improvement achieved in 2015. With the exceptions of Africa and the Middle East, all regions of the world posted slower RPK growth last year. Europe accounted for the largest share of international RPKs with 36 percent—a gain of 4.3 percent Asia-Pacific had the second largest share with 29 percent and achieved 8-percent growth.

The Middle East had a 15-percent share of international RPKs, with 11.2 percent growth. North America, with a 13-percent share, had the lowest rate of growth, at 3.5 percent. Latin America and the Caribbean, with 4 percent of RPKs, achieved 6.5 percent growth, while Africa, with 3 percent, boosted its growth rate to 5.7 percent (more than double the 2.3 percent it recorded in 2015).

Domestic scheduled services worldwide grew by 6.2 percent last year, down from 7.3 percent in 2015. North America is still the world's largest domestic air transport market, with 43 percent of all domestic RPKs. The highest growth rate worldwide, at 10 percent, came from Asia-Pacific, driven by burgeoning demand for flights within India and China. Collectively, this region now accounts for 40 percent of global domestic traffic.

LCCs Flourish

For the first time, more than 1 billion passengers flew on low-cost carriers (LCC) last year, with this sector of the airline industry carrying 28 percent of all scheduled passengers. Europe had the highest segment of LCC passengers with 32 percent, followed by Asia-Pacific and North America, with 31 percent and 25 percent, respectively.

Total air transport capacity, expressed in terms of available seat-kilometers (ASKs) climbed by 6.4 percent. As a result of this and slowing growth, overall load factors declined slightly to 80.3 percent last year from 80.4 percent in 2015.

According to ICAO, load factors are under growing pressure in the Middle East, where they were down to an average of 74.7 percent last year, compared with 76.3 percent in 2015.

Worldwide scheduled freight traffic, expressed in freight tonne-kilometers (FTKs), grew by 2.6 percent last year, a slight improvement from the 1.7 percent achieved in 2015. However, air cargo load factors declined to 46 percent in the year just ended from 47 percent in 2015.

Airline profitability last year was bolstered mainly by lower fuel costs, which accounted for nearly a fifth of industry-wide operating expenses—compared with around a third in 2015. The airline industry is expected to end 2016 with record operating profits of $60 billion and an operating margin of 8 percent. This compares with $58 billion and 8 percent in 2015.

ICAO's final statistics for 2016 are slated to be published in July. ❑

U.S. could scuttle airliner exports to Iran

by Bill Carey

Licenses the U.S. government granted to Airbus and Boeing last fall to sell airliners to Iran Air could be "amended, modified or revoked at any time," a provision that renders the transactions vulnerable at a time of political upheaval in Washington, D.C. During his successful campaign for the presidency, Republican Donald Trump denounced the July 2015 nuclear agreement with Iran that made the sales possible, and the previous Republican-ruled House of Representatives—now still under Republican control—voted to block any financing of aircraft sales to Iran.

"Yes, those licenses could be revoked or modified even after they've been granted," said Eric McClafferty, an attorney specializing in international trade with the law firm Kelley Drye. He was referring to licenses the U.S. Treasury Department's Office of Foreign Assets Control (OFAC) granted to the manufacturers in September and November for separate sales to Iran Air, that nation's state-owned flag carrier. Authorization from the OFAC is required to export or re-export commercial aircraft to Iran containing more than 10 percent U.S. technology content.

While a broad prohibition of U.S. sales to Iran still applies, the multinational Joint Comprehensive Plan of Action (JCPOA) concluded in July 2015 to ensure that Iran's nuclear program remains peaceful allowed for exports to that country of commercial passenger aircraft and related parts and services. As of the "Implementation Day" of the accord on Jan. 16, 2016, the OFAC put in place a "favorable licensing policy" allowing civil aircraft sales to Iran provided the transactions do not involve people on its Specially Designated Nationals and Blocked Persons (SDN) list.

In December, Boeing and Iran Air announced a contract agreement calling for the delivery of fifty 737s and thirty 777s valued at $16.6 billion at list prices. The sale will support nearly 100,000 U.S. jobs, Boeing said. Airbus and Iran Air confirmed an agreement for forty six A320s and fifty four A330s and A350 XWBs.

But the OFAC authorizations underpinning those transactions remain subject to the vicissitudes of politics in Washington. A 1998 provision of regulatory code that governs the agency—31 CFR 501.803—applies, McClafferty said; it states that "any rulings, licenses (whether general or specific), authorizations, instructions, orders or forms issued thereunder may be amended, modified or revoked at any time." Any such change would be made at the discretion of the secretary of the Treasury, who will change with the new administration. President Trump has proposed hedge fund co-CEO and former Goldman Sachs partner Steven Mnuchin for the cabinet position, an appointment that requires Senate confirmation.

New Threats to Nuke Deal

During his campaign for the presidency, Trump portrayed the JCPOA with Iran as "disastrous" and promised to dismantle the agreement. While the fate of the resulting aircraft export licenses may be the Treasury secretary's call, "my guess is that if the President wanted to say 'we're rescinding this license,' he could convince the secretary of the Treasury to do that," McClafferty said. He noted that in mid-November, during the term of the previous, 114th Congress, the House passed legislation introduced by Rep. Bill Huizenga (R-Mich.) that would have prohibited the Treasury Department from allowing U.S. financial institutions to support aircraft sales to Iran. The Senate had earlier failed to pass similar legislation, which faced a veto threat from President Barack Obama.

It is conceivable—but not likely—that an OFAC license could be revoked sometime after the deliveries to Iran have started, McClafferty said. "That can get complicated because a variety of different things can happen," he advised. "The problem is, once you've delivered an aircraft to the Iranians it's not like you're going to get it back. But the more difficult thing for Boeing in particular would be the payments issue." The government "can withdraw the authority to proceed under the license, which means that they might deliver [an aircraft] and not get the payment. That generally doesn't happen. The Trump administration is unlikely to allow Boeing to have delivered an aircraft and not get paid for it."

Uncertainty over the U.S. position with Iran has left the industry unsettled. "I think everybody's a little bit nervous about what the future holds for that," said Aerospace Industries Association president and CEO Dave Melcher, when asked about the prospects of commercial trade with Iran in early December. "I think everybody's just taking a breath and a pause to say: what will be the nature of this relationship? If it's within the bounds of diplomatic proprietary, if it is something that we agree as a nation we want to do, than we ought to find a way to allow those deals to happen if it's in our national interest."

In a statement provided to **AIN**, a Treasury spokesperson said: "Under the JCPOA, the United States committed to license the export of commercial passenger aircraft to Iran, and the U.S. continues to fulfill its commitments under the deal… by issuing such licenses. While I cannot comment on specific licenses, these licenses consistently contain strict conditions to require that the airplanes will be used exclusively for commercial passenger [operations] and that they are not resold or retransferred to a designated entity.

"As we have said previously, in the text of the JCPOA, the U.S. government reserved the right to cease performing the commitment to license the export of commercial passenger aircraft and related parts and services if we determine that licensed aircraft, goods or services have been used for purposes other than exclusively commercial passenger aviation end-use, or have been resold or re-transferred to persons on the SDN list. Beyond that, I cannot speculate on hypothetical situations." ❑

Maintenance News

Tempus Jets will provide service for the Pilatus PC-24 when it enters service late this year.

MARK WAGNER

COLORADO PILATUS DEALER EARNS PART 145 CERTIFICATION

The maintenance department of Colorado-based Pilatus authorized sales and service provider Tempus Jets has received FAA Part 145 certification, ahead of the anticipated entry-into-service of the PC-24 twinjet this year. The Denver company will introduce a customer-service portal to streamline maintenance scheduling, project status communication and work order approval, with the aim of improving turnaround time.

The company also operates a second service center in Scottsdale, Ariz., and has satellite maintenance facilities in Santa Ana, Calif., as well as three locations in Texas.

EMBRAER ADDS SUPPORT UNIT

Embraer has launched a service and support organization that will begin operations in this year's first half. Under the leadership of Johann Bordais, previously director of services and support in the Brazilian airframer's commercial aviation division, the new division will consolidate capabilities currently spread company-wide. Some 2,000 Embraer airliners and 1,000 business jets are in service. Daily customer relationship structures will remain the responsibility of their respective business units (executive jets, commercial and defense), but the new venture will be responsible for developments in support of current and new products and services and managing the associated processes and resources.

JET AVIATION VIENNA ADDS TO BOMBARDIER AUTHORIZATIONS

Jet Aviation's facility in Vienna has received EASA approval to provide line maintenance for the Bombardier Challenger 604, 605 and 650. The location at Vienna International Airport recently introduced new services for the Challenger 350 and Global series.

EASA OKs VECTOR ADS-B SOLUTION

Canadian MRO provider Vector Aerospace has received EASA STC approval for its ADS-B solution for the Airbus Helicopters AS332, Leonardo Helicopters AW139 and the Sikorsky S-76 series. The retrofittable ADS-B solution, based on the L-3 Lynx Multilink Surveillance System, had already received STC authorization from the FAA, Brazil's ANAC and Mexico's DGAC. The ADS-B IN/OUT unit replaces the aircraft's existing transponder with a panel-mounted touchscreen transponder. Vector also offers a remotely mounted transceiver with a compact control head for cockpits with limited space.

RECTRIX REBRANDS AIRFLYTE REPAIR BUSINESS

Massachusetts-based aviation services provider Rectrix Commercial Aviation Services has rebranded its AirFlyte Part 145 maintenance operation as Rectrix MRO to associate its corporate name better with the MRO business. The company acquired AirFlyte in 2013 along with its FBO at Barnes Regional Airport in Westfield, Mass. Rectrix also has a Part 145 repair station at Florida's Sarasota-Bradenton International Airport and a satellite facility at Worcester Regional Airport.

JET AVIATION BASEL BOOSTS ITS BIZLINER SERVICE

Jet Aviation conducted the first maintenance event on a privately owned BBJ 777 for an undisclosed Middle Eastern client at its Basel, Switzerland MRO facility. The company accepted the aircraft one week after receiving the request and returned the aircraft eight days later.

"This is a significant milestone for the large-aircraft maintenance team," said Estelle Thorin, the company's director of maintenance for large aircraft in Basel. The facility is a factory-approved service center for Boeing Business Jets.

The Switzerland-based company's Singapore MRO facility has also received FAA authorization to work on the Airbus ACJ series.

FAA SHELVES PARTS POLICY MEMO COVERING AIRCRAFT ENGINES

The FAA has withdrawn a policy memorandum that would have essentially defined "engine influencing parts." The decision to drop the memo came at the request of the Aeronautical Repair Station Association (ARSA) and Airlines for America. In October, the associations contacted the agency objecting to the memorandum, saying it incorrectly defined engine influencing parts by erroneously relying on an Advisory Circular providing guidance on life-limited engine parts. Noting that policy memoranda should not create new regulation, the associations said the term "'engine influencing parts' is not defined and it should not be added."

In December, the agency noted in response that "additive manufacturing is a new and novel technology without current statute, regulation, guidance or industry-wide accepted standards," but added, "We have removed this policy memorandum from the FAA's Regulatory and Guidance Library website." It also stated the agency would coordinate future policy on additive manufacturing (a k a 3D printing).

AERO-DIENST DEFENDS ITS BOMBARDIER MX CROWN

German MRO provider Aero-Dienst was named Bombardier's top authorized service facility (ASF) last year in the worldwide and Europe categories once again, having earned that distinction in 2015 for the first time. The airframer introduced the award in 2011, honoring its ASFs for exceptional quality, performance and outstanding service, and Aero-Dienst was singled out among the 33-member Bombardier Aircraft service network.

The large-aircraft maintenance team at Jet Aviation's Basel facility recently completed its first maintenance event on a BBJ 777, returning the aircraft to service eight days after taking it in.

AIRCRAFT TECHNICAL PUBLISHERS BUYS CASEBANK TECHNOLOGIES

San Francisco-based maintenance management system provider Aircraft Technical Publishers (ATP) has purchased Canadian analytical software company CaseBank Technologies, which specializes in integrated fault-detection tools. According to ATP, the move brings it closer to unified process management, enabling customers to drive improvements in productivity, cost savings, operational compliance and aircraft utilization. ATP links maintenance information directly from 54 airframers and 200 component manufacturers to maintenance tracking, parts inventory and troubleshooting and diagnostic systems. CaseBank's Spotlight is used by technicians and call centers to confirm equipment operating conditions, verify symptoms and isolate defects to determine the proper course of action.

CONSTANT AVIATION EXTENDS ITS WINTER AOG SERVICE

Cleveland-based MRO provider Constant Aviation has expanded AOG coverage in the Central U.S. with the addition of its 18th and 19th mobile repair team locations in the continental U.S. "With ski season upon us, we have dedicated AOG support deploying from both Denver and Rifle, Colorado," said Paul Witt, Constant's vice president for AOG operations. "The timing could not have been better as we are quickly nearing peak season for travel into the mountain cities."

NATA ASKS FAA TO HOLD OFF ON MX HUMAN-FACTORS GUIDANCE

The National Air Transportation Association (NATA) is asking the FAA to set aside a revised draft Advisory Circular (AC) on maintenance human factors training, saying the proposed changes are inconsistent and could be contradictory with existing policies. Draft AC 120-72A, "Maintenance Human Factors Training," is designed to provide guidance for certificate holders to develop and implement aircraft maintenance human factors training programs.

The draft, NATA noted, is based on AC 120-72, issued in 2002 to establish a maintenance resource management process that corresponded with the cockpit resource management philosophy at the time. However, the association emphasized that applying a maintenance resource management model to fit human factors "results in a document that does not fit the proper audience."

NATA also pointed out that the AC makes reference to a regulatory requirement for human factors training, but said that such training is not required by FAA regulations. ❑

Fill an empty seat with hope.

Give a cancer patient a lift on your next flight.

Corporate Angel Network arranges free flights to treatment for cancer patients in the empty seats on corporate jets.

Since 1981, Corporate Angel Network, a not-for-profit organization, has worked with more than 500 major corporations including half the *Fortune* 100, to fly more than 50,000 cancer patients to specialized treatment and currently transports 225 patients each month.

The process is simple. Corporate Angel Network does all the work. All you have to do is offer an empty seat to a cancer patient on your next flight.

50,000 flights and counting!

Corporate Angel Network

(866) 328-1313
WWW.CORPANGELNETWORK.ORG

BRINGING CANCER PATIENTS
CLOSER TO THEIR CURE.

Getting the Stomach for Upsets

▶ Continued from page 34

small triangle on the AOA gauge, I banked 15 degrees and watched as the vertical speed dropped and the altimeter stopped climbing. With bank at 30 degrees, the two gauges dropped further, and at 45 degrees the jet started descending. "The pitch angle has changed completely, but the AOA is still the same," he noted.

Before climbing too high, we did a runaway trim exercise, where even though I pushed the stick all the way forward, the nose kept climbing. I banked at 60 degrees to drop the nose, and got the jet stabilized, but going in circles. Oppenheimer asked me to carefully add some gentle top rudder, and this way I was able to gain more directional control. "Do you think you can land out of this?" he asked. "It might not be pretty, but I think you'll walk away from it."

The stall at low altitude was fairly benign, with some wing rock and gentle nose oscillations and some more robust buffet but altitude loss of just about 200 feet. This was nothing like the high-altitude stall.

We further explored the pitch-AOA disassociation climbing through 35,000 feet, still with the AOA at L/D max, but then after noting the pitch angle, I pulled the nose higher and slowed to Mach 0.67 then returned to the previous pitch angle. The AOA at this point remained higher than before and airspeed and VSI dropped; we were behind the power curve. I had to push the nose down to recover, and we lost more than 1,000 feet to get back to the Mach 0.72 climb.

We couldn't make it all the way to 40,000 feet because of the warm air and available mission time, but did get to about 39,000 feet. Here we simulated a congested-area slowdown, where ATC asks us to hold at a high altitude before descending. I started at a 15-degree bank, a typical half-bank angle used at high altitude, and here it already felt like there wasn't much stall margin left. Increasing the bank to 30 degrees, I could start to feel what Oppenheimer calls the "tickle" of the stall buffet, where the boundary layer starts separating from the wing, much earlier than at lower altitudes as evidenced by the AOA gauge showing 12 to 14 units at high Mach instead of 22 to 24 down below. I was unable to keep us level at that bank angle.

The best lesson of the day, in my opinion, was the full stall at high-altitude. When the buffet started and the wing dropped, I pushed the nose down, leveled the wings and added full military power. The nose was about 20 degrees low, and I kept pushing on the stick, waiting for the airflow to reattach to the wings. Here is where patience is mandatory, because nothing happens quickly at high altitudes. We descended from 39,000 feet, and finally at about 33,000 feet I was able to recover with confidence to a stabilized flight condition.

If I pulled back too soon, the jet would simply resume stalling, Oppenheimer had explained during the briefing. "At 20 degrees nose low and no power [because the thin air doesn't allow the engine to develop much power] going down from 40,000 feet, most pilots when they try to pull back, they're right back into the stall buffet because airflow is separated." This exercise highlights how the 2009 Air France 447 accident pilots might not have waited long enough when they tried—twice—pushing the stick forward during the stall in the Airbus A330. They didn't keep holding the stick forward long enough to allow the trimmed horizontal stabilizer to assist with the commanded unload until the airflow reattached. "You're going to have to go to 15 to 20 degrees nose low, or whatever it takes to reduce AOA below critical; it is the most insane thing," he told me before we took off.

Oppenheimer rocked the jet and flipped us upside down and nose low in a mock wake turbulence encounter at high altitude, to demonstrate more of the thin-air effects. During the recovery, speed builds quickly, and by the time I pushed forward on the stick and rolled wings level, speed had climbed Mach 0.15 to about Mach 0.87, and it took some time to slow down because the tools for reducing speed are much less effective in the thin air. With the power at idle and speed brakes out, nothing happened. And pulling back on the stick just kept the airflow separated, so again it was a matter of patience and accepting the loss of altitude until I could milk the stick to halt the descent rate.

We did a similar maneuver, rolling inverted and then recovering normally so Oppenheimer could show me how that recovery is far safer than just letting the nose drop and letting the jet swoop into a Split S (what not to do), where instead of rolling back upright the jet would zoom straight down and lose about 10,000 feet before pulling out. "That's assuming a business jet in the same condition didn't come apart because of high g and extreme speeds," Ransbury explained after the flight.

It was at this point that I could feel my stomach starting to try to disassociate itself from my body, and some sweat erupted on my forehead—just in time for the next maneuver, a demonstration of the Split S, which Oppenheimer would fly because APS wants to avoid negative transfer and doesn't want students to think this is a valid escape maneuver. "Without question, the all-attitude and expanded g capabilities of both the S211 and TA-4J provide critically important margins of safety to ensure participating pilots maximize their training experience by allowing mistakes to play out," Ransbury said.

Inverted Flight

At about 30,000 feet, Oppenheimer rolled inverted then allowed the nose to drop until we were pointed straight at the desert floor. While in this attitude, he pulled back on the stick to show me what a stall looks and feels like while racing toward the ground. "The airplane doesn't care what attitude it is in," he said. The recovery started with the standard push, which seems greatly unintuitive in such a radical attitude, but of course it worked. Staying below 2.5 g, he pulled the nose up and when the recovery was complete I looked at the altimeter, and we were down to about 19,000 feet. Describing the Split S during the briefing, he had said, "You'll see that that's not the correct way to get back to the horizon." Thankfully, the g load during the Split S sorted my stomach out and didn't worsen my slight nausea.

The final maneuver was a downhill speed run to feel how the pitch control changes as the TA-4J goes transonic. With Oppenheimer on the controls and me following through, he lowered the nose and added power. As the jet accelerated through Mach 0.85 then 0.90, he had me feel that the roll and pitch control was still normal, but after about Mach 0.91 the elevators started getting extremely heavy. "It will still move but it's like driving a ten-wheel dump truck," he had warned during the briefing. We stopped accelerating at Mach 0.95, and the elevators were indeed much heavier because of the supersonic shockwave, which was not only forming over the wing but also over the empennage, removing some of the elevators' authority, he explained.

Oppenheimer had me roll into a 60-degree bank and pull back on the stick to about 2.5 g, which required a strong pull, then as I held that attitude, he pulled the power back and suddenly the elevator control returned to normal and the load jumped by nearly one g. "It's just something to be aware of," he had explained in the briefing. "If you get into a high-speed dive of some kind and you're at MMO or beyond, past the barber pole [speed], be careful on the pullback, because as you come from transonic to subsonic, there is potential for an over-g. As you get rid of the supersonic shockwave, the elevator controls become very effective again."

We returned to Mesa Gateway, this time ending the flight with a 360-overhead pattern and landing on Runway 12C.

The APS all-attitude jet training adds a new dimension to UPRT, reinforcing what students learn in the Extra 300L and advanced simulators, while greatly expanding a flight envelope that most pilots never get to experience, and also helping them learn how to return to the heart of the normal flight envelope consistently and safely while dealing with the potentially incapacitating startle and fear factors. The initial course typically starts with three days of classroom training and developing the UPRT discipline in the Extra 300L and an advanced transport-category simulator session, then finishes with a day flying either of the three jets.

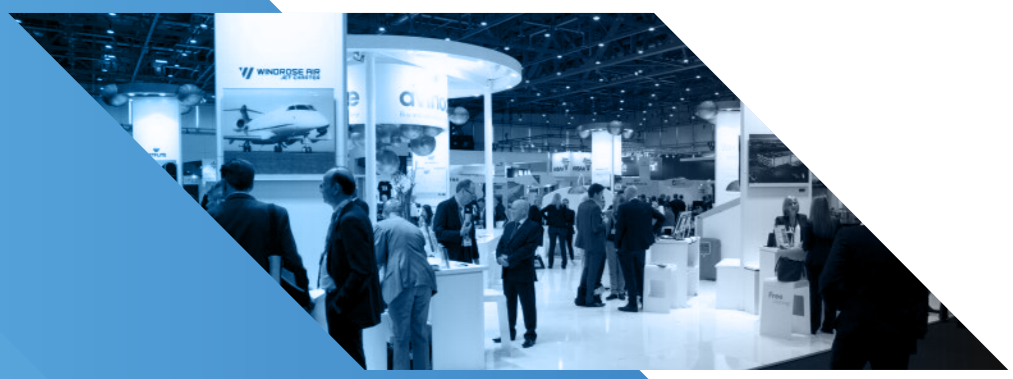
APS recommends that pilots return every two to three years for a day of recurrent training that can be done in any of the APS aircraft, including the S211, Alpha Jet and TA-4J. APS has found that many flight departments are opting to complete the entire four-flight on-aircraft program in the S211, yet Ransbury said that APS and its customers still find that the Extra 300L remains the best aircraft in which to develop initial UPRT skills before transitioning to the all-attitude jets.

"At the end of the program APS puts the training in perspective," he said. "The ultimate goal of APS UPRT is upset prevention through enhanced awareness, knowledge and skill. Hopefully the upset recovery is never needed. However, should an APS graduate be put into an airplane upset requiring recovery—and statistics show that to be possible and often fatal—they have the knowledge, skill and discipline to live to fly another day."

"I've not had a single pilot who didn't get something out of this," Oppenheimer concluded. "And usually, that something is critical to their safety as a professional pilot."

The cost of the APS course varies with each jet and is offered as an enhancement to the core program. Customers typically fly just one jet type: S211 from $3,695; Alpha Jet from $7,250; and TA-4J from $8,965.❑

The instructor returns the Douglas TA-4J to Mesa's Runway 12C after guiding Thurber through a series of maneuvers aimed at preventing and recovering from an upset.



EBACE

22 - 24 MAY 2017 | GENEVA

Join European business leaders, government officials, manufacturers, flight department personnel and all those involved in business aviation for the **European Business Aviation Convention & Exhibition (EBACE2017)**. Visit the website to learn more and register today.

REGISTER TODAY
www.ebace.aero/ain

Touching Bases by Curt Epstein

FBO and Airport News

Maintenance provider Redwings recently opened an FBO at Querétaro.

NEW FBO AT MEXICO'S QUERÉTARO

Querétaro, Mexico-based MRO provider Redwings has opened an FBO at Querétaro Intercontinental Airport, making it the second general aviation handler at the country's fastest-growing airport, located 100 nm north of Mexico City.

The two-acre, $2.5 million facility took 14 months to build and offers a 15,000-sq-ft, two-story terminal with waterfalls both inside and outside, as well as a fountain in the entryway. Amenities include four lounges, a conference room, pilots' lounge, shower and locker facilities, concierge service and a bar serving margaritas and other local cocktails. Open 24/7, the FBO has a 40,000-sq-ft hangar for aircraft up to a Legacy 600/650. In addition to aircraft storage, the structure houses Redwings's maintenance operation, which was recently awarded FAA Part 145 certification.

LYNX NETWORK CONTINUES EXPANSION WITH THIRD LOCATION

Newly formed FBO chain Lynx has added third and fourth facilities, with the acquisition of Cirrus Flight Operations and Key Air Twin Cities, the two service providers at Minneapolis/St. Paul area Anoka County-Blaine Airport. The FBO chain debuted in September with the purchase of Destin Jet Center in Florida, and began expansion in November, acquiring Aurora Jet Center near Portland, Ore.

Lynx's buy-and-build strategy, backed by Houston-based private equity firm The Sterling Group, marks its first steps toward creating a full FBO network. The company has assembled a group of veteran industry leaders to achieve that goal. "Key Air Twin Cities has developed world-class FBO terminal and hangar facilities, fuel farm and a large ramp capable of handling significant aircraft activity," said Lynx partner Tyson Goetz. He added, "Those attributes, combined with the Lynx team's experience in handling special events, the ease of access to U.S. Bank Stadium and a group of employees joining our team from both Cirrus and Key, make Lynx the optimal location to serve customers during the 2018 Super Bowl."

SOUTH CAROLINA AIRPORT TAKES OVER FBO OPERATIONS

At the beginning of the year, Greenville-Spartanburg International Airport/ Roger Milliken Field assumed operation of the lone FBO at the South Carolina field, which had been operated by Stevens Aviation since the airport opened in 1962. The airport commission decided in September 2015 that it would not renew Stevens's lease when it expired at the end of last year or request proposals for the management of the FBO. Once it learned that the lease would not be renewed, Stevens relocated its former turboprop MRO facility at GSP to its main aircraft maintenance location 10 miles away at Donaldson Field Airport, which previously specialized only in business jets. Early last year, at the commission's request, Stevens handed over the management of tenant hangars at the airport.

Renamed Cerulean Aviation, the self-managed, Ascent-branded FBO offers a 10,000-sq-ft terminal and 50,000 sq ft of heated hangars that can accommodate aircraft up to a G650. The facility is open 24/7 and offers a passenger lobby, conference rooms, pilots' lounge with flight-planning center, snooze room, concierge and valet service, complimentary snacks and beverages, crew cars, rampside vehicle access, international trash disposal and on-site car rental as well as dish and linen washing service.

HOUSTON HOOKS UPGRADES FOR THE BIG GAME

David Wayne Hooks Airport, the privately owned business and general aviation field in northwest Houston, has completed the second phase of a capital improvement program. The 3,500-foot secondary runway was resurfaced and reconfigured to improve access to the taxiway and create a greater safety buffer. In addition, the terminal for Gill Aviation, the airport-owned FBO, one of two service providers on the airport, was given a new roof, interior and exterior paint, new flooring and lighting, and more customer parking. The airport completed the improvements in time for this month's Super Bowl.

Phase one of the project, completed early last year, saw the resurfacing and repainting of the primary 7,000-foot runway, regrading and repaving of several taxiways, the enlargement and strengthening of the main ramp, upgrades to exterior lighting around hangars and the installation of high-speed security gates.

IN BELGIUM, LUXAVIATION UNVEILS HANGAR

Luxaviation Belgium (formerly Abelag) has opened a 43,000-sq-ft (4,000-sq-m) aircraft maintenance and storage hangar at Kortrijk-Wevelgem International Airport near Flanders. "Luxaviation sees significant demand for business aviation in the region, and has invested in the development of Luxaviation Belgium by providing this new facility," said company CEO Hervé Laitat.

The new Luxaviation hangar is designed for easy intake of larger aircraft.

Spring City has a four-year lease for an FBO at Lawrence Timmerman Airport.

Construction of the $4.23 million (€4 million) facility, located on the south side of the airport, took more than two years. It is the largest structure on the airfield and will be able to house up to 15 business aircraft, as well as provide a new home for Luxaviation Group subsidiary Execujet's Belgian MRO facility.

ANOTHER FBO OPENS AT TRENTON

New Jersey's state capital gained an FBO early last month, with the opening of a second service provider at Trenton Mercer Airport (TTN). Known as FlightServ, the Avfuel-branded facility on the southeast side of the field is an offshoot of sister company Aviation Charters, which has operated at TTN since 1985.

The facility, which offers easy access to both of the airport's runways, has a crew lounge, dining area, concierge service and Wi-Fi, and offers Avfuel's contract fuel and Avtrip loyalty program.

NORTHERN IRELAND FBO ON THE UP AT BELFAST

A year-and-a-half after it opened an FBO at Belfast International Airport (EGAA), Global Trek Aviation has received permission from the airport authority to double the size of the terminal.

"Our facility has been getting busier by the month and we have taken the decision to plan for future growth at an early stage," said company managing director David McColm, adding that the expansion project is slated for completion this summer. "Doubling the floor space will allow us to provide even greater comfort for our clients, put in additional amenities and expand our operations control center to keep up with customer demand." The 2,000-sq-ft facility is Wi-Fi equipped and features several computer work stations as well as a passenger lounge with floor-to-ceiling windows overlooking the ramp, a refreshment/bar area, a pilot lounge and shower facilities. It has its own secure entrance and parking lot, well removed from the commercial terminal. UK Border Force/Customs pre-clearance is available, and the facility has fuel trucks operated by NATA Safety 1st trained ground handling staff.

WISCONSIN FBO UNDER NEW MANAGEMENT

Gran-Aire, the lone FBO at Milwaukee Lawrence J. Timmerman Airport since 1946, has been sold to Wisconsin-based Spring City Aviation. The latter operates aviation businesses—flight school, aircraft sales, maintenance, management and charter—at Waukesha County Airport, as well as a flight school and maintenance operation at Burlington Airport.

"Spring City Aviation is excited to be the new fixed-base operator at Lawrence J. Timmerman Airport," said Gavin Leake, the location's new general manager.

Using outsized scissors provided by the Hayward (Calif.) Chamber of Commerce, city mayor Barbara Haliiday joined Meridian CEO Ken Forester (r.) along with company staff and other dignitaries to signal the official opening of the service provider's second FBO, and its first on the West Coast.

He added that the company has negotiated a 20-year lease on the four-acre facility. The location offers 150,000 sq ft of hangarage for aircraft up to the size of a Citation Excel, and it serves as a Cessna authorized service center. All existing employees of the Phillips 66-branded facility will be staying on through the transition, and Leake told **AIN** the company will embark on a $100,000 renovation of the customer facilities that will result in a new pilots' lounge with snooze room and upgrades to the customer reception area and flight-planning rooms.

GRAND OPENING AT MERIDIAN'S CALIFORNIA LOCATION

New Jersey-based aviation services provider Meridian marked an expansion to the West Coast with the grand opening of an FBO at San Francisco-area Hayward Executive Airport in December. What is described as phase one of the new location has a 6,300-sq-ft terminal with a business center, conference room, pilot briefing area, pilots' lounge, coffee bar, kitchen, snooze room, shower and locker facility, on-site car rental and crew cars. It also offers a 30,000-sq-ft hangar capable of sheltering the latest big business jets, and 3.5 acres of ramp space.

"This event marks the beginning of a new chapter for our company," said Meridian CEO Ken Forester. According to the company, which has a 50-year lease on the property, subsequent development will include 80,000 sq ft more hangar space, seven more acres of apron and another 12,000 sq ft of terminal.

FALCON AVIATION ADOPTS FBO ONE

Falcon Aviation has become the latest service provider to adopt the FBO One management program by Amsterdam Software. In operation at 150 FBOs worldwide, the software is officially supported and integrated with NetJets, Eurocontrol and FlightAware. It provides "logistics enhancements" across all front- and back-office operations, from confirming an order to handling, payment, invoicing and booking.

According to the Netherlands-based designer, the system's dashboard and search capabilities simplify payment card processing and management reporting, freeing staff of some administrative tasks and allowing them to focus more on customer service. ❑

CHARTER NEWS NOTES

> Fractional-share and charter/management provider **Executive AirShare has moved** from its original Dwight D. Eisenhower National Airport facility **into a new building at Col. James Jabara Airport** in Wichita. The new facility has 35 percent more hangar space and houses the company's 25 Wichita-based employees. The company operates Phenom 100s and 300s, and the new facility doubles as an authorized Embraer service center.

> Phoenix-based **Cutter Aviation has placed two HondaJets onto its charter certificate** and began flying charters in the new jets in late December.

> **XOJet and Etihad Airways have partnered to provide complementary services for each other's customers.** In the U.S., XOJet will offer Etihad Airways guests 24/7 support and free catering for charter flights, along with a $2,000 credit for first-time charter clients. The airline will assign gold status in its Etihad Guest frequent flier program to XOJet Preferred Access and Elite Access members and also provide free chauffeur service, airside connections, concierge and lounge access.

> **Jet Linx Aviation** of Omaha, Neb., **added 32 aircraft to its fleet** last year. The company has 14 bases and its fleet now numbers 82 aircraft. Jet Linx also saw a 20-percent gain in jet card holders, to 1,200 members. The company opened two bases last year, in Nashville, Tenn., and Fort Worth, Texas, and it is now authorized to fly to Cuba.

> **ExcelAire has added a Citation Latitude to its charter fleet**. The Latitude can fly coast-to-coast in the U.S., with a range of up to 2,700 nm carrying four passengers.

> **GI Aviation has launched PC-12NG charter services in the Middle East**, after receiving an air operator certificate from the UAE General Civil Aviation Authority in December. The company's second PC-12NG arrives this spring. ■

FBO PROFILE: Aurora Aviation

PACIFIC NORTHWEST SITE OFFERS EASY ACCESS TO VACATION SPOTS

For nearly half a century, Aurora Aviation has been a fixture at Portland, Ore.-area Aurora State Airport (UAO), which opened at the height of World War II. Formerly a federal facility, the airport was built by the Civilian Conservation Corps, a Depression-era public works program. It once stood out in the Oregon countryside but is now part of suburban Portland, as the city has grown out to reach it. In fact, according to Bruce Bennett, Aurora Aviation's president and chief pilot, some of Portland's most desirable real estate can now be found nearby. UAO, which got a new control tower in October 2015, is home to 100 turbine-powered aircraft. Its 5,000-foot runway is slated for a 1,000-foot extension.

The FBO, the oldest of three at the airport (one provides only avgas, the other recently changed hands) was established in 1968, and currently claims 60 percent of the traffic at UAO, according to Bennett. It occupies a 4,000-sq-ft terminal built in 1981, which was renovated two years ago to a Pacific Northwest cabin motif with pine paneling. It offers a passenger lounge, a 12-seat conference room, a business center with free Wi-Fi, two pilots' lounges, a snooze room, flight-planning area, kitchen, onsite car rental and of course, Starbucks coffee, a nod to its Seattle neighbor. Catering is available from several restaurants near the airport or from national providers who will deliver from Portland or Vancouver, Wash., and there's a championship golf course a mile from the airport.

The 10-acre location has a heated 12,000-sq-ft hangar, which can accommodate aircraft up to a midsize Hawker. It is located one-eighth of a mile from the terminal, on the other side of the control tower, necessitating the towing of aircraft. The company has already completed design and engineering work for a 6,000-sq-ft terminal attached to the hangar, leaving the old terminal to house the business's flight school. The company recently sold the flight school to Denver-based Aspen Flying Service.

The FBO is home to a dozen turbine-powered aircraft ranging from a managed Citation CJ to a new TBM 930. With Epic Fuels headquartered just down the road in Salem, it's not surprising that the facility has had the same fuel provider since the 1970s. It pumps 300,000 gallons of fuel a year from its tank farm, which holds 12,000 gallons each of jet fuel and 100LL. It is dispensed from a pair of refuelers, a 2,000-gallon truck on the jet-A side and an 800-gallon avgas tanker, by the FBO's Epic-trained line staff.

Despite its northerly location, the area has a rather mild climate year-round, explaining the absence of de-icing at the airport. While Oregon's mountains may remain snow capped year-round, snow and freezing rain are rare in the Portland area.

Aurora is the closest major airport to Oregon's wine-producing region, which Bennett noted now rivals California's Napa Valley for wineries, and the area overall is considered a vacation destination. As a result, the location's hours of operation vary seasonally. During the summer "half" of the year it is open from 7:30 a.m. to 8:30 p.m.; in winter it closes two hours earlier. Call-out service is always available for after-hours customers.

The location, which has a staff of 17, offers maintenance as a Cessna authorized service center and Part 135 maintenance provider. It specializes in routine service on Citations, Dassault Falcons and King Airs. Aurora also serves as the only charter operator on the field, offering an Embraer Phenom 300. In addition, the FBO serves as an FAA testing center for written exams, and an FAA flight physician visits once a week to conduct medical exams for certificates up to first class.

"We're run by pilots for pilots, and so we try to think of what they need ahead of time," Bennett told **AIN**. "Rather than reinventing the wheel, we know what they need and have it ready for them."

As proof of its dedication to customers, he recalled a recent occasion when weather closed the airport. A pilot heading there for a business meeting had apparently missed that information in his preflight planning and was forced to divert to another airport. One of the FBO's employees quickly drove to the other airport, picked up the pilot and delivered him to his business appointment in Aurora. At the end of the day, an FBO employee drove him back to his airplane.

The company is involved in the community, sponsoring frequent tours of the airport for groups for events ranging from school career days to senior citizen outings. It also serves as a regular stop on the Collins Foundation's vintage warbird tour circuit. —*C.E.*

Aurora Aviation operates an FBO at Oregon's Aurora State Airport that also serves as a Cessna authorized service center. The company offers charters in a Phenom 300.

PRELIMINARY REPORTS

HELICOPTER DOWN IN MOUNTAINS OF MOLOKAI ISLAND

Hughes 369D (MD500D), Nov. 15, 2016, Pukoo, Hawaii—The ATP-certified pilot and passenger were killed when their MD500 hit tree-covered terrain about a mile north of Pukoo, Hawaii, on a VFR Part 91 night flight into heavy rain showers. The pilot and his passenger departed the Honolulu International Airport (KHNL), Hawaii, just before sunset, destined for a private residence in the mountains near Pukoo, located on the Island of Molokai, a trip the pilot took regularly.

He was inbound to a lighted helipad (elevation 750 feet msl) and residence on the side of Kamakou mountain on Molokai Island. The property caretaker reported the aircraft overdue that night.

The helicopter was found two days later on the east side of a ridgeline in thick ferns and forest at 1,389 feet. The fuselage was consumed by fire and all other large components were located. South of the wreckage there were multiple broken tree limbs that revealed an impact approach angle of 18 degrees from treetops to the ground.

Witnesses living west of the accident site told the NTSB they saw the helicopter on the evening of the accident flying low and slow above their property with a bright landing light. It then departed for the shoreline. Another witness living just to the east of the pilot's property said that she watched the helicopter make a descent under dark, windy and very rainy conditions, then disappear behind the ridge.

Though the Metar at Molokai Airport earlier in the evening was VFR, Weather Service radar data shows moderately heavy bands of rain passing from the northeast through the accident area at the approximate time of the accident.

KING AIR E90 CRASHES EN ROUTE TO CASAIS, PORTUGAL

Beechcraft King Air E90, Dec. 4, 2016, Toledo, Spain—A U.S.-registered Beechcraft King Air E90 struck terrain in a rural area near Toledo, Spain, 20 minutes after takeoff, killing the owner-pilot, his right-seat passenger and two children seated behind them in a post-accident fire. The airplane departed Madrid's Cuatro Vientos Airport and was en route to Casais airport in Portugal. The last data point depicted on flight tracking website Flightradar24 showed the aircraft at 18,400 feet. The tail of the airplane was found 1km (0.4 nm) from the accident site.

BELL HELICOPTER VERTICAL STABILIZER FOUND BENT AFTER FLIGHT

Bell OH-58A, Dec. 4, 2016, Sacramento, Calif.—A Bell OH-58A registered and operated by the City of Sacramento as a public aircraft incurred substantial damage to its vertical stabilizer for reasons as yet unknown during a VMC flight near Sacramento, Calif. The commercial pilot and observer were not injured.

The pilot and observer reported noticing the vertical stabilizer damage during the post-flight inspection after completion of a routine patrol flight flown at 600 to 700 feet agl. The vertical stabilizer was bent downwards, away from the tail rotor. No turbulence or any other unusual flying conditions were encountered, according to both the pilot and observer. The helicopter's damaged vertical stabilizer was secured for further examination.

AERO COMMANDER DEPARTS RUNWAY, HITS ROCKS

Aero Commander 690, Nov. 30, 2016, Scottsdale, Ariz.—An Aero Commander 690 on a VMC Part 91 maintenance relocation flight from Safford Regional Airport, Safford, Ariz., was substantially damaged during a runway excursion after landing at Scottsdale Airport (KSDL), Scottsdale, Ariz. The sole occupant, an airline transport pilot, was not injured.

According to the pilot, the landing on Runway 21 was normal and he intended to exit to a taxiway left of the runway; however, shortly after he applied reverse thrust, the airplane veered to the right. The pilot applied rudder and brake to compensate, then decided to enter the runway safety area (RSA) to avoid hitting a sign. As the airplane rolled into the RSA the landing gear sank into sand and rock, and the left propeller blades hit fist-sized river rocks, sending debris into the left side of the fuselage. Several rocks entered the fuselage through the skin and side windows, compromising the fuselage structure, according to an FAA inspector on scene.

CITATION DAMAGED IN HARD LANDING

Cessna Citation 500, Dec. 4, 2016, Gunnison, Colo.—The sole-occupant pilot was uninjured when his Cessna Citation 500 on a Part 91 night flight in VMC was substantially damaged during a hard landing and runway excursion at Gunnison-Crested Butte Airport (KGUC) in Gunnison, Colo. He was attempting to land there after deviating from his instrument flight plan to Pueblo, Colo., because of low fuel. The flight departed San Jose International Airport (SJC), San Jose, Calif. at 6:15 p.m., according to FlightAware data.

The pilot reported to ATC that the airplane was low on fuel and ATC provided radar vectors to KGUC at 8:40 p.m., clearing the pilot to perform the GPS-B Runway 24 approach. When the pilot reported the runway in sight, ATC cleared the flight for a visual approach. During touchdown, the airplane's left main landing gear and nose gear collapsed and the airplane veered off the runway, substantially damaging the left wing. Wind at the time was 340 degrees at 4 knots.

FAIRCHILD BREAKS UP IN FLIGHT

Fairchild SA227-AC, Dec. 5, 2016, Camilla, Ga.—An on-demand Part 135 cargo pilot was killed when his Fairchild SA227-AC broke up in flight descending near Camilla, Ga. The ATP-rated pilot was flying cargo from Northwest Florida Beaches International Airport (KECP) in Panama City, Fla., to Southwest Georgia Regional Airport (KABY) in Albany, Ga. He knew about extreme precipitation along his route of flight. ATC suggested a routing around the weather, which the pilot declined because of fuel restrictions. He was diverting to Tallahassee International Airport (KTLH) and descending when radar and radio contact was lost.

The wreckage was scattered across an area 2,600 feet long and 1,500 feet wide. The outboard sections of both wings showed damage and paint transfer consistent with contact with the fuselage, which was at the end of the debris path alongside a residence. The wreckage was recovered from the site and retained for further examination.

KODIAK CRASHES ON TAKEOFF FROM CANYONLANDS

Quest Kodiak 100, Dec. 12, 2016, Moab, Utah—The pilot was killed departing Canyonlands Field Airport (KCNY) in Moab, Utah, in a Quest Kodiak that appeared to turn and then descend rapidly into powerlines before hitting the ground shortly after takeoff. The weather at the time was VFR with wind from 330 at 4 knots. A security camera recorded the takeoff. The aircraft lifted off, turned right, descended, first slightly, then rapidly, hitting the powerlines and then the ground, destroying it.

EPIC LT FLIGHT ENDS WITH INVERTED FLAT SPIN

Epic LT, Dec. 27, 2016, Port Orange, Florida—An Experimental-category Epic LT single-engine turboprop sustained substantial damage and its occupants were killed when it crashed inverted onto the front lawn of a home while flying a private instrument approach to Spruce Creek Airport (7FL6), in Port Orange, Fla. IMC prevailed for the flight, which originated at Millington Regional Jetport (NQA), Millington, Tenn.

The aircraft executed a private GPS approach to 7FL6. A witness told NTSB investigators he saw the airplane emerge from the overcast in an inverted flat spin.

All major flight controls were accounted for and appeared continuous to the cockpit, and there was no post-impact fire. Both wing fuel tanks were breached and jet fuel was present. The landing gear was locked down and the flaps were fully extended. The engine and the four-blade propeller assembly remained attached to the airplane. When investigators separated the engine from the airframe, they saw fuel draining from the main fuel line. ❑

FINAL REPORT

CITATION 550 OVERRAN RUNWAY AFTER UNSTABILIZED APPROACH

Cessna Citation 550, Dec. 11, 2015, Arbent, France—Two pilots and four passengers were uninjured after their Cessna Citation 550 ran off the runway at Oyonnax Arbent Aerodrome in Arbent, France, during an unstable approach and long landing caused by the pilot's disregard for both standardized aircraft checklists and numerous terrain and configuration warnings during the approach, according to the country's BEA accident investigation agency. Contributing to the accident was the crew's under-estimation of the workload induced by landing at an aerodrome with a short runway in a mountainous environment.

The pilot flying said he spent time briefing the pilot-not-flying on the mountainous terrain surrounding the airport, and its short Runway 22 (770m/2,526 feet), which also has a 0.6-percent downhill slope. Calculations showed the 550 required 702m/2,303 feet for landing at a VREF of 108 knots.

The cockpit voice recorder (CVR) revealed the last 30 minutes of flight. The pilot flying disconnected the autopilot on base leg and asked for "full flaps." The pilot-not-flying announced "full flaps." As they passed 500 feet agl and 1.2 nm from the threshold on final, the EGPWS "terrain, terrain" and then "pull up, pull up" warnings triggered. The pilot flying said he was "a little fast" but the pilot-not-flying replied, "No you are VREF +10." (The flight data recorder shows that the velocity from the middle of the downwind leg to the flare was actually VREF + 30 knots.) The EGPWS "too low flaps" alarm then triggered, followed by the announcement "Two hundred" and the "Too low flaps" alarm again. The pilot-not-flying called "speed brakes." At the flare the pilot-not-flying suddenly retracted the flaps just as the pilot flying pulled the power to idle.

The aircraft touched about halfway down the runway and the pilot flying braked and deployed thrust reversers, but the aircraft ran off the end, with the nosegear snapping as it crossed a slope 150 m (450 feet) past the end of the pavement. The aircraft stopped at a grove of trees.

The CVR indicated no standard airplane checklist was used, and the pilots appeared fixated on the external environment, to the detriment of the aircraft configuration and flightpath, according to the BEA. ■

The material on this page is based on the NTSB's report (preliminary, factual or final) of each accident or, in the case of recent accidents, on information obtained from the FAA or local authorities. It is not intended to judge or evaluate the ability of any person, living or dead, and is presented here for informational purposes.

Join thousands of top business aviation leaders, entrepreneurs, and other purchase decision-makers for the Asian Business Aviation Conference & Exhibition (ABACE2017). This is the perfect venue for investors considering aviation as a business opportunity; companies thinking of using an aircraft for business; and flight departments who have long used aircraft as a valuable business tool. Visit the website to learn more and register today.

ABACE

SHANGHAI, CHINA

APRIL 11 – 13, 2017

REGISTER TODAY

www.abace.aero/ain

Citation line is a springboard for Tamarack active winglets

by Charles Alcock

The Citation 525 series of business jets is the springboard from which Tamarack Aerospace intends to launch its Atlas active winglet technology into an upgrade market that it believes could extend to airliners and military aircraft. According to the Idaho-based company, the system will deliver fuel and range improvements of between 13 and 25 percent for the smaller Citations, which it claims represents a three- or four-fold improvement over the scale of benefits delivered by existing passive winglets already installed on other aircraft.

Last month the FAA validated the supplemental type certificate that the European Aviation Safety Agency had issued last year for installation of the winglets on the CJ, CJ1, CJ1+ and M2. The modifications, which take just under three weeks, are being offered through an exclusive partnership with Cessna, with the CJ1/1+ priced at $239,000. The price for the M2 has yet to be determined, but it will likely be closer to $300,000.

Tamarack CEO Nick Guida believes that subsequent approval processes for other aircraft will be completed more swiftly and on this basis he is actively pursuing options for retrofitting other business jets, either through partnerships with airframers or maintenance, repair and overhaul organizations. His team has held talks with the U.S. Air Force about an application for C-130 military transports, and UAVs are in Tamarack's sights as well.

For the CJ/CJ1/CJ1+, Tamarack extends the wingspan to 52 feet 6 inches from 46 feet 5 inches. For the M2, which already has modest winglets in the standard version, the wingspan grows to 52 feet 6 inches from 47 feet 3 inches. The company says that the Atlas active winglet technology overcomes the need to strengthen the elongated wing with more metal, which it claims can result in weight penalties of up to 500 pounds for a bizliner-class aircraft.

The active technology centers on a trailing-edge device that can reduce load on the wing, essentially by counteracting and alleviating gust and maneuver loads. This Tamarack active camber surface device is electronically controlled and monitors the load on the trailing edge, keeping the pilot informed at all times.

"When you are developing a passive winglet the stress guy is always going to be fighting the aerodynamicist, who wants the best possible wing shape, and generally the stress guy has to get his way," Guida told **AIN**. "We can allow for an extended wing, and a winglet, with lower loads, which is unparalleled. Aircraft can get to higher altitudes faster. We can get rid of the yaw damper and deliver better hot and high performance with about 640 pounds [for additional fuel or payload] in the CJs."

Tamarack has secured FAA and EASA approval for its Atlas active winglets on several Citation models and plans further approvals.

Other improvements for the Citation light jets include a 400-pound increase in zero-fuel weight, significant range increases, higher initial altitudes, a 12 to 15 percent boost in single-engine climb gradients, improved stability and extended wing life as a result of reduced fatigue.

After almost five years of development work, Tamarack is entering what has proved to be a lucrative market still dominated by Aviation Partners (API) with its blended winglets for the Hawker 800/800XP, Dassault Falcon 2000, 900 and 50, as well as the Boeing Business Jet line. These have delivered range and fuel burn improvements of the order of 5 to 7 percent. More recently, the company has introduced the split-scimitar winglet, promising even greater benefits in performance and operating economics.

According to API, its winglets boost performance mainly by reducing drag from vortices generated around the wingtip resulting from the pressure differences between the upper and lower surfaces of the wing that generate lift. The blended winglets feature a high aspect ratio for lower cruise drag while also maintaining buffet margins and favorable low-speed characteristics.

Winglet Technology developed its elliptical winglets for the Citation X and X+ (priced at $415,000) and says that it expects to earn an STC for the Citation Sovereign next month. For the Citation X, the upgrade boosts speed by 20 knots in ISA + 10-degree C conditions (just over a 4 percent improvement), extends range with four passengers by between 220 nm and 550 nm, allows higher initial flight levels, significantly reduces time-to-climb and raises hot-and-high payload by up to 1,270 pounds.

Winglet Technology says its technology optimizes lift distribution across the full span of the wing. It also claims that the design is superior to other winglets in delivering less interference drag around the transition point between the wing and the winglets, improved alignment of the winglet with the leading and trailing edges, and greater drag reduction across a broad range of speeds. ❑

Compliance Countdown by Gordon Gilbert

Within 6 Months

▶ **Feb. 15, 2017** NEW

EASA Wind Shear NPA

In a Notice of Proposed Amendment (NPA), the European Aviation Safety Agency (EASA) said there should be no changes to current regulations on wind shear warning equipment and pilot training. Citing an economic versus safety-benefit assessment, the agency concluded "that no regulatory action is needed to require wind shear equipment on European-registered aircraft." Present requirements are "expected to maintain the current level of safety," the EASA said. The NPA is in response to an ICAO safety recommendation that all turbine airplanes in excess of 12,500 pounds mtow or authorized to carry more than nine passengers be equipped with a wind shear warning system. Comments on the NPA are due Feb. 15, 2017.

▶ **April 24, 2017**

Part 135 Rotorcraft Radio Altimeters

Under revised Part 135.160, rotorcraft must be equipped with an operable FAA-approved radio altimeter, or an FAA-approved device that incorporates a radio altimeter, after April 24, 2017. Deviations from this requirement can be authorized for helicopters in which radio altimeters cannot physically be installed in the cockpit. The request for deviation authority is applicable to rotorcraft with an mtow no greater than 2,950 pounds. The radio altimeter mandate is contained in the final rule upgrading private, air-taxi and air ambulance helicopter operations, published on Feb. 21, 2014.

▶ **April 30, 2017**

Estimated Finish for SoCal ATC Redesign

From November 2016 through April 2017, the FAA will phase in the Southern California Metroplex (SoCal Metroplex) Project, which involves replacing dozens of conventional ATC procedures with new satellite-based procedures. Before publishing the procedures, however, the agency will conduct public meetings to inform people about the changes. The project will affect instrument arrivals and departures for 21 airports in Southern California.

Within 12 Months

▶ **Aug. 30, 2017** NEW

New FAR Part 23 Effective Date

The FAA's rewrite of Part 23 small airplane certification rules goes into effect on Aug. 30, 2017. The revised airworthiness standards will apply to normal-, utility-, acrobatic- and commuter-category airplanes, and replace current "prescriptive design requirements with performance-based" airworthiness standards. These standards also replace the current weight and propulsion divisions with "performance- and risk-based divisions of airplanes with a maximum seating capacity of 19 passengers or less and a mtow of 19,000 pounds or less. The new rules enact additional airworthiness standards to address certification for flight in icing conditions, enhanced stall characteristics, and minimum control speeds for multiengine airplanes. Additionally, revised rules will apply to Part 91, 121 and 135 operations to correspond with the new airworthiness standards.

▶ **Dec. 7, 2017 and Jan. 30, 2020**

Expansion of Datalink Com in North Atlantic

Phase 2 of the North Atlantic datalink mandate began with Phase 2a in February 2015, at which time flights within the North Atlantic Tracks (NAT) between FL350 and FL390 must be equipped with Fans 1/A controller-pilot datalink communications (CPDLC) and ADS-C. The program expands to these altitudes in the entire ICAO NAT region on Dec. 7, 2017, and to all flights in this region above FL290 on Jan. 30, 2020, a month sooner than the previous revised date.

▶ **Jan. 1, 2018**

Deadline for European 8.33-kHz Spacing

Starting Jan. 1, 2018, aircraft might not be able to operate in any EU member states' controlled airspace unless they are equipped with communications systems that have 8.33-kHz voice-channel spacing. Eurocontrol says extending 8.33 kHz below FL195 down to ground level is important, as "Europe has a known shortage of voice communication frequencies." The 8.33-kHz requirement for higher altitudes in controlled airspace has been in effect for some time. According to Eurocontrol, the consequences should this shortage of com frequencies not be addressed are "significant: there will be more air traffic delays; it will be harder to implement safety improvements; and we will lose flexibility in introducing operational enhancements

Beyond 12 Months

▶ **Nov. 8, 2018**

ICAO Adopts 15-min. Position Reporting

The International Civil Aviation Organization Council adopted a tracking standard for certain international flights that requires crews to report their aircraft's position at least every 15 minutes. It will become applicable Nov. 8, 2018. The new requirement will be made formal as Amendment 39 to Annex 6—*Operation of Aircraft*, Part I. The new standard is the outcome of recommendations stemming from the disappearance of the 777 operating Malaysia Airlines Flight MH370 while en route from Kuala Lumpur to Beijing, China, on March 8, 2014. The search for the 777 was called off last month.

▶ **Dec. 31, 2019**

Taiwan ADS-B Compliance Delayed

The Republic of China has postponed for three years—to Dec. 31, 2019—compliance with ADS-B OUT equipment within the Taiwan FIR above FL290. China is forced to delay compliance because too few aircraft are equipped to render the original ADS-B plan achievable. However, the new deadline for Taiwan essentially coincides with the Jan. 1, 2020 U.S. mandate for ADS-B OUT compliance. The deadline for Europe's ADS-B OUT mandate remains June 7, 2020.

▶ **Jan. 1, 2020**

U.S. ADS-B OUT Mandate

ADS-B OUT equipment must be operational starting Jan. 1, 2020, in aircraft that fly in the U.S. under IFR and where transponders are currently required, namely class A, B and C airspace.

▶ **June 7, 2020**

European ADS-B OUT Mandate

The ADS-B OUT retrofit requirement in Europe takes effect June 7, 2020. This date is about six months later than the U.S. ADS-B OUT mandate. The ADS-B OUT requirement in Europe had been June 8, 2016 for new aircraft. ❑

People in Aviation Compiled by Kerry Lynch

Jean Lydon-Rodgers has taken the role of president and CEO of *GE Aviation*, Services. Lydon-Rodgers began her career with GE in the aerospace division's manufacturing management program before moving to GE Aviation, where most recently she was president and CEO of GE Aviation, Military Systems.

Andreas Tielmann was named CEO of *Lufthansa Technik Logistik Services*. He succeeds **Christian Langer**, who is moving to Lufthansa Technik as head of digital fleet solutions. Tielmann has served in a number of roles with Lufthansa Technik since 1998, most recently leading the aircraft systems product division.

Esterline named **Pierre Rossignol** president of its advanced sensors group. Rossignol, who began his career at Esterline's sensors business, previously spent 14 years with Airbus Helicopters, most recently leading Malaysian operations, and has also served as a sales director for Aircelle's engine nacelle program.

Victoria Foy was named managing director of *Safran Nacelles'* UK subsidiary, Safran Nacelles Ltd., in Burnley, England.

Textron elected **Ralph Heath** to the company's board of directors. Heath, a former board member of Hawker Beechcraft, retired from Lockheed Martin as executive v-p of aeronautics in 2012 after a 37-year career with the company.

Ken McKenzie, senior v-p for strategy and corporate development for Airbus Group, has joined the *Experimental Aircraft Association* (EAA) board of directors. McKenzie, an EAA lifetime member, is a recreational aviation enthusiast who flies a homebuilt Lancair IV-P.

Vertis Aviation promoted **Catherine Buchanan** to chief commercial officer. Buchanan, who has been general manager of the Vertis office in Dubai, has spent the past eight years holding various roles in the Middle Eastern aviation market.

Cherie Hecker joined *Air 7* as v-p of operations. Hecker has 17 years of aviation operational leadership experience with Landmark Aviation, TWC Aviation and Century Aviation.

Priester Aviation appointed **Ted Pietrolaj** v-p of charter sales, responsible for the U.S. Midwest. Pietrolaj joined Priester a year ago as an owner services executive.

Freestream relocated two executives based in its Teterboro, N.J. office to staff a new base in Miami—**Connie Marrero** and **Angelika Ayala**. Executive v-p Marrero has worked at Freestream since 2007 and before that was with Avjet. Ayala, a sales executive who handles large-cabin aircraft sales and acquisitions, joined Freestream in 2014 after serving as a sales and marketing executive for Fontainebleau.

XJet appointed **Emily Watson** general manager and sales director of its facility at Denver Centennial Airport.

STG Aerospace named two new regional sales managers: **Robert Keepers**, based in Dallas, and **Theresa Härtel**, based in Germany. Keepers previously spent 16 years with Panasonic Avionics, most recently as marketing account manager. Härtel is joining STG from UTC Aerospace Systems, where she worked as product sales manager for Europe, the Middle East and Africa and program managerfor worldwide aftermarket for UTC subsidiary Goodrich Lighting Systems.

Adrian Chene joined *Duncan Aviation's* avionics sales team in Battle Creek, Mich. Chene has spent 16 years at the company's Battle Creek facility, previously serving as an avionics tech representative. The company also added **Chris Jordan** to its turbine engine service sales team to focus on new West Coast markets.

Christobal Henner was appointed general manager for South Africa-based aviation services firm *Hi-Fly Marketing*. Henner joins the company from Safran Electronics & Defense in Dallas, Texas, where he managed the Analysis Ground Station (AGS) global support and oversaw the sales of flight data management solutions to aircraft operators in both South and North America.

Traxxall Technologies named a number of executives assigned to a newly opened office in Jacksonville, Fla. **James Cook**, a former business analyst with SkyBooks who has 25 years of aviation maintenance and software application experience; **Jeremy Figus**, a former quality assurance analyst for SkyBooks who has 20 years of aviation maintenance experience; **Ryan Kraus**, a 25-year industry veteran who previously worked as a senior analyst at Gulfstream CMP; **Tory Martin**, formerly an account representative at SkyBooks who served in the U.S. Navy for 23 years; and **Michael Shelton**, previously a quality assurance analyst with SkyBooks, who has 15 years of industry experience. **Jeff Dougherty** and **Dewayne James**, already established in Florida for Traxxall, will lead the newly assembled team.

C&L Aerospace hired **Tim Bueschen** as a regional sales manager, with responsibility for the southern U.S., central Caribbean and South America. Bueschen most recently was regional sales manager for Bombardier Aerospace for Europe, the Middle East and Africa.

Alto Aviation appointed **Mike Nedoroscik** as an audio systems engineer. Previously an acoustical engineer for Loud Technologies, Nedoroscik brings a background of electro-acoustic design, system modeling and simulation, prototyping, acoustic testing and regulatory procedures to his new role.

Dassault Aviation named **Damien Farret** director of customer relations and field service in Europe, the Middle East, Africa and India.

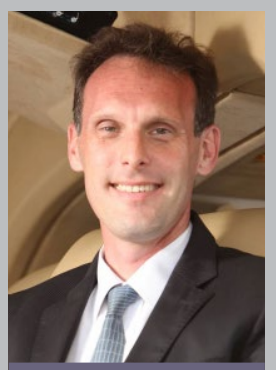
New Flight Charters named **Mark Baroni** charter manager. Baroni brings a background in aviation, program management and safety to his new role, including as U.S. Presidential travel advance agent, NATO international diplomatic officer, and director of the Air Force Wing Flight Safety Program.

Pentastar Aviation appointed **Calvin Ford** to lead client relations in emerging markets.

François-Xavier Camus was named managing director of *Air Charter Service's* French office.

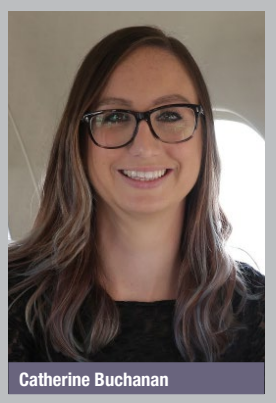
Keith Mordoff has joined *Westfourth Communications*, an Arlington, Va.-based public relations and marketing consultancy, as senior advisor.

Bob Frauenthal, lead captain on an AW139 based in Farmingdale, N.Y., retired from *Jet Aviation* after a 50-year career. Frauenthal began his career as a U.S. Army pilot in Vietnam and later became involved in flight instruction, sightseeing, charter, aerial photography, medical evacuation, movie and stunt flying, among other operations. He held the positions of chief pilot, director of operations and president for air-taxi operations and logged 22,000 accident- and incident-free flight hours, mostly in helicopters. ❑


Pierre Rossignol


Victoria Foy


Ralph Heath


Catherine Buchanan


Damien Farret

Awards & Honors

Directional Aviation Capital principal **Kenn Ricci**, veteran aviator and business aviation executive **Clay Lacy**, helicopter approach pioneer **Steve Hickock** and longtime pilot **Peter Paul Luce** are among the honorees of the 14th Annual Living Legends of Aviation Awards. The honorees were recognized on January 20 at the Beverly Hilton in Beverly Hills, Calif.

Ricci, whose business aviation portfolio includes Flexjet, Flight Options, Constant Aviation and Nextant Aerospace, will be presented the Lifetime Aviation Entrepreneur Award. "With Kenn's vision and leadership, Directional Aviation Capital is an umbrella facilitator creating efficiencies in fractional aircraft ownership, aircraft management as well as services, which has incrementally improved the entire industry," award organizers said.

Lacy will be the recipient of the Bob Hoover Freedom of Flight Award, a selection made by Bob Hoover himself before he passed on October 25 last year. Over the years Lacy has held the roles of airline captain, military aviator, experimental test pilot, air race champion, world distance record-setter, aerial cinematographer and business aviation entrepreneur, and has flown 300 aircraft types and logged 50,000 flight hours.

Hickock will be honored with the "Vertical Flight Hall of Fame Award" for advancements in GPS and IFR capabilities that allow emergency helicopters to operate safely at locations not previously served. Luce will receive the Harrison Ford Aviation Legacy Award. Award organizers note that Luce, "who at 87 years young is still an active board member for 'Wings Over the Rockies,' has flown 243 missions delivering organs to patients, which has saved numerous lives."

The Greater Miami Aviation Association (GMAA) honored **Don Campion**, president of Banyan Air Service, with the Edward Rickenbacker Award. Banyan was recognized for his dedication to aviation and leadership in building Banyan Air Service over four decades. GMAA presented Campion with the award at the 89th Annual Wright Brothers Memorial Gala and Awards Ceremony.

The Regional Air Cargo Carriers Association awarded $1,500 scholarships to three aviation students to help them pursue a career in aviation: **Sawyer Murphy**, a University of North Dakota student who is working toward her commercial and multi-engine ratings and has already obtained an unmanned aerial systems operator's certificate; **Jamie Posk**, a junior at Bridgewater State University who is a first officer at Cape Air and is working toward a degree in aviation science flight training; and **Adam Kee**, a graduate student at Purdue University who is active in the Aviation Technology program and also serves as an aircraft mechanic in the U.S. Air Force Reserve. ■

2017 HAI HELI-EXPO

BY HELICOPTER ASSOCIATION INTERNATIONAL

Direct to Dallas

March 6–9
Exhibits Open March 7–9

Kay Bailey Hutchison Convention Center
Dallas

HAI HELI-EXPO is a production of

Helicopter Association International

HAI HELI-EXPO is a fantastic opportunity to see old friends and new aircraft!

– Andrew Butte
Senior V.P., Brunner Aerospace LLC

HOUSING REGISTRATION NOW OPEN

heliexpo.rotor.org

AINCalendar

See www.ainonline.com for a comprehensive long-range aviation events calendar.

FEBRUARY

EBAA SHORTAGE OF SKILLS WORKSHOP...
February 3, Brussels, Belgium. Info: www.ebaa.org/en/events-62/ebaa-upcoming-events.aspx.

▲ SCHEDULERS AND DISPATCHERS CONFERENCE...February 7-10, Fort Worth, TX.
Info: (800) 783-9000; www.nbaa.org.

LEADERSHIP CONFERENCE...
February 14-16, Hyatt Regency, Miami, FL. Info: info@nbaa.org; www.nbaa.org/events/leadership/2017/.

OPPORTUNITIES IN BUSINESS JETS...
February 22, Grand Hotel Excelsior, Valletta, Malta. Info:www.quaynote.com/conference/opportunities-business-jets-2017/.

MARCH

BUSINESS AIRCRAFT FINANCE, REGISTRATION & LEGAL CONFERENCE...March 5-7, Hyatt Regency Coconut Point Resort, Bonita Springs, FL. Info: (202) 783-9451; www.nbaa.org/events/finance-registration-legal-conference/2017.

ACSF SAFETY SYMPOSIUM... March 7-8, NTSB Training Center, Ashburn, VA. Info: (888) 723-3135; www.acsf.aero/symposium/.

NATA FBO SUCCESS SEMINAR...March 7-8, Chateau Lemoyne, New Orleans, LA. Info: http://nata.aero/Events/2017-FBO-Success-Seminar-New-Orleans.aspx.

▲●◆ HELI-EXPO...March 7-9, Dallas, TX.
Info: (703) 683-4646; www.rotor.org.

ACSF AUDITOR TRAINING WORKSHOP...
March 8-9, NTSB Training Center, Ashburn, VA. Info: rlawton@acsf.aero; www.acsf.aero/events/acsf-auditor-training-workshop/.

▲ AEA INTERNATIONAL CONVENTION & TRADE SHOW...March 13-16, New Orleans, LA.
Info: www.aea.net/convention/2017.

INTERNATIONAL OPERATORS CONFERENCE...
March 13-16, Atlanta, GA.
Info: (800) 783-9000; www.nbaa.org.

REGIONAL FORUM... March 23, Fort Worth Meacham Airport, Fort Worth, TX.
Info: www.nbaa.org/events/forums/2017FTW/.

INTERNATIONAL BRAZIL AIRSHOW (IBAS)...
March 29-April 2; Galeão International Airport, Rio de Janeiro, Brazil. Info: +55 11 3032-5633; www.sators.com.br.

APRIL

▲ SUN 'N' FUN...April 4-9, Lakeland, FL.
Info: www.sun-n-fun.org/.

AERO FRIEDRICHSHAFEN GLOBAL SHOW...
April 5-8, Friedrichshafen, Germany.
Info: www.aero-expo.com/.

▲◆ ASIAN BUSINESS AVIATION CONFERENCE & EXHIBITION...April 11-13, Shanghai Hawker Pacific Business Aviation Service Centre, Hongqiao Airport, Shanghai, China.
Info: www.abace.aero.

AERO EXPO PANAMA PACIFICO...April 20-21, Panama Pacifico International Airport, Panama.
Info: yb@aeroexpo-panama.com; http://aero-expo-panama.com/en/.

AOPA FLY IN... April 28,-29, Camarillo Airport, Camarillo, CA. Info: www.aopa.org/community/events/aopa-fly-ins/2017-aopa-fly-ins.

MAY

MAINTENANCE CONFERENCE...May 2-4, West Palm Beach, FL. Info: www.nbaa.org/events/maintenance-conference/2017/.

AIRPORT SOLUTIONS CONFERENCE...May 3-4, Centro Banamex, Mexico City, Mexico.
Info: www.airportsolutions.com/mexico/.

BUSINESS AVIATION TAXES SEMINAR...
May 4-5, Marina del Rey, CA.
Info: www.nbaa.org/events/taxes-seminar/2017/.

AAAE CONFERENCE & EXHIBITION...
May 7-10, Long Beach Convention and Entertainment Center, Long Beach, CA.
Info: www.aaae.org/annual2017.

▲ AUVSI'S XPONENTIAL...May 8-11, Kay Bailey Hutchison Convention Center, Dallas, TX.
Info: www.xponential.org/xponential2017/public/enter.aspx.

▲●◆ EUROPEAN BUSINESS AVIATION CONVENTION & EXHIBITION...May 22-24, Palexpo Convention Center, Geneva, Switzerland.
Info: (202) 783-9000; www.ebace.aero/2017.

JUNE

FLIGHT ATTENDANTS/TECHNICIANS CONFERENCE...June 12-15, Long Beach, CA.
Info: www.nbaa.org/events/fa-ft/2017/.

2ND ANNUAL CARIBBEAN AVIATION MEETUP CONFERENCE...June 13-15, Saint Maarten.
Info: cdrbud@caribavia.com; www.caribavia.com/.

▲●◆ PARIS AIR SHOW...June 19-25, Exhibition Center of Le Bourget, France.
Info: visiteurs@siae.fr; www.siae.fr/.

JULY

ASA ANNUAL CONFERENCE...July 9-11, Hyatt Regency, Reston, VA.
Info: www.aviationsuppliers.org/annual-conference.

▲ EAA AIR VENTURE...July 24-30, Oshkosh, WI. Info: www.eaa.org/en/airventure.

AUGUST

LATIN AMERICAN BUSINESS AVIATION CONFERENCE AND EXHIBITION...August 15-17, Congonhas-São Paulo Airport, São Paulo, Brazil.
Info: www.abag.org.br/labace2017.

SEPTEMBER

REGIONAL FORUM...September 7, Morristown Airport, Morristown, NJ.
Info: www.nbaa.org/events/forums/2017MMU/.

OCTOBER

▲●◆ NBAA BUSINESS AVIATION CONVENTION & EXHIBITION...October 10-12, Las Vegas Convention Center, Las Vegas, NV.
Info: (202) 783-9000; www.nbaa.org.

BOMBARDIER SAFETY STANDDOWN...
October 31-November 2, Hyatt Regency Hotel, Wichita, KS. Info: (316) 946-7876; www.safetystanddown.com/.

NOVEMBER

▲●◆ DUBAI AIRSHOW...November 12-16, Airport Expo, Dubai, UAE.
Info: +97 1 4286 7755; www.dubaiairshow.aero.

◆ Indicates events at which **AIN** will publish on-site issues or distribute special reports.

▲ Indicates events for which **AIN** will provide special online coverage or e-newsletter.

● Indicates events at which **AIN** will produce AINtv.com videos.

SINGAPORE AIRSHOW 2018 6 – 11 Feb

THE SKY IS YOUR DOMAIN

Scale new heights at the show that attracts aviation's top flight.

The Singapore Airshow 2016:

- Attracted over 48,000 visitors from 143 countries & regions
- Drew 1,040 participating companies from 48 countries, including 65 of the top 100 aerospace companies and 20 country pavilions
- Attracted 916 accredited media
- Hosted 1,353 meetings between Exhibitors and 286 VIP Delegations from 90 countries

Fly higher in 2018. Only the sky is the limit.

ASIA'S LARGEST AEROSPACE AND DEFENCE EVENT

Secure a space now. For more information, contact us at sales@singaporeairshow.com

Organised by: experia events that influence

Supported by: EDB singapore; ie Singapore GO GLOBAL; SINGAPORE EXHIBITION & CONVENTION BUREAU

Endorsed by: aif Approved International Fair MEGA TRADE FAIR

Held in: YourSingapore; HEART OF AVIATION singapore

THE PROVEN 900LX.
REIMAGINED FOR THE FUTURE.

Introducing the new Falcon 900LX. Everything the world has come to expect of this proven, flexible platform. Its robustness, reliability, efficiency and comfort. Now with upgrades from cockpit to cabin that make the 900LX smarter, more efficient and more comfortable than ever. And perfect for any mission. The Falcon 900LX. **Right for today. Ready for tomorrow.**

Falcon 900LX

WWW.DASSAULTFALCON.COM | FRANCE: +33 1 47 11 88 68 | USA: +1 201 541 4600

DASSAULT FALCON

ENGINEERED WITH PASSION