

THE WEEKLY OF BusinessAviation

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Intelligence

Forty years ago, former astronaut Neil Armstrong flew the first Learjet 28. Armstrong flew the aircraft on Feb. 19 and Feb. 20, 1979, with co-pilot and program test pilot Peter Reynolds. The two set five world records for business jets in two weight categories. The Learjet 28 climbed to 50,000 ft. in just more than 12 min. At the time, Learjets were the only business jets certified to fly at 51,000 ft.

FORECASTS/INDUSTRY DATA

Used Business Jet Inventories To Rise, Consultant Says

After a decade of decline in the number of used business jets for sale, inventories are now expected to begin increasing, said Brian Foley, an aviation consultant and president of Brian Foley Associates in Sparta, New Jersey.

Foley said he believes inventories will increase because of an expected slowing economy, historical trends and new regulations.

Business jet inventory levels hit a 20-year low in January, with less than 9% of the fleet for sale. That is half the level available in 2009 during the financial crisis, when nearly one in five business jets were for sale, Foley said.

“It’s always a risk to call the high or low of any market. But after nearly a decade of tightening inventory, I feel we’re at a bottom and used business jet inventory will begin edging upward into the foreseeable future,” Foley said.

The U.S. economy is beginning to show early signs of fatigue, which will cause inventory to rise as confidence deteriorates and discretionary spending on aircraft is reined in, he said. New tax reform benefits “juiced” the pre-owned market, but many buyers who could benefit have already made their purchase, which reduces future demand.

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OEMS / SUPPLIERS

Bombardier’s Business Aircraft, Aerostructures Units Set To Grow

Bombardier starts 2019 with growing business aircraft and aerostructures revenues and sufficient backlog in commercial aircraft to buy it time to improve profitability and explore strategic options for its CRJ regional jet family.

CEO Elaine Bellemare describes 2018 as a “solid year,” keeping Bombardier on track to meet the targets set for 2020 under the five-year turnaround plan launched in 2015. Revenues were flat at \$16.2 billion, but earnings before interest and tax were up 42% year-on-year before restructuring charges.

The year just ended saw major changes for the company. Control of the C Series airliner program was transferred to Airbus, becoming the A220, the Global 7500 large-cabin business jet entered service and Bombardier agreed to sell both the Q400 regional turboprop program and its training business.

“We ended 2018 in a strong cash position and begin the fourth year of our turnaround as a much stronger company,” Bellemare says.

Bombardier Business Aircraft delivered 137 aircraft in 2018, compared to 138 in 2017,

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There is also a matter of simple analytics, Foley said. Previous periods of contracting inventory in the 1990s and 2000s each lasted a period of seven and six years, respectively. The current 2009-2019 10-year inventory contraction has already exceeded those periods, which suggests statistically that “a correction is overdue in this cyclical business.”

Finally, a new FAA mandate will require by year’s end that all business jets be equipped with ADS-B electronic equipment to signal aircraft whereabouts. As a result, some owners will put their aircraft on the market rather than comply, which will increase inventory levels, he said.

Sales Impact Not Significant

While levels will rise faster than they fell, the impact on sales will not be significant. This is because much of the increase will come from older and less desirable aircraft with prices that have already fallen considerably. As a result, jets will remain on the market for a longer period, Foley said.

As for used aircraft brokers, somewhat less pre-owned sales activity can be expected since rising inventory is indicative of more people wanting to get out of ownership than to get in.

At the same time, Foley is not expecting used aircraft pricing to recover much. “Whereas supply-and-demand dynamics once kept used prices propped up, basic capital good economics have caught up to business jets and softer residual values are now the norm,” he said.

—Kirby Harrison, kirbyjh12@hotmail.com

BOMBARDIER, from p. 1

and ended the year with a book-to-bill ratio of 1:1. The order backlog increased by \$500 million to \$14.3 billion, “reflecting healthy demand across the portfolio,” he says.

For 2018, Bombardier delivered 42 Global, 83 Challenger and 12 Learjet aircraft.

Revenues in the Business Aircraft segment were flat at \$5 billion, but are forecast to grow to around \$6.25 billion in 2019 as deliveries of the Global 7500 ramp up to 15-20 aircraft. Deliveries

are planned to double in 2020, boosting Business Aircraft to a revenue target of \$8.5 billion.

Aftermarket revenues grew 14% in 2018, but were offset by lower sales of used business jets because of the limited availability of inventory—“a sign of a market recovery,” Bellemare says.

The overall market for business jets has remained relatively stable year-over-year for the past few years, he said.

While the market has been good, “we haven’t seen the recovery we were expecting two or three years ago.”

De-Risking The Wing

Bombardier’s January acquisition of Global 7500 wing manufacturing from Triumph Group has significantly de-risked the aircraft program, Bellemare says. The company has set aside a \$250 million working-capital contingency in 2019 to take over the Red Oak, Texas, wing facility and drive down costs.

Ramping up of both the Global 7500 and Airbus A220 programs boosted revenues at Bombardier Aerostructures & Engineering to \$2 billion in 2018, up from \$1.6 billion in 2017. Revenues of \$2.25-2.5 billion are forecast for 2019 with the addition of the wing program and further Global 7500 and A220 ramp-ups.

Bombardier Commercial Aircraft delivered 20 CRJs and 15 Q400s in 2018, and deliveries are expected to remain at the 35-aircraft level for 2019. The February sale of nine CRJ900s to Canada’s Chorus Aviation takes the backlog to 54 aircraft and provides “a solid skyline for the next two years,” Bellemare says.

Bombardier is working to reduce costs and restore Commercial Aircraft to profitability, and the backlog “will provide some stability to the CRJ production line as we keep looking at all our options,” he says. The \$300 million sale of the Q400 program to Canada’s Longview Capital is expected to close at the end of September.

The CRJ550 program to reconfigure 70-passenger CRJ700s to 50-seaters, launched this month with United Airlines, is being offered to other airlines. “Scope clauses are not likely change for quite a while and the 550 offers a great option to refit a lot of 700s to 50 seats and offer a better passenger experience,” he says.

—Graham Warwick, warwick@aviationweek.com

Bombardier Business Jet Deliveries

Aircraft Family	4Q 2018	4Q 2017	4Q 2016	FY 2018	FY 2017	FY 2016
Learjet 70/75	3	2	11	12	14	24
Challenger 350	20	22	19	60	56	62
Challenger 650	5	6	10	23	21	25
Challenger 850	0	0	0	0	2	0
Global 5000/6000	12	13	13	41	45	51
Global 7500	1	0	0	1	0	0
Total	41	43	53	137	138	162

Source: Bombardier, General Aviation Manufacturers Association

IN WASHINGTON

Industry Supports Bill To Fund FAA In Future Shutdown

More than 40 aviation-related organizations have banded together to support a House bill that would fund the FAA in the event of a future government shutdown.

H.R. 1108, known as the Aviation Funding Stability Act of 2019, would authorize the FAA to draw funds from the Airport and Airway Trust Fund during a shutdown. The fund currently has an uncommitted balance of more than \$6 billion, they noted.

The organizations sent a letter Feb. 12 to the House Transportation and Infrastructure Committee and aviation subcommittee leadership is endorsing the bill. Congress passed a bipartisan agreement that averted another government shutdown Feb. 15.

The recent 35-day partial shutdown meant air traffic controllers and other aviation safety professionals were forced to work without pay and thousands of others were furloughed, the letter said.

At the same time, users of the air traffic control system continued to pay taxes and fees to fund the system, but the money could not be accessed to support air traffic controllers, safety specialists and other critical FAA personnel during the shutdown, the letter said. "Jobs and economic growth in the industry were threatened as manufacturers, airlines and other operators, and small businesses faced disruption," it said. "The effect on the nation's air transportation system and the workers charged with keeping the system safe was dramatic."

The situation is unacceptable, it said. "We want to work with Congress and the administration to prevent this from ever happening again."

A 'Dramatic' Impact

General Aviation Manufacturers Association President and CEO Pete Bunce testified before the House Transportation and Infrastructure Aviation Subcommittee about the "dramatic" impact of the recent shutdown on FAA operations and the general aviation manufacturing and maintenance industry.

The shutdown impacted aircraft certification, validation, operating authorizations, repair stations and recurrent certification and training, Bunce said.

It halted FAA review of design approvals, flight tests, development of new or revised policies and guidance, the approval of issue papers and other functions, Bunce said. Manufacturers could not start new certification projects. The shutdown significantly pushed back time lines. "We received weekly assessments of shutdown impacts and ascertained that for each week the shutdown continued, there would be a three-to-four-week impact on aircraft and product certification programs," he said. "The extended length of residual shutdown impact is due to the backlog of tasks that

only FAA can perform."

While the FAA is working to address the backlog, the pace of manufacturing and maintenance and the start of new projects that the agency supports complicates recovery efforts, Bunce said.

—Molly McMillin, molly.mcmillin@aviationweek.com

OEMS / SUPPLIERS

Embraer Executive Jet Deliveries Decline Across Models

As expected, Embraer delivered 91 business jets in 2018, including 64 light and 27 large jets, missing earlier projections of 105 to 125 aircraft, the company said Feb. 11.

Figures are down from 2017 deliveries of 109 executive jets.

Embraer said in a meeting with investors Jan. 16 that it had missed its forecasted delivery numbers.

In the fourth quarter, Embraer delivered 36 executive jets, including 24 light and 12 large jets, down from 50 deliveries in the same period the year before. "Global market conditions for executive jets, although gradually improving, continue to recover more slowly than expected," the company said in January. "In combination, Embraer's increased focus on improving profitability and price preservation, as well as the recent launch of the new midsize/super midsize executive jets, which will begin delivering in 2019, led the company to adopt a more cautious approach to deliveries in 2018."

"We were surprised," Rolland Vincent, president of Rolland Vincent Associates, said of the results.

While deliveries of the Legacy 450 and 500 declined some with the introduction of the Praetor 500 midsize jet and Praetor 600 super midsize jet in October, deliveries were down across all models year-over-year.

Holding On Price

Embraer Executive Jets President and CEO Michael Amalfitano told The Weekly of Business Aviation on Feb. 6 that the company had held on price and was trading deliveries for profit.

"I think they weren't willing to part with the aircraft at a certain price, and they're left holding the bag," Vincent said. "They built them. There's no question they're sitting around."

Vincent estimates that Embraer likely has 14-15 executive jets built but unsold as the company set production rates to earlier projections.

Now, "they've got their rates set for 2019," Vincent said. "The factory is loaded and ready to go and is going."

—Molly McMillin, molly.mcmillin@aviationweek.com

FORECASTS/INDUSTRY DATA

Fractional Flights Lead Rise In January Bizav Activity

Business aviation flight activity in North America increased 0.7% in January compared to a year ago, with fractional activity recording the largest increase with a 4.9% increase, according to Argus International.

Part 91 activity increased 1%, while Part 135 activity declined for the eighth straight month, posting an 0.9% decrease in January.

While fractional activity rose overall, fractional flights by large jets declined 19%, while flights by midsize jets rose 13%. Light jet Part 135 activity declined 8.4%, while large jet Part 135 activity rose 8.5%.

Data includes IFR arrivals and departures in the U.S., including Alaska and Hawaii, the Caribbean and Canada.

By aircraft category, results were mixed. Midsize jet activity rose 5%, while large jet activity increased 0.6%. Turboprop activity declined 1.8%, while light jet activity declined 0.9%.

In February, Argus analysts forecast a 1.1% increase in overall flight activity compared to a year ago.

Compared to December, business aviation activity in North America rose 1.4% in January, with Part 91 activity up 2.4% and Part 135 activity up 1.5%. Fractional activity, meanwhile, declined 2.5% in the month.

Large jet activity rose 5% in January compared to December, while midsize jet activity rose 1.3% and turboprop activity declined 1.4%. Light jet activity, meanwhile, declined 0.8% for the month.

—Molly McMillin, molly.mcmillin@aviationweek.com

FORECASTS/INDUSTRY DATA

European Bizav Activity Declines In January

Business aviation departures in Europe declined 0.8% in January compared to a year ago, with a 2.1% decline in business jet flights, according to WingX Advance.

Business aviation departures totaled 54,481 in Europe during the month. On a 12-month rolling basis, business aviation departures in Europe rose 1.4%, which is 10% above the 2016 trough, but lagging 11% behind its peak in January 2008, WingX said.

“The decline in this month’s flight activity reflects anecdotal feedback from the charter operator market that customer demand is down, which fits the wider deterioration in the macroeconomic situation in Europe,” said Richard Koe, WingX managing director. “This month’s drop was concentrated in the large cabin segments, which may reflect pullback from corporate flight departments.”

Large jet activity declined the most with a 6% decrease year-over-year. Small and medium jet activity was flat, while propeller activity increased year-over-year, largely due to an increase in piston flights, it said. Departures increased robustly in Spain, but declined from Italy, Turkey, Germany, and Switzerland, while flights from France and the UK rose slightly, WingX said. The busiest city in Europe in January was London with 3,598 departures, although flights declined 6% compared to a year ago. Flights within Europe declined by 1% in January. “It’s interesting to note the resilience of flight activity to and from Spain, also the charter demand for older aircraft types, such as CJ1 and Falcon 7X,” Koe said. “The 6% decline in the London market accurately demonstrates growing uncertainty around Brexit.”

—Molly McMillin, molly.mcmillin@aviationweek.com

January Business Aircraft Activity In The U.S., Canada And The Caribbean

January 2019 vs. January 2018

	Part 91	Part 135	Fractional	All
Turboprop	-3.1%	-0.1%	-2.9%	-1.8%
Light Jet	3.6%	-8.4%	2.8%	-0.9%
Mid-Size Cabin Jet	5.4%	-0.9%	13.0%	5.0%
Large Cabin Jet	-0.8%	8.5%	-19.0%	0.6%
All Aircraft Combined	1.0%	-0.9%	4.9%	0.7%

January 2019 vs. December 2018

	Part 91	Part 135	Fractional	All
Turboprop	-0.5%	4.5%	-6.3%	1.4%
Light Jet	2.3%	-2.5%	-8.8%	-0.8%
Mid-Size Cabin Jet	5.5%	-3.1%	0.6%	1.3%
Large Cabin Jet	4.0%	8.6%	-3.3%	5.0%
All Aircraft Combined	2.4%	1.5%	-2.5%	1.4%

Figures include all IFR flights in the U.S., including Alaska and Hawaii, the Caribbean and Canada.

Source: Argus International TraQPak data

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BCA⁷

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SUPPLIERS**Survey: 54% Of FBOs Say Fuel Sales Grew In 2018**

SAN ANTONIO—Year-over-year fuel sales increased for 54% of all U.S. FBOs in 2018, according to Aviation Business Strategies Group's annual survey.

"For the third consecutive year, we've seen an increase in fuel sales by more than half of FBOs responding to our survey," ABSG principal John Enticknap said. "This includes some standout fuel sale increases of more than 8% year-over-date by nearly 20% of FBOs reporting."

Enticknap and fellow ABSG principal Ron Jackson called the survey results "upbeat."

Forty-three percent of FBOs responding to the Annual FBO Fuel Sales Survey reported more transient traffic to their ramps in 2018. And a majority of FBOs expect fuel sales to increase in 2019, while 36% expect fuel sales to be about the same this year. Meanwhile, only 6% of FBOs reported they are expecting fuel sales to decrease, according to the survey results. FBOs remain confident in the economy, although the industry is less bullish than it was one year ago. Sixty-one percent of respondents to the 2019 survey say the economy is heading in the right direction, compared to 73% who said it was heading the right way a year ago.

Amid the optimism, the FBOs cite several challenges facing the industry. "An open-ended question resulted in these top five concerns: employee retention, fuel pricing, erosion of fuel margins due to contract fuel suppliers, lack of flight instructors and the cost of flying," Enticknap said. Along with the survey, ABSG released its forecast for 2019. "We expect a moderate 1.5 to 2% growth in FBO business aviation activities to include base customer aircraft movements, transient traffic arrivals and gallons pumped," Enticknap and Jackson said.

FBO operators will need to work across their organizations to minimize costs and be efficient, they said. Although ABSG does not see signs of major mergers, smaller FBO chains are likely to acquire FBOs "sporadically" to continue the consolidation trend, Enticknap and Jackson said.

A focus on safety, another ongoing trend, might pay off for FBOs that have set up a safety management system (SMS) or pursued IS-BAH registration. Enticknap and Jackson expect operators, particularly international operators, to favor FBOs with an SMS, IS-BAH registration or both.

Analyzing oil markets and the aviation fuel environment, ABSG expects oil prices to remain relatively low through the first three months of the year. Seasonal demand during the second and third quarters should cause prices to rise to a range of \$60 to \$65 per barrel, Enticknap and Jackson said. Jet A fuel prices will follow oil prices as well, they said.

—Justin Marciniak, justin.marciniak@aviationweek.com

TRAINING**Program Pays Training, Housing For Aviation Jobs**

WICHITA—A Kansas technical college is paying people to move here to train for jobs with local aviation and manufacturing operations.

After training, it offers guaranteed job interviews with Textron Aviation and Spirit AeroSystems.

Wichita State University Tech is offering to relocate those living at least 75 mi. outside the Wichita area for training and a guaranteed interview at no cost to the student. WSU

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REGULATORY/LEGISLATIVE

FAA To Require External ID Markings On Drones

WASHINGTON—Concerned that explosives concealed inside an unmanned aerial vehicle (UAV) could pose a danger to first responders attempting to find a drone's registration number, the FAA will now require owners to display their registration number on an outside surface.

The new rule takes effect on Feb. 23. The change has been issued as an interim final rule to avoid delaying implementation while seeking public comment as required for rulemaking.

Manned aircraft are required to carry externally visible N-numbers, but when the requirement to register drones was introduced in 2015, the FAA allowed the number to be placed in an enclosed compartment accessible without using tools.

This is because many small unmanned aircraft, particularly quadcopters, were considered too small to provide an external surface large enough for the registration number to be readably displayed. "Subsequently, law enforcement officials and the FAA's interagency security partners have expressed concerns about the risk a concealed explosive device might pose to first responders upon opening a compartment to find a drone's registration number," the agency said.

The FAA "believes this action will enhance safety and security by allowing a person to view the unique identifier directly without handling the drone."

The interim final rule does not specify a particular external surface on which the registration number must be placed, only that it can be seen upon visual inspection of the aircraft's exterior.

—Graham Warwick, warwick@aviationweek.com

TRAINING, from p. 5

Tech aims to attract 50 students to begin training in March.

The program, called "Wichita Promise Move," pays tuition and fees for training programs at WSU Tech. It also provides certifications and credentials, personal career coaching and a guaranteed job interview. It also pays relocation expenses, housing and cost-of-living expenses while in the program and offers a potential sign-on bonus when hired.

In a first round of training in the fall of 2018, it relocated and

SUPPLIERS

Safran Closes Collins Unit Acquisition

LYON, France—Multinational aerospace engine and component company Safran has finalized the acquisition of Collins Aerospace's electromechanical systems business unit.

The unit manufactures actuators and pilot controls such as trimmable horizontal stabilizer actuators (THSA), throttle quadrant assemblies and rudder pedals. The addition will enable Safran to create synergies and bolster its market position, the company said Feb. 11. It would not give the value of the deal. "Safran thus becomes a major player in pilot controls ... and strengthens its electrical actuation product line," Safran said. In pilot controls, Collins Aerospace will remain a major player; Lord and Woodward being other suppliers. In electrical actuation, Safran's competitors will include Liebherr Aerospace, Moog, Parker and Sener.


For Safran, adding the business unit to its existing activities in the field will represent a combined \$500 million of annual revenues. Under its previous owner, the business unit generated sales of \$159 million in 2018. It employs 575 in four sites in North America—mainly in Irvine, California and Mexicali, Mexico.

For Collins Aerospace, disposing of the activity was a requirement the European Commission set when it approved the takeover of Rockwell Collins by United Technologies Corporation (UTC) last year. The EC had competition concerns in the market for THSAs and some pilot controls. Brought together, Rockwell Collins and UTC Aerospace Systems formed Collins Aerospace. The electromechanical systems business unit was previously part of Rockwell Collins.

—Thierry Dubois, thierry.dubois@aviationweek.com

trained 50 people. All 50 received job offers from Textron Aviation or Spirit AeroSystems. "Wichita Promise Move is designed to help break down the barriers that keep individuals from getting trained," WSU Tech President Sheree Utash said. "Whether those barriers are financial, location, time or the fear of failing, we are ready to help anyone get the training they need to get a career in aviation and live, work and play in Wichita, Kansas."

—Molly McMillin, molly.mcmillin@aviationweek.com



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RESEARCH/DEVELOPMENT

Airbus Survey Shows Public Support For UAM

Safety and noise are the public's biggest concerns about urban air mobility (UAM), but initial acceptance of the concept is surprisingly high, concludes a public perception survey conducted by Airbus.

The survey, done in Los Angeles, Mexico City, New Zealand and Switzerland, shows 44.5% of all respondents support UAM while 41.4% believe it will be safe. The survey shows communities are most concerned by safety to people on the ground (55.6%), followed by the type and volume of sound (49.3% and 48.8%, respectively) generated by electric vertical-takeoff-and-landing (eVTOL) vehicles.

“What the survey told me ... is we need to do a lot more work here.... We identified pain points and validated that people are concerned about them.”

—Jessie Mooberry, Airbus UTM

The initial perception study was conducted by Airbus UTM, the former Altiscope unmanned traffic management project under Airbus' Silicon Valley outpost A3 that now reports to the European manufacturer's recently formed UAM unit. The survey is part of efforts to ensure responsible deployment of the new technology, says Jessie Mooberry, head of deployment at Airbus UTM.

“What the survey told me, which I expected, is we need to do a lot more work here. This is a baseline study. We identified pain points and validated that people are concerned about them,” she says. “We have our work cut out for us now, but what I learned is people are really excited about this technology. One out of two people are excited about this, keen to use it, and that's a surprise. I was expecting it to be closer to 15-20%—your early-adopter type, but it's much higher. We are at a good starting point.”

The survey involved 385 paid respondents in each of the four geographies. Los Angeles was chosen because of its congestion and pollution and high number of helipads, which gives it potential for early deployment of UAM. Mexico City has similar traffic problems and a history of adopting new mobility technologies: Airbus' Voom on-demand helicopter service is now operating in the city.

New Zealand has expressed interest in UAM as a way to provide intercity transport to promote tourism while preserving its natural landscape, says Airbus UTM, and Switzerland cites similar

increases in tourism and intercity travel, as well as a more open regulatory framework compared with the U.S.

Survey respondents were briefed on the technology and then asked psychographic questions to understand what types of lifestyles have strong views on UAM. Scenario-based questions elicited their reactions to different types of air-taxi operations and specific concerns about the time of day, frequency and altitude of flights, the sound and visibility of aircraft, types of passengers being flown and landing location.

In terms of positive perception, the best-case scenario is an aircraft that sounds like a bee buzzing, flies at high altitude once an hour, early in the morning, carrying four diverse passengers and landing far away from the respondent's home. The worst case is an aircraft that sounds like a helicopter, flies at low altitude 100 times an hour, at night, carrying a family of two and landing near to home.

Overall, 56% of respondents were concerned about safety to people on the ground. The next group of concerns, all at 48-49%, were type and volume (number of flights) of noise, and the time of day and altitude at which the aircraft are flying. Of lower concern were duration of noise (46%) and whether the aircraft was visible (45%). The parameter that generated the lowest concern was landing location (41%).

Generally, initial reactions are most positive as altitude increases, frequency of flights (sound) decreases, and time of day is earlier, says the study. This supports use of UAM during commuter rush hours. Higher altitude and lower flight frequency are also perceived as contributing to greater safety.

—Graham Warwick, warwick@aviationweek.com

SERVICES

Clay Lacy Aviation Opens Van Nuys Facility

Clay Lacy Aviation has opened a new 24-hr. maintenance, repair and overhaul facility for its Part 145 repair station at Van Nuys Airport in Los Angeles.

The facility provides light and heavy maintenance and repair services, avionics and cabin entertainment upgrades and installations, interior design, modifications and refurbishment and Aircraft On Ground support. It employs more than 70 workers and includes a 66,000-sq.-ft. hangar and 86,000 sq. ft. of office and shop space.

The facility services Gulfstream, Bombardier, Dassault Falcon and Hawker business jets and is an authorized service center for the Embraer Phenom 100 and 300 aircraft and includes \$3.4 million in parts inventory.

—Molly McMillin, molly.mcmillin@aviationweek.com

SUPPLIERS

Bristow Scraps Columbia Deal, Faces Uncertain Future

LONDON—Oil-and-gas helicopter operator Bristow Group has abandoned its proposed takeover of Columbia Helicopters as Bristow struggles with financial issues.

Bristow announced in November it had entered negotiations to buy the utility helicopter operator for \$560 million. But in announcing results for the company's fiscal 2019 third quarter (which ended Dec. 31, 2018) on Feb. 11, Bristow's management said it had uncovered "material weakness" in the internal controls over financial reporting, and that its financial results after March 31, 2018, "should no longer be relied upon."

The company says it is looking into whether the issues have resulted in errors in the company's financial statements, specifically over debt balances and whether waivers can be obtained from lenders. The evaluation will also look at whether the assessments affect the company's ability "to continue as a going concern." As a result of the findings, the company is holding off filing its quarterly report to the Securities and Exchange Commission. It has not said when the report will be formally filed.

Best known for its offshore helicopter services, Bristow also owned UK-based regional airline Eastern Airways and Australian airline AirNorth. The company is also contracted to provide the UK's Search and Rescue (SAR) Helicopter service from 10 bases around the British Isles.

Revenue Drops

Aviation Week Network has approached the UK Department of Transport for comment on the Bristow results and their effect on the UK SAR operation. Bristow has recorded drops in revenue since the slump in oil prices caused a dramatic fall in demand for offshore helicopter flights. Revenues in the three months to Dec. 31, 2018 were \$317 million, compared with \$345 million the year before.

The company has attempted to diversify its operation with investments into airlines and unmanned aircraft system services, and most recently the attempted takeover of Columbia, but has been hemorrhaging cash. Terminating the deal has cost Bristow \$20 million, and the company also paid \$14 million in termination costs for an aircraft purchase contract with Sikorsky that was canceled in December 2018.

Bristow says it saw "solid performance" in its UK SAR, Africa and Norway oil-and-gas businesses, but this was offset by continued losses at Eastern Airlines and AirNorth. Bristow says it is working to reduce its overhead, particularly aircraft leasing costs.

So far it has returned three helicopters to lessors during its 2019 fiscal year and will return two more shortly. It also plans to return another 19 aircraft during its fiscal 2020. "The decision to enter into a mutual termination of the purchase agreement was based on a number of developments following the entry into the agreement, which led both Bristow and Columbia to conclude that it was not possible to combine

the two companies at this time," said Thomas Knudson, Bristow's chairman. "We continue to value our relationship with Columbia and look forward to having the opportunity to work together in the future."

—Tony Osborne, tony.osborne@aviationweek.com

RESEARCH/DEVELOPMENT

Sikorsky Tie-Up To Provide UAM Insights

Sikorsky has announced an agreement with on-demand helicopter service provider Blade that will give the Lockheed Martin company access to data on the urban air mobility (UAM) market.

Under the agreement, Sikorsky's private charter and fractional ownership subsidiary Associated Aircraft Group (AAG) will provide and operate a dedicated S-76C+ helicopter for New York-based Blade, which will also have access to AAG's fleet of S-76s in the U.S. Northeast. "Additionally, the agreement establishes a working group to explore how AAG can leverage Blade's consumer, cockpit and operator technology platform," Sikorsky says in a statement.

Blade enables customers to use a mobile app to book a seat, charter an aircraft or crowdsource a complete flight from four heliports in Manhattan. Most trips are corporate flights to New York-area airports, including Teterboro in New Jersey. Others are to corporate campuses in Connecticut, as well as longer flights to Boston, Philadelphia and Washington, says Will Heyburn, head of corporate development.

Blade works with Part 135-licensed helicopter operators. The agreement with Sikorsky is different, Heyburn says. "Lockheed Martin and Sikorsky want to study urban air mobility, and we are the only people in the U.S. doing it today. We fly the exact routes future UAM vehicles will fly, so they can learn the use cases," he says. "We will share all the data and they will use the insights to plan future vehicles."

"Sikorsky is always looking to explore new market opportunities," says Audrey Brady, Sikorsky vice president of commercial systems and services. "Vertical lift becomes increasingly important as cities grow, and this relationship allows us to gain critical insights to emerging needs in that space."

Heyburn says Blade's service is intentionally equipment-agnostic so it can be ready for UAM when quieter, cheaper electric vertical-takeoff-and-landing (eVTOL) vehicles become available. "We believe it will be an evolutionary transition," he says. "There will be a long cohabitation phase when we need both." Blade, in which Airbus is an investor, has expanded into Los Angeles and will launch service in India in March under a pilot program with Hunch Ventures. The flights between two locations in Mumbai and heliports in Pune and Shirdi will replace 4-8-hr. drives with 35-min. helicopter flights, Blade says.

—Graham Warwick, warwick@aviationweek.com

RESEARCH/DEVELOPMENT

Wind Energy Company Graduates From Google Arm

Airborne wind energy developer Makani has graduated from X, the advanced research arm of Google parent company Alphabet.

Now an independent company, Makani has partnered with Shell to take its energy kites offshore.

Makani's system launches a tethered autonomous aircraft that flies crosswind in a circular path. As it flies, the wind drives rotors on the aircraft that power onboard generators to produce electricity that is transferred down the tether to the energy grid.

With a wingspan of 26 m (85 ft.), Makani's M600 energy kite can generate 600 kW of power. The technology has been tested onshore in Hawaii. Designed to be deployed at water depths greater than 50 m, the offshore system will be mounted on a floating platform. Instead of the large floating foundation required for a deep water wind turbine, the base station will be mounted on a small spar buoy.

This floats vertically, moored by a synthetic line and gravity anchor. This is possible because the kite is 90% lighter than turbines of similar power rating, Makani says.

Shell's Role

Shell will provide engineering and operational expertise with floating structures to help transition the energy-kite technology to offshore use. The companies plan to demonstrate the offshore floating system in Norway later this year.

In the Netherlands, Ampyx Power is developing the 2-megawatt Airborne Wind Energy System (AWES).

The company is building a smaller preproduction prototype of its autonomous aircraft, the AP3, with flight testing planned this year in Ireland.

Ampyx is targeting AWES at the market to "repower" the first generation of offshore wind farms. Constructed in the early 2000s, these will reach the end of their lives in 2020-25. But the infrastructure will not, and Ampyx plans to build platforms to launch and land tethered aircraft on the existing foundations.

—Graham Warwick, warwick@aviationweek.com

RESEARCH/DEVELOPMENT

BVLOS UAVs Begin Using UK Test Corridor

LONDON—British unmanned air system developer Blue Bear has begun flight testing along a flight corridor established for beyond visual line of sight (BVLOS) test work in conjunction with Cranfield University.

Blue Bear announced Feb. 6 that it has performed so-called extended visual line of sight (EVLOS) flights with 3 km racetrack patterns within the Cranfield air traffic control zone. This was part of the work to set up the National BVLOS Experimentation Corridor (NBEC) that the two organizations announced last August.

The corridor is being established to test technologies that will enable unmanned aircraft to fly in nonsegregated airspace. Under EVLOS conditions, observers are used to maintain the line of sight to the UAS. Under normal line-of-sight operations, the operator would have to be able to see the system.

The aim is to ultimately extend the size of the NBEC, from Blue Bear's headquarters in Oakley, England, to the university-operated Cranfield Airport, about 12 mi. away.

During this first phase of testing, the Cranfield air traffic zone was cleared of manned aircraft to enable the project team to establish the principles for future integrated NBEC operations. The test flights used Blue Bear's Blackstart UAS. "These initial flights enabled us to provide Cranfield Airport with reassurance from an operational safety perspective that the systems Blue Bear had developed and put in place are appropriate and compatible with Cranfield Airport operations," said Ian Williams-Wynn, managing director of Blue Bear.

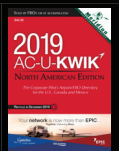
Professor Iain Gray, director of aerospace at Cranfield University, said the NBEC would be a "national asset that will support the journey to the creation of a unified traffic management system."

Once established, the NBEC will be open to other companies and research organizations looking to test BVLOS UAVs and traffic management systems. Later, part of the corridor will be enabled with 5G mobile communications technology under a UK government testbed program, with future plans to enable the entire corridor. 5G is seen as an enabling technology for both unmanned air and ground vehicles.

—Tony Osborne, tony.osborne@aviationweek.com

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The Bell 407GX light single helicopter has received type certification from the Civil Aviation Administration of China. The aircraft is equipped with the Garmin G1000H NXi integrated flight deck and dual-channel FADEC Rolls Royce M250-C47E/4 turboshaft engine. The approval paves the way for deliveries to Chinese customers, which will begin right after the lunar new year, which was Feb. 5, it said. The aircraft received FAA certification in October.

Air Charter Service has opened its sixth U.S. office, locating facilities in Atlanta as it continues to expand. The aircraft charter company, which offers private jet, commercial airliner and cargo aircraft charters, said it has built up a “considerable” client base over the years in the area. The office is the company’s 24th in its worldwide network. The company said it plans to announce additional offices in the coming months.

Avflight Corp. has expanded into Canada at the Winnipeg James Armstrong Richardson International Airport by acquiring Kelly Western Jet Center. It is Avflight’s first venture into Canada and is the company’s 21st full-service FBO in North America and Europe. Customers, transient traffic and staff at the FBO will experience a seamless transition, the company said.

Airbus Helicopters, Thales and Helisim have begun construction of a helicopter pilot and maintenance crew training center in Grand Prairie, Texas. Helisim is a joint venture of Thales and Airbus Helicopters, which will develop and operate the simulation center. They will initially invest \$40 million for the project, which will house Level D full-motion flight simulators for Airbus H145 and H175 aircraft. The first stage of the Helisim Simulation Center is scheduled for completion later this year when the first simulator will be delivered. The center will eventually expand to include an H160 simulator once the model is certified and production is underway. It will also incorporate existing Airbus training facilities.

Meridian Air Charter, a private aviation company, has added a new 2018 Challenger 650 business jet to its managed fleet. The aircraft is based in West Palm Beach, Florida, which serves the New York and Florida markets. The Challenger 650 is available for charter.

VistaJet, based in Malta, has adopted Osprey Flight Solutions data-led risk assessment technology, which allows the company to assess flight risks. The platform delivers immediate intelligence on the aviation environment and collects data from 200,000 sources in 60 languages. A team of analysts combine the data with algorithms, which paints a “real-time view of global safety.” It provides information that

could delay arrival of the crew at the airport to an evaluation of no flying zones, the company said.

Piper Aircraft has selected Flying Smart as its exclusive dealer for France, Belgium, Luxemburg and Monaco. Flying Smart is based in Biggin Hill, UK.

AES Engineering Solutions (AES Global), based in Braintree, UK, is now offering its cabin connectivity upgrade packages to business jets. Under its European Aviation Safety Agency (EASA) Part 21J approval, AES Global recently completed avionic modification installations on Bombardier Global 5000, Global Express, Challenger CL605 and Boeing BBJ aircraft. AES Global, in cooperation with Alamo Engineering, was responsible for the engineering, design and certification of the cabin connectivity upgrade programs.

Skyservice Business Aviation has received Transport Canada Civil Aviation approval for the installation of Satcom Direct Data Link Unit upgrade on Learjet 45 aircraft. Satcom Direct supported Skyservice through the TCCA’s Supplemental Type Certification process. EASA and FAA approvals are expected in the second quarter of 2019.

Valcora, an aviation fueling company based in Switzerland, is opening new offices in the U.S. and South Africa to expand operations. The offices are scheduled to open by mid-2019. It currently has bases in Switzerland, Ireland and Singapore. Valcora has experience handling the complexities of fueling taxes in the European Union and uses an “intelligent system” to make sure tax obligations are correctly calculated. Valcora began business in 2017.

Stuart Jet Center in Stuart, Florida, has added a U.S. Customs facility to streamline international travel. The 3,210-sq.-ft. facility is located at Witham Field. Visitors no longer must travel to Fort Pierce or West Palm Beach, Florida, for customs clearance. The FBO recently opened two 25,000-sq.-ft. hangars and 11,000 sq. ft. of office and shop space.

Falcon Aviation, a business aviation services company in the UAE, has been approved to handle business jet and regional aircraft maintenance, repair and overhaul services at its UAE bases by Saudi Arabia’s General Authority of Civil Aviation. Falcon Aviation is nearing completion on a new MRO facility for business jets at Dubai South, DWC Al Maktoum International Airport. It plans to open late in the first quarter of 2019. It is also expanding its facility at Al Bateen Executive Airport in Abu Dhabi.

APPOINTMENTS

Jill Plumb has been named vice president of marketing and sales management for **JetHQ**. **Walter Stark** has been named vice president of sales for the UK. Stark most recently served as Gulfstream regional vice president of sales for Southern Europe. Plumb most recently served as vice president of marketing and customer experience for AirShare.

Adam Beach has been named sales representative for **Duncan Aviation's** paint and interior sales team in Provo, Utah. For the past 10 years, Beach has held a variety of leadership and technical positions at Duncan.

Raphael Fabian has been named director of European Affairs at the **General Aviation Manufacturers Association**. Fabian most recently served on the Rolls-Royce European Affairs team in Brussels.

Marc Drobny, **Geoffrey Heck** and **Mike Magni** have joined the board of directors of the **National Air Transportation Association**. Drobny is president of business aviation for StandardAero in

Scottsdale, Arizona. Heck is senior vice president of operations for Signature Flight Support in Minneapolis. Magni is president of Monaco Air Duluth in Duluth, Minnesota.

Norbert Ehrich, has been named vice president of flight services for EMEA and Asia for **Jet Aviation**. Ehrich is the former vice president of sales for Jet Aviation Flight Services South East U.S. and South America.

Pamela Cooksey has joined the **Aircraft Owners and Pilots Association** as senior account executive for the organization's aviation finance team. Cooksey previously served at FirstMerit Bank in Akron, Ohio, where she helped form the first aircraft department for the bank.

Stuart Stevenson has been appointed head of Compliance and Safety for **TAG Aviation**. Stevenson will be based in Farnborough, UK. He joined TAG Aviation in 2018 as deputy head of Compliance and Safety.

CALENDAR

To list an event, send information in calendar format to Donna Thomas at donna.thomas@aviationweek.com. For a complete list of Aviation Week Network's upcoming events, and to register, visit www.aviationweek.com/events. (**Bold type indicates new calendar listing.**)

Feb. 18-20—Aircraft Electronics Association, Basic Wiring & Avionics Installation, AEA Headquarters, Lee's Summit, Missouri, <https://www.aea.net/training/courses/basicinstall/>

Feb. 19-20—Rotorcraft Structures Workshop 2019, Konrad-Adenauer-Ufer 3, Köln, 50668, Germany, <https://gama.aero/civcrm/?page=CiviCRM&q=civcrm/event/info&reset=1&id=99>

Feb. 19-21—Air Cargo Africa 2019, Casino Convention Resort/Emperors Palace, Ekurhuleni, South Africa, stattimes.com/ACA2019

Feb. 20—GAMA State of the Industry Press Conference, National Press Club, Washington, D.C., <https://gama.aero/>

Feb. 20-22—AAAE/ACC Airport Planning, Design and Construction Symposium, Denver, Colorado, <https://www.aaae.org/aaae/PDCS/Default.aspx>

Feb. 20-24—Aero India Show 2019, Yalahanka Air Force Station, Bengaluru, India, aeroindia.gov.in/aero-india

Feb. 22—ABA Forum on Air & Space Law - Update Conference, Ritz-Carlton, Pentagon City, <https://www.americanbar.org/events-cle/mtg/inperson/347164500/>

Feb. 25-28—2019 Intl. Operators Conference (IOC2019), Hyatt Regency San Francisco, San Francisco, California, <https://nbaa.org/events/2019-international-operators-conference-ioc2019/>

Feb. 26-29—AVSEC World 2019, Hilton Miami, Miami, Florida, iata.org/events/avsec/pages/index.aspx

Feb. 26-March 3—Avalon 2019, Australian International Aerospace & Defence Exposition, Avalon Airport, Geelong, Victoria, <https://www.airshow.com.au/airshow2019/TRADE/index.asp>

Mar. 1—The Society of Experimental Test Pilots, 12th Annual Southeast Section Symposium, Doolittle Institute, Niceville, Florida, <https://www.setp.org/symposium/meetings/southeast/>

Mar. 4—SpeedNews 9th Annual Aerospace Raw Materials & Manufacturers Supply Chain Conference, Beverly Hills, California, <http://events.aviationweek.com/current/Public/Enter.aspx>

Mar. 4—Airport Customer Experience Symposium, The Loews Chicago Hotel, Chicago, Illinois, <https://airportcouncil.org/conference/2019-airport-customer-experience-symposium/>

Mar. 4-6—SpeedNews 33rd Annual Commercial Aviation Industry Suppliers Conference (ASC), Beverly Hills, California, <http://events.aviationweek.com/current/Public/Enter.aspx>

Mar. 4-7—HAI Heli-Expo 2019, Georgia World Congress Center, Atlanta, Georgia, <https://www.rotor.org/Home/HELI-EXPO>