



## New rotorcraft 2018

# Stagnating civil market begins to show signs of a return to life

by Mark Huber

Oil topped \$60 per barrel at the end of last year, a harbinger of optimism for new rotorcraft sales. Growing geopolitical uncertainty combined with OPEC crude oil production cuts should send the price of oil and gas climbing further this year, benefiting the leading offshore operators as that sector consolidates and rebounds. However, expect to see more offshore activity in Austral-Asia and a growing shift from heavies to super-mediums to service that market, a development that bodes well for Airbus, Bell, and Leonardo—companies with available or soon-to-be available new models in that sector. Those models also will benefit from the global trend to privatize helicopter search-and-rescue operations.

What oil couldn't do for market optimism, Mother Nature did, lashing the Continental United States and the Caribbean with an unprecedented array of hurricanes, floods, and fires, reminding everyone with access to a video screen that, in times of disaster, there is no substitute for a helicopter commanded by a competent crew. Concurrent with these unfortunate events, new helicopter orders and deliveries, while not surging, showed marked improvement. Data released by the General Aviation Manufacturers Association (GAMA) revealed, that for the first three quarters of 2017, shipments of piston helicopters increased by 13.1 percent with 190 delivered in the first three quarters, while turbines rose by 5.6 percent, to 471. Rotorcraft billings increased 8.8 percent, to \$2.7 billion.

In that quarter, Textron's Bell Helicopter reported a 13.1 percent operating margin on the delivery of 39 commercial helicopters, up from 25 in the same period last year. The deliveries include five 412s and the start of 407GXP deliveries to China's Shaanxi Energy Group as part of a 100-ship order. Largely on the strength of increased commercial deliveries, revenues at Bell were up \$78 million in the quarter and segment profit increased by \$9 million from a year ago. However, backlog slid to \$5 billion, down by \$413 million from late June. Textron chairman and CEO Scott Donnelly said the increased civil orders were broad-based, both from a sector and geographic perspective, "which is good frankly." He added, "I think the overall market is still weaker than it has been in previous times, but it's much better than it was couple of years ago."



Airbus Helicopters posted mostly good news throughout the year, starting with a strong first quarter that saw new orders surge. Overall first-quarter helicopter orders at the company climbed 41 percent year-over-year, to \$1.55 billion and civil helicopter deliveries increased to 78 in the quarter, up from 56 in the same period last year. For the first nine months of the year net helicopter orders totaled 210 units, including 14 super-medium H175s in the third quarter. Airbus Helicopters' revenues were slightly higher with deliveries of 266 units; however, earnings before interest and taxes fell sharply as the result of continuing blowback from the post-crash grounding of Airbus H225 heavies in 2016. Airbus continues to hold its share of the North American civil market at 50 percent and is making a new push into the corporate sector, last year unveiling Airbus Corporate Helicopters (ACH), a unit that will be dedicated to its private and business aviation customers. The new organization will provide concierge-style end-to-end support, from purchase, through training, ownership and even possibly resale.

Likewise orders grew by 11.2 percent in the first nine months of the year for Leonardo Helicopters.

Overall, the civil helicopter market should continue to experience modest growth this year, led by demand for light singles and regional strength outside North America in Europe and Asia. Honeywell's helicopter forecast pegged demand for light singles at 58 percent of total units over the next four years, while demand for light twins shifts to medium twins and super-mediums. While virtually all new helicopter programs have experienced development delays, there is no shortage of new product in the pipeline, primed and ready for an ascending market.

## Piston Singles

### **Enstrom TH180**

The company announced the TH180 in 2014 and plans to use the type certificate basis and rotor system of the larger three-seat 280FX to speed development. The TH180 will be powered by a 210-hp Lycoming HIO-390 piston engine and feature an engine governor and electric clutch switch, robust landing gear and a useful load of 700 pounds, a maximum gross weight of around 2,250 pounds, including a standard 40-gallon fuel capacity. 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 Menominee, Michigan production plant has the capacity to build 100 TH180s per year. Last year, Enstrom announced that a second TH-180 prototype had joined the certification test program and that it was closing in on FAA certification.



Enstrom TH180

### **Cicare Model 12**

Argentine kit helicopter maker Cicare plans to enter the certified market with a variant of its Model 12 two-seater within three years. The Model 12 kit currently sells for \$189,000. It is powered by a Lycoming HIO-360G1A four-cylinder engine that delivers 180 hp; empty weight is 948 pounds 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 lifted on condition, monocoque cabin construction and tube skid gear, and a cabin that includes 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 already has been certified under ULM rules in Europe and Argentina.

## **Turbine Singles**

### **Bell 505 Jet Ranger X**

Bell Helicopter received type certificate approval from Transport Canada for its new five-seat Model 505 Jet Ranger X light single in late 2016 with FAA approval following in June 2017 and EASA approval in November. Customer deliveries are under way worldwide.

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. In March, Safran detailed 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 approximately \$300 per flight hour. Bell used much of the main rotor system of the Bell 206L4 LongRanger in the new single, reducing development time and costs.

The 505 will have 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 was set at \$1.017 million with typically equipped models costing \$1.2 to \$1.4 million. Bell currently holds letters of intent for more than 400 Jet Ranger Xs.

The company plans to offer a number of kits for the 505, some of which are very mature in certification testing, for a variety of executive, utility, and law enforcement missions. Additionally, the Mecaer Aviation Group (MAG) is developing a high-end VIP interior 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." In early 2016, United Rotorcraft unveiled an EMS interior for the 505. The simple quick-change system 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 beginning in 1981. The design first flew in 1996 and has undergone several refinements since Leonardo acquired a majority stake in the company in 2009. Recent improvements include new Genesys avionics, an improved hydraulics 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, Alabama, has been subcontracted to provide the avionics and integration of the powerful Rolls Royce -C30P engine into the helicopter.

While a firm price for the helicopter has not been set, Leonardo executives said it would be in the \$1.2 to \$1.5 million range. The aircraft will be built in Poland and shipped to the U.S., with completions and deliveries out of AAL Huntsville.

### **Innova/Composite Helicopters C630**

Last February, Innova Composite helicopters filed for liquidation in New Zealand. Attempts to contact the company to inquire about the program's current status have been unsuccessful. The company's bankruptcy auction included two prototype fuselages and various production machinery.



Composite Helicopters claimed its rotorcraft is the first with a full monocoque fuselage fabricated entirely from rigid composite materials. U.S.-based Innova Aerospace had been looking to fly a fully conforming prototype of the Composite Helicopters C630 five-place light single powered by a production Rolls-Royce RR300 turboshaft in 2016. The helicopter was to 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 certification this year. Privately held Innova said it had adequately capitalized the program to see it through certification and initial production in New Zealand. Innova acquired the intellectual property rights to the program in 2015.

Preliminary specifications for the carbon-fiber rotorcraft include a cruise speed of 125 knots, a range of 450 nm (no reserve) and 1,350 pounds of payload.

### MD Helicopters 6XX

The large 5,500-pound single is slated to be powered by an upgraded Rolls-Royce C47 E3 and could be certified by year end. Specifications call for a maximum speed of 160 knots, with a range of 500 nm and a 20,000-foot ceiling. It will feature a Genesys Aerosystems flight deck, Macro-Blue tactical displays, mission management system from TekFusion Global, all-new S411 main rotor blades from HTC, a four-blade tail rotor, boosted flight controls, and digital three-axis autopilot. The 6XX will share a cockpit with the company's latest generation 530G.



MD Helicopters 6XX



## **Marengo Swisshelicopter SKYe SHo9**

Marengo unveiled the \$3.5 million SKYe SHo9 single-turbine utility helicopter in 2009, but the program has experienced delays and schedule slippages. The first prototype did not take flight until 2014. Flight-testing was halted while the main rotorhead and rotor blades were redesigned and fitted to the second prototype, which then took flight in February 2016. Meanwhile, the certification timetable has slipped from 2016 to 2018. A third prototype (P3) was rolled out in June 2017 and began test flying shortly thereafter. Plans call for a P4 aircraft to be added to the test fleet early this year, and the company is still aiming for 2018 certification and 2019 deliveries. Currently, the company holds “more than 100” international purchasing commitments.

The SHo9 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 single Honeywell HTS900-2 turbine with Fadec. The SHo9 also will be equipped with the Honeywell HUMS, enabling operators to continuously monitor mechanical rotating components and subsystems and become aware of potential problems before they occur. Other features include a five-blade bearingless main rotor system and a shrouded tail rotor. Performance targets include a 5,842-pound mtow, 140-knot cruise speed, and 430 nm range.

## **Russian Helicopters VRT500**

Russian Helicopters unveiled a mock-up of the long-awaited VRT500 new light civil utility single in late July. Developed by Russian Helicopters subsidiary VR-Technologies, the coaxial design features two three-blade main rotors with shaped carbon-fiber blades to reduce noise, extensive composite construction, glass-panel avionics, and sliding rear-cabin doors. Plans call for its turboshaft engine to be Western-sourced, possibly from Safran. The five-seat helicopter is intended to compete with the Bell 505 and the Robinson R66.

Russian Helicopters plans to market it in the U.S. and Europe and pursue EASA and FAA certification, with serial production projected for 2020 or 2021. The Russian manufacturer indicated it will develop the VRT500 with unidentified European partners.

Preliminary specifications call for the VRT500 to have a maximum takeoff weight of 3,527 pounds, a payload of 1,600 pounds, a cruise speed of 124 knots, a service ceiling of 20,000 feet and a maximum range of 410 nm. Russia's past efforts to develop an indigenous light single have fallen flat for lack of expertise and resources and differing national priorities.

## **Kaman K-Max (K-1200)**

Kaman delivered its first new-production K-Max single-seat, single-engine K-Max utility external-lift helicopter in June. Powered by a single Honeywell T53-17 (flat-rated 1,500 shp) and characterized by its intermeshing, 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 previously built 38 before shutting the line in 2003.

The U.S. Marine Corps and Lockheed Martin operated two unmanned K-Maxes in Afghanistan on an extended trial. These aircraft successfully supported the U.S. Marine Corps in Afghanistan from 2011-2014 carrying more than 4.5 million pounds of cargo. That demonstration helped to rekindle interest in the helicopter, and two years ago Kaman announced that it would restart production. Kaman intends to keep its new K-Max production line open through at least 2019.

Kaman builds K-Max airframes in Jacksonville, Florida, and installs systems and wiring at its final assembly and flight-test facility in Bloomfield, Connecticut.

Additional unmanned firefighting and humanitarian missions for K-Max are also being developed and tested. During a demonstration in 2014, an unmanned K-Max lifted and dropped more than 24,000 pounds of water onto a target fire in an hour.

## Twins

### **Leonardo AW109 Trekker**

Leonardo's AW Trekker light twin received EASA certification on December 26 with deliveries set to begin in the first quarter of 2018. The Trekker is a skidded version of the company's AW109S Grand/GrandNew and features advanced single-pilot IFR Genesys Aerosystems avionics and a pair of Fadec-equipped, 815-shp Pratt & Whitney Canada PW207C engines that deliver a maximum speed of 168 knots. The Trekker has a maximum takeoff weight of 7,000 pounds and an endurance of four hours, 20 minutes or 445 nm with a modular, five-cell fuel system.

The helicopter is aimed primarily at the EMS and utility markets. The cabin can accommodate up to six passengers or one stretcher with three to four medical attendants or two stretchers with two medical attendants. The aircraft features a cocoon-type airframe, a crash-resistant fuel system, Cat. A/Class 1 performance in hot/high environments, and a 30-minute "run-dry" main gearbox. Available equipment includes cargo hook, external rescue hoist, searchlight, external loudspeakers, FLIR camera, video downlink, snow skis, and emergency floats. Leonardo holds orders for 40 of the helicopters.

### **MD Helicopters MD969**

This updated version of the 902 Notar-equipped light twin is slated to feature a Genesys Aerosystems glass cockpit, four-axis autopilot, more power for the Notar (no tail rotor) anti-torque system and upgraded Pratt & Whitney Canada engines.



## **Avicopter AC312e**

The Aviation Industry Corporation of China (Avic) began flight-testing its new AC312e light-medium twin helicopter in 2016 and is aiming to have it certified this year. This new model is derived from 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 featuring Arriel 2C engines was introduced in 2002. Cumulatively, Avic has produced more than 200 Z-9s.

According to Avic, the 312e will feature improved high/hot performance thanks to a pair of Safran Helicopter Engine Arriel 2E engines (1,000 shp each) and Rockwell Collins Pro Line 21 avionics to support growth for synthetic vision, helicopter TAWS and EFB. Options also include 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.

## **Russian Helicopters Ka-62**

More than a year after it performed its first hover, Russian Helicopters’s Kamov Ka-62 medium twin made a limited test flight—a 15-minute orbit—on May 25 at speeds up to 60 knots from the Progress test facility at Arsenyev. Since the helicopter first hovered on April 28, 2016, Russian Helicopters said the Ka-62 has been “gradually” subjected to increased systems and equipment testing as it prepares for certification testing on the ground and in the air. The company said “several” Ka-62 test aircraft have been produced. Announced in 1992, the program has been beset by multiyear delays.

The Ka-62 is expected to cost in the \$10 million range, seat 12 to 15 and be aimed primarily at the offshore energy and search-and-rescue markets. Russian defense and law enforcement agencies appear to be early customers for the model.

The 14,000- to 15,000-pound-mtow helicopter features a hybrid airframe that is 60 percent polymer composite by weight; a ducted tailrotor; five-blade main rotor system; twin hydraulics systems; and bird-resistant windshield. Power comes from a pair of 1,680-shp (max continuous) Safran Ardiden 3G engines. The avionics were developed locally by Russia’s Transas. Initial performance targets include a 156-knot cruising speed a maximum range of 389 nm or 613 nm with auxiliary tanks. Announced launch customers outside Russia include Atlas Taxi Aereo in Brazil and Vertical de Aviacion in Colombia.



## Harbin Z-20

This medium twin is basically a Chinese copy of the Sikorsky S-70 with fly-by-wire flight controls, a five-blade main rotor system, and slightly more powerful Chinese WZ-10 turboshaft engines (2,145 shp). First flight occurred in 2013 and the program remains in development. The Z-20 is said to have slightly more cabin space and range than the S-70. The People's Liberation Army Air Force (PLAAF) could place Z-20s into operation by year-end.

## Avicopter AC352

The Avicopter AC352 remains in flight test with the goal of CAAC certification by the end of 2018. The AC352 is the Chinese-manufactured version of the super-medium Airbus Helicopters H175. The H175 was jointly developed by Airbus Helicopters and Avicopter, with Avicopter 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 AC352 is powered by a pair of WZ16 engines, the Chinese variant of the Safran Ardiden 3C.

Safran said the new-generation 1,500- to 2,000-shp turboshaft features compact modular



**Bell 525**



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 consortium.

## **Airbus H160**

The H160's schedule has slipped to the right, with first deliveries now scheduled for 2019. Airbus executives blamed the delay on the need to redesign unspecified "mechanical parts." The third flight-test aircraft made its first flight in October.

Airbus Helicopters unveiled the all-composite H160 medium twin in 2015. The successor to the AS365/EC155, it is targeted at the market segment 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 feature a two-stage centrifugal compressor associated with variable inlet guided vanes reducing specific fuel consumption at all flight phases, particularly at cruise power.

The H160 features Blue Edge main rotor blades for quieter operation, a canted Fenestron tail rotor for increased 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. Other innovations include a full composite airframe, a biplane stabilizer—for improved main rotor efficiency—and an 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 radius of action with an mtow of 12,566 pounds. Other performance goals include maintaining hover out of ground effect at up to 5,000 feet; and 450 nm of range 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 provisions have been made. 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 just five major component assemblies that are fully completed and tested before they reach the final assembly line.

## **Bell 525**

Bell resumed test flying the 525 in July and plans to certify its super-medium 525 Relentless twin using four test aircraft. The flying part of the test program had been stood down since the fatal crash of the first prototype, FTV1, registered as N525TA, on July 6, 2016. The NTSB recently completed its investigation as to why the main rotor blades struck both the tailboom and the nose during the in-flight break-up sequence that 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.

Bell is continuing to assemble the next two flight-test aircraft and has started to build the first several customer aircraft. FTV4 is heavily kitted with search-and-rescue equipment and more flight-test instrumentation than originally planned. It should be ready to fly early this year. FTV5 will have a lot of the oil-and-gas 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.

The 525 is a 20,500-pound super-medium with passenger capacity of up to 20 (high-density), 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 GECT7-2F1s (1,800 shp each) driving an all-composite five-blade main rotor system and a four-blade tail rotor. The airframe is a hybrid aluminum composite design. 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 capabilities. Bell has not set a published price for the 525.

### **Russian Helicopters Mi-171A2**

Russian Helicopters obtained type certification last August for its medium-twin Mi-171A2 from Rosaviatsia, the Federal Air Transport Agency of the Russian Federation. This clears the way for serial production and commercial deliveries. Testing had begun in 2014 with four flying prototypes and two static test items.

This updated version of the Mi-8/17 features more than 80 upgrades and changes from the legacy helicopter, including VK-2500PS-03 engines with Fadec (2,400 shp each), a more robust transmission to accommodate the engine power increase, digital avionics with a health usage and monitoring system (HUMS), and a reconfigured cockpit for two-man crews. The new engines provide a 400-shp increase over the power of the Mi-8/17, increase cruise and maximum speeds by 16 knots, and boost range from 320 to 430 nm.

The helicopter also features a new rotor system that includes aerodynamically redesigned, all composite main rotor blades and an X-shaped tail rotor, which together provide 1,543 pounds of additional thrust and improved performance. The Mi-171A2 is certified for VFR/IFR, overwater, and Category A operations, including continued OEI flight at mtow.

### **Airbus Helicopters X6**

The replacement for the H225 family remains in the concept stage. Entry into service is expected in the mid-2020s. Airbus has given out a few clues on the new helicopter. Expect full fly-by-wire digital flight controls, all-weather capability including full de-icing, extensive use of composites



and advanced manufacturing, and a twin-engine design. Airbus has also hinted that there will be commonality, most likely in the avionics, between the X6 and the H160 and the H175.

### **Russian Helicopters Mi-38-2**

The long-delayed replacement to 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 feature power from a pair of Klimov TV7-117V turboshafts (2,800 shp each) and 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 model 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. M<sub>tow</sub> 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 18,701 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 Mother Russia's monster ship features 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 X3 research demonstrator, which debuted in 2010 and has since been retired. The X3 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 come as early as 2019 and the design could result in a commercial product by 2030.

### **Sikorsky S-97 Raider**

The lone flying prototype of this proof-of-concept aircraft sustained substantial damage during a hard landing in August that was blamed on the flight control system. A second prototype could fly this year. The Raider features a rigid coaxial main rotor system and an aft thruster propeller and is being used to gather data for a larger aircraft with the same style dynamics, the SB-1 Defiant, which will compete in the Defense Department's Future Vertical Lift program.



**Airbus LifeRCraft**

## Tiltrotors

### **Bell V-280**

Bell Helicopter's V-280 Valor next-generation tiltrotor prototype made its first flight on December 18 from the company's facility in Amarillo, Texas. The V-280 program is part of the Joint Multi-Role Technology Demonstrator initiative, a science and technology precursor to the Department of Defense's Future Vertical Lift program. Bell said the V-280 can carry 14 passengers and four crew and eliminates the V-22's rear loading ramp in favor of six-foot-wide fuselage doors under the wings. The tiltrotor provides twice the speed and range of conventional helicopters. Specifications include a maximum speed of 280 knots; combat range of 500 to 800 nm; maximum self-deployable range of more than 2,100 nm; and more than 13,000 pounds of useful load. It features fly-by-wire flight controls and a pair of GE Aviation T64-GE-419 turboshaft engines.

### **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 2016. Unlike tiltrotors such as the Bell Boeing V-22 Osprey or Leonardo AW609,

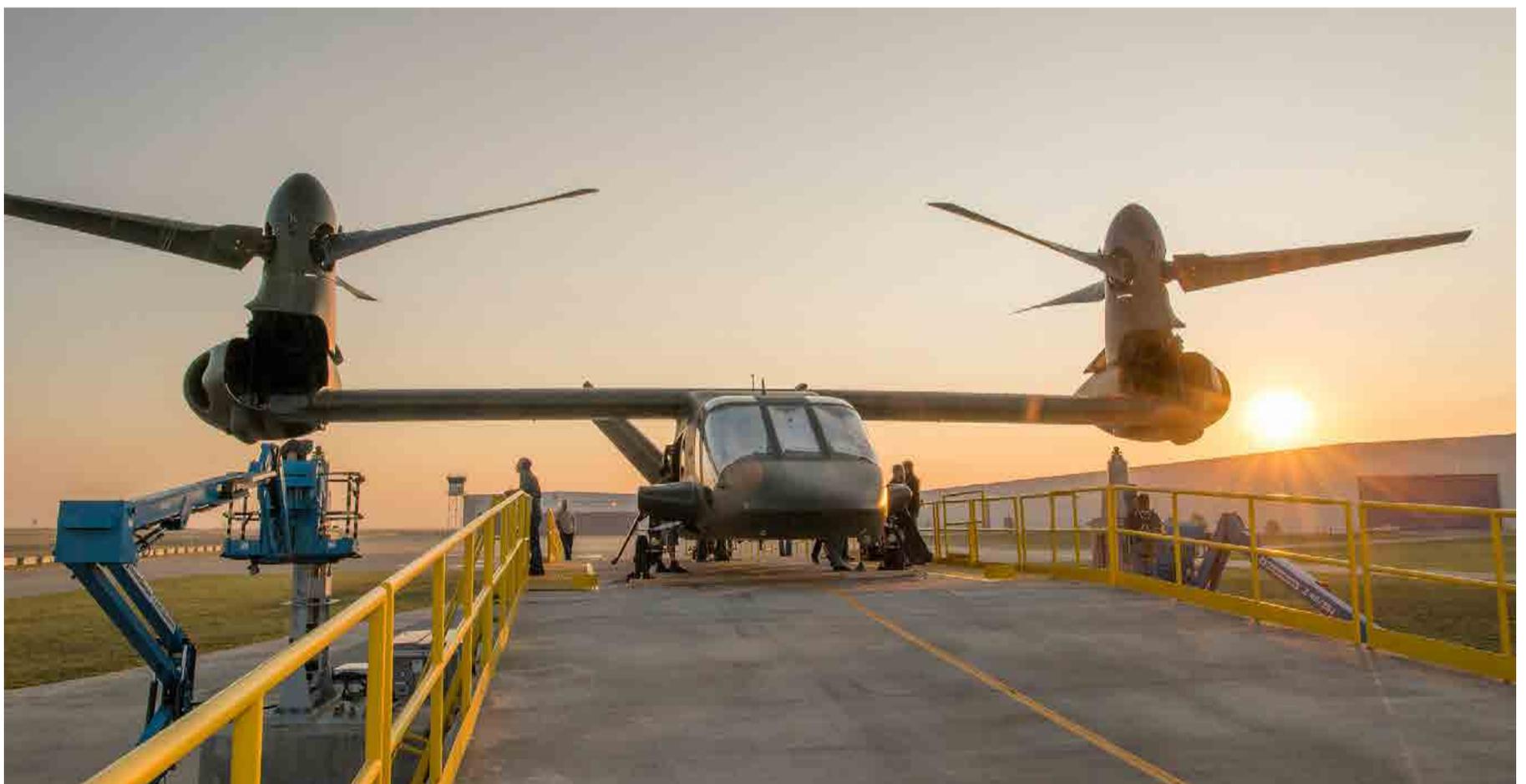


the Blue Whale is a quad-proprotor design. A medium variant is said to have an mtow of 44,090 pounds/20 metric tons and a heavy variant will have twice that capacity. Initial targeted range is 1,674 nm/3,100 km. Avic has not yet set a timetable for the program, with a company official saying only that he expects development to take “a long time.”

### Leonardo AW609

Leonardo Helicopters maintains that its AW609 civil tiltrotor program remains on track for entry into service in 2019. This past spring, the third AW609 test aircraft (AC3) successfully completed an artificial icing campaign in Marquette, Michigan, laying the groundwork for future testing in natural icing conditions. The company is beginning fuselage fatigue test certification and additional supplier component certification tests are proceeding as planned, the company reported.

In October Transport Canada certified the AW609's 2,000-shp Pratt & Whitney Canada PT6C-67A powerplant. A production engine was retrofitted onto AC3 last fall to complete the integration and ready the aircraft for certification testing. AC1 will return to the test fleet this year after retrofit and will start certification “load level” surveys. Assembly of test AC4 is progressing and Leonardo anticipates rolling it out this year. Following ground runs, it will be dedicated to avionics development and certification, leveraging the integrated lab results and testing already in progress. Rockwell Collins



Bell V-280



Pro Line Fusion touchscreen avionics will be available on board AC4 for its first flight.

Announced aircraft performance includes a 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 increase 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; 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. ■



**Bell 505 Jet Ranger X**