



Pilatus PC-12/PC-12NG



New Business Turboprops 2018

Strong market ready for new models

by Mark Huber

Twenty years ago, the conventional wisdom was that business turboprops were all but dead, destined to die ignominious deaths stripped of their executive interiors and then consigned to hauling small packages, dropping skydivers, or spraying pests before meeting that big smelter in the sky. Surely the market would opt for a new generation of fuel-efficient light jets as opposed to going steerable in something from the aeronautical Stone Age with—gasp—propellers.

Surely not. Consider the following:

While deliveries of new business jets are relatively flat year over year for the first six months of 2018, those for new turboprops are up nearly 10 percent, climbing to 260 from 237, according to the General Aviation Manufacturers Association (GAMA). The high-end, pressurized turboprop segment is up 12 percent. For the first six months of the year, deliveries of new Textron Aviation Beechcraft King Airs are up 30 percent. Gama Aviation, which operates the fleet for charter membership company Wheels Up, saw its flight hours for the first half of the year surge to 72,885 from 61,651 as it expanded its fleet from 99 to 117, most of them King Air 350s. Last year Wheels Up CEO Kenny Dichter said he could see a

future for his company having up to 75,000 members and 1,000 King Airs in North America and Europe by 2030.

The influx of new activity has turned this into a Lazarus Market, in which turboprop models previously left on the side of the road for dead have been brought back to life, to wit: Piaggio recently reported that it had 12 of its new Avanti Evos on the assembly line and India's NAL put the latest version of its Saras twin pusher into the air in January and is continuing the three-decade-old development program.

Then there's the used turboprop market: It remains extremely tight. The percentage of the used turboprop in-service fleet for sale in June stood at just 6.6 percent, down from 7.6 percent a year ago and compared to 9.1 percent of the used jet fleet available for sale. The scarcity of good used aircraft has convinced owners to pour money into upgrades and modifications for older turboprops. Blackhawk Modifications, which specializes in upgrades for turboprops including King Airs, Cessna Caravans, and Piper Cheyennes, reports that business is up 40 percent in 2018 year over year.

In years past, the turboprop market has been a steady constant against the shifting

winds of the larger business aviation market, but this year it is actually outperforming the rest of the market, in no small part thanks to the robust charter market and the growth of single seat and whole aircraft membership services. And this is a trend that is likely to continue. As business aviation becomes more democratized with more cost-effective service offerings that have wider market appeal, the hardware has to match the mission and pricing economics. And that hardware is still called a turboprop.

TWINS

Textron Aviation Cessna SkyCourier 408

Last November Textron announced the new high-wing twin and an initial order for up to 100 from FedEx in cargo configuration in a deal valued up to \$550 million. Textron developed the aircraft in concert with FedEx, but the aircraft has wider applications beyond small market air freight expediting. The SkyCourier can seat up to 19 passengers in a commuter layout. It features twin Pratt & Whitney Canada PT6A-65SC engines (1,100 shp each), Garmin G1000 avionics, an 87-inch cargo door, a 70-inch



square cabin that can swallow up to three LD3 shipping containers, a maximum payload of 6,000 pounds, a maximum range of 900 nm, a maximum speed of 200 kts, single-point pressure refueling, and all-aluminum construction. First flight is anticipated next year with deliveries beginning in 2020. The passenger variant will include crew and passenger doors and large windows. Wind tunnel testing was completed on the aircraft earlier this year.

Evektor EV-55 Outback

In March 2017 the company issued a statement saying the project had been “put on hold” due to “uncertainties with our Malaysian investor.” Those uncertainties were for good cause. The investor in question was reportedly none other than 93-year-old Mahathir bin Mohamad, who two months later would be sworn in as that country’s prime minister. Barring any new funding, the Outback will likely be on the shelf for some time.

The first conforming prototype flew in April 2016. The now \$4 million light twin from the Czech Republic has been in development for more than a decade and a non-conforming prototype first flew in 2011. Evektor says it holds orders for two dozen copies of the military/utility/cargo/combi/passenger aircraft, which seats between nine and 14 people. The project, underwritten thus far by the Czech ministry of industry and receiving technical assistance from the Czech army, had been receiving funding from Malaysian company Aspirasi Pertiwi. It was run by Mohamad before his return to politics, and had agreed to invest up to \$200 million. The aircraft is designed for high-elevation operations involving unpaved airstrips. Evektor claims interest from several air forces.

The Outback features a quick-change



EV Evektor EV-55 Outback



Dornier SeaStar

cabin that can be reconfigured in 20 minutes. Power comes from a pair of P&WC PT6A-21s rated at 536 shp each. Maximum speed at 10,000 feet is 220 knots and maximum payload is 4,021 pounds. Service ceiling is 29,000 feet. The volume of the combined cargo/passenger area is 447 cu ft and the maximum cargo payload is 3,021 pounds. Evektor claims the Outback can take off from, and land on, runways of less than 1,700 feet at 6,500 feet msl. Evektor had selected Esterline’s CMC SmartDeck integrated digital avionics system as standard equipment.

Dornier SeaStar

Dornier Seawings rolled out its first new production \$7.21 million Seastar amphibian push-pull twin in August 2017. The new-generation Seastar features an all-digital cockpit with Honeywell Primus Epic 2.0 avionics suite and four 10-inch LCD displays with advanced vision, communication, navigation, surveillance, and air traffic management systems. The aircraft is certified for single-pilot IFR. Other new items include a stern hydro thruster for improved water maneuvering, new corrosion-resistant landing gear with nosewheel steering, a revised

12 passenger cabin layout with air conditioning, and new propellers.

First flight is scheduled for the first half of 2019.

The Seastar made its first flight in 1984 and was initially certified in 1991; however, the effort to put the aircraft into serial production subsequently failed due to chronic undercapitalization. In 2014, Dornier partnered with two state-owned Chinese companies (Wuxi Industrial Development Group and the Wuxi Communications Industry Group Co., Ltd.) to bring the aircraft to market, announcing plans to assemble the aircraft in Germany and China. Last year Dornier Seawings China began construction of a purpose-built aircraft assembly plant in Yixing. Early last year, Dornier Seawings announced an agreement with Canada’s Diamond Aircraft Industries to have that company build Seastar airframes under contract.

The Seastar is powered by two in-line Pratt & Whitney Canada PT6A-135 engines, has a maximum cruise speed of 180 knots, a 900-nautical-mile range, a service ceiling of 15,000 feet, and a maximum demonstrated sea state of two feet. The Seastar was designed in the 1980s and was FAA certified under Part 23 in the early 1990s at a cost of almost \$150 million. A decade ago, the company said it held letters of intent (LOI) for more than 25 Seastars.

Turbine Mallard G-73T

Type certificate holder Frakes Aviation has formed Mallard Aircraft in Cleburne, Texas, with the goal of building new-production aircraft with new Pratt & Whitney Canada PT6 engines and Rockwell Collins avionics. Fred Frakes converted eight piston-powered Grumman Mallards to PT6 power between 1970 and 1984 and later purchased the Mallard’s TC. Mallard plans to offer several



interior configurations, among them an executive floorplan with six single seats and a three-place divan, eight single seats in a utility configuration, and a 17-seat high-density layout. Predicted numbers for the new Mallard: maximum takeoff weight (land or water) 14,000 pounds, up to 4,462 pounds of fuel, a useful load of 5,470 pounds, maximum payload of 2,350 pounds, typical cruise speed of 190 knots and a service ceiling of 24,500 feet.

Mahindra Airvan 18

Mahindra Aerospace has delayed plans to begin working on an updated version of the Government Aircraft Factories N24 Nomad twin; rebadged the Airvan 18. A Mahindra executive said the company is presently focused on bringing its recently certified Airvan 10 turboprop single to market. Plans for the Airvan 18 had included a modern glass cockpit and an 18-passenger layout with quick-change options for passenger, cargo and combi ops. The Airvan 18 was slated to be powered by a pair of upgraded 450-shp Rolls-Royce 250-series engines and new propellers that would allow it to retain its STOL capabilities, easily using runways shorter than 2,000 feet. Performance estimates include a maximum cruise speed of 173 knots and a range of 1,080 nm with 2,190 pounds of payload. Maximum useful load was projected at 4,405 pounds with an mtow of 9,400 pounds.

NAL Saras

The latest iteration of the NAL Saras twin-engine turboprop pusher took to the skies for the first time on Jan. 24, 2018. PT1N aka “Saras Mk 2” features a larger rudder, redesigned engine nacelle, new flight controls and brakes, composite components to cut weight, uprated engines, and more modern avionics. Given the upgraded systems and assumed improved performance, NAL now projects a demand for the aircraft, now nearing its fourth decade of development, for between 120 and 160 over the next 10 years and now anticipates having the aircraft ready to enter serial production by 2022. However, so far, the only customer to materialize for the aircraft is the Indian Air Force which has committed to taking 15.

While formal funding for Saras was cut off in late 2013, India’s National Aerospace Laboratory (NAL) managed to keep it alive with “lab” funds after that. Regular funding returned last year when NAL



announced plans to devote another \$60 million to two prototypes and resume limited flight testing. The Saras program has struggled since 2009 when the second prototype crashed.

SINGLES

Textron Aviation Cessna Denali

Launched in July 2016, the Denali is anticipated to make its first flight in 2019 with certification in 2020. Cessna is accepting letters of intent for the \$4.8 million, single-pilot-capable, six-to-nine passenger aircraft. The Denali will have a range of 1,600 nm, a maximum cruise speed of 285 knots, and a full fuel payload of 1,100 pounds. The aircraft features a flat-floor cabin, a 53 inch by 59 inch rear cargo door, a digital pressurization system that maintains a 6,130-foot cabin to 31,000 feet, and an optional externally serviceable belted lavatory with pocket door enclosure in the aft cabin. The cabin also incorporates large passenger windows, interior LED lighting, a refreshment cabinet, and an in-flight-accessible baggage compartment. The cabin is designed to be easily and quickly converted between passenger, combi, and cargo configurations. Textron unveiled a full-scale mock-up of the interior this summer at EAA AirVenture in Oshkosh.

The aircraft will be powered by a new GE Aviation Fadec-equipped 1,240-shp Catalyst engine with single-lever power and propeller control. GE announced the development of the engine in 2016. The engine incorporates the modular architecture of the T700/CT7 turboshaft for better performance and lower operating costs and features an all-titanium, 3D aero compressor design for lightweight and efficient power generation,

cooled turbine blades enabling higher thrust and fuel efficiency, and integrated and electronic propulsion control to enable single-lever power control. The new engine will have an initial TBO of 4,000 hours. It will be mated to McCauley’s new 105-inch diameter, five-blade, constant-speed propeller, which is full feathering with reversible pitch and ice protection. Brad Mottier, vice president and general manager BGA, GE Aviation, said the Catalyst was on schedule and that a second test engine was running well “at or above performance expectations” and completed altitude testing in Canada this summer. Three more test engines are headed to Wichita.

The Denali’s flight deck will be equipped with the Garmin G3000 touchscreen-controlled avionics suite and will include high-resolution multifunction displays and split-screen capability. The G3000 suite will include weather radar, advanced terrain awareness warning system (TAWS), and automatic dependent surveillance-broadcast (ADS-B) capability.

The Denali will be offered with a five-year limited warranty covering airframe, engine, and avionics and will qualify for Textron Aviation’s ProAdvantage programs.

Epic E1000

FAA certification of the \$3.25 million Epic E1000 turboprop single is now anticipated for the fourth quarter of 2018. A second conforming prototype first flew in January. The E1000 has carbon-fiber construction, three-screen Garmin G1000 avionics, and a Pratt & Whitney Canada PT6A-67A (1,200 shp, derated from 1,825 shp) mated to a Hartzell four-blade propeller. Fuel capacity is 288 gallons. Time to climb to FL340 is 15 minutes and the maximum rate is 4,000



fpm. The cabin seats six and measures 15 feet long, 4.6 feet wide and 4.9 feet high. Mtow is 7,500 pounds. Takeoff distance is 1,600 feet; landing distance is 1,840 feet over a 50-foot obstacle.

The E1000 differs from Epic's LT kit aircraft in that it has an emergency exit, different pressurization, air conditioning, and lighting systems and several switches, and a few structural changes. It will also have a service ceiling of 34,000 feet, compared to 28,000 for the LT. The E1000 is expected to have a full fuel payload of 1,100 pounds, a range of at least 1,600 nautical miles, and cruise at better than 300 knots while burning 40 gph. Epic holds over 85 orders and plans an initial production run of one aircraft per month following certification next year, gradually ramping up to one aircraft per week.

The company reports that it is on track to receive its production certificate in the first half of 2019 and the first four customer aircraft are already in build. Initial plans call for a production rate between 8 and 12 aircraft in 2019, 24 in 2020, and 36 in 2021 before reaching full-rate production in 2022.

One Aviation Kestrel K-350

The future of One Aviation and its Kestrel K-350 turboprop single project appears to have encountered significant financial headwinds with development highly uncertain. One did go so far as to announce major suppliers for the Kestrel in 2016 including Garmin for its G3000 touchscreen avionics system and Honeywell for the TPE331-14GR engine, flat-rated to 1,000 shp and providing a 5,000-hour TBO.

The aircraft has a four- to five-seat executive interior on par with those of modern corporate jets, including high-gloss wood veneers, fine leathers, a wide aisle and over-size oval cabin windows. It is just one of nine interiors Kestrel is developing, with passenger seating from five to nine people. The others will accommodate missions as diverse as medevac, cargo, and a high-density configuration for eight passengers.

The flight deck features sidestick controls, a low, contoured instrument panel with large flat-panel displays, and a wrap-around windshield. Kestrel has not released a price for the aircraft, but it is expected to be in the neighborhood of \$3 million. Preliminary specifications: maximum cruise speed of at least 320 ktas; 1,300-nm range (pilot, five passengers, maximum cruise speed at



Epic E1000

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One Aviation Kestrel K-350

31,000 feet and NBAA IFR reserves with 100-nm alternate); 1,200 pounds of payload with full fuel (319 U.S. gallons usable); and 8,500 pounds mtow.

Privateer Industries Privateer

The aircraft made its first flight on Aug. 6, 2018. In the first two months of test flying it accumulated more than 40 hours in the air and is currently being outfitted for water landings. Upon completion of the water-test series, the company plans to begin marketing the aircraft, said John Meekins, company president. Meekins told AIN in September that Privateer is looking for a joint-venture manufacturing partner capable of producing 2,000 aircraft. The prototype for this futuristic-looking, single-engine, carbon-fiber seven-seat amphibian has a 714-shp Walter 601 spinning a ducted, pusher MT propeller.

Predicted performance numbers: 215-knot cruise speed, service ceiling of 25,000 feet,

range of 1,000 nm fully loaded, water take-off run of 1,300 feet over a 50-foot obstacle, and useful load of 2,000 pounds. Plans call for the airplane to be marketed as a kit first and then as a certified aircraft. Starting price is estimated in the \$1.5 million range. Privateer claims to have received order interest from prospective customers in Canada, Brazil, Great Britain, France, Indonesia, China, Chile, and the Dominican Republic

UPGRADES/MODS

Quest Kodiak Series II

Earlier this year Quest introduced an improved version of its Kodiak utility single. The \$2.15 million Series II features an upgrade to Garmin G1000 NXi avionics, a free two-year subscription to the Garmin electronic flight bag (EFB) app, 18 new available exterior paint schemes, Rosen sun visors, an improved cargo door step mechanism, lower cabin noise, better



door mechanisms, an accessory gearbox chip detector, and an optional single-point refueling port for high-pressure fueling and defueling. The redesigned instrument panel also replaces the standby analog backup instruments with a compact L3 ESI-500 four-in-one standby electronic instrument and adds two new glove boxes.

Daher TBM 910 & 930

Daher has added backlit cockpits, heated seats, and a propeller extended warranty to its popular turboprop singles this year. Over the summer the company rolled out Version 2 of its “Me and My TBM” app for aircraft operators that captures all onboard information via iPhone or iPad that sends all relevant information to servers once disembarked and then pushes it to the selected personal device. The app allows up to 400 TBM owners to connect with each other and compare speeds and other records while accumulating points. Daher envisions using the data to enhance customer support and to provide TBM owners with concierge-level services



Textron Aviation Cessna Caravan

such as the seamless payment of airport fees and making hotel and rental car reservations.

Textron Aviation Cessna Caravan

Last year Textron announced that the new Garmin G1000 NXi avionics would be standard equipment on all new Cessna Caravans. Features include faster processing times and improved graphics rendering and enhanced

readability with LED back-lighting. Capability improvements include map overlay on the HSI, improved FMS capabilities to include visual approaches, standard ADS-B Out and optional ADS-B In, the capability to view VFR and IFR charts on the moving map, and animated Sirius XM weather depiction. Garmin SurfaceWatch for enhanced runway situational awareness is available.



Quest Kodiak Series II

MATT THURBER

Blackhawk Modifications is now the exclusive aftermarket distributor for the MT five-blade composite propeller for PT6A-140- and -42A-powered aircraft including the Grand Caravan EX. The propellers are made from natural composite materials, which saves about 30 pounds, and significantly dampens vibration and reduces noise on the ground and in flight. According to Blackhawk, this is the only propeller that meets the stringent European noise regulations and allows unrestricted operations in Europe.

In September, Wipaire received FAA approval to increase the Cessna Grand Caravan gross weight to 9,187 pounds on Wipline 8750 floats. The supplemental type certificate (STC) adds 125 pounds of useful load for aircraft equipped with the PT6A-140 engine. Eligible aircraft for the STC include the Grand Caravan EX and those converted to Blackhawk’s XP140 conversion.

Pilatus PC-12/PC-12NG

Skandia’s acoustic soundproofing kit for the Pilatus PC-12 received FAA STC approval in June. The kit reduces overall sound by as much as 6dB, according to the company and gives customers the choice of how much and what type of acoustic materials they want to use—such as fuselage skin and floor damping, thermal acoustic insulation bags, over-frame blankets, and/or carpet pad.



Daher TBM 910 & 930



The upgrade also improves the turboprop single's thermal insulation properties.

Nextant G90XT

In February, Nextant Aerospace received FAA certification approval for its new single-lever power control system on the G90XT twin, its remanufactured Beechcraft King Air C90A. The certification made the G90XT the first turboprop approved with both single-lever power control and a Uni-Son electronic engine control, the company said. Certified in 2015, the G90XT mates GE H75 engines to Garmin G1000 avionics, a new digital pressurization system, new cabin shell, new seats, new cockpit, and improved cooling system and cabin layout.

Textron Aviation/ Beechcraft King Airls

New King Air 350s are getting significant avionics upgrades. In May, Textron Aviation announced that iTAWS (integrated Terrain Awareness and Warning System) would be standard equipment on all Pro Line Fusion-equipped Beechcraft King Air 350i/ER turboprops. The system integrates iTAWS with the Rockwell Collins Pro Line fusion's synthetic vision system (SVS), brings aural and visual warnings to the primary flight display and multifunction displays, and eliminates the standalone TAWSLRU. Textron also announced that multi-scan radar with turbulence detection, which automatically detects short-, mid- and long-range weather, is now standard on the aircraft and that the



ability to upload charts, flight plans, and V-speeds from an iPad via the ArincDirect app is now optional.

More upgrade options are now coming online for owners of larger legacy King Airls as well. Earlier this year Advent Aircraft Systems received FAA STC approval for its eABS anti-skid braking system on the King Air 300 and 300LW (lower gross weight variant). The system is available through all Textron Aviation company-owned service centers, as well as select independent authorized King Air service facilities.

Blackhawk Modifications is expanding its XP67A engine upgrade program for the King Air 350 to the King Air 300, the company announced this summer. The program pairs the Pratt & Whitney Canada (P&WC) 1,200-shp PT6A-67A engine with the MT five-blade composite propeller to deliver

increased performance, noise abatement, and weight reduction. The upgrade is expected to deliver maximum cruise speeds of 345 to 350 ktas and time to climb from sea level to FL350 in less than 17 minutes. Higher cruise altitudes are also expected to lower total fuel consumption, while reduced block times will lower operational costs. Blackhawk engineers anticipate the FAA STC for the King Air 300 will be issued in the second quarter next year.

Pre-certification orders are now being accepted for XP67A delivery positions and Blackhawk is offering a \$50,000 pre-certification discount for orders placed before the STC approval. Qualifying core PT6A-60A engines are eligible for credit at \$70 per hour/per engine for time remaining to the 3,600-hour TBO.

For the existing XP67A upgrade for the King Air 350/350ER, Blackhawk announced FAA approval of the Garmin G1000 NXi. This STC allows engine parameters from the Blackhawk upgrade to be properly displayed on the glass panel interface. The Rockwell Collins Pro Line 21 panel is also approved for the Blackhawk XP67A. Blackhawk said of its King Air 350 conversion contracts it had signed to date, half were equipped with the Garmin G1000 NXi. The company said for the remainder of the year it will offer a \$50,000 avionics upgrade credit as part of the XP67A package.

Also, for the King Air 300/300LW, Raisbeck Engineering has received FAA STC approval for its five-blade composite swept propeller and four-blade aluminum swept propeller. The composite propeller blades have unlimited life and reduced maintenance costs. The company's four-blade aluminum swept propeller has already been approved for the King Air 90, King Air 200 series and King Air B300 series. ■

