

Textron is betting big with the Cessna Denali that turboprops have a solid future.

New Business Turboprops

by Mark Huber

In an ever-changing business aviation world, turboprops represent timeless value in a steady market segment.

Perhaps it is appropriate that things do not move very fast in the turboprop segment. Consider this: the Dornier Seastar first flew in 1984, was certified in 1991 and apparently will at last enter production later this year. Or that Cessna, after dipping its toes in the pressurized turboprop single market for the better part of a decade, finally decided to jump into the pool this year—with the Denali—and likely will have an aircraft to customers by 2020. Or India's NAL Saras. After three decades of development, two flying prototypes and reportedly nearly half a billion dollars, the Indian government finally decided to pull the financial feeding tube and kill it. Perhaps at one time there was a market for something that looked like a Hawker 125 with pusher propellers, but that time was probably the 1950s.

No, the turboprop market is plodding, deliberate; evolution in slow motion. More than 50 years after the King Air was introduced, companies are still finding ways not only to tweak the aircraft but also to improve performance significantly, and in ways that make economic sense. In Texas, a company wants to put the Grumman Mallard, an aircraft that first flew in 1946, back into production with Pratt & Whitney Canada PT6A-34s.

Twins

Dornier Seastar

After several years of uncertainty, the centerline push-pull, all-composite amphibian twin appears back on track after the Dornier family formed a new joint venture (Dornier Seawings) to manufacture the aircraft with China's Wuxi Industrial Development Group and the Wuxi Communications Industry Group. It then struck a deal in February this year for component airframe parts for the first 10 aircraft to be manufactured at Diamond Aircraft's plant in London, Ontario, and shipped to Dornier Seawings in Oberpfaffenhofen, Germany, for final assembly. Production eventually will be shifted to China.

The interior of the Seastar can be tailored to many different operations: personal, commercial, government or corporate missions. It features a light and spacious cabin that can be equipped with various configurations, with seating for seven to 12 and will be available with a "quick change" configuration option. The cockpit has been upgraded with Honeywell's Primus Epic 2.0 all-glass avionics suite with four 10-inch LCD displays with advanced vision, communication, navigation, surveillance and air traffic management systems. The aircraft is certified for single-pilot IFR. Customer deliveries are now forecast to begin in 2018.

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 of the \$6 million, 180-knot, unpressurized twins. Power for the 10,141-pound-tow Seastar comes from a pair of 650-shp P&WC PT6A-135s. It has a service ceiling of 15,000 feet, a maximum range of 900 nm and a maximum demonstrated sea state of two feet.

DAVID MCINTOSH



Dornier Seastar



Evktor EV-55 Outback



Mahindra Airvan 18

Evktor EV-55 Outback

Certification for the Outback is slated for next year; however, this schedule seems doubtful as the first conforming prototype did not fly until April 8 this year. This \$2.1 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. The aircraft was originally slated for certification in 2013. However, the order book to date appears slim and the flight-test program appears to be adhering to a leisurely schedule, perhaps a reflection that it is a largely public-sector project. Evktor 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, recently received funding from the Malaysian company Aspirasi Pertiwi, which has agreed to invest up to \$200 million. The aircraft is designed for high-altitude operations at unpaved airstrips. Evktor claims interest from several air forces and is marketing the aircraft to entities currently flying Cessna 402/404 piston twins and Antonov An-2 single-radial biplanes.

The Outback features a quick-change 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



On new-build Mallards, P&WC PT6s will replace the original P&W R-1340 Wasp radials.

Turbine Mallard G-73T

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. Evktor claims the Outback can take off from, and land on, runways of less than 1,700 feet at 6,500 feet msl. Evktor has selected Esterline's CMC SmartDeck integrated digital avionics system as standard equipment.

Mahindra Airvan 18

Indian-owned Mahindra is working on an updated version of the Government Aircraft Factories N24 Nomad twin; initially rebadged as the GA18, it is now the Airvan 18. Plans for the aircraft include a modern glass cockpit and an 18-passenger layout with quick-change options for passenger, cargo and combi ops. The Airvan 18 will be powered by a pair of upgraded 450-shp Rolls-Royce 250-series engines and new propellers, and it will retain its STOL capabilities, easily using runways shorter than 2,000 feet. Maximum cruise speed is 173 knots and range is 1,080 nm with 2,190 pounds of payload. Maximum useful load is 4,405 pounds with an mtow of 9,400 pounds.

NAL Saras

For the last three decades, India's National Aerospace Laboratory (NAL) has

struggled to develop the Saras twin-turboprop pusher for business aviation. A third prototype was spotted taxiing in 2014, but precious little has been heard about the program since. When quizzed about the status of the program last year, Dr. Harsh Vardhan, the country's minister of science and technology, told the Indian Defense Research Wing News Network, "I have no clue." Now we do.

As of the beginning of this year, the Saras program is officially dead and buried. Formal funding for Saras was cut off in late 2013, but NAL managed to keep it alive with "lab" funds after that. Now even that funding has been exhausted and the program has been officially disbanded. Two flight-test aircraft were built and flew, but one crashed in 2009 and the program never really regained traction after that. A third test aircraft was subsequently built and reportedly corrected the myriad problems with the original design, but it never flew.

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.

Remanufactured Twins

Ikhana X2

Ikhana Aircraft Services is remanufacturing the DHC-6 Twin Otter as the X2. For \$4.5 million, customers receive an aircraft refitted with GE H-series engines and a new interior. In addition, the aircraft incorporates a variety of proprietary STCs, among them an mtow increase to 12,500 pounds and re-lifed wing box, nacelles, flight controls and fuselage. Ikhana is working on an STC to raise the mtow to 14,000 pounds and hopes to have that in hand to apply to the X2 by year-end.

De Havilland Canada built

more than 800 Twin Otters, and an estimated 500 are still flying. The X2 package gives owners of timed-out aircraft an economically viable alternative to buying a new aircraft. (The DHC-6 has a life limit of 66,000 hours or 132,000 cycles.) Ikhana's remanufacturing process requires six to nine months of downtime. The completed aircraft is essentially "zero-timed" and good for another 66,000 hours. In addition to incorporating the STCs, the aircraft is torn down and etch-alodined on the inside, and it receives all-new wiring, circuit breakers and avionics.

Nextant G90XT

The company that remanufactures the Beechjet as the 400XTi has turned its sights to remaking C90-series Beech King Airs. The Nextant G90XT received FAA certification in November last year, but the company is delaying customer deliveries until it receives subsequent approval of the single-lever power control. According to Nextant, final approval, from both the FAA and the EASA, is anticipated during the fourth quarter this year, at which point it will be looking to firm up orders from the list of prospective clients from whom it now holds refundable deposits.

The G90XT is powered by

General Electric H75-100s and has Garmin G1000 glass-panel avionics, a new digital pressurization system, new air conditioning with twin evaporators that delivers 300 percent more cooling capacity, new seats and new interior. The single-lever power control has been developed to make the aircraft easier and safer for the pilot to control, as well as improving efficiency.

Nextant executive vice president Jay Heublein told **AIN** that he expected GE to deliver the first engine equipped with conforming hardware around the middle of last month, allowing final flight-testing to be performed. "This is novel technology and it has taken longer than expected to get all the paperwork completed," he acknowledged.

TBO for the H75 will be 4,000 hours, with no requirement for a midlife hot-section inspection. The H series uses a fuel slinger instead of fuel nozzles and employs an axial stage compressor rather than the PT6's reverse-flow design. Because there are no fuel nozzles to get clogged, there are no hot spots in the combustion chamber, ensuring even thermal distribution and thereby eliminating the need for an HSI. "GE undersold how good this engine is," said Heublein. "Our

performance data shows a 10- to 12-percent improvement in specific fuel consumption [over the standard PT6s], which is just incredible."

The cockpit of the G90XT will be substantially different from a typical G1000 retrofit in a King Air. The instrument panel is trimmed in carbon fiber. It has a three-screen layout with a backup Mid-Continent Instruments standby attitude module and a Luma Technologies LED glareshield warning panel.

The single-lever Unison power control manages engine power and prop speed and has in-flight torque- and temperature-limit protection, autostart and trend monitoring. It also offers full exceedance protection. The fuel-system controls are now mounted above the power levers, replacing pressurization switches that are no longer needed because control of the cabin altitude is integrated into the digital G1000 avionics.

Several different standard cabin configurations are available, among them special mission/air ambulance, a high-density five-passenger layout and an executive three-seat configuration. Beech has built more than 1,500 C90s and Nextant believes an abundance of them are suitable for the program. "We are at \$2.3 million for a full conversion (engines/avionics/inspection programs) when a customer brings us an airplane. Airframes start at \$400,000, so that takes the price for a completed airplane to \$2.75 million if we supply the airframe. We had a big opportunity to bring new technology to this aircraft and it has a real forward-fit feel, not that of a retrofit," Heublein concluded.

New Singles

Caiga AG300

(formerly Primus 150)

This new \$1.5 million, five-seat, all-composite aircraft is loosely based on the Epic Escape and remains in the flight-test phase,



Ikhana X2



Cessna Denali

according to China Aviation Industry General Aircraft (Caiga), and now appears to be falling significantly behind its original development schedule. Certification had been expected this year, but that now seems highly unlikely. Caiga claims the AG300 will have a maximum cruise speed of 352 knots (identical to the Escape), a

range of 1,410 nm and a ceiling of 28,000 feet. Power comes from the 850-shp GE H85.

Cessna Denali

Textron Aviation has officially named its long-awaited new single-engine pressurized turboprop. The Cessna Denali was announced at EAA AirVenture in July. First

flight is anticipated in 2018 and the company 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 has 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 of the cabin. The cabin also has passenger windows larger than those in other Cessna models, interior LED lighting, a refreshment cabinet and a baggage compartment accessible in flight. The cabin is designed to be easily and quickly converted between passenger and cargo configurations.

The aircraft will be powered by a new GE Aviation Fadec-equipped 1,240 shp turboprop with single-lever power and propeller control. GE announced it is developing the engine late last year. The engine draws on the modular architecture of the T700/CT7 turboshaft for better performance and lower operating costs and has an all-titanium, 3D compressor design for light weight and efficient

power generation, cooled turbine blades enabling higher thrust and fuel efficiency, and integrated and electronic propulsion control to enable single-lever operation. GE will conduct a detail design review of the new engine next year and start flight-testing in 2018. It will have an initial TBO of 4,000 hours. On the Denali the engine will be mated to a new McCauley (a Textron company) 105-inch-diameter, five-blade, constant-speed propeller, which is full feathering with reversible pitch and ice protection.

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

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

Diamond DA50-JP7

Originally conceived as the diesel-powered, seven-seat SuperStar in 2006, this updated version first flew in January this year with a 465-shp Motor Sich AI450S dual-Fadec turboprop made in Ukraine. Diamond claims that the AI450S burns 20 percent less fuel than comparable engines and is fuel-efficient even at medium altitudes.

Diamond plans to develop two variants of the aircraft: the Tundra, with oversized tires and STOL capabilities that will allow it to use unpaved runways as short as 650 feet; and another version for private owners and for use as a trainer that would feature normal landing gear and cruise at up to 230 knots. The DA50-JP7 is designed to fly in harsh environments such as Africa



Caiga AG300



Diamond DA50-JP7



Epic LT

The E1000 will be a certified version of the kit-built LT, shown.



One Aviation Kestrel K-350



King Air A90

Innova upgrade to King Air A90

and Russia, and its engine can endure an outside air temperature range of -50 degrees C to 50 degrees C, according to Diamond. The aircraft will be produced at Diamond's Wiener Neustadt factory in Austria. Diamond collaborated with Ukraine's Ivchenko Progress on the aircraft's design and will use the resources of Diamond's Austro Engine subsidiary in the certification program. Approval of the \$1.1 million DA50-JP7 is slated for 2018.

Epic E1000

Anticipated FAA certification of the \$2.95 million Epic

E1000 turboprop single has slipped six months, to the first quarter of next year, to accommodate the redesign of "about four parts" in the wing, CEO Doug King told AIN this summer. King said the delay is "unfortunate," but "one of the things we weren't going to do was compromise the performance of the airplane. Some of the engineers said that if we just lower the max takeoff weight or drop the speed we could lower some of these loads." But King said he resisted all suggestions to compromise the aircraft's performance and insisted on an

engineering fix even when it meant a further program delay.

"We took the time and got through that, and I am happy to report that our wing passed structural testing," he said. King said the main differences between the E1000 and the Epic LT kitplane are the addition of an emergency exit, different pressurization, air conditioning, and lighting systems and several switches, and a few structural changes on the certified version.

"But the really big difference is that we are certifying this airplane [the E1000] to Flight Level 340," he said. The LT has a ceiling of FL280. "To go 6,000 feet higher is a really big deal." He said Epic expects the E1000 to have a full-fuel payload of 1,100 pounds and a range of "at least 1,600 nautical miles and at [Flight Level] 340 a lot more, but I don't know what that number is yet." Epic expects the E1000 to cruise at better than 300 knots while burning 40 gph at its service ceiling, King said.

King said the company holds orders for more than 60 E1000s and that plans call for an initial production run of one aircraft

per month following certification next year, gradually ramping up to one aircraft per week "once we reach full production, and we're going to get there as quickly as possible."

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. Sea-level takeoff distance is 1,600 feet; landing distance is 1,840 feet over a 50-foot obstacle.

Mahindra Airvan 10

Developed from the boxy metal piston-powered Airvan 8, this unpressurized turboprop single is powered by a Rolls-Royce 250-B17 turning a Hartzell three-blade propeller. It features a 50-inch-wide sliding aft cargo door. It has a full-fuel payload of 1,400 pounds (useful load 2,250 pounds, standard fuel capacity 153 U.S. gallons), a maximum range of 550 nm with IFR reserves and a cruise speed of 145 ktas. Maximum climb rate is 1,000 fpm and the service ceiling is 20,000 feet. The takeoff roll is 1,100 feet (1,600 feet over a 50-foot obstacle), giving this aircraft true STOL capability. The flat floor of the Airvan 10 main cabin can be configured for diverse missions, from patrol/reconnaissance/surveillance, medevac and skydiving to freight and commuter operations.

An optional cargo pod (600 pounds capacity) can be attached to the aircraft, and fittings for amphibious floats are another likely option. At this point the program is several years behind schedule.

One Aviation Kestrel K-350

Work on One Aviation's Kestrel K-350 turboprop single

Piper M600



appears all but suspended as the company has shifted resources to the “Project Canada” refresh of the Eclipse very light twinjet. Through last year, major suppliers for the K-350 had been selected, among them 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, complete with high-gloss wood veneers, fine leather, a wide aisle and oversize oval cabin windows reminiscent of a Gulfstream’s. It is just one of nine interiors Kestrel is developing, with passenger seating for five to nine people. The others will accommodate missions as diverse as medevac, cargo and a high-density configuration for eight passengers. The cabin measures 50 inches wide, 45 inches tall and 16 feet one inch long and can be configured for nine passengers in the cabin (plus one in the copilot position) or a commuter configuration with

an additional 32 cu ft of cargo space in the rear cabin.

The cockpit features sidestick controls, a low, contoured instrument panel with large flat-panel displays and a wraparound windshield allowing views of both wingtips. 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 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. For now, One Aviation chairman Alan Klapmeier will say only that the timeline for the project has shifted, again, “to the right.”

Piper M600

The Piper M600 received FAA certification in June. Flight into known icing certification remains pending, but is expected later this year. Customer deliveries began in July. The \$2.853 million M600 is a refreshed and more powerful

version of the M500 (formerly known as the Meridian) with a new wing with room for 90 gallons more fuel (to 260 gallons), Garmin G3000 touchscreen-controlled avionics, an uprated Pratt & Whitney Canada PT6-42A flat rated to 600 shp from 500 shp, a higher mtow (6,000 pounds, up from 5,092), more full-fuel payload (645 pounds, up from 550), more range (1,484 nm at intermediate power, up from 1,000 nm), and a higher maximum cruise speed of 274 ktas, up from 260.

While the cabin dimensions of the M600 and M500 are identical, the M600 cabin has more usable space; seat foam has been resculpted to deliver more headroom and memory foam provides greater comfort. Several of the seats, including the copilot’s, now have breakover backs that convert into work surfaces and have cupholder detents. The cabin sidewall panels have been redesigned with improved stowage and better ergonomic interface, and there are now USB charging ports in the cabin.

The G3000 has two GTC 570 touchscreen controllers below the center MFD, forward of the power console. The avionics add 60/40 split-window capability on the PFDs, which allows display of synthetic vision in one 60-percent pane and a chart or other information in the 40-percent pane.

The G3000 package also adds the enhanced map HSI feature, which allows overlay of information on the HSI such as map, SafeTaxi, flight plan, Metars, Nexrad and weather radar. Other avionics features include emergency descent mode, electronic stability protection, level mode button and underspeed/overspeed protection. An Aspen Evolution backup display is mounted to the left of the pilot’s PFD. Piper CEO Simon Caldecott said the company plans to cap production at 35 aircraft per year.

Privateer Industries Privateer

Construction of this single-engine, carbon-fiber amphibian has resumed after being halted in July last year and relocated to Titusville, Fla. The prototype is entering final assembly and could fly later this year. The assembly team is currently awaiting a custom MT propeller from Germany. Power for the seven-seat aircraft comes from a 714-shp Walter 601 spinning a ducted pusher propeller. Predicted performance numbers: 215-knot cruise speed, service ceiling of 25,000 feet, range of 1,000 nm fully loaded, water takeoff 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/ Modifications Twins

Textron Beech King Air

- *Pro Line Fusion Avionics* Rockwell Collins Pro Line Fusion touchscreen avionics are now standard on all new King Airs. The suite has three 14-inch screens, high-resolution synthetic vision, full multi-sensor flight management system, presets that will reconfigure all three displays with one touch and automatic wireless database and chart uploads. The system was designed with an open and scalable architecture for future upgrades. Additionally, the cabin of new King Air 350is now has Wi-Fi and electrochromic passenger window dimming as standard.

- *Innova Aerospace GE H80 engine and BendixKing avionics STC for 90-series King Airs* Innova Aerospace is offering a pair of new modifications of interest to 90-series King Air owners. Replacing the stock Pratt & Whitney Canada PT6-135As with a pair of GE Aviation H80s is expected to yield 10 percent more range, an 8-percent improvement in specific fuel consumption, an additional 90 shp, a 4,000-hour TBO, no HSI and no recurrent fuel nozzle inspections. The H80 conversion is available now on the C90 and E90, and Innova plans to add H80 STCs for other 90-series models in next year's first quarter.

Installing the BendixKing AeroVue digital avionics system chops 105 pounds from the weight of the legacy avionics while bringing the aircraft into compliance with the latest avionics mandates. The AeroVue integrated flight deck features all-new radios and autopilot, three 12-inch displays, cursor control device, FMS with coupled Vnav and ADS-B out-compliant transponder. SmartView synthetic vision will be optional. Baseline price for the King Air 90 AeroVue upgrade is \$348,000, including engine instrumentation on the

Cessna Caravan



cockpit displays.

- *Raisbeck/Hartzell Swept Blade Aluminum Propellers* The new propellers are available for the King Air 250 along with Raisbeck's Epic performance package. The new props provide more thrust, shorten landing distances, increase cruise speed by up to 10 knots, are associated with quicker time-to-climb times and reduce noise.

Upgrades/ Modifications Singles

Cessna Caravan

Earlier this year, Texas-based Blackhawk Modifications received EASA approval for its 867-shp Pratt & Whitney Canada PT6A-140 upgrade for the Cessna Caravan and Grand Caravan (Blackhawk XP140 Performance Upgrade). The XP140 Upgrade retains many original items, among them the cowl, engine mounts and exhaust, while providing a factory-new engine and propeller, a new 325-amp starter/generator, all-new "smart" engine gauges, a new oil cooler and new engine hoses. Blackhawk has performed more than 20 conversions to date. The XP140 conversion provides gains in takeoff, climb and cruise performance over the stock PT6A-114A.

Blackhawk is also working on FAA STC approval for a Beechcraft King Air 350 engine upgrade that replaces the original



Daher TBM 900

1,050-shp Pratt & Whitney Canada PT6A-60As with 1,200-shp (flat-rated to 1,050 shp) PT6A-67As. The engines and five-blade composite propellers from MT were recently installed on the company's King Air 350 test-bed and initial performance has been "promising," according to Blackhawk.

In hot conditions, the company has seen climb rate more than double from sea level to the FL350 service ceiling, reducing time-to-climb to 18 minutes. Cruise speeds have also gone up by as much as 37 knots, to a maximum of 340 knots at engine power limits. The STC will include a new flight manual



Pilatus PC-12

supplement with full performance specifications for flight-planning purposes.

The company expects the initial certification to cover all Rockwell Collins Pro Line II-equipped 350s with analog engine instruments, and it is working with Garmin on G1000 compatibility on the initial STC. A separate STC is intended for King Air 350s equipped with the Pro Line 21 avionics suite. Blackhawk said the Hartzell 105-inch-diameter five-blade composite propeller will be available as an option, while Raisbeck Engineering is working to upgrade its newly certified Hartzell swept, four-blade aluminum propeller assembly to be compatible with the PT6A-67A installation.

Daher TBM 900 and 930

Beginning next year, TBM owners will have the option of a factory-installed toilet. This summer Daher senior vice president Nicolas Chabbert said that the company would renew its focus on improving the comfort of the aircraft and add a side-facing, quick-change, marine-style, electric-flushing toilet as a \$35,000 option on 2017 models. Installation of the toilet requires removal of the two rear seats. It is designed with a padded surround, personal item stowage, mirror, cabin soundproofing, and a screened privacy enclosure that can be deployed. The package has

been under development for 18 months, and there are plans to make it available for retrofit for older aircraft.

Chabbert said the addition of the toilet, combined with relaxed EASA charter rules governing single-engine turboprops, should make TBMs more popular in Europe. "A toilet is required for commercial charter operations. We're going to provide the best and most comfortable interior in this class of aircraft," Chabbert said. "We are going to be thinking more about the passengers. You can be in this cabin for up to five hours."

Chabbert said Daher will continue to produce both the TBM 900 and 930 to "provide customers with a choice" of avionics interface preferences. "We try not to impose our preferences on our customers. We deliver what people want." For the first half of 2016, Daher's deliveries were split 45 percent for TBM 900s equipped with the Garmin G1000 system and 55 percent with the newer G3000 touchscreen avionics.

Pilatus PC-12 NG and PC-12

The 2016 Pilatus PC-12 NG comes with a variety of upgrades that improve passenger comfort and boosts maximum speed by 5 knots, to 285, and maximum range to 1,840 nm (four passengers). The most noticeable feature is a

new five-blade, scimitar-shape, graphite Hartzell propeller that reduces interior and exterior noise as well as drag.

Pilatus also has aerodynamically cleaned up the airframe, giving the cabin door a flush handle, redesigning the flap actuators and fine-tuning the locations of external antennas. Time to climb to 28,000 feet has been reduced by 10 percent in the process, and takeoff distance has been reduced by 50 feet. The aircraft also received a minor makeover: Pilatus and BMW Designworks USA have fashioned six new interior styles and exterior paint schemes and the entry door received LED lighting.

Owners of legacy PC-12s can obtain the new propeller and its performance benefits under STC. In June the FAA approved installation by Finnoff Aviation in conjunction with that firm's engine upgrade program (P&WC PT6A-67P) to replace the standard four-blade Hartzell aluminum propeller. List price for the propeller is \$83,640.

Late last year Innovative Solutions & Support (IS&S) introduced its Future Generation (FG) flight deck with PT6 autothrottle for retrofit in the PC-12. The FG flight deck consists of primary flight and multifunction displays, integrated standby unit (ISU) as well as the integrated flight management (IFMS) and electronic flight bag system. The avionics suite comes

with dual flight management systems (FMS), autothrottles, synthetic vision and enhanced vision (Flir). An ADAHRS upgrade and a full-time oil-quantity sensor are optional.

The FG avionics suite integrates charts, maps, airspace depiction with low and high vector routes, satellite weather, engine instruments, IGuard engine monitoring, electronic checklists and dual satellite base augmentation system (SBAS) GPS receivers in support of the flight management system with LPV approach capability.

The IS&S-developed PT6 autothrottle allows a pilot to control the power setting of the aircraft's engines by setting a desired flight characteristic rather than manually controlling fuel flow. The system provides a maximum continuous thrust, speed hold and speed protection mode. The autothrottle system also has a torque/temperature mode, and AOA mode and protection modes will automatically activate, regardless of autopilot engagement state, in an attempt to keep airspeed, torque and temperature from exceeding pre-defined targets. The integrated FMS provides coupled Waas/LPV approaches, full RNP compliance, and required-time-of-arrival fully coupled flight profile performance based Vnav, autothrottle controls, dual FMS with synthetic DME. Pilatus delivered the 1,400th PC-12 in July. □