NEW BUSINESS TURBOPROPS 2012

Fast Glass Meets Old Reliable

by Mark Huber

New turboprop sales continue their slow, steady climb out of the cellar. For the first six months of this year, the General Aviation Manufacturers Association (GAMA) reports sales of the segment are up 10.5 percent compared with the same period one year ago, with 243 delivered. Hawker Beechcraft King Airs, Pilatus PC-12s and Cessna Caravans lead the pack, as usual. All three represent fully amortized designs that have stood the test of decades and benefited from the occasional engine and/or avionics upgrade. They exemplify why the market historically turns to turboprops: rugged construction, simple systems, good operating economics and loads of mission utility. The segment is also characterized by slow product evolution. Nevertheless, change for this sector is in the wind on several fronts.

The first involves the modernization of existing aircraft. The OEMs are no longer content to let the mod centers have all the fun–and profits.

< legacy aircraft >

Hawker Beechcraft King Air B200

In August, Hawker Beechcraft announced that its factory-owned service centers would begin taking orders for Blackhawk engine upgrades on Rockwell Collins Pro Line 21-equipped King Air 200s. This installation will replace the original Pratt & Whitney Canada PT6A-41s or -42s with factory-new PT6A-52s that come with a 2,500-hour/five-year warranty on primary parts.

Blackhawk Modifications expects certification of the engine upgrade on Pro Line 21-equipped aircraft by the end of this year. The company has completed 200 engine modifications of various non-Pro Line 21 King Air models to date.

The new Blackhawk XP52 engine, which powers the current-production King Air 250, boosts maximum cruise speeds up to 310 knots. The engine produces full takeoff power up to ISA+46 and maintains its 850-shp rating upward of FL190 before power slopes off. The maximum operating temperature limitation has been increased to 820 degrees C, safely allowing the engines to produce 275 more thermodynamic horsepower than the PT6A-42 on an ISA day. The improved performance is the result of incorporating a more capable and larger compressor section that is a derivative of the King Air 300's PT6A-60A.

Hawker Beechcraft says the conversion costs about the same as overhauling the old engines.

Pilatus PC-12

Near year-end, Pilatus Business Aircraft expects Garmin to receive STC approval for the installation of its New Perspective G600 glass-panel avionics system into legacy (non-NG) PC-12s through its authorized service centers and satellite service centers. All marketing and sales for the STC are being conducted through the Pilatus sales and service center network. Cost of the basic system is $169,000 and initial installation time is estimated at 350 man-hours. Price and installation time will increase as options are added.

The system requires a Garmin navigator (not included), which many owners already have in the form of the popular GNS 530/430 radio stack.

The dual-screen G600 pairs both a primary flight display (PFD) and a multifunction display (MFD) in a single 10-inch-wide bezel at each pilot station. Standard items include the Garmin GRS77 attitude heading reference system (AHRS) that is RVSM capable and receives inputs from GPS, magnetometer and air data computer and interfaces with autopilots, eliminating the need for a gyro ADI. Garmin's 3-D synthetic vision technology (SVT), which provides a representational view of terrain and obstacles through the PFD, FliteCharts U.S. approach plates and SafeTaxi are also standard with the system.

Among the options are Tcas, Taws and radar altimeter interface, JeppView service charts (including ChartView approach plates and airport surface charts), Garmin GWX68 or other Arinc 708 weather radar systems; the GDL 69 XM receiver for live weather and Nexrad coverage for the U.S. and SiriusXM satellite radio.

The GSR 56, which uses Iridium satellites to provide global weather data, radar imagery, voice/data connectivity and ground-based position tracking, is also an option. The system includes a video input option that allows the MFD to double as an EVS or live-cam video monitor.


Daher-Socata TBM 850

Cessna Grand Caravan EX

Cessna is taking a somewhat different tack toward the purveyors of aftermarket power mods available for the Caravan, blocking them from obtaining data related to the Garmin G1000 glass-panel system installation in those aircraft. The G1000 is currently offered in newer Caravans. Instead, Cessna unveiled its own more powerful production Caravan in July. The $2.149 million Grand Caravan EX features G1000 avionics and a 25-percent power boost from the new Pratt & Whitney Canada (P&WC) PT6A-140 (867 shp) for better high/hot performance and increased speed. Cessna says the EX will have a 350-foot reduction in takeoff roll, a 20-percent improvement in the rate of climb, and a 10- to 12-knot cruise speed improvement compared with the standard 675-shp Grand Caravan.

P&WC says the new engine provides a 5-percent improvement in specific fuel consumption through the incorporation of advanced aerodynamics, a more efficient compressor and modern hot-section materials. TBO is 3,600 hours and can be extended to 6,000 hours/12 years for specific conditions with FAR Part 121/135 operators. P&WC will be providing its flight data acquisition storage and transmission system engine diagnostic solution to PT6A-140 operators. The engine has received Transport Canada type certification.

Cessna also no doubt shrewdly calculated that owners of a midlife Caravan would prefer a factory-integrated system backed by an OEM warranty to a glass-panel avionics and engine STC. As on the Grand Caravan, the Oasis executive interior is an available option.

The EX yields another advantage: for the first time it allows a new production Grand Caravan to be equipped with amphibious floats. Wipaire certified the Wipline 8750 for the EX in July. The new float has an improved main gear retraction mechanism, a new oleo design and visible mechanical gear position indicators. The hull design has been modified to improve handling characteristics in rough water and more buoyancy has been added to the float aft for operations at high weights. Wipaire is working on an mtow increase for the aircraft.

Deliveries of the Grand Caravan EX are expected to begin before year-end.


Piper Meridian


Cessna Grand Caravan EX

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Hawker Beechcraft King Air B200


Piaggio Avanti II


Quest Kodiak

Daher-Socata TBM 850 Elite

OEMs are also defending and expanding market share by adding improvements and mission versatility to their existing products. In April, Daher-Socata unveiled the Elite quick-change interior for all new TBM 850s. The redesigned interior allows the two most aft passenger seats to be quickly removed to expand the size and capacity of the baggage area.

With rear seats out, the airplane can carry the pilot, three passengers and up to 507 pounds of cargo/baggage. The layout repositions the passenger supplemental oxygen system and uses new middle-row seats that have a narrower base and can be oriented to face forward. The company said the reconfiguration takes approximately 30 minutes.

Quest Kodiak

Quest Aircraft continues to refine the systems and interiors for its single-engine Kodiak. The Garmin G1000 system in the aircraft now has a Taws inhibit switch on the GTS 800 traffic awareness system and an air-conditioning inhibit function that automatically cuts the cabin cooling system during certain engine and generator power conditions. TKS anti-ice and a belly cargo pod are available.

Quest and Northrop Grumman entered into a teaming agreement to develop a special-mission aircraft, the Air Claw, which debuted at this year's Airborne Law Enforcement Convention.

The new Tundra and Timberline interiors have been designed with composite panels and a refined headliner to cut weight and improve cabin soundproofing. The Timberline includes sidewall storage pockets beside each seat, and cabin and cockpit cupholders. The cockpit seats in both interiors now include an improved headrest and have center pedestal closeouts. They will be available on 2012 models and can be retrofitted into existing aircraft. The new Summit executive interior will be available in the middle of next year.


Pilatus PC-12

Piper Meridian

Late last year Piper Aircraft announced major refinements for all its M-Class aircraft, including its $2.1 million turboprop single, the Meridian. They included a restyled and resculpted cockpit with better seats and more elbow and hip room, map pockets big enough for iPads, cockpit-entry assist handle, and fold-down-flat copilot and rear-facing passenger seats. The passenger seats also get a new foam treatment, bottom cushion and lumbar support for improved comfort. The backs of the folding seats are now designed to serve as work areas and contain molded cup holders.

Cabin and exterior lighting have been redone in LED. Bose A20 headsets are standard and include auxiliary audio input for Bluetooth phone connectivity. Two 110-volt outlets have been added, as has Astronics' EmPower to support passenger carry-on electronics. New air ducting and vents improve airflow distribution in the cabin and cockpit. Piper delivered its 500th Meridian in September.

Piaggio Avanti II

In July, Piaggio Aero signed an agreement with Abu Dhabi Autonomous System Investments (ADASI) to develop a new special-mission and surveillance aircraft based on the Avanti II. ADASI will finance two prototypes.

Piaggio said the aircraft will have an endurance of more than 10 hours, a maximum range of 3,300 nm, a cruise speed of 350 knots and a ceiling of 41,000 feet. It will have a larger, reinforced wing that allows for a higher mtow and additional fuel capacity and will retain the same Pratt & Whitney Canada PT6A-66 engines found on the Avanti II. Saab's defense and security division will develop and integrate the airborne sensors and surveillance systems. First flight is scheduled for 2014. Piaggio is also believed to be working on a range of improvements to the stock Avanti II, including anti-skid brakes and quieter propellers.

NEW AIRCRAFT

There are a few serious new turboprop projects in the works, but several have charted tortuous and prolonged development paths that have engendered some market skepticism. Some promising designs face capitalization challenges, exacerbated by global economic conditions, while others are tied to government agencies, with the resultant and predictable inefficiencies.

Beyond these factors one central question remains: Can a low annual production rate yield an economic return sufficient to merit the enormous investment required for a new aircraft certification program? A review of the 2011 GAMA annual shipment data spells out the risk, especially for developers of new turboprop singles. The delivery numbers for TBM 850s, Piper Meridians and Quest Kodiaks were 38, 32 and 13, respectively, and they've hung in this range for a few years now. Getting a clean-sheet-of-paper turboprop in this category certified is estimated to cost between $150 million and $200 million. For twins, that number is even higher against bleaker delivery numbers. The top-selling turboprop twin in the civil market last year was the Hawker Beechcraft King Air B350i, and the manufacturer delivered just 25 of them.

The name of the game in this environment is "risk reduction," answering as many questions as possible before building the test aircraft, according to Kestrel Aircraft CEO Alan Klapmeier, even if that means the development schedule slips. Nothing burns cash faster than a lengthy flight-test program. It also means building on the work and investment of others as opposed to a pure, clean-sheet design. The majority of the "new" turboprop programs do this and/or have a large degree of public-sector financing. ■

< singles >

Cessna Concept

After years of scuttlebutt about a fast, low-wing, single-engine turboprop, Cessna unveiled an aircraft interior mock-up in July to solicit prospective customer interest and opinion, gathering more than 350 detailed surveys during EAA AirVenture in Oshkosh, Wis.

While Cessna has not decided if it will move forward with the aircraft, a spokesman said the company is "very encouraged" by the positive feedback the concept has received to date. The OEM's current thinking on the aircraft is an all-composite design with retractable gear, sidestick controls, seating for seven in a cabin slightly larger than those of the Piper Meridian or TBM 850, and a maximum speed of 260 knots. The target price is between $2.1 million and $2.5 million.

Rough dimensions include a wingspan of 42 feet, a 26-cu-ft baggage compartment and a cabin that measures 53 inches tall, 54 inches wide and 17 feet 8 inches long. The aircraft bridges a space in Cessna's product line between its all-composite Corvalis piston single and the entry-level Citation Mustang twinjet.

Comp Air 11 and 12

The kitplane company's long-running quest to bring two new all-composite, certified turboprop singles to market may have reached an unhappy ending. The phone at its Merritt Island, Fla. headquarters has been disconnected without a forwarding message and the company has vacated its offices there, according to the local FBO. Company COO Bill Fedorko confirmed to **AIN** that its kitplane-building arm has been shut down and the company has yet to receive the needed financing to move forward on the to-be-certified Models 11 and 12.

A nonconforming prototype of the 310-knot, $3.75 million Model 12 first flew in 2007, and was slated to undergo a significant redesign. The smaller and faster Model 11 never flew.

Epic E1000

Epic Aircraft was acquired by a Russian MRO provider by the name of Engineering Llc. in March and less than a month later announced its intent to manufacture a certified version of its experimental LT kit aircraft, to be called the E1000.

An Epic spokesman said the company was aiming for certification in 2014 and had set an initial price of $2.75 million. Currently, 37 LTs are flying and Serial Number 48 is on the builder assist assembly line. Epic has hired 12 engineers to work on the E1000 and will add staff

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as required. Overall, Epic employs 60.

The spokesman said certifying the E1000 would be easier and faster than certifying a clean-sheet-of-paper program because the LT was "designed with certification in mind." The six-seat E1000 will be powered by a P&WC PT6-67A and have a maximum cruise speed of 325 ktas, a ceiling of 28,000 feet and a range of 1,625 nm.



Epic LT

Extra EA-500

Last year Extra Aircraft decided to abort its fruitless search for a U.S. assembly facility until it achieves full FAA certification of this all-composite German design. A more pressing problem might be that the six-seat aircraft's order book remains single-digit. The $1.75 million aircraft is powered by a 450-shp Rolls-Royce 250-B17F/2 that burns 19 gph and turns a five-blade propeller. Cruise speed is 226 knots at FL250 and maximum range is 1,600 nm. New production aircraft will be equipped with Avidyne Entegra R9 avionics, and that glass-panel avionics system has received EASA installation approval.

GippsAero GA10

Gipps began flight-testing its new GA10 utility single in May and says it remains on track for certification next year. The GA10 is a stretched turboprop version of the company's piston-powered GA8 Airvan. The 10-passenger GA10 is powered by a 450-shp Rolls-Royce 250-B17F/2, will have an empty weight of approximately 2,400 pounds and a mtow of 4,750 pounds. With a full 150-gallon fuel load it will be able to carry six 200-pound people (including the pilot), and a seventh person weighing no more than 145 pounds; or up to 10 people with a reduced fuel load for "short tourism flights."

Gipps reports strong market interest in the GA10, especially from skydiving clubs and governments that are interested in the aircraft for tactical use, including observation, surveillance, re-supply and personnel drops. To accommodate the wide range of possible missions, Gipps is developing a variety of interior configurations: skydiving, aerial survey, aerial surveillance, freight and passenger, including an executive option. The aircraft will be built at Gipps's Latrobe factory in Victoria, Australia.

Kestrel

The original Kestrel prototype first flew in 2006 when the company was called Farnborough Aircraft. Following bankruptcy reorganization, the company attracted several new investors and in 2010 former Cirrus Design CEO Alan Klapmeier joined the company. While the lone, all-composite prototype was powered by a 1,000-shp flat-rated P&WC PT6-67A, in 2011 the company announced that power on production aircraft will come from Honeywell's TPE331-14GR flat-rated to 1,000 shp (5,000-hour TBO). The aircraft subsequently underwent a redesign.

A new representative mockup was revealed earlier this year. It features a four- to five-seat executive interior on par with those of modern corporate jets, including high-gloss wood veneers, upscale leathers, a wide aisle and oversize oval cabin windows reminiscent of a Gulfstream. It is just one of nine interiors Kestrel is developing. The others will accommodate missions as diverse as medevac, cargo and a high-density configuration for eight passengers. The cockpit features sidestick controls, a low, contoured instrument panel with large, flat-panel displays and a wraparound windshield allowing views of both wingtips.

"The loft–the outside aerodynamics–is basically done and that is a huge part of the project, and we have done a lot of detail design," said Klapmeier, who is continuing to build his team and raise capital. Kestrel recently completed a successful new round of fundraising and employs 85, mostly from its new offices in Superior, Wis.

Kestrel has not released a price for the aircraft but it is expected to be in the $3 million range. Preliminary specifications include a maximum cruise speed of 320 ktas, 1,300 nm range (pilot, five passengers, maximum cruise speed at 31,000 feet and NBAA IFR reserves), 1,200 pounds of payload with full fuel (319 U.S. gallons usable) and 8,500-pound mtow.



GippsAero GA10

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Dornier Seastar CD-2

The phones are on, but no one was answering at the Dornier Seaplane Co. in St. Jean-sur-Richelieu, Quebec, last month. The lone flying Seastar isn't there either. At last report it was headed back to Germany for maintenance before beginning an Asian sales tour. After a multi-year marketing campaign, the $6 million Seastar has been able to generate only 25 "letters of intent" from prospective customers, a number apparently insufficient to place the already-certified twin-engine, push-pull centerline-thrust amphibian into production.

The 180-knot, all-composite amphibian was designed in the 1980s and was FAA certified under Part 23 in the early 1990s at a cost of almost $150 million, underwritten by the Dornier family. Power for the 10,000-pound Seastar comes from a pair of 650-shp P&WC PT6A-135s.


Dornier Seastar CD-2

Interiors for the unpressurized cabin range from six-seat executive layout to a 12-seat high-density configuration. Last year the company said it planned to start delivering customer aircraft in 2013 and was soliciting third parties to manufacture the production tooling.

Evektor EV-55 Outback

After seven years of development, the $2 million, twin-engine Evektor EV-55 made its first flight in June 2011. One year later, the Czech company, best known for its light-sport single-engine aircraft, says it has made more than 60 hours of test flights and anticipates certification in 2015. A third flight-test aircraft is under construction.

Evektor claims an international order book for its military/utility/cargo/combi/passenger aircraft that seats nine to 14. The project is being underwritten by the Czech ministry of industry and is receiving technical assistance from the Czech army. The aircraft is designed for high-altitude operations at unpaved airstrips. Evektor 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 FL100 is 220 knots and maximum payload is 4,021 pounds. 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-foot elevation. In March, the company announced the selection of Esterline's CMC SmartDeck integrated digital avionics system as standard equipment.



Evektor EV-55 Outback

GippsAero GA18

Gipps is working on an updated version of the classic Government Aircraft Factories N24 Nomad twin it is rebadging GA18. Gipps's plan for the aircraft includes an 18-passenger layout with quick-change options among passenger, cargo and combi. Gipps intends to fly the airplane this year, with certification (Part 23, Amendment 62–Commuter) and initial deliveries following in 2014.

The aircraft likely will be powered by a pair of upgraded Rolls-Royce 450-shp engines and receive new propellers and a modern glass cockpit, while retaining its historic Stol capabilities, easily using runways shorter than 2,000 feet. Maximum cruise speed is 170 knots and range is 1,080 nm with 2,190 pounds of payload. Maximum useful load is 4,405 pounds. The GA18 will be manufactured at Gipps's main complex in Victoria, Australia.

NAL Saras

Estimated certification for India's home-grown turboprop twin pusher has slipped again–this time to 2015–as the project is now into its third decade of development. National Aerospace Laboratories (NAL) is constructing a third prototype–the first was overweight and the second crashed in 2009–with more composite content, including the wings, to cut weight and increase speed. The Saras also is being mated to a pair of more powerful engines (this time P&WC PT6A-67As producing 1,200 shp each) and a modern glass cockpit. To date, the Indian Air Force (IAF) remains the sole customer, with 15 airplanes ordered for pilot training and patrol missions. ❑

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