



# New Business Turboprops 2011

A covey of new models on the horizon by Mark Huber

King Air 250

*One engine or two, turboprops still fill a need for swift, economical transportation off the beaten path.*

of the GA-18 Nomad twin. The troubled NAL Saras twin pusher, now officially in its third decade of development, is financed largely by the Indian government. The Czech Republic is doing the same for the EV-55 Outback twin.

Extra Aircraft continues its nationwide shopping campaign for a home that provides the correct "incentives" for a U.S. assembly plant for its EA-500 single-engine turboprop after its deal to set up shop in Montrose, Colo., fell apart last year. The Dornier Seaplane company hopes to bring its all-composite Seastar design from the 1980s to market after being enticed by a \$30 million provincial development package to locate in Saint-Jean-sur-Richelieu, Quebec.

While helpful as a means of buying time to attract additional private investment capital, with the exception of the Saras and Outback programs, virtually none of these government packages in and of themselves is sufficient to see these new aircraft through certification, much less serial production. The typical total tab for that can easily top \$150 million. In the new economy, companies need to be prepared to develop new aircraft concurrent with ongoing capitalization efforts, said Klapmeier. "We think financing is a staged process and we feel comfortable accepting that risk. We have an engineering team in place and this process will go on."

But Klapmeier does not understate the challenge ahead for himself and his peers. Few things in business create quite as spectacular a cash pyre as a new aircraft development program. While it chases down cash and tweaks its design, Kestrel is seeking to bring cash in the door by modifying existing aircraft at its Aeroworks division in Brunswick, Maine.

Initially, the company plans to focus on installation of the Avidyne R9 avionics

system and other upgrades in the Piper Meridian turboprop singles and piston-powered Cirrus SR22s. (Klapmeier is the former CEO of Cirrus and many key members of Kestrel's engineering team are Cirrus alumni.)

Klapmeier also said the company is targeting a price in the region of \$130,000 for installation of a new Meridian cockpit with the Avidyne system and initially has set a "conservative" goal of 15 installations per year. Avidyne hopes to have the system certified late this year and he said installations are to begin in early 2012 via a supplemental type certificate. Modifications offered for the Cirrus will also include installation of a four-blade propeller and a new cowling to accommodate it.

"What we know about pilot/vehicle interface is sufficiently different from the way other people do it," Klapmeier said. He added that he hopes Meridian owners who eventually would fly with a Kestrel cockpit will consider a new Kestrel turboprop down the road.

## DIVERSE CASH SOURCES

Other new and existing turboprop OEMs likewise are finding diverse ways to bring in new cash. Comp Air continues to sell its popular kitplanes while awaiting development financing for its Model I2 single. Extra is assembling aircraft at its plant in Germany and then flying them to customers in the U.S. Because of the dollar-euro imbalance, Extra's Errol Bader admits that this is not a profitable long-term strategy. "It is a little costly for us because of the euro exchange rate." Newly recapitalized Quest Aircraft is seeking new markets for its Kodiak utility turboprop.

"We're trying to refine the Kodiak,"

said Lynn Thomas, director of technical marketing for Quest Aircraft. "We've got a great utility airplane, but our customers would like more refinement going forward." As part of that process, Quest recently developed and certified a two-zone, \$39,750 optional air-conditioning system for the aircraft.

Thomas said Quest is working with customers who want truly custom executive interiors while at the same time developing the "Summit" packaged executive interior option. Currently, Kodiak sales are split in almost equal thirds among those buying the \$1.75 million (2012 base price) aircraft for utility, pleasure and business uses, but Thomas thinks as many as 20 percent of Kodiak customers may be looking for a truly executive interior.

Minnesota-based Wipaire and Quest are currently working with customers to define a final custom executive interior that will be submitted for STC approval by year-end, according to Steve Zinda, Quest's director of sales and marketing. Customers will be able to purchase this interior for new or used aircraft for retrofit. Quest has the option of purchasing interior kits from Wipaire and installing them at its own Sandpoint, Idaho factory.

## NEW VALUE TO OLDIES

Old-line OEMs such as Piper and Hawker Beechcraft also are bringing new value to their turboprops as a means of increasing sales.

Piper recently received FAA approval for its PA-46T Meridian to operate from grass strips. Operating on grass adds approximately 300 feet to the required takeoff roll and 200 feet to needed landing distance. Piper also announced refined seating, cockpits and connectivity

for the Meridian and its other "M-Class" aircraft, the piston-powered Mirage and Matrix. The new cockpit is "sculpted" to provide more hip and elbow room and have map pockets big enough for iPads. The aft-facing cabin seats get better seat cushions and seatbacks with lumbar support. The Meridian also gets two 110-volt outlets for passenger and pilot personal electronics.

Hawker Beechcraft's update of its venerable King Air 200 gets a new model designation altogether.

## The King Air 250

Hawker Beechcraft received certification for its latest Model 200 variant on June 9. Compared with its predecessors, the six- to eight-passenger, twin-engine 250 gives you more of what you buy a turboprop for: the ability to haul bigger loads out of shorter runways longer distances versus a similar-size jet, albeit at lower cruise speeds. This utility comes with a near-jet-like price of \$5.835 million.

The King Air 250 increased performance comes courtesy of Raisbeck Engineering's ram-air recovery system, BLR winglets, lighter and more efficient all-composite Hartzell propellers and a pair of P&WC PT6A-52 engines that deliver 850 shp each.

The Raisbeck system keeps foreign objects from being sucked into the engine during ground operations and in flight helps prevent engine icing and makes engine airflow more efficient. It has been available as a popular aftermarket option for King Airs for years. (The company also offers a variety of other performance improvement and supplemental storage enhancements for King Airs.)

The new Hartzell propellers and hubs are 65 pounds lighter (for the pair) and more efficient. The BLR winglets also improve the aircraft's aerodynamics and efficiency.

At maximum weights, the 250 can take off over a 50-foot obstacle in 2,111 feet at sea level—that's 400 feet shorter than the number for its immediate predecessor, the King Air B200GT. At high-altitude airports, this airplane also shines. At a 5,000-foot-elevation airport, it takes off in just 3,099 feet. Compared with a GT, the 250 can use 1,100 more of the world's airports. Cruise speed increases modestly to 310 knots.

## NEW TWINS

The growing single-engine market has not dissuaded all twin turboprop buyers. In addition to the King Air 250, some other new twins are coming to market.

## NAL Saras

During the last three decades, India's attempt to develop a homegrown business-class turboprop, the twin-pusher NAL (National Aerospace Laboratories) Saras, has been fraught with problems, chronic delays, official inquiries and outright embarrassment.

Designed with input from Russia's Myasishchev, which later pulled out of the project, the first prototype flew in 2004. The second aircraft flew in 2008 and crashed in 2009 during an engine relight test gone wrong, killing the crew. In the days that followed the crash, NAL put a brave spin on the program, insisting that the aircraft would still be certified in 2009. That was wildly optimistic. S.K. Brahmachari, director general of the Council of Scientific and Industrial

Research, proclaimed, "The Saras project will continue; we will not shelve it." And continued it has, right into a major redesign aimed at addressing the aircraft's ballooning costs as well as weight, performance and handling deficiencies. Certification has been pushed back again, this time to 2013.

NAL is consulting the Indian Defense Ministry for guidance on FAA Part 23 standards. The redesigned prototype is supposed to fly by the end of 2011 and engineers have targeted chopping 1,100 pounds from the airplane by increased use of composite structures. At the same time they are fitting it with more powerful 1,200-shp P&WC PT6A-67 engines in an effort to push cruise speed past 347 knots/400 mph. A second prototype is not scheduled to join the test fleet until late 2013, which casts doubt on the revised certification date.

To date, the Indian Air Force has emerged as the sole customer for the Saras, ordering 15 it plans to use to train cargo pilots before they transition to Russian aircraft. NAL sees the market for the aircraft eventually growing to include regional airlines, border patrol and air ambulance. However, at a unit price now topping \$10 million, it is hard to see how a private-sector case can be made for the aircraft. Against this backdrop, NAL's Brahmachari remains hopeful: "We learned from the failures and improved the design." NAL is also developing a series of regional airliners called the RTA-70.

The Indian government isn't the country's only aerospace player when it comes to turboprops.

In 2009 the Mahindra Group, a \$12 billion-a-year industrial and IT conglomerate based in Mumbai, bought a

controlling stake in Australia's Gippsland Aerospace (Gipps Aero).

## Gipps Aero GA-10 and GA-18

With the help of its new investor, Gipps is focusing on building the single-engine GA-10 Airvan and later fielding an improved version of the venerable twin-engine Nomad to be badged the GA-18. The aircraft are expected to sell for \$1.3 million and \$3.3 million, respectively. Gipps acquired the type certificate for the twin-engine Nomad (N24A) in 2008. Mahindra expects to invest \$37 million in Gippsland and could eventually move production to Mallur, India, where it already has an aviation facility, having long been a supplier of engineering services and structural components to OEMs, including Airbus and Hawker Beechcraft.

The GA-10 is expected to be a stretched, eight- to 10-passenger version of the piston GA8. Power for the GA10 single and GA-18 twin will come from Rolls-Royce 250 engines with upgrade paths anticipated to the RR500 when it becomes available. Certified production of the GA-10 is expected to begin in 2013 and could reach 20 aircraft per year.

Gipps announced in July that it had selected the Rolls-Royce M250-B17F/2 (715 shp) to power the single-engine, 10-passenger turboprop. The GA-10 will be certified on fixed gear and floats. Preliminary data indicates the aircraft will have an mtow of 4,450 pounds and be able to carry eight passengers with a full, 500-gallon fuel load, approximately five hours at 150 knots. The aircraft is to be built in Victoria, Australia. Gipps also said it is developing the GA-18 twin

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turboprop for certification in 2014.

Gipps is seeking a North American assembly facility for its GA8 Airvan and plans to increase its dealer network here. Currently, 26 GA8s operate in North America. On September 1, the Gipps-produced N5 piston single made its first flight. The aircraft was jointly developed by Mahindra and NAL and manufactured by Gipps.

## Evektor EV-55 Outback

After seven years of development, the \$2 million, twin-engine EV-55 made its first flight in June and the Czech company, best known for its EuroStar and SportStar light sport single-engine aircraft, 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.

The company is currently in negotiations with Russia on a coproduction agreement and claims a “big 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 easily take off from and land on runways of less than 1,700 feet at 6,500-foot elevation.

## Dornier Seastar

The Dornier Seastar CD-2 is one step closer to entering production now that the company has settled on a manufacturing site. The Dornier Seaplane Co. will be setting up shop in St. Jean-sur-Richelieu, Quebec, chosen for its proximity to Lake Champlain and the previously mentioned government incentive package. The company currently holds letters of intent for more than 25 copies of the \$6 million twin-engine, push-pull centerline-thrust amphibian and is currently soliciting European suppliers to build the aircraft’s tooling and composite structure. It hopes to make a vendor selection by year-end. Aircraft final assembly is to take place in St. Jean. The Seastar is to be available with an all-glass cockpit and certified for flight into known-icing.

The 180-knot, all-composite Low-E glass 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. The Dorniers formed the Dornier Seaplane Co. and installed U.S. business jet industry veteran Joe Walker to run it. Walker sees a potential market for as many as 300 to 500 aircraft over the next decade. He said the flying boat’s

cabin is 50 percent larger than that of a Cessna Caravan 675.

Power for the 10,000-pound Seastar comes from a pair of 650-shp P&WC PT6A-135s. Interiors for the unpressurized cabin range from an opulent six-seat executive layout to a 12-seat high-density configuration. Walker said the company plans to restart production gradually and deliver the first customer aircraft in 2013, with production eventually reaching 24 aircraft a year by 2016. Primary markets for the aircraft include governments, charter operators and wealthy individuals.

## THE SINGLES

### Kestrel

Composites are also finding their way into new single turboprop designs, including the refined Kestrel that first flew in 2006 when the company was called Farnborough Aircraft. Following bankruptcy reorganization, the company attracted several new investors and last year former Cirrus Design CEO Alan Klapmeier joined the company as president. While the lone prototype was powered by a 1,000-shp flat-rated P&WC PT6-67A, earlier this year the company announced that power on production aircraft will come from Honeywell’s 1,650-shp TPE331-14GR.

Klapmeier said Kestrel engineers are redesigning the aircraft’s engine intake inlet and firewall to accommodate the new engine and that, while the cabin for the six- to eight-passenger turboprop

remains largely the same, the prototype aircraft is “no longer representative” of the design likely to see production. “We are getting close to final configuration and we are in the last phase of airframe layout—specifically, the fine points of airfoil shape and twist,” he said. “At the conclusion of that we will start making airframe tools.” The reworked prototype could fly as early as 2012.

The Kestrel CEO won’t commit to performance numbers, price or a production schedule at this point but he did say that Kestrel is aiming to produce an aircraft with 325-knot maximum cruise speed, a tanks-full range of 1,300 nm with 1,250 pounds of payload and a price on par with or below that of a TBM 850. He said that, while the company has attracted sufficient capital to build a production prototype aircraft, additional capital is required to finance what he estimates will be a \$100 million-plus project through certification. He said the company has made significant progress in attracting additional private capital over the summer, and he added that, once in production, the estimated market for the aircraft is 35 to 50 units annually.

### Comp Air CA-12 and CA-11

Kitplane builder Comp Air Aviation continues its quest to bring certified, all-composite, single-engine turboprops to market. The company previously announced that its CA-12 and CA-11 turboprop singles would be powered

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Dornier Seastar



Comp Air CA-11



Kestrel



Kestrel cabin

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by Honeywell's TPE331-14GR and be equipped with its Primus Apex avionics suite. A nonconforming prototype of the 310-knot, \$3.75 million Model 12 first flew in 2007.

The production model is to undergo significant changes, including a 42-inch fuselage stretch. The four-inches-larger fuselage diameter would provide a six-foot-tall stand-up cabin. Plans are to offer three basic cabin layouts aft of the cockpit: a luxury executive configuration with six seats; a double-club layout with eight seats; and a high-density design with 10 forward-facing seats. The aircraft is projected to have a maximum useful load of 5,000 pounds and a maximum range of 2,535 nm.

A prototype of the smaller and faster 360-knot CA-11 should make its first flight by year-end, and the company hopes to bring it to market for a price near \$3 million after it develops the CA-12.

The aircraft is planned to have a maximum range of 2,100 nm and a maximum useful load of 3,400 pounds. A Comp Air spokesman said the production models of the 12 and 11 will look similar and will incorporate such refinements as trailing-link landing gear. The development cycle for both is expected to be 2.5 years after formal program launches are announced. Comp Air may also eventually offer its high-wing utility kit aircraft, the CA-9, as a production aircraft.

The spokesman said the company still intends to relocate to Florida's Space Coast once production gets closer.

## Extra 500

Extra continues its hunt for a U.S. assembly facility and is finalizing FAA certification for its \$1.75 million all-composite turboprop single. Extra's U.S. director of development, Errol Bader, said the company is looking at sites in Prescott, Ariz.; Boulder, Colo.; and the unused production plant of the now-defunct Adam Aircraft in Ogden, Utah.

To date the company has orders for eight aircraft and it plans to deliver aircraft number three to the U.S. later this year with German registry. Extra recently announced that the aircraft will be updated with the Avidyne Entegra R9 glass-panel avionics system and that it has received EASA approval for the installation. Power on the 500 comes from a 450-shp Rolls-Royce 250-B17F/2 that burns 19 gph mated to a five-blade propeller. Cruise speed is 226 knots at FL250 and maximum range is 1,600 nm.

## TWEAKED SINGLES & TWINS

In addition to Kestrel's Aeroworks, several other companies are offering re-engining and performance enhancement packages for legacy single-engine turboprops, primarily the Cessna Caravan. The Caravan conversions offer fuel burns reduced by four to six gallons per hour at typical cruise, up to 40 knots more maximum cruise speed and significantly shorter runway and greater payload capabilities.

Earlier this summer Blackhawk

Modifications received FAA STC approval for its conversion that replaces the aircraft's stock 675-shp Pratt & Whitney Canada PT6A-114A with an 850-shp PT6A-42A. The company is ramping up to do three conversions per month and estimates installation time at two weeks. Blackhawk joins Alaska-based Aero Twin and Texas Turbines in offering an STCed turbine retrofit for the Caravan. Aero Twin and Texas Turbines use the Honeywell TPE331-12JR engine, which produces 850 to 950 shp. Both the Honeywell installations and the Blackhawk retrofit enable the Caravan to be approved for flight into known icing.

Aero Twin was the first to receive STC approval for the TPE331 and offers it rated at 850 shp for the Caravan and 950 shp for the Grand Caravan. The \$720,000 conversion includes the engine, new propeller, a battery tender and a new standby vacuum pump. The old engine, propeller and other parts are returned to the customer.

Texas Turbines received its STC for its Supervan 900 TPE331 conversion in 2008 and has sold approximately 20 to date, said company president Bobby Bishop. Installations take place at Texas Turbines or at authorized dealers in the U.S. and abroad, including Banyan, Intercontinental Jet, Wipaire, CJ Aerospace (Australia) and Air Alliance (Germany). The \$570,000 conversion cost is based on the exchange of a stock run-out PT6A-114A and includes an engine core credit of approximately \$100,000.

All of the conversion providers noted that the retrofit can be done only to "legacy" aircraft as Garmin has yet to provide engine parameter data on its G1000 avionics system in newer Caravans. They also all said they expect demand for their conversions to increase substantially once the 208B Grand Caravan is certified for float operations. A leading manufacturer

of floats for the Caravan 208 said an announcement about floats for the longer 208B could come by year-end.

Turbine-engine upgrades have been available for decades on a variety of twins including the Piper Cheyenne, Beechcraft King Air and Cessna Conquest. All of these substantially increase speed, payload and range. Virtually complete aircraft remanufacturing programs also are offered on two popular but long out-of-production aircraft: the Commander 690B and the Mitsubishi MU-2, from Twin Commander Aircraft and Intercontinental Jet Service, respectively. These programs can give older aircraft contemporary functionality and reliability.

Several companies also continue to convert piston aircraft to turboprops, from WWII-vintage DC-3s, de Havilland Beavers, Beechcraft Model 18s, Bonanzas and Dukes, as well as Cessna 206s. One of the most successful has been Rocket Engineering in Spokane, Wash., which specializes in Piper Malibus.

The conversion candidate aircraft and \$580,000 buys a JetProp DLX conversion. The process discards the stock piston engine and replaces it with a new P&WC PT6A-35 turbine that generates 60 more horsepower than the 500-shp Dash 42 engine on the stock Piper Meridian turboprop. Rocket claims the conversion yields seven gallons per hour lower fuel burn, dramatically better short-field performance and a 41-percent faster rate of initial climb (3,000 fpm versus 1,741) than a Meridian.

Rocket owner Darwin Conrad said the company has done 260 conversions since 1995 and that the process is particularly popular with European owners. Typical combined cost of the used Malibu and the conversion is less than \$1 million.

Then there are companies such as Raisbeck Engineering that provide a variety of aftermarket options that can significantly increase the performance and utility of existing turboprops. Raisbeck specializes in Beechcraft King Airs, offering a complete line of modified landing-gear doors, wing lockers, propellers and ram-air recovery systems. Performance of virtually any legacy aircraft can be improved "using today's technologies," said company president James Raisbeck.

The question for operators is whether new turboprop aircraft or retrofits on legacy aircraft make economic sense given their initial cost and resale value. In the main and for decades, for most, that answer has been yes. But Kestrel's Klapmeier cautions that, despite their unique capabilities, turboprops are not immune from the current political turbulence buffeting business jets. "Aviation in general needs to do a better job explaining why these products make so much sense and why they are so valuable. Aircraft owners always tell me how they couldn't run their businesses without aviation, but as an industry we need to explain this to everyone else in terms they understand, so we don't look like a bunch of fat-cat golfers." □

Comp Air CA-12



Extra 500

