



# New Turboprops

## Airframers resurrect dormant programs as new designs languish on the drawing board

by Mark Huber

*The global economic downturn and the high cost of certification have conspired to delay or kill several new turboprop programs. However, several others that were either dead, in various states of incompleteness or long out of production appear to be coming back to life, albeit sometimes in different locales. For them, this could be the dawn of the dead. The simple reason for this resurrection: less risk.*

*Sales of new turboprops did not escape the great aviation carnage of 2009, but they were far better than the anemic numbers pistons and jets posted, down 54 and 34 percent, respectively, according to statistics from the General Aviation Manufacturers Association. Compared with 2008, turboprop sales last year were down "only" 17.6 percent for the year,*

*and they appear to be falling at a near-equivalent rate for the first six months of this year.*

*"It wasn't a brilliant year," Piaggio America president and CEO John Bingham said of 2009. "We suffered like everyone else." Piaggio sold 24 Avanti II turboprops last year and, while this was not a sterling performance, it and other established manufacturers of business-class turboprops appear to be hanging on. Last year Hawker Beechcraft delivered 119 King Airs (excluding military sales), Cessna shipped 97 Caravans and Pilatus sold out again with 100 PC-12s. Piper and Socata turboprop sales limped along, while newcomer Quest delivered 24 Kodiaks.*

*However, the last year proved more challenging for other relatively new market entrants.*

### Chinese Firm Acquires Epic's Assets

Composite aircraft builder Epic's plan for three new turboprops and two light jets collapsed when the Bend, Ore.-based company filed for bankruptcy last year, stranding 12 of its builder-assisted, single-engine turboprop LT kitplanes on the assembly line. On March 26 of this year a bankruptcy court accepted an all-cash \$4.3 million bid from China Aviation Industry General Aircraft, a recently formed government-owned subsidiary of the giant Aviation Industries of China (Avic), for Epic's assets, rejecting a competing bid from a group of seven LT kit owners called the LT Builders Group. China Aviation announced its

intention to build the former Epic aircraft in China. However, in April the court ordered China Aviation to form a partnership with the LT Builders Group, allowing it to operate the Bend plant, complete aircraft already in production, and to market former Epic kit aircraft in North America.

Don King, CEO of the LT Builders Group, said that LT kits were back in production by July and that five former Epic employees have been hired to assist kitbuilders and to make and sell parts for the existing fleet of LT aircraft. He also said the company worked extensively with the FAA to ensure it is in compliance with all regulations governing amateur-built aircraft and estimated that the cost of constructing a well

equipped LT is now \$1.9 million.

Conceivably, China Aviation could begin building an 80-percent-scale version of the LT that Epic had developed called the Escape. This aircraft is virtually identical to the Epic-built prototype of the Farnborough Aircraft Kestrel. That aircraft first flew in 2006. Plans for Epic to produce the aircraft for Farnborough collapsed and Farnborough filed for bankruptcy in September 2008 after failing to attract sufficient investment capital. A new ownership group took over the company in 2009, but then business director Adrian Norris acknowledged that the company needed to attract additional capital, and possibly form a partnership with another manufacturer, before it could bring the aircraft to market.

### Kestrel Redux

Enter Alan Klapmeier. The cofounder and former chairman of Cirrus Design made news last year when his bid to take over that company's fledgling single-engine jet program, the SF50 Vision, failed. He subsequently entered into discussions with Norris and Farnborough's Anthony Galley regarding the Kestrel. In July it



Farnborough Kestrel

JEFF BERLIN

was announced that Klapmeier would head the new Kestrel Aircraft Company, to be headquartered at the soon-to-be-shuttered naval air station at Brunswick Landing, Maine. Kestrel entered into a lease option with the Midcoast Regional Redevelopment Authority for Hangar #6, a 170,000-sq-ft aviation maintenance facility built in 2004.

The repackaged Kestrel venture still needs to raise substantial additional capital to get off the ground and qualify for the attractive incentives provided by Maine governments, according to Klapmeier. "We need to come up with a lot of money," he said, estimating that number at approximately \$100 million. However, while he declined to provide an exact amount, Klapmeier said the new company has already raised some of that capital, and he expressed confidence that it could attract the remainder, in part because of what he characterized as the Kestrel's inherent advantages over the competition. Chief among those is a flying aircraft backed by \$20 million to \$30 million already invested in its engineering. "A huge amount of design work has already been done with an eye toward certification," giving the Kestrel a big advantage over any clean-sheet design, he said. "We are going to be editing the design, not starting over."

Part of that editing will be a redesign of the wing, to make it easier to manufacture, a slightly bigger cabin with

larger windows, and an engine less powerful than the 1,200-shp PT6 currently in the nose. Projected range with five passengers is 1,324 nm. While Kestrel declined to name a price for the 350-knot, six- to eight-passenger aircraft, Klapmeier said he hopes it will be less than a TBM850, which sells for approximately \$3.2 million. He said the company's goal is to sell 35 to 50 aircraft per year in what he calls a "niche market." While acknowledging that the Chinese could make a similar product with lower labor costs in light of their acquisition of Epic's designs, Klapmeier said, "I am confident in our ability to design the better airplane."

### Here Comes India

China is not the only country looking at developing turboprops, either indigenously or by acquiring designs. India, with its high population density, scarce airport resources and underserved rural populations, seems a natural for turboprops.

During the last three decades, India's attempt to develop a home-grown business-class turboprop, the twin-pusher NAL (National Aerospace Laboratories) Saras, has been fraught with problems and delays. Designed with input from Russia's Myasischev, which later pulled out of the project, the first prototype flew in 2004. The second flew in 2008 and crashed last year during an engine relight



Epic LT Escape



NAL Saras

test, killing the crew. In the days that followed the crash, NAL put a brave spin on the program, insisting that the aircraft would be certified this year. "The Saras project will continue; we will not shelve it," said SK Brahmachari, director general of the Council of Scientific and Industrial Research. Meanwhile, the Indian Air Force reaffirmed its order for 15 of the \$9 million aircraft.

That was before India's Directorate General of Civil Aviation (DGCA) issued its scathing crash investigation report earlier this year. The DGCA blasted both NAL and the Indian Air

the aircraft's design and stay with the program through certification, which seems unlikely this year. However, when it does happen, production is expected to be transferred to HAL-Kanpur, the same facility making components under contract for the revived Dornier Do-228-212NG.

NAL meanwhile is continuing with preliminary development of a 70-seat commuter turboprop called the RTA-70, which it expects to best the ATR 72. Preliminary goals call for an aircraft that costs at least 25 percent less to acquire and operate, with a range of 1,100 nm, and

a stretched, eight- to 10-passenger version of the piston engine GA8. Power for the GA10 single and GA18 twin will come from Rolls-Royce 250 turboprops with upgrade paths anticipated to the RR500 when it becomes available. Certification of the GA10 is expected in 2012 and the first fuselage is already built. 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. Immediate plans call for the plant to be used to produce subcontracted structures and the N5, a light five-seat aircraft Mahindra is developing with NAL.

### The German Phoenix

Three moribund German designs, two from Dornier and one from Extra, are poised for renewed production.

The twin Honeywell TPE331-10-powered Dornier Do-228-212-NG is once again in production, with India's Hindustan Aeronautics making structural components, including the fuselage, wing and vertical stabilizer. Those are then shipped to Ruag's plant in Oberpfaffenhofen for aircraft final assembly. More than 150 older-generation 228s remain in service worldwide from a production run that spanned from 1982 to 2002. HAL built and sold 80 of those under license. The NG is a revised design with new five-blade composite propellers, glass-panel avionics and more comfortable seats. The aircraft can be configured to seat up to 19 passengers. Ruag has orders for the aircraft from customers in Australia, Mexico and Japan.

On August 18, the EASA granted Ruag extended type



Extra EA500

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Dornier Do-228

certificate approval for the aircraft. One month later, Ruag handed over the first NG to New Central Airservice of Japan, connecting Tokyo to offshore islands. The aircraft entered service with the airline last month. Ruag also announced that it is building a special-mission variant of the aircraft for the German Navy, which will use it for pollution detection in the North and Baltic seas. The 228NG "Special Mission" will be equipped with side-looking airborne radar, color line and IR/UV line scanners, and an electro-optical sensor.

Another design with German roots, the Dornier Seastar CD-2, is one step closer to entering production now that the company has chosen a production site. The Dornier Seaplane Company will be setting up shop in St. Jean-sur-Richelieu, Quebec, chosen for its proximity to Lake Champlain and a government incentive package. Construction on the plant should be completed late next year, allowing customer deliveries of the twin-engine, push-pull

amphibian to start in 2012. The company currently holds letters of intent for more than 25 copies of the \$6 million aircraft.

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. 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. Walker 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.

Like the 228NG and the Seastar, the Extra EA500 is already certified. The brainchild of German aerobatic aircraft guru Walter Extra, the 500 was poised to take on the Piper Meridian, but the strain of developing the aircraft threw the company into insolvency in 2003 and the program languished. The company's new owner, Ken Keith, has now begun selling the \$1.65 million, Rolls-Royce 250-B17F/2-powered, single-engine turboprop.

Plans announced this summer call for the aircraft structural components to continue to be produced at the Extra factory in Dinslaken, Germany, but for

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Gippsland GA10



Gippsland's in-development GA18 will be based on the company's current GA24A.

AIRSAFARI

Force's Aircraft System and Testing Establishment, which flew the flight tests, for conducting a shoddy program with lax controls, poor procedures and an overall lack of accountability. It faulted NAL for subcontracting and inadequately monitoring almost all of the Saras's development and flight-test analysis to a company called Aircraft Design and Engineering Services in Bangalore, and for using unapproved propellers on the aircraft that crashed. The report also noted the crew's negative remarks about aircraft controllability with regard to excessive control surface drag, and faulted the crew for poor coordination, inadequate cockpit procedures and an overall lack of professionalism.

After six years of flight tests, the Indian firm has called the Russians back in to help fix

the ability to cruise at 300 knots at 30,000 feet and use 3,000-foot runways. Plans are for the aircraft possibly to be fashioned from composites, have FBW controls and be powered by next-generation engines.

Private Indian companies are also getting in the game. Late last year the Mahindra Group, a \$7 billion-a-year industrial and IT conglomerate based in Mumbai, bought a controlling stake in Australia's Gippsland Aerospace with an eye to kick-starting the single-engine GA10 Airvan, and later fielding an improved version of the venerable twin-engine Nomad, to be badged the GA18. The aircraft are expected to sell for \$1.3 million and \$3.3 million, respectively. Gippsland Aeronautics acquired the type certificate for the twin-engine Nomad in 2008.

The GA10 is expected to be



Dornier Seastar CD-2

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final assembly to take place at a new facility to be built in Montrose, Colo. As of late September, those plans apparently had hit a snag over how much of a proposed \$2.6 million government incentive package can actually be provided. In the middle of last month, however, the county offered a new plan—to build a hangar on the airport and lease it to the manufacturer.

Errol Bader, Extra vice president of business development, told *AIN* that the Montrose snag would not delay the company's plan to deliver its first U.S. customer aircraft by year-end. "That airplane will be completed in Germany now," he said. Bader said the Montrose impasse had delayed Extra's production plans, that other communities are interested in hosting the plant, and that "at some point, you have to move on."

The company has firm orders for five copies of the six-seat, 226-knot (25,000 feet) aircraft from U.S. buyers, according to Bader. As with the Gippsland aircraft, Bader said he expects Rolls-Royce to offer an RR500 upgrade for the Extra 500 when it becomes available. He also said he expects the aircraft's 19-gph fuel economy to win it additional orders.

### Waiting for the Dough

The global recession has placed developers of "clean sheet" designs at a financial disadvantage when it comes to raising capital and completing certification.

Comp Air never saw the anticipated \$150 million required to develop and certify the CA-12

single-engine turboprop and finance a proposed new facility in Melbourne, Fla. The company had hoped to have the \$2.95 million single certified by 2012, but a spokesman told *AIN* that a single non-conforming prototype flying has been retired and that, for now, the project is shelved. That aircraft first flew in 2007, but plans called for significant changes to the production aircraft, including a 42-inch fuselage stretch. He said the company has returned to its core competency of kit building and is developing a smaller, faster version of the CA-12 for that market called the CA-11, and recently has sold several of its high-wing CA-9 kits into Brazil.

There are several other apparent casualties of this financial entropy. For the last seven years, Evektor has been working on its new-design twin, the EV-55 Outback, and late last year conducted successful ground power tests of the high-wing aircraft. The Czech Republic company, best known for its single-engine light sport aircraft, said the Outback will make its first flight later this year. It hopes to position the new turboprop to compete against the Cessna 208, but without a significant financial infusion this appears unlikely.

Some proposed amphibians also linger in this financial limbo. Two remakes of classic Grumman designs—the Goose and the Albatross—are in various stages of development and also await additional funding, as does the Russian Beriev Be-112.

The once much discussed Freight Feeder FF5000 cargo container twin turboprop appears dead.



Evektor EV-55 Outback

Privateer Industries is currently constructing a prototype of an all-composite, single-engine amphibian powered by a single GE M601 with a shrouded propeller and aiming for a first flight next year. The company says the aircraft will cruise at 215 knots and have a range of 1,000 nm with its seven seats full. Company principal Frank Leventhal says the company has enough money to fund the aircraft through its first flight but will then have to raise \$200 million to get it certified and start production. Leventhal said the company is angling to partner with an established OEM. Failing that, he said, Privateer would "fund it on our own."

### Projects Under Wraps

Ambiguity and secrecy cloak some other long-discussed projects. The fate of the long-anticipated follow-on to the TBM850, code named NTx, is unknown following Daher-Socata's announcement that it is studying plans to resurrect the former Grob SPn twin-jet program with the current owner of those assets, Allied Aviation Technologies. Grob filed for bankruptcy last year after building three prototypes.

While Pilatus Aircraft president Thomas Bosshard acknowledged that the company is studying options for a follow-on to its PC-12 turboprop single,

he refused to address speculation that one of those options involves unducted fan propulsion. "We are looking at several things," he said, adding that any announcement this year would be "premature."

Likewise, a spokeswoman for Piper declined to comment specifically on reports that the Florida-based OEM is contemplating a revised Meridian turboprop, possibly with winglets, insisting instead that the company is focusing all of its attention on the development of the single-engine PiperJet. She said

any change to the Meridian would be a "long-range" project.

At last month's NBAA Convention Hawker Beechcraft announced a new variant of its popular King Air B200 series, the \$5.799 million B250. This revised model features composite winglets, composite propellers and an improved ram-air recovery system. The company said the changes will produce significantly better short-field and hot-and-high performance that will exceed that of the Cessna Grand Caravan or the Pilatus PC-12, enabling the B250 to operate out of 2,000-foot runways and maintain a 300-knot cruise speed. Deliveries are scheduled to start early next year.

For now, most established OEMs appear to be keeping their powder dry with regard to new turboprop projects as the air of general economic nervousness lingers. "Turboprops are doing remarkably well," said Pilatus's Bosshard, "but I would be cautious on 2011." □

### CHEYENNE MOD EARNS EASA TICKET

After 11 years in the aircraft modification business, Blackhawk Modifications has announced the European certification of its latest project, the XP engine upgrade for the Piper Cheyenne. The EASA certification covers the Cheyenne I, II and IIXL models of the twin-engine turboprop, which replaces the aircraft's original engines with factory-new 750-shp Pratt & Whitney Canada PT6A-135As.

Blackhawk's approach has been to replace lower-power P&WC engines with higher powered turboprops that use the original engine's footprint, thus delivering a simplified bolt-on upgrade. The performance increase with the XP mod comes from flat rating the new engines to the Cheyenne's airframe horsepower limit, which provides an increase in available torque in the climb and cruise phases. The net result is an advertised maximum cruise speed in the 280-knot range for all Cheyenne models, plus reduced time to climb and extended range.

The XP upgrade offers the operator the option of higher cruising speed or reduced fuel consumption at lower cruise speeds with reduced operating and maintenance costs. Resale value is also enhanced with the more powerful engines; valuation guides such as Vref and Aircraft Bluebook show upgraded legacy aircraft remain competitive in today's market.

Blackhawk, which is headquartered in Waco, Texas, offers similar engine upgrades for other popular turboprops such as Beechcraft's King Air 90 and 200, Cessna's Conquest I and the single-engine Caravan. ■

Comp Air CA-12



Comp Air CA-9



Privateer Industries



Piper Cheyenne