



Turboprop Round-Up 2007

Propjets growing in business aviation. by Dave Higdon

Time for a little story – and you know how they all begin... “Once upon a time, clever engineers and designers created a new generation of small jets, entry-level models with economics and purchase prices that spurred predictions of a pending demise of the turboprop as a meaningful player in business aviation.

“Outside specialty operations and some utility roles, the venerable turboprop could-

n’t compete against these new jets – designs offering greater speed, lower costs, single-pilot capabilities and runway flexibility.”

Then the fairytale story began to appear true; sales of propjets. The speeds and economies made things look grim for the venerable propeller-turbine combination – and not as in the Brothers Grimm.

Suddenly some Fairy Godmothers intervened on behalf of the endangered species. The saving innovators waved their design

wants to develop newer, more-modern singles and a couple of seemingly stagnant twin programs received updates.

Performance improvements, advanced panels and competitive economics sprouted across the fertile fields of the turboprop.

Before you could say, “Presto, chango!” the propjet market turned hot again, fueled by the arrival of these new designs and fed by continuing innovation – including the continuing development of new designs and >



CESSNA CARAVAN

advances for older ones. As sales and deliveries of turboprops grew stronger, the “once upon a time” turned into “happily ever after”.

So much for fairy tales - today the turboprop market is more dynamic than in prior years – and sales of these business-ready machines appear headed for a strong future. For example, through the first three quarters of 2007, turboprop shipments grew 14.5 percent to 293 from 256 in the same nine months of 2006. Advance sales also continue to grow - so much for forecasts of propjets dying off.

Of course, the newest jet competition coming may alter the outcome of this story. Very Light Jets and Personal Jets remain unproven players where competition with propjets is concerned. But in the meantime, advanced turboprops are here, now, and available with much shorter lead times than these newest jets. And progress continues in propjet design and development.

No fewer than seven new or derivative propjet designs are in flight tests, three others are in pre-flight-test development and one clean-sheet design received its approval earlier this year.

And that’s in addition to the existing inventory of singles and twins that have helped drive a surge in turboprop sales in recent years. Whether these new choices attract their own new share of the market or cut into the propjet sales remains a question for the future.

So it will be a while before the final page of this fairy tale is written. But don’t expect an ending that lacks the propjet as a significant player in business aviation. Mission suitability never goes out of style – and for many pilots and operators, the propjet will always be the smartest choice.

BREAKING DOWN THE TURBOPROPS

Regular readers likely remember the weight-based parameters we use to differentiate the various classes of business jets we examine throughout the year. Although turboprops do vary in weight, size and engine numbers, we’ve generally approached all propjet-powered aircraft as a single category.

While there are numerous new aircraft programs in development today, we decided to discuss coming improvements in any existing model right below addressing the current incarnation.

For programs without an existing model, we thought it best to provide a separate section for the ‘up-and-coming’ designs.

So, first we’ll examine the inventory of in-production, certificated models available today, followed by any upgrade work announced; then we’ll look at programs with new designs already in flight tests as well as a snapshot of developmental programs not yet flying. As you’ll see, the turboprop segment is alive, healthy and growing.

THE HERE AND NOW TURBOS CESSNA AIRCRAFT: CARAVAN 208-675/GRAND CARAVAN 208B

The elder statesman of the propjet singles available today, the Caravan and Grand Caravan number in the thousands, and continue to evolve nearly 25 years after the original’s introduction. The Caravan’s embrace by FedEx for feeder service all but guaranteed its success.

Un-pressurized and extremely sturdy, Caravans provide heavy duty service in everything from package-express service connecting urban centers to small towns around the U.S., to bush flying in some of the most-challenging locales around the

world – and a little of everything in between.

The standard-fuselage Caravan offers seating for up to nine, plus a pilot; the Grand Caravan can accommodate several more, thanks to a four-foot stretch of the standard model’s 37.6-foot fuselage.

Both Caravan models sport a single 675 shp Pratt & Whitney Canada PT6A-114A engine that represents a considerable gain over the original engines.

With the Dash 114A engines, the standard Caravan delivers cruise speeds of about 186 knots; the longer, higher-gross-weight Grand Caravan suffers by only four knots, at 182.

With full fuel of 2,224 pounds, the standard 208-675 offers a full 900 pounds of payload capacity, while the 208B offers more than 1,300 pounds of lift capacity with the same fuel load – a key element in its popularity.

Cessna, working in partnership with Wichita-based Yingling Aircraft, offers the executive-class Oasis interior in either model, an option popular among private and corporate operators alike. And Cessna continues to develop new improvements for the Caravans, most recently starting tests to certify the 208 series with Garmin’s G1000 integrated avionics system already available on all the piston singles and the Cessna Citation Mustang VLJ.

Equipped, the standard Caravan sells for approximately \$1.8 million - the Grand about \$50,000 more. The value equation represented by these prices and the performance and capabilities of the 208 series help explain why the Caravans continue to sell well for Cessna.

› More information from www.cessna.com



BEECH KING AIR B200GT

EXTRA AIRCRAFT: EA-500

Arguably the most-innovative of the propjet singles, the diminutive Extra 500 fills a niche that should make it a popular seller among the business pilot set.

Capable of speeding along at more than 230 knots and cruising as high as FL250, the pressurized Extra 500 gets its power from a single Rolls-Royce 250-B17F/2 engine rated at 450shp. Easily the most-fuel efficient of the propjet singles, the EA-500 can cover as much as 1,600 nautical miles on its 1,220-pounds fuel capacity, with comfortable reserves. The weakest aspect of the Extra's traits may be its payload, a slim 478 pounds when fully fueled. Cut back on fuel to mission-specific needs, however, and you can come closer to filling its six seats.

Equipped for flight into known icing, the Extra 500 should never suffer from corrosion issues thanks to its sleek carbon-fiber airframe. The cost for this state-of-the-art propjet comes in at around \$1.3 million.

› More information from www.extraaircraft.com

HAWKER BEECHCRAFT: KING AIR C90GT

The latest incarnation of the original King Air of more than 40 years ago - the C90GT - boasts upgrades that make it among the

best-performing ever. The company left unchanged the five-to-six-seat, tall cabin with its squared-oval shape.

The 'GT' designation came when Hawker Beechcraft fitted the C90B with a pair of 550shp PT6A-135A engines and new four-blade props. Those with an eye on details may protest that the new engines make the same power as the old PT6A-21 engines previously employed. In fact, though, the Dash 135A engines are flat rated to 550shp from their thermodynamic limit of 750shp - which means better hot-and-high performance, better high-altitude climb rates, and no degradation in range.

The most-visible result of fitting the new powerplants is a nominal 25-knot improvement in cruise speed, now a very competitive 270 knots while holding to the capability to fly legs as long as 1,000 nautical miles, carrying as much as 437 pounds when fueled to its full 2,573-pounds capacity.

The Collins Pro Line avionics remain standard on the C90GT, with the EFIS 84 electronic instruments part of the package. Unless you have an outstanding order for a C90GT, though, you may be out of luck picking up this \$2.9 million propjet twin. As you'll see below, Hawker is already improving on the already substantial C90GT.

C90GTi - THE NEXT UPGRADE

Already in the pipeline is the C90GTi, incorporating an upgrade to the Collins equipment in the panel of the C90GT.

The company is upgrading the speedy C90GT with the highly capable Collins Pro Line 21 avionics suite. The change essentially standardizes the same panel for all the King Air line and on to the Hawker 900XP. Announced in May, the C90GTi is scheduled for certification before year end.

KING AIR 200

Make the cabin longer, beef up the airframe and add the power of a pair of PT6A-42 engines making 850shp and you have the King Air 200, an eight-seat business workhorse. With speeds of up to 289 knots available or range capabilities of up to 1,600 nautical miles, the B200 has long been the choice for operators needing rugged, rapid transit in a higher-capacity airframe. Payload available with full fuel is a slim 245 pounds - but with more than 3,600 pounds of capacity for those maximum-range trips, the smart pilot should have no problem loading for executive trips and still keeping fuel enough for 1,000 miles. About \$5 million is what it takes to buy a King Air B200. And like its smaller cousin, the B200 is also receiving an upgrade. ›



PILATUS PC-12 NG

KING AIR B200GT

Take the excellent traits of the B200 and swap in a pair of engines, and you get the 305-knot B200GT, with improved climb performance to go with the higher speed.

The B200GT essentially follows the same philosophy as the upgrade that created the C90GT – in this case with an all-new engine, the PT6A-52. The Dash 52 engine is essentially a new variant using proven components from two other powerplants.

The Dash 52 combines the existing B200's gearbox with the power section of the 1,050shp PT6A-60A engine used on the Super King Air 350 – but flat rated to the same 850shp as the Dash 42 engines used on the existing B200.

In addition to the higher cruise provided by this upgraded powerplant, the change gives the B200GT improved climb performance while preserving range capabilities. The higher-altitude power reserve is expected to remove a take-off-elevation restriction currently in effect for the B200 – 10,000 msl. This variant is also due for approval before year's end.

KING AIR 350

Already a 300-knot-plus speedster, the 350 provides more of everything that makes the King Air line popular, including sturdy airframe, tall cabin, and seating for 10 – or more, in some configurations.

Employing two PT6A-60A engines rated at 1,050 shp, the 350 can fly legs as long as 1,500 nautical miles and still carry a massive 1,600 pounds in the cabin. With as much as 2,900 pounds in the cabin, the 350 can still

cover nearly 1,000 nautical miles – a testament to its flexibility.

The King Air 350 sports the modern Collins Pro Line 21 panel, with all the 'bells and whistles' you'd find in a jet with the same system. And this combination of performance, carrying capacity and flexibility are why this \$8.1 million propjet remains a major player today.

› More information from www.hawkerbeechcraft.com

PIAGGIO AERO INDUSTRIES: P-180 AVANTI II

The fairy tale of light jets doing away with propjets because of inferior performance gets its biggest refutation in this unique, distinct twin turboprop – the P-180 Avanti II certified in May this year.

Equipped with new PT6A-66B engines flat-rated to 850shp from 1,630, the Avanti II is already establishing world records for speed, thanks to its maximum cruise capability of 402 knots at FL300.

With seating for eight, the Avanti II can carry more than 1,500 pounds when fully fueled – enough to fill six seats and carry plenty of baggage for all six.

Carrying that full-fuel-and-cabin load, the Avanti II can cruise in excess of 1,500 nautical miles – or, with a maximum cabin load, still nearly 1,000 nautical. The service ceiling is at the top of the propjet stack at FL410, a full 10,000 feet higher than any other turboprop.

The Collins Pro Line 21 panel helps keep pilots of this advanced propjet flying in the same league as their jet-pilot kin. And the roomy, oval-shaped cabin stands 69 inches tall and is enhanced by the P-180's pusher

powerplant configuration, while its excellent handling and smooth ride are products of the cat-whiskers-like canard and T-tail. Although it uses an aluminum airframe, Piaggio's unique construction method results in a finish that rivals the best composite finishes.

Figure on paying a respectable \$6.4 million for a Piaggio P180 Avanti II.

› More information from www.piaggioaero.com

PILATUS: NEXT GENERATION PC-12

Viewed by many as the family SUV of general aviation, the Next Generation PC-12 from Pilatus continues a long line of single engine aircraft from the Swiss plane maker known for their robust nature and excellent traits. The Next Generation PC-12 has a large cargo door on the left side of the aft fuselage, suitable for loading oversize cargo coupled with an airstair passenger door on the left side forward of the wing.

The airplane is equipped with the Pratt & Whitney Canada PT6A-67P turboprop engine providing increased high altitude power. In addition, it is equipped with the cutting-edge Honeywell Primus Apex four-screen fully integrated avionics system in a BMW-designed cockpit.

The PT6A-67P engine's 1,200 shp delivers the thrust needed to lift the PC-12's 10,450 pound maximum takeoff weight off runways as short as 2,650 feet and take it to FL300. This engine can drive the Next Generation PC-12 to speeds as high as 280 knots. The airplane also has the ability to range 1,500 nautical miles carrying 1,000 pounds of payload with full fuel including NBAA IFR fuel reserve.



EPIC DYNASTY

It's an impressive blend of attractive numbers that keeps the PC-12 in demand among owner-pilots and corporate operators alike. Over the average business flight, the Next Generation PC-12 provides a very competitive set of numbers when compared with some of the business jets in the same price range – about \$3.9 million equipped.

› More information from www.pilatus-aircraft.com

PIPER AIRCRAFT: MERIDIAN

Currently the top of the Piper Aircraft line – and the company's only turbine aircraft until the PiperJet becomes a reality – the Meridian has been major player in the turboprop market during the past decade.

With seating for up to six, the Meridian offers a cruise speed of up to 260 knots, the ability to fly legs as long as 1,000 miles, and the kind of handling that makes pilots feel at home in the sky.

For the typical executive mission, the Meridian can carry three about 1,000 miles – or all you need on the average stage length for the average personal or business flight. It's all about balancing the needed payload with the available fuel capacity, as it is with others in the propjet, VLJ and light jet segments. It takes about \$1.9 million to buy a Meridian.

› More information from www.piper.com

EADS SOCATA: TBM 850

Take an already strong propjet single, give it the option of using more power, and refine it

for top performance and you have the TBM 850, Socata's latest evolution to the TBM 700 that first entered the market about 17 years ago.

Capable of making 850 shp, the PT6A-66D engine is nominally rated at 700 shp; but that extra capability is where the TBM 850 gets power needed to make its 315-knot top cruise speed.

With seating for up to seven, the TBM 850 can cover as much as 1,100 miles carrying an executive load, or as much as 1,300 nautical miles with full fuel – and still lift a payload of more than 650 pounds.

Socata announced at NBAA that it is at work upgrading the TBM 850 to the Garmin G1000 panel so popular within the classes of owner-flown piston and turbine aircraft. In the meantime, a TBM 850 will set you back about \$2.8 million equipped.

› More information from www.socata.eads.net

QUEST AIRCRAFT: KODIAK

Certificated earlier this year, the Kodiak offers operators capability of handling rugged backcountry airfields, and is often viewed as a replacement for the legendary Otter and Beaver aircraft. Capable of carrying full fuel and more than 1,000 pounds in the cabin, the Kodiak gets its power from a single PT6A-34 making 750 shp.

With its maximum cruise speed at a respectable 190 knots, the fully fueled Kodiak can fly legs as long as 1,250 miles after taking off with as little as a 700-foot ground roll.

The Kodiak's 10-place interior provides operators with a significant degree of flexibility, with a base-price of \$1.45 million.

› More information from www.questaircraft.com

IN FLIGHT TESTING... EPIC AIRCRAFT: DYNASTY

For the business pilot looking for a little less than a 10 seats in a composite propjet single, it would be worth considering the Epic Dynasty, a six-place single that fits this description.

Using a PT6A-67A engine, the Dynasty can speed along at 340 knots – comfortably in VLJ-speed territory – and cover 1,465 nautical miles on its standard fuel tanks traveling at max cruise, FL 310. Add the optional tanks and maximum range jumps by about 50 percent, but at the penalty of about 400 pounds in the cabin, when used.

Even with the optional fuel, cabin payload is still a respectable 955 pounds. Well along in its flight-test program, the \$1.95 million Dynasty is scheduled for certification in the second half of 2008.

› More information from www.epicaircraft.com

FARNBOROUGH AIRCRAFT: F1 KESTREL

In flight tests since July of 2006, the Kestrel has been in development for several years and could be a player in the single-engine turboprop market when certificated - a date now targeted for 2010 instead of 2008.

The single PT6A-67P engine is flat-rated ›



EVEKTOR EV-55

at 1,000 shp from more than 1,700 shp, providing the Kestrel with excellent power reserve at high altitudes and temperatures. With a service ceiling of FL310, the Kestrel can cruise as fast as some jets at 352 knots; maximum range is also VLJ competitive since it exceeds 1,500 nautical miles carrying four, according to the company.

As with so many of these new-propjet designs, much of what makes the Kestrel this efficient can be traced to its composite airframe.

The test article that's been in flight tests will be replaced soon by a new test bed more closely in line with the final, conformal shape and configuration, resulting in more space than in the original prototype. The company expects the certificated F1 to go for about \$2.2 million, including a state-of-the-art electronic panel.

› More information from www.farnborough-aircraft.com

NAL: SARAS

A pusher twin, the Saras from The National Aerospace Lab (NAL) of India is now in the process of flying its second prototype from its operation in Bangalore.

Unlike previous pusher propjet designs,

the Saras sports no canard, or forewing. In fact, at first glance it resembles any number of the current generation of light jets, thanks to the aft-fuselage-mounted engines – a pair of 1,200 shp PT6A-67A engines.

This change and others ongoing should help the 16-seat Saras achieve its target of a 300-knot cruise speed and range approaching 800 nautical miles. Certification is anticipated for sometime in 2009.

› More information from www.nal.res.in/pages/saras-pilot-account07.htm

FLYING SOON... EVEKTOR: EV-55 OUTBACK

From Evektor in the Czech Republic comes yet another contender for the unpressurized utility twin market, the EV-55 Outback. Using what's promised to be a modern all-electronic panel, a pair of 536shp PT6A-21 engines and modern aerodynamics, the Outback is expected to cruise as fast as 220 knots while carrying full fuel and about 700 pounds of payload on legs as long as 1,200 nautical miles.

Versions configured for all-cargo, all-passenger, combi and for float operations are planned. Construction of the first prototype is ongoing; first flight is expected late in

2008, with certification of the \$1.7 million twin due in 2010.

› More information from www.evektor.cz

UTILICRAFT: FF1080-300ER

Although created as an all-cargo airplane, this unpressurized twin could find its way into other roles for an enterprising operator interested in hauling the human equivalent of the Utilicraft FF1080-300ER's 20,000-pound full-fuel payload. Yes, we said 20,000 – roughly – because this 83,800-pound bird is aiming at the small-package connector market generally the purview of old converted passenger and old military aircraft.

Powered by a pair of PW150 engines making 5,000 shp each, the FF1080-300ER is simply a big box truck capable of cruising at 280 knots on legs as long as 3,200 miles – that's right, a propjet twin capable of staying aloft 12 hours at its long-range cruise speed of 250 knots.

As a support aircraft, the FF1080-300ER can boast of the ability to fly unsupported to remote destinations as far 1,200 miles away – while carrying nearly 10 tons in each direction.

No price or certification date has been set.
› More information from www.utilicraft.com