

The power of one

Turboprop singles come of age

BY THOMAS A. HORNE

In light of their current success, it's difficult to imagine a time when single-engine turboprops seemed like starry-eyed concepts. Sure, the 400-shaft-horsepower, 275-knot Rockwell Interceptor—a hybrid of a Myers 200 with a Garrett turboprop engine—was certified back in 1971, but it lived a tenuous two years, then dropped into the mists of time—



Cessna's Caravan has been the hands-down sales leader in the single-engine turboprop market.

along with the idea of a viable single-engine turboprop market.

But back in 1982 the first stirrings of what seemed like a nascent turbine-single market caught *AOPA Pilot's* imagination, and in the January 1983 issue (see "The High and the Mighty: Turbine Singles") we wrote, "If the first-generation products are on the way, can other manufacturers be far behind?" and "They will have to be there. Because the idea makes sense."

Back then, there were a mere handful of single-engine turboprops—all of them in the prototype stage. Four were intended to be either kitbuilts or supplemental-type-certificated (STCed) modifications. Only one—Beechcraft's



The TBM 700C2 is the speed demon of the turboprop singles, with a high-speed cruise of 300 knots.

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Model 38P Lightning—had the stated goal of becoming a production airplane. This airplane, which used a Bonanza airframe, a B58P Baron's pressurized cabin, and a Pratt & Whitney PT6A-40 engine of 500- to 550 shaft horsepower, promised cruise speeds better than 275 knots at 25,000 feet, with IFR ranges up to 1,100 nm.

The price? An up-front deposit of \$20,000, and a final price tag anywhere from \$495,000 to \$595,000 (there were plans to produce three types of Lightnings, ranging from 400- to 550 shaft horsepower). Beech flew prototypes successfully, and even stoked the market by publishing a newsletter for depositors. But by 1984, the company killed the project. The reason? The projected sales price had crept to the \$1 million mark and no one, they figured, would pay that kind of money for a single-engine airplane—even a turboprop.

How wrong can you be? The following year, Cessna rolled out the first of what would be a 1,400-plus production run of its Caravan single-engine turboprops. EADS (European Aeronautic Defense and Space Company) Socata division followed in 1989 with its TBM 700 single-engine turboprop. Caravans were introduced with price tags around \$700,000, but the TBM 700 broke the million-dollar barrier with a rollout price averaging \$1.4 million. Some 210 TBM 700s have been delivered.

Today, at least 13 turboprop singles are players in a market that seems to be growing at a steady pace (and, most certainly, at the expense of turboprop-twin sales). Four are certified production aircraft, five are awaiting certification, and four are STCed modifications to production airplanes. There are other, kitbuilt, Experimental category single-engine airplanes with turboprop engines, but these are not included in this report.

What follows is a roundup, in brief, of today's general aviation turboprop singles, with the emphasis on production airplanes. It's proof positive of the performance, safety, and reliability aspects of turbine flying—and the pitfalls of underestimating the power of unconventional thinking.

Cessna 208 Caravan

Cessna's Caravans are the utility haulers of the single-engine turbo-

The Pilatus PC-12 is a combination of huge payload and respectable (270-knot) speed (right). The New Piper Meridian is easy to fly and features Meggitt's three-tube glass cockpit (below).



props. Big, boxy, and with the dimensions of a way-oversized Cessna piston single, Caravans were originally designed for use by Federal Express, and hundreds of FedEx Caravans continue to lug packages to this day. Caravans are also available as mini-airliners with up to 12 seats; as huge amphibious floatplanes; and the Grand Caravan can serve as luxury executive transportation, complete with up to seven leather seats and a cabin entertainment system. While not known for speed or high-altitude operations (the cabin is unpressurized), Caravans show their strengths in terms of mission flexibility and useful load. You can even order an external, belly-mounted cargo pod capable of handling 1,090 pounds. With price tags under \$2 million, many feel that Caravans offer the most bang for the buck among single-engine turboprops.

Price: \$1.6 million (Caravan Super Cargomaster) to \$1.8 million (Caravan 675 Amphibian)

Engine: Pratt & Whitney PT6A-114 (600 shp) or -114A (675 shp)

Max cruise speed: 186 kt

Max range: 932 nm

Max useful load: 4,500 lb (Grand Caravan) to 4,215 lb (Super Cargomaster)

Fuel capacity: 335 gal

Max takeoff weight: 8,750 lb

Deliveries: 1,475

www.cessna.com

EADS Socata TBM 700C2

Sleek, powerful, and luxurious, the TBM 700 is the fastest of the single-engine turboprops. It's powered by a 700-shaft-horsepower engine and comes with six seats. Built in Tarbes, France, by Socata—the same company that builds the Tampico, Tobago, and Trinidad piston singles—the TBM 700 began as a ven-

ture with Mooney. (TBM stands for *Tarbes-Mooney*.) Since their debut in 1990, TBM 700s have increased in maximum gross weight and useful load, and a large aft cabin door has been made standard. The newest version, the TBM 700C2, earned an 815-pound gross weight increase, which gives the airplane a full-fuel payload of 895 pounds, according to Socata. For freight versions, a small pilot door is available as an option. While it can be configured as a cargo or medical evacuation airplane, the TBM 700's heart and soul is that of a hot rod. For many of its 300-odd owners, it is the ultimate single-engine, propeller-driven airplane.

Price: \$2.7 million

Engine: Pratt & Whitney PT6A-64
(700 shp)

Max cruise speed: 300 kt

Max range: 1,565 nm

Max useful load: 2,545 lb

Fuel capacity: 281 gal usable

Max takeoff weight: 7,394 lb

Deliveries: 292

www.socata.eads.net

Pilatus PC-12

If the Caravan is the all-purpose barge and the TBM 700 is the hot rod, then the PC-12 is a melding of the two. It has versatility galore, and carries on Pilatus' strong reputation for making high-quality single-engine turboprops. (In fact, Pilatus has built more single-engine turboprops than any other manufacturer.) The PC-12 has a large fuselage that can be configured with a plush, six-seat executive interior (the most popular option), set up in a 10-seat, high-density seating arrangement, or cleared of frills to serve as a cargo hauler. There's a large aft cabin door, hinged at the top and opened by a push button, and a large-jet-style airstair door—complete with handrail—just aft of the cockpit. It has a good combination of speed and load-carrying capability, plus a spacious, professional-looking instrument panel and center console. Lifting big, heavy loads out of short fields and unimproved landing strips is usually no problem, thanks to the engine's high power output. With a maximum operating altitude of 30,000 feet and a pressurization system that can hold the cabin at sea level to 13,000 feet, the PC-12 can be fitted out with enough creature comforts (berthable seats, large-screen entertainment systems, and refreshment centers with galleys) to make both short trips

Single-engine turbine modifications

Owners of Cessna's P210, Beechcraft's A36 and B36TC Bonanzas, and The New Piper's Malibu/Mirage airplanes can have their airplanes converted from piston to turbine power. The conversions include propeller, engine controls, and engine and fuel-flow instrumentation. Advantages include turbine reliability and operational simplicity. Some big trade-offs arise when the airplane to be converted is unpressurized. Turbo-props are most fuel-efficient in the 17,000-to-23,000-foot-altitude range, so fuel flows can be very high when cruising at lower altitudes. For this reason, some modifiers add extra fuel cells. To take advantage of lower fuel flows and higher true airspeeds, occupants have to don oxygen masks if they want to fly at turboprop-happy altitudes.

JetPROP LLC, of Spokane, Washington, offers its JetPROP DL and JetPROP DLX turboprop conversions for Malibus and Mirages—conversions that, in effect, transform them into Meridian-like airplanes. The DL conversion uses a 550-shaft-horsepower Pratt & Whitney PT6A-21 engine, which pushes maximum climb rates and cruise speeds to an advertised 3,000 fpm and 245 to



JetPROP DLX

252 knots. The DLX uses a PT6A-35 engine of 560 shaft horsepower to give max cruise speeds of 265-plus knots. The DL conversion costs \$479,000; the DLX, \$540,000. Visit the Web site (www.jetprop.com).

Rocket Engineering—the contractor that builds the JetPROP DL and DLX for JetPROP LLC—makes the TurbineAir conversion for Beechcraft B36TCs. This swaps the B36TC's 285-horsepower Continental for a 500-shaft-horsepower PT6A-21. Maximum cruise speeds leap from the stock airplane's 200 knots to 250 knots (while burning Jet-A at a rate of 29 gph), Rocket says. Because the airplane is unpressurized, making full use of the airplane's 25,000-foot maxi-

and long the most comfortable of all the turboprop singles.

Price: \$2.9 million

Engine: Pratt & Whitney PT6A-67B (1,200 shp)

Max cruise speed: 270 kt

Max range: 1,800 nm

Max useful load: 3,670 lb

Fuel capacity: 402 gal usable

Max takeoff weight: 9,920 lb

Deliveries: 500

www.pilatus-aircraft.com

New Piper PA-46-500T Meridian

Of all the production general aviation single-engine turboprops, The New Piper's Meridian has the simplest systems and is the easiest to fly. Stepping up from a high-performance piston single to any turboprop single involves a learning curve, sure, and requires formal training, too. But comparatively speaking, the Meridian is a snap to master. A relative latecomer (the first models were delivered in 2001), the Meridian is the flagship of The New Piper fleet, and features a Meggitt/S-Tec MAGIC (Meggitt Avionics Ad-

vanced Generation Integrated Cockpit) electronic flight information system (EFIS) and digital flight control system. The glass-cockpit avionics suite includes three big panel display units—a primary flight display, a navigation display, and an engine display. It all adds up to a pretty impressive list of factory-standard avionics, which are more advanced than those in any other single-engine turboprop to date.

Price: \$1.8 million

Engine: Pratt & Whitney PT6A-42A (500 shp)

Max cruise speed: 260 kt

Max range: 960 nm

Max useful load: 1,730 lb

Fuel capacity: 170 gal usable

Max takeoff weight: 5,092 lb

Deliveries: 200

www.newpiper.com

Extra Aircraft EA-500

Think of Extra Aircraft and you'd be most apt to think of the company's Extra 300 and other aerobatic airplanes. But the company has also ventured into the six-seat single-engine



PropJet Bonanza

mum operating altitude will, of course, require oxygen. This conversion runs \$420,000, and includes an additional 16 gallons of fuel capacity, stored in wing tanks. Visit the Web site (www.rock-etengineering.com/turb.html).

Tradewind Turbines' PropJet Bonanza puts a 420-shaft-horsepower Rolls-Royce (formerly Allison) engine in Beechcraft's A36 Bonanzas. The company says that 220-knot cruise speeds and 1,000-nm ranges result. The \$535,000 conversion includes wingtip fuel tanks. Visit the Web site (www.tradewind-bonanza.com).

O&N Aircraft Modifications takes run-of-the-mill pressurized Cessna P210s and turns them into its Silver Eagle conver-



Silver Eagle

sion by installing the 450-shaft-horsepower Rolls-Royce 250-B17F/2 engine. A new instrument panel featuring Garmin GNS 530 and 430 and MX20 avionics; a new interior, paint, and air-conditioning system; structural strengthening; 27 extra gallons of fuel capacity; and a 140-pound payload increase come with the package. Cruise speeds bump up to 216 knots (at 20 gph), the company says. The price of the basic conversion is \$640,000. Visit the Web site (www.onaircraft.com).

i Links to additional information about turboprop singles may be found on AOPA Online (www.aopa.org/pilot/links.shtml).

market. First, with its EA-400, a pressurized piston single, and now the EA-500—its composite-construction, Rolls-Royce-powered turboprop. This German-built airplane has yet to be certified in the United States, but has made the rounds at all of the general aviation airshows and has generated a fair amount of prospects. Walter Extra,

president and chief executive officer, says he expects to sell as many as 60 EA-500s a year once the airplane goes into production. Right now, the airplane is being fitted out and tested with Honeywell's new APEX integrated flight control system, which features three large display screens and will be standard equipment in all EA-500s.



The Extra 500 awaits U.S. certification and Honeywell's new APEX avionics suite.

The Ibis Ae270 mimics the Pilatus PC-12 in both design (except for its conventional tail) and mission capability.



Price: \$1.3 million
Engine: Rolls-Royce B17F/2 (450 shp)
Max cruise speed: 220 kt
Max range: 1,600 nm
Max useful load: 1,610 lb
Fuel capacity: 176 gal
Max takeoff weight: 4,698 lb
Orders: 10
www.extraaircraft.com/home.asp

Ibis Aerospace Ae270 Spirit

The Ibis Ae270 resembles the PC-12 in both appearance and mission capability. Built in the Czech Republic by a partnership between Czech manufacturer Aero Vodochody (best known for its L-39 and L-159 military jet trainers) and Aerospace Industrial Development Corporation (AIDC), of Taiwan, the Ae270 has a large rear cabin door reminiscent of the PC-12's, and a front pilot door that looks rather like the TBM 700's optional pilot door.

The airplane can be configured with a five-seat executive interior, as a 10-seat commuter airliner, or set up for medevac or cargo transportation.

Like the Extra 500, the Ae270 will be offered with Honeywell's APEX integrated avionics system. European Aviation Safety Agency (EASA) certification is anticipated this month, with U.S. certification to follow sometime in the third quarter of 2005.

Price: \$2.5 million
Engine: Pratt & Whitney PT6A-66A (850 shp)
Max cruise speed: 270 kt
Max range: 1,338 nm
Max useful load: 2,819 lb
Fuel capacity: 304 gal
Max takeoff weight: 8,818 lb
Orders: 79
www.ibisaerospace.com

Grob G140TP and G160

Germany's Grob Aerospace, long known for its high-performance sailplanes and motorgliders, has come up with two single-engine turboprops. One, the G140TP, is a four-seater aimed at the personal-transport and training market. An aerobatic version of the 140TP will be certi-

The Grob G160 is versatile—it can be an executive aircraft or a cargo carrier (below).





Maule Air's M-7-420 is the ultimate short-field performer and climbout king.

fied to load limits of plus 6/minus 4 Gs. The other, the G160, is a six-seat pressurized airplane that can have an executive, medevac, or cargo-carrying interior. Both are of all-composite construction. Both the G160 and G140TP are currently in flight test; certification is anticipated at the end of 2005, and first deliveries should begin in early 2006, according to Grob. The company says it isn't taking orders until the airplane makes more progress, and is now concentrating on building a European dealer network. Pricing for the U. S. market has yet to be established.

G140TP/Utility category

Price: 1.1 million euros
Engine: Rolls-Royce 250-B17F (450 shp)
Max cruise speed: 230 kt
Max range: 1,150 nm
Max useful load: 1,212 lb
Fuel capacity: 137 gal
Max takeoff weight: 3,637 lb

G160

Price: 2.3 million euros
Engine: Pratt & Whitney PT6A-42A (850 shp)
Max cruise speed: 270 kt
Max range: 2,200 nm
Max useful load: 1,587 lb
Fuel capacity: 437 gal
Max takeoff weight: 7,275 lb
www.grob-aerospace.com

Maule Air M-7-420AC and MT-7-420

Maule Air wins the contest for lowest-priced turbine aircraft compared to others in this listing. The tricycle gear model is the MT-7-420 while the tail-wheel model, more suitable for rough fields, is the M-7-420AC.

Both models, in production for several years, can take off in 600 feet and

land in 500 feet, but Maule officials want you to know that with just a pilot aboard and a half-tank of fuel, either airplane can take off in 200 feet. After takeoff you'll climb at 2,800 fpm. It may look like a four-seater, but these aircraft carry five including the pilot. Two cargo doors mean one side of the fuselage opens up for easy cargo entry. Maule touts its negative 7-degree flap setting as improving cruise speed, and offers spring-aluminum landing gear to absorb the shock of rough strips.

—Alton K. Marsh

M-7-420AC

Price: \$450,000
Engine: Allison 250-B17-C, 420 shp
Max cruise speed: 165 kt
Max range: 480 nm
Max useful load: 930 lb (estimate)
Fuel capacity: 85 gal
Max takeoff weight: 2,500 lb
Sold: 4

MT-7-420

Price: \$470,000
Engine: Allison 250-B17-C, 420 shp
Max cruise speed: 165 kt

Max range: 480 nm
Max useful load: 900 lb (estimate)
Fuel capacity: 85 gal
Max takeoff weight: 2,500 lb
Sold: 2
www.mauleairinc.com

Quest Aircraft Kodiak

First word of the Kodiak came from missionary groups who hope to use it around the world at barely cleared, sloping, and otherwise-nasty airstrips. Built in Sandpoint, Idaho, in the northern tip of that state, the aircraft was the vision of Quest Chief Technical Officer Thomas S. Hamilton, formerly of Stoddard-Hamilton, the company that developed the Glasair line of kitplanes. He left Stoddard-Hamilton to form northern-Idaho-based Aerocet, a manufacturer of composite floats, and he retains the title of president of that company while overseeing Quest Aircraft.

The aircraft is to debut next month at the Alaska State Aviation Trade Show (May 14 and 15), where performance specifications are to be announced. It carries a pilot and nine

Quest's Kodiak can carry nine passengers plus a cargo pod.



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passengers and has a 50-by-50-inch cargo door. It can carry a cargo pod beneath the aircraft. At this writing, testing was incomplete, but the aircraft has been flown at its never-exceed speed of 180 knots. It has had 50 test flights and the company expects it to be certified in early 2006. —AKM

Price: \$1 million

Engine: Pratt & Whitney PT6A-34 (750 shp)

Max cruise speed: Still in testing

Max range: Still in testing

Max useful load: Still in testing

Fuel capacity: 320 gal

Max takeoff weight: 6,750 lb

Orders: Orders taken starting in May

www.questaircraft.com



The PAC 750XL is aimed at the skydiving market.

PAC 750XL

Built by New Zealand's Pacific Aerospace Corporation, Ltd., the PAC 750XL is currently aimed at the skydiving industry. It has a cabin the size of a Beech 18's, and the ability to take 17 jumpers from sea level to 13,000 feet, make the jump run, and return for the landing—all in 16 minutes.

—Steven W. Ells

Price: \$1.1 million

Engine: Pratt & Whitney PT6A-34 (750 shp)

Max cruise speed: 169 kt

Max range: 582 nm

Max useful load: 4,428 lb

Fuel capacity: 221 gal usable

Max takeoff weight: 7,500 lb

Deliveries: 19

www.aerospace.co.nz

ACPA

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