



Piper's Meridian

It's Not Your Father's Malibu

By Paul Richfield

Photography by Paul Brou

Piper's new Malibu Meridian turboprop is a pretty slick piece of machinery. Its look is all-business, it's easy to fly, and its Meggitt avionics are a refreshing departure from the antiquated steam gauges found in the instrument panels of most light aircraft. Some will no doubt say the Meridian is what the Malibu should have been in the first place, but it's really a different airplane.

The PA-46-500T Meridian is bigger, heavier, faster, more powerful, and at \$1.5 million, nearly twice as costly as its piston-powered cousin. From a design standpoint, the two aircraft share only their fuselage pressure vessels. Whereas Malibu pilots can meander below 10,000 feet in search of scenic views and thousand-dollar hamburgers, the Meridian is geared for speed runs above FL 180, where the capabilities of its 500-hp Pratt & Whitney PT6A-42 are best realized.

"The missed approach to a holding pattern is a good illustration of the difference between the Malibu and the Meridian," says one Piper employee involved with the Meridian program. "You can stay low in the Malibu, but if you do that in the Meridian, you'll be sucking fumes before you know it. It's going to take a different attitude on the pilot's part."

So who are these Meridian pilots? For the most part they're well-heeled, venturesome individuals, including more than a few Malibu, Mooney and Beech Bonanza owners. As such, Piper plans to market the aircraft as part of larger "lifestyle image" to buyers of second homes, boats and other luxury items. Dan Snell, who



Meridian owners can reasonably expect to match or beat performance numbers.



To enhance the sense of spaciousness, most of the interior edges are rounded.

left a successful stint at Harley-Davidson to run Piper's customer service effort, describes early purchasers as large-living entrepreneurs seeking maximum visibility with clients and friends.

"Time is the one commodity they can control, and the Meridian helps them do it," he says. "Early purchasers consider the Meridian an achievement, both to earn the money to buy it, and to gain the skill and knowledge to fly it. They've been doing their whole lives, and do not want to delegate the flying to a hired hand. Most won't even let their pilot friends touch the controls."

Thus, the Meridian is the latest of the "personal" turbine-powered aircraft that give non-professional pilots access to the flight levels.

Insurance coverage can be a factor when non-professionals operate at such rarefied altitudes. For example, U.S. Specialty Insurance in Addison, Texas, reports it will provide Meridian coverage, but it requires 750 hours total time and previous experience in high-performance aircraft with retractable landing gear. The company declined to furnish a quote, saying it handles applications on a case-by-case basis.

"There are questions about insurance and training as the number of aircraft in the FL 250 to 410 range increases, and we designed the Meridian with that in mind," says Chuck Suma, The New Piper Aircraft's president and CEO. "We took away fuel management in the Meridian, and soon will have new simulators at SimCom [Piper's training partner], including LOFT [Line-Oriented Flight Training] that insurance companies are likely to insist on. LOFT puts another pilot in the right seat for a specified period, and uses pass/fail training scenarios."

Meridian is unlikely to see much use as an FAR Part 135 mount. It's an expensive competitor with the used fleet. It also doesn't carry enough supplemental oxygen to meet the FAA's requirements for single-engine IFR commercial flights, and its payload



Meggitt displays are standard equipment.

capacity isn't in the same league as the Cessna Caravan or Pilatus PC-12, both single-turboprop heavy haulers. Knowing-icing certification for the Meridian was imminent as B/CA went to press.

Flying Impressions

The PT6A-42 lights easily; our test aircraft (N17PW) idled at 65.7-percent torque at first, then stabilized at 64.0 percent. The parking brake held despite the formidable thrust produced with the propeller in flat pitch, but ground operations are best conducted in the beta range to keep the taxi speed down and reduce brake wear. Headsets without noise-canceling reduced the engine noise to a dull, reassuring rumble.

The Meggitt avionics display is reminiscent of a personal computer, and offers the same type of information that is available on the EFISes found on the largest business jets and airliners. Initialization time is quick, as it is for the aircraft's dual Garmin GNS 530s. The Meridian is the first original equipment application for the Meggitt system, and according to Piper pilot Bart Jones, my supervisor on this flight, "reliability's been great."

The PT6A surges a bit as power is applied or reduced through the upper range; Jones says this apparent sensitivity is endemic to the -42 variant and Piper is exploring ways to remedy it, including modifying the throttle linkage. This is a minor issue, however, and the aircraft accelerates quickly, rotates smoothly and tracks straight on the climbout, and even straighter if a little right rudder trim is applied prior to takeoff.

Speeds at low altitudes are reminiscent of high-end piston twins and low-end twin turboprops — our Meridian was evenly matched with Patty Wagstaff's Beech Baron 55 photo platform below 10,000 feet, even at high torque settings — but the PA-46-500T pulls away handily as the air gets thinner.

Control-wise, the Meridian feels like a cabin-class twin or light jet, with none of the "Spam can" feel typically associated with aircraft under 5,000 pounds MTOW. Long wings make for firm ailerons, but overall control harmony is good. Our test aircraft was well-rigged, with predictable rudder inputs in turns and only slight trim changes needed during configuration changes. The Meridian stayed where I put it, slowly recovering in the absence of trim, and the Meggitt's digital airspeed and altitude readouts reflected pitch changes instantly.

The aircraft is just as docile with the autopilot engaged; pilots can fly it one-handed using just the heading bug controller and pitch button, though I, a stodgy Luddite, would prefer a "pitch wheel"-type system as found on most older units. As with most autopilots in this class of aircraft, turns greater than 180 degrees must be handled in at least two steps so the device knows which way to turn. Altitudes may be pre-selected and captures are smooth.



The EFIS/AHRS cockpit presents flight information in a whole new way.

Piper Meridian Specifications

B/CA Equipped Price \$1,500,000

Characteristics

Seating 1+4/5
Wing Loading 26.5
Power Loading 9.7
Noise (dBA) 72.0

Dimensions (ft/m)

External See Three-Views
Internal
Length 12.4/3.8
Height 3.1/0.9
Width 4.2/1.3

Power

Engine P&WC PT6A-42A
Output (shp) 500
Flat Rating ISA+55°C
Inspection Interval 3,600

Weights (lb/kg)

Max Ramp 4,893/2,219
Max Takeoff 4,850/2,200
Max Landing 4,850/2,200
Zero Fuel 4,393/1,993
EOW 3,286/1,491
Max Payload 1,107/502
Useful Load 1,607/729
Executive Payload 1,000/454
Max Fuel 1,139/517
Payload w/Max Fuel 468/212
Fuel w/Max Payload 500/227
Fuel w/Executive Payload 607/275

Limits

V_{MO} 187
V_A 133
PSI 5.5

Climb

Time to FL 250 16 min.
Initial Gradient (ft/nm) 837

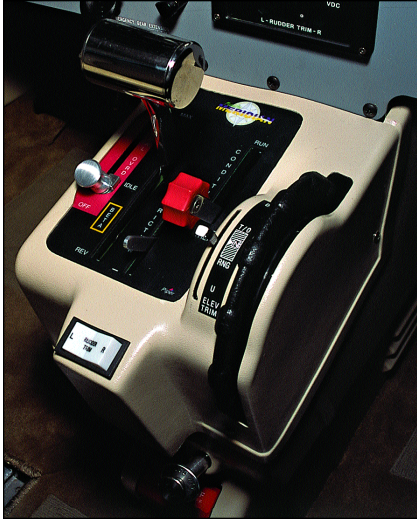
Ceilings (ft/m)

Certificated 30,000/9,144
Service 30,000/9,144
Sea Level Cabin 12,400/3,780

Cruise

Long Range
TAS 151
Fuel Flow 107
Altitude FL 300
Specific Range 1.411
HighSpeed
TAS 262
Fuel Flow 222
Altitude FL 300
Specific Range 1.180

Certification FAR Part 23A-52



Piper is exploring ways to improve throttle sensitivity.

The Meridian has spirited climb performance — according to the pilot information manual it will top 20,000 feet in a beat shy of 15 minutes on a standard day. Just remember to reduce power at level-off, or the next sound you hear will be the Meggitt's 188-knot (indicated) overspeed warning. For max cruise at 30,000 feet, you can expect 262-knot TAS while burning 222 pph.

In the pattern, the Meridian can be flown fast or slow, and the PT6A can compensate for a variety of sins. High and hot? No problem. Retarding the throttle turns the four-blade aluminum propeller into a massive speed brake — and down you go. Low and slow? A mere suggestion of power puts you back on the glidepath, but watch that -42 surge. Navy trained? Lock in that airspeed and whipsaw the throttle forward and back to your heart's content; the PT6A doesn't care. Piston driver? Forget about stage cooling, overheating, glowing turbochargers and bootstrapping — this is a turbine.

Landings are routine, and the straight leg (as opposed to trailing-link) gear quickly resolves any ambiguity over the

exact instant of ground contact. Reverse thrust is a help and will no doubt impress the natives, but remember that the engine/prop combination generates a maximum of only 310 to 360 foot-pounds of torque in reverse thrust mode (compared to 1,313 at takeoff), so be ready on the brakes if you want to make the first turnoff.

Meridian owners can reasonably expect their aircraft to match or beat its published performance criteria, since Piper eased off its test data slightly to head off litigious number-crunchers.

Although its interior is significantly smaller than that of the Pilatus PC-12 and even the TBM 700, the Meridian cabin is surprisingly comfortable with enough legroom and headroom for WWF-sized passengers. Each aircraft is custom-crafted to the customer's specifications. And "crafted" is the operant word. The leather work on the aircraft flown for this report displayed excellent handiwork, reminiscent of Coach goods.

To enhance the sense of spaciousness, most of the cabin interior edges are rounded and buttons, levers and handles are recessed. Five passenger seats are standard, but buyers can select a four-seat layout with an optional entertainment center equipped with an ice chest, stereo, VCR and flat-panel monitor.

The only shortcomings noted in the Meridian cabin were an awkward writing table, which can only be used by those occupying the two right-hand seats, and the modest luggage accommodation (100 pounds is the rear area limit.)

Overall environmental controls were easy to use, pressurization has a 5.5-psi maximum differential and the 72.0 dBA cabin noise level was lower than expected and quieter than the TBM 700 (76.2 dBA) and the PC-12 (74.3 dBA).

Building the Meridian

It all begins with "airplane eggs," Piper's term for huge rolls of sheet aluminum that



The clamshell door makes cabin access easy.

enter through one side of the company's Vero Beach, Fla., plant and emerge from the other side as finished flying machines. Construction is by traditional means; parts and structures are built up in jigs in a logical sequence and installed as needed. Piper's goal is to move toward the "integrated product team" approach, which gives small groups "ownership" of entire substructures.

Molly Martin Pearce, Piper's marketing manager, says the factory is in the midst of a comprehensive upgrade in technology, and recent additions include a multimillion-dollar Finn Turret Punch and other computerized milling machines. A new Stretch Press enables the construction of complex shapes on both sides of a part, and some plastic parts, like cowling pieces and fairings, can now be crafted from aluminum using the new tools.

Older machine tools are in abundance, however, and many earn their keep every day. Others, including a vast number of

Piper Meridian



construction jigs, are retained to build parts for the 100,000 aircraft Piper continues to support in the field. With all components, bar codes are used to track who built what, in case a problem crops up with a particular person, part or process, and a team of industrial engineers patrols the factory floor in search of bottlenecks.

Piper does far less outsourcing than many other OEMs, even going so far as cutting and finishing the leathers and woods used in aircraft seats and interiors: “[interior supplier] Nordam does some of the moldings, we do everything else,” Pearce says. Technical representatives from Garmin, S-TEC and other suppliers are on site as well, to resolve issues quickly.

Piper has suspended Malibu Mirage production while it gets the Meridian line going, though it plans to build 30 Mirages in the second half of this year. Of the 542 aircraft Piper plans to build this year, 114 will be turboprops.

Light aircraft production takes place in another area of the plant. Piper’s most

popular model this year is the venerable Archer (120 are to be built), followed by the Saratoga TC (89) and the Seneca V twin (50). Chuck Suma says the next five years will be “critical” in determining Piper’s future. Plans for an initial public stock offering have been back-burnered, at least for now. Success with the Meridian could lead to a jet, but only as part of a joint venture, Suma says. Development of a new twin will hinge on the company’s ability to make the \$250 million to \$300 million investment needed to see an original design through to fruition.

“We’re exploring markets above and below our current product line, including the growing sport aviation market,” Suma says. “A stretched Meridian is not likely, due to the cost of moving the wing spar box, but we are looking at ways to use the new turbine engines, the Williams Turboprop and the [Pratt & Whitney Canada] PW600, and for these you need a pressurized cabin.”

Suma says people often ask him about restarting Navajo and Cheyenne production, but a study Piper undertook in 1995 revealed a market that didn’t justify the cost of such an undertaking. Though many piston twins are nearing the end of their operational lives, Suma believes used Beech 1900 turboprops will fill their role in freight operations and third-level carriers in remote parts of the world.

Closer to home, talk of an imminent downturn has been the source of much speculation. “We saw big problems with the economy when the first Meridian deposits came due, but this turned out to be a non-issue,” Suma says. “Actually, we’ve found that people tend to put their money into hard assets when the market tanks — homes, boats and aircraft.”

Piper’s newest offering, the Meridian, is also the company’s most expensive. Time will tell how well it performs as an asset. But its performance as a flying machine is strong and has its makers hopeful about what lies ahead. **B/CA**

Shop Talk By Dave Benoff

General maintenance for the PA-46-500TP Meridian has been simplified by the bonding of the all-metal fuselage and multi-sectional wing. The process is performed in an autoclave and causes the ribs to permanently adhere to the structure. Advantages of this type of construction include decreased weight because of the lack of rivets and increased strength. The main drawback comes when any major structural repair is necessary.



“Since the skin is bonded, you can’t drill out rivets and replace sections,” said Rick Davis, Piper’s technical support specialist. “The wing is built in three sections and you would have to replace the damaged portion.”

The aircraft is designed to readily accommodate inspection and maintenance of its mechanical flight controls and components. However, technicians will need to work with care on the engine fire detection system. The “Fenwal” style continuous-loop single wire detector can easily be damaged.

“The loop is delicate and very brittle. You need to be cautious when pulling fuel filters, nozzles or igniters,” said Davis.

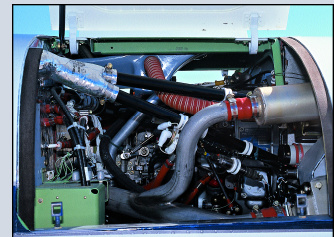
The least mature system on the Meridian is the Meggitt Avionics Next Generation Integrated Cockpit (MAGIC) system. Used as the primary EFIS/AHRS cockpit display device, the MAGIC system is new to Piper products. It presents all of the information obtained from the sensors and receivers and processed by the Data Acquisition Unit (DAU), an analog-to-digital converter. The devices monitored by the DAU include torque, ITT, Np, Ng, Vac, oil temperature/pressure, OAT, transponder, ADF, autopilot, DME, GPS/NAV, marker beacon, radar altimeter and overspeed aural warning.

The Meridian’s powerplant, the Pratt & Whitney PT6A-42A, was derated to 500 maximum takeoff shp at 1,313 ft/lb.

“We chose the PT6 because we knew the engine was ‘bulletproof’ when it comes to maintenance,” said Davis. “The PT6 line already had a great

Piper history when we used it on the Cheyenne IIIA.”

The Pratt engine comes standard with Exxon 2380 oil, but can operate on five other alternatives as per P&W Service Bulletin 3001. Hot-section inspection for the PT6A-42 is performed at 1,800 hours and can be accomplished on the wing through borescope inspection, a capability that reduces engine/aircraft downtime. Currently, the TBO for the engine is 3,600 hours. The aircraft operates under a 100-hour progressive inspection program, but the Meridian comes standard with an Engine Condition Trend Monitoring (ECTM) system that will allow operators to use an “on-condition” engine inspection program. Data can automatically be downloaded using a laptop computer, and Piper provides one year’s worth of free trending through the Trend Group.



“We are hoping that operators take advantage of this program and continue using the trending program with either the Trend Group or directly with Pratt,” said Davis.

Regarding maintenance, Davis said the most important thing is to follow the manuals and adhere to scheduled inspection periods. In addition, lubrication of the flap tracks and nose gear is especially important. After discovering that operators were washing off the grease and that the nosewheel was not getting the same loads as the mains, Piper recommended operators use Mobil 88’s red grease.

Piper says Meridian maintenance costs are not yet confirmed, but estimates from multiple sources were \$58.00 per flight hour for powerplant overhaul, \$48.30 for labor per flight hour and \$30.00 per flight hour for parts. Cost savings can vary depending on variables such as the optional Pratt & Whitney Eagle Service Plans (ESP) and the on-condition inspection program.