



# PIAGGIO AERO

A turboprop with the soul of a jet

# AVANTI II

A thing of surpassing beauty and great speed,  
the P.180 Avanti II has a little secret: Flying it is a real bargain.

BY Robert Goyer PHOTOS Piaggio and Matthieu Carlin

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here's a phenomenon in biology called **convergence**, whereby different animals starting in different places over time somehow wind up looking very similar. The same thing happens with aircraft. Convergence is behind the fact that many twin-engine bizjets born from different companies on different continents look as though they were hatched in adjoining nests. This is not, I should emphasise, what has happened with the Piaggio Aero Avanti II. With its rounded fuselage, canard-like wing design and pusher turboprop engines, it looks nothing like the light jets with which it competes. In aviation, one typically speaks in absolutes at one's own peril, but I think I'm on solid ground with this one: the P.180 Avanti II is the most distinctive, high-end personal transport machine on the planet.

The important thing to remember here, though, is that as much as it looks like it, the aircraft was not created simply to look cool. Its industry-standard-defying design choices all have practical, easily enumerated benefits that prove that the shape is not for show. Well, at least not just for show. The Avanti is the fastest aircraft in its class, though that's not a fair fight, as the aircraft is, in all honesty, in a class of one. There are very few turboprop, business class twins in production, and the Avanti is around 80 knots faster than the fastest of those competitors (a fact that might make one wonder at the meaning of the term 'competition'). And the truth is the aircraft doesn't really compete with King Airs as much as it competes with Citations and Premiers and Embraers. It is a turboprop with the soul of a jet.



#### Jumbled history

For as solid and coherent a product as the P.180 Avanti II is today, its history is surprisingly jumbled. Initial design studies for the aircraft were begun in 1980, and a lot of early work was shared by Learjet, a relationship that did not last but which conferred numerous design characteristics, such as the ventral fins and, more importantly, a commitment to speed, upon the Avanti. The Avanti was initially certified in 1990, and the P.180 Avanti II, a big improvement in a number of ways, earned approval in 2005. Today, Piaggio Aero is owned by a consortium of international concerns, including Ferrari, another Italian brand that is all about speed and style.

When the original Avanti was introduced in 1990, it came onto the scene in the wake of a lot of hoopla—and subsequent disappointment—over canard and canard-like aircraft. Although I won't go into the tortured specifics of canard designs—it is one of the testiest subjects in aerodynamics—suffice it to say, a canard is essentially an aircraft with a small stabilising wing mounted at the fore of the aircraft and a larger main wing rearward of that. Though canards have been around since near the dawn of flight, in the 1960s Burt Rutan's homebuilt canard designs set off a wave of excitement over the canard configuration and, by the way, composite construction. For the record, the Avanti is not a full-fledged canard... or a composite aircraft for that matter either. On the subject of composites, the P.180 Avanti II is built about 90 percent out of metal. The aluminium skins are formed in a vacuum mould to create the beautiful complex curves of the fuselage. I only bring up the issue of composites because another famous canard-like aircraft, the Beech Starship, was built of composites (largely carbon-fibre) and suffered an ignominious production and post production life—only a handful are flying still.

To the untrained eye, the Starship, designed by Rutan, and the Avanti might seem similar, but

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The location of the wing far aft allows for the huge cabin that is a principle part of the P.180 Avanti II's identity.

their differences couldn't be more dramatic. As I said, the Piaggio is a conventional sheet-metal construction design, and in this case (as in most cases) this choice saved a great deal of weight. The Avanti's aerodynamic configuration is different, too. Unlike the Starship, the Piaggio pusher has a tail, and its main wing is fitted with ailerons and big flaps. The small forward wing is basically a stabilising and lifting device that allows the use of a substantially smaller tail than would otherwise be necessary. Perhaps the most important difference, though, is in the success of the two models. The P.180 Avanti II has sold nearly 200 copies, and as time passes, it looks ready to take on the jet world for at least the next decade, perhaps for a couple more. The Starship, on the other hand, is a footnote.

#### Cabin Class

The location of the Avanti's wing far aft allows for the huge cabin that is a principle part of the aircraft's identity. Because the wing structure passes through the fuselage aft of the cabin, the P.180 Avanti II's passenger enclosure can be very large, and it is, with a 5'8"-tall, aisled cabin. Piaggio refers to it as a stand-up cabin and rightly so: It is nearly a foot taller than some of the competition. This height allows for much easier entry, exit and moving about enroute, not to mention a feeling of space that small bizjet owners must typically pay millions more to obtain. At better than six feet in width, the Avanti's cabin is also quite wide, allowing for excellent shoul-

der and headroom. In fact, in terms of cabin size and amenities, the aircraft can be compared more directly with mid-sized jets. The cabin features a full lavatory with a solid sliding door, one or two snack/beverage centres, and a pair of hide-away desks. It is truly a spectacular cabin for any light jet... or, in this case, turboprop. And with extensive soundproofing and vibration damping, the cabin comfort is very good for a turboprop.

A look at the shape of the fuselage reveals that it is widest and tallest where the passengers are seated and narrowest and shortest at the front and rear. The 44-cubic foot baggage compartment is located behind the wing, along the fuselage. The air-stair door is an amalgam of popular designs, utilising a side-opening upper section and a stair for the lower section.

With the advent of the P.180 Avanti II, the cabin is world-class in style as well as size, with fine materials and large seats that recline, swivel and shift outward for maximum passenger comfort. A variety of cabin layouts, including one with a side-facing divan, are available.

And with a pressurisation differential of 9.0, the P.180 Avanti II can maintain a sea-level cabin up to 24,000 feet, an altitude where many flights are flown. The P.180 Avanti II gives passengers a very comfortable environment, which is especially welcome on longer flights. Up front the P.180 Avanti II enjoys a thoroughly modern avionics suite. The flat-panel LCD Collins Pro Line 21 package in the Avanti gives its pilots not only great displays but a wealth of the latest safety tools, including moving map with satellite weather (where available), obstructions, traffic, terrain and more.

The cabin features a full lavatory with a solid sliding door, beverage centres and a pair of hide-away desks.





WITH ITS ROUNDED FUSELAGE, CANARD-LIKE WING DESIGN AND PUSHER TURBOPROP ENGINES, THE P.180 AVANTI II IS THE MOST DISTINCTIVE, HIGH-END PERSONAL TRANSPORT MACHINE ON THE PLANET.

#### **Turboprop Advantage**

Because of the high price of fuel, business aircraft owners, like everyone else, are paying ever increasing attention to costs. And turboprops, while they have their disadvantages, including higher noise, vibration and a notable lack of sex appeal, are hands-down cheaper to operate than jets. For Piaggio this has been a good thing. The aircraft is undeniably sexy, and Piaggio designers have done an impressive job of making it quiet and smooth. So, instead of the turboprop engines being a feature that Piaggio has to defend, they are in fact one of its strongest selling points.

The cost and performance numbers are compelling. The Avanti, thanks in large part to its long, very narrow-chord, whisper-thin wing, is by far the fastest production turboprop. Moreover, its Pratt & Whitney Canada PT-6 engines are far more efficient at lower altitudes (in the mid- to high 20s) than are jet engines (though jets win out at higher flight levels, where the air is thinner and props are less efficient). It is in the mid-20s, however, that many regional distance flights - those of from around 500 to 1,000 miles - are flown, and it is here that the Avanti has clear advantages, flying at speeds that rival those of light jets while burning a great deal less fuel.

Indeed, the PT-6s burn between 30 and 40 percent less jet fuel than the turbofan engines on com-



## Piaggio Avanti II Specifications

**Basic equipped price** US\$ 7,195,000

**Variable Hourly Price** US\$ 1,171

### PERFORMANCE

**Max cruising speed** 745km/h / 402kts

**Max range (NBAA, IFR)** 2,722 km / 1,470nm

**Take-off run (SL, ISA, MTOW)** 869 m / 2,850ft

**Landing run (SL, ISA, MLW)** 872 m / 2,860ft

**Ceiling** 12,437 m / 41,000ft

### EXTERNAL DIMENSIONS

**Length** 14.41 m / 47.28ft

**Height** 3.98 m / 13.06ft

**Wingspan (including winglets)**

14.03 m / 46.03ft

### CABIN

**Crew and passengers** 1/2 + 6 (VIP) to 9

**Height** 1.75 m / 5.74ft

**Max width** 1.85 m / 6.07ft

**Length (without cockpit)** 4.55 m / 14.93ft

**Cabin volume (not including cockpit)**

10.62 m<sup>3</sup> / 375cu ft

**Aft baggage compartment volume**

1.25 m<sup>3</sup> / 44,15cu ft

### ENGINES

2 x Pratt & Whitney Canada PT6A-66B

**Power** 1630 shp (flat rated at 850 shp)

### AVIONICS

Rockwell Collins ProLine 21

### LIMITATIONS

**Max takeoff weight** 5,489 kg / 12,100lbs

**Max landing weight** 5,216 kg / 11,500lbs

### TYPICAL TRIP

Paris – Moscow 3 h 46'

Berne – Izmir 2 h 45'

Friedrichshafen – Billund 1 h 20'



parably-sized jets. Consequently, the direct operating costs (what you pay to fly, not to own, the aircraft) are a great deal lower than for jets, too, around 33 percent lower, according to Piaggio. Thanks to the speed of the aircraft, the aerodynamically-efficient design and the latest generation Pratt engines, the P.180 Avanti II burns around 25 percent less fuel on a per-mile basis than other twin turboprops. The Avanti II also has some features more common on jets, including single-point refuelling, which greatly quickens turnarounds, and heated leading-edge ice protection instead of pneumatic boots. While there are several separate fuel tanks—the very thin wing holds relatively little fuel—fuel management is easy for the pilots, as the fuel system takes care of the fuel feed automatically.

### Fast and Long Legged

Size is great, but the reason that Piaggio can sell its aircraft against jets is that the P.180 Avanti II is very fast. With a top speed of nearly 400 knots (398 knots, or 458 mph), it can fly at the same speed or faster than many jets and does it on a lot less fuel. Two of the very nice jets in the same general price range—around \$6.5 million—as the P.180 Avanti II, the Cessna Citation CJ3 and the Beechcraft Premier I, are both a little faster, but both burn a great deal more fuel than the Piaggio. Range is another strong suit of the P.180 Avanti II. From London, for instance, all of Western Europe is within easy non-stop range, and Lisbon, Oslo, Reykjavik and even Tunis are within the range ring. From Paris, it's even a better fit. And for Middle Eastern flyers (who, granted, aren't typically as concerned about fuel costs as other business aircraft users), the P.180 Avanti II puts the entire region within easy reach. In the United States the P.180 Avanti II has proven a very popular charter and fractional aircraft, as it gets to the best destinations often within minutes of its turboprop competitors, for a great deal less cash.

As I said, the P.180 Avanti II is truly in a class of its own. It is, doubtless, the beneficiary of some historic good fortune. High fuel costs, a renewed appreciation of the benefits of turboprops and the realisation that cabins as luxurious as the P.180 Avanti II's don't grow on trees, have all contributed to the aircraft's solid hold on a surprisingly robust market: one for a beautiful, sophisticated mid-range light jet with a world-class cabin that, oh, by the way, isn't really a jet at all. ■

