



## Flying Catfish?

Piaggio's P180 Avanti is an Italian twin turboprop of unconventional design. In addition to its pusher engine configuration and constantly curved fuselage, it incorporates two main lifting surfaces, plus a T-tail. Piaggio says the fuselage design and patented combination of three lifting surfaces result in a 34-percent drag reduction versus comparable airplanes.

The three-surface design enables the high aspect-ratio main wing to be placed well aft, outside the passenger compartment. The forward wing, meanwhile, is designed to stall before the main wing, producing a nose-down pitching moment. It's equipped with flaps, which deploy with those incorporated into the main wing.

By incorporating a more-or-less conventional tail, Piaggio's engineers were able to build high-lift devices into the main and forward wings. In a two-lifting-surface—or "pure" canard—design, building high-lift devices like flaps and slats into the main wing places the forward wing at a disadvantage since its lift coefficient must always be greater than the main one. The P180's configuration allows both wings to generate lift and minimizes the need for downforce produced by the tail, minimizing drag and increasing efficiency.