Dubbed ‘one of the few truly new aircraft since the Wright Brothers’ by The New York Times, the oddly configured FanWing, which employs an arrangement of wing rotors to obtain lift and propulsion, made its first public demonstration at the annual ParcAberporth Unmanned Systems event this year. The debut flights that week exhibited both fast take-off and stable cruise performance, attracting attention that has since spread worldwide. It seems that the innovative aircraft technology may provide not only unmanned surveillance applications, but also potential solutions to aviation noise, land-use and fuel concerns.

Winner of a Saatchi & Saatchi prize for innovation, and peer nominated for other prizes, Pat Peebles, the self-educated inventor who conceived and then single-handedly developed the FanWing, originally had a vision of creating lift and thrust by transferring the work of the propeller to the wing. After years of experiments he finally set horizontal fans into the leading edge. It’s not the first attempt to use cross-flow fans for flight, as Professor J. M. R. Graham from London’s Imperial College commented to Newsweek: “Many people have tried. The fact remains that it works.”

How does it work? Air is sucked in by the fan, accelerates, and is ejected behind the fan, producing lift and thrust. The large propeller wings are left empty, making the FanWing lighter than its conventional competitors.

It is rare that something totally original that could completely change our perception of normal flight invades the aerospace industry. That time has come: the FanWing has landed.
**FAN TIME**

It has taken more than a decade for the FanWing concept to take off

1995/6: Earliest tests used a swinging-arm rig with the basic wing design as a ‘paddle wheel’ in the wing slot. Before giving up on the design, a cross-flow fan rotor was inserted.

1997: A wind tunnel was loaned by the University of Rome using a model then loaned to Imperial College London, where it was tested as a basis for two M.Eng theses.

2001: Construction of a specialist wind tunnel.

2002: The wind-tunnel model was designed with a variable wing shape, achieving improved efficiency from 20G/W to 30G/W of lift.

2005: The vectored-thrust model used a primitive balance and a manual tethers system to measure vertical thrust with horizontal flight tests to test hover and stability.

2008: The latest VT model has an on-board data logger to measure speed, altitude, climb rate, rotor rpm, engine temperature and control surface deflection.

2008+: Plans are to construct a larger wind tunnel model (40cm diameter rotor x 2m span) with moveable wing surfaces and different rotors for rotor optimization, in conjunction with CFD analysis. (CFD on such an unusual technology has not produced reliable results so far.)

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Dikla Peebles is a founding director of FanWing

Below: FanWing principle of flight. Pilot Mark Easey before his first FanWing flight, ParcAberporth, West Wales Airport

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