



NOT JUST

HOT AIR

Forget the Goodyear blimp.

The race is on to launch a new breed of game-changing hybrid airship

and Britain is leading the way, as easyJet pilot **Robin Evans** reports

IN A GIANT HANGAR IN BEDFORDSHIRE, A GREAT BRITISH SUCCESS STORY IS GETTING READY TO FLOAT.



The giant, bulbous Airlander 10 stole column inches worldwide when it was unveiled in August 2016. A hybrid airship – fusing airship, helicopter and fixed-wing technology – it has the ability to remain airborne for up to three weeks and land almost anywhere, including on water, with the potential to change the face of aviation.

“Just as easyJet was a disruptor more than 20 years ago, we think we can change the industry,” says Chris Daniels, of Hybrid Air Vehicles (HAV), the decade-old company behind the Airlander, the world’s largest aircraft, which continues testing this year, with plans to

A BRIEF HISTORY OF AIRSHIPS

1670

Jesuit Father Francesco Lana de Terzi publishes a description of an Aerial Ship, with four copper spheres



1852

French engineer Henri Giffard builds the first steam-powered airship, or dirigible, travelling 27km from Paris to Elancourt



A very big craft

At 92 metres long, the Airlander is as long as a regulation football pitch. That’s short, though, compared to many of the Zeppelins of the 1930s, which were up to 245m long.

launch production models in 2019. “There’s this huge potential market: a really interesting open space, with no rules and no incumbents.”

Airships have been used since Victorian times, having had their golden era in the 1920s and 30s, when belief in them was such that the Empire State Building was built with an airship mast. This new breed however, of which the Airlander is leader of the pack, is a giant leap from the Zeppelins and Hindenburgs, which relied purely on flammable hydrogen for lift. “Traditional airships have a lot of problems,” says Daniels. “They’re heavily affected by wind and weather and, because they’re lighter than air, are difficult to land, requiring a lot of ground crew.”

Hybrids, like the 92m Airlander, though, are relatively low-maintenance in terms of infrastructure, personnel and fuel. Some 60% of the Airlander’s lift comes from its inert lifting gas helium, with the rest produced by a wing-like shape and turbocharged diesel engines. It flies low and quietly, at a sedate maximum speed of 158km/h, burning less than a third of the fuel of large aircraft, even when carrying its full 10-tonne payload.

What’s enabled it are key technological advances such as commercially available helium, computing power and composite materials, like the Airlander’s ‘double-bubble’ hull fabric, developed from a NASA spacesuit and America’s Cup sail technology. “You get all the efficiencies of a traditional helium airship, but with much more control,” says Daniels. “People have been trying to do this for a century. It’s only now that technology has caught up with the ideas.”

HAV isn’t alone in chasing the dream of a commercially viable hybrid. Many companies are attempting to get similar aircraft to market, most notably American aviation giant Lockheed Martin’s LMH-1. Though hybrids cost around €29m each, independent analysis suggests a \$50bn (approx €46bn) market.

The scope of the aircraft is almost endless, from beaming 5G signals across music festivals, to search-and-rescue missions, disaster relief and lifting heavy infrastructure, supplies or medical equipment to wilderness areas. Amazon has revealed plans to use them as mobile platforms to launch fleets of drones. Enquiries at HAV have come from,

PEOPLE HAVE BEEN TRYING TO MAKE AN AIRCRAFT LIKE THIS FOR A CENTURY – NOW TECHNOLOGY HAS HELPED US FIND THE ANSWER



1883

French adventurer Gaston Tissandier fits a Siemens motor to an airship, creating the first electric-powered flight



1900

The game-changing Zeppelin LZ-1, created by German ex-general Count Ferdinand von Zeppelin, makes its first flight



Hello, slow travel

The Airlander 10 can fly around the world twice, if it flies at its top speed of 92mph for three weeks. That means it can go more than five times further than the world’s longest passenger flights. Iron Maiden front man Bruce Dickinson, an aviation enthusiast and entrepreneur who has invested in the Airlander, has said he wants to “get in this thing and fly it pole to pole.”



among others, the police and military, while Straightline Aviation, vying to be the first operator to deploy the hybrid, suggests that Alaska and Canada’s Northern Territories are a prime target within the oil and gas industries.

There’s also potential for luxury tourism: flying low, with the option of opening the windows, the hybrid might be perfect for safaris or panoramic Grand Canyon tours.

I was introduced to the Airlander four years ago, when I met my musical hero, Iron Maiden’s Bruce Dickinson, at an aviation event. We share passions for rock and aviation (he flies the band on world tours in a customised Boeing 747, and owns an aircraft maintenance business), but in our brief conversation he just wanted to talk about this new kind of aircraft that he’d invested £250,000 (€290,000) in. It’s not the first time that rock and airships have collided. In the 60s, The Who’s Keith Moon allegedly told

fellow band The New Yardbirds that their brand of English psychedelia would go down like a lead zeppelin. Guitarist Jimmy Page took the name, if not the sentiment.

By chance, the Airlander was being built and tested at the Cardington Hangars in Bedfordshire, near my home. I’d been aware something was going on there and since going to see the site, I’ve become fascinated. Cardington is a special place: its giant Hangar One – 100 years old this year – produced the first British airship in pursuit of a dream to connect the Empire. Today, it sits on a skills corridor for industry, taking the dream to the world.

I discovered I was latching on to an aviation quest that’s been burning for nearly a century. Roger Munk, founder of HAV, was a former naval architect who had spent 40 years studying hybrid technology, making a series of technical breakthroughs. He was inspired

At 92m long, 43.5m wide and 26m high, the Airlander 10 is currently the largest aircraft in the sky, though plans are already in the works for its big brother, Airlander 50

1914-17

German, French and Italian forces use airships for surveillance and bombing during World War I



1928-37

The LZ-127 Graf Zeppelin becomes the first commercial transatlantic flight service and travels over a million miles





in part by the great British aviation designer Barnes Wallis, best known as the inventor of the World War II bouncing bomb, who also designed the R101 airship of 1929. Here were two pioneers sharing a unique skill set: scientific brilliance, unshakeable persistence and the belief to dream big, with the torch passing from one to another in the 1970s.

Munk died in 2010, but his dream lived on: HAV had already won \$500m from the US Army to develop the Long Endurance Multi-Intelligence Vehicle, a design that would become the Airlander. HAV has since received funding from the EU and UK governments, as well as significant crowdfunding and private contributions, like Dickinson's. "We're simply way ahead of the competition in terms of funding," says Daniels.

Last August, the Airlander 10 (there are also plans for an Airlander 50, which can carry 50 tonnes) made its maiden flight over the fields of Bedfordshire, watched by crowds of locals. It sustained damage on its second outing, the result of an arduous test schedule designed to push the envelope – but this is now rectified and it's ready to fly again.

Meanwhile, the Airlander's competition is fierce. Mike Kendrick, cofounder of Straightline Aviation, is intending to be the debut operator of the rival Lockheed Martin LMH-1, which has a 20-tonne payload. He says that deployment could begin as early as 2018. Kendrick is an interesting character himself: he grew up on

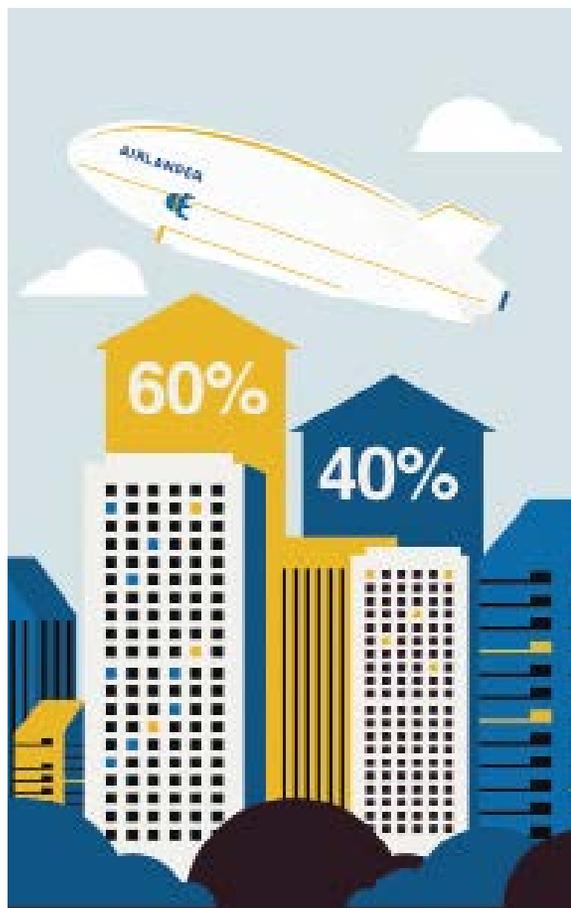


1937

The explosion of Zeppelin's Hindenburg airship kills 36 and ends a golden age

1942-45

The US Navy builds 154 airships as effective convoys for ships during WWII



How it flies

60 per cent of the Airlander's lift comes from helium. Most of the rest comes from its aerodynamic wing-like profile, helped where needed by V8 diesel engines.

1930

The Goodyear blimp *Defender* becomes the first airship to carry a lit neon sign



1980

British airship pioneer Roger Munk creates the Skyship 500, the first using polyester materials



2006

US aviation giants Lockheed Martin debut the experimental P-791 hybrid airship



2018-

Game-changing hybrid airships to go into mass production?

IT'S A DISRUPTIVE TECHNOLOGY THAT COULD BE A WIN FOR CONSUMERS AND THE PLANET



These new airships could transport freight around the globe faster than ships and at a lower cost than planes. - Paul

The Airlander 10 comes in to land after its maiden voyage on 17 August 2016, watched by a crowd of Bedfordshire locals

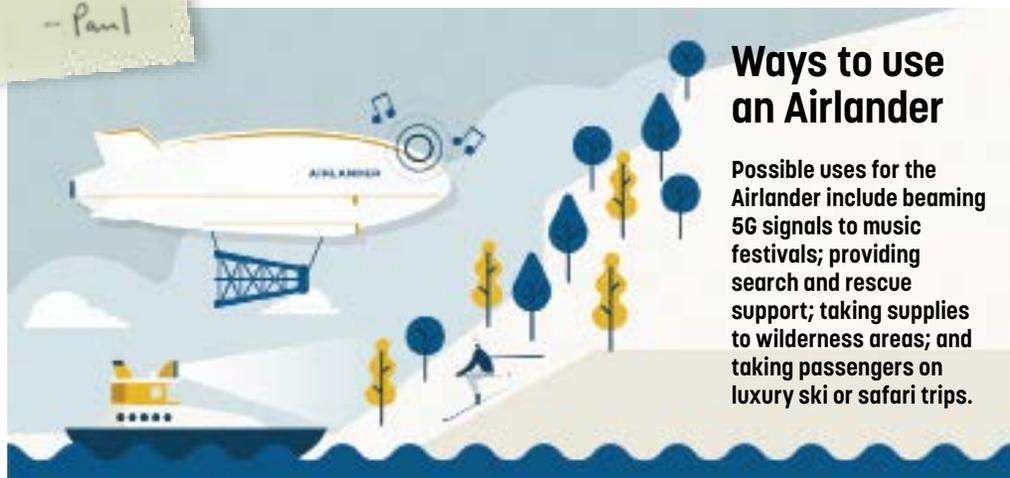
a Wolverhampton council estate and went on to become a pioneer in balloon advertising, set assorted ballooning records and become a friend and business partner to Richard Branson.

It says something that a man as savvy as Kendrick has put his heft behind the hybrid. "I like disruptive technology that can deliver great benefit to the customer and ultimately the consumer and the planet," he says. "Not just a win-win, but a win-win-win. Look at disaster relief: with a hybrid airship, you can get cargo and medical supplies in and switch communications back on."

Daniels questions Straightline's time claims. "Lockheed Martin is a fearsome competitor, but other companies have at least a three-year journey to catch up to where we are."

Whoever wins the race, these giant craft are set to change the world's skies and history will have been made, thanks to some buoyant British ingenuity. Keep looking up.

Robin Evans is an easyJet pilot and STEM ambassador for Hybrid Air Vehicles. Join the Airlander Club at hybridairvehicles.com



Ways to use an Airlander

Possible uses for the Airlander include beaming 5G signals to music festivals; providing search and rescue support; taking supplies to wilderness areas; and taking passengers on luxury ski or safari trips.