



Hybrid Air Vehicles Ltd: Long range, lower cost flight

Background

Getting from A to B is something we all take for granted. Living in the UK, we have more than 30 million cars, a well-developed infrastructure and a public transport system that works well, most of the time! Transport availability and reliability is a given.

Yet there are numerous parts of the world where this is not the case. Many industries have to deal with logistical challenges as part of the daily routine. Take oil and gas companies; much of the world's easily accessible reserves have been exploited, requiring companies to explore more remote parts of the globe for hydrocarbon resources. Not only does this add significant costs, it challenges existing technologies too. A good example of this is the operating range of many forms of air transport, such as helicopters, simply isn't big enough. This is referred to in the industry as the 'cliff of despair' and presents increasing challenges.

Transport safety is another concern. The flexibility required means that air transportation, specifically rotary wing, is used extensively for activities such as moving people to and from offshore platforms and remote locations. There is concern about the safety of these aircraft. If alternatives existed, they would be considered.

Development

These challenges have inspired Hybrid Air Vehicles Ltd to create an aircraft that offers a new transport category. Combining the best aspects of airships, fixed wing aircraft and helicopters, the Company has designed new hybrid air vehicles.



Its initial solutions address two specific applications - surveillance and heavy lifting needs.

- **Surveillance:** The need for Persistent Wide Area Surveillance (PWAS) called for an aircraft that could stay aloft for days or weeks whilst carrying a sizeable payload of equipment and operate at acceptable costs. Hybrid Air Vehicles Ltd designed and built the LEMV (Long Endurance Multi-Intelligence Vehicle) for the US Army. It can remain at 20,000ft. for up to 21 days while carrying 2,200 lbs. (1 metric tonne) of equipment. The first LEMV flew in August 2012. A manned surveillance vehicle, based on the AIRLANDER 50 is also available, offering 5 days endurance at up to 16,000 ft. with living accommodation and working space for up to 12 people.
- **Heavy Lift.** The AIRLANDER 50 is optimised for carrying cargo. It has a spacious payload module offering over 550 m3 of internal space and 50 metric tonnes of payload capacity during conventional take-off and landing. Using vector thrust, the vehicle can also be operated in helicopter mode, with a payload capacity of 20 metric tonnes. This exceeds the capability of any helicopter. A further benefit is that once the loading / off-loading has been completed, the vehicle reverts back to operating like a fixed wing aircraft, offering much lower operating costs and longer range than a helicopter.





The AIRLANDER 50 also has the following benefits:

- It is designed to be the safest aircraft. It does not stall, has slow approach and take-off speeds (45 knots), can land on any reasonable flat surface, has four engines located far apart (less risk of damage to more than one unit), and can fly on one propulsion unit. It also has the Air Cushion Landing System (ACLS) to absorb impact in the extremely unlikely case of full propulsion power failure.
- Operating costs are lower. Fuel burn is 50 – 65% less than conventional fixed wing aircraft, when compared on a tonne per mile / km basis. Fuel burn is obviously even lower when compared to rotary wing.
- Cargo flexibility – The large payload is ideal for carrying large equipment, such as drill rigs or mining equipment. It has a useful rectangular shape, large rear hatch and can accommodate a variety of containers. It can, for example, hold six 20-foot ISO containers.
- AIRLANDER 50 does not have wheels but uses the Air Cushion Landing System instead. Working like large hoverpads, it enables the vehicle to land anywhere reasonably flat, be it on land, water, ice or snow.
- Environmental benefits – the vehicle burns less fuel and has lower emissions. More importantly, it replaces more traditional infrastructure such as roads, railway lines, bridges and ports. These are carbon-intensive and have long-lasting impacts on the environment.
- Most importantly, the hybrid air vehicle offers game changer applications in both surveillance and heavy lift. Cost-effective surveillance over long periods of time is now possible. In Heavy Lift application, remote areas can be accessed and operations previously not deemed economically viable become possible.



Results:

In June 2010, Hybrid Air Vehicles Ltd. secured a \$500m order from the US Army for three surveillance Long Endurance Multi-intelligence Vehicles (LEMVs), in partnership with Northrop Grumman.

On the 7th August 2012, the LEMV successfully completed its first flight. In just 26 months the product went from 'PowerPoint to plane'.

In February 2012, Hybrid Air Vehicles Ltd was selected by Cambridge Energy Research Associates (CERA) as an Energy Sector Innovation Pioneer and presented at the prestigious CERAWEEK 2012 in Houston.

Hybrid Air Vehicles Ltd is focused on pioneering applications in the energy, mining, government / defence and logistics markets, leading the way in delivering this new technology to the market. Its next product, AIRLANDER 50, is currently in its detailed design phase. The first batch of these air vehicles will be available for commercial application in 2015.

“ The team at Hybrid Air Vehicles has re-examined the basic principles behind Lighter-Than-Air Science and applied modern technology and materials to this 100-year old concept. ”