

Airlander - Questions and Answers

1 Where can I find technical information about the Airlander?

Technical Details of the Airlander 10 are available [here](#).

Technical Details of the Airlander 50 are available [here](#).

2 What are the key capabilities of the Airlander?

The Airlander is a new and revolutionary form of hybrid aircraft characterised by:

- An environmentally friendly benchmark for air transport & logistics (between 20% and 40% of the fuel consumption and operating costs of equivalent traditional aircraft)
- Rotary wing functionality with fixed wing range combined with reduced operating costs
- The ability to operate from land or water, snow, ice, desert - no dedicated infrastructure needed
- Payload flexibility – containers, infrastructure, cargo, people and combinations
- An ability to revolutionise cargo delivery and land in most places, wherever required
- Direct end-to-end transport of cargo, without transfer delay, even to inaccessible areas
- Best in class platform for persistent surveillance
- Ability to double up as a Search and Rescue platform in hostile seas

This means the Airlander can fulfil a wide range of civilian and military applications – passenger transport, communication, cargo transport, survey and reconnaissance – without the need for ground infrastructure.

3 How does the Airlander use Lighter-Than-Air Technology to fly?

The Airlander is a new breed of hybrid air vehicle combining the best attributes of an aircraft and an airship. Buoyancy - the ability to float - is created by the Helium filled hull. As a unique part of the design, 60% of the lift is produced aerostatically by being Lighter-Than-Air and a further 40% lift is generated aerodynamically by having a wing-shaped hull. The engines can be rotated to provide an additional 25% of thrust up or down, to help landing, take-off and hover.

4 What is the payload of the Airlander?

The Airlander 10 was designed for payloads of up to ten tonnes. It would be used mostly for search and rescue, reconnaissance, communication and aid distribution purposes. The Airlander 50 has a much larger payload of 50 tonnes and is intended primarily for heavy lift and cargo transport.

Both the Airlander 10 and Airlander 50 have a long payload module, located along the centreline of the hull underside. This comprises of a flight deck with payload compartment at the fore, a mid-body payload beam for externally slung loads, and an aft section for fuel tanks and additional payloads.

5 What are the ground handling capabilities of the Airlander?

The Airlander has much better ground handling capabilities and requires far less ground crew than a traditional airship. It can land like a conventional aircraft when heavy and can power itself down onto the ground when light. In addition, each Airlander is fitted with integrated mooring mast attachment. After landing, this is connected to a mooring mast so that the Airlander is free to rotate and face the wind, similar to a weather vane. This allows the Airlander to withstand wind speeds of up to 80 knots at ground level.

Cargo can be loaded and unloaded by crane, winch, ramp or scissor lift, depending on the configuration and type of cargo. Minimal ground crew are required: two for an Airlander 10 and none for an Airlander 50.

6 How safe is the Airlander?

The Airlander was originally designed for military purposes, therefore is highly damage tolerant. The same characteristics make it an ultra-safe form of air transport for civilian roles. The hull is filled with Helium, an inert gas which is not flammable – hence it does not pose any form of risk, unlike the original hydrogen filled airships.

Being Lighter-Than-Air, the characteristics of the Airlander bring many safety benefits. It has four engines and can fly on just one. Even if all engines fail, which is extremely unlikely, it can still float or glide under pilot control.

It is more robust in hostile environments than most people would anticipate*:

“...small-arms fire is not as serious for hull pressure as it might seem. The Airlander can keep flying despite numerous bullet holes. The pressure of the Helium inside the hull is only slightly higher than the air pressure outside (approximately 0.15 psi higher), so if there is a hole, the Helium does not come gushing out, it more or less oozes out.”

* adapted from an article in Defence News

7 What is the Airlander landing system?

The Airlander 10 has abrasion resistant pneumatic skids on the underside of the two outer hulls offering multi-surface ground operation, including amphibious capability.

The Airlander 50 is designed for cargo transport in austere environments with little or no infrastructure. The integrated Air Cushion Landing System allows it to operate just like a hovercraft over land, snow, ice and even water; it can land and take off from any reasonably flat surface. Suction can also be used to ensure the aircraft remains stationary during loading and unloading.

8 How does the Airlander cope with extreme weather conditions?

The Airlander is able to operate in all weather conditions:

- Designed to be able to take off and land in winds of up to 35 knots
- 70+ knots cruising speed allows it to outrun severe weather
- Designed to survive a direct Class A lightning strike (fibre-optically signalled flight control systems reduce vulnerability)
- Has de-icing protection for the engine intakes, sensors, propellers and cockpit windows (the rest of the aircraft is not significantly affected by icing conditions)
- Equipped with weather radar, able to identify and avoid extreme weather conditions
- When moored on the mast, it can withstand ground level winds up to 80 knots

9 What materials are used in the construction of the Airlander?

The hull is formed from a laminated fabric formed from three discrete layers of advanced materials, each with a specific purpose. Vectran provides the strength, Mylar as a gas barrier to minimise Helium loss and Tedlar for the protective outer coating. The hull is fabricated from shaped pieces of the material bonded together using a special process. To provide maximum lightness, the rigid structures are manufactured from a selection of carbon fibre and glass fibre materials.

10 What cockpit instrumentation is onboard the Airlander?

The Airlander uses a Garmin G600 electronic display unit which provides standard readings of altitude, airspeed, vertical speed, side slip, navigation; the unit also includes an altitude direction indicator (ADI) and a horizontal situation indicator (HSI). A separate radar altimeter (Rad Alt) unit gives an accurate reading of height above the ground.

Airspace communication is provided by two VHF radios with standard 8.33kHz channel spacing.

Airlander navigation is provided by:

- Global Positioning System (GPS) for Satellite navigation
- Altitude and Heading Reference System (AHRS) for on-board altitude and heading references; this is also updated by the GPS
- Distance Measuring Equipment (DME) for radio navigation giving distance from navigation beacons
- VHF Omni Range (VOR) for radio navigation giving bearing from navigation beacons
- Automatic Direction Finding (ADF) for radio navigation giving bearing from navigation beacons

Airlander communication with Air Traffic Control and other aircraft is provided by a Mode S transponder unit.

Operation in all conditions requires a weather radar system to ensure the complete status of weather around the aircraft. This allows the pilot to plan evasive action in the event of an impending hostile weather system.