Airship Industries (USA) – Rigid cargo airships

Peter Lobner, 12 May 2025

1. Introduction

James Coutre founded the U.S. firm Airship Industries in 2024 in Los Angeles, CA, with the mission to "disrupt international airfreight" with autonomous, scaleable, rigid airships that implement advanced technologies and materials to greatly reduce transportation costs and carbon emissions while also opening new point-to-point market opportunities.

Rendering of an Airship Industries cargo airship design concept, stern quarter view. Source: Airship Industries (circa Oct 2024)

In August 2024, the firm announced that its management team was in place with James Coutre as CEO, Eric Wostenberg as VP Engineering - Mechanical Systems, Wes Regimbal responsible for vehicle structures and Aaron Olds responsible for guidance, navigation & control.

This is a new firm using the name "Airship Industries," not to be confused with Roger Munk's famous UK firm Airship Industries Ltd., which was a major airship designer and constructor from 1980 to 1990 and the progenitor of several other important airship firms.

The new Airship Industries website is here: https://www.airship-industries.com

2. Business case: Swift, Affordable, Clean

Airship Industries summarizes their business case as follows:

> “Airship Industries isn't just changing how freight moves—we're transforming the economics of global logistics. Our approach combines the speed of air freight with costs closer to trucking, creating an unparalleled value proposition. By utilizing uncongested skyways and autonomous systems, we minimize fuel consumption, reduce labor costs, and optimize routes for maximum efficiency. This translates to a potential cost reduction of up to 50% while slashing emissions by 75%. Moreover, our ability to bypass congested ports and deliver directly to customer sites opens up new markets and opportunities.”

Airship Industries states that they plan to utilize their talent pool, which is experienced in rapid prototyping and modern manufacturing, to develop a family of airships that meet market needs in a timely manner and can attract investors in the current favorable capital environment for aerospace and climate impact projects.

Rendering of an Airship Industries cargo airship conducting a load exchange from a hover. Source: Airship Industries (circa Oct 2024)

3. Design features of the rigid airship

Airship Industries notes that the following technological advances over the past several decades have revolutionized the potential of airships to transform domestic and international cargo transportation:

- **Advanced materials** offer 2 to 8 times the strength-to-weight ratios of the materials used in the large rigid airships from the 1930s (aluminum, magnesium and steel).
- **Modern manufacturing techniques** and computational design tools allow for optimized structural design and efficient production.
- **Autonomous systems** can minimize or eliminate the need for on-board crews while maintaining operational reliability and safety, and greatly reducing operating labor cost.
- **Hybrid-electric propulsion** allows for distributed propulsion systems that provide improved operational performance and flight efficiency and low carbon emissions.
- **AI-aided weather prediction** improves route planning and in-flight weather-related flight management.

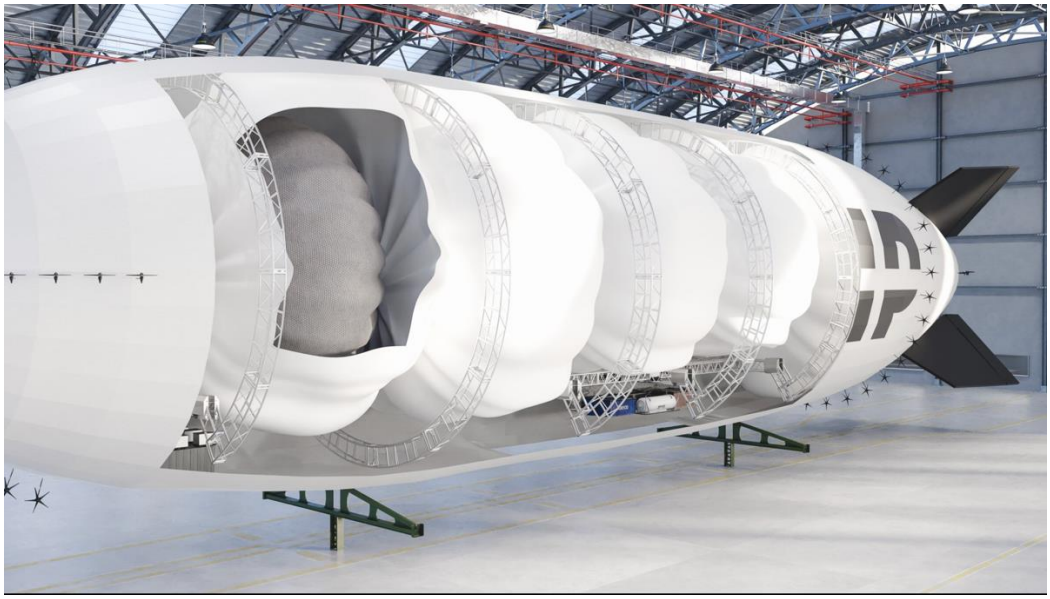
Airship Industries expects that, collectively, these features will dramatically enhance the viability of airship freight operations.

LTA Research & Exploration's Pathfinder 1 incorporates all of these technical advances and already has made its initial free flights. LTA is factoring lessons learned from Pathfinder 1 into their larger Pathfinder 3. Other rigid cargo airship competitors, including Flying Whales, Euro Airship, and Buoyant Aircraft Systems International (BASI), likely will incorporate similar technological advances in their designs, so these features will not be the market discriminators that drive an individual firm's airship sales.

Rigid hull and cargo bay

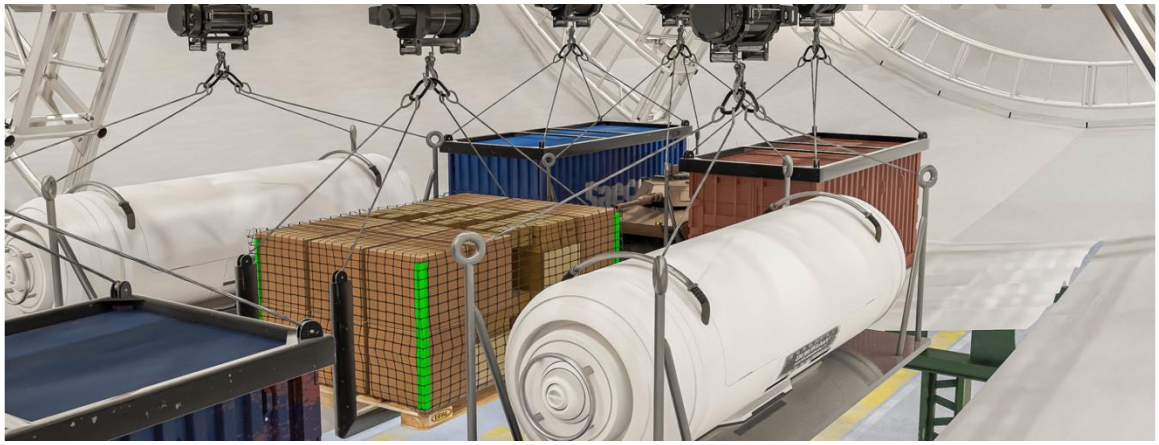
The Airship Industries airship appears to be a large Zeppelin-style rigid airship with conventional transverse ribs forming a series of hull sections, each containing a lift gas cell with an internal air ballonet.

Exterior view, aft two-thirds of the rigid hull. Note the circumferential array of micro-propulsors installed forward of the X-configured tail fins.



Cut-away diagram showing several box-girder transverse ribs and lift gas cells with internal ballonets. The midships cargo bay is along the bottom centerline. Longitudinal airframe structures and diagonal bracing cables are not shown. Source, both graphics: Airship Industries (circa May 2025)

A closer look at the transverse rib structure of the hull reveals how the cargo bay is framed by trusses that bridge the bay and support the suspended cargo loads. Source: Airship Industries (circa Oct 2024)



Heavy loads in the cargo bay are shown supported from cranes that are attached to the overhead bridge structures, which are integrated with the rigid airframe structure. Source: Airship Industries (circa May 2025)

Airborne load exchange

The new Airship Industries rigid airship is designed to conduct airborne load exchanges, during which the airship's cargo handling system will either pick up or deliver cargo items while the airship hovers above a designated site.

Unlike the CargoLifter CL160, the Airship Industries airship is not positioned with the aid of cables secured to the ground during a load exchange. Instead, it uses arrays of micro-propulsors to provide a precise, active, 3-D positioning capability. This capability may be a market discriminator, and in this respect, the Airship Industries airship appears to be a direct competitor to the Flying Whales LCA60T.

Rendering of an Airship Industries cargo airship during airborne cargo handling operations. Note the cargo bay cover is retracted during cargo handling.
Source: Airship Industries (circa May 2025)

A closer look at an airborne cargo handling operation.
Source: Airship Industries (circa May 2025)

Airship Industries has not yet described how it will conduct an airborne load exchange.

Following is a generic description of a process for conducting a load exchange from an untethered, hovering airship.

Two key functions must be accomplished during such an airborne load exchange:

- Maintain precise aerostatic buoyancy control when the airship mass changes during a load exchange.
    - Coordinated exchanges of cargo and ballast (or two cargo items) can minimize the net change in airship mass.
    - A variable buoyancy control system can negate the need for a physical ballast exchange.
- Maintain the airship in a precise 3-D spatial position throughout the load exchange.
    - Precise positioning above the x-y coordinates of the pickup / delivery site, at a specified altitude and heading.
    - Minimize pendulum motion and rotation of the load.
    - Suspended cargo not under precise control can become a hazard to people, equipment and structures on the ground, and perhaps, to the airship itself.

For an airborne pickup, the airship establishes a precise 3-D position above a designated cargo pickup site. It must be able to maintain that position in current weather conditions before the cargo handling system lowers cargo cables to the ground. When the cargo item is connected, the airship's cargo handling system takes a tension on the cables, transferring the weight of the cargo from the ground to the airship, and then lifts the cargo item into the cargo bay, where it will be secured for flight. Without increasing the buoyancy or decreasing the mass (i.e. dumping some ballast) of the airship during the load exchange, a heavy cargo item can't be lifted aerostatically. An alternative is to apply dynamic lift from powerful vertical thrusters to enable the cargo item to be lifted off the ground and secured in the cargo bay. Then, the heavy airship can fly away and, as airspeed increases, the hull generates aerodynamic lift that can carry part or all of the added weight of the cargo.

For an airborne cargo delivery, the airship approaches the designated site and hovers at a precise 3-D geo-location, altitude and heading, which it maintains throughout the load exchange. The cargo handling system lowers the selected cargo item to the ground and then must transfer the weight of the cargo to the ground so the lifting cables go slack. This requires decreasing the buoyancy or increasing the mass (i.e., taking on ballast) of the airship as the cargo is being set on the ground. An alternative is to apply dynamic thrust from powerful vertical thrusters to hold the airship down and enable the cargo cables to be safely disconnected. Then, the light airship can fly away and, as airspeed increases, the hull can be pitched to an angle that generates aerodynamic downforce to compensate for the light condition.

Distributed micro-thruster arrays for propulsion & maneuvering

The Airship Industries rigid airship is festooned with arrays of small, fixed micro-propulsors, much like the Flying Whales LCA-60:

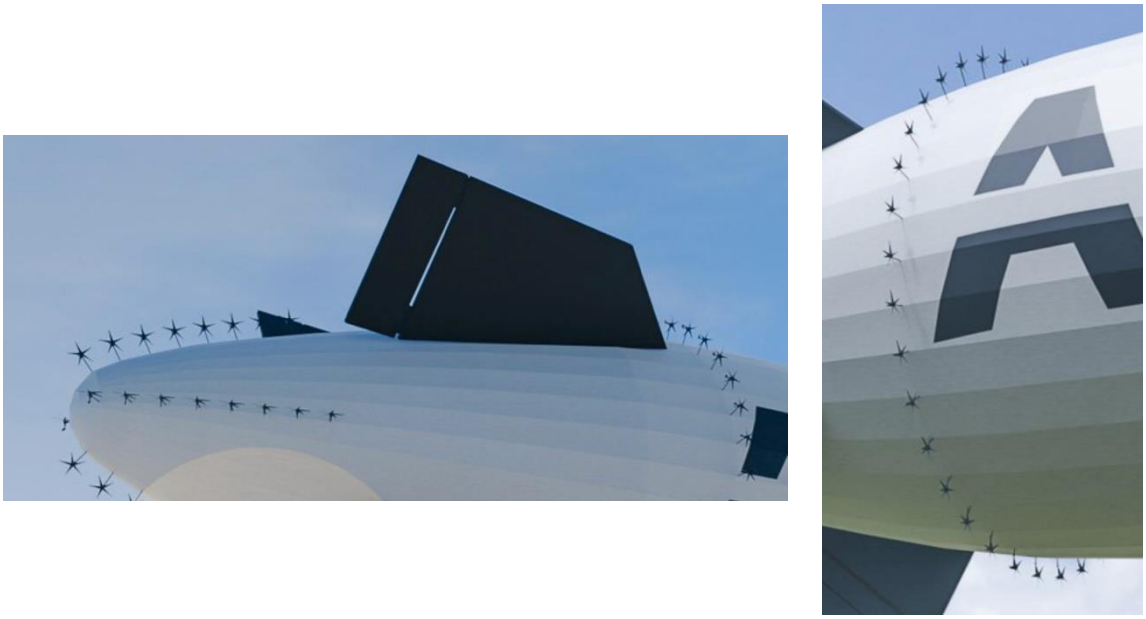
- 4 x longitudinal arrays spaced 90° apart around the bow and stern provide vertical and lateral thrust (for pitch, yaw & roll control, as well as control of vertical and lateral positioning).
- 1 x transverse array around the entire circumference of the hull, about three-quarters of the way back from the nose of the airship, for fore and aft thrust (propulsion, braking).

The arrays of micro-propulsors appear to be designed to provide precise, active altitude, position and heading control during an airborne load exchange.

Design refinements between mid-2024 and the current (mid-2025) design are evident in the following graphics: similar propulsor array locations, with fewer, larger propulsors in the latest design.

During cruise flight, ruddervators on the X-tail perform the same functions as conventional rudders and elevators.

Micro-propulsor design concept, circa mid-2024.



Micro-propulsor design concept, circa mid-2025.

4. For more information

- “Airship Industries Assembles World-Class Leadership Team to Revolutionize Air Freight,” Airship Industries press release, 27 August 2024: https://www.airship-industries.com/newsroom/airship-industries-assembles-leadership-team
- Eli Dourado, “Cargo airships are happening,” Eli Dourado blog, 14 October 2024: https://www.elidourado.com/p/airship-industries

Modern Airships articles

- *Modern Airships - Part 1*: https://lynceans.org/all-posts/modern-airships-part-1/
    - Aeros – Aeroscraft variable buoyancy airships
    - Airship Industries Ltd. (UK, 1980 – 1990)
    - LTA Research and Exploration – Pathfinder 1 rigid airship
- *Modern Airships - Part 2*: https://lynceans.org/all-posts/modern-airships-part-2/
    - Aerosmena – hybrid, thermal, variable buoyancy airships
    - Buoyant Aircraft Systems International (BASI) – MB-310, -30T & -100T rigid airships
    - Euro Airship – 10T, 50T, 400T & Solar Airship One rigid airships
    - Flying Whales – LCA60T rigid airship
- *Modern Airships - Part 3*: https://lynceans.org/all-posts/modern-airships-part-3/