

Airships

For many of us, airships occupy a sort of odd speculative space left open where materials science, aviation, engineering, computerization, and air traffic control have all improved massively while airships themselves have seen comparatively little use. That leaves a lot of room for argument and a handful of startups that promise that everything is fixed now and they can slot neatly into this low carbon, slower than planes, faster than ships, with fewer transfers, cargo or passenger niche.

The interesting thing is that airships didn't actually vanish with the Hindenburg, though there are certainly fewer examples in operation, and many of those that remained were military. Still, these airships give us some solid evidence backing up the kind of improvements we expect from massively more powerful motors, better materials, etc.

Misconceptions

The remaining hurdles are in terms of the lack of available experts and sufficient funding to undergo a years-long research and development program for a large airship, but it has long been established in World War II and the Cold War that airships can be engineered to serve as safe, practical, low-cost alternatives to conventional aircraft where speed isn't a priority.

Much in the same way we know that it is possible to build reliable, profitable high-speed rail, even if the concept of such a thing seems wildly out of reach to people in places where it doesn't exist.

Types of Modern Airship Design

This section gathers broad categories of design and intended use

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The Airship Niche

With ships, they can compete sometimes (fresh food, high-value manufactured goods, etc), with freight trains, definitely not, but trucks? The largest airships can compete with trucks in terms of cargo cost per ton/mile, and are considerably faster, in addition to their capability to carry things too bulky and/or too heavy for a truck. That won't detract from trucks' ability to transport things last-mile, of course, but there's certainly some useful applications.

Relevant Technological Advancements

What can you expect from a modern airship?

Airships actually benefit far more from electrification than other aircraft, for a number of reasons—which are many and varied, but basically boil down to the advantages of electric propulsion not being particularly helpful to airplanes and helicopters, while the disadvantages exacerbate their

greatest weaknesses.

For airships, it's the reverse—they're greatly aided by the benefits of electrification, and the disadvantages of electrification aren't particularly harmful to airships, or are even beneficial instead.

For example, airplanes and helicopters are greatly disadvantaged by the fact that batteries and fuel cells either don't lighten at all or lighten far less than a kerosene fuel tank, which can be reduced by tens of tons over the course of a flight, making it much more efficient. By contrast, airships greatly appreciate a constant, unchanging weight since that allows them to operate more efficiently without having to compensate for changes in buoyancy.

Movement Speed

Lift Gas Types, Sources, and Storage Requirements

The astronomical improvements in aviation safety would more than make up for the difference in safety between hydrogen and helium, such that a properly designed modern hydrogen airship would be incomparably safer than a historical helium one, but that doesn't change the fact that hydrogen is always going to be more dangerous.

Docking Facilities

Traditionally Airships had to dock at a mooring mast (of which there were several types) or shelter inside a hangar. This is because an airship is basically a huge sail, and is as likely to drift while not under power as a ship on the ocean. Landing them was a massive

Modern airships are considerably less picky about their landing

Realistically a lot of locations might use platforms on the ground which rotate so the airship can land and still weathervane in the wind instead of mooring masts. I've seen these called Boyant Aircraft Rotating Terminals or Depots (BARTs or BARDs).

Airships have such a light footprint they often land on completely unimproved grassy fields. They have also landed on lakes, beaches, swamps, ice floes, and aircraft carriers. Some of the new designs, such as those of Lockheed-Martin, have no ground infrastructure or crew requirements whatsoever.

Further Reading:

The best layman-accessible compendium on the various airship projects over the years, past and current, is Peter Lobner's excellent "Modern Airships" series of articles, which are given a handy index and general airship industry overview/airship science summary [here](#).

The best source for understanding airship science, economics, and design from a far more technical perspective is the [Feasibility Study of Modern Airships](#), a vast, multi-phase, multi-part study for NASA and the Department of Commerce conducted in many separate parts by Boeing and Goodyear Aerospace. These can be found on NASA's archives for free.

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Last update: **2025/11/13 03:11**

