

Skyacht Aircraft, Inc. - Personal Blimp thermal airship

Peter Lobner, updated 8 March 2022

1. Introduction

Skyacht Aircraft, Inc., located in Amherst, Massachusetts, started development of the Personal Blimp thermal airship in 2002. The Personal Blimp is a semi-rigid, foldable airship that uses hot air produced by propane burners for lift and a vectoring engine-driven propeller in the tail for propulsion. First flight of the two-person Personal Blimp #1, "Airship Alberto," was on 27 October 2006.

The Skyacht website is at the following link:

<http://www.personalblimp.com/>



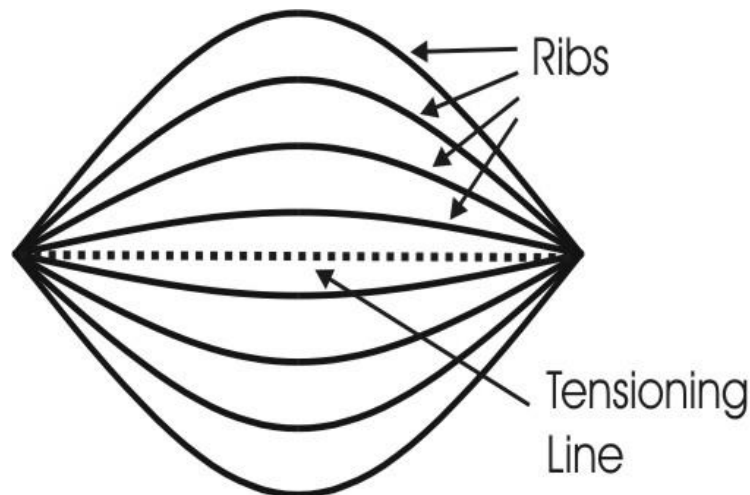
Personal Blimp "Airship Alberto." Source: Skyacht Aircraft, Inc.

2. Skyacht patent

Daniel Nachbar and John Fabel developed the foldable technology for this airship and filed a patent application for a “Lighter Than Air Foldable Airship,” in August 2002. Patent US 6793180B2 was granted on 21 September 2004. This invention is described as follows:

“A system and method for constructing an airship hull is described, comprising a plurality of flexible members disposed lengthwise about the perimeter of the airship skin. The flexible members can be held in place in sleeves on the skin of the airship. The ends of the flexible members are drawn toward one another by tensioning means, causing the members to bow outwardly from a central axis and providing a rigid structure for the skin.”

This is easier to visualize in the following diagram



Source: Skyacht Aircraft, Inc.

Skyacht describes the airship shape: “The end result (using ribs of uniform cross section) is an object roughly the shape of an American style football. Abstractly, one can think of the Personal Blimp hull as a pair of gigantic umbrellas pointing in opposite directions with their ribs running continuously and the handles of the umbrellas hooked together.”

3. Skyacht design

Basic design characteristics of a Personal Blimp are as follows:

- Length: 102 feet (31 m); diameter 70 feet (21 m)
- Maximum weight: 4,100 pounds (1,860 kg)
- Cruise speed: 10 mph (16 kph), with a 24-hp gasoline engine.
- Hot air lift gas
 - Gas envelope volume is 205,000 ft³ (5,805 m³)
 - A given volume of hot air can lift only about one-third as much as the same volume of helium
- Aluminum tensile membrane structure maintains the stiffness of the airship's nylon envelope
- The tensile membrane structure folds up like the ribs in an umbrella when the airship is not in use.
 - Skyacht claims the folded airship can fit in a 24-ft trailer.
- The tensile membrane structure supports the tail-mounted, steerable engine / propeller, which provides propulsion and vectored thrust for maneuvering
- The vectoring tail-mounted propeller provides excellent low-speed handling, even in moderate ground breeze.

The structural design on the Personal Blimp was described in New Atlas (<https://newatlas.com/go/6595/>) as follows:

“The Personal Blimp has a rigid, but folding, skeleton (much like an umbrella) to allow the envelope to retain its shape without requiring internal air pressurization. The Personal Blimp's rigid but foldable structure also provides hardpoints at strategic locations (e.g. on the tail) for mounting systems such as the engine and propeller. With the engine/propeller mounted on the tail, the Personal Blimp can use vectored thrust for steering. This provides far greater maneuverability, particularly for hovering, than any previous hot air airship.”

You'll find more details on the Skyacht Aircraft, Inc. website and you can download the document, “Personal Blimp – Thermal Airship Development,” dated December 2006 here:

http://www.personalblimp.com/press/personalblimp_overview.pdf

You also can watch as short video of a Personal Blimp in flight, making a controlled 360° turn using its thrust vectoring propeller here: https://www.youtube.com/watch?v=rRMax0s_cRg



A close-up look at the tail, showing that the engine has been rotated to the right (away from the camera), pushing the tail to the left and turns the nose of the aircraft to the right.

Source: Skyacht Aircraft, Inc.

4. For more information

- D. Nachbar & J. Fabel, “Next Generation Thermal Airship,” DOI: 10.2514/6.2003-6839, November 2003: https://www.researchgate.net/publication/249907981_Next_Generation_Thermal_Airship
- Mike Hanlon, “The sub US \$200,000 family aircraft – the Sky Yacht,” New Atlas, 12 December 2006: <https://newatlas.com/the-sub-us200000-family-aircraft-the-sky-yacht/6595/>

Patent

- Patent US 6793180B2, “Lighter than air foldable airship,” inventor Daniel Nachbar & John Fabel, application filed 5 August 2002, granted 21 September 2004:
<https://patents.google.com/patent/US6793180B2/en>

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