

SAIC - Skybus 1500

Peter Lobner, updated 8 March 2022

1. Introduction

In about 2010, Science Applications International Corporation (SAIC) developed design concepts for a family of large semi-rigid airships

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known as the Skybus 1500, which appear to share a similar airframe configuration (envelope, empennages, rigid keel with an abbreviated gondola / cockpit and engines)

and mission-specific modules that can be attached to the keel. Two design concepts were developed, the Skybus 1500E persistent surveillance airship and the Skybus 1500HL modular cargo airship. Both are described in this article.

2. Skybus 1500E persistent surveillance airship

SAIC's concept for the optionally manned Skybus 1500E surveillance airship is shown in the following graphics.



Concept drawing for an optionally manned Skybus 1500E persistent surveillance airship. Source: SAIC



*Skybus 1500E close-up view of engine layout with “push-pull” twin engine nacelles supported from the rigid keel by short pylons.
Source: SAIC*

This airship was designed to carry a payload of about 1,020 kg (2,249 lb), three times the payload of a Predator UAV, and stay aloft for up to 21 days. Surveillance mission equipment would be carried in a pod (blue, above) attached to the keel and abutting the back of the fixed gondola. Operating altitude likely was above 20,000 ft (6,096 m).

3. Skybus 1500HL modular cargo airship

SAIC senior aerospace engineer Ron Hochstetler reported that the Skybus 1500HL was designed to carry an economically useful load, but not so large that its very size magnified the engineering and construction challenges of developing and certifying the airship. This philosophy led to the selection of a payload capacity of 20 metric tons (22 tons), which was consistent with commercial demand. He said, “We reasoned that there would be a greater likelihood for a 20-tonne ship to fly with a full load most of the time..... We knew that the last

thing an aircraft operator wants to do is fly around with a partial load while still paying full hourly operating expenses.”



Renderings of the Skybus 1500HL carrying modular cargo containers (CONEX boxes, red) externally, secured by cargo-handling gear on the rigid keel. Source: SAIC



Renderings of the Skybus 1500HL flying with cargo in a remote Arctic region. Note the “push-pull” twin engine nacelles and the engine pylon configuration evident in the bottom graphic. Source: SAIC



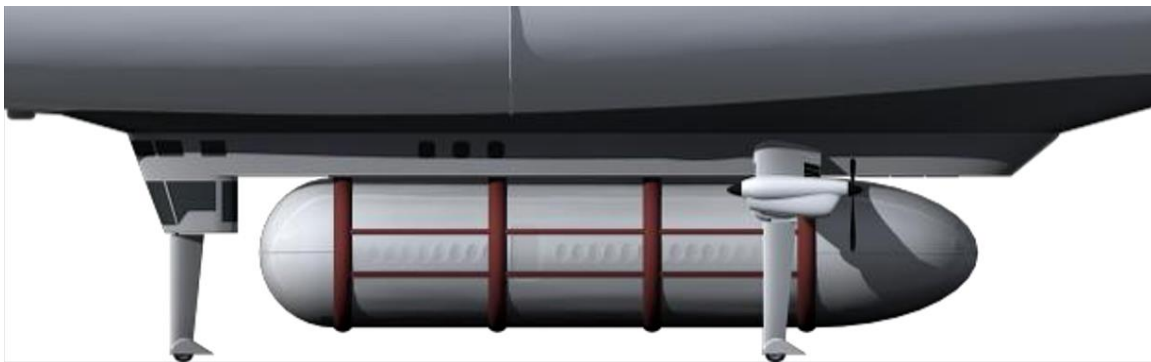
Renderings of the Skybus 1500HL flying with cargo in a remote Arctic region. Note the configuration of the stern propulsors. Source: SAIC



The Skybus 1500HL stern propulsor configuration (left) resembles the Zeppelin NT's vectorable longitudinal propulsor and fixed lateral thruster (right). Sources: SAIC (left), Wikiwand (right)



Skybus 1500HL carrying three standard CONEX boxes. Note the raised landing gear midway out on the engine pylon. Source, above & below: Melton & Hochstettler, Airships 101



Skybus 1500HL with special landing gear carrying a 20 ft. diameter aircraft fuselage section.



Skybus 1500HL. Source: SAIC via Winnipeg Free Press



Skybus 1500HL. Source: Melton & Hochstettler, Airships 101

4. For more information

- Ron Hochstetler, “Airships Ahoy,” IEEE Spectrum, October 2010:
<http://www.ecpe.nu.ac.th/suchart/SPEC/SPEC102010.PDF>
- “High Flying Demand of Bust,” Air Cargo World, pp. 34 – 39, July 2011: <https://aircargoworld.com/wp-content/uploads/2016/03/AirCargoWorld2011-07.pdf>
- Ron Hochstetler, “Long-duration, heavy-lift designs breathe new life into the world’s oldest aircraft technology,” Aerospace, 16 October 2011:
<https://aerospaceblog.wordpress.com/2011/10/16/airships-for-the-21st-century-3/>
- Ananthakrishna Sarma, “Airships and Weather,” SAIC, presentation at the Airships to the Arctic VI Conference, Seattle, 5-6 December 2011: https://isopolar.com/wp-content/uploads/2013/04/Ananthakrishna-Sarma-presentation-Weather_and_Piloting.pdf

Video

- “Airship Renaissance” (1:58 minutes), IEEE Spectrum, 1 October 2010: https://www.youtube.com/watch?v=hH1i44-2R5k&feature=emb_logo

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- *Modern Airships - Part 1*: <https://lynceans.org/all-posts/modern-airships-part-1/>
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