

Airship do Brasil (ADB) airships

Peter Lobner, Updated 21 December 2020

1. Introduction

Airship do Brasil (ADB), with offices in São Carlos and Brasília, has flown its ADB 3-X01 prototype airship and is developing the larger ADB 3-3 and ADB 3-15/30 commercial airships. ADB has other projects for unmanned airships and high-altitude “atmospheric satellite” applications. ADB has an important role in Brazil’s national program to build an indigenous airship industry. The ADB website is here: <http://www.airshipdobrasil.com.br>



ADB factory. Source: Airship do Brasil

In March 2018, Dr. Marcelo Felippes, CEO of Airships do Brasil, announced that ADB and Canadian airship firm Buoyant Aircraft Systems International (BASI) had signed a Memorandum of Understanding (MoU) under which the two companies would work together to produce zeppelin-style rigid airships that eventually will be able to carry up to 100 metric tons (110 short tons) of cargo. The two businesses intend to work together to develop a cargo airship industry that will be able to serve the large remote regions of both countries that are without road access (about 70% of both Canada and Brazil). The first airship to be developed under this MoU is expected to be a 15 metric ton (16.5 short ton) cargo airship to be designated the ADB 3-15/30. BASI president, Dr. Barry Prentice, noted that an airship capable of carrying 15 metric tons could cut the costs of moving perishable goods into remote communities in half.

Airships do Brasil brings engineering expertise to their partnership with BASI as well as important airship infrastructure. One particularly valuable asset is a full-sized, functional airship hangar dating back to the 1930s when it was used to support trans-Atlantic zeppelin operations. In those days, zeppelins were successfully flying passengers and cargo across the ocean. ADB's hangar is about 900 feet (274 meters) long and 150 feet (46 meters) high and is large enough to build a modern airship designed to carry 100 metric tons (110 short tons) of cargo.



The ADB airship hangar.

Source: <https://www.cbc.ca/news/>, 11 March 2018

On 2 July 2019, ADB announced that the Brazil's Post Office (Correios) was sponsoring a feasibility study for the use of airships in Post Office operations. ADB reported that:

“The study will be based on specific routes and with greater operational obstacles aiming at the reduction of the operational cost, increase of the quality of the services and security of the load, as well as the reduction of delivery terms.”

“Initially the study will be based on the ADB-3-3 airship, the soon-to-be first certified airship in Latin America, due to its immediate availability and great maneuverability in small

spaces. In a second moment, after the feasibility study with ADB-3-3 airship, the feasibility study will continue for the ADB-3-15/30 airship, which will carry larger volumes of cargo between the routes of interest of the Post Office.”

2. The ADB-3-X01 prototype

The ADB airship prototype, the ADB 3-X01 (registration PR-ZOV), made its inaugural flight on 24 July 2017, becoming the first indigenous, manned airship built and flown in Latin America.

This 48 meter (157 ft) long airship has a conventional non-rigid design. The gas envelope, manufactured by Lindstrand Technologies, Ltd., is made of polyester fabric coated with polyurethane. The ADB 3-X01 is designed to carry six people and loads of up to 1.5 metric tons (1.65 tons, 3,300 lb).



ADB 3-X01. Source, both photos: Airship do Brasil



You can watch a short (2:07 minutes) video on the ADB-3-X01, “The airships are reborn in Brazil,” at the following link:
<https://www.youtube.com/watch?v=MWq0ny-zxDk>

In July 2019, ADB announced that ADB-3-X01 airship had been designated as a “Strategic Product of Defense” and was available to fulfill tasks of surveillance, civil defense, public security and support to isolated communities, when requested by a branch of Brazil’s military.



ADB 3-X01. Source: Airship do Brasil

3. The ADB 3-3 airship

Airship do Brasil’s 138S (3-X01) airship, which is the base model for the certification of the airship line ADB 3-3, received its type certification on 24 May 2018 from the national certification agency of Brazil (ANAC) and became the first indigenous airship certified in Latin America (and the entire southern hemisphere). The ADB 3-3 will be certified via an amendment to the 138S type certificate. As of December 2020, certification was still in progress.

The ADB 3-3 is a 49 meter (160.7 ft) long airship, essentially the same size and configuration as the ADB 3-X01 prototype. Its service ceiling is 9,000 ft (2,743 m).

It is designed for operation by a single pilot with five passengers or a useful payload of about 3 metric tons (3.3 tons, 6,600 lb). The airship’s envelope is a low-permeability fabric with aluminum control surfaces. It can be configured for a variety of functions, including

surveillance and border patrol, advertising, electric transmission line inspection, mineral prospecting, agriculture (crop surveys & spraying), pilot training, and other functions.



ADB 3-3 concept drawings. Source, both graphics: Airship do Brasil



4. The ADB 3-30 airship

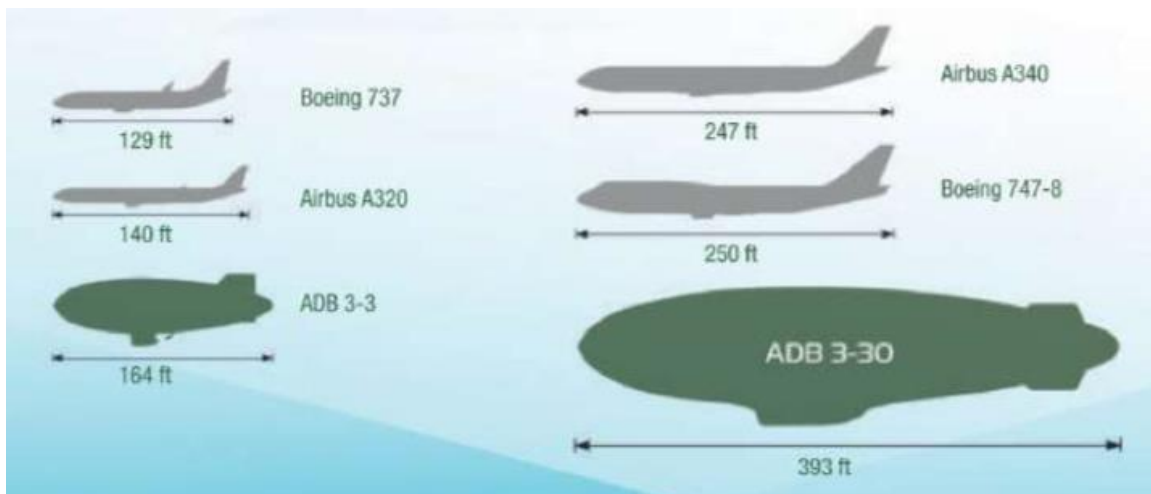
A larger semi-rigid cargo airship, the 120-meter (393-ft) long ADB 3-30, is being designed to transport 30 metric tons (33 tons, 66,000 lb) at a cruising speed of 125 kph (78 mph) and an operating altitude between 400 and 1,000 meters (1,200 to 3,281 ft).

The great majority of Brazil's roads are unpaved, making ground transportation very difficult even in areas of the country that have roads. Large remote areas of Brazil have no roads at all. This cargo airship will be capable of handling heavy cargo in an internal cargo bay or as an underslung load, making it useful to a wide range of industries and other applications.



ADB 3-30 concept drawing. Source: Airship do Brasil

The concept drawing show a semi-rigid airship with a long gondola / keel, vectored thrust propulsors under the envelope, and another propulsor mounted at the stern of the envelope.



Relative sizes of the ADB 3-3 and the larger ADB 3-30 cargo airship. Source: Airship do Brasil

In 2017, Paulo Caleffi, president of Airship do Brasil, reported that at least five private and two state-owned companies were already negotiating the purchase or lease of the ADB 3-30 airship.

Potential applications include:

- State-owned company Eletronorte plans to use an airship to inspect high voltage lines in difficult-to-reach places such as mountains and forests.
- The Post Office intends to use the aircraft to deliver parcels.

A schedule for certification and delivery of the ADB 3-30 to customers has not been announced. As of December 2020, the ADB-3-30 is no longer mentioned on the ADB website. It appears that its development may have been superseded by the newer concept, the ADB-3-15/30.

5. The ADB 3-15/30 cargo airship

This is the airship that is expected to be developed under the 2018 MoU between ADB and BASI. It is being designed to carry a 15 metric ton (16.5 short ton) payload and will be able to carry large indivisible loads (i.e., externally, as a sling load).

This airship is expected to operate with low carbon emissions. One approach could be to implement a hydrogen fuel cell power system for an all-electric airship, which would have zero carbon emissions.



ADB 3-15/30 concept drawing. Source: Airship do Brasil



ADB 3-15/30 concept drawing. Source: Airship do Brasil

6. SAGA (Satellite Atmospheric High Altitude)

This is the ADB high-altitude atmospheric pseudo-satellite program, which is intended to build Brazil's capabilities in the development of High Altitude Platforms (HAPs) that can be adapted for a variety of applications, particularly for telecommunication and remote monitoring.



SAGA concept drawing. Source: Airship do Brasil

SAGA offers the following advantages:

- Lower mission costs
- Larger payload capacity (compared to orbital satellites);
- Recoverable and reusable
- High data quality (due to the proximity to the user on the surface).
- Operational ceiling in the stratosphere, with low wind speed and less impact from adverse weather conditions in the troposphere.

7. For more information:

- Fabricio De Avellar, "Brazil Emerges," *The Noon Balloon*, Summer 2017, p. 12, The Naval Airship Association, Inc.
- Mark Piesing, "Can a new airship unlock the Amazon," BBC, 11 July 2017: <https://www.bbc.com/future/article/20170711-can-brazil-bring-the-airship-back-from-the-dead>