

## **GEFA-Flug thermal airships**

Peter Lobner, 8 August 2019

### **Background**

GEFA-Flug GmbH (acronym for “company for the development and promotion of aerostatic air systems”) was founded in 1975 by Karl-Ludwig Busemeyer in Aachen, Germany to design and build balloons and airships for advertising campaigns, promotional tours and pilot training. Since 1980, the firm has been developing thermal airships. GEFA-Flug is approved by the German Federal Aviation Authority (LBA) as a development, manufacturing and aerospace company under JAR 21, and also carries out maintenance and repair work on types approved by the Civil Aviation Authority (CAA). GEFA-Flug became the world’s only thermal (hot-air) airship manufacturer to have its airships certified by the European Union Aviation Safety Agency (EASA). The GEFA-Flug website is here:

<https://gefafly.com>

The GEFA-Flug type certificates were sold to a company in Mexico City called Impacto Aereo, run by Javier Merino Escamilla. As of 2017, Impacto Aereo was planning to resume production of the GEFA-Flug airships in a Mexico City factory once Mexican Type Certification was achieved. Their website is here:

<https://www.impactoaereo.com>

### **General characteristics of GEFA-Flug airships**

GEFA-Flug built the four seat AS-105GD/4 and six seat AS-105GD/6 thermal airships. General characteristics of these airships include the following:

- There are several fabric dividing walls (bulkheads) within the hot air envelope, which divide the hull into different parts similar to the gas cells in rigid airships.
- Fore and aft burners direct their heat to different cells, which enables the burners to be used to trim the airship.

- The airship's instrument panel meets the requirements for flying in controlled airspace.
- The airship is certified for night flying.

### **Four Seat Airship AS-105GD/4**

The German Federal Aviation Office approved the registration of the four-seat version at the end of 1999. Since 2001, it also has been approved for night flying.

General parameters of this airship are:

- Volume 3,000 m<sup>3</sup> (106,000 ft<sup>3</sup>)
- Length 41.0 m (134.5 ft)
- Diameter 12.8 m (42 ft)
- Max. airspeed 35 kph (19 knots)
- Flight time (4 pax) Approx. 1.0 hour
- Max. all up weight 900 kg (1,984 lb)

This thermal airship has a gondola for a pilot plus three passengers, or space for additional propane tanks for long missions. The gondola is made of aerospace-grade steel tubing.



*AS-105GD/4 profile view. Source: GEFA-Flug*



*AS-105GD/4 in flight. Source: GEFA-Flug*



*AS-105GD/4. Source: <http://www.cheersaerialmedia.com>*



Photo by: Gefa-Flug

AS-105GD/4 four-place gondola. Source: GEFA-Flug



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AS-105GD/4 controls for rudder & horizontal stabilizer.  
Source: <http://www.cheersaerialmedia.com>

## **Six Seat Airship AS-105GD/6**

Development of the GD/6 began in 2005. The airship received its trial approval from EASA in August 2008.

The basic form of the body shell of the four-seat airship was scaled up for the GD/6. The horizontal stabilizers are no longer completely horizontal, but hang down (anhedral), making it much easier to land in headwinds.

General parameters of this airship are:

- Volume 5,000 m<sup>3</sup> (176,500 ft<sup>3</sup>)
- Length 48.6 m (159.5 ft)
- Diameter 14.88 m (48.8 ft)
- Max. airspeed 35 kph (19 knots)
- Flight time (4 pax) Approx. 2.0 hours
- Max. all up weight 1,488 kg (3,280 lb)
- Payload 450 kg (992 lb)

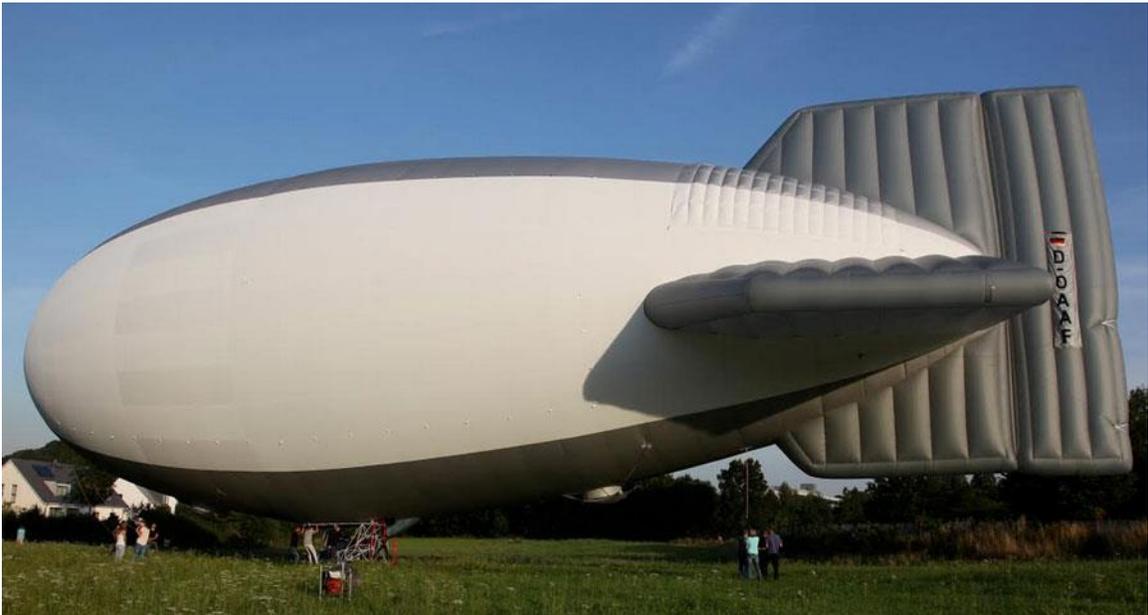
The gondola carries a pilot plus five passengers with the same versatile characteristics as the 4-seater airship, with a much better payload weight. It is well suited for commercial passenger transport, tourist flights, and scientific projects.

The new autopilot system, which controls the four burners and their heat output, saves approximately 15-20% propane gas.

Another innovation is lighting for night flying, which allows the airship to operate between sunset and sunrise. In combination with the light from the burners, the lighting system results in very good illumination of the airship shell, which is quite effective for advertising at night.



*AS-105GD/6. Source: GEFA-Flug*



*AS-105GD/6. Source: <http://www.zebedeelist.co.uk/>*



Photo by: Gefa-Flug

*AS-105GD/6 six-place gondola. Source: GEFA-Flug*