

DDBA Airships

Peter Lobner, 3 April 2021

1. Introduction



Public corporation JSC

Dolgoprudnenskoe Design Bureau of Automatics (DDBA, aka DKBA) was established on 26 November 1956 and today is the only state-owned company in Russia (a Federal State Unitary Enterprise)

engaged in the design and manufacture of all-purpose lighter-than-air vehicles (airships and free/moored balloons). The firm is located in Dolgoprudniy, just north of Moscow, Russia. The DDBA website is here: <https://www.dkba.ru/who-we-are>

DDBA produces two unmanned airships that have flown successfully: the lenticular DP-27 “Anuta” and the conventional DP-29.

2. The DP-27 lenticular airship

The small, remotely-controlled DP-27 “Anuta” lenticular (lens-shaped) airship first flew on 22 September 2011 from the Kirzhach airfield northeast of Moscow. The lenticular, semi-rigid hull design presents the same cross-section to the wind at all times and is intended to provide good stability in cross-wind and gusty conditions, ease of control, and high maneuverability.

DDBA identified the following potential applications:

- Delivery of equipment to sites up to 40 km (25 miles) away.
- Real-time video monitoring and/or radio tracking for waterways, national frontiers, highways, places of interest, and sports / entertainment events
- Search and rescue operations
- Remote sensing:
 - Environmental, agricultural, and natural resource monitoring

- Monitoring the operating condition of hazardous facilities, such as refineries and oil / gas pipelines
- Monitoring and supervision of large construction projects
- Communications relay
- Illumination of objects on the ground at night
- Hydrographic, geographic and other research
- Promotional activities (airborne advertising)

DP-27 characteristics		
Envelope diameter	16 m	52.5 ft
Envelope volume	520 m ³	18364 ft ³
Lifting gas	helium / stabilized hydrogen	
Maximum useful load	200 kg	440 lb
Propulsion	4 x 25 hp internal combustion engines, each driving a vectorable propeller	
Maximum speed	70 kph	43.5 mph
Maximum flight altitude (above mean sea level)	1,000 m	3,281 ft
Maximum flight range (with 40 liters of fuel)	300 km	186 miles
Equipment set power consumption	1 kW	
Operating ambient temperature	-10°C to +30°C	14°F to 86°F



DP-27 leaving its hanger. Source: DDBA



DP-27 tethered with gondola exterior skin removed. Source: DDBA



DP-27 vectoring propeller (1 of 4). Source: DDBA



DP-27 in free flight. Source: DDBA

A production version would have been much larger than the DP-27. Basic design parameters for the planned production version were:

- Diameter: 50 m (164 ft)
- Maximum flight altitude (above msl): 5 km (3.1 miles)
- Propulsion: 8 x 400 hp (298 kW) engines
- Maximum speed: 90 to 100 kph (56 to 62 mph)
- Maximum flight range: 800 km (497 miles)

Apparently the DP-27 had stability problems that were not resolved. The larger version was not built.

3. The DP-29 conventional airship

The DP-29 is a small, unmanned, semi-rigid airship with a classical ellipsoid hull shape. The airship made its first flight in September 2014. It is designed to carry a 10 kg (22 lb) payload to a maximum altitude of one km (0.62 miles) on missions lasting up to three hours. DDBA Deputy Director General, Alexander Kolesov, reported that the airship can be configured to support a wide range of users, such as

the Emergencies Ministry, the Ministry of Internal Affairs, the Armed Forces, and natural resource management agencies. Factory tests of the airship were successfully conducted in 2014 at the testing grounds in Krasnoarmeysk and in the Vladimir region east of Moscow.

The DP-29 was on display at the Russian airshow MAKS 2015, where it was promoted primarily for military tasks: high-altitude reconnaissance, aerial photography and mapping, delivery and automatic drop of cargo.

In 2020 the firm Rostec offered modular semi-rigid airships, based on DDBA's DP-29 that could be enlarged with one or more additional center hull modules to carry heavier payloads. Rostec claimed that, "Adding one module allows you to increase the carrying capacity by 4 (metric) tons." Rostec further noted that "...these versatile airships can be used to deliver any cargo, including heavy and oversized, to any areas inaccessible to ground vehicles. It does not require the creation of complex ground-based infrastructure." A demo model of the modular airship is expected to be developed in 2021.



DP-29. Source: rustechnologies via The LTA Society



DP-29 in free flight. Sources: DDBA (above), TopWar (below).





DP-29 in free flight. Source: DDBA



Close-up of DP-29 propulsion and payload modules. Source: DDBA



*DP-29 on display at MAKS-2015. Source:
<https://sdelanounas.ru/blogs/?search=дурижаблн>*

4. For more information

DP-27

- “Unmanned aircraft: terminology, classification, current status,” Section 1.2.2.5, “UAV of aerostatic type,” (this section contains a short description of the DP 27 unmanned airship in a longer Russian language article): <https://arsenal-info.ru/b/book/3398882726/12>
- “For Rosatom in 2015 to build an unmanned airship,” Encyclopedia of Safety, 18 October 2013: <https://survincity.com/2013/10/for-rosatom-in-2015-to-build-an-unmanned-airship-2/>
- “Airship DP-27 ‘ANUTA’.” RS TradeHouse, 2016: <https://www.rstradehouse.com/item?id=100210119861&l=en>

DP-29

- Tanyana Rusakova, “Defense Ministry enlists unmanned dirigibles to patrol Russian skies,” sUAS News, 16 October 2014: <https://www.suasnews.com/2014/10/defense-ministry-enlists-unmanned-dirigibles-to-patrol-russian-skies/>
- “The first Russian unmanned airship presented at MAKS-2015,” TASS, 25 August 2015 (in Russian): <https://tjournal.ru/flood/12752-pervyy-rossiyskiy-bespilotnyy-dirizhabl-predstavili-na-maks-2015>
- “Rostec announced the development of modular ‘airship transformers’,” TopWar, 19 April 2020: <https://en.topwar.ru/170377-rosteh-zajavil-o-razrabotke-modulnyh-dirizhablej-transformerov.html>