

Aviation Industry Corporation of China (AVIC) – AS700 blimp

Peter Lobner, updated 26 December 2023



The Ministry of Industry and Information Technology established an airship project that resulted in the "Walk in the Cloud" (AS700) series of non-rigid manned airships developed by China's largest aircraft manufacturer, Aviation Industry Corp. of China (AVIC). Work on the project started in August 2018 at the Special Aircraft Research Institute, an AVIC subsidiary in Jingmen, Hubei province. The AS700 airship is being developed to meet the demand for domestic and international airships for low altitude sightseeing air tours. AVIC estimates that there is a market demand for 100 airships of this type over the next 10 years.



*AVIC AS700 non-rigid airship.
Source: AVIC Special Vehicle Research Institute*

The AS700 can be configured for other missions, such as geological exploration, aerial photography, marine surveillance, emergency rescue, and small cargo transport. It also can be configured as a luxury vehicle for corporate and other users.

At the time it was announced in 2018, AS700 first flight was expected to occur in 2020.

General characteristics of the AVIC AS700 blimp

Parameter	AVIC AS700
Airship type	Non-rigid
Length	48 m (158 ft), estimate *
Height	12 m (39 ft), estimate *
Lift gas	Helium
Envelope volume	3,500 m ³ (123,600 ft ³)
Propulsion system	Two Lycoming IO-390-C3B6 aviation piston engines @ 215 shp (160 kW) each, driving thrust vectoring ducted propellers cantilevered transversely, near the rear of the gondola.
Takeoff weight, max.	4.15 metric tons (4,150 kg, 9,149 lb)
Payload	840 kg (1,852 lb)
Accommodations	1 Crew + up to 9 passengers
Speed, cruise	70 kph (43.5 mph)
Speed, maximum	100 kph (62.2 mph)
Rate of climb, max	7.5 m/s (25 fps)
Rate of descent, max	4 m/s (13 fps)
Max wind speed	20 m/s (67 fps, 44.7 mph)
Range	700 km (435 miles)
Endurance	up to 10 hours

* Estimate based on similar volume American Blimp Corp A-130.

The AS700 has an ellipsoid hull, an "X" layout rigid tail with flight control surfaces, and a non-retractable single-point landing gear under the gondola. The AS700 envelope is a single lift gas cell manufactured from a multi-layer fabric-film laminate composite material that provides the needed strength, low helium leak rate, tear and weather resistance. The air ballonets are lightweight polymer cells inside the gas envelope, which is equipped with helium safety valves to prevent over-pressurization and to allow for a safe landing in the event of maneuvering system failure.

The AS700 features a fly-by-wire flight control system with advanced avionics. It is designed for single-pilot operation with a side stick controller intended to make the blimp easy to operate. It also can be configured for uncrewed (remote) operation.

With its thrust vectoring propulsion system, the AS700 is capable of short takeoff and landing (STOL) and vertical takeoff and landing (VTOL) operations. AVIC recommends that the site for AS700

operations should be flat ground not less than 200 m (656 ft) in diameter or have an airstrip available.

The AS700 is not intended to fly under known conditions of thunderstorm, snow, heavy fog, and lightning.



Rendering of AVIC AS700.

Source: AVIC Special Vehicle Research Institute

The gondola is designed to accommodate a single pilot and up to nine passengers. It can be configured with a food service facility and a washroom. The large windows are designed to open in flight.



Details of the AVIC AS700 gondola.

Source: AVIC Special Vehicle Research Institute



*Renderings of AVIC AS700.
Source: AVIC Special Vehicle Research Institute*



China Daily reported that three AS700 prototypes were built. The first prototype was configured and operated as an unmanned platform for technology demonstration. That phase of the flight test program was completed successfully in October 2022. The second and third prototypes are crewed vehicles tasked with completing test flights needed for type certification.

The second AS700 prototype made its maiden flight in Hubei province's Jingmen airport on Thursday, 29 December 2022. The maiden flight lasted 39 minutes, with a pilot and an observer on board.



*Bow quarter view of the AS700 2nd prototype being rolled out of its hangar.
Source: MEMRI (Middle East Media Research Institute) 3 Jan 2023*



*AS700 2nd prototype during its first test flight on 29 December 2022.
Source: ChinaDaily*



*Bow quarter view of AS-700 prototype in flight.
Note shrouded propulsors vectored down for added dynamic lift.
Source: screenshot from China News Agency video (4 Dec 2023)*



*Side view of AS-700 prototype in flight.
Note shrouded propulsors vectored down for added dynamic lift.
Source: screenshot from China News Agency video (4 Dec 2023)*



*Cockpit view from AS-700 prototype in flight.
Source: screenshot from China News Agency video (4 Dec 2023)*



*AS-700 prototype on landing approach.
Note shrouded propulsors in cruise position (horizontal).
Source: screenshot from China News Agency video (4 Dec 2023)*



*Side view of AS-700 prototype on the ground on its single-point landing gear
Source: screenshot from China News Agency video (4 Dec 2023)*



*Side view of AS700 prototype on its mobile mooring mast.
Source: miit.gov.cn*



*Bow view of an AS700 prototype on its mobile mooring mast.
Source: Xinhua News Agency via ChinaDaily*

AVIC announced that, on 13 December 2023, the Civil Aviation Administration of China issued a type certificate for the AS700, making it the first manned airship in China to be domestically developed and certified.

As reported by China Daily, Zhao Xiajun, deputy director of the AVIC Special Aircraft Research Institute said, "After receiving the type certificate, we will cooperate with the airship's first users to develop a set of standard procedures for its business operations. And we will also work together to get the production certificate as soon as possible."



*Bow quarter view of an AS700 prototype in its hangar.
Source: inf.news*



*Side view of an AS700 prototype at its mobile mooring mast.
Source: ChinaDaily*



*AS700 prototype during flight testing in central China's
Hubei Province, 16 September 2022. Source: CFP via CGTN*

For more information

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<https://www.chinadailyhk.com/article/367769>

Video

- 国产民用载人飞艇 AS700 完成合格审查 (“Domestic civilian manned airship AS700 completes qualification review”), (1:07 min), posted by China News Agency, 4 December 2023:
<https://www.youtube.com/watch?v=JukPKJib4po>

Other Modern Airships articles

- *Modern Airships - Part 1:* <https://lynceans.org/all-posts/modern-airships-part-1/>
 - Airship do Brasil (ADB) - ADB-3-3 blimp
 - American Blimp Corp. – A-60+, -150 & -170 blimps
 - Vantage Airship – CA-80, -150, -180 & -300 blimps
- *Modern Airships - Part 2:* <https://lynceans.org/all-posts/modern-airships-part-2/>
 - Worldwide Aeros Corp. – Aeros 40 Sky Dragon blimp
 - Atlas LTA Advanced Technology blimps – Atlas-6 & -11 blimps
- *Modern Airships - Part 3:* <https://lynceans.org/all-posts/modern-airships-part-3/>