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DEVELOPMENT OF THE NEWEST SUPERSONICAIRCRAFT

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As the most challenging technologies in aircraft building prove the right to exist, we decided to examine a range of recently published articles and Internet sites on the topic to research new aircraft designs that can dramatically change the way people will carry cargo and passengers in future years.

Purpose of the conference paper: to familiarize with the latest technologies in the civil aviation industry of the People's Republic of China; to consider the prospects of their developments in this industry; to draw the scientific world's attention to hypersonic flight. Objectives: to figure out the features of the newest Chinese project of the supersonic aircraft; to evaluate the effectiveness of this project's implementation.

Target and subject of research. Target: the prototype of the newest double-winged hypersonic aircraft "I-Plane", developed by the Chinese Academy of Sciences. Subject: I-Plane`s design, value and terms of commissioning.

The method of research is theoretical**:** analysis and systematization of the scientific literature in the subject.

The scientific novelty and practical value of the obtained results. Prospects of a new generation of supersonic aircrafts are discussed for the first time. Relying on the received information and its analysis, it becomes possible to involve more talented scientists to work on the project, to attract investments and to increase private financing.

Since the first supersonic flight in 1947 in USA, more than 70 years have passed. The legendary Soviet plane Tu-144 took the first flight on December 31, 1968. It became the world's first passenger supersonic airliner.

The world-famous French "Concorde" has flown passengers since 1976 till 2003. Unfortunately, due to high costs and accidents, corporations preferred to abandon supersonic flights. Despite the fact that today such flights are stopped, the idea to travel faster than the sound remains actual. [5]

Now the development of a supersonic aircraft is being conducted by the United States, but since 2013 China is equal with them. [1]

A team of researchers at the Chinese Academy of Sciences have tested a hypersonic plane in a wind tunnel to speeds of Mach 7, or 5,600 miles per hour. The test showed good performance of the model, and the level of air resistance, according to scientists, was extremely low.[2]

Cui Kai is in charge of the project that is a part of the Key Laboratory of High Temperature Gas Dynamics at the Chinese Academy of Sciences. However, the plane is likely a bi-product of other Chinese hypersonic research programs, including military ones. It goes by other Chinese hypersonic successes, including China's DF-17 HGV. [1]

The aerodynamic qualities of a hypersonic aircraft differ from a subsonic dramatically: higher speed, its body and wings run hot quicker. Chinese researchers proposed a new design of a hypersonic aircraft. Instead of the usual single wing, it will have a second, located above the first one. This will help reduce aerodynamic drag. The I-Plane will likely be powered with a combined-cycle engine that uses turbofans for low speeds before switching scramjets for hypersonic flight. Its large payload could enable it to act as the first stage of a reusable space launch system, and in hypersonic flight it could carry and release rockets into the stratosphere. [3]

The successfully tested craft produces low drag and high lift. As reported by the South China Morning Post, the I Plane's lift capacity exceeds by 25 percent of the Boeing 737 lift

capacity. As compared to the Boeing 737, the I Plane of the same size can carry 5 tons or 50 passengers.[2]

These jets could carry 50 passengers, flying from New York to London for three hours and 15 minutes. However, it will not be cheap; one way is expected to cost $2,500.

Table 1 − Comparison with existing most popular airliners

	Boeing 747	Concorde	I-Plane
Max. speed	988	2330	5600
Carrying capacity	46.8 tons	14.0 tons	5.0 tons
Number of passengers (1st class)	-	108	50
Number of passengers (standard class)	416	124	-
Number of passengers (touristic class)	524	144	-
Number of pair of wings	1	1	2
Mach number	0.84-0.8555	1.8-2.23	5.5-7.0
Engine	4 × General Electric CF6-80	Olympus 593—610-14-28	TRRE

Cui Kai said: "To do this, we need original designs", adding that the I-Plane is not a single model, but a whole series, which a group of scientists from the Chinese Academy of Sciences has not yet reported. [4]

It is possible that the development of Chinese scientists will lead to the creation of a hypersonic heavy bomber, according to American experts. It is certainly within possibility.[5]

To sum up, China today is an absolute leader in scientific research. Hypersonic flights have good prospects, despite their high cost. In the era of technological progress, scientific breakthrough and achievements are more important than profitability. All great powers have to pay more attention to the scientific sector.

Key words: *I-Plane, seven speeds of sound, revival of hypersonic air travel, newest supersonic aircraft*

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