

NATIONAL ACADEMY OF SCIENCES OF UKRAINE  
MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE  
NATIONAL AVIATION UNIVERSITY



# PROCEEDINGS

**THE SEVENTH WORLD CONGRESS  
"AVIATION IN THE XXI-st CENTURY"**

**"Safety in Aviation  
and Space Technologies"**

**September 19-21, 2016  
Kyiv, Ukraine**

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### **The dream of wings (life and scientific achievements of Stepan Hryzodubov)**

*The article deals with the life and scientific achievements of Stepan Hryzodubov who is credited with building and flying one of the first airplanes. Shown is his contribution to the development of aviation and mechanics.*

The biography of Stepan Vasyliovych Hryzodubov (1884-1965) is full of creative activity. He was born on 13 July 1884 in the village of Parkhomivki, Bohodukhiv county, Kharkiv province. Among his ancestors were clergymen and nobles. His grandfather was a nobleman and distinguished policeman and was awarded very prestigious orders of the Russian Empire (among them are those of St. Vladimir, St. Anna, and St. Stanislav) four times [1]. His father was Marshal of the Nobility of Sumy County.

The future inventor moved to Kharkiv in his adolescent years. In 1904 he graduated from the Kharkiv Railroad Technical School of the South Railway. Today it is known as the Order of the Badge of Honor Kharkiv Electromechanical College of Transport Facilities Construction. This school was founded in July 1872 and until 1917 it produced around 1000 specialists. S. Hryzodubov is the most famous of them. As a specialist in electro-mechanics he worked in a steam locomotive repair shop. In the turbulent 1905 he participated in a strike and, as a result, lost his job. But he did not give way to despair and organized a private workshop. [6].

The crucial point in the life of the future aircraft designer was the end of 1908 when he saw in a cinema a documentary about the first flight of Orville and Wilbur Wright. On 17 December 1903 these American inventors made the first flight in history on their Flyer I airplane. S. Hryzodubov was so fascinated with what he had seen that he persuaded the projectionist to sell him several picture frames which he later used for the construction of his own airplane. It took him several years to achieve his dream. In 1910 he created the airplane G1. The plane's technical innovations met the requirements of that time. In many aspects Hryzodubov's airplane was similar to that of the Wright brothers. The difference was that his airplane had a stabilizer and chassis with wooden wheels. To get the chassis, Hryzodubov had to arrange a paid exhibition of his airplane. Hryzodubov equipped his airplane with a four-cylinder liquid-cooled gasoline engine of his own design. In fact S. Hryzodubov became the creator of the first aviation gasoline engine in Tsarist Russia [3].

The G1 airplane test was scheduled for the spring of 1911. In the territory of the Kharkiv hippodrome Hryzodubov tried to take off, but all his efforts ended in failure, he only drove across the field. However, the failure did not stop the inventor; he designed new models of airplanes: G2, G3 and G4. The G3 was the first among them to take off. The G4 cost 5500 rubles and it was a serious sum for S. Hryzodubov. Thus he had to borrow the money or purchase on credit. [6]

With the advent of the First World War S. Hryzodubov joined the army. In February 1916 he was enrolled into the war pilot school at the Imperial All-Russian Flying Club where he received a pilot diploma.

After the 1917 October coup S. Hryzodubov continued to work in the sphere of aviation. In 1919-1924 he was in charge of the aircraft repair shop of the Kharkiv airplane park. During the Civil War he repaired military planes for the Red Army. From 1924 the aircraft designer worked in the Occupational Hygiene and Diseases Research Institute where he led the work on designing, developing, manufacturing, testing, and installation of control equipment for various industries. S. Hryzodubov worked there until the Nazi occupation of Kharkiv.

But the dream of the sky did not leave him. From 1925 S. Hryzodubov headed the gliding section at the Society of Aviation and Aeronautics of Ukraine and Crimea (SAAUC). He is one of the organizers of gliding in Ukraine; he took part in creation of some gliders. In 1939 he designed and constructed with the help of the flying club activists a glider and tested it. From 1928 to 1938 Hryzodubov developed and built three types of snow-planes (self-propelled sleighs which are moved by the driving force of the screw) [3].

Hryzodubov was an amazing polymath. There is a saying that a gifted person has many talents. Hryzodubov had talents for many things: aviation, mechanical engineering, writing, molding, welding ... 18 in total [1].

Stepan Hryzodubov had a daughter, Valentina Stepanovna Hryzodubova (1909-1993), who also brought glory to the Hryzodubov family. She was the only woman in the Soviet Union who had both highest Soviet decorations – Golden Star Medal of the Hero of the Soviet Union and Golden Star Medal of the Hero of Socialist Labor. When she was 15 her father took her to Crimea to watch a glider competition where she performed a solo flight on a glider [1]. She, like her father, had many talents. She played piano, graduated from a conservatory and later from the Kharkov Technical Institute. She could also speak several foreign languages. In 1928 she was enrolled in the Kharkiv flying school and after graduating from it became a professional pilot. In 1938 she, together with M. Raskova and P. Osipenko, performed on a long-range bomber DB-2-B “Motherland” a strait flight from Moscow to the Far East and became famous all over the Soviet Union. For that flight she received her first Golden Star. In general, she set 5 world records in velocity and height. Valentina also worked as a flight instructor and trained over 80 pilots, many of whom were later decorated with prestigious Soviet medals and orders. [2] During the Second World War she was an air regiment commander. The subordinates respected and loved her and called her “Mother” among themselves. During the war she personally flew about 200 sorties, mainly nocturnal, behind enemy lines. From 1937 till 1946 she was a deputy of the Supreme Soviet of the USSR and thanks to that position and her glory she managed to save thousands of Soviet people from repressions [2].

In the center of Kharkiv, there is a memorial museum-apartment of the Hryzodubov family. According to Vitalii Vlasko, director of the museum, S. Hryzodubov was also a gifted photographer. The museum holds a collection of over 300 hundred pictures made by the famous aircraft designer. The pictures reveal the history of aviation in Ukraine. Many of them are rarity [4].

Stepan Hryzodubov stopped his engineering activity after the Second World War and switched to popularization of the achievements of the Soviet aviation among school and university students. He died on 11 December 1965, at age 81 in Kharkiv. In 1968 one of Kharkiv's streets was named after him.

All who knew S. Hryzodubov remember him as a modest and patriotic man. Igor Sikorsky, an outstanding helicopter designer, invited Hryzodubov to the United States, promising him big money. According to his daughter, Valentina Hryzodubova, her father answered: "My Motherland is here! I will work for my people!" [5].

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