

## Alexei Leonov. Half a Century since the First Spacewalk of Human

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50 years - so many years have passed since one of the most important events in the history of space exploration and of our country. March 18, 1965 Cosmonaut Alexei Leonov became the first human to walk in space.

When you watch fantastic films about space, it rarely leaves a deep feeling of reliability, solidity of these space ships and stations. Everything is shown very massive: thick multilayer cladding, automatic doors.

But when you look at the pictures and drawings of these ships, and, especially, older design, the hair on your head stand on end. How to on it at all is possible to fly, to say nothing of space? And what you need to have the courage to entrust their lives to this fragile, close structure?

Here's how to look "Voskhod-2"(Fig. 1), where cosmonauts Alexei Leonov and Pavel Belyaev went to the flight.

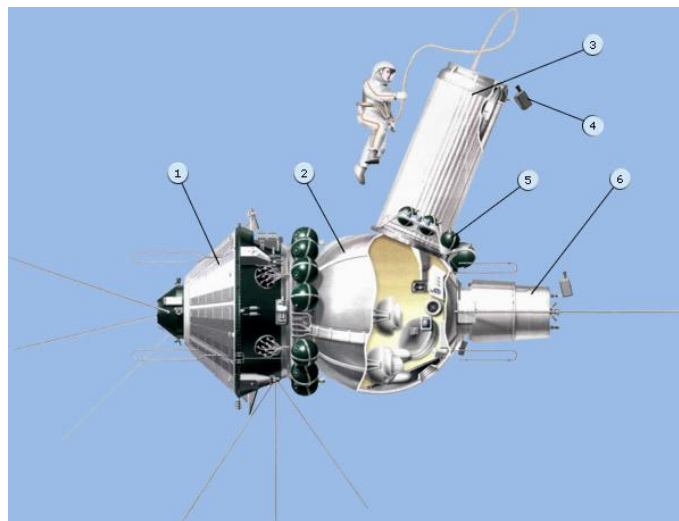


Figure 1 - The Soviet spaceship "Voskhod-2"

1. instrumentation equipment compartment
2. descent vehicle
3. sluiice chamber inflated
4. Imaging Camera spacewalk
5. System of pressurization sluiice chamber
6. Duplicate of brake propulsion.

This silver corrugated cylinder is inflatable sluiice chamber (Fig. 2). Can assess how tightly as it was in the sluiice (internal diameter in the inflated condition - 1 m, length - 2.5 m), and in the ship [1].



Figure 2 - Inflatable sluce chamber

Tightness spherical descent module, in which there were the cosmonauts and the sluce, was caused by stringent dimensional constraints of launcher. The same being the idea of an inflatable sluce, very compact when folded.

Both cosmonauts were dressed in spacesuits "Berkut" (Fig. 3), inside which keeps the pressure of 0.4 atmospheres:



Figure 3 - Spacesuit "Berkut"

The first ever spacewalk lasted for 12 minutes and 9 seconds. In this case, physical well-being of Alexei Arkhipovich left much to be desired: tachycardia started, quickened breath, the temperature rose to 38, and besides intense sweating. All this time, Leonov was connected with ship rope short length slightly more than 5 meters (Fig. 4). For 12 minutes of being in space Alexei Arkhipovich five times moved away from the vehicle and returned to him. By the way, the american astronaut to walk in space, three months after Leonov, never left the ship because of fears of any emergency.

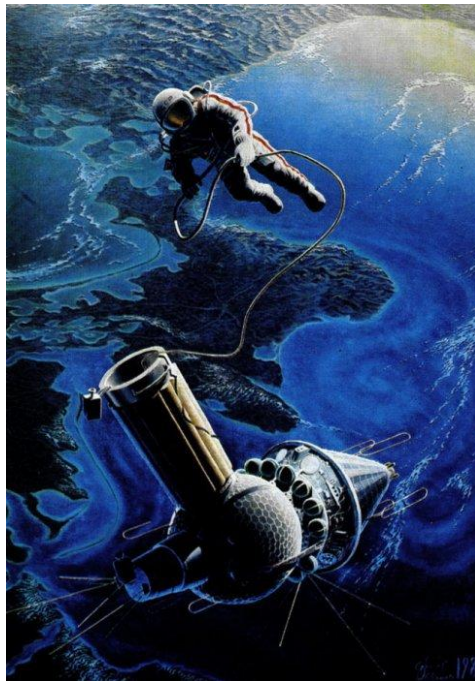


Figure 4 - Picture flights of cosmonauts Leonov above the Earth

While returning to the ship there was a problem: bloated internal pressure spacesuit is not allowed to get into sluice. Leonov had to reduce the pressure to 0.27 atm to get inside. And as he entered into a ship headfirst, had to work hard to turn around inside the sluice - and then was able to return to the ship. After closing the door the sluice was jettisoned.

Above I have mentioned the external fragility of the spacecraft. It was not for effect: after returning Leonov became clear that because of thermal deformation the hatch closes with leaking, and equipment began to give more oxygen. There was a danger of fire. However, cosmonauts were lucky: Leonov accidentally touched switch the air supply from the reserve tanks, air pressure in the vehicle increased and it ... slightly inflated. Like a tin can. Quite a bit, but it were enough to slit near the hatch has disappeared and decompression stopped. After this equipment returned supply of oxygen to previous levels.

By the way, the historic flight was the last for ships such as "Voskhod" (Fig. 5), two years later they were replaced by "Soyuz".



Figure 5 - Postage stamp issued in honor of the first-ever spacewalk of human

Randomness has saved Leonov from death again in 1971. Then he was appointed commander of the primary crew of "Soyuz-11", but before the start it was decided to send the backup crew Dobrovolsky, Volkov and Patsaev. All three died during the descent from orbit.

10 years after his spacewalk Leonov (Fig. 6) went into its second flight. He was the commander of "Soyuz-19". This time it was the first in the history of the docking of two spacecraft from different countries, flight "Soyuz - Apollo" [2].



Figure 6 - Alexei Leonov - Soviet cosmonaut, first man to walk in space.  
Twice Hero of Soviet Union

In addition to their main profession, Alexei Leonov, who last year celebrated its 80th anniversary, has become famous in our country and as a painter which promotes space exploration. In particular, the three sets of postage stamps were issued, for which Leonov created drawings.[3]

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### **Oxygen Supply on a Spaceship**

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Life support systems in spacecraft are designed to provide a safe, habitable environment for the astronauts, and one of the most significant challenges is managing acceptable air quality. For example, CO<sub>2</sub> is respired normally by humans at concentrations that are toxic if inhaled directly. As a result, the cabin air must be tightly managed, with CO<sub>2</sub> levels kept below 0.5% at maximum, and preferably below 0.1% for the optimal safety and comfort of the crew.