

Boris Yeregov, First Physician in Space, and the Voskhod 1 Spaceflight

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Boris Yegorov flew on Voskhod 1 and was the first physician in space (**Fig. 1**). This claim has been challenged by some due to the confusion over the Soviet medical education system. Yegorov graduated from the First Moscow Medical Institute in 1961, but did not receive his M.D. until 1965 from the Humbolt University of Berlin in 1965. However, the Soviet system is similar to the English system, where, after 6 yr of medical education after high school, the student receives the equivalent of an M.B.B.S. (Medical Bachelor, Bachelor of Surgery). They are then called a “Physician” and are allowed to practice medicine. The M.D. from Humbolt was really the equivalent of a Ph.D.

Dr. Yegorov was born in 1937 in Moscow. His mother was an ophthalmologist and his father was a prominent heart surgeon and a member of the Soviet Academy of Sciences. His father knew Sergei Korolev and had political ties to members of the Politburo, which no doubt helped in his eventual crew selection. During his initial medical education, he became interested in aerospace medicine and neurovestibular dysfunctions. Following graduation, he served as a lieutenant in the Soviet Medical Corps and participated in reviewing the medical telemetry downlinked by the Vostok spacecraft. He was selected as a cosmonaut in the Voskhod Group on May 26, 1964. This group was made up of four physicians and three scientist-engineers.

The Voskhod 1 flight was centered on flying three cosmonauts in space and was the first multicrewed flight (beating Gemini 3 by 5 months). The Voskhod program was a repurposing of the obsolete one-seat Vostok spacecraft to provide the appearance of equivalence to the upcoming American Gemini spacecraft until the true Soviet equivalent, the Soyuz, could begin flying. The



Fig. 1. Boris Yegorov, the first physician in space. This is an in-flight photo taken during the Voskhod 1 mission.

single Vostok ejection seat was removed and replaced with three light-weight seats positioned at a right angle to the Vostok crew-member orientation (**Fig. 2**). Thus, the control panel was difficult to read or reach (this would become a factor in the poor landing of the later Voskhod 2). The cabin was so cramped that the cosmonauts could not wear spacesuits (a fact that was publicly touted as a feature of the new, advanced spacecraft). This practice of omitting spacesuits would continue (except on the spacewalk mission of Voskhod 2) until the deaths of three cosmonauts onboard Soyuz 11 due to cabin depressurization. The cosmonauts were in a knee-to-chest position, which also increased their landing impact tolerance and is still used in modern Soyuz spacecraft.²

An upgraded upper stage allowed for a heavier spacecraft, but in the absence of ejection seats or any other launch escape system, a launch abort was not possible until T plus 44 s, when the booster engines could be shut down and the retrorocket fired to thrust the capsule a safe distance away. Voskhod could thus reach a slightly higher orbit than Vostok, which was always placed in a low orbit that would naturally degrade after several days. However, a backup retrorocket was present on the capsule nose due to the unreliability of the primary retrorocket system (this proved to be well founded as the retrorocket system later failed on Voskhod 2).

The flight of Voskhod 1 had many firsts: the first physician in space, the first engineer in space, and the first nonmilitary crew-members in space. There was a soft-landing rocket package in the parachute lines which allowed for the first soft landing (the cosmonaut used an ejection seat for a parachute landing on every Vostok). It also had the first live TV downlink and it set a new altitude record of 209 miles. Khrushchev spoke to the cosmonauts in flight, but immediately thereafter was overthrown and replaced by Brezhnev, who spoke to the cosmonauts postlanding. There was great concern about being able to provide life support to a three-man crew. There were enough consumables for a 3-day flight, but only a 1-day flight was planned (some claim that a 3-day flight was planned but was terminated early due to the Khrushchev coup). The cosmonauts requested to extend the mission while in flight but were refused.⁶

The prime crew was initially made up of Col. Boris Volynov, Georgi Katys, and Boris Yegorov, but there were extensive political disputes regarding crew selection and the crew was not officially approved by the State Commission until 3 days before the flight.

From Paris, TX, and Houston, TX.

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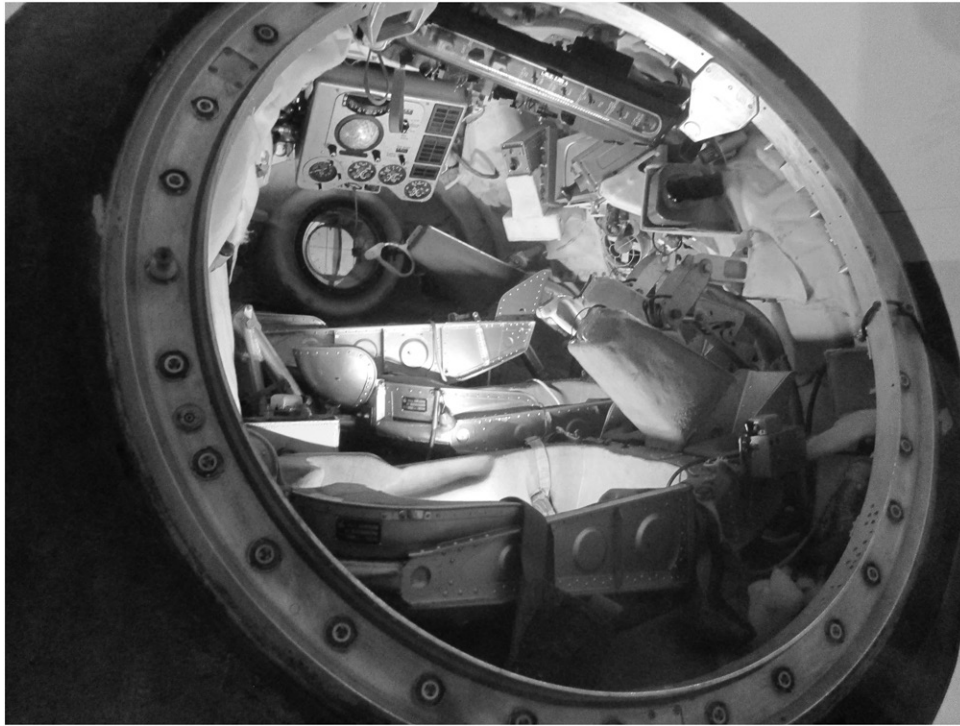


Fig. 2. The interior of the Voskhod 1 capsule as visualized through the hatch showing the cramped arrangement of the three seats which had to be oriented at a right angle to the control panel.

Volynov was replaced by Col. Vladimir Komarov at the insistence of Soviet Chief Designer Sergei Korolev. Katys was replaced with Konstantin Feoktistov after he had been discovered by the KGB to have family loyalty problems: his father had been shot by the Soviets during the purge in 1937 and his brother and sister had both fled the country and were living in Paris. Nikolai Kamanin (head of the Cosmonaut Training Center) tried to medically disqualify Yegorov and Feoktistov, stating that they were “medical invalids.” However, they were both strongly backed by Korolev.⁴

A Special Physician’s Panel had to approve Feoktistov. He was also opposed by many because he was not a member of the Communist Party. Interestingly, Feoktistov was “executed” by the German SS in World War II and pretended to be dead until he could escape. He was a close associate of Korolev and was heavily involved in the engineering design of the Sputnik, Vostok, Voskhod, and the Soyuz spacecraft. In fact, as one of Korolev’s lead designers, he had opposed the stopgap Voskhod program as a distraction from the primary goal of bringing the more capable Soyuz on-line—until Korolev told him he could fly on Voskhod! Later he was involved in the design of the Progress, Salyut, and Mir spacecraft.³ Yegorov also had medical issues and had performed poorly in parabolic flight (developing nausea and vomiting), but his political connections assured his presence on the crew.

The crew only had 4 months of training. Medical pre-launch evaluations were greatly curtailed due to time constraints. Voskhod 1 was launched on October 12, 1964 (appropriately, Columbus Day in the United States), and was a 16-orbit, 24-hour flight.

Yegorov and Feoktistov both initially had problems with spatial adaptation (an early indication of what would later be termed “space motion sickness”), but it quickly resolved. During the flight, Yegorov drew blood samples, studied muscle coordination, observed space adaptation, took blood pressure readings, and recorded brain wave tracings. He also did biomedical experiments on *Drosophila* fruit flies and plants. Voskhod 1 made a successfully soft landing with the crew feeling well post-landing.⁵

Yegorov was awarded the Hero of the Soviet Union immediately after the Voskhod 1 flight. He then gave up his temporary role as a cosmonaut but remained with the team of space doctors which examined each successive crew after they

returned to Earth. In this connection, he made 11 parachute training jumps and became an experienced mountaineer.

Yegorov received his M.D. from Humbolt University in 1965, his “Candidate of Medical Sciences” degree in 1967, and his “Doctorate of Medical Sciences” in 1976. His specialty was in disorders of the sense of balance, no doubt informed by his own sensations and observations during his brief spaceflight. He had begun working at the Institute of Biomedical Problems (IBMP) in 1964¹ just prior to his selection as a cosmonaut and was later involved in the 1966 Kosmos-110 mission in which two dogs orbited for 22 days through the lower reaches of the Van Allen belts in a Voskhod capsule originally intended for a long-duration manned flight. Later he was the Chief of the Laboratory at the IBMP and then the Director of the Scientific-Industrial Center at the Soviet Health Ministry from 1982–1989. He died of a myocardial infarction in 1994 at the age of 56.

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