

SPACE

Titov Reports on Flight

The Russian cosmonaut revealed at a space symposium that he rocketed into space on booster as powerful as the U.S. Saturn successfully tested but not ready for flight until 1964.

► **COSMONAUT** Gherman S. Titov was sent on his 17-orbit space trip by a multi-stage rocket having 1,300,000 pounds of thrust, a booster as powerful as the U. S. Saturn successfully tested on Oct. 27, 1961, and April 25, 1962.

The cosmonaut told the Third International Symposium on Space in Washington, D. C. that his rocket had six liquid propellant engines. The rocket had supposedly three stages according to his autobiography distributed by the Soviet Embassy. The new information indicates that the Russians had an operational rocket the size of the Saturn when Titov went into space Aug. 6 whereas the United States does not expect to have the Saturn ready to "fly" until 1964.

Titov reported that he controlled Vostok II manually during his second and seventh orbit around the earth. He also revealed that the cabin seat of his capsule provides for ejection of the cosmonaut and his descent by parachute. It "contained all that is necessary for sustaining the cosmonaut after landing."

The seat was even equipped with an inflatable dinghy which deploys automatically if the astronaut lands in the water.

He was able to control the ship's attitude, to orient it in space, and to land the ship.

Earth environment conditions were maintained in the cabin through a life system which included air conditioning, pressure regulation, food and water, and a special device for the disposal of excretion products. Although the cosmonaut wore a space suit, he kept the face-piece of his helmet open throughout most of his flight.

He ate three hours and 42 minutes after launch while the ship was in its third orbit. "The cosmic snack needs a certain knack," Titov said. When he opened a tube containing black currant juice, he spilled a drop of the liquid which remained suspended in front of his nose until he caught it.

The food flavors were the same in space as on earth. It was during his seventh orbit while operating the space ship manually that he had his supper.

During this orbit he covered the distance between Washington and Moscow in only 18 minutes. He sent his greetings to the American people and told his audience "cosmic space brought our cities closer together."

The cosmonaut minimized the symptoms of space sickness which he experienced during weightlessness. The sensation, he said, did not affect his efficiency; and after the seventh orbit he prepared for sleep which at first was restless. Then, Titov said, "I slept the sleep of the just and spent 35 minutes more on it than scheduled."

In contrast to Astronaut John H. Glenn's obvious pleasure and adjustment to weightlessness, Titov reported he preferred the increase in gravity. "G-load increase had a wholesome effect on me," he said, "either because of the unpleasant sensation of nausea, or because of the fact that I was returning to earth."

When G-load reached its maximum, his body weight had increased several times but his vision was not disturbed and his breathing remained deep and even.

Titov said "the principal and primary result of the flight was proof that man can withstand prolonged stay in weightless conditions and retain his capacity for work during the whole period of a 24-hour flight."

The ship's structures and systems maintained normal life conditions. No extraneous odors were detected; the space suit did not hamper his movement; the systems of manual and automatic solar orientation functioned "faultlessly."

Titov reported that he saw something that looked like snow passing in front of the porthole of the spaceship. From afar, it looked like fluorescent points and fluorescent eroded spots.

He saw these when he first went into orbit and again after almost 10 hours of flight. He said he and Glenn discussed this phenomenon, which has been called the Glenn effect. Astronaut Glenn reported seeing these particles each time his spacecraft entered into the sunrise zone.

Cosmonaut Titov said the phenomena may have resulted from extra fuel ejected from the space craft. On descent back to earth, Titov said he could clearly observe molten droplets of the melting heat shield from his spacecraft float by. Some of the portholes were entirely covered with the molten material during the trip back to earth.

In concluding his address, he spoke against the diplomatic and political stresses which keep men on earth under tensions.

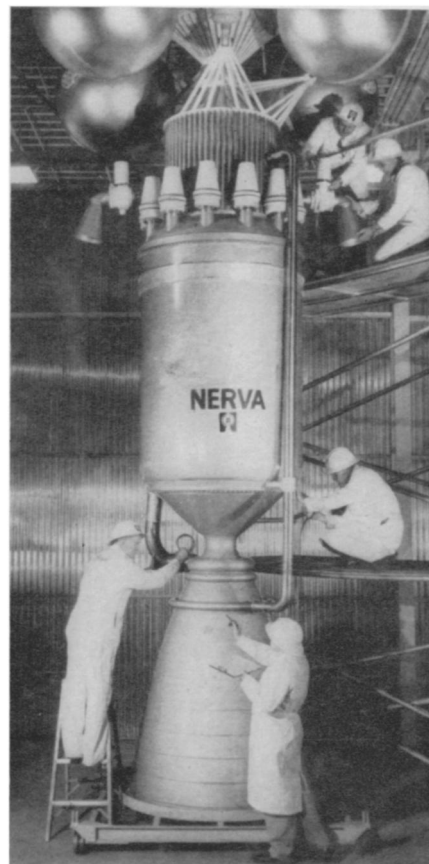
It is time, he said, to "do away with the stresses and put the ship of humanity into the orbit of peace, progress and prosperity."

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Unmanned Space Probes

► **THE EMPHASIS** on man in space was deplored as detrimental to space achievements by a British scientist attending the Third International Symposium on Space in Washington, D. C.

Dr. R. L. F. Boyd of the department of physics, University College, London, said, "there is nothing really scientific about putting a man into space or sending him to



NERVA MODEL—A full-scale model of the Nuclear Engine for Rocket Vehicle application (NERVA) was constructed by Aerojet-General, Azusa, Calif., to aid the design of NERVA engines by helping engineers observe component orientation and limitations on spatial arrangement.

the moon. This activity is better labeled exploration or adventure. And the money spent on such achievements could better be spent on unmanned scientific space probes.

Dr. Boyd is closely allied with the S-51 research satellite prepared and launched jointly by the United Kingdom and the United States last month.

The question of who is ahead in space, the United States or the USSR is obvious, Dr. Boyd said, if measured by scientific achievements.

The United States is first in space, he said. More scientific knowledge about the earth and its environment was gained from the U.S. grapefruit-sized satellite Vanguard I than from the giant-sized Soviet Sputniks. He hoped that now that the United States had shown the world, through the successful flight of Astronaut John H. Glenn Jr., that it had the capability to orbit a man in space, it would concentrate more time on unmanned satellite probes aimed at pure science research.

"There is absolutely no justification for expending large funds to send a man to the moon," he said, "unless the man who goes is a scientist equipped to do scientific research there."

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