

# Space

# INTELLIGENCE NOTES

SPACE SYSTEMS INFORMATION BRANCH, GEORGE C. MARSHALL SPACE FLIGHT CENTER

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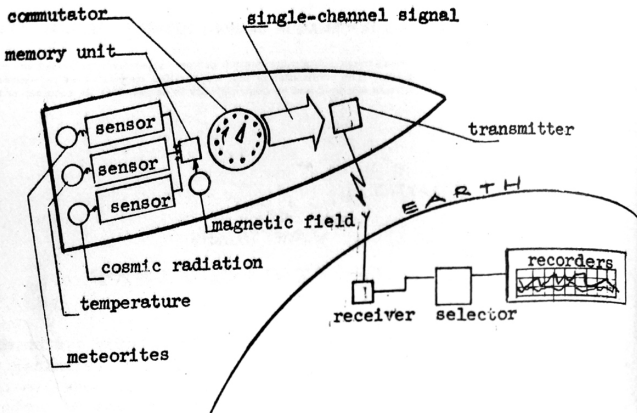
## FEATURED ARTICLES

- ◆ SOVIET SECURITY
- ◆ SOVIET SPACE FEAT CONFIRMED

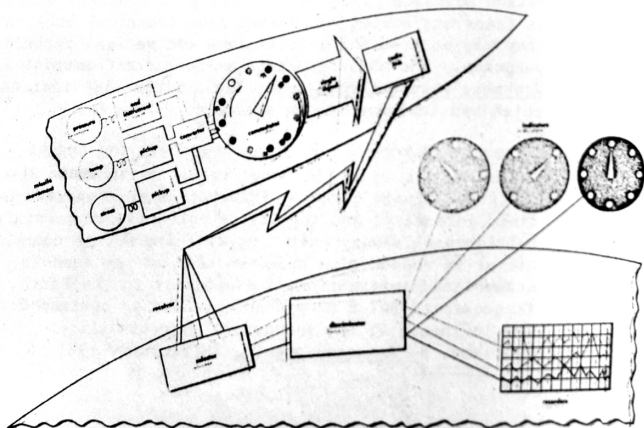
SOVIET SECURITY. The "iron clad" security system employed by the Soviet Union in regard to the release of technical information in the space science field might serve as a model to those who dream of a maximum security system. The release of technical information to the general public, that is, the decision as to what should or should not be released, will always be a problem in an effective security system. The case described in the following paragraphs illustrates how the Soviet Union has solved this problem.

The following is an abstract which was published by the Air Information Division of the U.S. Library of Congress whose mission is to translate Soviet and Soviet Bloc technical publications so that they may be used for intelligence and general technical information purposes. The abstract is taken from the Communist Party newspaper Krasnaya zvezda (Red Star). The article also included a diagram which was included in the abstract.

TELEMETRY SYSTEM OF THE VENUS SPACE STATION (USSR): The multichannel telemetry system of the Venus rocket is shown in the illustration. Electric signals carrying information on temperature, magnetic-field intensity, and density of meteorite streams are fed into a multichannel memory unit. A switching device connects the transmitter in consecutive order to each of the sensors, "reads" the accumulated information, and sends it to the Earth. The operational frequency of 922.8 mc was selected as an optimum for minimizing the influence of the ionosphere on reliability of communications. (Surikov, B. Krasnaya zvezda, 18 February 1961, 6, cols. 5-7).



The following illustration has been reproduced from U. S. Air Force Instruction Manual No. 52-31, page 492, 20 September 1957.



Telemetering system

This is an interesting example of what has become standard procedure in Russia. Rather than take the risk of releasing technical information which may prove useful to the U. S., they simply copy material produced in the U. S. which is readily available to them.

It is ironic that the Soviet people must learn of their nation's great achievements in space through the medium of American literature, most of it published years before the event.

SOVIET SPACE FEAT CONFIRMED. At the recent annual convention of the American Society of Newspaper Editors, an editor of a Texas newspaper arose to announce that some people down in Texas did not believe that the Soviet Union had actually put a man into space.

The reaction of the Texans was symptomatic of a flurry of widespread doubt seemingly stirred up by a combination of hurt national pride and deepseated distrust in the Russians.

What skepticism still exists is in the face of not only Soviet announcements but of official U. S. confirmation. Dr. Frank Press, a member of the President's Science Advisory Committee, stated, "There is no doubt in the minds of any knowledgeable person in this field that the Russians did what they said they did."

Based On Tracking Information: The certainty of American officials springs from the fact that through a combination of electronic and conventional espionage the United States is able to keep a secret eye on Soviet space activities.

For several years the United States has maintained a global surveillance network to keep track of Soviet launchings. The effectiveness of this system is evident from the fact that the U. S. has had advance knowledge of every major Russian space shot announced by Moscow and also of those which were not announced.

Preparation Monitored: The first clue that a major space shot was impending came early in April when Soviet tracking ships were spotted taking up positions in the Atlantic and Pacific Ocean. The surveillance network was alerted as launching preparations were begun at the Soviet missile site at Tyura Tam, north of the Aral Sea. Listening posts in the Middle East tuned in on the increasing volume of radio messages passing between the launching site and the downrange tracking stations.

The Russians are aware of the fact that their launching preparations are being subjected to electronic eavesdropping; however, they might be surprised at the effectiveness of this method. One report common within U. S. space circles is that we are able to follow the complete Soviet countdown procedure.

Earlier Attempt Ruled Out: The effectiveness of the surveillance network and the fact that no such launching was monitored prompted the officials to rule out the popular rumor that an unsuccessful manned orbital attempt was made before April 12. As U. S. officials have pointed out, they would have known if a Soviet satellite had been launched and there was no evidence that a space ship was placed into orbit before the five-ton vehicle of Major Gagarin.

Still Room for Doubt? The skeptics point out that if we are sure a Soviet satellite was launched we still aren't sure that an astronaut was on board. Even if Gagarin's voice was monitored as he maintained radio contact with Soviet stations, it would be difficult to prove that it was not just a recorded voice.

Primary Cause of Doubt: Probably the main cause of suspicion in the entire matter is the secrecy of the U. S. Administration and of the Soviet Union. Any announcements which have been made by the Soviet Union in regard to technical facts of the space shot have been extremely obscure and in many cases contradictory.

The Soviet Union has always been reluctant to describe the details of its space missions and may never clear up the mystery surrounding this most important first in the conquest of space. But there is no mystery about whether Major Gagarin circled the Earth. Every bit of evidence available to the United States confirms the feat and rules out the possibility of deception. (New York Times, April 23, 1961)

NEW COMPUTER. The Ukrainian Academy of Science Computer Center has designed a high-speed digital computer "Kiyev" to be used in the solution of logical and mathematical problems. Since all of its units are mounted in separate cabinets, they may be operated independently, thus making it possible to modernize each unit separately. The computer, it is claimed, can perform 12,000 additions and subtractions, 5,000 multiplications, and 3,000 divisions per second. The Computer Center is presently designing a unit for automatic control of the Bessemer process. (Pil'kevich L., Radio, No. 10, October 1960, 6)

SOVIETS TEST GLASS FIBER NUCLEAR FUEL. An article entitled "Nuclear Fuel in the Form of Glass Fibers," by K. Lustig appeared in the Soviet Journal of Glass and Ceramics (Vol. XVII, No. 3, p. 42, March 1960), which proposes that nuclear fuel elements be made of glass fibers containing oxides of uranium, plutonium, or thorium.

This novel approach to the nuclear fuel problem offers several advantages such as chemical stability; thermal stability and heat resistance which makes it possible to operate reactors at temperatures up to 1000°C; extensive possibilities for varying the content of fissionable material and using different types of fuel; suitability for many different types

of low temperature reactors; facility of continuous removal of fission products by the liquid coolant and of the replacement of fuel elements; and simplicity and low cost of production.

Lustig suggests various methods of producing this glass fiber and states that glass fiber containing uranium - 235 has already been tested in Soviet nuclear reactors. (Consultants Bureau)

#### SOVIET SPACE MEDICINE:

✓ Cells Divide Faster in Space: Soviet biochemist N. Sisaskyan reported that the processes of cellular division in pea, corn, and wheat seeds were speeded up in space. He also reports that definite modifications were noticed in the division of cells in bone marrow samples from mice. The stimulating and somewhat harmful effect was not a result of one factor alone, he noted, but of a whole complex of factors including weightlessness, radiation, and the high acceleration of launch and reentry. Although the processes of cell division were affected, no major effects on the physiological functions of the organisms were apparent or would be expected as long as they were kept away from the great radiation (Van Allen) belts. (Discovery, Vol. XXII, No. 3, March 1961, p. 91)

✓ FLYING SAUCERS IN RUSSIA. The flying saucer has finally shown up in the Soviet Union much to the distress of the Red Government. An interview with Academician Leo A. Artsimovich, a foremost Soviet physicist, appeared in a recent issue of Pravada in which he attacked rumors of flying saucers allegedly seen over Russian territory. He claimed the prime source of such rumors as "the dishonest and anti-scientific data contained in reports read (at scholarly meetings) in Moscow by some completely irresponsible persons." Professor Artsimovich further claimed that "these fantastic fairy tales were for the most part borrowed from the American press." (Missiles and Rockets)

VENUS ROCKET REPORT. At a mid-April International Space Symposium in Florence, Italy, Academician A. A. Blagongrarov stated that all efforts to re-establish radio contact with the Venus probe had failed. "Without needing correction," the probe will pass within 62,000 miles of the target planet on May 19th, according to the report.

BETTER US INTELLIGENCE ON RUSSIA? Senator Richard B. Russell, Chairman of the Senate Armed Services Committee, expressed the opinion recently that U. S. intelligence estimates on Soviet military strength have improved considerably.

NEW SCIENTIFIC RESEARCH AGENCY ESTABLISHED. A new agency has been created in the USSR to control all scientific research within the country, and as well exercise authority over Soviet international scientific relationships.

Called the State Committee of Scientific Research Work, it apparently will take over many of the powers previously reserved for the Soviet Academy of Sciences. The new agency is headed by Lt. General Mikhail V. Khrunichev, who was formerly the First Deputy Chairman of the State Planning Committee. In the future the new organization will concentrate on basic research, on accelerating the transition between research and production, on introducing the results of research into the Soviet economy, and on collecting and disseminating scientific information. The Academy of Sciences, meanwhile, will focus its attentions on the more rapidly advancing branches of science, such as physics.

NEW DATA ON THE TUNGUSSKA METEORITE. The Tungusska explosion, which was discussed in some detail in SIN, Vol. 1, No. 2, December 1960, is still an object of scientific interest in the Soviet Union. A new paper has been added to the already extensive literature on this tremendous explosion which occurred in the Siberian wastelands in 1908. The article entitled "New Data on the Tungusska Catastrophe of 1908," by A. V. Volotov, Doklady Akademii Nauk SSSR, Vol. 136, 1961, No. 1, pp. 84-87, is based on research conducted in the Summer of 1959.

The region of complete destruction extends for a distance of 20 to 22 kilometers from the epicenter of the explosion which was equivalent to ten million tons of TNT. The presence of standing trees for a distance of 5 km from the epicenter of the explosion indicates that the explosion of the meteorite occurred in the air at a height of several kilometers (not less than five kilometers). An evaluation is made of the velocity of the meteorite at the time of the explosion and the evidence and methods used in this determination are fully described. The terminal velocity is reckoned at 3 to 4 kilometers per second. The explosion was not due to a conversion of kinetic energy to thermal energy, as in re-entry heating, but was due to a conversion of internal energy. A determination of its light energy indicated that this was on the order of  $(1.1 - 2.8) \times 10^{23}$  erg. Hence, the author states, the ratio of light energy to full energy is of the same order as in a nuclear explosion. (Office of Technical Services, Department of Commerce)

VOSTOK AND EKONOMICHESKAYA GAZETA. Some details of the first Soviet manned satellite were found in an unlikely source: The Economic Gazette. In an article by V. Denisov, it is learned that the capsule containing Major Yuri A. Gagarin's couch was mounted on bearings so that it could make a complete circle. In terms of the line of travel, the pilot was always in the horizontal position. The article went on to outline means of recovering space vehicles, but did not specify what technique was employed in the Vostok experiment.