

# Secrecy, Tragedy Mark Soviet Flight

**Despite the secrecy, the U.S. compiled a record of the mission almost as it happened.**

"When Volodya goes away on a trip, he never tells me where he is going," complained Valentina Komarov about her husband, as he flashed around the world in the first Russian manned spacecraft to be launched in more than two years. She was not told, in fact, until after his ship had been launched, at 3:35 A.M., Moscow time, on April 23. Hours later he was dead.

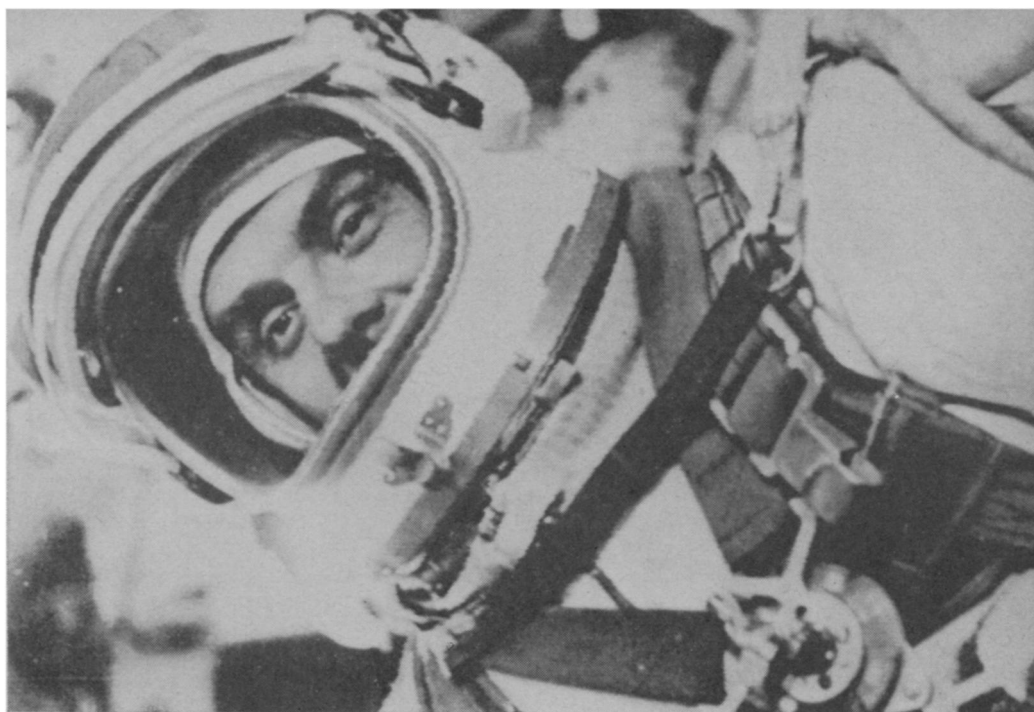


<sup>UPI</sup>  
Valentina Komarov

The secrecy that surrounds the Soviet space program is a very real thing; a wall that excludes even the relatives and friends of the cosmonauts themselves. The flight of the Soyuz 1 spacecraft, far from representing any lessening of safeguards, was instead given less publicity and fewer progress reports than any previous Russian manned flight.

But the wall is by no means impenetrable. U.S. space analysts have assembled a picture of the flight and the events leading up to it that is astounding in view of the limited sources from which it was compiled.

The official Russian version, made public through the Tass news agency in brief spurts beginning after the firing, revealed only that the spacecraft's orbit measured 140 by 125 miles; that each orbit lasted 88.6 minutes; that Cosmonaut Komarov was conducting several unnamed experiments; and that as he was attempting to land, while still 23,000 feet up, the



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The only cosmonaut to go twice into space, Komarov had piloted Voskhod 1.

spacecraft's parachute lines became tangled and the vehicle crashed, killing its occupant.

Yet the U.S. had been expecting the flight for more than a year, and not just because of the unnaturally long Russian hiatus in manned space flight. Data and photos from sources such as the Samos spy satellites had convinced U.S. intelligence officials that the Soviet Union was developing a new booster rocket. When National Aeronautics and Space Administration officials complained at an international scientific conference attended by the Russians that Congress was cutting their budget, the Soviets laughingly told the Americans that the budget would be restored after the next Russian manned flight. In a Russian magazine last month, Cosmonaut Yuri Gagarin, who in 1961 became the first man ever to orbit the earth, hinted that a major Soviet launch was not far off.

In addition, indications are that four of the almost two dozen Cosmos satellites launched since late November were actually unmanned test versions of the Soyuz spacecraft. All four were in orbits inclined at 51 degrees, the same angle as Soyuz 1. Cosmos 133 and 140 were in orbit for two days; Cosmos 146 and 154 lasted eight days each. It is believed that some problems were encountered during those flights.

The technique which enabled such conclusions to be drawn about supposedly secret Cosmos probes—and which has almost certainly provided the U.S. with detailed sketches of Russian spacecraft complete down to objects the size of doorknobs—is what one of its practitioners describes as the black art of radar signature analysis

(SN: 9/24/66). RSA, as it is called, is basically the use of pinpoint radar to identify the shape of an object in orbit and of its various appendages such as solar cells, antennas, rocket nozzles and exterior instrument packages. The radar equipment automatically draws graphs of what it sees that analysts can convert into actual drawings.

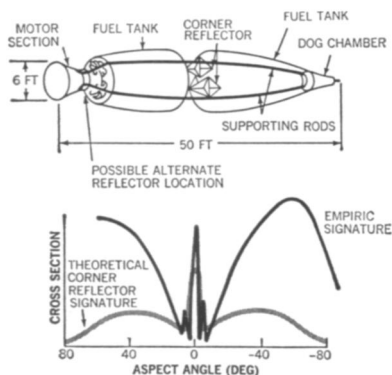
In 1958, RSA was used to draw a remarkably detailed picture of Russia's Sputnik 2, the second satellite ever launched. By revealing the corner-shaped reflectors aboard the satellite, designed to provide the strongest possible return for a weak signal, RSA enabled U.S. observers to deduce that the Soviet tracking network was using a number of low-powered radar units that dated back to World War II.

During the tragedy-bound flight of Soyuz 1, RSA and other techniques were used constantly by the North American Air Defense Command (NORAD), the chief U.S. satellite tracking organization, which keeps watch on every manmade object in the sky. NORAD kept a highly accurate, constantly updated record of the spacecraft's orbit. The data would have been used to spot any maneuvers and also provided what is one of the most valuable pieces of intelligence about any object in orbit—its weight—one of the best indications of the mission's intentions as well as of Soviet state-of-the-art.

Combined with NORAD's elaborate Baker-Nunn tracking cameras, which can follow the reflection from a hubcap 50,000 miles away, all this analysis revealed that Soyuz 1 probably weighed somewhat less than 15,000 pounds, compared to a little more

than 12,000 pounds for both the Apollo capsule and for Voskhod 2, the previous Soviet manned flight in 1965.

This means that it was far from the heaviest spacecraft ever launched by the Russians. Proton 1 and 2, described by the Soviet Union as "physics laboratories," each weighed some 27,000 pounds, and the Proton 3 mission is believed to have carried more than 60,000 pounds into orbit around the earth. This is about the combined weight of an Apollo capsule and the rocket that will carry it from its earth orbit to a lunar one. U.S. officials thus reason that a manned mission, perhaps in a Soyuz spacecraft, using the same kind of huge booster that carried Pro-



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Radar analysis pictured Sputnik 2.

ton 3, would be capable at least of making a non-landing flight around the moon.

Monitoring of Soviet communications also helps to cut holes in the secrecy screen. NORAD's tracking stations are located in Alaska, Greenland, England and Turkey, but even within the continental United States are listening posts which provide valuable information. Though there were no public Soviet announcements about trouble during the flight, one California outpost overheard a broadcast saying that Komarov fought for control of his spacecraft for three orbits before bringing it down into the atmosphere. The message said that there had been difficulties in attitude control and communications, and that the spacecraft had been using too much power.

The Russians did not announce where the spacecraft had crashed, except to say that it was somewhere in the Ural Mountains. But another listening post caught a piece of a message saying that it was near the city of Sverdlovsk, about 675 miles from the Baikonur space center from which it was launched and about 180 miles from the spot where the previous Soviet manned flight landed.

Though there is a lot of information thus unofficially available to the U.S. space analysts, there is one upcoming plum they'd like to have. Within a day

after the tragic end of the flight, Soviet space officials announced that an official review board would investigate the accident in detail. The results of the investigation, if it is indeed a rigorous one, will certainly not be made public, and if it provides the same exhaustive space program survey as appeared in NASA's report of its own tragedy on Jan. 27, the Russian report would be a prize indeed for U.S. spies.

## Draft Changes

While draft legislation faces vocal opposition in Congress, the Pentagon is quietly preparing an executive order to do away with the draft deferments for graduate students.

It is not known exactly when the President will issue the order, which complies with recommendations the National Advisory Commission on Selective Service sent to the White House earlier this year (SN: 3/18), but Government officials believe it will not be retroactive.

Whether or not deferments will still be granted to undergraduates remains an open question, or a White House secret, officials say, but the President has definitely decided that when a man finishes college he should stand as much chance of being called into service as anyone else.

## Social Science Study

Domestic programs have increasingly aimed at a base in the social sciences in the last five years. Poverty, crime, urban chaos, poor health and education—all will supposedly yield to a well-designed program based on social research.

The aim is fine, but the research is hard to find, a House subcommittee report said last week.

The report came in four volumes and represented the first major investigation into Federally sponsored social research. Put together by sociologist Dr. Harold Orlans of the Brookings Institution, the report charges that too much Federal research is trivial, repetitive or simply not applied to the burning domestic issues.

It also makes clear that both Government and social scientists are responsible for research whose quality and utility is questionable.

The report, however, only raises questions; it makes no recommendations. Public hearings will be held later to determine whether agencies can be prodded into action or if legislation must be proposed.

Federal support for social and behavioral research has increased five-

fold since 1960 and this year stands at \$380 million. Money is being spent not only by old line agencies, such as Health, Education and Welfare, Defense and Agriculture, but by the newer agencies—the Office of Economic Opportunity, the National Aeronautics and Space Administration, Arms Control and so forth.

Evaluations of how much good this money is doing are hard to come by, the report charges.

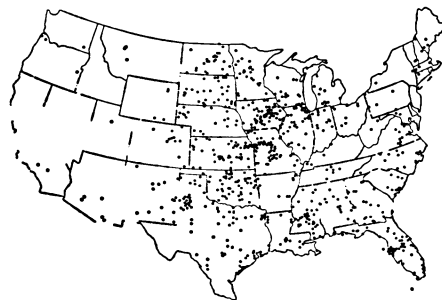
Of 21 agencies queried on the relevance and quality of their research, only two had answers of any consequence. Six others claimed they do have procedures for evaluation, but gave little information; seven did not bother to answer at all.

Besides Government agencies, the House investigators sent inquiries to well-known scientists, private researchers and foundations. Their views, published in full by the subcommittee, represent a span of opinions, from endorsement of the kind of research supported by Government to harsh criticism.

## Tornadoes, a Mystery

Hundreds of tornadoes maul the surface of the earth every year, taking hundreds of lives and smashing all but the sturdiest of man's works, yet they remain one of the least understood of natural phenomena.

Those that killed more than 50 people and caused more than \$20 mil-



Tornadoes, 1966. And no solution.

lion worth of damage in Illinois alone on April 21 underscored man's total helplessness against their fury.

While meteorologists can predict with fair certainty the broad areas where tornadoes are likely to form, they can neither pinpoint the exact locations of future funnel clouds nor do anything about them once they have formed.

The best anyone can do—as was done in the eight states visited by the April 21 twisters—is issue a tornado watch, a warning to the community that atmospheric conditions are right