

SPACE

# Space Shot Significance

Russia's three-man space flight, though not as epochal as Sputnik I, introduced "soft" landing on land and did away with space suits—By Jonathan Eberhart

► THE SOVIET UNION has sent three men in a single spaceship around the world 16 times. So what?

Although the Sunrise flight, manned by cosmonauts Konstantin Feoktistov, Vladimir Komarov and Boris Yegorov, launched Oct. 12 was not as significant a milestone as the first satellite, Sputnik I, or the first man in orbit, Yuri Gagarin, it represented a number of important scientific developments:

Perhaps the most obvious is the fact that the cabin of the Sunrise was safe and secure enough to do away with the need for space suits. If the U.S. decided to follow this idea, they could save almost 75 fuel-consuming pounds on the Apollo three-man shot, and permit greater movement.

The Sunrise used retrorockets as "brakes" to permit a "soft" landing on land. This is an exceedingly important technique, as all previous Soviet cosmonauts except Gagarin have had to parachute from their vehicles before landing. American astronauts have stayed with their capsules, but have been limited to landings on water.

The fact that the crew included medical and engineering specialists instead of merely two more cosmonauts offered much more complete data on the flight than would have otherwise been available.

The Soviet Union views the Sunrise flight, which lasted 24 hours and 17 minutes, as but the first of a string of multi-manned shots aimed at the moon and planets. Sources say that there are already more and longer flights in the works involving Sunrise-type vehicles.

There were apprehensions that the flight indicated some kind of new Russian super-booster. However, it now appears that the Sunrise capsule weighed only about 1,700 pounds more than the earlier Vostoks, which would mean that the already-existing, tried-and-true model could have been used.

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## U.S. Astronauts Could Fly Without Space Suits

► U.S. ASTRONAUTS will not need space suits for the Gemini and Apollo space flights any more than the three Russian cosmonauts did for their 16-orbit trip aboard the "Sunrise."

John Glenn, Scott Carpenter and the other Project Mercury astronauts had "double protection" against the cold airlessness of space from space suits and the pressurized cabins of the space capsules themselves.

At no time during any of the Mercury flights did the air pressure in the capsule fail. The astronauts could have left their space suits behind at Cape Kennedy and still "flown" in perfect safety.

There are several good reasons for doing away with space suits. One is that a space suit, with its cooling and heating systems, joints, fittings and a heavy helmet, can add up to a considerable weight problem. Even though the Mercury space suits, and current suit designs for Gemini and Apollo, only weigh between 20 and 25 pounds, every pound of weight on a space flight

adds many pounds to the amount of fuel that must be carried along.

Dr. Michael Del Duca, biotechnology bureau chief of the Federal space agency's office of advanced research and technology, pointed out that the freedom of movement in a "shirt-sleeve environment" such as existed in the Sunrise allows the designers of space vehicles much more latitude than they would otherwise have in planning equipment layout and panel location.

Even simple control switches must sometimes be redesigned because of some restriction of a space suit, such as a thickly insulated glove.

In addition, there is a psychological advantage for an astronaut (or cosmonaut) in not looking like the Creature from the Black Lagoon. Any "earth comforts," as the Soviet news agency, Tass, called the blue and gray wool suits of the Sunrise cosmonauts, are welcome relief from the free-fall environment of a space ship.

The Russians do not need space suits; why do we? "There is no reason other than safety," said Dr. Del Duca. The National Aeronautics and Space Administration strongly believes in redundancy, or duplication, in all the systems in U.S. spacecraft, and the most important parts of a space vehicle are the safety devices.

There is always the possibility, says NASA, that a tiny meteorite could puncture a spacecraft, leaving the crew with not nearly enough time to don space suits. Some experts feel, on the other hand, that it is this redundancy that is slowing down the U.S. space program.

John Young and Virgil "Gus" Grissom, who will fly the first Gemini spacecraft early next year, will wear several layers of clothing, each with a special purpose.

The most important layers will be the ones on the outside and the inside, though there will be several layers of insulation in between. The outermost layer may be made of a canvas-like white nylon instead of the metallic silver paint of the Project Mercury suits. The heat-resistant nylon will not flake and peel, as the paint did.

Innermost will be one of the most remarkable developments in the space suit program—water-cooled underwear. A network of plastic tubes will carry water over the astronauts' bodies from a cooling unit attached to the suit.

This unit has already proved itself outside the space program on the stock car racing circuit. After one race, in which cockpit temperatures rose above 130 degrees, every driver was examined at the finish line. All the drivers except one were running fevers. The one exception was wearing under his driving suit the prototype of the exact design that will cool Grissom, Young and our other astronauts.

There is one other reason for not abandoning space suits altogether. When men do finally land on the moon and other planets, space suits will be a necessity. Project Gemini will provide the proving ground for these suits when astronauts open the hatches for the first time in outer space, and, in later flights, actually leave the protection of the capsule.

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Novosti Press Agency

**FIRST SPACE CREW**—"Sunrise" cosmonauts Konstantin Feoktistov, spaceship designer, Vladimir Komarov, craft commander, and Boris Yegorov, the physician, stand at the gate of the Kremlin, Moscow.