

SPACE

Schirra Joins Space Club

Astronaut Walter M. Schirra's six-orbit flight marks the high point in the advancement of space knowledge for the Mercury man-in-space program, Lillian Levy reports.

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► **ASTRONAUT WALTER M. SCHIRRA**, seen on this week's front cover, joined the select group of astronauts successfully shot into space when he completed his six-orbit flight on October 3.

The astronaut splashed down into the Pacific a little more than nine hours after blastoff. He was then quickly picked up by a helicopter and taken to Navy carrier, *Kearsarge*, waiting only 9,000 yards away.

The letter-perfect flight established many firsts for the United States. It was the first U.S. manned space flight designed primarily to test engineering and operational capabilities. It is the highest U.S. manned flight (176 miles), and it was the first space flight, either East or West, telecast to both Eastern and Western Europe via Telstar, the active communications satellite.

Astronaut Schirra travelled 160,000 miles in a flight that produced little or no trouble. Jubilant U.S. space officials echoed President Kennedy's sentiments on the "historic exploration into space."

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Space Program Achieves Science-Technology Peak

► **THE SUCCESS** of Sigma-7, the National Aeronautics and Space Administration's eighth mating of the Atlas booster with the Mercury space capsule, marks the high point of scientific knowledge and engineering data gained from the Project Mercury man-in-space program. Further Mercury-Atlas manned flights into space, even the 18-orbital mission now scheduled for early next year, will not yield significantly more information to advance U.S. space capability, a leading scientist and engineer predicted.

"The program is approaching a dead end beyond which we cannot proceed. Now is the time, therefore, to begin concentrating on building advanced propulsion systems more powerful than the Atlas or Titan II to be used for Gemini and a space vehicle which a pilot can control completely and maneuver from launch through landing," Air Force Maj. Gen. Leighton I. Davis, Commander of the Atlantic Missile Range, told SCIENCE SERVICE at Cape Canaveral.

NASA's liquid-fueled advanced Saturn C-5, which will have 7.5 million pounds of thrust to send a man or crew of men into space by 1964 according to current estimates, is only one step forward, Gen. Davis indicated. The nation's engineering and scientific talent should be mobilized so that even greater advances, now theoretically possible, may become reality. One of these is the concept of a hybrid rocket, a fusing of

liquid and solid propellants combining the best features of both: the guidance advantages of the former with the reliability and long storage capability of the latter.

The Air Force's Dynasoar concept of a space vehicle which can be flown and guided like a plane is under this reasoning a preferred goal as a next step rather than Gemini, the two-manned space capsule, which is essentially an enlargement of the Mercury capsule. Gemini, according to many space experts, is too similar to Project Mercury to be other than a dead-end type of program. They question whether spending for this kind of program is justifiable. In fact, there was, for a time, debate within NASA whether Gemini should be abandoned.

Sigma-7 and the other Mercury flights as well as the Soviet manned space flights, have proved, according to Gen. Davis, that "there is no 'Bogeyman' in space that man cannot overcome." Hazards from micrometeorites and cosmic rays are essentially no greater than motor collisions on the highway.

Protections against these space hazards can be developed.

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Douglas Aircraft

"TINKER-TOY" IN SPACE — A concept of a "tinker-toy" type space vehicle known as *Spaceball* was devised by space engineer T. J. Gordon of the Douglas Aircraft missile and space systems division. It could double as a space station or planetary transport and be lofted into orbit by the National Aeronautics and Space Administration's advanced Saturn C-5 vehicle now under development.

SPACE

Astronaut Schirra Enjoys 'Out-of-This-World' Food

► **OUT-OF-THIS-WORLD** food for fast and high living in space was dished up for Astronaut Walter M. Schirra in a brand new mobile dining facility he has dubbed "the astronauts' mess."

Located conveniently just behind Hangar S, where Project Mercury spacemen were quartered prior to launch, the mess was well-equipped to serve the low-residue diet to which Astronaut Schirra was limited after he began final preparations for his orbital venture. Before the new dining facility was built, astronauts dined at the forward medical center which is quite a distance from Hangar S.

Air Force nutritionist Beatrice Finkelstein, who is also dietitian to the astronauts, planned special diet menus designed to satisfy both test and energy requirements while, at the same time, slowing down and reducing strain on the digestive system. This latter, Miss Finkelstein pointed out, is specially important during the 96-hour pre-launch period when the astronaut is almost continuously in the close-fitting, closed-circuit full pressure suit that he wears during actual orbital flight.

The most important meal for the astronaut, Miss Finkelstein said, is the breakfast before launch. This is a large meal, extremely high in protein and includes steak as well as eggs and fruit juice, toast, tea or coffee, depending on the effect these beverages have on the astronaut. The mammoth size breakfast is designed to give extra energy for the stresses of the flight so that the astronaut can function at maximum efficiency. It also keeps him hydrated.

Schirra was the first U.S. astronaut to eat in space because he needed food to satisfy nutritional and energy requirements. In previous Project Mercury space flights, the astronauts ate primarily to test their capability to perform this function under the weightless conditions imposed by space.

Astronaut Schirra dined in space on pureed meat and vegetables in special squeeze tubes and bite-sized solids made crumbless by edible coating, fruit juice and coffee.

Crumbs could make eating a fatal experience in space if any should lodge and block the breathing apparatus of the astronaut's spacesuit.

While it is not known what the two Soviet cosmonauts ate prior to and during the recent almost week-long ride in space, it is known that the Russian space cooks were largely guided by the book on space-feeding written by Miss Finkelstein, Albert A. Kaylor, and Robert E. Hayes, Air Force scientists. Miss Finkelstein is a pioneer in this domestic side of space flight which has top priority in the Air Force and the National Aeronautics and Space Administration programming for manned space experiments.

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