



NASA

Cosmonauts Leonov, far left, Shatalov, front right, study Apollo in classroom.

American-Soviet space mission: Keeping a fast pace

by Everly Driscoll

A step-by-step procedure, called a "flight plan" in space jargon, is now being worked out in two languages, English and Russian, for the docking of a manned Apollo spacecraft and a manned Soyuz spacecraft in July 1975.

"We have found a common language," cosmonaut Aleksey A. Leonov said last week after a two-week visit at the Johnson Space Center in Houston (SN: 7/14/73, p. 23). He and nine other cosmonauts were in Houston for a familiarization session which precedes actual training in the Apollo simulators. The Soviet spacemen went to class to study Apollo spacecraft. They saw the simulators used to train astronauts. They entered the Skylab trainer. They visited the Rockwell International plant in Downey, Calif., where the docking module for the mission is being built.

The cosmonauts received tapes and films of the American astronauts actually docking spacecraft in earth and lunar orbit. Tapes of Soviet voices and docking procedures in earth orbit are being made for the American astronauts for their first familiarization session to be held in Moscow this November. The hope is that each side will become familiar not only with mechanical procedures, but the words and phrases used in each language as well.

Working groups also discussed elements of guidance and control of the two spacecraft. Since President Nixon and Premier Kosygin signed the agreement May 24, 1972, to conduct the joint space mission, technical groups have met almost monthly either in Moscow or Houston.

The meetings have been productive. In their first year, the working groups have:

- Agreed on a trajectory and rendezvous procedure. The Soyuz spacecraft will be launched first. It will perform two maneuvers to put the spacecraft into a circular orbit. Seven and a half hours after the Soyuz launch when the orbit of Soyuz crosses Cape Kennedy, the Apollo will be launched. The

two ships will rendezvous and dock about one day later. They will remain docked for about two days during which time the astronauts will visit Soyuz and vice versa.

- Established a basis for the scientific experiments to be performed during the mission. The candidate experiments include observations of earth and the sun. A plasma physics experiment that will provide an understanding of the effect of the spacecraft moving through space plasma is being discussed. Also under study is an experiment to investigate the earth's magnetic field by beaming electrons from one spacecraft to the other. The groups are also considering a way to use one spacecraft to occult the sun while crewmen of the other spacecraft photograph the solar environment.

- Begun building full-scale docking systems. Tests will begin on them in Houston in September.

- Decided to make the two spacecraft atmospheres compatible. Soyuz has a mixture of nitrogen and oxygen at 15 pounds of pressure per square inch (psi). Apollo has oxygen at 5 psi. The groups have agreed that to eliminate time-consuming prebreathing procedures, the Soyuz pressure would be lowered to 10 psi for docking.

- Outlined emergency plans. For example, if astronauts were in the Soyuz and unable to return to the Apollo for some reason, they would return to earth in the Soyuz, and vice versa.

- Added to the Soyuz and Apollo spacecraft. In addition to the docking collar and related equipment, items such as orientation lights and antennas have been added to the Soyuz design. Switches and wiring are being changed in the Apollo. Neither spacecraft is being modified structurally to any extent.

"We are far ahead of the pace and schedule we have usually maintained in our own [NASA] program," says Glynn Lunney, the U.S. technical director for the flight. □

OFF *the* BEAT

Half-answers and a request for patience

A Soviet space official meets the American press

Konstantin D. Bushuyev was facing the American press.

It was July 20 in Houston following a two-week meeting of the joint working groups for the 1975 U.S.-U.S.S.R. space mission, and Bushuyev was taking part in a press conference before American space reporters to discuss what had been accomplished by the working groups. As the Soviet technical director for the Apollo-Soyuz Test Project (ASTP), he had promised during a similar meeting with the press in March to answer some questions about which ground control center the Soviets would use for the joint mission in July 1975.

He only partially kept his promise. Bushuyev: "We have made a final decision and chosen the flight control center which is near Moscow."

Reporter: "Would you be more specific than near Moscow? Is there a town in which it is located?"

Bushuyev: "The control center of which I spoke is located near Moscow. It can be called the Moscow Flight Control Center in the same way you call this the Houston Control Center, although it is not located in Houston; it is located near Houston."

A hungry press: "Are we to infer then that the control center is something like 40 kilometers from the center of Moscow? . . . north, south, east or west?"

Bushuyev: "I don't see any necessity at the present moment to give you in greater detail the number of kilometers between the control center and Moscow, but I can assure you that it is not farther located from Moscow than this center is from Houston." (The Johnson Space Center is 25 miles from Houston.)

Again: "Is the control center located in or very near Zvezdnyy Gorodok [Star City]?"

Bushuyev: "I would like to terminate with the problem of the precise location of the Soviet Control Center. Your specialists will visit it, will be there, and they will be able to tell you precisely just where it is and what it consists of."

The reporters, never giving up, decided to ask American astronaut Thomas P. Stafford, who has made several trips to the Soviet Union. They had no luck. Stafford: "I do not know the exact location of the control agency . . . and it is not important enough at this time."

To a Soviet official, groomed by a