A busy week for cosmonauts

It was busy season in the cosmonaut corps last week, with as many as 14 Soviet spacemen hard at work on three different missions. Soyuz 17 crewmen Aleksei Gubarev and Georgi Grechko set a Soviet record of 30 days in orbit, most of it aboard the Salyut 4 space station, before landing safely on Feb. 9. Two days earlier, the eight cosmonauts in training for July's Apollo-Soyuz rendezvous mission (the two-man prime crew and three backup crews) arrived in the United States for a two-week workout that will be the last joint practice session for the flight with their American counterparts. Finally, there were hints that within a few weeks another Soyuz crew may visit the Salyut station, possibly for as long as 60 days, which means that the prime and backup crews for that flight are hard at work preparing for it.

The Soyuz 17 mission was only the second complete success in five Soyuz-Salyut undertakings (SN: 1/18/75, p. 39), and its successful landing occurred in disconcertingly inclement weather: 44-mile-per-hour winds, 1,600-foot horizontal visibility and a cloud deck only 800 feet above the ground. An analysis of the sunlight angles preferred by Soviet space officials for recovery operations suggests that the flight was supposed to have landed the day before, but weather conditions on that day in the landing area in Kazakhstan apparently were even worse.

While in orbit, Gubarev and Grechko worked their way through a wide-ranging program that included X-ray studies of the sun, infrared temperature scans of earth's upper atmosphere, stellar observations and natural resources investigations. They also spent up to two hours a day exercising on bicycle and treadmill devices, as well as trying out negative pressure suits and other items related to keeping fit in weightlessness. Early Soviet manned space flights left some cosmonauts rather weak, and even the Soyuz 17 crewmen spent a few shaky days at the beginning of their mission. Their fatigue reactions apparently leveled off, however, and Tass, the Soviet news agency, reported that they "withstood well the long space flight."

One of the cosmonauts' tasks, carried out a few days before departing from their Salyut laboratory, was to spray new reflective coatings on the receiving and focusing mirrors of their solar telescope. This could have been merely a test of the spraying technique, but it may also have been an additional sign that someone else is going to be using the instrument—such as a Soyuz 18 crew. In either case, the experiment is of interest to designers of the U.S. Large Space Telescope, which is to be launched and periodically reserviced by the space shuttle.

The Soviet crews for the Apollo-Soyuz flight, meanwhile, are at NASA's Johnson Space Center in Houston for the last of three U.S. joint training sessions. Besides practicing in docking and command-module simulators, they are working with the U.S. astronauts on how to fly a mission in two languages (each group has learned the other's tongue), and are being briefed on the countless contingency plans, emergency procedures and mission rules that attend any manned space flight—U.S. or Soviet.

Amid the hustle and bustle of missions ending and in the works, however, there was an event that caused sorrow among space hands both within and outside of the Soviet Union. Anatoly Blagonravov, head of the Soviet Research Institute and long the chairman of the Commission for the Exploration and Exploitation of Cosmic Space of the Soviet Academy of Sciences, passed away Feb. 4. Often a refreshingly and atypically loquacious spokesman for the Soviet space program, he died in Moscow at the age of 80. □

Gubarev and Grechko: A Soviet record.

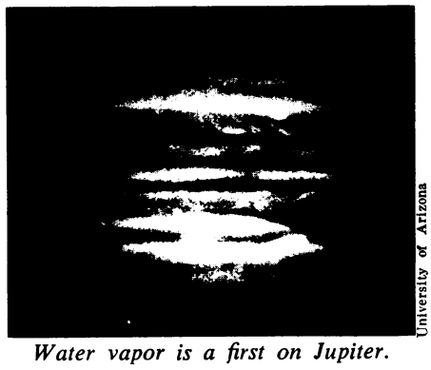
Water in Jupiter's atmosphere

Water vapor in the atmosphere of Jupiter—"the first oxygen-bearing molecule identified in the outer planets"—has been discovered by a team of astronomers from the University of Arizona. Their tool was not a spacecraft (the Pioneer probes lacked the necessary instrumentation), but a C-141 Starlifter jet plane flying 40,000 to 50,000 feet above the earth, carrying a specially developed spectrometer that can stare at a planet for hours, measuring its infrared emissions.

Early estimates, says Harold Larson of the university's Lunar and Planetary Laboratory, suggest that the water vapor exists at between 300 and 400 degrees K. (300 degrees K. is about room temperature—81 degrees F.) and at a pressure equivalent to 20 earth atmospheres or less. The ratio of water vapor to hydrogen, the dominant element on Jupiter as well as in the universe as a whole, appears to be about one part per million in the Jovian atmosphere—and there could be more water in other forms.

"The detection of water on Jupiter fills a very critical gap in our understanding of the chemistry of the solar system," according to Larson, together with Uwe Fink, Richard Treffers and T. Nicholas Gautier. Oxygen was the third most common of the elements available when the solar system was being formed, so it ought to show up on Jupiter, which is closer to its primordial state than any of the sun's other worlds. And indeed, Larson points out, it appeared almost as soon as there was a good way to look for it. The measurements were made on Oct. 23 and 25, during some of the first fully operational flights of the NASA-equipped, Air Force-owned C-141, which served to carry the detecting instrument above most of the water vapor in earth's atmosphere. Additional water may turn up in the form of ice crystals, while oxygen may further exist in silicates and other combinations.

Upcoming space probes such as the Mariner Jupiter Orbiter may have more to add. Using them merely to verify the presence of the water vapor would be a waste of their limited instrument space, Larson says, but, he adds, their improved resolution would enable them to map its abundance. This could reveal, for example, whether there is even more water over the poles. □



Water vapor is a first on Jupiter.