

# Last chance for a handshake in space

James Oberg believes the time is right for a shuttle-Salyut joint mission

**S**OME TIME this year, an American space shuttle carrying Spacelab and a Soviet Salyut space station will be in orbits so close that the people on board would need to do little more than reach out to shake hands with each other.

Such a handshake would be far more productive than the exciting but largely symbolic Apollo-Soyuz link-up of 1975. And in the mid-1980s, with tension between East and West running high, even symbolic cooperation in space is nothing to sneeze at either.

NASA once regarded a Shuttle-Salyut programme as a logical follow up to the first joint mission. But the disintegration of detente in the late 1970s forestalled any real progress. The Reagan administration

James Oberg lives in Houston and writes about the Soviet space programme. This is an excerpt from his book, *The New Race for Space*.

has halted all bilateral space projects between the US and Soviet Union. Multi-lateral agreements, however, are still in force. That is the loophole through which we may be able to launch a space ship.

Despite the political problems, the technological logic for joint space missions has become more compelling in the 1980s. The US and Soviet Union have followed different courses in crewed spaceflight. The Soviets, bedevilled by the failure of automatic systems, have set their sights on permanently inhabited space stations served by tried and true expendable launch vehicles. This is nothing the US could not have done in the late 1970s, if the government had expanded the Skylab programme.

Instead, the US tackled the much more challenging task of building a reusable space shuttle. Now, at the end to the 1980s, the two nations' paths will probably again

converge. The Soviet Union is looking for greater flexibility and economy in going into orbit, while the US wants to build a space station.

When the Soviets have a shuttle and the Americans have a space station, most of the mutual need for cooperation will go away. But for the next five years or so, the shuttle and Salyut could form the two complementary halves of a complete international crewed space effort.

Here's one way that Americans and Soviets might get together in space.

In 1985, NASA plans to fly several Spacelab missions in high-inclination orbits. Meanwhile, the Soviets will have at least one space station in a similar orbit. The Soviet outpost—perhaps Salyut 7 or even Kosmograd 1—will orbit Earth at an altitude of 360 kilometres and an orbital inclination of 52 degrees. Spacelab's orbit will be just over 370 kilometres at an inclination of 50 degrees.

The Spacelab 2 mission is an astro-physical expedition. The shuttle could spend a week in orbit with seven people on board. Three will be NASA astronauts, two will be mission specialists. The others will be civilian payload specialists.

The Soviet station could have as many as six cosmonauts on board. The complex will consist of a Salyut-type module plus a number of add-on specialised modules.

It would not be difficult to conduct a rendezvous in space between the two missions. NASA would have to raise the inclination of Spacelab 2 just a bit, merely a matter of altering its launch azimuth from Kennedy Space Center from 47 degrees to a barely more northerly 45 degrees.

To make matters simpler, the first joint mission need not involve linking the spacecraft physically. But it could demonstrate emergency communications channels, the compatibility of spacewalk equipment, and other rescue procedures.

A spacewalk from one craft to the other could accommodate ceremonial needs and have the practical value of simulating an emergency evacuation. Astronauts could carry small packets of equipment to Salyut to keep in space for long-term experiments. And the shuttle could carry recent results from Salyut back to Earth.

Even if the craft were to link physically, the modifications would be nowhere near as complex as those needed in 1975. The atmosphere in both nations' craft is of the same composition and pressure—it was different in 1975. When Spacelab carries crew, it has a special tunnel with an airlock set atop the payload bay. A docking tube

compatible with the standard Soviet fitting would have to be installed atop the airlock, and structural reinforcements added to transfer the stresses of docking to the shuttle's payload bay. These modifications could be designed, verified and built within a year or 18 months.

The astronauts and cosmonauts would have plenty of fields for cooperation. Space medicine might be a particularly rewarding activity. Even today, there is a vigorous and mutually beneficial exchange of data worldwide.

On the first joint mission, an American astronaut, perhaps even a doctor, could visit the Salyut and spend several hours carrying out medical examinations in order to calibrate space-medicine equipment that the US has developed. Such studies would produce a baseline for monitoring the health of crews on long missions. At the same time, Soviet scientists would gain a new angle on their own observations of medicine in space.

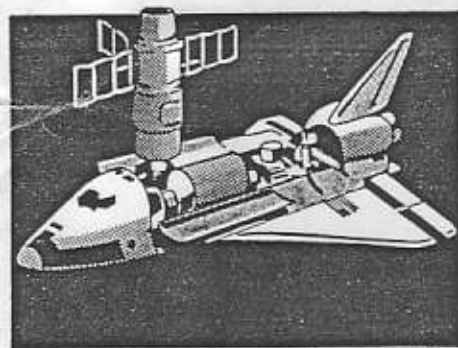
In later missions, which might happen once a year for the rest of the decade, the two nations could exchange personnel for longer and longer periods. American specialists could carry out experiments in Salyut's furnaces, perhaps powered by "jump leads" from the shuttle's fuel cells.

Soviet cosmonauts could make observations with American astronomical instruments. Shuttle crews might place cages containing large animals on Salyut for retrieval up to a year later. Ultimately, by the late 1990s, the swapped crews might even be able to complete their missions and return to Earth in the other side's spacecraft.

The Soviet and American space agencies could take several preparatory steps now. First, they could designate emergency landing zones for each other's space vehicles. The Soviet Union has a runway at its launch site easily long enough to handle a returning shuttle if guidance equipment were on site. Space agencies could set up standard radio frequencies for emergencies, and carry the appropriate documents on all space missions.

Meanwhile, a link between shuttle and Salyut has its own compelling logic. The Russians can do what the Americans cannot: keep people working in orbit for months at a time. The Americans can do what the Russians cannot: transport large crews and bulk cargoes rapidly and easily from Earth to orbit and back again.

Symbiosis has been a time-tested and valuable trick of the trade for life on Earth, often even between mutually antagonistic organisms. Perhaps the technique can move out into space. The 1980s are a time for learning to operate both independently and jointly in near-Earth orbits. Lessons learnt could be applied in the 1990s to a new deep-space exploratory mood. And if the Russians and the Americans have learnt through long practice how to cooperate productively in space, nothing—not even Mars—could be beyond their synergistic reach. □



Artist's impression of shuttle-Salyut link

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