
Chapter 8

International Competition and Cooperation

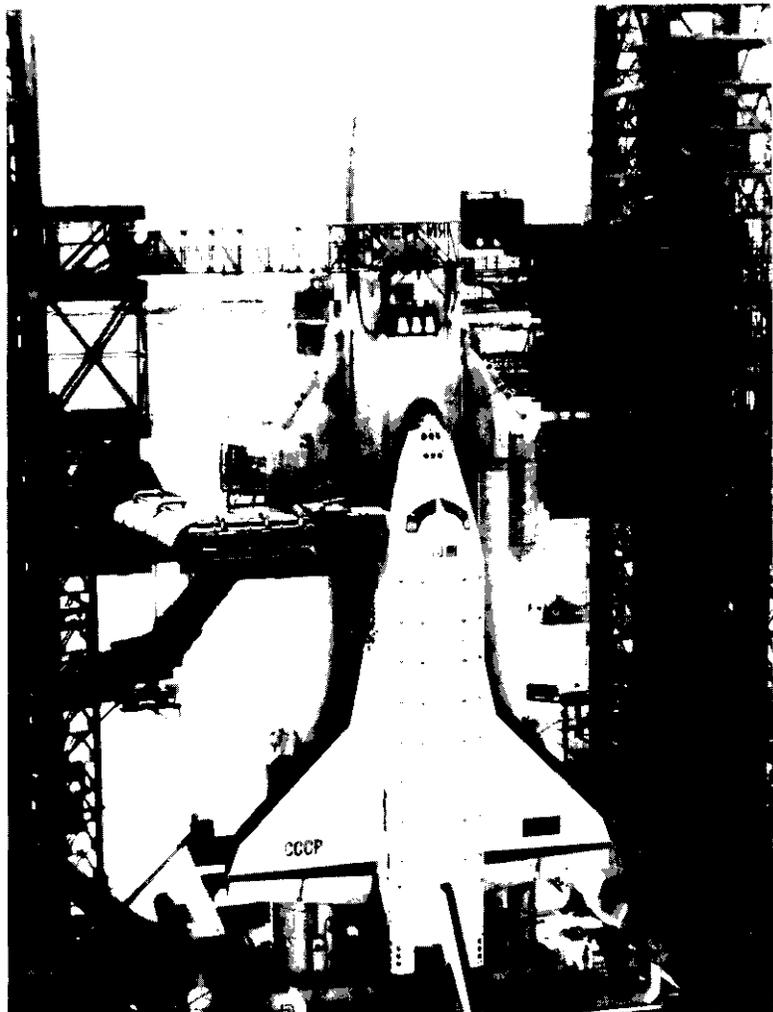


Photo credit: Novosti

Soviet Shuttle *Buran* on the launch pad at the Soviet launch complex

International Competition and Cooperation

COMPETITION

This decade has seen the rise of intergovernmental competition in space transportation. The development of space transportation systems is a national achievement that signals a nation's status as a space power, able to develop and use advanced technology. The Soviet Union, Europe, Japan, and China now operate launch systems capable of reaching space with sizable payloads. Although only the United States and the Soviet Union are currently able to send humans to and from space, ESA, France, Germany, Japan, and the United Kingdom are all in various stages of developing their own reusable launch systems, which, if successful, would be capable of transporting human crews.

Recently, commercial competition subsidized by governments has become an important part of space transportation competition. Europe, the Soviet Union, and China now compete with U.S. private firms for the international space launch market. Each government has developed its own mechanisms for assisting its launch firms. For example, Glavcosmos (U. S. S. R.) and the Great Wall Corp. (China) are government corporations, for which sales of launch services are an integral part of international policy. Arianespace, S.A. (France) is a private corporation owned in part by the French Government. Although it operates as a private firm, Arianespace receives considerable indirect support from the European Space Agency, which has developed the various Ariane launchers, built the launch complexes, and purchases launch services. The United States Government has assisted U.S. private firms by developing the expendable launch vehicles and launch facilities (which are leased to the firms), by purchasing launchers and launch services from them, and in numerous other ways.²

A number of experts have raised doubts about the capability of the U.S. private sector to compete for providing launch services in the world market, especially in the face of a relatively small market for commercial launch services. Projected launch services supply far exceeds expected demand. Launch firms in the United States, France, the Soviet Union,

and China expect to be able to supply about 35 to 40 vehicles per year to launch only 15 to 20 commercial payloads per year over the next decade.

A launch industry capable of competing on the basis of price as well as capability in the world market could contribute several hundred million dollars per year toward improving the current strong negative balance of payments with foreign countries, directly by making sales to foreign customers, and indirectly by keeping U.S. payload owners from going off-shore to purchase launch services. Congress could assist the U.S. private sector by helping the Executive work to develop and maintain a "level playing field" in the marketplace, in which prices are arrived at by rules based on justifiable economic rationales and agreed on by the launch providers.³ The recent negotiations with China in which that country agreed to price its launch services to reflect actual manufacturing and launch cost have been a step in the right direction, but similar arrangements need to be negotiated with all launching nations who are offering their launch vehicles in the commercial market.

COOPERATION

The United States has always maintained a vigorous program of international cooperation in space in order to support U.S. political and economic goals. However, it has cooperated very little with other countries in space transportation, in large part because most launch technology has direct military applications and much of the technology has been classified or sensitive.

Today, because other countries have developed their own indigenous launch capabilities, reducing much of the competitive edge the United States once held, and because progress in space will continue to be expensive, cooperating on space transportation and sharing costs could be beneficial. Several cooperative ventures have been suggested:

- *Space Station resupply.* The United States could share responsibility for resupply of the international Space Station with its Space Station partners. In order for other countries to

¹Arianespace is owned by 35 companies, 13 banks, and CNES, the French Space Agency.

²The commercial market alone is insufficient to support more than one U.S. commercial medium-capacity launch system. No large launch system has yet been privately developed, and at least for the next decade or two commercial traffic levels will probably not justify future private development.

³See Public Law 100-657 (102 Stat. 3900), "The Commercial Space Launch Act Amendments of 1988."

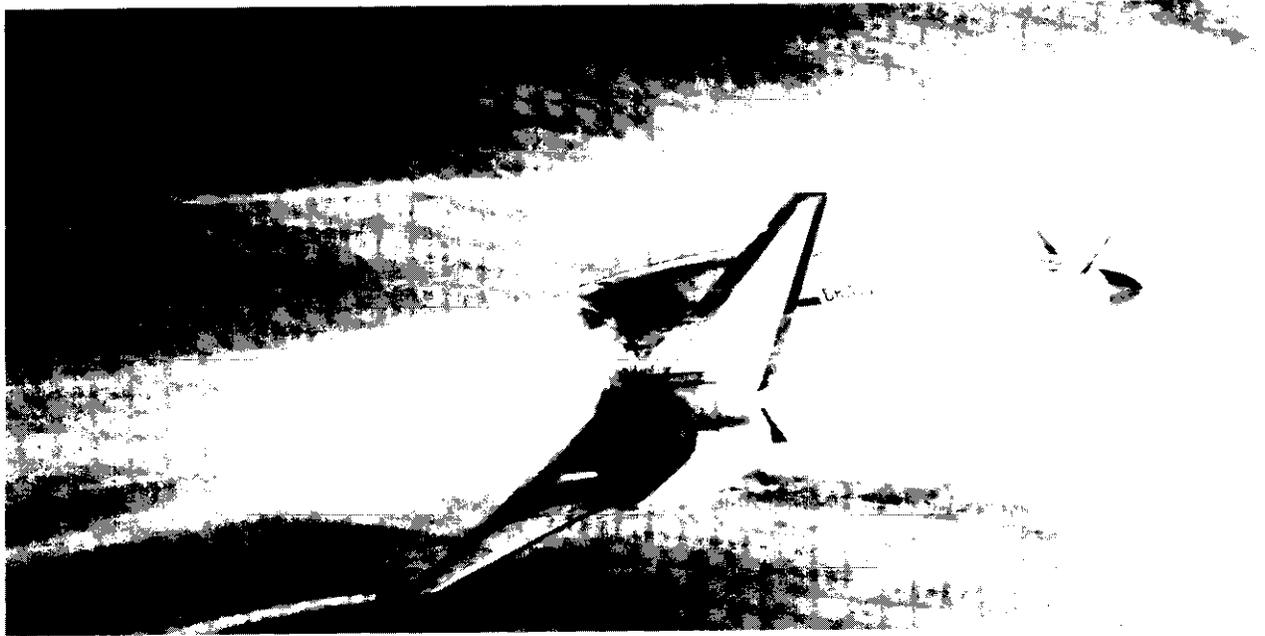


Photo credit: British Aerospace

Artist's conception of British Aerospace's Hotel aerospace plane taking off. If successful, this space plane would reach Earth orbit with a single propulsion stage.

use their launch systems to supply the Space Station, or to dock with it, the countries will have to reach agreement with the United States on appropriate standards for packaging, docking, and safety. ESA and NASA have now established a working committee to discuss these matters. If successful, such cooperation could be extended to include cooperation on more sensitive aspects of space transportation. In particular, because Europe and Japan have now developed and operated their own launch systems, they may have specific technologies or methods to share with the United States in return for access to some U.S. technology.

- *Emergency rescue from Space Station.* As noted in an earlier section, NASA is planning to provide some sort of emergency crew return capability for the Space Station. NASA estimates that developing such a capability would cost between \$1 billion and \$2 billion, depending on its level of sophistication. If properly outfitted, the European Hermes or the Japanese HOPE might be used as an emergency return vehicle. In addition, Hermes could

even back up the Shuttle for limited space station crew replacement. However, such international cooperation would also require a degree of international coordination and technology sharing for which the United States has little precedent.

- *Cooperative space rescue efforts.* At present, the Soviet Union is the only country beyond the United States with the capability to launch people into space. As Europe and Japan develop their crew-carrying systems, the potential for emergencies requiring rescue from a variety of space vehicles will increase. Broad agreements on docking standards, and procedures for space rescue,⁴ could increase astronaut safety for all nations and lead to more extensive cooperative activities in the future. Initial meetings have been scheduled this spring to discuss the nature and extent of such cooperation. Both this cooperative project and the use of foreign vehicles to supply Space Station have the advantage that they risk transferring very little U.S. technology to other participants.⁵

⁴The United States, the U. S. S. R., the European countries and Japan have signed the Agreement On the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space—UST 7570; TIAS 6599.

⁵The Apollo-Soyuz Test Program, for example, was designed to minimize the potential for technology transfer.

- *Aerospace plane research and development.* With strong encouragement from their private sectors, Germany, Japan, and the United Kingdom are working independently toward development of aerospace planes. The level of foreign sophistication in certain areas of advanced materials, advanced propulsion, and aerodynamic computation is on a par with U.S. work. A joint development program with one or more of these partners might allow the United States to develop an aerospace plane faster and with lower cost to the United States than the United States could on its own. Although a joint project would risk some technology transfer, if properly structured, such a joint project could be to the mutual benefit of all countries involved.
- *U.S. use of the Soviet Energia heavy-lift launcher.* The U.S.S.R. has offered informally to make its *Energia* heavy-lift launch vehicle available to the United States for launching large payloads. As noted throughout this report, the United States has no existing heavy lift capability. Thus, the Soviet offer could assist in developing U.S. plans to launch large, heavy payloads, such as Space Station components. However, concerns about the transfer of militarily useful technology to the Soviet Union would inhibit U.S. use of *Energia* for such high-technology payloads. As well, NASA would be understandably reluctant to make use of a Soviet launcher because such use might be seen as sufficient reason for the United States to defer development of its own heavy-lift vehicle.

Although cooperation in space transportation can be expected to be more difficult than cooperation in other areas of space endeavor, it could assist the United States to achieve much more in space than



Photo credit: Arianespace

Night launch of Ariane 3 launcher from the European Space Agency launch pad in Kourou, French Guiana.

this country can afford to attempt on its own. However, it will require that NASA and the U.S. aerospace industry make a greater effort to tap the expertise and technology now available in other industrialized countries.