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Chapter One

The Development of International Space Cooperation

by John M. Logsdon

The National Aeronautics and Space Act of 1958, among its many provisions, indicated that NASA “under the foreign policy guidance of the President, may engage in a program of international cooperation in work done pursuant to this Act, and in the peaceful applications of the results thereof, pursuant to agreements made by the President with the advice and consent of the Senate.”¹ The new space agency interpreted this provision as giving it authority to take the initiative in international space dealings. Therefore, within six months, NASA began to develop a program of international cooperation in space that over the following three decades has resulted in agreements with more than 100 countries and in major cooperative projects with both traditional U.S. allies and the country’s erstwhile competitor in space, the Soviet Union. The engagement of other countries with the space activities of the United States has been a hallmark of the U.S. space program.

The language of the Space Act seemed to present unintentionally a formal obstacle to NASA in taking the lead in initiating such cooperative activities. The Space Act stated that the United States would enter into cooperative activities “pursuant to agreements entered into by the President with the advice and consent of the Senate.” This seemed to require that the executive branch treat every cooperative space agreement as if it had the status of an international treaty, which certainly was not the intent of the congressional drafters of the final bill nor the desire of the White House. Thus, as he signed the document on July 29, 1958, President Dwight D. Eisenhower stated that he regarded this section of the Space Act “as recognizing that international treaties *may* [emphasis added] be made in this field, and as not precluding, in appropriate cases, less formal arrangements for cooperation.”² [I-1]³ With that clarification, NASA felt free to begin exploring the possibilities of cooperative activity with other countries interested in space—and particularly in the new scientific opportunities made available by the ability to place instruments aboard orbiting satellites and into space beyond the near vicinity of Earth. Cooperation in space science (in addition to the creation of the international agreements needed to locate tracking and data reception sites in other countries) dominated the first decade of

1. “National Aeronautics and Space Act of 1958,” Public Law 85-568, 72 Stat., 426, Section 205. Signed by the president on July 29, 1958. This is document II-17 in John M. Logsdon, gen. ed., with Linda J. Lear, Jannelle Warren-Findley, Ray A. Williamson, and Dwayne A. Day, *Exploring the Unknown: Selected Documents in the History of the U.S. Civil Space Program, Volume I: Organizing for Exploration* (Washington, DC: NASA Special Publication (SP)-4407, 1995), 1: 334-45.

2. Office of the Press Secretary, “Statement by the President,” July 29, 1958, Presidential Files, NASA Historical Reference Collection, NASA History Office, NASA Headquarters, Washington, DC.

3. Unlike most other chapters in *Exploring the Unknown*, the documents supporting this essay are listed in the order in which they appear, rather than in chronological order, because of the unique nature of the international effort in space and the importance of ensuring a regional continuity. This has been done at the expense of maintaining a chronological unity to the essay, but the overall understanding of this complex subject is enhanced as a result.

NASA's international activities, and this has continued as a centerpiece of U.S. cooperative activities to the present.

From its start, space cooperation was linked to broader U.S. foreign policy and national security objectives. The first comprehensive post-Sputnik statement of U.S. space policy, NSC 5814, suggested: "International cooperation in certain outer space activities appears highly desirable from a scientific, *political and psychological* [emphasis added] standpoint. . . . International cooperation agreements in which the United States participates could have the effect of . . . enhancing the position of the United States as a leader in advocating the uses of outer space for peaceful purposes. . . ." The considerations of American leadership have been associated with the nation's approach to international cooperation from the beginning.

Early Space Science Cooperation

The initial NASA approach to space cooperation was crafted by individuals who had been involved in the U.S. activities related to the International Geophysical Year (IGY), which ended on December 31, 1958. These included Hugh Dryden, Deputy Administrator of NASA; Homer Newell, who came to NASA in October 1958 as its first head of space science; and Arnold Frutkin, who had worked on IGY matters with the National Academy of Sciences and then became NASA's second director of international affairs in September 1959 (a position he held for almost two decades).⁵

Under the coordinating umbrella of the International Council of Scientific Unions (ICSU), the nongovernmental scientific academies of participating states had carried out most IGY activities. NASA and National Academy of Sciences leaders hoped that ICSU could provide a venue for discussing, and perhaps coordinating, emerging cooperative activities in space, although some in the United States suggested that the North American Treaty Organization (NATO) would be a more appropriate body to perform this function. At the urging of the United States, ICSU created the Committee on Space Research (COSPAR) in October 1958. At the time of COSPAR's second meeting in March 1959, Richard Porter, the delegate from the National Academy of Sciences, after consultation with NASA, communicated to the president of COSPAR, H.C. van de Hulst of the Netherlands, a groundbreaking offer. The United States hoped that COSPAR "could serve as an avenue through which the capabilities of satellite launching nations and the scientific potential of other nations may be brought together." To facilitate such a development, the United States was willing to launch on U.S. boosters "suitable and worthy experiments proposed by scientists of other countries. This can be done by sending into space either single experiments as part of a larger payload or groups of experiments comprising complete payloads."⁶ [I-2, I-3]

4. National Security Council, NSC 5814, "U.S. Policy on Outer Space," June 20, 1958. This was published as Document II-18 in Logsdon, gen. ed., *Exploring the Unknown*, 1: 349.

5. Arnold W. Frutkin's 1965 book, *International Cooperation in Space* (Englewood Cliffs, NJ: Prentice-Hall, 1965) provides an insider's view of the early years of cooperative space activity. Another source that describes this period is Homer E. Newell, *Beyond the Atmosphere: Early Years of Space Science* (Washington, DC: NASA SP-4211, 1980), Chap. 18.

6. Richard W. Porter to Professor Dr. H.C. van de Hulst, President, Committee on Space Research (COSPAR), March 14, 1959, Space Policy Institute Documentary History Collection, George Washington University, Washington, DC.

It soon became clear that COSPAR was not well suited for the actual coordination of cooperative scientific missions; instead, for the most part, NASA would be cooperating with an appropriate government body in a partner country. The first country to respond to the U.S. invitation was the United Kingdom; even before the U.S. invitation to COSPAR, U.K. and U.S. scientists had been discussing possible cooperative projects. British Prime Minister Harold McMillan personally announced on May 12, 1959, that a delegation led by Professor Harrie S.W. Massey would visit the United States to discuss specific cooperative projects. Massey was chairman of the British National Space Committee, which had been formed by the Royal Society (the U.K. academy of science) in close consultation with the British government.⁷ The British delegation met with NASA counterparts from June 25 through July 3, 1959, and reached agreement in principle on initial cooperative activities. This agreement was reflected in an exchange of correspondence between Massey and NASA Administrator T. Keith Glennan; although this was not a formal agreement, the exchange provided the basis for beginning NASA's first cooperative project. [I-4] Only in September 1961 did the U.S. and U.K. governments exchange diplomatic notes that put the cooperation on a formal basis.⁸ The first of the cooperative U.S.-U.K. satellites, *Ariel 1*, was launched on April 26, 1962.⁹

Then, as Europe decided in the early 1960s to undertake most of its space science activities through a new multinational entity, the European Space Research Organization (ESRO), NASA quickly extended its cooperative offer to that new body.¹⁰ [I-5]

These initial cooperative efforts and most others since were carried out within the framework of a set of guiding principles that were developed during the first year of U.S. space activity.¹¹ These principles were relatively conservative in character; they did not commit the United States to help pay for other countries' shares of cooperative projects. Rather, they provided some specific and rather limiting criteria that cooperative proposals would have to meet, as follows:

1. *Designation by each participating government of a central agency for the negotiation and supervision of joint efforts*
2. *Agreements on specific projects rather than generalized programs*
3. *Each country's acceptance of financial responsibility for its own contributions to joint projects*
4. *Projects of mutual scientific interest*
5. *General publication of scientific results¹²*

Added to this framework for cooperation in later years were the requirements that each cooperating partner assume technical as well as financial responsibility for its contributions and that there be simple technical interfaces between the contributions from different countries. This latter requirement was originally established to minimize

7. NASA, "Statement by NASA," Release 59-193, July 29, 1959, Press Release Files, NASA Historical Reference Collection.

8. Arnold S. Levine, *Ariel 1: An Experiment in International Cooperation*, Goddard Historical Note Number 4, NASA Goddard Space Flight Center, September 1967, NASA Historical Reference Collection.

9. Frutkin, *International Cooperation*, pp. 42-43.

10. See John Krige and Arturo Russo, *Europe in Space, 1960-1973* (Noordwijk, The Netherlands: European Space Agency, 1994), for a brief account of the origins of ESRO.

11. See Newell, *Beyond the Atmosphere*, p. 306, and Frutkin, *International Cooperation*, pp. 32-36, for a discussion of the development of the NASA guidelines for cooperation.

12. NASA, *International Programs*, 1962, NASA Historical Reference Collection.

the managerial complexity of cooperative projects, but in later years it also became an important safeguard to prevent unwanted technology transfer as a result of such projects.¹³

Operating under these guidelines over the years, NASA and its partners have been able to conduct numerous space science projects that have been scientifically productive, of increasing technical complexity, and in general free of rancor. On balance, the record of cooperation in space science is strongly positive, with both political and scientific benefits to all involved. This is not to say, however, that the path has been totally smooth. While Canada and most European countries worked closely with the United States in developing capabilities for performing space science, Japan chose to develop that capability on its own.¹⁴ [I-6] Only after its Institute for Space and Astronautical Science in the 1970s developed an autonomous space science program, including its own launch vehicle, was Japan ready to enter into cooperative scientific projects with the United States.

Despite efforts from the late 1950s on to engage the Soviet Union in scientific cooperation (described in more detail below), such cooperation was slow to emerge, being constantly "held hostage" to the state of the overall political relationship between the two global superpowers. In the mid-1960s, the United States also initiated cooperative interactions with emerging spacefaring countries such as India and Brazil. [I-7] For many years, however, America's primary cooperative partner was Europe.

Even with Europe, there were difficulties.¹⁵ On the U.S. side, scientists eager to have their instruments and experiments fly in space could not participate as principal investigators in the missions undertaken by ESRO and its successor, the European Space Agency (ESA), which was created in 1975. Europe gave priority to nurturing its own space scientists and did not want to have them compete with their U.S. counterparts for the limited payload space available on European missions. In contrast, European scientists from the beginning were afforded such an opportunity to participate in NASA missions. Meanwhile, U.S. scientists complained that scarce space on U.S. scientific missions was being allocated to non-U.S. scientists and instruments, both for political reasons and because the non-U.S. contributions did not cost NASA any money. Securing European participation in the kind of large science missions that became the NASA norm in the 1970s required delicate and lengthy negotiations.¹⁶

On the European side, there were reservations about the U.S. role as the dominant partner in almost every cooperative project. This often meant that NASA and U.S. scientists would define the objectives and content of a scientific mission and only then invite non-U.S. scientists to participate. In addition, the value of any international contribution to a U.S. mission depended on NASA's ability to sustain political and budgetary support for that mission.

These reservations peaked in the 1979-1981 period. First, Europe, frustrated by U.S. vacillation over whether to undertake a mission to Halley's comet during its 1986 visit to

13. Personal communication from Richard Barnes, former Director of NASA's Office of International Affairs, to John M. Logsdon, December 11, 1995.

14. Newell, *Beyond the Atmosphere*, pp. 309-11. See Joan Johnson-Freese, *Over the Pacific: Japanese Space Policy into the Twenty-First Century* (Dubuque, IA: Kendall/Hunt Publishing, 1993), for an overview of the Japanese space program.

15. See Roger Bonnet and Vittorio Manno, *International Cooperation in Space: The Example of the European Space Agency* (Cambridge, MA: Harvard University Press, 1994).

16. For an expansion of this point, see Noel Hinners, "Space Science and Humanistic Concerns," in Jerry Grey and Lawrence Levy, eds., *Global Implications of Space Activities* (New York: American Institute of Aeronautics and Astronautics, 1981), pp. 38-39; John M. Logsdon, "U.S.-European Cooperation in Space: A 25-Year Perspective," *Science* 223 (January 6, 1984): 11-16.

the inner Solar System, decided to undertake a Halley mission of its own. Europe did not want to wait for the United States to make up its mind whether it would initiate a Halley mission and then invite Europe to participate.¹⁷ Then, in early 1981, the United States informed Europe that it was withdrawing its spacecraft from the cooperative two-spacecraft International Solar Polar Mission (ISPM). [I-8, I-9] This withdrawal was forced by the decision of the new administration of Ronald Reagan to reduce the federal budget. The White House required NASA to cancel one of its three major approved science missions (the Hubble Space Telescope, the Galileo mission to Jupiter, and ISPM), and the space agency chose the ISPM spacecraft for cancellation.¹⁸ The European Space Agency and individual European countries protested loudly, but the decision was not reversed. Europe left this experience with a reminder of its dependence on U.S. political and budgetary decisions for achieving its own objectives in its many cooperative efforts with the United States. [I-10]

While the ISPM controversy cast a temporary chill on cooperation in space science, its effect did not linger (although the incident was frequently raised during subsequent negotiations concerning cooperative arrangements for other U.S.-European projects). The mutual benefits of cooperation in space science were evident to all. By 1983, for example, NASA and the European Space Agency had established regular consultations regarding areas for possible future cooperation. [I-11] Similar consultations between the United States and Japan and between the United States and Canada have provided the venue for discussions on when cooperative scientific projects were the best ways of achieving the objectives of the participating scientific communities, as well as on when those objectives were best served (in the case of infrared astronomy, for example) by mounting separate missions. In addition, the Inter-Agency Consultative Group, with the space agencies of the United States, the Soviet Union, Europe, and Japan as members, has proven a valuable forum for coordinating multilateral scientific undertakings.¹⁹ From its beginning during the IGY to the present, space science remains the paradigm for successful international space cooperation.²⁰

Cooperation in Human Spaceflight: Post-Apollo, the Spacelab, and the Space Station

The Apollo program was, by its very nature, competitive and unilateral in character. Its objective was to demonstrate to the world U.S. technological and managerial competence by being the first to and on the Moon. Although President Kennedy had considered turning Apollo into a cooperative U.S.-Soviet undertaking in 1963 (see below), as the first lunar landing grew near, it was clearly viewed as a symbol of U.S. power and capability.²¹ [I-12]

17. See John M. Logsdon, "Missing Halley's Comet: The Politics of Big Science," *Isis* 80 (1989): 268-70.

18. See Joan Johnson-Freese, "Canceling the U.S. Solar-Polar Spacecraft: Implications for International Cooperation in Space," *Space Policy* 3 (February 1987): 24-37, for more details on this incident.

19. For a description and analysis of the Inter-Agency Consultative Group, see Joan Johnson-Freese, "A Model for Multinational Space Cooperation: The Inter-Agency Consultative Group," *Space Policy* 5 (November 1989): 288-300; Joan Johnson-Freese, "From Halley's Comet to Solar Terrestrial Science: The Evolution of the Inter-Agency Consultative Group," *Space Policy* 8 (August 1992): 245-55.

20. See Bonnet and Manno, *International Cooperation in Space*, for a European perspective on this.

21. Again, as mentioned previously in footnote 3, the documents associated with this chapter are arranged in the order in which they are discussed, rather than in strict chronological order. This organization was chosen to best represent the diverse character of NASA's international relationships.

The idea of expanded international space cooperation had been under discussion within the top levels of the U.S. government since the mid-1960s, and these discussions continued after Richard Nixon became president in January 1969. [I-13] With the Apollo 11 mission a success, NASA and the Nixon administration made a conscious decision to broaden the basis of international participation in U.S. post-Apollo efforts in space.²² This broadening took two directions: (1) attempting to engage the Soviet Union in more substantial cooperative undertakings (discussed later in this essay) and (2) inviting U.S. allies to participate in the human spaceflight and technology development parts of the U.S. program (from which they previously had been largely excluded).

Such a broadening was one of the recommendations of the Space Task Group, which had been established by President Nixon in February 1969 to advise him on post-Apollo space plans. In its September 1969 report, the Space Task Group recommended "the use of our space capability not only to extend the benefits of space to the rest of the world, but also to increase direct participation of the world community in both manned and unmanned exploration and use of space." The group recognized that for other industrial countries "the form of cooperation most sought after . . . would be technical assistance to enable them to develop their own capabilities." The group also suggested that the United States should "move toward a liberalization of our policies affecting cooperation in space activities, should stand ready to provide launch services and share technology wherever possible, and should make arrangements to involve foreign experts in the detailed definition of future United States space programs. . . ."²³

Armed with these recommendations and what he believed was a direct mandate from President Nixon to seek such expanded cooperation, during late 1969 and the early months of 1970, NASA Administrator Thomas O. Paine visited Europe, Canada, Japan, and Australia for initial discussions of cooperative opportunities in the post-Apollo period. [I-14, I-15, I-16] Paine believed that he could use the post-Apollo proposals spelled out in the September 1969 report of the Space Task Group as the basis for what the U.S. program during the 1970s would be—and thus for what cooperative possibilities might be open for U.S. allies. The reactions to Paine's overtures were varied. In addition, NASA found that some in the Nixon White House were far less enthusiastic about cooperation in large hardware programs than were Paine and the Space Task Group and that President Nixon had no intention of approving in toto the group's recommended program that had been the basis of Paine's briefings to foreign officials.

Early on, Australia indicated that space was not among its highest priorities and that it was not able to spend the considerable amount of money required to cooperate with the United States on a meaningful basis. The Japanese response was somewhat similar.²⁴ In the late 1960s, Japan had decided to accelerate its acquisition of an autonomous capability for space launch and satellite construction for missions other than space science. Japan asked the U.S. government to allow U.S. aerospace firms to license space technology to Japan to "jump start" that capability development process. Although NASA and the Department of

22. See Arnold W. Frutkin, "International Cooperation in Space," *Science* 169 (July 24, 1970): 333-38, for an early discussion of this policy change. More recently, see Lorenza Sebesta, "The Politics of Technological Cooperation in Space: US-European Negotiations on the Post-Apollo Programme," *History and Technology: An International Journal* 11 (1994): 317-41.

23. Space Task Group, *The Post-Apollo Space Program: Directions for the Future* (Washington, DC: U.S. Government Printing Office, September 1969), pp. 7, 16.

24. For a discussion of the evolution of U.S.-Japanese space relations, see John M. Logsdon, "U.S.-Japanese Space Relations at a Crossroads," *Science* 255 (January 17, 1992): 294-300; Johnson-Freese, *Over the Pacific*.

Defense opposed such licensing, advocates of the diplomatic and strategic importance of the U.S.-Japanese alliance, particularly within the State Department, prevailed. [I-17]

On July 31, 1969, the United States and Japan signed an agreement that cleared the way for firm-to-firm cooperation between the two countries.²⁵ This agreement and its subsequent modifications in 1976 and 1980 facilitated Japanese acquisition of launch-related technology that was used and modified as the basis of Japanese booster capability for more than twenty years; by contrast, there was limited transfer of satellite-related technology. During most of the 1970s, cooperation between the United States and Japan was at the firm-to-firm, not the government agency-to-government agency, level. Although Japan eventually indicated limited interest in participating in post-Apollo efforts, clear priority was given to Japanese autonomy in space, and the Japanese interest did not lead to a post-Apollo cooperative agreement.

Canada, in contrast, indicated that it was interested, in the context of its modest space effort, in making a contribution to the U.S. post-Apollo program. [I-18] After several years of harmonious negotiations, it was agreed in 1975 that Canada would be responsible for developing the Remote Manipulator System for use aboard the Space Shuttle.

The most difficult post-Apollo interactions were between the United States and Europe. In addition to the uncertainties surrounding which of those systems proposed in the Space Task Group report the Nixon administration would approve, and then what contributions Europe could best make to such systems, there were two background issues that influenced the discussions. One was the question of whether the United States would guarantee to launch communication satellites for European regional use or whether Europe would have to develop its own launch vehicle to guarantee its access to, in particular, geosynchronous orbit. The second issue was the concern by some at the White House that space cooperation could be a means for European firms to gain access, at minimum cost, to advanced or sensitive U.S. technology. In the background of both of these issues was a concern on the part of some in the White House that NASA and the Department of State were advocating an approach to international cooperation that was not in the administration's interest. [I-19]

During this period, a goal of U.S. policy was to discourage Europe from developing its own launcher capable of lifting sizable payloads to orbit, thereby connecting much of Europe's future in space to cooperative projects with the United States launched on U.S. boosters, particularly the Space Shuttle. For example, NASA Administrator Thomas Paine, in his November 7, 1969, letter to President Nixon, indicated that his "fundamental objective was to stimulate Europeans to rethink their present limited space objectives, to avoid their wasting resources on obsolescent developments [a thinly veiled reference to European development of an expendable launch vehicle at the time that the United States was planning to develop a totally reusable Space Shuttle], and eventually to establish more considerable prospects for future international collaboration on major space projects."²⁶ One reason for this posture was to maintain the U.S. monopoly on access to space for such payloads and to create customers for the Space Shuttle once it became available. A second reason was the U.S. attempt to protect U.S. communications satellite manufacturers—companies that in 1970 had a "free-world" monopoly on the technology.

25. Department of State, "Agreement between the United States of America and Japan, July 31, 1969," *Treaties and Other International Acts*, Series 6375.

26. Thomas O. Paine, NASA Administrator, to the President, November 7, 1969, Administrators Files, NASA Historical Reference Collection.

Also, the United States and its partners in the International Telecommunications Satellite Consortium (INTELSAT) were participating in difficult negotiations over the future of the organization, and the United States wanted to block the emergence of regional competitors to INTELSAT in Europe and elsewhere.²⁷

After lengthy discussions and negotiations within the U.S. government [I-20, I-21] and between the United States and the European Space Conference (a policy-level entity created to coordinate European responses to U.S. positions on space issues), the United States on September 1, 1971, set forth a policy on the availability of U.S. launchers for European satellites. The United States also made it clear that the issue of post-Apollo cooperation was, in U.S. thinking, not linked to the launcher issue.²⁸ [I-22]

The other obstacle—concern that the United States would be forced to transfer valuable technology to Europe to ensure that Europe could successfully complete its share of the post-Apollo program—proved more difficult to surmount. Assistant to the President Peter Flanigan, who had responsibility within the White House for space issues, raised concerns about technology flows related to U.S.-European cooperation. Flanigan suggested that President Nixon's 1969 mandate to NASA seeking expanded international cooperation was really focused on greater European participation as astronauts or in-orbit scientific investigators, not on Europe as a developer of hardware to be used by the United States. [I-23]

The debate over European involvement in the post-Apollo program had continued throughout 1971. As the Space Shuttle finally gained approval in January 1972 as the major post-Apollo development project, the question of European participation was still undecided.²⁹ Over the next several months, debates over how to proceed continued within the administration. [I-24]

Among those attempting to find a position satisfactory to both the advocates of cooperation within NASA and the State Department and the skeptics inside the White House was the executive secretary of the National Aeronautics and Space Council, former astronaut William A. Anders. In a March 17, 1972, memorandum to Flanigan, Anders suggested that Europe be invited only to develop a "sortie can"—a pressurized laboratory to fly inside the shuttle's payload bay—rather than be allowed to develop a technologically more challenging orbit-to-orbit "space tug" or parts of the shuttle orbiter itself.³⁰ [I-25] Responding to the Anders proposal on April 29, Secretary of State William Rogers argued against reversing the U.S. position that the space tug might be developed by Europe on a cooperative basis and against limiting European cooperation to developing the sortie can (also called the Research and Application Module).³¹ [I-26] Commenting on Secretary Rogers's memorandum, NASA indicated that its "preferred objective is to obtain

27. For some background on how the issue of launch guarantees interacted with European-U.S. negotiations on post-Apollo cooperation, see Douglas R. Lord, *Spacelab: An International Success Story* (Washington, DC: NASA SP-487, 1987), Chap. 1; Sebesta, "Politics of Technological Cooperation in Space."

28. U. Alexis Johnson, Under Secretary of State, to Theo Lefevre, Chairman of European Space Conference, September 1, 1971, NASA Historical Reference Collection.

29. James C. Fletcher, NASA Administrator, memorandum to George M. Low, NASA Deputy Administrator, "Summary of Peter Flanigan Meeting," March 3, 1972, Administrators Files, NASA Historical Reference Collection.

30. William A. Anders, Executive Secretary, National Aeronautics and Space Council, to The Honorable Peter M. Flanigan, March 17, 1972, with attached: "Position Paper on European Participation in our Post Apollo Space Program," Space Policy Institute Documentary History Collection.

31. William P. Rogers, Secretary of State, Memorandum for the President, "Post-Apollo Relationships With the Europeans," April 29, 1972, NASA Historical Reference Collection.

European agreement to develop a specific type of sortie module” and that European development of the space tug was “a distinctly second choice, and much less desirable.”³² [I-27]

The State Department argument did not prevail, and U.S. representatives informed their European colleagues in June 1972 that only the sortie can was an acceptable contribution to post-Apollo efforts. [I-28] European governments and industry were displeased by this outcome; substantial study funds had been invested in the tug, and the sortie can was technologically a much less interesting development.³³ Within a little more than a year, however, a U.S.-European agreement on the terms for the cooperative development of the sortie can (renamed the Spacelab) had been achieved [I-29], committing Europe to a cooperative project with the United States that was much more expensive and highly visible than previously had been the case.³⁴ Europe’s agreement to develop the Spacelab came in the context of a comprehensive “package deal” that also committed European nations to develop their own launch vehicle (in spite of the 1971 U.S. assurance of access to U.S. launchers) and to begin work on a maritime communications satellite. In addition, Europe decided to develop a single space organization, to be called the European Space Agency (ESA), to manage these large projects and other European efforts in space. The European nations’ experience in post-Apollo dealings with the United States was a major factor in convincing leading European countries to pool the better part of their future projects in a multilateral alliance for space.³⁵

Despite the difficulties in reaching agreement on a mutually satisfactory undertaking, as well as substantial European dissatisfaction with the results of the cooperative effort, European-U.S. cooperation on the Spacelab created a precedent for contemplating—even expecting—similar close cooperation on any subsequent large-scale program that NASA might undertake. In fact, within a year after signing the Spacelab agreement, some at NASA were already thinking about international participation in a space station program. [I-30] When NASA Headquarters once again began active planning for a space station in 1982, the head of the Space Station Task Force, John Hodge, asked NASA Director of International Affairs Kenneth Pedersen—Arnold Frutkin had left NASA in 1979—for his ideas on what might be learned from the post-Apollo experience with respect to preparing for international participation in a space station. In reply, Pedersen prepared a lengthy memorandum containing his thoughts not only on the relevance of past experience but also on a strategy for obtaining international commitments to the emerging station program. [I-31]

Pedersen’s ideas largely governed the NASA approach to international participation in the space station during 1982 and 1983. In addition, in August 1982 the Reagan administration adopted an overall policy statement with respect to international space relationships that provided a context for making the station an international project. [I-32]

When Ronald Reagan announced the approval of the space station program in his January 25, 1984, State of the Union address, he also stated that “NASA will invite other countries to participate so we can strengthen peace, build prosperity and expand freedom

32. James C. Fletcher, Administrator, NASA, to Honorable Henry A. Kissinger, Assistant to the President for National Security Affairs, May 5, 1972, with attached: “NASA’s Comments on Secretary Rogers’ Memorandum of April 29, 1972,” Administrators Files, NASA Historical Reference Collection.

33. See, for example, “Europeans Delay Post-Apollo Meeting,” *Aviation Week & Space Technology*, July 17, 1972, p. 19.

34. See Lord, *Spacelab*, for a participant’s account on the international dimensions of the undertaking.

35. See Krige and Russo, *Europe in Space*; Michiel Schwarz, “European Policies on Space Science and Technology, 1960-1978,” *Research Policy* 8 (1979): 205-44; Michiel Schwarz, *Europe’s Future in Space* (London: Routledge & Kegan Paul, 1988), Chap. 4, for discussions of the early years of European space cooperation.

for all who share our goals."³⁶ NASA Administrator James Beggs, acting as Reagan's personal emissary, extended the president's invitation to join the space station program to leaders in Europe, Canada, and Japan during a series of rapid visits during March 1984. After returning from his visits to Europe and Japan, he reported the following to Secretary of State George Shultz:

*The reaction so far to the President's call for international cooperation has been strongly positive and openly appreciative. It has been positive in the sense that our principal Allies are moving quickly, or have already moved, to take political decisions to participate. And their reactions clearly show appreciation for the major foreign policy benefits that will flow from open and collaborative cooperation on such a bold, visible, and imaginative project.*³⁷ [I-33]

Beggs also wrote a letter to a senior official in each of the countries he had visited, summarizing his understandings, clarifying issues that had been raised, and laying out the next steps. He reiterated the basic U.S. position:

*President Reagan has committed the U.S. to building an \$8B fully functional Space Station to be operational by the early 1990s, but has also set the stage for working together to develop a more expansive international Space Station with even greater benefits and capabilities for all to use. Thus, we are inviting your Government to take a close look at our plans and concepts and then, based on your long-term interests and goals, share with us your ideas for cooperation that will expand the capabilities of the Space Station.*³⁸ [I-34]

It would take more than four years of difficult negotiations to develop a framework for cooperation in the space station program that was acceptable to the United States and its partners—ten European countries acting through the European Space Agency, Japan, and Canada. In agreeing to that framework, the station partners launched what was the most expensive, longest duration in international scientific and technological cooperation ever undertaken. The station agreements included a multilateral intergovernmental agreement among the governments of the United States, Japan, Canada, and the nine European countries,³⁹ as well as three separate and lengthy memoranda of understanding (one between NASA and ESA, another between NASA and its counterpart agency in Canada, and the third between NASA and Japan's space agency.⁴⁰ [I-35] In its scope and complexity, international space cooperation had come a long way from the initial, quickly negotiated, informal, and straightforward 1959 agreement that, almost three decades earlier, had led to the U.S.-U.K. *Ariel* project.

36. See John M. Logsdon, *Together in Orbit: The Origins of International Participation in Space Station Freedom* (Washington, DC: Space Policy Institute, George Washington University, December 1991), for an account of the process of internationalizing the U.S. space station program.

37. James M. Beggs, NASA Administrator, to George P. Shultz, Secretary of State, March 16, 1984, Administrators Files, NASA Historical Reference Collection.

38. James M. Beggs, NASA Administrator, to Kenneth Baker, MP, Minister of State for Industry with Special Responsibility for Space and Information Technology, United Kingdom, April 6, 1984, Administrators Files, NASA Historical Reference Collection.

39. At the time this essay was written, the Department of State had not yet published the space station intergovernmental agreement. When it is published, it will appear in the Department of State series *United States Treaties and Other International Acts*. However, a copy of the agreement does appear in Hein's Microfiche Service, *United States Treaties and Other International Acts*, No. KAV 2383.

40. Each memorandum of understanding was slightly different but covered essentially the same points. The one with Japan was signed by a representative of the Science and Technology Agency in the name of the government of Japan; the Japanese National Space Development Agency was not formally a government body. The Canadian signatory was the Ministry of State for Science and Technology, because the new Canadian Space Agency had not yet been formally established in September 1988.

Cooperation With the Soviet Union

From their inception, the space programs of the United States and the Soviet Union were closely linked to the global political and military rivalry between the two superpowers. Issues of U.S.-U.S.S.R. space cooperation have historically received separate treatment in U.S. policy making from those related to cooperation with U.S. allies. Although the IGY provided the context for the first scientific satellite launches, space cooperation was the most disappointing aspect of the IGY, primarily because the Soviet Union shared only very limited information about the substantive character of its satellite programs with other IGY participants. Also, the Soviet Union did not make the data obtained by those satellites available for analysis to scientists outside of its borders.⁴¹

Although the Soviet Union had refused to discuss the possibility of space cooperation with the United States during the Eisenhower administration, newly inaugurated President John F. Kennedy attempted to open the door to such discussions in his January 20, 1961, inaugural address, stating "let both sides seek to invoke the wonders of science instead of its terrors. Together let us explore the stars. . . ."⁴² Kennedy added more detail to this call in his first State of the Union address ten days later:

*I now invite all nations—including the Soviet Union—to join with us in developing a weather prediction program, in a new communications satellite program, and in preparation for probing the distant planets of Mars and Venus, probes which someday may unlock the deepest secrets of the universe.*⁴³

To back up his cooperative initiative, Kennedy in early February asked his science advisor, Jerome Wiesner, to establish a NASA-Department of State panel on international space cooperation. During its meetings over the following few weeks, the panel considered not only the cooperative possibilities mentioned by President Kennedy in the State of the Union address but also such bold initiatives as the creation of an international scientific outpost on the Moon. In its report, the panel listed more than twenty possibilities for U.S.-Soviet space cooperation. [I-36]

However, by the time the panel's final report was completed, its recommendations had been overtaken by events. The first orbital flight by Yuri Gagarin, on April 12, 1961, had stimulated John F. Kennedy to a competitive response.⁴⁴ With the announcement of the decision to go to the Moon a few weeks later, the chances for significant cooperation in space with the Soviet Union disappeared, at least for the time being.⁴⁵

Tense U.S.-U.S.S.R. relations during 1961, symbolized by the Kennedy-Khrushchev confrontations at a June summit meeting in Vienna and the August erecting of the Berlin Wall, seemed to make any chance of cooperation in space remote. However, even after challenging the Soviet Union to a space race, President Kennedy never abandoned his

41. See Frutkin, *International Cooperation*, pp. 19-20, for this assessment.

42. Quoted in Dodd L. Harvey and Linda Ciccioritti, *U.S.-Soviet Cooperation in Space* (Miami, FL: University of Miami Center for Advanced International Studies, 1974), p. 65. The following account of cooperative initiatives in the first months of the Kennedy administration is taken from pages 66 through 74 of this study.

43. *Ibid.*

44. This story has been told in a series of documents contained in Volume I of this series. See Documents III-6 through III-12 in Logsdon, gen. ed., *Exploring the Unknown*, 1: 423-54.

45. See John M. Logsdon, *The Decision to Go to the Moon: Project Apollo and the National Interest* (Cambridge, MA: MIT Press, 1970).

hope of turning space into an arena for cooperation rather than competition. Apparently, Nikita Khrushchev was willing to change slightly the prior Soviet position linking the possibility of space cooperation with progress in the U.S.-U.S.S.R. disarmament talks. In late 1961, the Soviet Union joined with the United States in supporting United Nations resolution 1721 (XVI), which among other things called for strengthening international space cooperation. In his February 21, 1962, message to President Kennedy, which congratulated the United States on the orbital flight of John Glenn, Khrushchev suggested:

If our countries pooled their efforts—scientific, technical, and material—to master the universe, this would be very beneficial for the advance of science and would be joyfully acclaimed by all peoples who would like to see scientific achievements benefit man and not be used for “cold war” purposes and the arms race.⁴⁶

Quickly seizing what seemed to be an opening, the next day President Kennedy cabled Khrushchev. Kennedy stated that he was “instructing the appropriate officers of this Government to prepare new and concrete proposals for immediate projects of common action.”⁴⁷ Those proposals were contained in a March 7 letter from Kennedy to Khrushchev. [I-37] Kennedy proposed specific cooperative undertakings in five areas: weather satellites, tracking services, mapping of the Earth’s magnetic field, satellite communications, and space medicine.⁴⁸

Khrushchev’s reply came within two weeks. [I-38] It in effect accepted the notion of cooperation in most of the areas suggested by Kennedy, and it added other areas as candidates for cooperation. Most importantly, Khrushchev agreed to a meeting between U.S. and Soviet representatives to discuss how to implement the proposals that he and President Kennedy had made. However, Khrushchev also made it clear that the scope of U.S.-U.S.S.R. space cooperation was limited by broader considerations; he noted that “the scale of our cooperation in the peaceful conquest of space, as well as the choice of lines along which such cooperation would seem possible, is to a certain extent related to the solution of the disarmament problem.”⁴⁹

President Kennedy appointed NASA Deputy Administrator Hugh Dryden as his representative to the U.S.-U.S.S.R. talks, and Khrushchev appointed academician Anatoli Blagonravov. Both were experienced in international scientific diplomacy. Their first meeting took place on March 27 through 30, 1962 [I-39]; by June the two sides had agreed on three areas of initial cooperation.⁵⁰ [I-40] During October 1962 (in the midst of the Cuban missile crisis), an exchange of letters between NASA Administrator James Webb and the president of the Soviet Academy of Sciences, M.V. Keldysh, put the agreements into effect.⁵¹

46. Quoted in Harvey and Ciccoritti, *U.S.-Soviet Cooperation in Space*, p. 86.

47. *Ibid.*

48. John F. Kennedy, “Text of Letter Dated March 7, 1962, From President Kennedy to Chairman Khrushchev Re Cooperation in Peaceful Uses of Outer Space,” March 7, 1962, Space Policy Institute Documentary History Collection.

49. Nikita Khrushchev, “Text of Letter From Chairman Khrushchev in Reply to President Kennedy’s Letter of March 7, 1962,” March 7, 1962, Space Policy Institute Documentary History Collection.

50. For an account of the Dryden-Blagonravov negotiations, see Harvey and Ciccoritti, *U.S.-Soviet Cooperation*, pp. 92-102; Frutkin, *International Cooperation*, pp. 94-105.

51. For the text of the letters, see U.S. Congress, Senate Committee on Aeronautical and Space Sciences, *Documents on International Aspects of the Exploration and Use of Outer Space, 1954-1962*, Staff Report, May 9, 1963, pp. 357-58.

Early results from this initial cooperative agreement were disappointing. By September 1963, however, the Kennedy administration was considering a bold initiative—turning Project Apollo from an exercise in U.S.-U.S.S.R. competition into a cooperative undertaking.⁵² [I-41] The two countries had signed the Limited Test Ban Treaty in August 1963, and President Kennedy wanted to build on that agreement to move toward a broad détente between the superpowers. Joining together in sending people to the Moon would be a dramatic symbol of such détente, and on September 20, 1963, in a speech to the General Assembly of the United Nations, Kennedy asked:

*Why, therefore, should man's first flight to the Moon be a matter of national competition? Why should the United States and the Soviet Union, in preparing for such expeditions, become involved in immense duplication of research, construction, and expenditure? Surely we should explore whether the scientists and astronauts of our two countries—indeed of all the world—cannot work together in the conquest of space, sending some day in this decade to the Moon not the representatives of a single nation, but the representatives of all our countries.*⁵³

Kennedy's proposal got a mixed reaction within the United States—and no response from the Soviet Union—but the president was not dissuaded. On November 12, 1963, Kennedy directed NASA Administrator James Webb “to assume personally the initiative and central responsibility within the government for the development of a program of substantive cooperation with the Soviet Union in the field of outer space.” This program, said Kennedy, should include “cooperation in lunar landing proposals.”⁵⁴ [I-42]

Ten days later, Kennedy was assassinated. While President Lyndon B. Johnson was also in favor of U.S.-U.S.S.R. space cooperation, the continued lack of a Soviet response to Kennedy's September 20 invitation and the absence of Kennedy's personal involvement led to the initiative gradually fading away. By the time NASA responded to the November directive on January 31, 1964, the focus had shifted to cooperation on the robotic predecessors to a human landing on the Moon. [I-43] Even that did not happen, and throughout the rest of the 1960s, U.S.-U.S.S.R. cooperation in space continued at a very modest level.⁵⁵

As mentioned earlier, in the aftermath of the first lunar landing on July 20, 1969, the Nixon administration decided to broaden the basis of its cooperative space activities. One set of initiatives was directed at U.S. allies; other overtures were made to the Soviet Union. Rather than proposing cooperation across a broad range of space activities, NASA Administrator Thomas O. Paine, in a July 31, 1970, letter to Keldysh, proposed that cooperation focus on the issue of astronaut safety—and particularly on a program to achieve compatible rendezvous and docking systems between U.S. and Soviet spacecraft.⁵⁶ [I-44]

52. This account of the consideration of making the Moon landing a cooperative undertaking is drawn from Harvey and Ciccoritti, *U.S.-Soviet Cooperation*, pp. 112-40; Frutkin, *International Cooperation*, pp. 105-19.

53. Quoted in Harvey and Ciccoritti, *U.S.-Soviet Cooperation*, p. 123.

54. National Security Action Memorandum No. 271, “Cooperation with the USSR on Outer Space Matters,” November 12, 1963, Space Policy Institute Documentary History Collection.

55. For an assessment of the record of U.S.-U.S.S.R. cooperation during the 1960s, in addition to the sources cited above, see U.S. Congress, Office of Technology Assessment, *U.S.-Soviet Cooperation in Space*, Technical Memorandum (Washington, DC: U.S. Government Printing Office, July 1985).

56. Thomas O. Paine, NASA Administrator, to Academician M.V. Keldysh, President, Academy of Sciences of the USSR, July 31, 1970, Administrators Files, NASA Historical Reference Collection. For a full history of what eventually became the Apollo-Soyuz Test Project, see Edward Clinton Ezell and Linda Neuman Ezell, *The Partnership: A History of the Apollo-Soyuz Test Project* (Washington, DC: NASA SP-4209, 1978).

This proposal produced a positive response from the Soviet Union, and on October 26, 1970, a NASA delegation traveled to Moscow to discuss the feasibility of such a program with its Soviet counterparts. [I-45] This was the first official NASA delegation to visit the Soviet Union. These meetings went quite well, and they seemed to break a logjam in U.S.-U.S.S.R. cooperative relations. In January 1971, Acting NASA Administrator George Low and an accompanying delegation traveled to Moscow to meet with Keldysh and his colleagues, and they reached a preliminary agreement on renewed and expanded cooperation in a variety of areas. Following an exchange of letters between Low and Keldysh, a broad agreement on areas of U.S.-U.S.S.R. cooperation was announced on March 31, 1971. To implement the agreement, U.S.-U.S.S.R. joint working groups on meteorological satellites, meteorological rocket soundings, the natural environment, the exploration of near-Earth, the Moon and the planets, and space biology and medicine were established. These working groups and their successors have been the principal mechanisms for planning U.S.-U.S.S.R. space cooperation since 1971.

Meanwhile, discussions on the feasibility of a 1975 joint test flight involving the in-orbit rendezvous of U.S. and Soviet spacecraft had proceeded to the point where George Low, now back in his position as NASA's deputy administrator, journeyed to Moscow in April 1972 to determine whether the United States should commit to such a mission. This trip was made secretly at the request of the White House, because a formal agreement on such a mission was to be announced at a planned May 1972 summit meeting between President Richard Nixon and Soviet Premier Leonid Brezhnev.⁵⁷ [I-46]

Low's recommendation was to go ahead with the mission, which was accepted by the White House. [I-47] On May 24, 1972, President Richard Nixon and Chairman of the Soviet Council of Ministers Alexei Kosygin signed the government-to-government "Agreement Concerning Cooperation in the Exploration and Use of Outer Space for Peaceful Purposes."⁵⁸ Although this agreement incorporated all the areas of cooperation that had been agreed to in 1971, its centerpiece was the announcement of the Apollo-Soyuz Test Project (ASTP). The agreement had a five-year lifetime, with the possibility of an extension by mutual agreement.

Soviet and U.S. engineers, managers, and astronauts met frequently over the next three years. [I-48] This led to the successful ASTP mission, which took place from July 14 to 24, 1975. The mission itself was accomplished without major problems.⁵⁹

Even as the launch dates for the ASTP mission approached, George Low and Keldysh began to discuss follow-on cooperation, particularly in human spaceflight and robotic missions to the far side of the Moon and to Mars. [I-49] These discussions continued over the next two years, and by May 1977, when the U.S.-U.S.S.R. space cooperation agreement was renewed for five more years, the two countries had also agreed to consider a joint mission between the U.S. Space Shuttle and the Soviet *Salyut* space station, as well as cooperation in the development of an "international space platform."⁶⁰ [I-50]

As it turned out, however, the ASTP mission marked the high point of U.S.-U.S.S.R. space cooperation for some time to come. That cooperation fell prey to a deterioration in the overall state of U.S.-U.S.S.R. relations during the presidency of Jimmy Carter and the first White House term of Ronald Reagan. The Carter White House by 1978 was ques-

57. George M. Low, NASA Deputy Administrator, "Visit to Moscow, April 1972, to Discuss Compatible Docking Systems for US and USSR Manned Spacecraft," April 4-6, 1972, with attached: "Addendum, Moscow Trip, April 4-6, 1972," May 30, 1972, Deputy Administrators Files, NASA Historical Reference Collection.

58. For more on the agreement, see Ezell and Ezell, *The Partnership*, pp. 192-93.

59. See *ibid.* for details.

60. Office of Technology Assessment, *U.S.-Soviet Cooperation*, p. 32.

tioning whether it was in the U.S. interest to be seen as a highly visible cooperative partner with a Soviet Union that it was accusing of human rights violations, and the shuttle-*Salyut* project was set aside. As part of the U.S. reaction to Soviet involvement in the declaration of martial law in Poland in 1981, the U.S.-U.S.S.R. space cooperation agreement was allowed to lapse when it came up for renewal in 1982. With that development, any cooperation in space between the United States and the Soviet Union had to be on a scientist-to-scientist basis, with no formal government involvement or funding.

This situation lasted for several years. Then in 1986, the United States, in response to the reforms of new Soviet leader Mikhail Gorbachev and to increasing pressure from scientists and others in the United States who viewed space as an arena for demonstrating a new, post-Cold War superpower relationship, indicated its willingness to resume formal cooperative relations in space with the Soviet Union. Negotiations led to the April 1987 signing of a new government-to-government cooperative agreement that identified sixteen areas for initial cooperation.⁶¹ [I-51]

The U.S.-U.S.S.R. space relationship, always a barometer of the overall state of relations between the two countries, was once again on the upswing. Cooperation increased after the collapse of the Soviet Union and the emergence of Russia as the inheritor of most of the former Soviet Union's space capabilities. By the mid-1990s, U.S.-Russian cooperation had become the centerpiece of NASA's international space activities, as the two countries in effect merged their programs of human spaceflight in the period leading to the creation of the International Space Station. Initial steps in this direction came in 1992, when Russia created a civilian space agency and when Russian President Boris Yeltsin and President George Bush agreed to broaden U.S.-Russian space interactions. [I-52] This accelerated under President Bill Clinton; the United States and Russia in effect merged most of their programs of human spaceflight. [I-53, I-54, I-55] Russia was invited to become a key participant in the International Space Station. [I-56]

After almost forty years, cooperation had replaced competition as the central focus of U.S.-Russian space relations. The January 1961 hopes of President John Kennedy finally neared realization.

61. George P. Shultz and Eduard Shevardnadze, "Agreement Between the United States of America and the Union of Soviet Socialist Republics Concerning Cooperation in the Exploration and Use of Outer Space for Peaceful Purposes," April 15, 1987, with attached: "Agreed List of Cooperative Projects," Space Policy Institute Documentary History Collection.

Document I-1**Document title: Office of the Press Secretary, Statement by the President, July 29, 1958.****Source: NASA Historical Reference Collection, NASA History Office, NASA Headquarters, Washington, D.C.**

The congressional drafters of changes to the Eisenhower administration's version of a bill that set out the goals and organizational features of the U.S. civilian space program were strong advocates of international cooperation in carrying out the new program. They inserted in the bill a provision, contained in Section 205, that appeared to require Senate approval for any cooperative agreement into which the executive branch or the new space agency might enter. This was intended to signal congressional interest in international space issues, but legal experts pointed out after the bill had passed Congress that such approval could be interpreted as trespassing on the power of the president and his appointees to enter into nontreaty agreements for cooperation. At the time he signed the National Aeronautics and Space Act of 1958, President Eisenhower placed this statement on the record to dispel the possibility of such an interpretation.

[1] IMMEDIATE RELEASE

July 29, 1958

James C. Hagerty, Press Secretary to the President

THE WHITE HOUSE

Statement by the President

I have today signed H. R. 12575, the National Aeronautics and Space Act of 1958.

The enactment of this legislation is an historic step, further equipping the United States for leadership in the space age. I wish to commend the Congress for the promptness with which it has created the organization and provided the authority needed for an effective national effort in the fields of aeronautics and space exploration.

The new Act contains one provision that requires comment. Section 205 authorizes cooperation with other nations and groups of nations in work done pursuant to the Act and in the peaceful application of the results of such work, pursuant to international agreements entered into by the President with the advice and consent of the Senate. I regard this section merely as recognizing that international treaties may be made in this field, and as not precluding, in appropriate cases, less formal arrangements for cooperation. To construe the section otherwise would raise substantial constitutional questions.

The present National Advisory Committee for Aeronautics (NACA), with its large and competent staff and well-equipped laboratories, will provide the nucleus for the NASA. The NACA has an established record of research performance and of cooperation with the Armed Services. The combination of space exploration responsibilities with the NACA's traditional aeronautical research functions is a natural evolution.

The enactment of the law establishing the NACA in 1915 proved a decisive step in the advancement of our civil and military aviation. The Aeronautics and Space Act of 1958 should have an even greater impact on our future.

Document I-2

Document title: Hugh L. Dryden, Deputy Administrator, NASA, to T. Keith Glennan, *et al.*, March 12, 1959.

Source: NASA Historical Reference Collection, NASA History Office, NASA Headquarters, Washington, D.C.

Document I-3

Document title: Richard W. Porter, to Professor Dr. H.C. van de Hulst, President, Committee on Space Research (COSPAR), March 14, 1959.

Source: Archives, National Academy of Sciences, Washington, D.C.

The National Academy of Sciences (NAS) had managed U.S. participation in the International Geophysical Year, including related U.S. space activities, and had suggested to the International Council of Scientific Unions that it establish a continuing Committee on Space Research (COSPAR). When the new space agency, NASA, was formed, its initial staff handling both space science and international affairs had close ties to the NAS. Once a decision had been made not to use the United Nations for carrying out international space programs, NASA worked closely with the NAS. They authorized the U.S. delegate to COSPAR, Richard Porter, to invite other members of COSPAR to plan experiments that would be launched on U.S. boosters and to cooperate with NASA in getting started in space. NASA's head scientist, Homer Newell, attended the COSPAR meeting and stayed in touch with Deputy Administrator Hugh Dryden as the U.S. offer took final shape. Dryden in turn informed others at NASA headquarters about the final changes to the U.S. offer; Administrator T. Keith Glennan wrote "OK—Good" on his copy of Dryden's memorandum, which is reproduced here. The final offer came in the form of Richard Porter's letter to COSPAR President H.C. van de Hulst. With this letter, the United States initiated a program of productive cooperation in space science that has continued to the present.

Document I-2

[1]

March 12, 1959

Memorandum for Dr. T. Keith Glennan
Mr. Henry E. Billingsley
Mr. Franklyn W. Phillips
Mr. Harold R. Lawrence

1. On March 11th Homer Newell telephoned me from Holland to ask further advice on the statements that could be made with respect to cooperation with COSPAR in satellite launchings. The Executive Committee of COSPAR had met during the day in the absence of the Russian member, Dr. Federov, who arrived after the meeting had adjourned.

2. We had previously authorized to the U.S. delegation to offer cooperation in the provision of payload space or possibly a booster for a complete COSPAR payload. The U.S. delegation felt, from the nature of the discussion at the Executive Committee meeting, that it would be desirable to make this offer somewhat more specific. After discussion with

Newell, I authorized him to make the definite offer for a booster for a COSPAR payload, the booster not to be named although we have in mind either Scout or Thor Delta. The payload would be described as 150 to 500 pounds, depending on the specific booster; and the general nature of the available orbits would be described. The booster would be available in 1-1/2 to 2 years. It was agreed that the payload should be recommended by COSPAR, that it should be acceptable to NASA, and that it should pass environmental tests prescribed by NASA.

3. The question was raised as to whether the foreign scientists would be permitted to be present at the launching. I suggested that this question be avoided for the present for we are not in a position to commit the Atlantic or Pacific Missile Range.

4. The meeting of COSPAR itself takes place today.

Hugh L. Dryden
Deputy Administrator

Document I-3

[1]

March 14, 1959

Professor Dr. H. C. van de Hulst,
President,
Committee on Space Research (COSPAR),
Paleis Nooreinde 68,
THE HAGUE, The Netherlands.

Dear Mr. President,

COSPAR has a truly historic opportunity to become an effective force for international cooperation in space research. This cooperation will be most fruitful and meaningful if the maximum opportunity to participate in, and contribute to, all aspects of space research can be provided to the entire scientific community. In this regard, COSPAR can serve as an avenue through which the capabilities of satellite launching nations and the scientific potential of other nations may be brought together.

The United States will support COSPAR in this objective by undertaking the launching of suitable and worthy experiments proposed by scientists of other countries. This can be done by sending into space either single experiments as part of a larger payload or groups of experiments comprising complete payloads.

In the case of individual experiments to become part of a larger payload, the originator will be invited to work in a United States laboratory on the construction, calibration, and installation of the necessary equipment in a U.S. research vehicle. If this is impossible, a U.S. scientist may be designated to represent the originator, working on the project in consultation with him. Or, in the last report, the originator might prepare his experiment abroad, supplying the launching group with a final piece of equipment, or "black box," for installation. However, this last approach may not be practical in most cases.

In the case of complete payloads, the United States also will support COSPAR. As a first step, the delegate of the U.S. National Academy of Sciences is authorized to state that the U.S. National Aeronautics and Space Administration will undertake to launch an entire payload to be recommended by COSPAR. This payload may weigh from 100 to 300 pounds and can be placed in an orbit ranging from 200 to 2,000 miles altitude. It is

expected that the choice of the experiments and the preparation of the payload may require a period of 1 1/2 to 2 years. NASA is prepared to advise on the feasibility of proposed experiments, the design and construction of the payload package, and the necessary pre-flight environmental testing. The U.S. delegate will be pleased to receive COSPAR's recommendations for the proposed payload when they can be readied.

In further support of COSPAR, the U.S. delegate would like to call attention to the availability of resident research associateships at the National Aeronautics and Space Administration in both theoretical and experimental space research. These provide for stipends of \$8000 per annum and up.

Very truly yours,
Richard W. Porter

Document I-4

Document title: T. Keith Glennan, Administrator, NASA, to Professor H.S.W. Massey, United Kingdom Scientific Ministry, July 6, 1959, with attached: H.S.W. Massey, "U.K.-U.S. Technical Discussions on Space Research, June 25-July 3, 1959," July 3, 1959.

Source: NASA Historical Reference Collection, NASA History Office, NASA Headquarters, Washington, D.C.

This exchange of documents constituted what was, in effect, the first (albeit informal) cooperative agreement concluded by NASA and a counterpart space organization (in this case, the British National Space Committee of the nongovernmental Royal Society). Upon its return to the United Kingdom, the proposals for cooperation developed by Professor Massey and his delegation were quickly approved by the U.K. government, although a formal U.S.-U.K. agreement implementing the cooperative program was not signed until 1961. The first mission resulting from this agreement, Ariel 1, was launched in less than three years, on April 26, 1962.

[1]

July 6, 1959

Professor H. S. W. Massey
United Kingdom Scientific Mission
1907 K Street, Northwest
Washington 6, D.C.

Dear Professor Massey:

I have examined your statement of July 3, 1959, of the discussions held here between your group and our people and find it accurate and acceptable, from my standpoint.

It is my understanding that this statement represents only an informal technical understanding between us and does not commit either of our governments to proceeding with this undertaking until further arrangements have been consummated. On both sides, it must be recognized that the exact content and pace of the proposed program is subject to the success we may have with supporting technological developments and the financial resources made available by our respective governments.

Because of the importance of this matter and its relationship to the improvement of international understanding between our two countries in this field, I hope we shall hear from you further after you have reported the results of our talks to your people in London.

I trust this understanding is satisfactory to you and that your trip here has been pleasant and satisfactory in all regards.

Sincerely,

T. Keith Glennan
Administrator

[Attachment page 1]

U.K.-U.S. Technical Discussions on Space Research June 25-July 3, 1959

Discussions have been held between N.A.S.A. and the team of British scientists led by myself, to consider the offer made by N.A.S.A. to assist other countries in scientific work with satellites, in the interest of developing a programme of international cooperation in space research. Specifically, this paper records the outcome of meetings held in Washington in late June and early July. As far as the U.K. side is concerned the outcome of these discussions, as recorded below, will be reported as soon as possible to the U.K. Steering Group on Space Research:

1. N.A.S.A. confirm that they would be ready to offer facilities to the U.K. for launching U.K. instrumented satellites in the U.S.A. by means of the SCOUT vehicle.
2. The U.K. side consider that three SCOUT satellites should provide sufficient space for first flights of the instruments which would be required for a programme of experiments of the type and range provisionally listed in Document NCSP 41 (59).
3. On present plans, N.A.S.A. hope that the launching of three British-instrumented SCOUT satellites could be completed within 3 to 4 years from now—with the aim that the first launching would be in about 2 years from now.
4. If it is decided to accept the N.A.S.A. offer, the U.K. side would hope to provide specific proposals for the instrument content of the first satellite in the near future. Consideration of the possible content of further satellites would proceed as soon as possible, but would obviously be affected by success or otherwise in launching.
- [2] 5. In the first instance, N.A.S.A. would provide the satellite shell and auxiliary facilities, including solar cells and batteries, temperature control and data transmission.
6. During the whole process of planning and constructing the satellites, the U.K. would do everything possible to maintain the necessary direct scientific and technical cooperation between the experts.
7. Both sides agreed that a detailed exchange of views was desirable about possible extension of worldwide tracking and telemetry reception stations.
8. N.A.S.A. said that the financial basis of their offer was "no billing" on either side.
9. In making this offer it is N.A.S.A.'s position that this should be a mutually cooperative programme, with benefits flowing to both parties, for the advancement of science. It is contemplated that the experiments, conducted with the instruments flown by the British scientists, would form an integral part of the total spectrum of scientific experiments in space, and mutually agreed upon as a reasonable and important group of experiments.

The U.K. side explained that they were not at this stage authorized to come to any agreement, as this was a matter for the authorities in London.

July 3, 1959

H.S.W. MASSEY

Document I-5

Document title: Hugh L. Dryden, NASA Deputy Administrator, to Sir Harrie Massey, European Preparatory Commission for Space Research, June 27, 1962.

Source: NASA Historical Reference Collection, NASA History Office, NASA Headquarters, Washington, D.C.

At the urging of many leading scientists in Europe, the European governments decided in 1962 to create a multilateral European Space Research Organization as the primary mechanism for carrying out a European space science effort. It was general U.S. policy to favor the development of multilateral institutions in Europe, and NASA wasted no time in extending to the new organization the same cooperative offer it had earlier extended to individual European countries.

[1]

June 27, 1962

Sir Harrie Massey, President
European Preparatory Commission for Space Research
36, rue La Perouse
Paris 16, France

Dear Sir Harrie:

On behalf of the National Aeronautics and Space Administration, I should like to extend felicitations upon the recent signing of the Convention for establishment of the European Preparatory Commission for Space Research.

NASA will welcome ESRO as a major new force contributing to the advancement of space science and technology in the context of peaceful cooperation among nations. It is our hope that we may participate with ESRO in cooperative efforts which may enhance our respective programs and our contributions toward this goal. There are many possibilities for specific projects in which we may join our efforts. It may serve a useful purpose to suggest a few of them:

1. We should be very happy to enter with ESRO into a joint program of the type proposed in COSPAR on our behalf in March 1959. In such a program, NASA would provide a suitable launching vehicle to place in orbit a satellite of scientific interest which might be prepared by ESRO.
2. As you know, NASA plans the launching of complex "Observatory" satellites, each bearing a variety of experiments. Some of these satellites are to be placed in polar orbits, others into highly eccentric orbits of lower inclination to the equator. We would propose to notify ESRO of opportunities for it to recommend the incorporation of specific European experiments in these satellites. Such recommendations would be given the same consideration as proposals from American scientists for the same satellites.

- [2] 3. With the concurrence of the Department of State, certain satellite boosters manufactured in the United States would be available under reasonable conditions for purchase by ESRO for scientific purposes.
4. NASA is prepared to accommodate in its own laboratories, in conjunction with agreed programs of the above character, technicians and scientists sponsored and supported by ESRO for such training and orientation as desired. In addition, fellowships in American university laboratories devoted to space theory and experimentation will continue to be available to ESRO nominees.

I hope that ESRO will soon be prepared to discuss these and other possibilities for useful cooperation. At such time, or at any stage in your preparation for such discussions, we will be happy to welcome here scientific representatives of ESRO to discuss possible satellite or sounding rocket experiments.

Sincerely yours,

Hugh L. Dryden
Deputy Administrator

Document I-6

Document title: James E. Webb, Administrator, NASA, to Dean Rusk, Secretary of State, May 24, 1966.

Source: NASA Historical Reference Collection, NASA History Office, NASA Headquarters, Washington, D.C.

Beginning in late 1965, the United States tried to expand the scope and intensity of its space science cooperation with other countries. Initial initiatives were made with Europe, but the hope was to involve Japan as well. In this letter, NASA Administrator James E. Webb suggests to Secretary of State Dean Rusk why he was not optimistic about the potential for enhanced U.S.-Japanese space cooperation. At this point, Japan's space effort was concentrated at an institute of the University of Tokyo.

[1] Honorable Dean Rusk
Secretary of State
Washington, D.C.

Dear Dean:

I share the views expressed in your letter of May 12 regarding the desirability of cooperation with Japan in the space field and would be happy to send to Japan a team similar to that which visited Europe in connection with President Johnson's offer on the occasion of Chancellor Erhard's December visit. In order to work out an appropriate approach to the Japanese, I am asking Mr. Arnold Frutkin, Assistant Administrator for International Affairs, to work with Mr. Pollack.

There are certain limitations with respect to an approach to the Japanese which I think you will want to consider. As you know, the President's proposals for cooperation on the European side were of a scale and character necessarily multilateral. Proposals of the same dimensions could not well be made to the Japanese since Japan could not be expect-

ed to carry a burden of spacecraft development which would be appropriate to the combined resources of the leading European nations. Thus, it seems inevitable that the subject matter of any space cooperation with Japan would have to be scaled down to the bilateral level, unless Europe itself should invite Japan to participate in its broader multi-lateral project.

When the question of Japanese participation with Europe came up in the Advance Team discussions in Europe last February, the Team made it quite clear that the U.S. would welcome such an overture by the European countries. Unfortunately, the prospect of positive European action on the President's proposal is in itself uncertain. While the matter is probably best not further complicated at this particular time, it may be that the possibility of Japanese contributions might be reopened in Europe in terms of European interest.

[2] With regard to bilateral cooperation with the Japanese, the pertinent history is rather dubious. Over the years, Dr. Dryden and Mr. Frutkin both made strenuous efforts to interest Japan in a bilateral satellite program comparable with those which have been entered into with virtually all other advanced nations. Japan clearly made a conscious decision to proceed on its own without involvement with the United States. (At the COSPAR meeting in Vienna early in May, Japanese scientists for the first time officially reported plans to launch small satellites this year and next year in the course of a self-contained Japanese program.) In order to obtain this decision, the dominant figures in Japanese space activity, particularly Professor Itokawa at the University of Japan, have quite consciously distorted the conditions of cooperation with the United States. Professor Itokawa is understood to have a close family association with the Prime Minister. Professor Kaneshige, with whom we have maintained very close touch, who is the Japanese Chairman of the US-Japan Scientific Commission, and who has been the senior Japanese scientific adviser to the Prime Minister, only last month told me that his continuing efforts to promote space cooperation with the United States have failed. He frankly confirmed the policy of deliberate distortion of our program (a matter which we have sought to bring to Embassy attention).

It is our understanding that the reception given in Tokyo to the Vice President's remarks on cooperation was rather cool. In the circumstances, a team, even of the caliber sent to Europe in February, would almost certainly find its efforts contained within a Japanese policy of noncooperation at quite senior levels. You may wish then to consider how persistent the U.S. ought to be and through what channels in pressing an objective that has met quite calculated and entrenched opposition over a period of years.

Sincerely yours,

James E. Webb
Administrator

Document I-7

Document title: James E. Webb, NASA Administrator, to U. Alexis Johnson, Deputy Under Secretary of State for Political Affairs, May 19, 1966.

Source: Administrators Files, NASA Historical Reference Collection, NASA History Office, NASA Headquarters, Washington, D.C.

During late 1965 and 1966, the United States considered ways to increase its cooperative activities in space. Most of the focus was on increased cooperation with Europe and Japan. However, there was interest in involving some of the larger developing countries with space ambitions of their own, such as India and Brazil, in cooperative efforts with NASA. This letter outlined for the first time a possible initiative with India to use a NASA communications satellite to broadcast educational programming to Indian villages. Almost a decade after the idea was first broached, between August 1, 1975, and July 31, 1976, the United States and India cooperated on the Satellite Instructional Television Experiment (SITE). During this experiment, the NASA Applications Technology Satellite ATS-6 was moved to an orbital position over India, and educational programming was broadcast to more than 5,000 Indian villages.

[1]

May 19, 1966

U. Alexis Johnson
Deputy Under Secretary for Political Affairs
Department of State
Washington, D.C. 20520

Dear Alex:

In my letter of April 26, I forwarded to you some thoughts for extending international cooperation in space. I would now like to supplement those with an additional suggestion that could prove valuable in opening new avenues for US-Indian collaboration in the practical applications of space.

The proposal should be understood on several levels: (1) A technical experiment in direct broadcasting, (2) A pilot project in the social impact of direct broadcasting, (3) A stimulus to Indian industrial electronics, [and] (4) An attack upon the food and population problems of India. The only step proposed is a joint US-India study of feasibility—which would have political value in and of itself.

If they agree, India and the United States would jointly establish a study group to examine the feasibility, the advantages and disadvantages, and the trade-off considerations of alternate approaches as these factors relate to a continuing experiment in direct broadcasting. In this experiment, the US would build and position a synchronous satellite near India in such a way that broadcasts from it could be received over the major part of the Indian subcontinent. Most of the basic technology for this experiment exists already and it should prove possible to beam the broadcasts tightly enough and on such frequencies that no interference would be caused to adjacent nations.

India, for its part, would use its nascent electronics capability now focussed [sic] at the atomic energy center at Bombay to develop (with some design assistance from the US) improved television receivers to be established in perhaps a thousand rural population centers. India has [2] already demonstrated a significant capacity to contribute to such a task: Bombay is currently turning out analog computers, oscilloscopes, solid state components, and the like. In addition, there exists within India a considerable capacity for the production of radio receivers and other, simpler electronics devices.

The satellites would be turned over to India for its own use in broadcasting to its people news and other material of an informational and educational value. The US would probably want to limit its commitment to provide satellites to perhaps two with a total projected life expectancy of five years. Following this experimental period, India would be expected to arrange with the US or INTELSAT for continuing service if desired. The cost to the US would be that of placing two large synchronous satellites in orbit. The cost to India would be that of the receivers themselves. One thousand such receivers might cost about \$1.6 million, much of it in rupees. Since there are over 100,000 villages that might

benefit from this program it would be up to India to decide the extent of its commitment beyond the initial one thousand receivers. In any case, much could be done by moving receivers from village to village to maximize the size of audience.

I would not understate the problems we would be likely to encounter. The cost of the program might be more than either we or the Indian Government would care to bear. Television appears to possess a significant informational and educational potential, but there may be many pitfalls to its application on a scale such as this. We should certainly have to reach definite prior agreement with the Indians concerning the uses to which space broadcasting was put. We obviously could not tolerate its use to defame us or our actions or to embarrass us in our relations with nations such as Pakistan. We might also have to face the question of continuing subsidies after the experimental satellite had gone dead; India might not be able to finance new satellites solely from its own pocket. We should also have to be careful that the experiment remained clearly separate from commercial communications projects and did not prejudice relations with INTELSAT or the concept of a single global communications satellite system.

Nevertheless, there remain powerful arguments in favor of discussing such an experiment with the Indian Government. The discussions and the institution of a joint study group would be a convincing display to that Government of our intent to use the most advanced technologies in helping it to cope with its urgent human problems. The joint study itself would bring Indians and Americans into intimate technical collaboration. India could learn from the study new technological and management approaches to education and to the uses of *informational media to weld together a nation-state*. The US would, in turn, learn more about the Indians and their most pressing problems.

[3] Should the project come to fruition, then important additional benefits would flow. India would, on its own initiative and with its own resources, begin the accelerated development of a modern electronics industry. This "bootstrapping" operation would materially raise India's technological base and contribute thereby to the development of other, similar industries. Some Indian energies might also be diverted from concern with nuclear weapons development, the more so perhaps as the success of the experiment contributed to India's prestige in Asia. The posture of the US would also be improved through a generous demonstration of its willingness to share the benefits of advanced space technology with underdeveloped nations.

As I view the proposal, we would at no time be exposing ourselves by unconsidered commitments or precipitous action. Each step, from the initial, private discussions with the Indian Government, through the careful and detailed examination by the joint study group would provide renewed opportunities to reexamine initial premises and search for possible flaws in all facets of the proposal. Even should it prove infeasible in the end, both we and the Indians could not fail to have profited by the intimacy of our cooperation in a joint technological venture.

I look forward with interest to hearing your reaction to this proposal. I do want to add that we are already negotiating or entertaining a number of other prospective projects for the near or distant future and so have excluded these possibilities from the category of suggestions for new cooperation. . . .

Sincerely yours,

James E. Webb
Administrator

Document I-8

Document title: Robert J. Allnut, for A.M. Lovelace, Acting Administrator, NASA, via Margaret Finarelli, NASA Headquarters, to Erik Quistgaard, Director General, European Space Agency, Telegraphic Message, February 20, 1981.

Source: NASA Historical Reference Collection, NASA History Office, NASA Headquarters, Washington, D.C.

In February 1981, the Office of Management and Budget, under the new administration of President Ronald Reagan, ordered NASA to cancel one of its major science programs. This represented a way of reducing the NASA budget in future years. NASA chose to cancel the spacecraft it was committed to provide as part of the International Solar Polar Mission, a joint venture of NASA and the European Space Agency. Because of the secrecy surrounding budget decisions, NASA was unable to alert ESA of the possibility of such a cancellation until a telephone call on February 18, the same day that President Reagan announced the cuts he was making in the budget submitted by outgoing President Jimmy Carter. Formal notice of the cancellation was provided by this telegram, signed by Robert Allnut, one of the top staff of NASA's Acting Administrator Alan Lovelace, and forwarded by Margaret Finarelli of the Office of International Affairs.

[1]

TO: MR. ERIK QUISTGAARD
DIRECTOR GENERAL
EUROPEAN SPACE AGENCY
8-10 RUE MARIO NIKIS
75738 PARIS CEDEX 15
FRANCE

INFO:
MR. JAMES MORRISON
NASA EUROPEAN REP.
RUFNPS AMEMBASSY
PARIS, FRANCE

MR. WILFRED MELLORS
ESA WASHINGTON OFFICE
(CODE LID-18 TO MAIL)

As I indicated to you in our telephone conversation yesterday, the administration's budget for FY82 requires severe cuts in the full range of NASA's programs. Because work on vital shuttle activities must continue, we have been forced to cancel or otherwise forego a number of major programs in the science and applications areas. We are foregoing starts for both VOIR and GRO; monies for the development of Spacelab payloads have been cut back even further: NOSS has been cancelled; and numerous other programs in the applications area such as our agricultural forecasting program have suffered deep cuts.

[2] We have endeavored, and will continue to endeavor, to honor our international commitments to the fullest extent possible. Nonetheless, the deep budget cuts have necessitated cancellation of part of the joint NASA/ESA ISPM Mission, namely the US Spacecraft which was to have participated in the Solar Polar mission. In view of the major scientific importance of Solar Polar research, we hope that ESA will continue with the mission which can now be launched in 1986 on a Shuttle/Centaur and that we will be able to maintain its cooperative nature.

As I indicated to you yesterday, the NASA budget will permit support of the remaining spacecraft, including the U.S. experiments previously planned for the ESA spacecraft.

[3] As I mentioned to you on the telephone, I propose that Dr. Stofan, NASA's Acting Associate Administrator for Space Science, and Dr. Trendlenberg, ESA's Director for Scientific and Meteorological Programs, meet promptly to review the current spacecraft situation, assess the impact of the budget reduction on the scientific value of the mission and determine the most effective way to proceed with the ESA spacecraft. When Stofan and Trendlenberg have concluded their discussions regarding the spacecraft, you and I should then discuss the mission further.

I want to assure you that cancellation of the US Spacecraft in the ISPM mission is taken with great reluctance and was unavoidable given the broad and deep cuts occurring throughout NASA and throughout the US Government budget. I would like to reiterate my deep appreciation for ESA's cooperation with NASA in the past and my continuing sense of commitment to working with ESA on programs of mutual interest.

[4] I share your view about the value of looking closely at our existing consultation procedures to see if, within the constraints on both sides, improvements can be made. I have asked Ken Pedersen to be sure this topic gets a high place on the agenda for our informal talk on March 9. I am looking forward to seeing you again.

Robert J. Allnutt signed for
A. M. Lovelace
Acting Administrator

Document I-9

Document title: W.J. Mellors, Head, Washington Office, European Space Agency, "Aide Memoire, International Solar Polar Mission (ISPM)," February 24, 1981.

Source: NASA Historical Reference Collection, NASA History Office NASA Headquarters, Washington, D.C.

Not surprisingly, the European Space Agency (ESA) and its member states reacted with outrage to the U.S. cancellation of its spacecraft contribution to the International Solar Polar Mission. Diplomatic protests were lodged on a government-to-government basis, and Congress was made aware of Europe's unhappiness. These notes, prepared by Wilfred Mellors, the head of ESA's Washington office, were the basis of his initial formal presentation of the ESA response to the cancellation.

[1]

24th February, 1981

Aide Memoire International Solar Polar Mission (ISPM)

1. Last week the Acting Administrator of NASA informed the Director General of the European Space Agency that the cuts announced by President Reagan in his speech on February 18th, 1981 included the cancellation of the US spacecraft and the associated U.S. experiments for the above mentioned mission. At a meeting held on February 23rd NASA confirmed this situation.

2. I am to say that:

- a) The cancellation of the NASA satellite, which was effected without consultation, is a unilateral breach of the ISPM MOU; this cancellation is totally

unacceptable and ESA requests full restoration of the programme to its original level.

- b) If the cancellation were permitted to stand, there would be serious long term damage to European/United States cooperation in space.
- c) Naturally, there has been a very unfavorable reaction in Europe. No less than seventeen European scientific institutes are involved in the United States spacecraft and would consequently be unable to fly. These experimenters have already committed more than 50% of the total cost of their experiments. Indeed, Europe has already made a major investment of the order of one hundred millions of US dollars, equivalent to the whole of ESA's annual budget for Space Science, in the ISPM programme.

3. It is to be noted that at the time ESA decided to participate in ISPM, other candidate missions were considered, including some purely European projects with no American participation. However, ESA decided to collaborate with NASA because first, the ISPM mission—as it was with two spacecraft—was of outstanding value to the scientific community in Europe and in the United States as it permitted simultaneous measurements over the Northern and Southern hemispheres of the sun and, secondly, (of equal and even greater importance), it was believed there was great value in such transatlantic cooperation.

[2] 4. I am further to say that this present cancellation of the US spacecraft is not the first instance of a unilateral action by the US in this project which has had serious consequences for ESA. I am to point out that in March of 1980 the revision of the NASA FY 81 budget resulted in a delay of two years in the launch date which cost ESA and the European scientific institutes supporting the mission at least an additional twenty millions of dollars; while in January of this year a decision was taken to change the upper stage from the IUS [Inertial Upper Stage] to the CENTAUR vehicle, the full consequences of which have not yet been established.

5. In view of the above the Director General has today requested each Member State immediately to make through its Washington Embassy at Ambassador level, the strongest possible protest against the announced cancellation and to request a full restoration of the two spacecraft mission.

6. Finally I am to point out that it is ESA's view that such unilateral actions as now taken by the United States could destroy the basis for collaborations of this nature in the future and that the impact could well go beyond the field of scientific space research.

W. J. Mellors

Head, Washington Office
European Space Agency

Document I-10

Document title: "Meeting of NASA Administrator and ESA Director General, 17 June 1982, ESA Head Office," with attached: "General Principles for NASA/ESA Cooperative Agreements."

Source: ESA Collection, European Community Archives, Florence, Italy.

In the months following the cancellation of the International Solar Polar Mission, the European Space Agency (ESA) and its member states conducted a comprehensive assessment of the desirability of continuing Europe's close cooperation with the United States. The conclusion of this assessment was that such cooperation remained desirable but the terms and conditions under which it would be carried out had to provide more protection to European interests. These terms and conditions were agreed to at a June 1982 meeting between the heads of NASA and ESA.

[1]

Meeting of NASA Administrator and ESA Director General 17 June 1982, ESA Head Office

FUTURE NASA/ESA COOPERATION

A. *Principles and terms of future agreements.*

Having confirmed their intention to continue their long-standing cooperation, ESA and NASA agreed on the "General Principles for NASA/ESA Cooperative Agreements" attached to these minutes (Annex 1).

B. *Procedures for regular exchange of views on future programmes in space science and applications.*

NASA proposed three measures to set up such procedures:

- schedule regular discussions between the respective division directors responsible for astrophysics, environmental observations, and earth and planetary exploration programmes;
- encourage exchange of information and ideas among US and European scientists who participate in the respective NASA and ESA programmes;
- encourage regular meetings between the NASA Associate Administrator for Space Science and Applications and the ESA Directors of Scientific Programmes and Application Programmes.

ESA gave a brief outline of ground rules recently approved by its Science Programme Committee for future scientific cooperation.

These ground rules are attached (Annex 2).

[2] As to applications, ESA stated to be in favor of regular meetings at working level in the field of earth observation. In the telecommunications sector further ad hoc discussions on specific topics could be envisaged.

ESA agreed to the three measures proposed by NASA and outlined above. . . .

[3]

DG/A Meeting
17 June 1982
Annex 1

General Principles for NASA/ESA Cooperative Agreements

The National Aeronautics and Space Administration and the European Space Agency confirm their desire to continue conducting cooperative space projects. They recognize that in the past, cooperation has in general, been of great mutual interest to both parties.

NASA and ESA intend to continue formalizing such cooperation through either Memoranda of Understanding (MOUs) between the two agencies, the standard form of agreement for joint projects, or, for some specific major programmes, Intergovernmental Agreements between ESA Member States and the Government of the United States of America. Before a proposed MOU is concluded, it will be submitted by NASA to the U.S. Department of State, which will determine whether it constitutes an international agreement as defined by the provisions of Public law 92-403. This action is necessary because of Sec. 503 of Public law 92-426, which requires that the Secretary of State be informed and consulted before any agency of the United States Government takes any major action, primarily involving science or technology, with respect to any foreign government or international organization, and also because of Sec. 504 of that law which stipulates that the Secretary of State has primary responsibility for coordination and oversight with respect to all major science or science and technology agreements and activities between the United States and foreign countries or international organizations. NASA will notify ESA of the U.S. Department of State opinion before submission of the proposed MOU to the ESA Council.

As such international agreements have general limitations within the U.S. legal system and may have to contain, for legal or institutional reasons, specific limitations regarding their liabilities, the parties note that some degree of risk is involved in joint projects. Thus, NASA and ESA agree that, in order to alleviate the uncertainties and the risks, they will from now on apply the following guidelines:

1. In developing the type and degree of assurances to be included in a particular agreement, NASA and ESA will take into consideration the degree of risk and the importance of the project for each of the parties. The calculation of risk will include such factors as the possibility of one party losing all or a major part of its investment if the other party cannot further fulfill its commitment, the cost burden assumed by each party, the overall cost of the mission, and the time criticality of the mission. Both parties, in the process of negotiating an agreement, will undertake to provide within that agreement for a degree of assurances appropriate to the degree of risk resulting from the factors mentioned above.
- [4] 2. NASA and ESA will endeavor to inform each other of any legislative or regulatory provisions existing, or coming into force subsequent to the signing of a[n] MOU, that might limit or prevent implementation of the agreement's provisions.
3. NASA and ESA recognize the importance of timely and full consultation to the effective implementation and completion of joint projects. Consultation is particularly important when one party experiences difficulties in meeting its obligations as stated in the project agreement of its annexes, if any. NASA and ESA will, to the fullest extent practicable in such cases, consult before a decision is taken.

4. NASA and ESA will consider whether a proposed project is suited to being implemented in discrete phases which could be the subject of separate agreements. The purpose of this approach would be to permit, after conclusion of each phase, each party to review its interest in continuing with the project. It is recognized that many projects will not be amenable to this approach.
5. In the course of negotiation [of future cooperative project agreements, NASA and ESA will examine possibilities for proving assurances relative to alternative flight opportunities or developed flight hardware in the event the agreement is not able to be executed in full.

Document I-11

Document title: Burton I. Edelson, Associate Administrator, Space Science Applications, NASA, and Roger M. Bonnet, Director, Scientific Programme, ESA, "NASA/ESA Space Science Planning Meeting, ESA Head Office—27th-29th June 1983," June 29, 1983.

Source: NASA Historical Reference Collection, NASA History Office, NASA Headquarters, Washington, D.C.

By 1983, the unhappiness of the European Space Agency (ESA) had not completely disappeared with respect to the 1981 cancellation of the U.S. spacecraft intended as part of the joint NASA-ESA International Solar Polar Mission. However, the two organizations still recognized the benefits of regular consultations on their future space science plans to identify productive synergies and opportunities for collaboration. For example, the following minutes of a June 1983 meeting show that together the two agencies identified areas, such as solar terrestrial research, in which enhanced cooperation would be fruitful. They also recognized other areas, such as infrared astronomy, in which each would pursue separate missions.

[1]

NASA/ESA Space Science Planning Meeting ESA Head Office—27th-29th June 1983

At their meeting on 27th, 28th, 29th June 1983 in Paris, ESA and NASA reaffirmed the great advantage of international cooperation in space science which they consider of particular importance from the point of view of scientific, technological, political and financial considerations.

The meeting was held with the aim of reaching an in-depth understanding of the other party's goals on fundamental as well as more immediate practical issues. Three areas of cooperation were discussed in more detail:

- Infrared Astronomy
- Solar Terrestrial Research
- Planetary Exploration

Each of these areas is treated in the following sections.

1. *General Framework of Cooperation between ESA and NASA*

It was agreed during the meeting that measures should be taken to improve in the future the framework of cooperation between the two parties. Two such measures have already been identified:

- a) ESA and NASA agree to set up an international committee to advise the two parties on specific issues related to cooperation. The committee will be co-chaired by R. Bonnet from ESA and F. MacDonald from NASA and will include four American and four European senior scientists with experience in international cooperative programmes. The committee will in particular analyze the best ways of implementing the principle of reciprocity by which American participation in European programmes is applied in recognition of the US principle of opening their AOs [Announcements of Opportunity] to the non-US scientific community. The committee will report to ESA and NASA before the end of January 1984.
 - b) In order to widen their cooperation at the level of the younger scientists, the two parties agreed to formalize an exchange of fellowship programmes whereby a number of post-doctoral European fellows will each year be based in NASA centres and the same number of American fellows based in the Space Science Department of ESA/ESTEC [European Space Technology Education Centre]. The exact procedure for selection of the scientists and for reviewing their research programmes will be analyzed in detail before the next bilateral meeting.
- Action: NASA, F. MacDonald; ESA, D.E. Page

2. *Infrared Astronomy*

ESA and NASA note the technological and scientific success of IRAS [Infrared Astronomical Satellite] and reaffirm their commitment to infrared astronomy in space.

[2] They agree to continue to explore further joint effort in infrared space astronomy.

ESA notes NASA's revised plans to make SIRTf [Space Infrared Telescope Facility] a long duration, reserviceable mission operating in a Shuttle/Space Station compatible orbit, and NASA's strong interest in collaborating to develop a single major international infrared Space telescope facility.

NASA notes the firm commitment of ESA to the approved Infrared Space Observatory, ISO, which is an Ariane launched mission with an elliptical orbit.

The parties discussed the possibility for US participation in the ISO mission and European participation in the SIRTf mission by furnishing focal plane instruments and exchange of observing time. It is noted that the differences in orbit and launch vehicle restrict any major hardware collaboration between these two missions as currently defined.

It is recognised that in the post-IRAS time frame, coordination in programme planning is desirable to optimize the overall scientific return. It is therefore agreed to set up a joint study team to:

- a) analyse the objectives and anticipated performances of ISO and SIRTf to identify their complementarity;
- b) identify characteristics of focal plane instruments in both facilities which could optimise the overall performance capability of these two missions;
- c) identify elements in both programmes which could be considered as reciprocal contributions.

The joint study team will be headed by Dr. Nancy Boggess of NASA and Dr. Henk Olthof of ESA and will meet during the autumn with a preliminary report in time for the next ESA/NASA Space Science Planning Meeting.

3. *Future Solar Terrestrial Research*

The ESA/NASA representatives surveyed the large number of missions under study in the USA, Europe and Japan in the area of Solar Terrestrial physics (DISCO, SDO, SOHO, Cluster, OPEN, OPEN J, Plasma Turbulence Explorer) and agreed that a need exists for an integrated look at all these missions.

There seems to be considerable merit in considering a joint NASA/ESA/ISAS [Institute of Space and Astronautical Science of Japan] mission which would cover major parts of solar heliospheric physics of DISCO, SDO and SOHO and at the same time cover magnetospheric and interplanetary physics and thereby replace IPL of OPEN in conjunction with the utilization of an enhanced OPEN J as the EML portion of OPEN.

[3] It was agreed that NASA and ESA will set up a preparatory meeting, to which ISAS will be invited, with two or three representatives from each Agency and one or two representatives from each of the projects mentioned above. The meeting will be organized by NASA in Washington DC in late September 1983. The goal of this meeting should be to look for joint missions which can satisfy the main scientific requirements in a cost-effective way.

Following reporting to the advisory committees of the Agencies in October/November, and a further round of meetings of the preparatory committee and advisory committees in January 1984, the aim is to define missions which can go into ESA phase A and NASA studies in approximately March 1984.

4. *Planetary Exploration*

The ESA/NASA representatives reviewed the status of the plans and studies of the two Agencies in the area of planetary exploration in order to identify mutually beneficial opportunities for cooperative missions.

a) *Saturn-Titan Probe Mission*

Pending the recommendation of ESA's advisory committees, NASA and ESA agree to undertake a joint assessment study in 1984 of a Saturn-Titan probe mission for launch around 1992. This mission would call for an FY 1989 NASA new start. The mission would be based on the ESA Cassini proposal and on the Titan probe mission identified by NASA's Solar System Exploration Committee, and would take into account the recommendations of the NAS/ESF Joint Working Group.

b) *Small Bodies Rendezvous Mission*

NASA and ESA plan to undertake a joint assessment study of a small bodies rendezvous mission using a European Solar Electric Propulsion System for launch in the 1990s. The mission would be based on the ESA Agora proposal and on the Multi-Mainbelt Asteroid mission identified by NASA's Solar System Exploration Committee, and would take into account the recommendation of the NAS/ESF Joint Working Group. The organization and timing of this study will be addressed at the next NASA/ESF Space Science Planning Meeting.

c) *Mars Missions*

The Announcement of Opportunity (AO) for the NASA Mars Geoscience-Climatology Orbiter (MGCO) mission is planned for release in 1985 and, as such, is well timed for coordination with an ESA AO for a 1992 Kepler mission, if this mission is approved for launch in that year.

[4] 5. *Next Meeting*

The next ESA/NASA Space Science Planning meeting is scheduled to take place in the US in December 1983/January 1984.

Burton I. Edelson
Associate Administrator
Space Science Applications
NASA

Roger M. Bonnet
Director
Scientific Programme
ESA

Paris, 29th June 1983

[5] *List of Participants*

NASA

Burton Edelson

Charles Pellerin

Shelby Tilford

Frank MacDonald

Geff Briggs

Richard Barnes

Lyn Wigbels

ESA

Roger Bonnet

Vittorio Manno

Edgar Page

Henk Olthof

George Haskell

Gordan Whitcomb

Roger Emery

Arne Pedersen

Brian Taylor

Valerie Hood

Document I-12

Document title: George M. Low, Manager, Apollo Spacecraft Program, to Director, Apollo Spacecraft Program, "Flag for Lunar Landing Mission," January 23, 1969.

Source: NASA Historical Reference Collection, NASA History Office, NASA Headquarters, Washington, D.C.

In his January 20, 1969, Inaugural Address, Richard Nixon had suggested that "as we explore the reaches of space, let us go to the new worlds together—not as new worlds to be conquered, but as a new adventure to be shared." Unsure of the intent behind the new president's words, NASA headquarters began to think of how best to make the first lunar landing appear to be more of an international accomplishment. To those working on the Apollo program who saw the enterprise primarily in nationalistic terms, this was a troubling development. This memorandum from George Low, who had assumed personal direction of the Apollo spacecraft program after the Apollo 204 capsule fire, gives a sense of this reaction. George Hage, mentioned in the memorandum, was an official of the Apollo Program Office at NASA headquarters. The Apollo 11 mission eventually carried very lightweight flags of every country, which were returned to Earth and presented, along with a small lunar sample, to heads of state. A plaque saying "We Came in Peace for All Mankind" was attached to the lunar lander and left on the Moon.

[1]

AA /Director

January 23, 1969

In reply refer to:

PA-9-1-40

PA/Manager, Apollo Spacecraft Program

Flag for lunar landing mission

I received a call from George Hage indicating that, in light of Nixon's inaugural address, many questions are being raised in Headquarters as to how we might emphasize the international flavor of the Apollo lunar landing. Specifically, it was suggested that we

might paint a United Nations flag on the LM [Lunar Module] descent stage instead of the United States flag. My response cannot be repeated here. I feel very strongly that planting the United States flag on the moon represents a most important aspect of all of our efforts; I indicated that, from a personal point of view, I would have no objection to carrying some small United Nations flags to the moon and bringing them back for subsequent presentation to the UN (provided, of course, that they don't weigh too much).

I thought that you should be aware of these discussions since the subject will probably come up again on several occasions.

George M. Low

Document I-13

Document title: Thomas O. Paine, NASA Acting Administrator, to President Richard Nixon, February 12, 1969.

Source: Thomas O. Paine Papers, Manuscript Division, Library of Congress, Washington, D.C.

As Richard M. Nixon assumed the presidency on January 20, 1969, interest in space was at a peak. The December 1968 Apollo 8 circumlunar mission, commanded by astronaut Frank Borman, had captured the imagination of the world and cleared the way for an initial lunar landing attempt. Thomas O. Paine, who had been NASA Deputy Administrator since March 1968 and had become Acting Administrator after James E. Webb retired in November 1968, stayed on during the presidential transition. In this letter, Paine provides to the president an assessment of the space situation in Europe and of U.S.-European space relations. The Dr. DuBridge mentioned in the letter is Lee A. DuBridge, the president's science advisor.

[1]

February 12, 1969

The President
The White House
Washington, D. C.

Dear Mr. President:

Dr. DuBridge has informed me of your desire for a summary of European space activities in connection with your forthcoming visit abroad and for advice on space-related matters that might be appropriate for you to discuss with the Europeans.

Frank Borman's visits are being enthusiastically received and may serve to generate more interest in space at the time of your trip than would otherwise be the case. The Borman family is now visiting the countries on your itinerary and we have offered your staff any assistance our people in Europe may be able to give in advance work and arrangements for your trip.

The following brief review covers national and regional space activities in Europe, European cooperative activities with NASA, and suggested positions which you might take on both European and cooperative space activities. This review has been coordinated with the State Department people concerned and accords with their views.

I have also considered two suggestions for additional ways in which you might express your personal interest in space cooperation while you are in Europe. One would be through your participation in a ceremony in Rome to confirm two pending agreements. The other would be to extend personal invitations to the Chiefs of State you meet to attend the historic Apollo 11 launch now scheduled to undertake a lunar landing this summer. The Department of State feels, however, that both suggestions could create problems that might outweigh the advantages, and we concur in their view that these proposals should not be pursued without further careful consideration by State.

I - General

Although much study and discussion has taken place, the European countries have not yet defined and agreed upon their individual and joint basic policies in space. They are making limited [2] investments in national programs at a level of about \$300 million annually. They have pooled resources in two intergovernmental regional bodies: the European Space Research Organization (ESRO), and the European Launcher Development Organization (ELDO). These are maintained on a marginal basis only, however, with severe internal divisions as to purpose, structure, funding level, contract-sharing, and future direction and pace.

The countries you will visit all belong to the 65-nation communications satellite consortium, Intelsat, for which the US Comsat Corporation is manager and NASA is the launching agency on a reimbursable basis. Intelsat has made excellent progress toward a global satellite communications system, but certain quarters (particularly France) argue that the United States unduly dominates Intelsat through its technological advantages, large voting rights, designation of the US Comsat Corporation as manager, NASA's position as the only source of suitable launch vehicles, and by obtaining (competitively) the largest share of contracts for US industry. These basic issues will be the subjects of negotiating sessions beginning this month in Washington to arrive at definitive arrangements for Intelsat's future. Also at issue will be the place, if any, for domestic or regional communications satellite systems inside or outside of the Intelsat.

There has been and continues to be significant and productive cooperation between NASA on the one hand and the European national space agencies and ESRO on the other. This includes: a dozen European satellites launched or to be launched by NASA with full international data-sharing, some twenty European experiments contributed for flight on NASA satellites, dozens of joint scientific sounding rocket launchings, important support for meteorological and communications experiments, accommodation and operation of U.S. tracking and data acquisition facilities overseas, advanced information exchange programs, and joint fellowship and training programs.

Nevertheless, the European nations have still not determined whether they should rely ultimately on cooperation with the United States or should develop a completely independent capability for space operations. Near the heart of this issue is the specific question in Europe whether they should develop an independent launch capability for communications satellites, or should remain dependent upon U.S. boosters only, thereby submitting to the alleged American domination of Intelsat.

In the meantime European Space Agency-NASA cooperation proceeds very satisfactorily on the technical level and is proving most productive. It appears limited, however, to essentially small scientific satellites and one larger undertaking now nearing agreement with Germany until the above fundamental issue is resolved. Efforts on NASA's part to increase the scale of cooperation in the past several years have been [3] viewed in Europe against the background of the Intelsat issue. Thus, we have been suspected of attempting

to divert European activities toward scientific pursuits and away from "high pay-off" projects in space communications, and our offers of boosters for their satellites have been interpreted in some quarters as calculated to undermine support for ELDO's development of a European booster. In general, however, you will find a positive view of American space cooperation, and a very enthusiastic view of NASA in the wake of Astronaut Borman's highly successful Presidential good-will tour.

II - National Situations

France is the third "space power" and the only country besides the U.S. and the USSR to have launched its own satellites with its own launchers. It possesses an excellent space laboratory at Bretigny and is developing a unique equatorial-polar launch site in Guiana. Cooperation between NASA and its French counterpart (CNES) has been professional, extensive, and scientifically rewarding. The first French scientific satellite, FR-1, was launched by NASA in December 1965. Another major French satellite, EOLE, is to be launched by NASA in 1970 to determine the feasibility of a satellite-balloon system for mapping global winds systems. Of five French scientific experiments accepted for flight on NASA satellites, four have already flown.

With respect to other space relationships, France has reflected Gaullist policies, has sought to dominate both ESRO and ELDO, has led the attempt to direct both organizations toward local communications satellite objectives, and had led the most severe criticism of alleged U.S. domination of Intelsat. France is now engaged with Germany in an experimental communications satellite, Symphonie. France is the only western nation to have reached a cooperative agreement with the Soviet Union for the actual development of a scientific satellite. This was delayed by French budget cuts and by French scientists' efforts to obtain access to Soviet launch sites necessary for validating their work, and is now reported abandoned.

The United Kingdom has contributed three scientific satellites for launching by NASA, agreement has been reached on a fourth, and a fifth is under consideration. British scientists have also contributed eleven outstanding experiments selected for flight on NASA satellites (more than any other country) and have made major contributions to ESRO satellites. This is significant, since the contribution of an individual experiment for a NASA satellite may cost the contributing country perhaps \$300 thousand. Although Britain initiated ELDO in [4] 1962, it has led the current movement to scuttle the organization on grounds of excessive cost, poor reliability, and the ready availability of proven U.S. launch vehicles.

Germany was slow to initiate space activity but is now developing the largest space budget in Europe, over \$100 million annually. Two small satellites are being prepared for launching in 1970 and 1972 on NASA launch vehicles. A space probe will be launched in 1970 by another NASA launch vehicle, and an ambitious solar probe, HELIOS, is in the final stages of joint definition. This will carry German and U.S. experiments closer to the sun than has yet been done, again using a U.S. launch vehicle. Germany usually aligns itself with France on European regional space issues and has joined with France in the Symphonie communications satellite project. These projects are straining Germany's project management capability to the utmost.

Italy has focussed [sic] mainly on cooperative satellite agreements with NASA (signed in Rome by then Vice-President Johnson in 1962). Under these agreements, Italy has developed an imaginative launch complex on towable platforms moored in the Indian Ocean off Kenya.

Here, the San Marco satellite was launched by Italians using a contributed NASA booster to make unique measurements of the density of the spatial medium. A jointly-instrumented satellite will be launched here in the next cooperative effort in 1970. NASA has a new agreement pending with Italy for the launching of two U.S. spacecraft from this complex on a reimbursable basis; the platform's location on the equator permits us to use smaller boosters than would otherwise be required to achieve equatorial orbits, thereby saving NASA \$2-3 million per launch. Italy is the weakest supporter for ELDO and ESRO at the present time.

The Netherlands and Belgium maintain small but high-quality space science programs, primarily in selected university laboratories. The principal ESRO laboratory is located in Holland at Noordwijk. Dutch scientific groups have made contributions to ESRO and NASA satellites out of all proportion to their modest domestic support. Dutch scientific and industrial interests are pressing their government to propose the cooperative launching by NASA of a small but sophisticated astronomical satellite. Both Belgium and Holland possess excellent laboratory facilities in aeronautics as well as in space science. Both countries support the regional space institutions in Europe, although Belgium has tended to follow France's hostile lead with regard to Intelsat.

[5]

III - Regional Organizations

ESRO is a ten-member intergovernmental agency for the development and operation of spacecraft and sounding rockets for scientific purposes and practical applications. It spends about \$50 million a year and has developed highly professional facilities at Noordwijk in Holland, other facilities elsewhere, and a small tracking and data acquisition network. NASA has, on a cooperative basis, launched ESRO's first two scientific satellites and, on a reimbursable basis, has launched a third. NASA and ESRO have developed a sophisticated integrated data exchanged system and conduct a jointly-funding training program. The ELDO crisis and financial and contract-sharing difficulties have strained ESRO and currently limit opportunities for enlarging the scale of U.S. cooperation.

ELDO is a seven-member intergovernmental organization, spending now about \$90 million annually to develop a large European launch vehicle. England has developed the first rocket stage with U.S. technology, France the second stage, and Germany the third, while Belgium, the Netherlands and Italy are contributing ancillary systems. The Australian launch site at Woomera has been used for test launchings but the vehicle will ultimately be shifted to the French Guiana range. The three-stage ELDO launch vehicle falls between the U.S. Thor and Atlas rockets, but has yet to function successfully as a whole, though it probably will in time. Severe cost overruns and a decision by the UK to discontinue membership after 1971 have thrown ELDO into a serious crisis which jeopardizes its future as well as that of ESRO. ELDO has called on NASA only for minor assistance through visits or discussions relating to technical background and management systems. U.S. policy has supported both ESRO and ELDO as having European institutional values. Other U.S. policies, however, conflict to the extent that they restrict technical assistance which might conceivably be used to support European communications satellite capabilities inconsistent with Intelsat.

NATO. With regard to larger U.S. policy, efforts were made before the establishment of ELDO and ESRO to develop a European regional space activity based on NATO. European interests nevertheless insisted on: (1) projecting an uncompromising civilian posture in space, (2) making it possible for non-NATO nations like Switzerland and Sweden to join with others, and (3) preserving the option for an independent European space effort.

It is not yet clear whether Europe will be able to save and strengthen ELDO and ESRO, although efforts are in progress and the situation is very sensitive, particularly with regard to putative U.S. motivations [6] and European goals. European leaders have discussed an ultimate possibility that ESRO and ELDO might be merged into a single European "NASA" but plans for this purpose are not due for consideration until the end of this year.

IV - Suggested Positions During Your Trip

We anticipate that the Intelsat question would be the major space-related matter that might arise during your visit. This is a matter of central concern to the Department of State and other agencies. NASA is in complete agreement with the State Department's position that the United States should respond to questions and criticisms on Intelsat to the effect that these matters are negotiable in the Intelsat definitive negotiations beginning later this month. In particular, the French and German space commissions have jointly asked NASA whether we would launch their joint experimental communications satellite, *Symphonie*, on a reimbursable basis. With the guidance of the Department of State, we have responded positively. This was considered the best answer under the circumstances, though it was recognized that some Europeans would interpret this positive answer as designed to undercut ELDO's European launcher programs, just as they would have interpreted a negative answer as designed to monopolize satellite communication experiments by denying launching assistance in this area to European nations. We believe it important to continue to maintain as positive a posture on this point as possible.

Against this background, it would appear to us desirable if you could reassure Europeans, wherever space matters arise, that the U.S. is not seeking to impose its will on the direction of future West European space activities and that we recognize that European nations should determine their own courses based on their own assessments of where their interests lie. If U.S. cooperation can figure positively to our mutual advantage, it will indeed be available. There is a strong positive interest in NASA to further develop international cooperation in space in *both the science and applications areas*, on the basis of mutual interest.

Respectfully yours,

T. O. Paine
Acting Administrator

Document I-14

Document title: Thomas O. Paine, NASA Administrator, to the President, August 12, 1969.

Document I-15

Document title: Thomas O. Paine, NASA Administrator, to the President, November 7, 1969.

Document I-16

Document title: Thomas O. Paine, NASA Administrator, to the President, March 26, 1970.

Source: All in Thomas O. Paine Papers, Manuscript Division, Library of Congress, Washington, D.C.

These three letters record the initiatives that NASA, and particularly Administrator Thomas O. Paine, took in the aftermath of the Apollo 11 landing to increase international participation in the U.S. post-Apollo space program. Paine believed that he had a mandate directly from President Richard M. Nixon, delivered as they flew to the Apollo 11 landing (splashdown) in the Pacific Ocean, to actively seek enhanced international cooperation. Paine based his briefings to leading officials in other countries on the future plans laid out in the report of the Space Task Group, chaired by Vice President Spiro T. Agnew. As the Nixon administration made it clear in early 1970 that it did not intend to approve the program recommended by the Space Task Group and as the president's advisors raised concerns about the potential of technology transfer to other countries through cooperative space programs, the early enthusiasm about the possibility of major cooperative initiatives faded.

Document I-14

[1]

August 12, 1969

The President
The White House
Washington, D.C.

Dear Mr. President:

This is a brief status report on our current efforts and immediate plans to find new ways to increase international participation in space programs in the favorable situation generated by Apollo 11.

1. On August 12, I met with Professor Herman Bondi, Director General of the European Space Research Organization (ESRO), briefed him fully on U.S. post-Apollo thinking and urged him to begin serious consideration of new approaches to achieve more substantial European participation in the manned and unmanned exploration and utilization of major space systems in the 1970's and 1980's. European thinking with respect to space activity has been relatively restricted heretofore [because] ESRO's current annual budget is slightly over \$50 million and the European Launch Development Organization budget is slightly over \$90 million. In addition, individual national efforts total over \$160 million, for a total European space effort of something in excess of \$300 million.

Professor Bondi agreed that a series of presentations should be made by top NASA personnel to senior space officials in Europe within the next few months to raise their sights to more advanced projects of greater mutual value.

2. To initiate these presentations and to conduct more direct and private discussions with officials in the best position to respond positively, I plan to brief senior (government) officials of the European Space Conference on future U.S. programs and the concrete opportunities they will [have] for rewarding participation. I will also talk with Ministers of Science in the three principal countries but especially with Minister Stoltenberg in West Germany, which is probably in the best position to consider substantial new participation. While we cannot achieve immediate commitments of a major character from these first discussions, we do hope to gain early agreement to an arrangement which could involve the Europeans ever more closely with us and place the benefits of participation constantly in their view. To this end, I plan to propose to the leading European space agencies that they associate their top space experts with us in phased program studies which we will be undertaking for important post-Apollo missions. The knowledge and interest which we jointly develop should then open the door to more substantial [2] participation in specific projects which flow out of these studies, and which would be suitable for European attention to the opportunities which would then develop to associate their own astronauts with us in future programs in the context of substantive joint contributions to space exploration and application. This could generate greater public interest and support abroad for participation with the United States in this venture.

3. Professor Bondi's mission to the U.S. was to obtain information needed to decide whether the European Launch Development Organization should continue the costly development of an already-outmoded medium launch vehicle, duplicating those we have had for years, or should halt this work and rely on reimbursable launch services from NASA. Europeans have heretofore feared that the U.S. would not provide launchings for regional communications satellites, which has motivated them toward small independent efforts rather than major joint ventures along the lines we will be proposing. A forthcoming response to Dr. Bondi has now been obtained from the Department of State and will, we hope, remove a long-standing negative element in the environment and facilitate our discussions looking to more significant cooperation. If Europe should now decide to abandon its trouble-plagued and obsolescent launch vehicle program in favor of purchasing U.S. launchings, European funds would be freed for more constructive cooperative purposes and a modest additional dollar market would be created for our vehicles and launch services.

4. Among other promising near-term prospects for significant cooperation with Europe are a prototype North Atlantic Air Traffic Control and Navigation Satellite Program, and a Synchronous Meteorological Satellite Program. NASA would develop the former in partnership with ESRO to meet requirements defined by the Department of Transportation (FAA) and its European counterparts. The latter would be developed with the French Space Commission as a contribution to the Global Atmospheric Research Program. We are pursuing both these prospects energetically.

5. We have recently significantly extended our data exchange arrangements with ESRO to the point where they now constitute, we believe, the most extensive and sophisticated international data system in existence. ESRO uses NASA computer software systems and formats to collect the European technical literature and feed it into their own and into NASA's computer banks making possible a totally integrated space publication and search system. ESRO has also introduced the NASA Recon (Remote Control) System to Europe. An international on-line computerized aerospace information network is thus enabling researchers at a number of scattered locations in Europe and in the U.S. to

retrieve from the NASA ESRO data bank in "real time," scientific and technical information for immediate use. This is the first international system of its kind and is being studied both in Europe and this country as a model for similar [sic] systems.

6. NASA welcomes and will participate enthusiastically in the review called for by Dr. Kissinger to consider U.S. policies on space and other technology exports. This is a timely opportunity to clear away unnecessary restrictions which could seriously obstruct the increased international activity which you have called for.

[3] 7. With regard to potential cooperation with the Soviet Union, I have recently written top Soviet space authorities offering to discuss carrying Soviet scientists' experiments of future NASA planetary probes. I am now inviting Soviet scientists to attend a preparatory briefing next month for scientists from many other countries on our Viking Mars mission with a view to discussing possible participation in that mission and the achievement of some measure of cooperation between U.S. and Soviet planetary programs. Whether the Apollo 11 success will moderate past Soviet negativists in this area is not yet clear.

8. Japan, Australia, and Canada are the principal remaining areas whose potential for greater participation will be carefully explored. I believe NASA has contributed to a reasonable formulation of the new agreement with Japan to initiate that country's purchase of certain space technology here and we will play a role in providing for the implementation of the agreement. Under your recent directive, we will provide Canada launch services for her planned communications satellite system; this action has clearly improved relationships in this area, and we are already discussing with Canadian officials their active interest in possible participation in our advanced earth resources technology satellite series. I discussed yesterday with our new Ambassador to Australia the great services that have been rendered through Australian operation of our large tracking and data acquisition complex there and our strong interest in further participation. I expect to visit these three countries at the earliest opportunity for greater international cooperation in those quarters.

I will, of course, report to you the results of my forthcoming visit to Europe immediately upon my return.

Respectfully yours,

T. O. Paine
Administrator

Document I-15

[1]

Nov. 7, 1989

The President
The White House
Washington, D.C.

Dear Mr. President:

This is to report to you the results of my recent three-day visit to Europe and related actions seeking to promote greater international participation in future U.S. space programs.

1. On October 13, 14, and 15, I met with Ministers of Science and senior space program officials of the Federal Republic of Germany, France and the United Kingdom plus

the Committee of Senior Officials of the European Space Conference in Paris. I described for them the principal elements of our space program in the next decades—the reusable Space Shuttle, the multi-purpose space station, and the advanced nuclear stage—as recommended in the Space Task Group Report. I invited their careful study of these plans so that Europeans might assess the implications for their own planning and determine what interest they may have in constructive participation with us.

Our audiences were clearly impressed by the prospects for development of an economic, shuttle-based space transportation system and by the prospects for a space station as a platform for work in both practical applications and science. The Europeans appear to recognize that the shuttle and space station together clearly imply the gradual convergence of manned and unmanned flight programs and that this may well outmode their previous assumption that automated missions might suffice for Europe in the next decade.

Our fundamental objective was to stimulate Europeans to rethink their present limited space objectives, to [2] help them avoid wasting resources on obsolescent developments, and eventually to establish more considerable prospects for future international collaboration on major space projects. In these respects, I believe our visits were more successful than might have been expected in the present circumstances of very limited budgets and organizational difficulties in European space affairs. We were given to understand privately that the general reaction to our discussions was that current European space planning must indeed be thoroughly reassessed in the light of the opportunities inherent in the proposed U.S. programs. Chancellor Brandt's speech of last week called for increased cooperation in direct response to our suggestions.

2. On October 16 and 17, NASA convened in Washington a conference of industrial firms to critique concepts for the Space Shuttle and to lay our design considerations for next steps in the program to develop the shuttle. At our invitation, some 43 foreign participants and observers attended from Germany, France, the UK, Netherlands, Canada, Sweden, and Italy, as well as the European Launcher Development Organization. This event interacted most favorably with my visit to Europe, lending credibility to my statements that the U.S. would welcome broader participation in our overall programs. In turn, the broad opportunities described during the European visit provided a meaningful framework for international participation in the Space Shuttle conference. We plan to continue this pattern of activity to the extent that substantive European interest permits.

3. In the area of earth resources surveys by satellite, we have moved forward in several respects to follow through on your recent remarks to the United Nations General Assembly:

(a) An invitation was circulated to the entire UN membership to send observers to the 1969 International Symposium on Remote Sensing of the Environment, conducted at the University of Michigan last week. Some 41 foreign experts from 12 countries attended.

(b) If suitable arrangements can be made, we plan to invite the United Nations Outer Space Committee and representatives of the UN specialized agencies to inspect earth resources program work [3] and facilities at NASA's Manned Spacecraft Center in Houston at an early date.

(c) We are proceeding with several domestic universities to provide a number of graduate fellowships covering work in the earth resources disciplines; this fact will be reported to the Outer Space Affairs Group of the United Nations so that training possibilities will be generally known; and

(d) We are also moving forward with plans for an international workshop in 1970 to review the status of research and experimentation in the earth resources field for all interested nations.

4. I believe you know already of the agreement signed by NASA and an Indian counterpart agency in mid-September to make available access to a NASA satellite for an experiment in instructional TV broadcasting to 5,000 remote Indian villages, beginning in 1973. Our ability to make available a share of the time of an advanced satellite in the course of an on-going program and to suggest a programmatic framework for the experiment stimulated India to a very considerable effort which will include the construction of augmented TV village receivers, the planning of instructional programs, and the logistics system required to coordinate and support all elements of the system. Such programs have the greatest implications for benefit to the developing world and for political value to the United States as a generous source of advanced technology able to serve the interests of the LDC's.

5. I have in the past weeks written several times to President Keldysh of the Academy of Sciences of the Soviet Union. We invited him to send Soviet scientists to a briefing on our Viking Mars mission with a view to discussing possible participation in that mission as well as possibilities for coordination between American and Soviet planetary programs. Another letter assured Keldysh that NASA will welcome proposals from Soviet scientists for the analysis of lunar samples. Finally, I am forwarding to him copies of the Space Task Group [4] Report, suggesting that this may be an appropriate time for a meeting to discuss the possibilities of complementary or cooperative space programs. The exchange of astronaut/cosmonaut visits may indicate a greater receptivity on their part to such discussions.

Beyond this, I plan visits to Canada, Australia and Japan to provide the same sort of briefing and open the same opportunities to these nations as in my European visit. I shall continue to report to you as progress is made in any of the relevant areas and in particular to the extent that any substantial European interest develops.

Respectfully yours,

T. O. Paine
Administrator

Document I-16

[1]

March 26, 1970

The President
The White House

Dear Mr. President:

My recent talks in Australia and Japan completed the first round of foreign visits to discuss our space plans for the next decade and to stimulate consideration of new and more extensive international participation in the development and realization of those plans.

In Australia, I met with the Minister of Supply, his principal colleagues, and senior officials of the Department of Education and Science. A number of representatives of other agencies with interest in the practical applications of space technology participated in broader discussions. My impression is that our proposals for increased international participation in space activities will receive thoughtful consideration. Australian interest

will probably focus on future application satellite programs and the possibilities for a role in operational aspects of space station/Space Shuttle activities.

In Japan, my discussions were with the leadership of the Science and Technics Agency, the Ministries of Education, International Trade, Transport, Posts and Telecommunications, Foreign Affairs, and with Japan's space agencies. I was encouraged by evidence of top-level industrial interest in our programs. Our meetings included a full afternoon session with major corporation executives who are members of the Keidanren, the federation of Japanese industry. Japan clearly construes its interests in participation in the proposed international program in hard and practical terms. As one deputy minister stated, Japan realizes that in the future it must go beyond quality initiative work and move on to undertake new, highly creative enterprises. Participation in the proposed major space development projects for the '70s may offer Japanese industry a unique opportunity for such technical creativity.

[2] Upon my return to Washington, NASA held an important meeting on March 13 attended by 40 space officials and representatives from 17 countries and from the three regional European space organizations: the European [Space] Research Organization, the European Launcher Development Organization, and the European Space Conference. These visitors participated in a quarterly review by NASA management of contractor design and definition studies for our space station and Space Shuttle programs. The principal discussion centered on the potential of these new systems for replacing many of the space systems which had previously been proposed in their development programs for the 1970's. It seems clear that our proposed space station/Space Shuttle systems would obsolete many of their proposed developments before they became fully operational. For this reason our proposals for international participation are receiving thoughtful attention.

The stakes are high and the issues complex here, so we should expect an extended period of up to a year during which foreign governments and their space agency officials will be increasing their grasp of the technical details and potentials of our new space systems for the '70s. European circles are now giving more serious and open consideration to the possibilities for their participation (an example is the attached item from today's Christian Science Monitor). The choices are, however, difficult ones. Many in Europe believe that they must choose either an independent European space effort of a limited and retrograde character or commit to a much bolder joint program that will be dominated by the United States. We are discussing with the Department of State the kinds of assurances of access to and use of the proposed jointly developed new systems that we should be prepared to give foreign collaborators in order to win their participation.

We will continue to involve foreign space interests in government and industry more closely with us, to stimulate their interest, and to begin to formulate for their consideration more specific proposals and institutional formats for joint development work.

Respectfully yours,

T. O. Paine
Administrator

Document I-17

Document title: Secretary of State, Telegram 93721 for U.S. Ambassador, Tokyo, "Space Cooperation with Japan," January 5, 1968.

Source: Lyndon B. Johnson Library, Austin, Texas.

This telegram transmitted policy guidance to U.S. Ambassador to Japan U. Alexis Johnson regarding new initiatives in U.S.-Japanese space cooperation. Johnson had pressured his colleagues in Washington to approve firm-to-firm licensing agreements that would help Japan develop launch a capability equivalent to an early model of the U.S. Delta booster, as well as application satellite capability. NASA and the Department of Defense opposed such an arrangement, but Johnson and the Department of State prevailed. The terms and conditions suggested in this telegram were incorporated in a July 31, 1969, exchange of diplomatic notes.

[1] R 050540Z Jan 68
FM SecState WashDC
To AmEmbassy Tokyo 0000
Info CINCPAC . . .

[2] For Ambassador

Subject: Space Cooperation with Japan

Reference: Tokyo 3837

1. Agreement in November 15 communique between President Johnson and Prime Minister Sato (para 9) opens way for expanded space cooperation with Japan and we would like to initiate discussion with [the Government of Japan (GOJ)] to this end. We consider close cooperation with Japan in field of space very much in US interest. Such cooperation, first, entirely consistent with our basic relationship with Japan and national policy of closest possible partnership with Japan in both bilateral relations and joint actions to strengthen non-Communist position in east Asia. [Remainder of paragraph excised during declassification review]

2. Therefore, on basis of discussions with you here, we have developed following policy regarding space cooperation with Japan:

A. Under NSAM 338, we are prepared to cooperate in all aspects of communications satellite development and launch on the assumption that both governments will continue to act in sphere in conformity with their INTELSAT commitments.

[2] Therefore, we would approve technology transfers only after determining to our satisfaction that it would be used only in (i) purely experimental (as opposed to operational) systems or (ii) operationally domestic systems compatible with INTELSAT arrangements as they evolve. FYI—Neither Japanese nor we are in position to predict just what arrangements for satellite ownership and control other than by INTELSAT will be reflected in renegotiated INTELSAT agreements. However, President Johnson, in his message of August 14 (CA 1299, dated August 15), committed us to support continuation of INTELSAT and to avoid course of action which is incompatible with our support for a global system. Under these circumstances, it is not unreasonable to indicate to Japanese that we could not assist them if their policy is to contrary. End FYI.

B. [Paragraph excised during declassification review]

C. Only unclassified US technology is involved.

D. There must be Japanese [government] commitment on third country controls transfers [sic] of technology derived from US cooperation to Communist China and Soviet Union must be explicitly excluded. Sales or technical exchanges involving other third countries will require prior US [Government]/GOJ agreement, based on common policy for US and GOJ suppliers.

E. [Paragraph excised during declassification review]

[4] 3. Guidelines for review of applications for licenses, export of equipment or technology will be:

A. [Paragraphs A and B excised during declassification review]

C. Licenses for export of equipment or technology will be granted if equipment or technology is unclassified and related to an identified Japanese peaceful space program or objective:

and

D. We are satisfied that end-use of technology applied to communications satellites will be consistent with INTELSAT arrangements as they develop.

4. On basis above, we propose moving ahead with GOJ along following lines:

A. We anticipate space cooperation could be extended at two levels: (1) government-to-government and/or agency-level agreements in specific joint projects, including provision of reimbursable launch services and (2) industry-to-industry licensing arrangements requiring government approval under munitions control procedures and consistent with provisions of NSAM 338.

B. We are prepared [sic] to adopt positive position in all areas of peaceful space cooperation including technology, reimbursable launch services, and assistance in development of launch vehicles necessary [sic] for application satellites [sic].

C. The Japanese should understand that we take our commitment to INTELSAT seriously and would not act inconsistently with it. Therefore, we would approve technology transfers [5] only after determining to our satisfaction that it would be used only in (i) purely experimental (as opposed to operational) systems or (ii) operationally domestic systems compatible in INTELSAT arrangements as they evolve.

D. We would want an agreement with Japanese government (preferably through exchange of notes) covering two points:

(1) Technology or equipment transferred under either government-to-government agreements or industry-to-industry arrangements will be for peaceful purposes except as may be otherwise mutually agreed; and,

(2) Technology or equipment derived from US cooperation cannot be transferred under any circumstances to Communist China or the Soviet Union and can be transferred to other third countries only after mutual agreement based on common export policies.

5. We suggest you undertake appropriate discussions with GOJ. If, in your judgment, GOJ [is] sincere on end-use technology consistent with INTELSAT arrangements, we will be in position to move ahead vis-a-vis NSAM 338 on government, agency, and later on industry levels as appropriate. Action on proposals involving NSAM 294 would be undertaken following appropriate agreement as set forth [in] para 3 D above. When it becomes clear that such an arrangement is acceptable to the Japanese, we would want to undertake appropriate congressional consultation prior to formalizing agreement with the Japanese.

GP-3 Rusk

Document I-18

Document Title: Arnold W. Frutkin, NASA Assistant Administrator for International Affairs, to Administrator, "Canadian Interest in Remote Manipulator Technology to be Used with the Space Shuttle," April 3, 1972.

Source: NASA Historical Reference Collection, NASA History Office, NASA Headquarters, Washington, D.C.

After President Nixon gave his go-ahead to the Space Shuttle program on January 5, 1972, it was time to decide what contributions, if any, other countries might make to the program. While U.S.-European negotiations on this question were rather acrimonious, the discussions on a Canadian contribution proceeded relatively smoothly. This memorandum summarizes the prospects for U.S.-Canadian post-Apollo cooperation as of early 1972; a final agreement that Canada would contribute a remote manipulator system (later named "Canadarm") to the Space Transportation System was reached in 1975. NASA Administrator James Fletcher, in a handwritten note to NASA staffer Donald Morris on the first page of this memorandum, stated: "O.K. to start discussions, but let's not get as far into it as we have on the shuttle (Post-Apollo) with the Europeans. I don't want any embarrassment if we decide not to go ahead."

[1]

APR 3, 1972

Memorandum

TO: A/Administrator

FROM: I/Assistant Administrator for International Affairs

SUBJECT: Canadian interest in remote manipulator technology to be used with the Space Shuttle

The only result of the NASA offer to the Canadians on post-Apollo participation has been interest in possible development of remote manipulator equipment which might be used in the Space Shuttle to service the Large Space Telescope [LST], and possibly other orbiting spacecraft. This offer stems from a specialized Canadian capability and technology resulting from the development of extensible booms for use in space, and the particular requirements of their nuclear power reactors—which are fueled without shutting down.

Two methods are now under consideration for servicing of the Large Space Telescope. The first involves a special RAM-telescope combination which would be serviced by technicians entering the RAM from the docked Space Shuttle for film and subsystem recovery and replacement. The second involves the use of an end-effector deployed by a technician-operator from the Shuttle, and designed to detach and replace equipment packages on the Large Space Telescope. Current study activity sponsored by [the Office of Manned Space Flight] is directed to a choice between these two options sometime next summer.

The Canadian Department of Trade, Industry and Commerce would like to have a Canadian industry team assist in a Goddard-conducted interface study of the Space

Shuttle and LST, which will explore the second option described above. Their goal is to indicate sincere Canadian interest in hardware development participation, to promote better understanding in Canada of the factors which would be involved in possible Canadian participation in any subsequent development effort, and to demonstrate to NASA what they have to offer.

[2] In considering possible Canadian association in this early study phase, we have examined the following factors relevant to subsequent hardware development:

1. Remote manipulator technology related to the LST would not affect the Space Shuttle development schedule. It would involve relatively simple interfaces with the Shuttle itself. The Shuttle Program would develop the basic manipulator and the Canadians would develop the end-effector to attach to the manipulator.

2. The development of remote manipulator end-effectors is not comparable to the kinds of "bits and pieces" of the Space Shuttle central to current discussions of post-Apollo participation. Manipulator end-effectors are related more to the payloads under consideration than to the development of the Shuttle itself.

3. The Canadians have a very special capability in this field which our people feel would be of benefit to the program.

4. Canadian association in the study effort and in a subsequent development effort would not require transfer of US technology to Canada. Interface and parametric data will be provided.

5. Although the Canadians would expect us to agree to procure a certain number of production units (in the same manner we have suggested to the Europeans we would be prepared to do in the case of Sortie modules or Tugs) the ratio of development cost to production costs is reasonable. Goddard estimates that development of a manipulator to work with the LST would cost the Canadians about \$7-9 million while the cost per unit for production should be about \$2.5 million.

Both [Associate Administrator for Manned Space Flight] Dale Myers and I believe this proposed activity lies more in the area of "separable items" than in "bit and pieces" of the Shuttle and that NASA would stand to benefit from Canadian participation in development of remote manipulators if this option is chosen by [the Office of Manned Space Flight]. Therefore, unless you feel [3] differently we would propose to respond positively to the Canadian request to work with us on the current interface study on a no-commitment basis along the lines of the attached draft letter. I would, of course, discuss this with State and John Walsh before proceeding.

Arnold W. Frutkin [initialed]

Document I-19

Document title: Peter M. Flanigan, "Memorandum for John Erlichman," February 16, 1971, with attached: Clay T. Whitehead, "Memorandum for Mr. Peter Flanigan," February 6, 1971.

Source: Nixon Project, National Archives and Records Administration, Washington, D.C.

Thomas Paine, supported by the Department of State, had taken a bullish approach to expanded international space cooperation. Paine, however, was frustrated by the Nixon administration's unwillingness to approve a large post-Apollo space program, and he resigned in September 1970. Deputy Administrator George Low, who had come to Washington from Houston after the Apollo 11 mission, became Acting Administrator. Within the White House staff, Assistant to the President Peter

Flanigan had responsibility for policy oversight of NASA. His assistant, Clay T. "Tom" Whitehead, worked with Flanigan on NASA and telecommunications policy issues, even after he became the director of the newly established Office of Telecommunications Policy. This memorandum is an early indication of the split within the executive branch over the approach to be taken with respect to European involvement in the post-Apollo program. President Nixon had made it clear that he wanted increased international cooperation, but just what that meant was a subject of some debate within top policy circles.

[1]

February 16, 1971

Memorandum for John Erlichman

FROM: PETER. M. FLANIGAN

Attached is a thoughtful memorandum which I asked Tom Whitehead to prepare on NASA. One obvious use of this memorandum is to give it to the new Administrator when he comes on board (I am expecting that Jim Fletcher will take the job in about four weeks).

You will particularly note the discussion starting in the middle of page two regarding international cooperation in space. I suggest that either you or I, or both of us, talk to the President about this before we get ourselves too deeply committed. If the President is not, as I suspect, committed to the current sharing program, then I think I should immediately get George Low in and discuss with him the kind of international cooperation that is desired.

[attachment page 1]

February 6, 1971

Memorandum for Mr. Peter Flanigan

This Administration has never really faced up to where we are going in Space. NASA, with some help from the Vice President, made a try in 1969 to get the President committed to an "ever-onward-and-upward" post-Apollo program with continued budget growth into the \$6-10 billion range. We were successful in holding that off at least temporarily, but we have not developed any theme or consistency in policy. As a result, NASA is both drifting and lobbying for bigger things [parenthetical comment: "the bigger the best" correct]—without being forced to focus realistically on what it ought to be doing. They are playing the President's vaguely defined desire for international cooperation for all it's worth, and no one is effectively forcing them to put their cooperative schemes in any perspective of whether they are good or not so good, what are their side effects, and are they worth the candle. For the last two years, we have cut the NASA budget, but they manage each year to get a "compromise" of a few hundred million on their shuttle and space station plans. Is the President really going to ignore a billion or so of sunk costs and industry expectations when he gets hit for the really big money in a year or two?

I will try to be constructive by sketching out a few thoughts on the subject that might suggest what we should do about all this.

NASA is—or should be—making a transition from rapid razzle-dazzle growth and glamour to organizational maturity and more stable operation for the long term. Such a transition requires wise and agile management at the top if it is to be achieved successfully. NASA has not had that. (Tom Paine may have had the ability, but he lacked the inclination—preferring to aim for continued growth.) They have a tremendous overhead structure, far too large for any reasonable size space program, that will have to be reduced. There will be internal morale problems of obvious kinds. The bright young experts attracted by the Apollo adventure are leaving or becoming middle-aged bureaucrats with vested interests and narrow perspectives. (Remember when atomic power was a young glamour technology? Look at [the Atomic Energy Commission] now and you see what NASA could easily become.)

[2] There needs to be a sense of direction, both publicly and within NASA. The President's statement on the seventies in space laid the groundwork, but no one is following up. What do we expect of a space program? We need to define a balance of science, technology development, applications, defense, international prestige and the like; but someone will have to do that in a way that really controls the program rather than vice-versa. In particular, we need a new balance of manned and unmanned space activity, for that one dimension has big implications for everything else. We need a more sensible balance of overhead expenditures and money for actual hardware and operations; the aerospace industry could be getting a lot more business than they are, I suspect, with the same overall NASA budget if we could get into all that overhead.

NASA is aggressively pursuing European funding for their post-Apollo program. It superficially sounds like the "cooperation" the President wants, but is this what the President would really want if we really thought it through? We have not yet decided what we want our post-Apollo program to be or how fast it will go, but if NASA successfully gets a European commitment of \$1 billion, the President and the Congress will have been locked into NASA's grand plans because the political cost of renegeing would be too high. I assume the President wants space cooperation as a way of building good will and reducing international tensions. But it does not follow that all joint ventures will have that effect. INTELSAT, for example, is a fully cooperative space venture and less political than the post-Apollo effort now envisaged would be, but most would agree it has been more of a headache than a joy and has created new tensions and contentions rather than good will and constructive working relationships. [parenthetical comment: "yes!"] Finally, the U.S. trade advantage in the future will increasingly depend on our technological know-how. The kind of cooperation now being talked up will have the effect of giving away our space launch, space operations, and related know-how at 10 cents on the dollar. [parenthetical emphasis: "!!!"] It does seem to me that taking space operations out of the political realm and putting it more nearly in the commercial area would diminish international bickering and give U.S. high technology industries the advantages and opportunities they deserve; this may or may not prove fully feasible but the point is, no one in this Administration is seriously trying to find out.

[3] The key thing missing, I think, is management attention to these issues. We need a new Administrator who will turn down NASA's empire-building fervor and turn his attention to (1) sensible straightening away of internal management and (2) working with [the Office of Management and Budget] and White House to show us what broad but concrete alternative the President has that meet[s] all his various objectives. [parenthetical comment: "implying Paine was not"] In short, we need someone who will work with us rather than against us, and will seek progress toward the President's stated goals, and will shape the program to reflect credit on the President rather than embarrassment. We need a generalist who can understand dedicated technical experts rather than the opposite. But we

also need someone in the Executive Office who has the time, inclination, and authority to coordinate policy aspects. Separate handling of political, budget, technical, and international aspects of NASA planning here means that we have no effective control over the course of events because all these aspects are interrelated.

We really ought to decide if we mean to muddle through on space policy for the rest of the President's term in office or want to get serious about it.

Clay T. Whitehead [signed "Tom"]

Document I-20

Document title: Memorandum from Edward E. David, Jr., Science Advisor, for Henry Kissinger and Peter Flanigan, "Post-Apollo Space Cooperation with the Europeans," July 23, 1971, with attached: "Technology Transfer in the Post-Apollo Program" and Henry A. Kissinger, National Security Advisor, to William P. Rogers, Secretary of State, no dates.

Source: NASA Historical Reference Collection, NASA History Office, NASA Headquarters, Washington, D.C.

Document I-21

Document title: George M. Low, NASA Deputy Administrator, to NASA Administrator, "Items of Interest," August 12, 1971.

Source: James C. Fletcher Papers, Special Collections, Marriott Library, University of Utah, Salt Lake City, Utah.

These two documents give a sense of the state of discussion on post-Apollo cooperation during the summer of 1971. The president's science advisor, Edward David, was one of those in the White House trying to find a position acceptable to those holding more nationalistic views, such as Peter Flanigan, and those in the State Department and NASA's international office taking a more internationalist perspective. James Fletcher had become NASA Administrator in May 1971, and George Low, who had been Acting Administrator from the time that Thomas Paine left in September 1970 until Fletcher was sworn in May 1971, had returned to his position as Deputy Administrator. Fletcher and Low worked closely together in dealings with the White House and the Executive Office of the President and let each other know what they were doing through frequent private memoranda.

Document I-20

[1]

July 23, 1971

Memorandum for Henry Kissinger Peter Flanigan

Subject: Post-Apollo Space Cooperation with the Europeans

Background

It was agreed at our meeting with Jim Fletcher on April 23, 1971, that NASA should prepare an evaluation of (1) the degree of technology transfer to the Europeans, which would take place if the proposed U.S.-European cooperation on development of a space transportation system (STS) were to materialize; and (2) alternative subjects for U.S.-European cooperation. I have now reviewed NASA's informal paper (summary attached) and discussed the subject with Jim Fletcher, who concurs with the course of action recommended in this memorandum.

Pending further consideration of the details of the NASA analysis, and additional discussions at the technical level between the U.S. and European space groups, I am not prepared to have the U.S. commit itself to this cooperative program of STS development. Although the NASA study (concurred in by Jim Fletcher) suggests that the technology transfer question as well as management complications are not of significant proportions, my personal concerns on these points have not yet been answered to my full satisfaction, nor can they be answered until there is a better understanding of the potential European contribution. Furthermore, U.S. shuttle planning is not sufficiently definitive at present to permit any agreement on the shuttle with the Europeans in the near future. Nonetheless, I do believe that a resumption of technical-level discussions with the Europeans would be in order at this time for the purpose of more clearly defining, without any precommitment, the potential interests and contributions of both sides.

[2] It is also apparent from recent telegrams from Europe that a reply to Minister Theo Lefevre's letter to Alex Johnson of March 3, requesting a statement of the U.S. position on post-Apollo space cooperation, cannot be delayed much longer. Europe's space officials must move ahead with their own planning for the future. I believe this matter can be resolved by separating the issue into two components and addressing each separately.

The urgent question before the Europeans is whether U.S. launchers will be available at a fair price and on a non-discriminatory basis for launching European satellites. If the answer is no, the Europeans will likely proceed to develop their own EUROPA-III launch vehicle, with little or no funds left for cooperation with the U.S. in any areas; if yes, they will most probably abandon their launcher development plans, freeing funds for increased cooperation with the U.S. and/or for other space developments of their own.

The first alternative would require European expenditures of almost a billion dollars to build a launch capability which has already existed in the United States for several years. In the process, it will doubtless engender some bitterness on the part of those countries who oppose this choice on practical grounds, but would feel constrained to support it on political grounds. However, this approach will by 1976-78 provide the Europeans with a capability to launch their own geosynchronous satellites independently of U.S. views or influence.

The second alternative would perpetuate European dependence on the U.S. for launch services, would generate sales for U.S. booster manufacturing firms, and would preserve the chance for a major European input to a cooperative program with the U.S. This alternative would seem more attractive than the first for longer-range U.S. interests.

Although the availability of U.S. launchers might also enable the Europeans to compete with U.S. firms for satellite construction contracts from other countries, both the U.S. aerospace industry and I believe that this would not be a significant commercial threat, in view of our vastly superiority [sic] satellite technology.

[3] *Recommendation*

Accordingly, I propose that we separate the two elements of launch assurances and space cooperation and that State be advised to proceed along the lines of the attached draft letter to Bill Rogers. If you are in agreement, I believe this course of action provides a satisfactory exit from the present impasse.

Edward E. David, Jr.
Science Advisor

Attachments

[Attachment page 1]

Technology Transfer in the Post-Apollo Program

As background for a decision on the course of action to be pursued in defining a mutually acceptable set of tasks for European participation in the post-Apollo space program, NASA was asked to examine the implications of cooperation in Space Shuttle development, particularly from the standpoint of technology transfer. The detailed report on this effort is attached.

One conclusion of the NASA study was that development of specific components of the shuttle, such as the vertical tail or elements of the attitude control system by the Europeans could provide technology benefits to both the United States and Europe, and that the transfer of critical technology to Europe would be a relatively small percentage of the program value. European development of the space tug might entail a broader range of technology transfer, but would be amenable to some controls. Other potential cooperative projects in the Post-Apollo Program such as payload modules would generally fall between these two cases. European cooperation in payload development could vary from zero transfer to modest transfer, depending on the policies we choose to follow in selecting and approving proposals.

In general, it has been understood that the major thrust of our international post-Apollo effort is to obtain foreign contributions primarily through the exercise of *foreign* capabilities and not through utilization of U.S. technology transferred abroad for that purpose. It is already widely understood abroad that NASA means to accept foreign participation only in those tasks for which Europe has an existing or potential capability and that this capability must be *validated* by joint teams from NASA, NASA's contractors, and the foreign governments concerned. If we could determine in some cases that it is in our own interest to provide certain elements of a task in order to make possible larger foreign contribution, we will still retain an option to provide those elements either *as technology* or, if they are particularly sensitive in character, on a "black-box" or end-product basis.

[2] It was judged that the transfer of management knowhow and systems engineering capability that would occur as a byproduct of European participation with the U.S. in a large-scale development such as the shuttle would be one of the principal objectives of such European participation. The significance of the transfer that might take place is open to question, and future implications are difficult to assess.

In the longer term, the impact of transfer of technology or management expertise will depend more upon the degree to which these elements can be transferred to other activities in the commercial sector, than upon their direct application to advanced space systems. It has been our experience that transfer of aerospace technical capabilities to other commercial areas has not been an easy or very successful process.

At the present time, direct commercial benefits from use of space systems have been restricted to communications satellites operated by the Intelsat Consortium. European contractors are playing an increasing role in supplying subsystems, satellites and ground elements of the Intelsat system. In the future, there may be additional space-based systems that provide income to the supplier from sale of satellites and services in areas such as navigation, traffic control, mobile communications, pollution monitoring, earth resources and crop surveys, and an increase in technical sophistication in European industry would enable a greater degree of competition with potential U.S. suppliers. In a meeting with U.S. aerospace industry managers, it was quite apparent that they are not concerned about being unable to compete for such contracts with European firms, as a result of cooperation on post-Apollo or the technology transfer which might ensue.

Furthermore, it is characteristic that the service provided by a space system is international in nature, requiring agreements and cooperation between nations if the potential benefits are to be realized. In the future, therefore, the U.S. is likely to depend upon the ties that can be developed with other nations in order to insure a role for U.S. industry and U.S. interests in service provided by space systems. It would be preferable to develop cooperative programs that foster these ties, rather than to force nations to develop capabilities that permit decisions independent of the U.S. Similarly, in a commercial sense, it is likely to be of greater value to involve many nations in cooperative systems with shared contracting than to see separate systems developed that may isolate the U.S.

[3] The previous record of major cooperative development programs, such as Skybolt, the Main Battle Tank, US/FRG fighter aircraft, and Concorde, have left some doubt whether such programs foster closer ties between the participants or act as an irritant which limits full development of cooperative relationships. The record of cooperative space projects conducted by NASA, on the other hand, has been excellent and provides an indication of those characteristics which produce favorable results from cooperative enterprises. They are in part:

- (1) Mutual interest and mutual benefits.
- (2) Financial contributions by both partners—usually no transfer of funds.
- (3) Clearly defined interfaces and objectives.
- (4) Capability for performance of agreed tasks can be assured.

While the scale of potential European participation in the shuttle program is much larger than previous programs, it appears possible to define tasks that meet these criteria.

One of the principal European contributions to the Space Shuttle program could be development of the Space Tug. This propulsion module would represent a major technological and economic challenge to Europe, and would fit the above criteria—particularly the ability to define interfaces and objectives clearly, since there would be minimum impact on design characteristics of the respective systems, as a result of changes within each element. The U.S. will be required to have some technical involvement in the development of the Tug, and in general, some technology support would be required for both

the propulsion and avionics modules, as well as in total systems engineering. As the program develops, some additional technology may be required to alleviate unanticipated problems which arise.

In the future, it is expected that there will be sustained production of the Space Tug and that it will be used for both DOD and NASA missions. This would imply dependence upon a European supplier, or alternatively development of an independent U.S. production capability, perhaps on a license basis.

[4] A similar, highly separable component of the shuttle system that would be an attractive candidate for European development is a Research and Applications Module that would be used as the payload of a shuttle orbiter, providing a structure for observing instruments and other experiments, either manned or man-attended. In addition, European technology appears adequate to support design and construction of major structural elements of the shuttle such as wing and tail surfaces and the thrusters for the auxiliary propulsion and control system.

Alternatives to major participation in shuttle system development are limited, particularly in view of the unique scope, challenge, and economic implication of the shuttle program; the narrow focus of European space interests; the degree to which the U.S. is considered abroad to be committed to welcoming post-Apollo participation; and the wide range of existing international space programs and overtures by the U.S. None of the alternative cooperative ventures that have been developed appear to be acceptable, either individually or collectively, as replacements for shuttle participation. They may be pursued, however, on their own merits. If the U.S. should withdraw from the Shuttle program or decide to pursue it unilaterally, discussions of possible other projects would certainly continue.

A final question concerns launch assurance. It is generally understood that Europe desires assured access to U.S. launchers on a fee basis if she is to give up the development of her own launch vehicles so as to free funds for contribution to post-Apollo tasks. The response which the U.S. gave last September on this question was widely regarded as satisfactory in Europe but has since been reversed in part and become confused.

A restatement of the U.S. policy regarding provision of launch services, valid for all nations, is being developed through the interagency committee on space cooperation established under NSSM 72, and, if approved, should reduce European concerns about launch assurances and separate this issue from the question of post-Apollo cooperation. The proposed policy statement would have the effect of assuring availability of launch services for payloads that are for peaceful purposes and are consistent with international agreements.

[Attachment page 1]

Dear Bill:

Uncertainties in U.S. domestic shuttle planning and a need for additional review of the problems of technology transfer and management complications in undertaking a joint program of space transportation system (STS) development with the Europeans have delayed this reply to your letter to the President of March 23.

Although that review is not yet complete, the President feels it is now possible to develop a reply to Minister Lefevre and the European Space Conference (ESC) and to resume a dialogue with the Europeans; however, in a way that does not condition U.S. launch

assurances for European payloads upon substantial European participation in a joint STS program, but treats each of these two matters separately.

A first priority would be to prepare a position for discussion with the Europeans, indicating U.S. willingness to provide launch assurances for foreign satellites of a peaceful nature. Language acceptable to the Europeans, but recognizing overall U.S. obligations to Intelsat, should be sought for such assurances.

[2]. However, one possible formulation which would be acceptable to the President, if such a degree of assurance is necessary to avoid European charges that the U.S. seeks to retain a veto over their space plans, would provide for launch services by the U.S. of foreign systems approved under Article 14 of the definitive arrangements of Intelsat; and would permit sale of the necessary launch vehicle for "unapproved" systems, leaving to the launching nation the interpretation of its obligations under Article 14.

Renewed discussions with the ESC about post-Apollo cooperation should be undertaken at the technical working level. Their purpose would be to seek to define a possible cooperative relationship between Europe and the U.S. in a program of STS development, with full understanding that no commitment on either side is expected or assured until the results of these discussions have been referred to the involved governments for review and final decision. Although no cooperative programs have been discussed in the present context with the Europeans to compare in magnitude with STS development, it will be useful in the course of these talks to keep in mind the full range [3] of potential cooperative opportunities, in the eventuality that a satisfactory agreement is not reached on the STS program and assuming that the Europeans do respond to the offer of U.S. launch assurances by abandoning EUROPA-III.

The President hopes that this course of action will address the pressing European concern regarding launcher availability, will permit a continued dialogue with the Europeans directed toward mutually beneficial space cooperation with full protection of U.S. interests, and will avoid locking the U.S. prematurely into a commitment or schedule for the STS.

Sincerely,

Henry A. Kissinger

Honorable William P. Rogers
Secretary of State
Washington, D.C. 20520
