Chapter 2

The International Environment

Chapter 2

The International Environment

INTRODUCTION

From August 9 to 21, 1982, 94 nations met in Vienna, Austria at the U.N. Conference on the Exploration and Peaceful Uses of Outer Space UNISPACE '82) to discuss the state of space technology and its future use for the countries of the world, particularly the developing countries. UNISPACE '82, the second such conference ever held, offered the attending delegations an opportunity to see exhibits illustrating the uses of space echnology, and discuss the potential benefits it holds for their countries. It also constituted a orum to raise for general discusson some of the 'rucial international political, social, and economic questions that the use of space technology engenders.

For the United States, UNISPACE '82 offered an opportunity to demonstrate its mastery of space technology, explain its interests, and influence other countries while gaining insight into their interests and concerns. How did the United States respond to the challenge presented by UNISPACE '82? What is the importance of the conference to the future exploitation of outer space? Will positions taken or stated at this conference affect other international conferences deal-

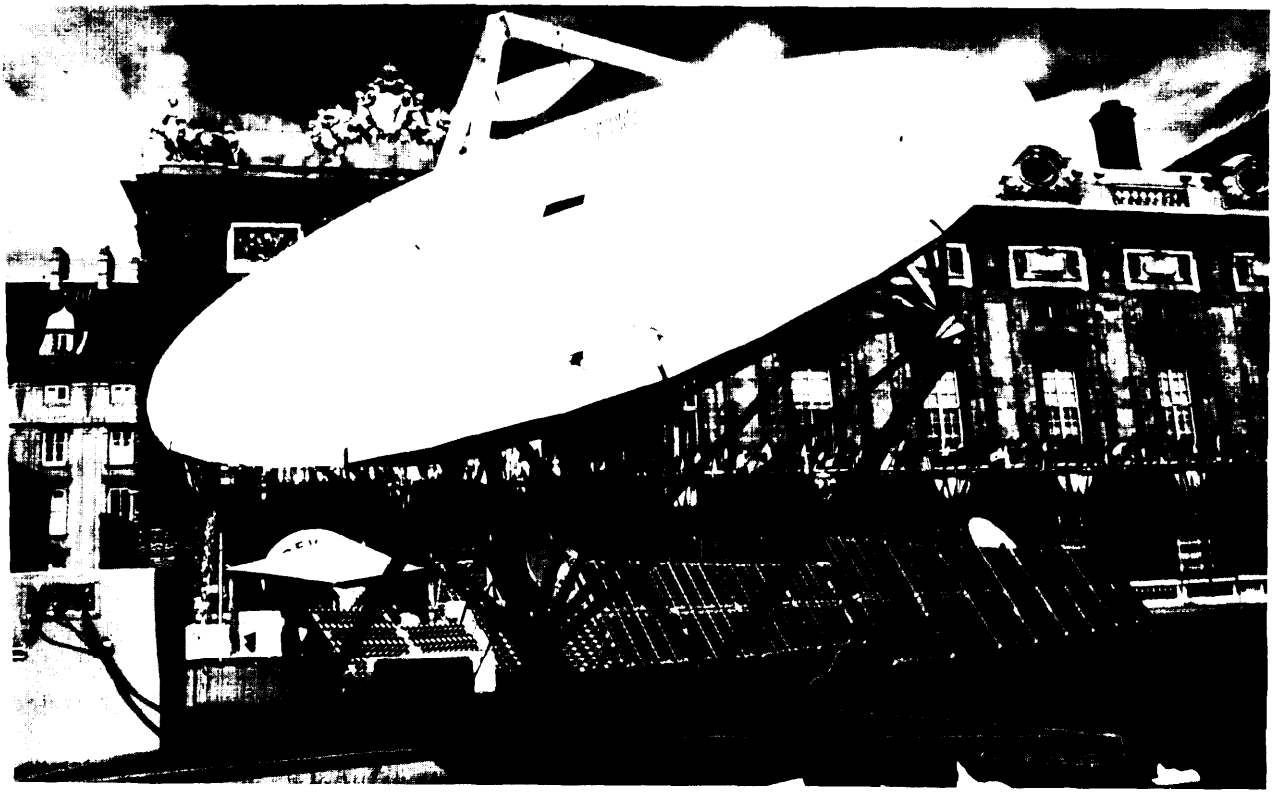


Photo credit International Telecommunication Vn)on

iolar. Powered Earth Station — A key to effective rural communications systems is smal 1, low-cost Earth stat i ons. One sol ut ion /hic h IS being explored by the U.S. Rural Satellite Program is the use of solar panels to power satellite ground stations, Pictured here is a prototype system that was demonstrated in Vienna at UN ISPACE '82

ing with science and technology? How can the United States make the best use of the lessons of UNISPACE '82 to enhance its commerce with other countries?

It is within the context of these questions that the Office of Technology Assessment (OTA) prepared this technical memorandum; it was requested by the Committee on Science and Technology of the U.S. House of Representatives and the Joint Economic Committee. The memorandum is part of a forthcoming major assessment of international cooperation and competition in civilian space activities that was requested by these same committees.

UNISPACE '82 illustrated the fact that we now accept access to, and the use of, space technologies as relatively routine. In the 25 years since the Soviet Union and the United States began the space age, several additional countries have created vital, expanding space programs. Some 150 countries are now direct or indirect users of commercial space systems. This is a major change in the context of the use of outer space since the first conference on the Exploration Peaceful Uses of Outer Space and was held in 1968. While the primary focus of UNISPACE '82 was to consider the present and future state of space science, space technology, applications for economic and social development, and cooperative programs, competition by nations for commercial markets and/or political prestige played an important role at both the conference and in the preparations countries made for it.

The lessons of UNISPACE '82 are of particular interest for the United States. As an OTA report on the 1979 World Administrative Radio Conference (WARC '79)[1] stated: "it is highly unlikely that traditional U.S. approaches to these issues (radiofrequency spectrum management in an international forum) will be sufficient to protect U.S. vital interests in the future. " This report could make the same statement.

The issues that surfaced in connection with UNISPACE '82 are increasingly evident at other multinational technological conferences. UNISPACE '82 corroborated that significant long-term political trends in communication and space technologies are developing which are inconsistent with presently articulated U.S. interests. The United States must find the means to participate more effectively at similar technological conferences. Not to do so will leave it increasingly isolated from the rest of the world body politic.

In order to collect the data for this report, OTA staff attended the March/April meetings of the Committee on the Peaceful Uses of Outer Spac~ (cOpUOS), and the August meeting of UNISPACE '82 itself. It also interviewed more than 75 expert: on some facet or other of the issues raised b} UNISPACE '82. These included U.S. Governmen officials, representatives of the aerospace anc communications industry, members of foreigr governments, and other private citizens. In ad dition, 70 people from other countries were pollef on their views of UNISPACE '82. Additional in formation was supplied by contractors and by , workshop on UNISPACE '82 held at OTA, No vember 30, 1982.

Although planned as a scientific and technicz conference, UNISPACE '82 also provided the OF portunity for nations to examine the politica" economic, regulatory, and military aspects c space technology, In order to understand mor clearly the issues and the conflicts that arose dul ing the conference, it is useful to examine the ir ternational environment in which UNISPACE 8~ took place.

[1] *Radio frequency Use and Management Impacts From the World Administrative Radio Conference of* **1979** (Washington, D. C.: U.S. Congress, Office of Technology Assessment, January 1982), OTA-**CIT-163, p. 4.**

SPACE APPLICATIONS TECHNOLOGY AND THE INTERNATIONAL COMMUNITY

Since the inception of spaceflight 25 years ago there have been only two full-scale space powers, the United States and the Soviet Union. Each has developed and maintained large and varied pr grams for civilian and military uses of outer spac However, during the last decade additional cou

tries have started their own space programs and others have begun to rely more on space-based services:

- **France and Japan,** have expanding national programs that include space transportation, communications, remote sensing, meteorology, and space science systems. Much French research on space has been conducted within the European Space Agency (ESA).
- **Canada, Great Britain, and West Germany, and other European countries have individual programs and also contribute to bilateral and multilateral ventures.** Except for Canada, these are carried out primarily through the ESA.
- **India, Brazil, and China,** newly industrializing countries, have relatively advanced space programs that aim to generate a variety of indigenous space industries and services.
- **A growing number of countries and regional associations** have, or plan, satellite communications systems; these include Indonesia (Palapa A&B), India (Insat), the Middle East (Arabsat), Brazil (Brasilsat), Mexico (Ilhuicahau), Australia (Australsat), and Colombia (Satcol).
- Many industrialized and developing **countries that use space technologies,** primarily through the International Telecommunications Satellite System (INTELSAT); the International Maritime Satellite system (INMARSAT); the Intersputnik network (a Soviet-based communications satellite system); the U.S. Landsat (for land optical sensing); and the U.S. and other meteorological satellites.

~pace technology has come to play an increas-~gly important role in the domestic and internaonal technology policy decisions of countries. ethnologically advanced nations have become ~er more dependent on space technology to itisfy their domestic and international communication and information gathering needs. ~ace technology may contribute to domestic "osperity and a favorable balance of trade. Therefore, some less-developed countries view space technology as one means to accelerate their development.

Because the development and use of space technology is a long-term, expensive, and often international undertaking, governments have traditionally been the driver behind the evolution and growth of most space technology. This preeminent government role, combined with the political sensitivity of technologies that by their nature transcend national boundaries, has made the use of space technology the subject of continued international scrutiny. It has, therefore, become increasingly difficult to discuss space technology without discussing political issues.

The importance which nations attach to space systems and services challenges the commercial, diplomatic, and technical skills of the United States. The United States must define how it will respond to new international competition in space services heretofore only offered by the United States.[2]

New challenges in international cooperation also exist. The desire for economic growth and technological independence has prompted the less developed nations to apply pressure on the industrialized states to provide space services and hardware on a fully equitable basis and to institutionalize the means of transfer of this technology within the U.N. system. The major questions posed for the United States are:

- How far should it go to accommodate such demands?
- What advantages are there to doing so?
- What institutional mechanisms (eg., bilateral v. multilateral agreements) can best accommodate both the long-term needs of the United States and those of the less developed nations?

[2] *Civilian Space Policy and Applications* (Washington, DC.: U.S. Congress, Office of Technology Assessment, June **1982),** OTA-STI-177.

U.S. SPACE TECHNOLOGY AND INTERNATIONAL COMPETITION

As virtually the only supplier of space technology, the United States until recently benefited from the space programs of other nations because they constituted an excellent market for U.S. goods and services. Now, even though the overall market is increasing, other countries with mature space programs compete with us in selling satellite communication systems and services and launching services. They will soon compete in selling remotely sensed data from space and in manufacturing in space. Foreign competition threatens the United States with the loss of significant revenue opportunities as well as with potential loss of prestige and political influence.[3]

Satellite Communications.—By far the most developed and commercialized of all space technologies, satellite communications technology was developed in the early 1960's by the National Aeronautics and Space Administration (NASA), the military, and private companies. The creation of INTELSAT in 1964 made satellite communications available to the world and fostered the development of the U.S. satellite industry. (Through COMSAT and other private companies, satellites have come to play a central role in domestic communications as well.)

The future global demand for satellite communication services appears strong. At home, the market for voice, data, and video transmission is growing rapidly, and the advent of direct-broadcast satellite (DBS) systems, recently approved by the Federal Communications Commission for domestic service, will contribute to this growth. Internationally, both developed and developing countries appear eager to make greater use of satellites for regional and domestic communications, But failure of the United States to maintain its technological lead could prevent U.S. industry from capitalizing fully on these opportunities.[4] In *1973,* the White House directed NASA to phase out its advanced satellite communications research program. By 1977, the communications industry, prompted by foreign competition, was urging NASA to resume research in advanced communications techniques. Upon congressional approval, NASA reinstituted a limited program in 1978.

One reason for pursuing advanced communications research is the future need to use higher frequencies, such as *30/20* GHz (Ka band), for commercial purposes. While U.S. firms have maintained consistently that the technology is too complex and costly for them to afford, European and Japanese industries, with subsidies from their governments, are already developing *30/20* GHz systems. The virtual certainty that foreign systems will be used in this decade[5] has occasioned debate about whether NASA should undertake a large 30/20 GHz technology research and development (R&D) program, including flight-testing of the hardware. Proponents of a NASA program point out that if the technology is not developed in the United States, U.S. firms will lose an important market as well as their strong lead in communications technology.

Land Remote Sensing by Satellite.—Since 1972 the United States has had the world's only globa civilian remote-sensing system. At present how ever, it is uncertain whether the United States wil have a civilian land remote-sensing capabilit: after Landsat 5 terminates in the late 1980's. For eign and domestic users of the Landsat system have expressed concern about the continuity c data from Landsat. It is essential to them that the data flow be continuous and that any price in creases to be predictable and incremental,

There are political, technical, budgetary, an institutional problems in Landsat planning. Be cause Landsat 4 carries new and untried sense] as well as proven ones, one cannot yet be certain that it will provide acceptable operational service The French, Japanese, and the ESA, on the other hand, plan satellite systems that are express] designed for commercial operation. Althoug complete success of these systems is not assuret these systems will use less expensive and mo reliable multispectral linear array (MLA) sense

[3] Ibid.
[4] Ibid.
[5] *Aerospace Daily,* Feb. **7, 1983, p. 1, Japan launched its** comm nications **satellite CS-2A on** Feb. **4, 1983. It carries four 30/20 G] transponders** for commercial use.

technology, which the United States does not currently plan to use for civilian systems. * The most advanced foreign system is the French Systeme Probetoire Observationale Terrestrial (SPOT), scheduled for launch in 1984; the French have already begun to market future SPOT data products through a semiprivate firm, Spotimage.

Space Transportation.—Despite the technological triumph of the space shuttle, need for commercial and Government launch services is likely to exceed the shuttle's availability. If the United States has no expendable vehicles ready to launch commercial satellites at competitive prices, then the private sector, and perhaps Government agencies as well, will be forced to purchase launch services from the Europeans.

The emergence of foreign competition against U.S. launch services is a major change from the past and a competitive challenge for the future, Developed by ESA, the Ariane expendable launcher is being marketed by a French-incorporated company called Arianespace. Several U.S. companies have already announced plans to launch on Ariane rather than on the shuttle. The Japanese now launch their own satellites by means of Delta-class launchers, which they construct under agreements with the U.S. firms that originally produced the rockets. The Soviets and the Chinese also launch their own satellites. The Soviets have offered to place satellites of certain other countries in orbit. Thus, although the market for launch services is growing, foreign launch capability is also growing rapidly.

Materials Processing in Space (MPS).—The commercial prospects for producing new or refined products in space, such as pharmaceuticals and metal alloys, are uncertain. To date onIy one company, McDonnell-Douglas Astronautical Co., has committed itself to a long-term commercial space manufacturing project, The central issues here are the degree and kind of government incentives available to firms that wish to consider MPS. ' Such incentives can include conducting generic and publicly available R&D on the shuttle or the European-built spacelab, or specific agreements to share the costs and results of MPS efforts. At present, NASA has instituted the Joint-Endeavor Agreement and related arrangements in an effort to stimulate industry's interest in MPS. Several other countries, including Japan and West Germany, have well-developed materials science programs that include ground-based research and eventual plans to use the European-developed spacelab for government-funded experiments.

*Landsat 4 sensors, the multispectral scanner (MSS) and thematic mapper (TM) are semimechanical and are therefore subject to mechanical failure and jitter problems. Multispectral linear array sensors require no mechanical devices.

[6] *Civilian Space Policy and Applications*, op, cit,

U.S. SPACE TECHNOLOGY AND INTERNATIONAL COOPERATION

International cooperation has been a central element of the U.S. civilian space program since its nception (see app. B), According to the National Aeronautics and Space Act of 1958, space activties should: "be devoted to peaceful purposes for he benefit of all mankind." Further, the U.S. will engage in "cooperation . . . with other nations and groups of nations, "

In the past *25* years, the United States has engaged in hundreds of bilateral and multilateral operative ventures in every area of space technology. U.S. launchers have orbited complete satillites and instrument payloads for dozens of countries. In 1963, the United States took the lead in establishing INTELSAT and providing satellite communications around the world, U.S. meteorological satellites have been used for global weather coverage since the early 1960's, and the Landsat Earth remote-sensing system has been in operation since 1972 under a policy whereby the United States has sold imagery to any country for little more than the price of reproduction. NASA and the Agency for International Development have cooperated in giving developing countries valuable training in the use of Landsat data, as well as in using satellite communications to deliver programs to rural areas. The Applications Technology Satellite series of experimental DBS was used in the mid-1970's to carry out several impor-

18-780 O - 83 - 4

tant studies in India and South America. The National Oceanographic and Atmospheric Administration (NOAA) has cooperated with other countries and with the World Meteorological Organization (wMO) in supplying weather data from satellites free of charge.

More recently, the United States has engaged in a major cooperative project with ESA and Canada to develop the Space Transportation System (STS). In return for access to the space shuttle, ESA has produced Spacelab and the Canadians the Shuttle Remote Manipulator Arm (an essential component of the shuttle's ability to release and retrieve satellites in orbit).

In manned spaceflight, the United States and the Soviet Union cooperated in several projects during the *1970's,* culminating in the 1975 Apollo-Soyuz Test Project. In one of the most dramatic symbols of detente, a U.S. Apollo spacecraft docked in orbit with a Soviet Soyuz.

Not all U.S. cooperative ventures have been entirely successful, though. In the early 1970's, the United States made a proposal to the Europeans for the development of **a** Space Tug; it was later withdrawn for economic and political reasons. In particular, the Air Force did not want the United States to depend on a foreign consortium for a

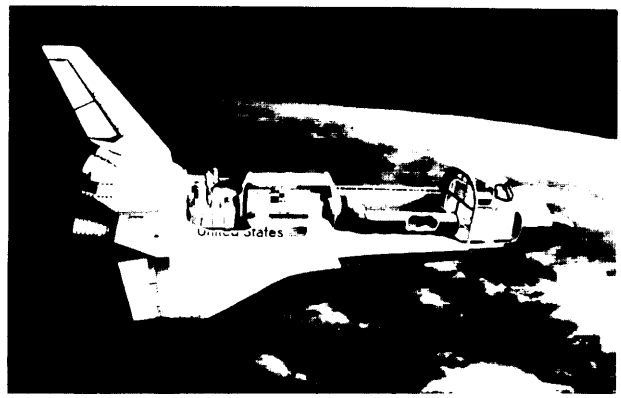


Photo credit: National Aeronautics and Space Administratloc

Artist's conception of Spacelab in the cargo bay of the orbiting space shuttle

major part of STS. Another difficult venture was the International Solar Polar Mission (ISPM), a dual-spacecraft scientific project being conducted jointly with ESA. For budgetary reasons, the United States withdrew its satellite from the mission in 1981. These setbacks have made some European countries highly skeptical of the U.S. ability to stick to long-term commitments. Cooperation with the Soviet Union has been subjecl to the ups and downs of East-West relations, anc most cooperative projects have recently been can celled.

THE INTERNATIONAL REGIME FOR OUTER SPACE

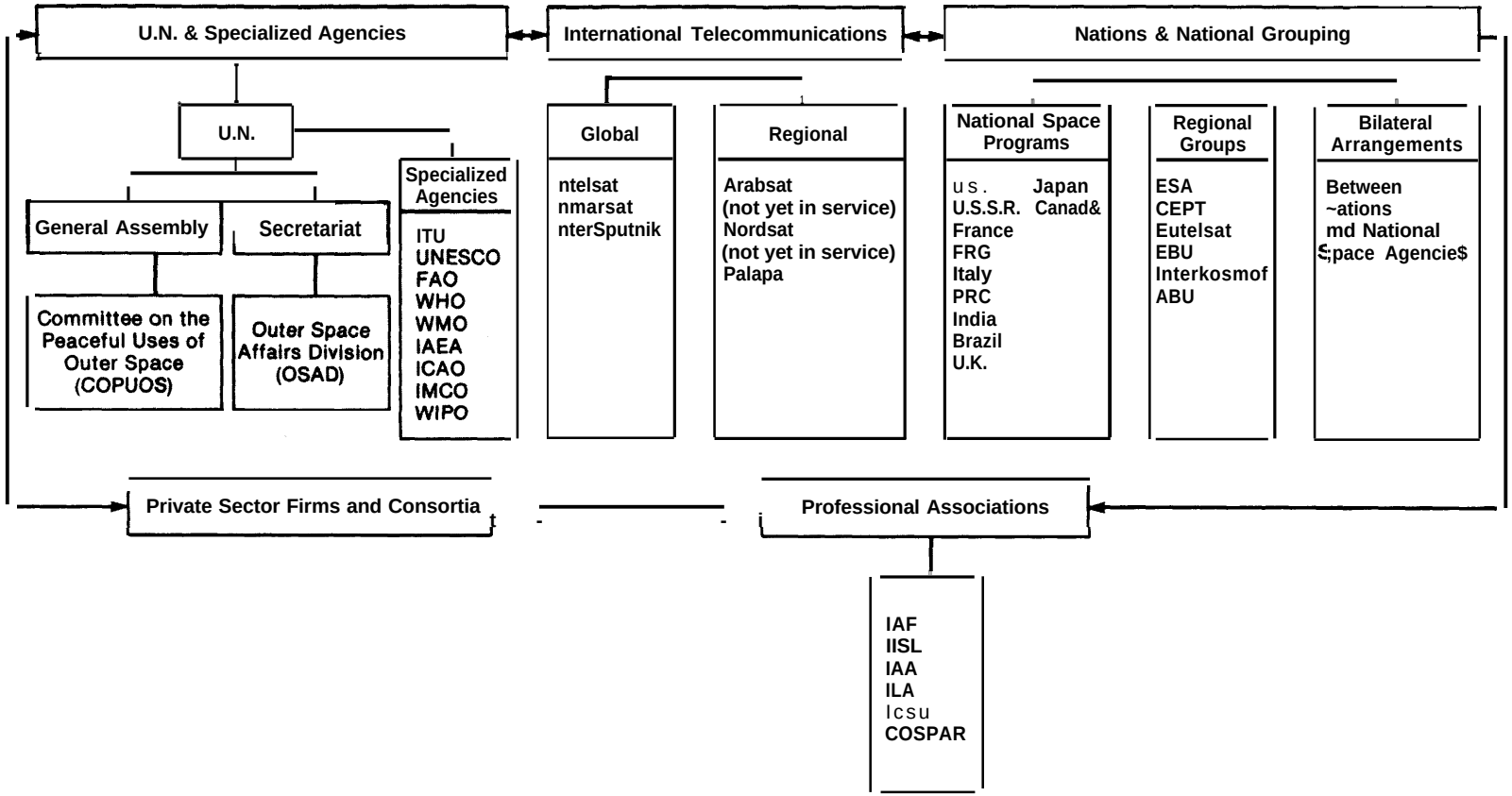
International regulation and coordination of states' activities are supposed to protect common interests and to ensure that special interests are dealt with in a common framework. Given the ever larger number of nations that use or produce space technology, the United States is increasingly affected by decisions taken in other nations and in international organizations (see fig. 1).

The United States is a member of the following international organizations which order and regulate the use of space:

United Nations Committee on the Peaceful uses of Outer Space.—COPUOS was established in 1959 with an initial membership of 24 countries, which was expanded to 28 in 1961, 37 in 1973, and 54 today (see table 1). Within COPUOS, decisions are made by consensus, rather than by ma jority vote. COPUOS is serviced by the U.N Outer Space Affairs Division, which is part of th U.N. Secretariat and has a small permanent staf (see fig. 2). It has a legal subcommittee and scientific and technical subcommittee, The leg: subcommittee is the primary locus for the discu: sion of legal principles concerning outer space an development of space treaties. It has formulate five major treaties, for most of which the Unite States played a leading drafting and negotiating role:

- Treaty on Principles Governing the Activiti~ of States in the Exploration and Use of Out~ Space, Including the Moon and Other Cele tial Bodies (1967).

Figurel .—Patterns of Global Outer Space Activities



SOURCE Office of Technology Assessment

Table 1.–Current Membership of COPUOST

Albania	Kenya
Argentina	Lebanon
Australia	Mexico
Austria	Mongolia
Belgium	*Morocco*
Benin	Netherlands
Brazil	Niger
Bulgeria	Nigeria
Canada	Pakistan
Chad	Philippines
Chile	*Poland*
China*	*Romania*
Columbia	*Sierra Leone*
Czechoslovakia	Spain
Ecuador	Sudan
Egypt	*Sweden*
Federal Republic of Germany	Syria
France	*United Kingdom*
German Democratic Republic	United Republic of Cameroon
Greece	*United States* •
Hungary	Upper Volta
India •	Uraguay
Indonesia	U.S. S. *R.* "
Iran	Venezuela
Iraq	Vietnam
Italy	Yugoslavia
Japan •	

NOTE: **Italics indicate** COPUOS membership 1961-73, Asterisk indicates inde. pendent launch capability,
tGreece and Turkey, Spain and Portugal, alternate membership every 3 years.
SOURCE" Office of Technology Assessment.

- Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (1968).
- Convention on International Liability for Damage Caused by Space Objects (1972).
- Convention on Registration of Objects Launched into Outer Space (1974).
- Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (Moon Treaty) (1979).

With the exception of the 1979 Moon Treaty, the United States has signed and ratified each of these international agreements. COPUOS served as the preparatory committee for the first conference on the Exploration and Peaceful Uses of Outer Space in 1968, and UNISPACE '82; it was the major forum for debate over the UNISPACE '82 conference report prior to the conference.

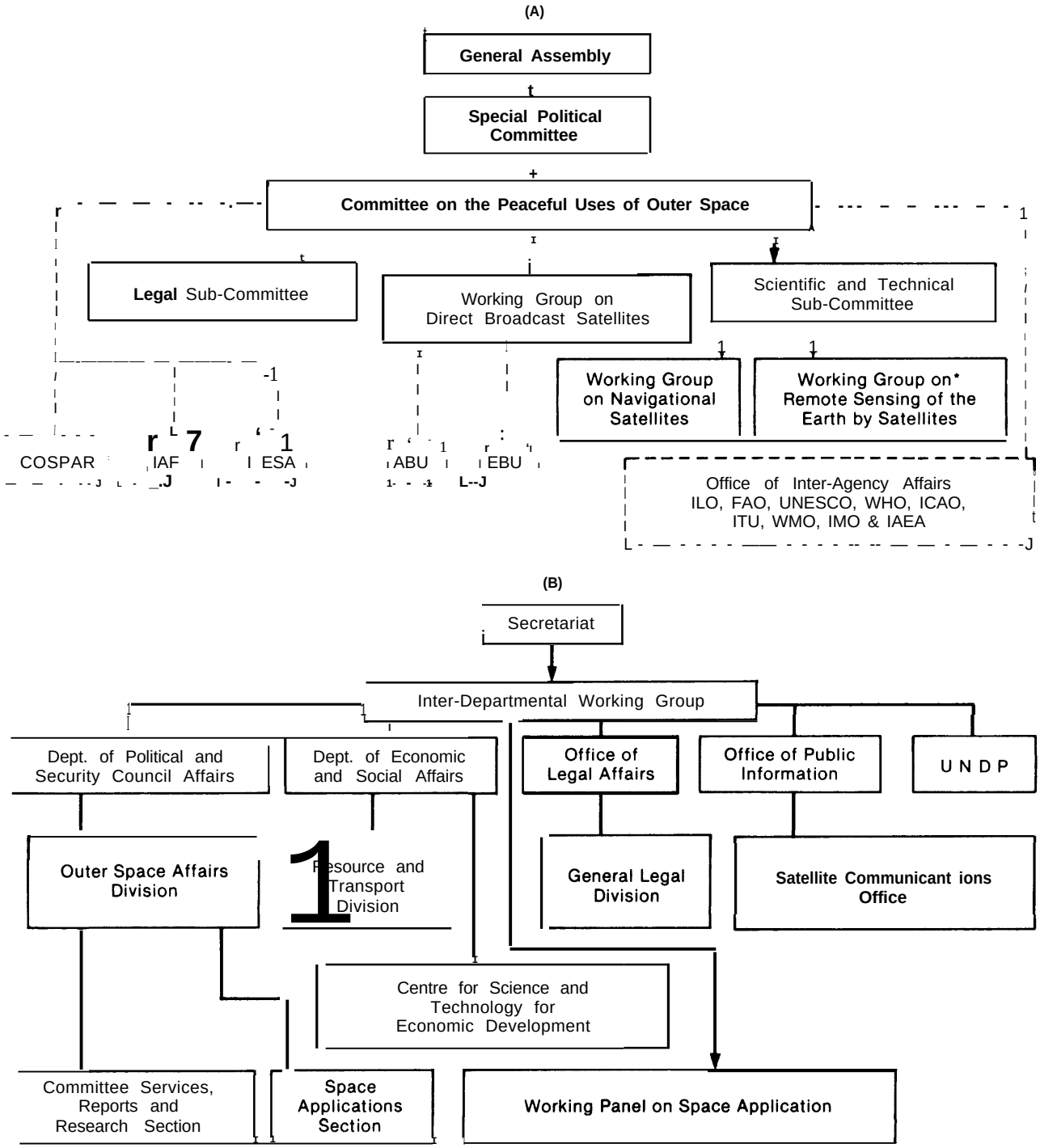
International Telecommunication Union.—A specialized agency of the U. N., the ITU is an international intergovernmental organization with 157 members that coordinates and regulates international communications. Its primary task is to allocate frequencies to the various radio services and to register the specific operational assignments. Inherent in the registration process for space radio services is the coordination of the positioning of satellites in the geostationary orbit. The ITU'S allocation of the spectrum to particular types of users (e.g., to space services), is done by periodic World and Regional Administrative Radio Conferences (WARCS and RARCS). The last WARC was held in 1979; it was the occasion for considerable conflict between the United States and other countries over frequency allocations and the appropriate placement of satellites in the geostationary orbit.[7]

Other U.N. Agencies

U.N. Educational, Scientific and Cultural Orga" nization (UNESCO) .-UNESCO is neither a regulatory agency like ITU, nor does it have a broac

[7] *Radio frequency Use and Management Impacts From the WorI Administrative Radio Conference of 1979,* op. cit.

Figure 2.— U.N. Bodies



compl(shed Its **ortglnal mandate In 1974 but can be :alled at any t I me by the parent Comm(ttee**

)TE Broken **hnes represent observers**

interest in space matters like COPUOS. However, as the U.N. agency most concerned with scientific and cultural issues, including the use of communications for third world development, it necessarily has an interest in space systems as they relate to these matters. UNESCO is also the focal point for discussions of the New World Information Order (see "The Political Context for Outer Space") and related issues.

World Meteorological Organization.—WMO is the chief organization for international coordination in gathering and exchanging weather data. It also organizes and coordinates global weather and climate studies such as World Weather Watch (W w w) and the Global Atmospheric Research Project (GARP). Virtually all of WMO'S work involves the use of satellite information.

Food and Agricultural Organization (FAO).– FAO has established a remote-sensing center to monitor renewable resources, using Landsat imagery to support its field services. FAO has an extensive library of Landsat data as well as a laboratory for interpreting aerial and satellite images.

United Nations Development Programme (UNDP).-UNDP funds a variety of development projects, including training courses and regional centers for broadcasting and resource management. An experimental satellite prototype thin-route communication Earth terminal suited for low-cost mass production is among its current programs.

THE POLITICAL CONTEXT FOR OUTER SPACE

The political context for outer space and space technology has two main components: a long-standing East-West rivalry that goes back to the beginning of the space age, and a more recent set of North-South disagreements over proposals for restructuring relations between developed and developing countries.

In April 1958, President Eisenhower sent a special message to Congress proposing a civilian space agency, which would ". . . emphasize the concern of our Nation that Outer Space be devoted to Peaceful and Scientific purposes. " After extensive hearings in which the importance of international cooperation was stressed, the Congress passed the National Aeronautics and Space (NAS) Act of 1958. The act opened with the congressional declaration that ". . . it is the policy of the United States that activities in space should be devoted to peaceful purposes for the benefit of all mankind. " The act also provided that U.S. space activites were to be conducted so as to contribute to "cooperation by the United States with other nations and groups of nations in work done pursuant to this act and in the application thereof. "

When Congress passed the Communications Satellite (COMSAT) Act of *1962,* the United States declared its intent to provide a global communications satellite system to be established "in conjunction and in cooperation with other countries, " paying care to "providing such services to economically less developed countries as well as those more highly developed. "

At the U. N., the United States played a key rok in the formation in 1958 of the Committee on th(Peaceful Uses of Outer Space. Several interna. tional treaties and protocols on the use of spac(have come out of the committee's work. Perhap: the most significant of these, the 1967 Outer Spac~ Treaty, contains language that reflects the sen timents found in the NAS Act and the COMSAI Act. Article I of this treaty declares, in part, that

> The exploration and use of outer space . . . shall be carried out for the benefit and in the interest of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind.

In recent times, however, the United States ha come under intensifying criticism from develop

ing countries for some of its activities in space. The criticism stems from changes both within the United States and in the international community. In the United States, emphasis has shifted from using space for "all mankind" to exploiting its special properties for the United States in particular. In the international community, the developing world has coalesced into a political bloc capable of opposing the will of the industrialized countries.

The space age began amidst an ideological struggle between the United States and the Soviet Union in which both parties sought to use this new technology to exemplify the superiority of their individual political systems. Each of the superpowers had a strong interest in demonstrating that the value of their accomplishments would accrue not only to themselves, but to the whole of mankind. Consequently, the "space dialogue" which developed during the late 19.50's and early 1960's did not emphasize the value of space industries to the economic welfare of individual nations, nor did it emphasize the military value of space. Instead, it was the potential for space to solve large scale global problems that was most often cited to the world community.

It was while nations were viewing space with this "global perspective" that institutions within the United Nations, such as the Committee on the Peaceful Uses of Outer Space, were formed. The United States and the Soviet Union encouraged the nations of the world to aid in planning for the future exploitation of space. However, the United States and the Soviet Union no longer control access to space. Although both space technology and the political context in which space activities are undertaken have altered substantially since the nception of the space age, the idea that all naions have the right to participate in formulating principles to govern the exploration and utilization of space has never altered.

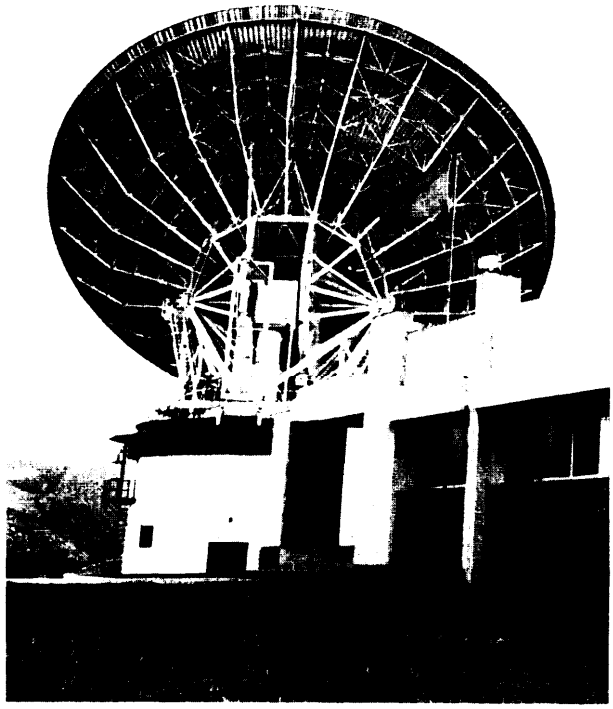
As COPUOS and other U.N. organizations vere formulating principles to govern space acivities, the United States was building a large and liverse space industry to support defense and ivilian needs. Although these two activities riginated and grew at the same time, their somemes antagonistic ideological bases are difficult to reconcile: COPUOS and other international organizations focussed on ideological goals such as establishing an "international regime for outer space. " By contrast, the U.S. private sector centered primarily on developing technologies to meet specific communication, meteorological, and resource management needs.

The dominant political division over the use and acquisition of space technology is between the industrialized and the developing countries. In general, the developing countries seek to gain greater access to and control over the resources of outer space and the advanced space technologies of the industrialized nations. They do this primarily by advocating legal and regulatory regimes for space activities in international organizations, where developing countries outnumber and can outvote industrialized countries. The developing countries also promote multilaterally funded and controlled bodies to transfer know-how and technology to the developing world. Industrialized countries, on the other hand, fear turning over too much control to mulitlateral organizations.

An excellent example of effective use of an international cooperative mechanism is INTELSAT. Although INTELSAT is a multinational corporation owned by the participating states, it is highly successful in balancing private and state interests. COMSAT, the designated participating U.S. entity is a legislatively created private U.S. company; it was the initial manager of INTELSAT. The INTELSAT organization functions profitably and provides high quality international communications services. Voting power in INTELSAT is a function of each member state's use of the system,[8] and the major users are interested in maintaining a profitable, efficient organization. This voting regime makes it difficult for the numerically superior minority members of INTELSAT to abuse the function of the organization by raising larger political and economic issues. *

Third world proposals in space affairs often draw on broader agendas that have gained wide-

[8] INTELSAT Agreement, article V.
*The United States currently has a 25 percent vote.



INTELSAT station located in Rabat

spread support from developing countries during the past decade. These include:

The New International Economic Order (NIEO).–The idea of NIEO emerged at the U.N. in 1974, when the General Assembly approved the Charter of Economic Rights and Duties of States. Championed by the developing nations (loosely organized into the so-called "Group of 77" (G-77) (see table z), * the Charter was premised on the idea that economic relations between developed and developing countries were inequitable and should be fundamentally altered. Global economic restructuring would transfer wealth, expertise, and political power from the "haves" (the industrialized West or "North") to the "have-nets" (the less-developed countries or "South"). The negotiations over the Law of the Sea Treaty exemplified this thrust by the developing world.

At the U.N. and elsewhere the G-77 has largely succeeded in setting the terms of the debate on North-South relations, putting the North on the moral defensive and legitimating demands for the transfer of wealth and power to the South. An important consequence of the promotion of NIEO has been the politicization of economic discussions: the developing countries claim a right to an equal share of the world's economic and technological pie; the North responds that any assistance is not a matter of right or of compensation for past injustice. Much of the South's effort has gone towards restricting the activities of foreign private corporations in developing countries: New Economic Order positions favor state control of internal economic affairs and direct state-to-state agreements that give political authorities greater control over international trade. There is a marked preference also for comprehensive multilateral transfer programs rather than the more traditional bilateral aid projects.

Though largely successful in dissociating themselves from the West, the Soviets have on occasion been lumped together with the North; therefore they sometimes (usually as tacitly as possible) side with the West in opposing transfer proposals. China, on the other hand, initially stooc aloof from the nonaligned movement and the New Economic Order, but in recent years has associ ated itself increasingly with the South.

Neither the North nor the South maintain un animity on all issues. Though the G-77 has been particularly successful in articulating common pc sitions and organizing bloc votes, for particula issues it is often split along political, regional, an economic lines. Agreement on general issues does not always carry over to specific proposals. With in the West, disagreements are more frequent with voting en bloc a rarity, The United State and other countries with a strong preference fc a relatively unrestricted private sector are occi sionally at odds with those western countries **thi** favor state-oriented programs and are more syn pathetic with the South.

.—

"The Group of 77 (G-77) was not a new organization in **1974. Created by 77 developing countries** in the early **1960's to coordinate their position at** UNCTAD, G-77 was evolved into the principal negotiating body for developing countries in the North-South dialogue. As figure 4 shows, virtually every developing country is a member of G-77. Although G-77 is often confused with the nonaligned movement, the two movements are different. While the membership of the two groups overlap, G-77 includes countries aligned with East or Western blocs; and where the nonaligned movement addresses political, military and economic issues, *G-77* focuses its attention predominantly on economic issues.

Table 2.—The Members of the "Group of 77," Fall 1980[a]

1. Afghanistan
2. Algeria
3. Angola
4. Argentina
5. Bahamas
6. Bahrain
7. Bangladesh
8. Barbados
9. Benin
10. Bhutan
11. Bolivia
12. Botswana
13. Brazil
14. Burma
15. Burundi
16. Cape Verde
17. Central African Republic
18. Chad
19. Chile
20. Colombia
21. Comoros
22. Congo
23. Costa Rica
24. Cuba
25. Cyprus
26. Democratic Kampuchea
27. Democratic People's Republic of Korea
28. Democratic Yemen
29. Djibouti
30. Dominica
31. Dominican Republic
32. Ecuador
33. Egypt
34. El Salvador
35. Equatorial Guinea
36. Ethiopia
37. Fiji
38. Gabon
39. Gambia
40. Ghana
41. Grenada
42. Guatemala
43. Guinea
44. Guinea-Bissau
45. Guyana
46. Haiti
47. Honduras
48. India
49. Indonesia
50. Iran
51. Iraq
52. Ivory Coast
53. Jamaica
54. Jordan
55. Kenya
56. Kuwait
57. Lao People Democratic Republic
58. Lebanon
59. Lesotho
60. Liberia
61. Libyan Arab Jamahiriya
62. Madagascar
63. Malawi
64. Malaysia
65. Maldives
66. Mali
67. Malta
68. Mauritania
69. Mauritius
70. Mexico
71. Morocco
72. Mozambique
73. Nepal
74. Nicaragua
75. Niger
76. Nigeria
77. Oman
78. Pakistan
79. Palestine Liberation Organization
80. Panama
81. Papua New Guinea
82. Paraguay
83. Peru
84. Philippines
85. Qatar
86. Republic of Korea
87. Romania
88. Rwanda
89. Saint Lucia
90. Samoa
91. Sao Tome and Principe
92. Saudi Arabia
93. Senegal
94. Seychelles
95. Sierra Leone
96. Singapore
97. Solomon Islands
98. Somalia
99. Sri Lanka
100. St. Vincent and the Grenadines
101. Sudan
102. Suriname
103. Swaziland
104. Syrian Arab Republic
105. Thailand
106. Togo
107. Tonga
108. Trinidad and Tobago
109. Tunisia
110. Uganda
111. United Arab Emirates
112. United Republic of Cameroon
113. United Republic of Tanzania
114. Upper Volta
115. Uruguay
116. Venezuela
117. Viet Nam~
118. Yemen
119. Yugoslavia
120. Zaire
121. Zambia
122. Zimbabwe

[a]The Group of 77 now numbers 122 The 77 signatories of the 1964 Joint Declaration of the Seventy-Seven are in Italics
'Before Republic of Viet-Nam

SOURCE Office of Technology Assessment

Developing countries have recently begun to ace greater emphasis on access to technology, eluding space technology, asserting that without chnical expertise they will be relegated to peranent economic inferiority. The 1979 U.N. Conrence on Science and Technology for Development (UNCSTD) helped to crystallize these sennents: it pointed to the unequal distribution of chnology as a primary factor in the dependent)sition of developing countries and called for a major effort to transfer technology from North South.

The New World Information Order (NWIO).– In many ways similar to the New World Economic Order, the proposals for NWIO stem from assertions by developing countries that: 1) they do not have equal access either to relevant information or to the technologies needed to acquire and disseminate it, and are hence at a disadvantage in economic and political dealings with the North; 2) news coverage of their countries is both sparse and slanted, due to the cultural and political biases of Western reporters; and 3) Western media bring about cultural and economic disrup-

18-780 0 - 83 - 5

tion in developing countries by raising expectations and popularizing alien perceptions.

New World Information Order proposals generally involve increased state control over what foreign journalists would be allowed to report and over what its own citizens may learn from international broadcasts, wire services, and newspapers. The Soviet Union and other communist countries have enthusiastically supported NWIO proposals. The United States and most Western countries have been strongly opposed to prior restrictions on the flow of information and have invoked the U.N. General Assembly Declaration of Human Rights which guarantees unrestricted access to information. [9]

The *means* of communication are also at issue. On the one hand, developing countries point to their lack of communications infrastructure as a key cause of information inequities. On the other, they see advanced Western technologies, such as communications satellites, as posing an even greater threat to their sovereignty. Hence, while they demand aid in acquiring communication systems, they propose to regulate and restrict its use. This approach is most apparent in UNESCO negotiations over a "Declaration of Guiding Principles on the Use of Satellite Broadcasting for the Free Flow of Information, the Spread of Education and Greater Cultural Exchange. " Developing countries have also proposed establishing multinational satellite systems through the U.N. that would give them greater control over and access to advanced technologies. The most authoritative expression of NWIO proposals, the so-called MacBride report, [10] endorses efforts at ITU to allocate geostationary slots on a more equitable basis.

It is important to note that "information" includes not only traditional voice, print, and video but also computer data and satellite remote-sensing imagery. Regulating the international movement of information, in all its forms, would therefore affect not simply political news coverage but also access to resource and financial management data by governments and multinational firms.

[9] Universal Declaration of Human Rights, U.N. General Assembly Resolution 217 (11) of Dec. 10, **1948, article** 19.

[10] *Many Voices, One World,* UNESCO, 1980.

Common Heritage of Mankind (CHM).–CHM was first proposed in 1967 by Arvid Pardo of Malta at the U.N. during discussion of the proposed negotiations on the Law of the Sea. Subsequently, it became an integral part of the draft Law of the Sea Treaty as well as the draft Agreement Governing the Activities of States on the Moon and other Celestial Bodies (the so-called "Moon Treaty"), which was negotiated in the Legal Subcommittee of COPUOS during the 1970's.

The CHM concept is generally applied to area: such as the deep sea-bed, and outer space, that are not a sovereign part of any one nation. Such areas have always been understood to be oper to transit and exploitation by any nation, withoul being subject to permanent appropriation. How ever, under the influence of the New World Eco nomic Order, some developing nations began to press for active jurisdiction over such areas by multinational bodies. In the Law of the Sea ne gotiations, certain countries advocated a Seabe[Authority with power to define the terms uncle which private companies could mine ocean min erals. The Seabed Authority would be mandate to transfer ocean mining technology and a pox tion of the revenues from ocean mining to devel oping countries. In the Moon Treaty, under pel haps a more limited use of CHM, an undefine "international regime" was envisioned to regulat future ventures for exploitating resources on the Moon and other celestial bodies. The nature of this international regime and the extent of i authority were left to subsequent treaty negoti; tions. In both cases, the proposals were justifi~ on the grounds that the developing countri[should share in the exploitation of resources th, belonged to all but were accessible only to a(vanced industrialized countries.

Though the United States initially supported t] Common Heritage idea, and is generally credit(with bringing about the consensus agreement (its use in the Moon Treaty, it eventually came oppose both the Law of the Sea and the Mo(Treaty. Such opposition was the source of co siderable discontent among the G-77 and certa developed countries. The effects, if any, of t} opposition, particularly with respect to the L: of the Sea Treaty, are not yet known; none w[visible at UNISPACE '82.

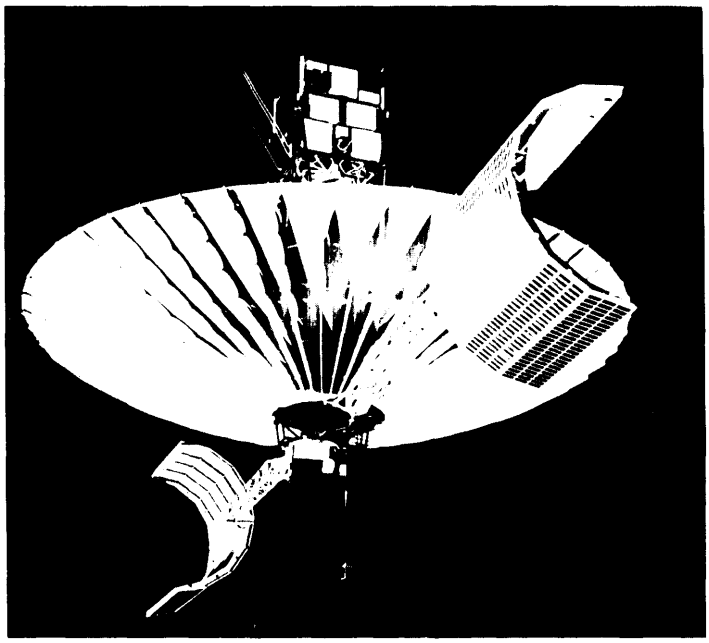


Photo credits Nationa/ Aeronau(fcs and S~ace Adrn/n/sfraf/on

Di ect receive antenna (lower left) installed i n the village of Kerell i (about 300 miles southeast of Bombay, India) utilized in conjunction with the Applications **Technology Satellite (ATS-6) (top) permitted** TV broadcast ng to villages across India (lower right)

Though not explicitly invoked, the Common Heritage concept has also played an important role in shaping discussions about the allocation of other common resources, particularly the geosynchronous orbit and the electromagnetic spectrum. This fact was apparent at UNISPACE '82.

MILITARIZATION OF SPACE*

Another important factor of the UNISPACE '82 "environment" is the global concern over the issue of the militarization of Space, The 1967 Outer Space Treaty prohibits weapons of mass destruction (primarily nuclear weapons) in outer space, but until recently there has been relatively little discussion of military space systems. However, in 1981 key members of the G-77, including Brazil, Egypt, India, Nigeria, and Yugoslavia, expressed concern over "the growing dangers of the military uses of outer space. "

The sense of danger some states experience has been aroused by the emergence of weapons designed to attack other satellites (antisatellite or A-sats) as well as by the increased use by both the United States and Soviet Union of space systems to support terrestrial military activities. (The Soviet Union possesses a first generation operational A-Sat and the United States has one under development. Neither system, however, is based in space.)

From 1977 to 1979, the United States and the Soviet Union conducted talks on limiting A-sat deployment; the United States broke these off following the Soviet invasion of Afghanistan. At these talks the Soviets professed worry about the possibility of the U.S. space shuttle being used as an A-sat system. In August of 1981, the U.S.S.R. proposed, at the General Assembly, a "Draft Treaty on the Prohibition of the Stationing of Weapons of Any Kind in Outer Space. " Article One of the proposed treaty prohibits stationing weapons in space (by implication, direct intercept A-sats launched from the ground without going into orbit would not be prohibited), including on any "reuseable manned space vehicle, " i.e., the shuttle. The Soviet proposal was referred not to COPUOS but to the Committee on Disarmament.

In the months preceding UNISPACE '82, a number of U.S. actions and statements strengthened the perception abroad that the United States intends to expand its military space activities. These included:

- the release on July **4,** 1982, of a White House Fact Sheet on National Space Policy with strong emphasis on national security programs. The fact sheet announced the formation of a new Senior Interagency Group on Space, chaired by the Assistant to the President for National Security Affairs;
- statements by the Secretary of Defense indicating that the United States is actively considering placing defensive weapons systems in space, along with highly publicized discussions of direct-energy systems in Congress;
- establishment of an Air Force Space Command to coordinate military programs; and
- the flight of a classified Department of Defense payload on the fourth space shuttle mission (landing on July **4,** 1982).

The introduction of weapons into space, though not specifically prohibited by international law, raises strong emotions. From the inception of the space age, many have seen space as a "clean slate, " an area from which earth-bound political and military rivalries could be excluded. Numerous declarations in U.N. and other fora have extolled the peaceful uses of outer space.

*See app. A for a more detailed treatment of this issue.