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**Space WARC:  
Regulation of the  
Geostationary Orbit**



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An Intelligence Assessment

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July 1985

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# Space WARC: Regulation of the Geostationary Orbit [Redacted]

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An Intelligence Assessment

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This paper was prepared by [Redacted] Office  
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[Redacted] Comments and queries are welcome  
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**Space WARC:  
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Geostationary Orbit** 

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**Key Judgments***Information available  
as of 1 July 1985  
was used in this report.*

The International Telecommunication Union (ITU) will convene a global conference next month on radiofrequencies and orbital slots for communications satellites. The outcome of the conference will affect future US Government and commercial development of satellite communications and could, under some scenarios, threaten current military communications systems. The Space World Administrative Radio Conference (Space WARC) was called for by a coalition of developing countries bent on securing rights to future use of the geostationary orbital slots and frequencies, which they perceive as limited.

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The key technical issue at the first session of the conference, scheduled to run through August and September, is devising a new method for planning use of orbital slots and frequencies. Implementation of the new procedures will not be considered until the second session of Space WARC, scheduled for 1988. Many of the developing countries want to establish a system of prior planning that would permanently assign orbital slots and frequencies to each country, regardless of current use patterns. Most developed countries, including the United States and the Soviet Union, oppose this approach for the most heavily used frequency bands on grounds that it would create inefficiencies in their operations and stifle future developments in the space telecommunications industry.

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We believe that this session of the conference is likely to opt for prior planning in some form for some frequencies. The particular form adopted, the reaction of other countries with major investments in space communications, and the implementation will determine whether, and which, US interests are affected. At worst, the conference could select a rigid plan supported not only by almost all developing countries, but in which most developed countries also acquiesce. This would effectively bind the United States to the plan and could limit US commercial satellite interests and force the United States to alter some military communications and radar operations. The most likely outcome would plan little-used frequencies, a development that could disrupt some US Government operations.

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Political rhetoric, as in all UN-associated conferences, will play a visible and important role. The most sensitive is likely to be the Soviet Union's use of the forum to push its campaign against the US Strategic Defense Initiative (SDI). The Soviets are certain to have lined up Bloc and some Third World support for their anti-SDI campaign. On technical matters the Soviets are generally in accord with US positions. As in other international meetings

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where their technical interests coincide with US interests, they will let the Western industrial nations take the lead in arguing with Third World states. Other political issues that could complicate life for the United States include:

- UK-Argentine debate of sovereignty over South Atlantic Islands.
- A Cuban condemnation of US Radio Marti broadcasts.
- A credentials conflict, possibly over participation by Israel. 

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**Space WARC:  
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**Background and Introduction**

In August 1985 the International Telecommunication Union (ITU) will convene the first of two sessions of a Space World Administrative Radio Conference (Space WARC). Delegates to this conference will consider revising the regulations—established in 1963 and last revised in 1979—governing space telecommunications systems using satellites in the geostationary orbit (see inset, *The Geostationary Satellite Orbit*). Many developing countries are concerned that room in the orbit required for geostationary satellites at appropriate frequencies for transmitting via such satellites will be “used up” before these countries are technologically and economically ready to use space-based telecommunications systems. According to the agenda set by the ITU, the conference seeks to “guarantee in practice, for all countries, equitable access to the geostationary satellite orbit and to the frequency bands allocated to the space services utilizing it.” [Redacted]

The stakes are high. The geostationary orbit plays a key role in the economic and military security of many developed countries, especially the United States. Some of the major users of the orbit have much to lose by altering the manner in which its use is now regulated (see inset, *US Interests at Space WARC*). The technologically advanced industrialized countries will be pitted against the less developed states. Both sides will be striving to maximize future positions in the telecommunications game. But whereas the “North” believes it can probably best reach its goal through evolutionary tinkering with the existing system for regulating those frequencies of primary interest, the “South” believes it can probably best satisfy its perceived needs through radical or revolutionary departures from the status quo. [Redacted]

**Conference Issues**

Space WARC is technically empowered to consider all of the space telecommunications services (see inset, *The Space Satellite Services*). We believe that most

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***The Geostationary Satellite Orbit***

*If a satellite is launched into a circular orbit in the plane of the equator at the right altitude (approximately 35,800 kilometers), it will orbit the Earth at the same rate that the Earth rotates on its axis beneath it. When viewed from the Earth, the satellite will appear suspended over a fixed point on the Earth’s equator. The circle in space formed by all such orbits is called the geostationary satellite orbit, and satellites in such an orbit are called geostationary satellites. Earth stations can remain directed at such satellites without the need for expensive, complicated tracking equipment. Among the functions of satellites in this orbit are telecommunications and broadcasting.* [Redacted]

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*Geostationary satellites using the same frequency bands may interfere with each other. Other uses of the same frequencies may also lead to interference. Interference occurs, depending on:*

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- *The separation between the areas on Earth the satellites are servicing.*
- *The technology in the satellite and its Earth stations (particularly the directivity and polarization of antennas).*
- *The separation between the satellites.*
- *Other systems, not in the geostationary satellite orbit or on Earth (such as aircraft and ships), using the same frequency bands.*

*Space technology is rapidly evolving, allowing a greater satellite communications capacity and closer spacing of like-frequency satellites than before.* [Redacted]

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of the effort will focus on the Broadcasting and Fixed Satellite Services. Another potentially controversial topic on the agenda is consideration of a new service dedicated to radiobroadcasting from space. Political issues ranging from Soviet opposition to the US Strategic Defense Initiative (SDI) to a challenge to Israeli credentials could also come up. [Redacted]

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### *US Interests at Space WARC*

*The United States makes more use of the geostationary orbit and spectrum than any other nation. A long-term, detailed plan that allows each country equal orbit slots and frequency assignments in frequency bands of US interest would jeopardize US commercial and Government operations, particularly military systems. Such a plan would most likely favor the domestic interests of the LDCs over the global strategic and commercial interests of superpowers. Among the US concerns are protection of:*

- *The Defense Satellite Communications System. This primary US Government communications system uses the 7/8-GHz band in the Fixed Satellite Service worldwide. The United States is committed to this system through the 1990s.*
- *Commercial Fixed Satellite Service. The US Federal Communications Commission has applications or indications of applications for more of the domestic arc than can be accommodated at the 4/6-GHz band using current technology. The situation at the 11/14-GHz band over the Americas is tightening. Rigid planning based on assignments for all countries would worsen this situation.*
- *US military radar operations in the 3.4- to 3.7-GHz band. According to a US Government study, the United States has invested \$11 billion in US airborne and shipborne systems operating worldwide in this spectrum. INTELSAT, the LDCs, and INTERSPUTNIK want to expand domestic satellite operations to this band. The 1979 WARC agreed to reallocate the band on a shared basis to the Fixed Satellite Service and urged abandonment of radar operations in the 3.4- to 3.7-GHz band by 1985. If domestic satellites begin using these frequencies, US radars such as those supporting AWACS, Phoenix, and AEGIS will interfere with the satellite operations.*
- *US and NATO military fixed and transportable communications operations in Europe in the 4.5- to 4.8-GHz band. If this band is allocated to North American and European commercial satellites, the military systems could interfere with satellite operations.*
- *US airborne reconnaissance platforms operating at 14.5 to 14.8 GHz. US airborne intelligence collectors operate worldwide using the 14.5- to 14.8-GHz band. WARC-79 allocated this frequency band along with other spectrum for feeder links to the Broadcasting Satellite Service plan. If Region 1 and 3 countries plan feeder links in this band, the military may no longer be able to use these frequencies.*
- *Global operations. A rigid plan or a plan based on regions could limit US access to the geostationary satellite orbit for commercial and military satellites.*
- *US policies for competitive access. If a rigid planning method is imposed by the Space WARC, the method could disrupt the current US practice of promoting competitive access to the geostationary orbit by any entity that can demonstrate financial capability and market demand for its service.*
- *US monetary obligations. The US Government is concerned about the rising costs of international organizations and has established a policy of zero net program growth and absorption of nondiscretionary cost increases, such as inflation of costs and salaries, on its assessed international organization obligations. Decisions in Space WARC could increase budget costs for the ITU.*

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**The Space Satellite Services**

**Fixed Satellite Service.** This service is used to transmit voice, data, and telex signals. Also used for distributing television signals from space to Earth and feeding signals to the Broadcasting Satellite Service.

there are satellite-to-satellite links in the space research service. Use of this service is anticipated in future systems.

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**Broadcasting Satellite Service.** Signals are transmitted or retransmitted by satellites to Earth for reception by the public. Currently, spectrum has only been allocated for television signals; however, a radio service is under consideration.

**Earth-Exploration Satellite Service.** A satellite is used to collect information about the characteristics of the Earth and its natural phenomena.

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**Mobile Satellite Service.** Earth stations on land, at sea, or on aircraft may send and receive signals from space.

**Meteorological Satellite Service.** This service is a subset of the Earth-Exploration Satellite Service. Several geostationary meteorological satellites are operational.

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**Radiodetermination Satellite and Radionavigation Satellite Service.** Signals used for navigation and determining location. Satellites that provide this function do not currently use the geostationary orbit.

**Standard Frequency and Time Signal Satellite Service.** No operational satellites yet. The Bureau International De l'Heure will probably regulate this service.

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**Space Operation Service.** Designed to facilitate tracking, telemetry, and command functions of any satellite.

**Space Research Service.** Satellites are for scientific research, data relay between near-Earth and deep space and corresponding Earth stations, and testing of new technology. These satellites vary widely.

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**Intersatellite Service.** No operational satellite systems have been implemented in this service, although

**Amateur Satellite Service.** Several experimental satellites that fill educational and scientific roles and promote new communications skills among users. No amateur satellites currently use the geostationary orbit.

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**The Key Issue: Planning**

The method for planning the placement of satellites in the geostationary orbit and use of appropriate frequencies in ways to avoid interference with other users will underlie all of the technical discussions at Space WARC. Currently, a country planning to launch a satellite is expected to inform other ITU members no more than five years before the launch. The launching country then coordinates its plans with other countries that have existing or planned systems so that interference will not occur among the satellites or other systems and registers the final technical details with the ITU. This registration provides international recognition and is the only international protection a country has against interference from other systems.

Many countries that have not yet begun to use space communications services believe that current procedures favor the industrialized countries and that adoption of rigid planning is essential (see inset, *Rigid Planning at High-Frequency Broadcasting WARC*). As early as 1970, some developing countries began to express the view that industrialized countries would so intensively use the geostationary orbit and frequencies allocated to space services that these resources would soon be used up. They expressed concern that when they were financially and technically able to deploy their own systems they could not do so without interfering with existing systems.

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**Rigid Planning at High-Frequency  
Broadcasting WARC**

LDC proposals for rigid planning would not be unique to the Space WARC. The LDCs advocated a similar concept for the 1984 High-Frequency Broadcasting WARC (HF WARC) but agreed to a test of a "planning method" that is neither long term nor a priori in nature. The result of this testing will be presented to the second session of the HF WARC for approval, modification, and final decision. [redacted]

[redacted] a key NAM leader, Srirangan of India, said that the planning problems of Space WARC are not directly parallel with those of the HF WARC. He stated that, unlike the geostationary orbit, high frequencies are not a limited resource. Also, ground-based, high-frequency broadcasting transmitters are more easily altered than satellites. Once most satellites are launched, altering their technical characteristics and frequencies is difficult. [redacted]

Furthermore, Srirangan said that the position of the LDCs at Space WARC will be much harder and more political than it was at the HF WARC. In contrast to their position with respect to shortwave broadcasting, most LDCs have little to lose because they have little or no money invested in space communication (except for INTELSAT participation). [redacted]

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Rooted in philosophical notions about an "equitable division of resources," the LDC position on planning has also been affected by practical experience. For example:

- During the prelaunch coordination process in the late 1970s, India had to reduce the capacity of its first communications satellite because of potential interference with an existing Soviet satellite.
- Indonesia was forced to change the location of its Palapa satellite because of potential interference with INTELSAT, the Soviet Stationar system, and the Indian satellite. [redacted]

LDCs are not alone in their support of rigid planning, although their demands cover a broader range of the orbit and frequency spectrum than do others. The

Soviet Union is supporting rigid planning in a limited and little-used area of the frequency spectrum, largely to curry favor with the LDCs at little cost to itself. Australia has proposed a form of rigid planning because its space needs are minimal and few countries will launch satellites in the part of the geostationary orbit useful to Australia. Canada may also propose a rigid planning method for a limited portion of the orbit and spectrum. We believe Ottawa's real motivation is to assure itself that the United States will not deprive Canada of opportunities to use the orbit. [redacted]

The merits of flexible versus fixed plans will be compared in discussions on planning the Fixed Satellite Service and the Broadcasting Satellite Service. Work on planning the Broadcasting Satellite Service has been under way since 1977 (see inset, *Broadcasting Satellite Plans*). This process has set the stage for consideration of a plan for the Fixed Satellite Service. When the ITU put together the first two of three regional broadcasting plans in 1977, it locked itself into the technology of the time. This became apparent in 1983 when planners for Region 2 took advantage of new technologies in developing a plan that is far more efficient than the 1977 efforts. [redacted]

A fear of getting locked into similar inefficiencies in planning for the Fixed Satellite Service is fundamental to the resistance of most current users of satellites to any form of rigid planning. Most users believe that a rigid plan that went beyond today's "publish, consult, and register" provisions would limit the future development and capacity of satellites in the geostationary orbit and reduce incentives for developing more efficient technology. A rigid plan would also, in their view, be wasteful because it would encourage countries to reserve orbital positions and frequency assignments far into the future, potentially leaving large portions of the orbit and frequency spectrum unused. Rigid plans could undercut, or be undercut by, changes in other telecommunications technologies such as microwave and fiber optics. [redacted]

**Technical Issues**

As the debate on planning methods unfolds, we believe that the conference will finally concentrate on

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**Broadcasting Satellite Plans**

**WARC-77.** In 1977, the ITU convened a World Broadcasting Satellite Radio Conference (WARC-77) to regulate television broadcasting from satellites. According to a US delegate to that conference, most European nations wanted a worldwide plan that detailed satellite system characteristics and allotted frequency channels to each ITU member. The official said that the Europeans believed a detailed plan was necessary to provide guaranteed access for the future broadcasting satellite systems of developing nations. The United States and other countries opposed such a plan because countries would be restrained by long-term projections and technology that would become obsolete, wasting spectrum before allotments were used. Regions 1 and 3 (Europe and Asia) developed a detailed a priori plan, assigning the broadcasting or downlink frequencies to countries in the two regions. The WARC-77 plan was incorporated into the ITU Radio Regulations at the 1979 WARC. Regions 1 and 3 must now plan the uplinks or feeder links that provide programs to the satellites at Space WARC.

[ ]

**RARC-83.** Region 2 (Western Hemisphere) countries postponed planning broadcasting satellites for six years. At a regional administrative radio conference in 1983 (RARC-83), Region 2 delegates developed a plan that included not only the downlink broadcasting frequencies but also the feeder links. This plan cannot enter into effect until it is incorporated into the ITU Radio Regulations. The Space WARC has the power to incorporate the conference final acts. [ ]

**Comparing the Plans.** After only six years, technology had progressed so that Region 2 was able to

accommodate more channels using less spectrum. The Region 2 plan also provides better standards for protection from interference by other satellites. A comparison of the two plans follows:

WARC-77	RARC-83
150 countries and territories	56 countries and territories
252 service areas	130 service areas
11.7 to 12.5 GHz (Region 1)	12.2 to 12.7 GHz (Region 2)
11.7 to 12.2 GHz (Region 3)	
40 frequency channels (Region 1)	32 frequency channels
24 frequency channels (Region 3)	
19.18-MHz spacing	14.48-MHz spacing 5 Caribbean beams, 1 Andean beam
35 orbital positions, with clusters of two or more satellites	48 orbital positions, with clusters of two or more satellites
6 degree orbital spacing	Nonuniform orbital spacing
5 channels per service area (Region 1)	32 channels per service area
4 channels per service area (Region 3)	

[ ]

portions of the frequency spectrum currently designated for use by satellites but not much used. This poses a threat to some US and Western military communications and radar systems that now operate in portions of this spectrum where some countries—including Algeria and India—would argue they do not belong. Rigid planning in these frequency ranges

could force the United States to change or limit the use of these military systems:

- US AWACS, Phoenix, and AEGIS radars could at times interfere with satellites permitted to operate from 3.4 to 3.7 GHz.

- NATO tactical communications systems that operate in the 4.5- to 4.8-GHz range would in some cases interfere with satellites permitted to use those frequencies.
- Planning in the 7/8-GHz range would limit the flexibility of US Government and NATO satellites.

[redacted]

It is less likely—but still possible—that the conference could decide to adopt a rigid planning approach to those portions of the frequency spectrum already heavily used by commercial communications satellites. Should this happen, US operators might have to accept higher interference levels, use less efficient technologies, and severely limit the number of new satellites they could place in the geostationary orbit. At the very least, such a decision could lead to closer scrutiny of US operators for compliance with ITU rules. [redacted]

Other technical sticking points may include:

- Europe, Africa, and Asia need to agree on frequencies for the uplinks (Earth to satellite transmissions) to their television broadcast satellites. US military operations could interfere with some of the candidate frequencies.
- The conference has been asked to adopt, at this session, a plan for television broadcast satellites for the Americas. Key countries from the other two regions, including the Soviet Union and some West Europeans, oppose adoption of the plan until they have settled on the assignment of the uplinks mentioned above. US commercial operators will find it difficult to secure financial backing for development of television broadcast satellites until a plan is internationally recognized.
- Most members of the conference, except the Soviets and their allies, would like to agree on setting up a new satellite service for radiobroadcasting from space. Candidate frequencies considered so far interfere with existing users; the conference probably will agree to broaden the range of frequencies to be considered. [redacted]

**Political Issues**

The political issue most likely to plague the United States at Space WARC is a Soviet-inspired attack on

the US SDI. Under the guise of restraining “non-peaceful uses of outer space,” the Soviets and their friends are preparing to undertake a number of actions aimed at SDI:

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- State Department reporting from Geneva indicates that the Soviet Union recently passed out a draft proposal calling on the ITU to consider studying the “disastrous consequences” of spreading the arms race to outer space.

- According to State Department reporting, in August 1984 the Soviet Ministry of Communications told the ITU Secretary General that the Soviets would focus their efforts on getting the UN General Assembly (UNGA) to adopt a resolution that serves Soviet purposes at Space WARC (see appendix D, *Recent UN General Assembly Resolutions on the Outer Space Arms Race*).

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- At the 1982 ITU Plenipotentiary Conference, the Preamble to the Convention was changed at the insistence of India, Algeria, Iraq, Kuwait, and the Eastern Bloc to read, “having regard to the growing importance of telecommunication for the *preservation of peace* . . . with the object of facilitating *peaceful* relations . . . have agreed to establish this Convention.”

- Colombia and Kenya proposed that Space WARC consider the utilization of the geostationary orbit for nonmilitary ends and “exclusively for peaceful purposes” at a meeting in preparation for Space WARC, according to diplomatic reporting. [redacted]

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As in many UN-affiliated meetings, including an ITU meeting in 1982, there will be some anti-Israel rhetoric. [redacted]

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[redacted] Nonetheless, technical issues involving Israel now exist that increase the opportunity for controversy. In 1984, Israel notified the ITU of its intention to sponsor the placing of a satellite in the geostationary orbit. More than 20 nations, mostly African and Arab, complained to the UN and ITU

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Secretaries General about the Israeli plans. The Arabs want to avoid public recognition of Israel and also believe the proposed satellite will interfere with the ARABSAT system.

Several other political issues could also draw attention at the conference:

- *UK-Argentine debate over South Atlantic Islands.* The 1983 Regional Broadcasting Plan gives Buenos Aires assignments to islands disputed with London. The United Kingdom shall take exception to this part of the Western plan. Argentina is adamant in gaining international recognition for the plan's assignments.
- *Cuban condemnation of Radio Marti.* We cannot rule out the possibility that Havana will publicly condemn Radio Marti. Space WARC's agenda does not include conventional radiobroadcasting, but Castro may choose this public forum to voice his displeasure.
- *Election of conference and committee chairpersons.* Unlike past ITU conferences where North-South and sometimes East-West lines delayed choosing conference officers, we believe the countries will agree in advance on a candidate to chair the WARC. Choosing committee heads may be more contentious (see inset, *Delegates Under Consideration for Conference Leadership Posts*).
- *Special treatment.* The LDCs seek special rules for developing countries using the geostationary orbit. Colombia insists that "taking into account the special economic position of the LDCs" is the essential purpose of Space WARC. Japanese officials think the LDCs may propose attaching economic value to orbit slots.
- *Sovereignty.* If the LDCs become sufficiently unhappy with Western conference positions, they may give lipservice to claims over the geostationary orbit by the equatorial countries. The Equatorials, led by Colombia, Ecuador, Kenya, and Indonesia, insist that other countries seek permission before launching geostationary satellites into positions above their respective territories (see inset, *Chronology of the Equatorials*).

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#### *Delegates Under Consideration for Conference Leadership Posts*

*The following people have been suggested for conference positions:*

- *Professor Ilija Stojanovic from Yugoslavia is well- and favorably known in his field. According to US telecommunications officials, he has shown no tendency to allow ideological or political considerations to influence his judgment on ITU matters.*
- *Rumulo Furtado of Brazil has a ministerial post. Secretary General Butler thinks that Furtado may not be available for the position.*
- *K. P. R. Menon of Malaysia was suggested by the United Kingdom and Switzerland. According to diplomatic reporting, Secretary General Butler may not agree with this selection.*
- *Noureddine Bouhired of Algeria was proposed by the Soviets. Secretary General Butler claims he told the Soviets that Bouhired was unlikely to obtain much support.*
- *Stephen Challo of Kenya has been suggested by Secretary General Butler for committee leadership. Butler believes him to be a capable NAM candidate, according to State Department officials.*
- *Francisco Pinheiro of Brazil has also been suggested by Secretary General Butler to head a committee. Pinheiro demonstrated an ability to work with developed and developing countries at the 1984 conference preparatory meeting, where he helped achieve a difficult compromise on defining "planning."*
- *Kavouss Arasteh of Iran has indicated an interest in a leadership position, according to State Department reporting. During past ITU conferences, he has been a strong proponent of LDC positions.*
- *Stanley Malumbe of Kenya has been proposed as a committee chairman, according to Secretary General Butler. This, Butler says, would be a "package deal" with the appointment of Stojanovic.*

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### Chronology of the Equatorials

- In October 1975 during the UN General Assembly, Colombia first claimed a segment of the geostationary orbit above its national territory. The next year Ecuador and Panama joined Colombia in this stand.
- In 1976, seven equatorial countries—Colombia, Congo, Ecuador, Indonesia, Kenya, Uganda, and Zaire—issued the Bogota Declaration asserting that segments of the geostationary satellite orbit above their territories are an “integral part” of the territory over which the equatorial countries exercise complete and exclusive sovereignty. Brazil had observer status.
- At the 1979 WARC, Colombia, Congo, Ecuador, Gabon, Kenya, Uganda, Somalia, and Zaire spoke of “adopting regulations guaranteeing rational and equitable access to the geostationary satellite orbit.” They proposed prior agreement for the use of orbital positions over the territory of equatorial states. Indonesia reaffirmed its stand on the 1976 Bogota Declaration.
- These countries spoke out again at UNISPACE in 1982 and succeeded in inserting a phrase in the conference report indicating their belief that the orbit “should not be included in the concept of outer space and its utilization should be regulated under a sui generis regime.” They also succeeded in inserting, “the special geographical situation of particular countries” in reference to a planning method for the geostationary orbit. (According to State Department reporting, the majority of nations interpret special geographical situations as problems of using the geostationary orbit in regions such as in the northern latitudes or mountainous areas and not as problems peculiar to the equatorial region.)
- At the ITU Plenipotentiary in 1982, the Equatorials inserted “the special geographical situation of particular countries” into the ITU Convention.
- The geostationary orbit has been discussed during sessions of the UN Committee on the Peaceful Uses of Outer Space (COPUOS) since the late 1970s. The 1983 UN General Assembly voted to elevate the subject’s status to a working group. Some countries are supporting the creation of a regime for the geostationary orbit to assure that it is used for peaceful purposes and that it is distributed equitably. State Department reporting indicates that, during the 1984 Legal Subcommittee session of COPUOS, the equatorial states of Colombia, Kenya, Ecuador, and Indonesia introduced geostationary orbit principles that recognized their sovereignty over the orbit. According to US officials, during private conversations an Indian delegate said that the G-77 did not fully agree with these principles, and an Indonesian official indicated that his country was “not enthusiastic” about the principles (appendix D).
- In April 1985, Colombia wrote to the US State Department protesting US occupancy of the Colombian geostationary orbit. Colombia claims the United States did not get Colombia’s approval to put a satellite in orbit above its territory.

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### Key Countries and Groups

We believe that investment in space systems, affiliations with global and regional telecommunications systems, and political alignment will, for most nations, determine positions at the Space WARC. The industrialized nations have the greatest stake. A few developing countries have their own satellites. Most

LDCs, however, merely subscribe to international systems. Major country groups operating at Space WARC will include:

- The LDCs.
- The Soviet Union and its allies.
- The Western developed nations.
- Global and regional satellite organizations.

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**The Developing Countries**

The 101-member Non-Aligned Movement (NAM) will work actively in the Space WARC to organize LDC positions. [redacted] key leaders have been working for more than a year to coordinate positions and seek consensus. Cameroon reportedly is the telecommunications coordinator, and the most active participants are Algeria, India, Iran, Iraq, Kenya, and Yugoslavia. Despite efforts to achieve a consensus, the NAM countries may not, in our view, speak with one voice during Space WARC. Brazil, China, India, and Indonesia, for example, have their own communications satellites and consequently will be less eager to make changes that could affect existing systems. [redacted]

**The Soviet Union and Its Allies**

The Soviet Union is the second heaviest user of the geostationary satellite orbit and, like the United States, will seek to protect its continued access to the orbit and the frequency bands allocated for use by satellites (see inset, *Common US and Soviet Goals*). We believe the USSR will try to achieve this objective but try, at the same time, to appear to side with the LDCs. State Department reporting indicates that the USSR may also raise outer space disarmament issues at Space WARC. [redacted]

The Soviet Union and its allies—Bulgaria, Cuba, Czechoslovakia, the German Democratic Republic, Hungary, North Korea, Mongolia, Poland, Romania, and Vietnam—meet regularly during ITU meetings. Moscow's allies usually support Soviet positions during open debate, and, with the exception of Romania, they invariably vote as a bloc. [redacted]

**The Western Nations**

In our judgment, the Western industrial nations that have an investment in the geostationary orbit will agree generally with US objectives for the conference. Differences, however, exist:

- The European nations, under the apparent guidance of the United Kingdom, oppose incorporation of the Western Hemisphere broadcasting plan into the ITU Radio Regulations, according to State Department reporting. We believe they want to finish their own broadcasting plan first so that all the regional plans can be reviewed at the same time.

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**Common US and Soviet Goals**

*As heavy users of the satellite spectrum and geostationary satellite orbit, the United States and the Soviet Union share interests in the outcome of several conference issues, such as:*

- *The need for a planning method that allows heavier users of the orbit a greater number of satellites and more spectrum rather than a method that might infringe on the satellite requirements Moscow and Washington believe are essential.*

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- *The need for a method that allows flexibility to implement new technology and meet special needs. Plans that specify the lowest common denominator of technology so that all nations can afford it would limit capacity of the orbit and possibly curb the full potential of new systems.*

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- *The need to allow worldwide access to the orbit.*

- *The need for a planning method that protects existing and planned satellites.*

- *The desire not to plan all space services and frequency bands and probably to channel the planning desires of the LDCs to some of the less heavily used frequency bands.*

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- *The desire to obtain a procedure for regulating the geostationary orbit that meets the real needs of all countries. Neither the United States nor the Soviet Union would want a plan that reserves major portions of the frequency bands and orbit for hypothetical satellite systems that might never materialize. A plan that gives orbit to each country could penalize the operations of countries and organizations with satellites.* [redacted]

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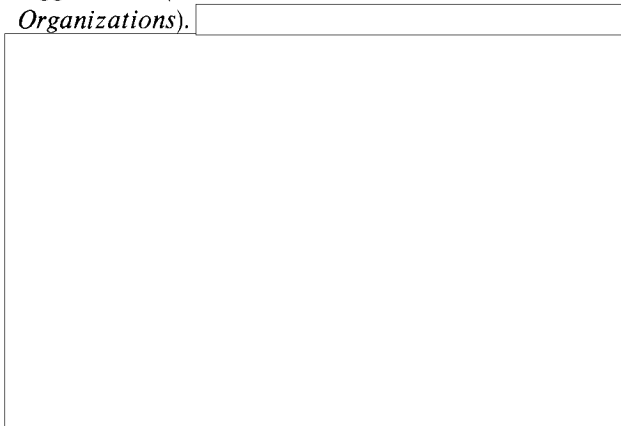
- Bilateral discussions with Australia, Canada, and Sweden indicate that they support variations of rigid planning—which they believe can fill their needs—according to US telecommunications officials.

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We believe that, without full support from countries such as Australia, Canada, and Sweden, the United States will face an uphill struggle in avoiding some form of rigid planning for certain portions of the spectrum.

**Other Groups With Influence**

Only countries can vote at ITU conferences. However, other bodies, both international and regional, may speak on the floor, write papers, and lobby at ITU sessions. Of the international organizations, INTEL-SAT and INTERSPUTNIK probably will play the biggest roles (see inset, *Major Multinational Satellite Organizations*).



Regional groups likely to be active at Space WARC include:

- The Association of the National Telecommunications Administrations of the Andean Area (ASETA). State Department reporting and open sources indicate that Colombia, Ecuador, Bolivia, Peru, and Venezuela have coordinated positions for the conference. These countries are also planning for regional satellites.
- Pan-African Telecommunications Union (PATU). This 41-nation organization, a subsidiary of the Organization of African Unity, has discussed a regional satellite, AFROSAT.
- African Posts and Telecommunications Union (APTU). In early 1985, this 12-nation group ratified a draft agreement for AFSAT, a regional satellite system. A French company prepared a feasibility study for the group.

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**Major Multinational Satellite Organizations**

*Membership in the three largest global satellite organizations is as follows:*

- *The International Communications Satellite Organization (INTELSAT) includes 109 countries.*
- *The International Maritime Satellite Organization (INMARSAT) includes 37 countries.*
- *International System and Organization of Space Communications (INTERSPUTNIK) includes 14 countries.*

*Some countries belong to more than one of these organizations, and some countries that are not members use the organizations' services.*

*Regional satellite organizations are also forming. Among the regional groupings are:*

- *The Arab Satellite Communication Organization (ARABSAT) with 22 countries.*
- *The European Telecommunications Satellite Organization (EUTELSAT) with 20 countries.*
- *The European Space Agency (ESA) with 11 countries.*

*These multistate organizations allow groups of nations to combine resources and coordinate their communications with a minimum number of satellites. Such organizations offer small countries telecommunications services without the expenses of individual national satellites. Some domestic systems, such as the Indonesian Palapa satellite series, also provide services to neighboring nations. If planning increases the likelihood of an increasing number of national satellites, the role of these multinational satellites may be diminished.*



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### Possible WARC Outcomes: Impact on the United States and Likelihood of Occurrence

Outcomes	Impact on the United States	Likelihood (percent probability)
LDCs and some major satellite-owning countries agree on rigid plan		
In frequencies not used by the United States	Neutral	90 (probable)
In commercial frequencies	Negative	65 (possible)
In frequencies of US concern	Negative	80 (probable)
US isolated against rigid plan		
In frequencies not used by the United States	Neutral	65 (possible)
In commercial frequencies	Negative	40 (unlikely)
In frequencies of US concern	Negative	60 (possible)
Consensus with US agreement on new flexible approach for regulating orbit		
In frequencies not used by the United States	Positive	60 (possible)
In commercial frequencies	Positive	50 (possible)
Regions differ—Regions 1 and 3 plan, Region 2 delays		
In frequencies not used by the United States	Neutral	40 (possible)
In commercial frequencies	Neutral	40 (possible)
In frequencies of US concern	Negative	40 (possible)
Stalemate/declare failure		
	Positive	40 (possible)
LDCs pass rigid planning; no satellite-owning countries support		
In frequencies not used by the United States	Neutral	30 (unlikely)
In commercial frequencies	Neutral	30 (unlikely)
In frequencies of US concern	Neutral	30 (unlikely)
New consensus on status quo		
	Positive	20 (very unlikely)

[Redacted]

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#### Possible Outcomes and Implications

We believe there is a good chance that Space WARC will make decisions detrimental to US interests. The delegates may either make decisions outright at the first session or make some provisional decisions and ask an intersessional group to study the choices. Odds are that the LDCs and some major satellite-owning countries will agree on a rigid plan affecting some frequencies currently used by the United States for purposes relating to national security. The degree of planning may be a delicate mix that some can call "a priori" and others call "flexible" (see the table for the range of possible WARC outcomes). [Redacted]

The best hope for the United States is that other satellite-owning countries stand firm either on maintaining flexible procedures for regulating the orbit or—as a fallback position—on limiting planning schemes to just enough of the spectrum to satisfy LDC demands. If the satellite-owning countries remain united in opposition to whole-scale planning, then—even if the conference votes for such a scheme—the more advanced countries probably would be in a position to take reservations and honor the conference's will only in the breach. If, however, a

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majority of space-using countries agree to a rigid planning scheme, the US Government might be forced to go along, even if it maintained legal opposition. Not to do so would open up US satellite communications—both government and commercial—to unacceptable levels of random interference.

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The next best hope for the United States is that the conference make only provisional decisions on regulating the orbit and the spectrum, leaving it to an intersessional study group to determine feasibility and make recommendations to the 1988 session. This would allow time to put additional pressure on other satellite-using countries to stand firmly behind a more flexible approach to planning.

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## Appendix A

### Developments Leading Up to Space WARC

Regulations—requiring advance publication, coordination, and notification—governing space systems using the geostationary satellite orbit and spectrum were first recommended and partially formulated by the International Telecommunication Union in 1963, adopted in 1971, and modified in 1979. They provide the mechanism for coordinating satellites in the geostationary orbit today. The provisions state that:

- All members of the ITU have a right to an equitable and rational use of frequency bands allocated to space radio communications.
- Use and exploitation of the frequency bands allocated to space services are subject to international agreements based on justice and equity, permitting the use and sharing of these bands in the mutual interest of all nations.
- Countries that have registered with the ITU do not have permanent authority for their space services and “should not create an obstacle to the establishment of space systems by other countries.” Furthermore, states that have registered with the ITU “should take all practicable measures to realize the possibility of the use of new space systems by other countries or groups so desiring.”

#### Previous Conferences

The *World Administrative Radio Conference for Space Telecommunication* in 1971:

- Defined the broadcasting satellite service from transmitter to receiver (downlink) and allocated the first frequency bands to this service.
- Decreed that stations in the broadcasting satellite service would be established and operated in accordance with agreements and plans adopted by world or regional administrative conferences.

Proponents of planning forced adoption of the provision calling for plans and agreements by arguing that one could not implement terrestrial services in the

same bands as space services without causing interference unless one knew the frequencies and orbital positions of future satellites.

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The *World Broadcasting Satellite Administrative Radio Conference*, the first space planning conference, was held in 1977 to plan the broadcasting satellite band near 12 GHz, which it did for ITU Region 1 (Africa, Europe, and the USSR) and Region 3 (Asia and the Pacific Southwest). The conference planned in detail the use of five channels per satellite service area. Region 2 (the Americas) delayed planning until 1983. Technology had advanced so much by then that the Region 2 conference planned the use of 32 channels per satellite service area.

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Although these various conferences dealt with satellite services, the 1979 *World Administrative Radio Conference* was the first in 20 years with the authority to revise allocations, regulations, and procedures for all the services and all the frequency bands. During the deliberations, some governments argued that the current regulatory process for satellites using the geostationary orbit might be inequitable and that arrangements for rectifying the situation should be investigated. The conference acted on the following space matters:

- Calling for a two-session WARC on the use of the geostationary orbit and the planning of space services utilizing it.
- Endorsing the 1971 WARC resolution decreeing that all stations in the broadcasting satellite service be established and operated under agreements adopted by world or regional conferences.
- Allocating several new fixed satellite service bands, some of which are reserved for feeder links (uplinks) for broadcasting satellites.
- Incorporating the 1977 Broadcasting Satellite Plan for Regions 1 and 3 into the ITU Radio Regulations and adopting a resolution calling for a WARC to plan feeder links (uplinks) for Regions 1 and 3 broadcasting satellites.

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The 1979 WARC resolution that calls for the convening of the Space WARC states that the geostationary orbit and radiofrequency spectrum are limited natural resources and that there is need for equitable access to, and efficient and economical use of, these resources by all countries. The resolution also states that the conference shall be convened to "guarantee in practice for all countries equitable access to the geostationary orbit and the frequency bands allocated to space services."

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## **Appendix B**

### **The Third World and the Consultative Process**

Prior to most ITU conferences, the Union sponsors a series of working groups and a preparatory meeting to consider technical subjects relating to the upcoming conference. The conference preparatory meeting for Space WARC took place in Geneva in June and July 1984. Recently, according to US officials, some of the LDCs, particularly India, have stated that the ITU consultative process is controlled by the developed nations and does not represent the views of the developing countries. The consultative meetings are open to all nations, but the LDCs claim that the expenses of attending such meetings are excessive. We believe that, during the actual Space WARC, the LDCs may choose to ignore some of the compromises previously worked out in the consultative sessions.



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## Appendix C

### Principles Governing the Geostationary Satellite Orbit

A working paper was introduced by Colombia, Kenya, Ecuador, and Indonesia at the April 1984 session of the Legal Subcommittee of the UN Committee on the Peaceful Uses of Outer Space. According to State Department reporting, this working paper contains eight principles, providing:

- That the geostationary satellite orbit shall be used “exclusively for peaceful purposes and for the benefit of all mankind.”
- That the geostationary satellite orbit is a limited natural resource to be preserved in the interests of all states, “taking into account the needs of the developing countries and the rights of the equatorial states.”
- That the equatorial states “shall preserve the corresponding segments of the geostationary satellite orbit superadjacent to their territories for the opportune and appropriate utilization of the orbit by all states, particularly the developing countries.”
- That the equatorial states “shall have preferential right” to the geostationary satellite orbit segment above their territories.
- That “placement of a space object” in such segment shall require “prior authorization” by the underlying state, except in cases of “transit for peaceful purposes.”
- That all states “shall endeavor to cooperate in the efficient and economic utilization” of the geostationary satellite orbit.
- That developed countries, international organizations, and developing countries having space capabilities should “facilitate and accelerate space science and technology transfers” to the LDCs.
- That “necessary actions” shall be taken to remove nonoperational or unutilized space objects from the geostationary satellite orbit.

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## Appendix D

### Recent UN General Assembly Resolutions on the Outer Space Arms Race

From General Assembly Resolution 39/96,  
*International cooperation in the peaceful uses of  
outer space*, adopted without a vote on 14 December  
1984:

*Gravely concerned* at the extension of an arms race  
into outer space,  
*Recognizing* that all States, in particular those with  
major space capabilities, should contribute actively to  
the goal of preventing an arms race in outer space as  
an essential condition for the promotion of interna-  
tional cooperation in the exploration and uses of outer  
space for peaceful purposes.

13. *Urges* all States, in particular those with major  
space capabilities to contribute actively to the goals of  
preventing an arms race in outer space as an essential  
condition for the promotion of international coopera-  
tion in the exploration and uses of outer space for  
peaceful purposes.

15. *Requests* the Committee on the Peaceful Uses of  
Outer Space to consider, as a matter of priority, ways  
and means for maintaining outer space for peaceful  
purposes and to report thereon to the General Assem-  
bly at its fortieth session.

20. *Requests* the Committee on Peaceful Uses of  
Outer Space to continue its work, in accordance with  
the present resolution, to consider, as appropriate, new  
projects in outer space activities and to submit a  
report to the General Assembly at its fortieth session,  
including its views on which subjects should be stud-  
ied in the future.

From General Assembly Resolution 39/59,  
*Prevention of an arms race in outer space*,  
vote 150-0-1 (US abstained) on 12 December 1984:

The General Assembly,

*Reaffirming* . . . of the Tenth Special Session of the  
General Assembly, the first special session devoted to  
disarmament, in which it is stated that, in order to

prevent an arms race in outer space, further measures  
should be taken and appropriate international negoti-  
ations held in accordance with the spirit of the Treaty.

*Gravely concerned* at the danger posed to all mankind  
by an arms race in outer space, in particular the  
impending danger of exacerbating the current state of  
insecurity by developments that could further under-  
mine international peace and security,

1. *Recalls* the obligation of all States to refrain from  
the threat or use of force in their space activities;

2. *Reaffirms* that general and complete disarmament  
under effective international control warrants that  
outer space shall be used exclusively for peaceful  
purposes and that it shall not become an arena for an  
arms race;

4. *Calls upon* all States, in particular those with  
major space capabilities, to contribute actively to the  
objective of the peaceful use of outer space and to  
take immediate measures to prevent an arms race in  
outer space in the interest of maintaining interna-  
tional peace, security and promoting international cooper-  
ation and understanding;

9. *Urges* the Union of Soviet Socialist Republics and  
the United States of America to initiate immediately  
and in a constructive spirit negotiations aimed at  
preventing an arms race in outer space and to advise  
the Conference on Disarmament regularly of the  
progress of their bilateral negotiations so as to facili-  
tate its work;

12. *Decides* to include in the provisional agenda of its  
fortieth session the item entitled "Prevention of an  
arms race in outer space."



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## Appendix E

### Soviet Draft Resolution for 1985 Administrative Council

#### *The Activities of the ITU in Telecommunications and the Peaceful Uses of Outer Space*

The Administrative Council,

Guided by the provisions of the International Telecommunication Convention (Nairobi, 1982) with regard to the role of telecommunications in the peaceful uses of outer space, Resolution 36 "collaboration with international organizations interested in space radio-communications" and other appropriate resolutions adopted by the ITU Plenipotentiary Conference (Nairobi, 1982);

Having considered the annual report of the activities of the ITU in telecommunications and the peaceful uses of outer space;

Noting with satisfaction the growing role of the ITU in this field;

Recognizing the constantly increasing importance of satellite communication systems in the exploration and use of natural resources, meteorology, in the development of the economy, culture, and education of all countries, particularly the developing countries;

Mindful that the *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies*, stipulates that the exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries and shall be the province of all mankind;

Referring in particular to articles III and IV of the aforesaid treaty, point 80 of the final document of the Tenth Special Session of the United Nations General Assembly, the relevant provision of the report of the Second United Nations Conference on Peaceful Uses of Outer Space A/Conf.101/10, United Nations General Assembly Resolutions 36/99, 37/83, 37/89, 37/90, 37/92, 38/70, 39/59, 39/96 and other relevant resolutions;

Taking note of Resolution 38/1888J, approved by the United Nations General Assembly at its 38th session, inviting the "specialized agencies and other bodies and programs within the United Nations system to increase further their contribution within the sphere of their competence to the cause of the limitation of armaments and disarmament;"

Taking note also of the United Nations General Assembly Resolution 39/96 which expresses deep concern over the extension of the arms race into outer space and recognizes that all States should actively contribute to the goal of preventing the arms race in outer space as an important condition for promoting international cooperation in the field of exploration and peaceful use of outer space and invites the United Nations specialized agencies and other international organizations to continue and, as far as possible, broaden their cooperation with the United Nations Committee on the Peaceful Uses of Outer Space and to report to it on the progress in their work related to peaceful uses of outer space;

Expressing the general concern of all mankind in the further exploration and use of outer space for peaceful purposes;

Recognizing the danger that would threaten mankind should outer space become an arena of the armaments race, which might in particular result in serious consequences and inflict substantial damage to the development and existence of satellite communications;

Noting that the success of World Communications Year 1983 provided a fresh confirmation of the importance of the telecommunications infrastructure both as an essential condition for economic and social development and as an inseparable element of such development;

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1. Instructs the Secretary General to continue (sic) and the United Nations, its specialized agencies and other international organizations in the field of peaceful uses of outer space;
2. Requests the directors of the International Consultative Committees to assign to their study groups the thorough consideration of the disastrous consequences of spreading the arms race to outer space for the normal working of satellite communications;
3. Requests the Secretary General to bring this resolution to the attention of the telecommunication administrations of the ITU member states and the appropriate bodies of the United Nations and its specialized agencies.

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## Appendix F

### Legal Impact of the Space WARC

Delegates at the first session of the Space WARC will produce a *final report*. This report does not modify the treaty instruments of the ITU. However, at the concluding session of the WARC, delegates will put the first session's final report, perhaps modified, together with the work of the second session into the *final acts*. The final acts contain modifications for the ITU Radio Regulations, an international treaty the United States has ratified. During the final days, the US delegation may submit statements and counter-statements to the *final protocol* of the conference. Such statements may be responses to statements in the *initial protocol*, or they may constitute reservations to portions of the conference final acts.

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Because the final acts modify a treaty instrument, the executive branch of the US Government must submit them to the Senate for advice and consent. Subsequently, the President has to ratify the final acts. At the time of ratification, the President may reaffirm prior reservations.

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