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Major Legal Issues Arising from the Use of the Geostationary Orbit

Stephen Gorove*

INTRODUCTION

The remarkable scientific and technological developments of the past three decades have resulted in the increasing use of the "geostationary orbit."[1] Advances in the technology of broadcasting, meteorological reconnaissance, tracking and data relay from orbital satellites, for example, have greatly enlarged its importance.[2] The growing number of geostationary satellites and the anticipated increases in their use have evoked widespread concerns among many less-developed countries (LDCs) about the early preemption of available orbital positions by more developed nations. Attention has focused on the question of the maximum number of satellites that can be accommodated in the orbit. Although estimates have varied widely, ranging from 180 to 1,800, a study prepared by the United Nations Secretariat correctly observed that it was "impossible" to determine precisely the number of satellites that could occupy the geostationary orbit. The Secretariat concluded, however, that it was possible to determine whether a specific satellite system, with all its physical parameters defined, would interfere with other systems.[3]

Interference may result from physical impact or collision with other satellites, or from the simultaneous use of the radio spectrum, the availability of which is limited. While overcrowding of the geostationary orbit may not become a problem for many years (perhaps the problem may be avoided by improved or new technologies), the increasing concern of LDCs

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with the possible preemption of the orbit by more developed nations has raised a number of significant issues.

CLAIMS OF SOVEREIGNTY OVER THE GEOSTATIONARY ORBIT

Is the geostationary orbit a part of outer space? This question was brought to the fore by the Bogota Declaration of 1976,[4] in which eight equatorial countries claimed segments of the orbit directly above them as integral parts of their national territories over which they exercised complete and exclusive sovereignty. These countries also declared that segments of the orbit over the high seas constituted the "common heritage of mankind." In support of their claim, they argued principally that there was no satisfactory definition of outer space to warrant the inclusion of the geostationary orbit in outer space; that the ban on national appropriation mandated by article II of the Outer Space Treaty[5] of 1967 was not applicable because of the lack of such a definition; and, consequently, that the geostationary satellite orbit (GSO) was not covered by the Outer Space Treaty.[6]

International Customary Law

Before the recent claims of equatorial countries, no formal objections had been made by underlying states to the orbiting directly overhead of satellites by other countries. This acquiescence for almost two decades of satellite launchings appeared to indicate a general consensus that earth orbiting satellites were located in outer space and not in an area subject to the sovereignty of the underlying state. Even though no precise line had been drawn between air space and outer space, a norm of customary international law seemed to have emerged.[7]

International Treaty Law

The Outer Space Treaty, the first major international agreement of its kind, was negotiated out of a desire to establish principles governing man's activities in outer space. As earth orbiting satellites represented the principal activities before and during the drafting of the treaty, the drafters must have intended to apply the treaty provisions, including the freedom of exploration and use of outer space, to satellites irrespective of whether they moved in lower or higher orbits. If the Outer Space Treaty applied to earth orbiting satellites, then its ban on the national appropriation of outer space by claim of sovereignty or by any other means also applied.[8]

In view of international customary and treaty law, the legal validity of

the claims of equatorial countries received little support in the United Nations.[9] The recent UNISPACE Conference summarized the dominant view in the following statement:

> Despite the lack of agreement on defining the precise boundary between airspace and outer space, it is accepted by most nations that GSO is a part of outer space and, as such, it is available for use by all States, in accordance with the Outer Space Treaty of 1967.[10]

In all fairness to the position adopted by the equatorial countries at Bogota, one should note that, in their view, the geostationary orbit was a physical phenomenon related to the reality of our planet because its existence depended exclusively on the earth's gravitational phenomena. For this reason, they felt it should not be included in the concept of outer space but instead, regulated, under a *sui generis* regime.[11]

NATIONAL APPROPRIATION

Another major issue that has been raised in connection with the claims of equatorial states is whether article II of the Outer Space Treaty, which prohibits the national appropriation of outer space, bars the placement and maintenance of satellites in designated geostationary orbital locations. Such a result would undermine claims of sovereignty over segments of the orbit; in fact, it appears to deny the existence of any right, by claim of sovereignty or otherwise, to the continued exclusive use of orbital locations.

Crucial to a proper analysis of this issue is an understanding of the concept of "appropriation." The term "appropriation" in law is used most frequently to signify "the taking of property for one's own or exclusive use with a sense of permanence."[12] The word thus indicates something more than just casual use.

The question then becomes whether the continued exclusive occupation by a geostationary satellite of the same physical area is a violation of the ban on national appropriation. While a state may certainly exercise exclusive control over a traditional object, such as a ship, or an aircraft, or a part of airspace, it is not clear that a satellite in geostationary orbit would be able to maintain its exact position and occupy the same area over a period of time.[13] Even if a position could be accurately maintained, and thus possibly constitute an "appropriation" within the meaning of article II, the satellite would have to be kept in that orbit with a "sense of permanence" and not on a temporary basis.

It has been suggested that the keeping of a solar power satellite in

geostationary orbit for a period of thirty years would not constitute appropriation.[14] In point of fact, thirty years would probably satisfy the "sense of permanence" requirement, unless the geostationary orbit were considered a natural resource as characterized by the International Telecommunication Convention of 1973 (ITC)[15] and as claimed by the equatorial countries. Authority exists to support the view that the ban on national appropriation of outer space does not relate to resources.[16] In view of this and the additional fact that solar energy is an inexhaustible and unlimited resource, its utilization for transmission to earth by satellites does not appear to fall under the prohibition of article II of the 1967 Treaty.

EQUITABLE ACCESS

The third major issue concerning the use of the geostationary orbit is the definition of the term "equitable access," which appears in several international instruments associated with the International Telecommunication Union (ITU). The use of this phrase reflects the persistent efforts of LDCs to guarantee for themselves equal rights to the geostationary orbit. Their efforts yielded early results with the adoption of a resolution by the 1971 World Administrative Radio Conference for Space Telecommunications (WARC-ST) which, while not constituting a legal obligation, stated in rather unequivocal terms that all countries had equal rights to both the use of radio frequencies allocated to various space radio communication services and to the geostationary satellite orbits associated with them.[17] The resolution also stated that the radio frequency spectrum and the geostationary satellite orbit were limited natural resources required to be used most effectively and economically. Moreover, the resolution stressed that registration with the ITU of frequency assignments for space radio communication services and their use should not provide any permanent priority for any individual country or groups of countries and should not create an obstacle to the establishment of space systems by other countries.[18]

In 1973, the term "equitable access" appeared for the first time in an international agreement binding on the parties. The International Telecommunication Convention stipulated that

> In using frequency bands for space radio services Members shall bear in mind that radio frequencies and the geostationary satellite orbit are limited natural resources, that they must be used efficiently and economically so that countries or groups of countries may have equitable access to both in conformity with the provisions of radio regulations according to their needs and the technical facilities at their disposal.[19]

The convention also mandated that all stations, whatever their purpose, must be established and operated in such a manner as not to cause harmful interference to the radio services or communications of other members.[20]

The requirement of equitable access was reiterated in Resolution No. 3 of the 1979 World Administrative Radio Conference (WARC '79) in the proviso contemplating a future WARC "to guarantee in practice for all countries equitable access to the geostationary-satellite orbit and the frequency bands allocated to space services."[21] This particular sentence of the Resolution appeared to be a broad sweeping provision requiring unconditional equitable access if considered in isolation and if the words "in practice" were interpreted to mean "in fact" rather than "in use." This language must, however, be read in the full context of all relevant ITU instruments.

Resolutions of the ITU administrative conferences are not legally binding but rather expressions of aspirations, if not moral commitments. By contrast, the ITC and the Radio Regulations legally bind the states which are parties to them. Any meaningful attempt to interpret Resolution 3 of WARC '79 should bear in mind that ITC provisions and WARC resolutions on equitable access are closely related. Thus, it is essential to consider, in addition to Resolution 3 itself, Resolution 2 of WARC '79[22] and article 33 of the ITC.

As for Resolution 3, it should be stressed that the guarantee of equitable access "in practice" does not refer to an already existing situation but only to a goal to be achieved since the resolution states that a future conference would be called "to guarantee in practice for all countries equitable access." Other sections of the Resolution also speak of the "need for" equitable access, implying that it does not exist at the present time.

The phrase "guarantee in practice" can be interpreted to mean that the guarantee hinges "on practice;" that is, without "practice," or ability to engage "in practice," there can be no guarantee. In other words, the countries must actually be able to use the geostationary orbit and not just merely assert a claim in order to avail themselves of the guarantee of equitable access. To be sure, such an interpretation is inconsistent with the position that the words "guarantee in practice" mean "guarantee in fact." Several persuasive arguments exist, however, which appear to support fully the position that the guarantee is related to actual use. Resolution 3 clearly states that its reference to equitable access is "as provided for" in article 33 of the ITC which, in turn, dictates that such access is to be afforded in conformity with the radio regulations and according to the countries' "needs and the technical facilities at their disposal." Article 33 thus confirms that, without a demonstrated need and the ability to use the orbit measured in terms of available technical facilities, no guarantee or right to such access exists.

This interpretation does not conflict with the letter and spirit of Resolution 3 and Resolution 2. Resolution 3 also notes that the use of the orbit-spectrum resource by individual countries and groups of countries can take place at "various points of time," based on their "requirements" and the "availability of the resources at their disposal." An almost identical statement appears in Resolution 2, except that instead of the phrase "availability of the resources at their disposal," Resolution 2 contains the words "readiness of technical facilities of countries."

It is clear from this analysis that the two crucial preconditions of equitable access set forth in Article 33—"need" and "availability of technical facilities"—have not been changed by the two resolutions of WARC '79. On the contrary, the Resolutions go further than Article 33 in making clear that access to the orbit-spectrum resource is not necessarily immediate but depends upon a country's requirements and available resources. The substitution of the word "requirements" in the two Resolutions for the word "need" in Article 33 does not appear to modify the basic precondition for the use of the orbit-spectrum resource. In addition, requirements of efficient and economic use, which are included in all three instruments as discussed below, fully support this interpretation.

Effects of the Nairobi Conference

The preceding analysis of the meaning of the term "equitable access" has been based on the "*lex lata*," that is, on the law as it exists today. Certain changes were, however, introduced at the recent ITU Plenipotentiary Conference in Nairobi which will enter into force on January 1, 1984, for countries that have adopted them.[23]

The most important change relevant to our discussion is the deletion from article 33 of the ITC of the phrase "according to their [countries'] needs and the technical facilities at their disposal" and the substitution in its place of the words "taking into account the special needs of the developing countries and the geographical situation of particular countries." This change was preceded by a similarly worded addition to article 10, para. 3(c) of the ITC requiring the International Frequency Registration Board (IFRB), in furnishing advice to members, to take into account such "special needs" and "geographical situations."[24]

While these changes were made in a climate of increasing demands on the part of LDCs for social and economic development and for technical cooperation and assistance, their effect on existing law must be carefully determined. At first glance, the omission of the reference to needs and technical facilities seems to suggest that these will no longer play a role in determining equitable access. This impression is, however, incorrect for several reasons. First, the substituted phrase still refers to needs, albeit

"special needs," of the LDCs which must be taken into account. Second, whether the actual needs of both developing and developed countries must still be considered, in addition to their "special needs," depends upon the interpretation of the word "equitable" as part of the phrase "equitable access," which has been retained in the revised version of article 33.

The word "equitable" generally is taken to mean "fair," "reasonable," "impartial," or something that is "not arbitrary."[25] The term does not necessarily imply equality. Clearly, a country which has no need or desire for access should not be accorded access.[26] Since equitable means an absence of "arbitrariness," no permanent priority should thus be given to any country for access or use of the orbit/spectrum. This is quite clear from the relevant portions of the 1971 and 1979 WARC resolutions which have not been altered either explicitly or implicitly.[27]

As for the omission of the reference to available technical facilities, a similar analysis can be made. The word "access" presupposes a technical ability to reach the geostationary orbit. Access clearly does not imply ownership of a position, or segment of the orbit, but only admittance to it. In addition, access does not imply sharing of the benefits that a country may derive from its use of the geostationary orbit. Although the common heritage provision of the Moon Agreement[28] requires "equitable sharing" by the parties in the benefits derived from lunar and other natural resources, no such requirement exists for the geostationary orbit.

The preceding interpretation of the word "access" is in complete harmony with the unaltered requirements of "efficient and economical use" contained in article 33 of the ITC. Efficiency and economy are vital because of the limited nature of the orbit-spectrum resource. Evidently, neither the requirement of needs nor that of technical ability has been eliminated because they are implicit in the terms "efficient and economical use" and "equitable access." In other words, the revised version of article 33 avoids a somewhat unnecessary repetition.

The additional requirement, however, to take into account the "special needs of developing countries" and the "geographical situation of particular countries" clearly introduces two new elements into the equation. While the precise meaning of the terms "special needs" and "geographical situation" remains elusive, Resolution 3 of WARC '79 did state that, in the use of the geostationary orbit for space services, attention should be given to the "relevant technical aspects concerning the special geographical situation of particular countries."[29] This language resulted from a compromise deleting a proposed reference to equatorial countries and substituting the phrase in question. The substitution allowed for possible consideration of polar and other (including equatorial) regions. The new version of article 33 omits reference to relevant technical aspects but appears to leave the door wide open for consideration of geographical situations in general, and

not just of the "special" geographical situations of particular countries. Thus, the geographical situations of particular countries, based on whatever criteria (equatorial, polar, etc.), are to be taken into account along with the special needs of developing countries. Both terms must be considered within the overall framework of the other essential requirements.

By far the most intriguing question is the relative importance of the principles of efficient and economical use and equitable access. In what way, if any, should greater economy or efficiency of newer satellites affect priorities? Should access be guaranteed when actual use would involve lesser efficiency and economy? Neither the old nor the revised version of article 33 answers these questions. Resolutions 2 and 3 of WARC '79 provide little help as well. Article 33 in both of its forms mentions first "efficient and economical use" and adds "equitable access" at the end of the same sentence. Resolution 3, on the other hand, reverses the order. Thus, it appears doubtful that special emphasis was intended by the relevant order of words. More likely, efficiency, economy and equity were intended to be considered equally in a particular case. It remains to be seen whether the same can be said for the consideration of the special needs of developing countries and the geographical situations of particular countries.

CONCLUDING THOUGHTS

This article has identified three major legal issues arising from the use of the geostationary orbit: issues of sovereignty, national appropriation, and equitable access. The first two were raised by claims of equatorial countries culminating in the Bogota Declaration; the last has resulted from the persistent efforts of LDCs to obtain what they perceive as their fair share of global resources. These efforts have stretched well over a decade and are reflected in ITU related instruments and deliberations.

These issues are closely related, not only because they concern the geostationary orbit, but also because they stem from the same underlying motivations of developing countries. The LDC's aspirations have been expressed frequently in the United Nations and are reflected in the catch-all phrases of "economic development" and "technical assistance;" in the invention of new concepts, such as the "common heritage of mankind;" and in unwavering efforts to establish special international regimes for the exploitation of the moon and other celestial bodies and the deep seabed.

While the issues of sovereignty and national appropriation appear, for all practical purposes, to be legally defunct, the LDC's have been successful in sustaining their demand for a *sui generis* outer space regime in the United Nations. Although UNCOPUOS has so far been unable to define outer

space or to construct a special legal regime, the developing countries' efforts in the ITU to press for equitable access have moved the debate in the direction of planning the space services using the geostationary orbit.

The 1985 Space WARC is expected to address the issue of planning and to determine the kinds of frequency bands and space services to be planned with due regard to efficient and economical use and equitable access. Once the Nairobi changes go into effect, the "special needs" of developing countries and the "geographical situation" of particular countries must also be considered. Ultimately, what is or is not "efficient and economical use" and "equitable access," much like what are or are not to be regarded "special needs" and "geographical situations," will have to be determined on the basis of accepted criteria.

NOTES

[1] The term "geostationary orbit" describes the area located at a distance of approximately 35,800 kilometers above the earth's surface. A satellite placed in this orbit appears stationary in relation to a point on the earth. However, it is not quite accurate to describe the satellite so placed as being completely stationary, because within the geostationary orbit satellites move in a three-dimensional corridor. Thus, depending on its altitude, speed and inclination to the equatorial plane, the satellite can move up to seventy-five kilometers in a north-south direction and fifteen kilometers in an east-west direction. In view of this, station-keeping operations are necessary to keep a satellite in the generally desired position. *See generally* THE WORLD IN SPACE-A SURVEY OF SPACE ACTIVITIES AND ISSUES 459 (R. Chapman ed. 1982) (prepared for the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space, commonly referred to as UNISPACE 82) [hereinafter cited as WORLD IN SPACE]; *see also infra* notes 10 & 11 and accompanying text.

[2] *See* Busak, *The Geostationary Orbit—International Co-operation or National Sovereignty?*, 45 TELECOM J. 167 (1978); Gehrig, *Geostationary Orbit—Technology and Law*, in PROCEEDINGS OF THE NINETEENTH COLLOQUIUM ON THE LAW OF OUTER SPACE 267 (1977); Gorove, *The Geostationary Orbit: Issues of Law and Policy*, 73 AM. J. INT'L L. 444 (1979).

[3] United Nations Committee on the Peaceful Uses of Outer Space [UNCOPUOS], Physical and Technical Attributes of the Geostationary Orbit, U.N. Doc. A/AC.105/203, at 7 (1977).

[4] *See* International Telecommunications Union [ITU] Doc. No. 81-E, Annex 4 (1977), *reprinted in* 6 J. SPACE L. 193 (1978).

[5] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967, 18 U.S.T. 2410, T.I.A.S. No. 6347, 610 U.N.T.S. 205 (entered into force Oct. 10, 1967) [hereinafter cited as Outer Space Treaty].

[6] *See supra* note 4.

[7] *Cf.* McDougal, *The Emerging Customary Law of Space*, 58 NW. U.L. REV. 618 (1964) (discussion of customary law governing outer space).

[8] *See* Outer Space Treaty, *supra* note 5, at art. II.

[9] *See* Gorove, *supra* note 2, at 459.

[10] Report of the Second United Nations Conference on the Exploration and Peaceful Uses

of Outer Space, U.N. Doc. A/Conf.101/PC/L.20, at 70 (1982) [hereinafter cited as Report of UNISPACE 82]; *see also* WORLD IN SPACE, *supra* note 1.

11 Report of UNISPACE 82, *supra* note 10, at 70.

12 S. GOROVE, STUDIES IN SPACE LAW: ITS CHALLENGES AND PROSPECTS 82 (1977).

13 WORLD IN SPACE, *supra* note 1, at 459.

14 *See* POLITICAL AND LEGAL IMPLICATIONS OF DEVELOPING AND OPERATING A SATELLITE POWER SYSTEM 48 (G. Hazelrigg ed. 1977) (report prepared for NASA by Econ., Inc.).

15 International Telecommunications Convention, Oct. 25, 1973, art. XXXIII(2), 28 U.S.T. 2495, T.I.A.S. No. 8572.

16 *E.g.*, INTERNATIONAL LAW ASSOCIATION, REPORT OF THE FIFTY-FOURTH CONFERENCE 427 (1970). This position has also been adopted by UNCOPUOS in reference to the natural resources of the moon and other celestial bodies. *See* UNCOPUOS, Doc. A/AC.105/C.2/WG.1/WP.3; Press release U.S.-U.N. 37 (73).

17 ITU, FINAL ACTS OF THE WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS 311 (1971) [hereinafter cited as FINAL ACTS-71].

18 *Id.*

19 International Telecommunications Convention, *supra* note 15, at art. XXIII(2).

20 *Id.* at art. XXV(1).

21 ITU, FINAL ACTS OF THE WORLD ADMINISTRATIVE RADIO CONFERENCE FOR SPACE TELECOMMUNICATIONS, sec. II.A.8 (1979), *reprinted in* 2 UNITED STATES SPACE LAW - NATIONAL AND INTERNATIONAL REGULATION 184-87 (S. Gorove ed. 1982) [hereinafter cited as FINAL ACTS-79].

22 *Id.* at 183.

23 *See* ITU, FINAL ACTS OF THE PLENIPOTENTIARY CONFERENCE 24 (1982).

24 One further change was the addition of the word "equitable" before the phrase "utilization of the geostationary orbit." *Id.* at 9.

25 *See* L. ORFIELD, EQUITY AS A CONCEPT OF INTERNATIONAL LAW 128 (1930) (observation that the concept of equity in international law may include ideas such as overall reasonableness and the use of interpretation and suitable analogies).

26 Need in this context can be measured by such criteria as the size of the country, its population, its investment in the resource and many other factors.

27 *Compare* FINAL ACTS-71, *supra* note 18, at 312 *with* FINAL ACTS-79, *supra* note 21, at 184.

28 Draft agreement governing the activities of States on the moon and other celestial bodies, U.N. Doc. A/34/20, *reprinted in* UNITED STATES SPACE LAW, *supra* note 21, at 82.

29 FINAL ACTS - 79, *supra* note 21, at 184.