SPACE LAW AND THE GEOSTATIONARY ORBIT: THE ITU'S WARC-ORB 85-88 CONCLUDED

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Introduction

Another chapter has been written in space law. A revised set of international radio regulations has been formulated to regulate selected communication satellite uses of the geostationary satellite orbit (GSO). Because some operational communication satellite systems would not accommodate some proposed systems over a decade ago, future GSO systems were seriously threatened with unnecessary burdens. The burdens may yet be avoidable, however, with due diligence and a little common sense.

A problem that arose, in part, out of arrogance, and was aggravated by emotion, has now been resolved, but in a less than optimal way. Acting through the International Telecommunication Union (ITU) the international community has rationalized a method to overregulate selected future uses of the GSO by means agreed to in a compromise revision of the ITU Radio Regulations.

Serving in the time-honored tradition of a successful bureaucracy, the ITU has helped us muddle through another crisis of resource mismanagement, and helped us all to avoid responding to a problem with a solution that could have been more difficult to manage than the problem that was being addressed.

I. Background

The World Administrative Radio Conference (WARC) on the Geostationary-Satellite Orbit and the Planning of the Space Services Utilizing It (ORB-85-88) was a two-part conference that grew out of problems which arose in the mid-1970's. India and Indonesia were planning the establishment of their respective domestic satellite systems, which included use of fixed-satellite service (FSS) radio frequencies and desired positions on the geostationary orbit. Nations with services in that orbit and Intelsat, with satellites in service in that orbit, did not readily agree to adjust their operational systems and internationally coordinated system plans to accommodate the proposed systems of India and Indonesia[1]. Protracted negotiations ensued and the Indian and Indonesian governments decided that their positions as late-comers left them too vulnerable to the intentions and desires of developed countries. Subsequently, India and Indonesia

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1. For a general account of these events see First Report of the FCC Advisory Committee for WARC-ORB-1 (Dec. 1983) 4-24, submitted in FCC Doc. GEN-80-741; also redacted in Doyle, S.E. *"Regulating the Geostationary Orbit: ITU's WARC-ORB-85-88"* 15 J. SPACE L. 1-23, at 7-8 (1987). The Indian Government explained its frustration in IFRB Report to the First Session of WARC-ORB, ITU, Geneva, 1985 (annex); see WARC-ORB-1, Conf. Doc. No. 4E, 10 January 1985.

developed a strategy to seek from the 1979 ITU General World Administrative Radio Conference (GWARC) a decision to deal frontally with such conflicting claims as were emerging over the geostationary orbit. The issue was joined in Geneva at the GWARC-1979.[2]

The 1979 GWARC adopted a resolution declaring that a conference would be convened for the purpose of guaranteeing in practice for all nations access to the use of appropriate radio spectrum and orbital locations for communication systems on the GSO.[3] That resolution (and one other)[4] set the groundwork in place for the WARC-ORB-85-88. Details of this background have been well documented and need not be repeated here.[5]

As it developed, the conference became, particularly during its first (1985) session, a rather politicized event in an otherwise generally technical forum. Although the ITU has a record of more than a century of dealing effectively with international coordination and cooperation in the technology and the economics of communications, the issue now being brought to the ITU forum was much more political, and to some extent emotional. This issue would require a special solution because of its political and emotional content. Clearly, any significant action taken by the ITU to "guarantee" access to the GSO would involve some measure of regulation if not denials to some nations of the use of the resources. Results of this conference could affect all satellite services for many years depending upon what scope and complexity of action were to be decided upon.[6]

The ITU is the sole specialized agency of the UN dedicated to the coordination and regulation of the radio spectrum and facilities interconnected for global communication. The political aspect of the new preoccupation with the GSO is the necessity now for the ITU to enter the process of resource allocation in an environment

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2. For interpretations of these events see Rutkowski, A.M., *"Space WARC: The stake for developing countries,"* 1 SPACE POL'Y 240-243 (1985); Jasentuliyana and Chipman, *"Developing Countries, the GEO and the WARC-ORB-85 Conference,"* 1 SPACE POL'Y 244-249 (1985); Srirangan, T., *"Equity in Orbit: Planned Use of a Unique Resource"* a paper presented to the International Institute of Communications Annual Conference 1984, Berlin, Sept. 21-23, 1984; and Du Charme, Bowen and Irwin, *"The Genesis of the 1985/87 ITU WARC on the Use of the GSO and the Planning of Space Services Utilizing It,"* 7 ANNALS AIR & SPACE L. 261 (1982).

3. ITU, *Radio Regulations,* Geneva, 1982, Resolution 3, WARC '79.

4. ITU, *Radio Regulations,* Geneva, 1982, Resolution 2, WARC '79, which provides, *inter alia*, that registration of a satellite with the ITU "should not provide any permanent priority...and should not create an obstacle to the establishment of space systems by other countries."

5. See sources cited at note 2 above and sources cited in them.

6. A measure of the extent of U.S. interests in the Conference can be determined by noting the existence of U.S. Congressional advisers on the U.S. Delegation to the Conference and by the convening of special hearings to assess the results of the first session; see *World Administrative Radio Conference: Hearing before the Subcomm. on Communications and the Subcomm. on Science Technology and Space Transportation of the Senate Comm. on Commerce, Science and Transportation,* 99th Cong., 1st Sess., G.P.O., Wash., D.C. 1986.

where the demand exceeds the supply. Historically, the supply has been expanding faster than demand could consume it, but now we are reaching a cross-over where demand, at least in some regions and in some frequency bands, appears to be exceeding the available supply.[7] The perception of scarcity of resources results in:

- -- some countries wanting to protect the late entrant;
- -- some countries wanting to maintain flexibility of use; and
- -- some countries and organizations beginning to perceive, however dimly, that cooperation and accommodation in the use of the GSO are far superior solutions to a conference to establish a long-term, global, *a priori* plan.

II. WARC-ORB-85: The First Session

Details of the planning, organization and conduct of the first session of WARC-ORB have been reported in this journal[8] and in other locations. For this discussion, let us concentrate on the major decisions taken by the first session.

It was decided early and unanimously that it was not necessary to plan beyond the Broadcasting-Satellite Service (BSS) and the Fixed Satellite Services (FSS) at that time. It was agreed that within the FSS bands planning would be applied to selected bands only (6/4, 14/11-12 and 20/30 GHz bands). A series of eleven planning principles were adopted dealing with:

1. Guarantee of access and equitability
2. Sharing with other services
3. Reservation of resources
4. Technical aspects of special geographical situations
5. Consideration of existing systems
6. Provisions for multi-administration systems
7. Flexibility to accommodate unforeseen needs
8. Planning solutions adapted to circumstances
9. Efficiency in orbit and spectrum use
10. Provisions for multi-service and multi-band networks
11. Administrative costs controlled[9].

With these principles agreed, two approaches to a planning method were developed. An allotment plan was agreed that would permit each administration to satisfy requirements for national service from at least one orbital position within a predetermined arc and in predetermined bands. The allotment plan was agreed to be established in the bands:

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7. Doyle, S.E., *"Legal and Policy Implications of Treating Natural Resources as the Common Heritage of Mankind,* in PROC. 29TH COLLOQ. L. OUTER SPACE 31 (1986).

8. See Doyle, S.E., *op. cit.* note 1; see also Smith, M. L., *"Space Law/Space WARC: An Analysis of the Space Law Issues Raised at the 1985 ITU WARC-ORB,"* 8 HOUSTON J. INT'L L. 227-245 (1986).

9. These principles are elaborated at Doyle, S.E., *op. cit.* note 1.

4 500 - 4 800 MHz and 300 MHz to be selected in the band 6 425 -7 075MHz , and 10.70 - 10.95 GHz, 11.20 - 11.45 GHz and 12.75 - 13.25 GHz.

It was agreed that improved procedures would be established to satisfy requirements in addition to those appearing in the allotment plan. Improved procedures would apply in the bands:

3 700 - 4 200 MHz
5 850 - 6 425 MHz and
10.95 - 11.20 GHz
11.45 - 11.70 GHz
11.70 - 12.20 GHz in Region 2
12.50 - 12.75 GHz in Regions 1 and 3
14.00 - 14.50 GHz
18.10 - 18.30 GHz
18.30 - 20.20 GHz
27.00 - 30.00 GHz.

Both planning approaches were to comply with the eleven principles, recited above. The planning methods were to preserve the rights of other services having equal and primary status in the bands to which the methods applied. This fact creates the need for adoption of appropriate sharing criteria.

Various additional decisions and consequential actions were adopted at the first session.[10] Planning was limited to the FSS; planning would use an arc allotment approach in some bands and improved procedures in others. The arc allotment plans would guarantee access for at least one slot for every country for a total of 800 MHz of band width in a defined service area. It was understood that some countries might require more than one orbital position. When the first session ended there still remained a great deal of work to be done. There was limited time and there were limited resources at the ITU to undertake extensive intersessional studies.

A substantial amount of work was undertaken by several administrations working with the IFRB staff in the intersessional period. By the time the second session was ready to convene in August 1988, there was an almost completed set of computer programs that could greatly assist in the arc allotment planning process. The ITU issued a call for requirements to be considered at the second session and many nations provided system requirements to support the arc allotment plan.

III. WARC-ORB-88: The Second Session

The second session of WARC-ORB commenced in Geneva on 29 August 1988 and concluded there on 6 October 1988. In total, the Conference modified eleven articles of the Radio Regulations and made modifications to or added four major appendices of the Regulations. The articles and appendices involved are:

Articles 1, 8, 11, 12, 13, 14, 15A, 27, 28, 29 and 69.

10. See ITU, *Report to the Second Session*, Geneva, 1988.

Appendices 3, 4, 28, 29, 30A (ORB 88) and 30B.

The Conference also took decisions considered necessary or appropriate, including the review and revision of existing Resolutions and Recommendations associated with the Radio Regulations, and the Conference adopted various new Resolutions and Recommendations contained in the FINAL ACTS.[11]

This partial revision of the Radio Regulations (RR) shall form an integral part of the Regulations and shall enter into force on March 16, 1990.

In changes to Article 1, the Conference adopted new definitions of the Fixed-Satellite Service and of Radio Stations and Systems. Modifications were also made to definitional terms on frequency sharing. Some technical terms related to space also were modified.

The Article 8 changes involved aspects of Frequency Allocations and as one progresses deeper into the FINAL ACTS, the technical nature of the language and the changes becomes so arcane that only the most dedicated electrical engineer specializing in radio/satellite system operation could be comfortable. Consequently, rather than describe the results of the second session in terms of what was done technically, we can consider the results of the second session in terms of their impact or consequences.

Prior to convening the second session a great deal of effort was devoted to developing computer programs for use by the ITU in arc allotment planning. France, Japan, the United States and staff of the International Frequency Registration Board (IFRB) in Geneva devoted hundreds of manhours and untold machine hours to developing and proving operable computer programs. When the second session convened, early in the session, a number of technical constraints on planning systems were agreed by the Conference that had not been included in the computer programs. During the Conference, when computer runs were made, manual adjustments to program printouts were attempted, but no fully effective program could be demonstrated to the satisfaction of all delegations. Eventually a working plan was formulated and agreed. Assumptions underlying the plan are technically conservative, and relatively few new satellite systems are anticipated in the foreseeable future. Consequently, the adopted plan is expected to be serviceable and manageable for some time. It is anticipated that work will continue on computer software to improve its use in the planning function.

The improved procedures adopted essentially refine the international notification, filing and coordination systems that exist, and they provide that when appropriate and if needed, concerned nations can call for multilateral planning meetings (MPMs) to work out regional issues involving several nations simultaneously. The fact that MPMs are available as an alternative may, in fact, encourage and facilitate early bilateral settlements of coordination. It is in the coordination process that each nation must

11. FINAL ACTS, Adopted by the Second Session of the World Administrative Radio Conference on the Use of the Geostationary - Satellite Orbit and the Planning of Space Services Utilizing It (ORB-88), ITU, Geneva, 1988 (prelim.ed.), w/errata.

understand the far-reaching consequences of a failure to be reasonable, accommodating and willing to share burdens.

An arc allotment plan has been established which guarantees for every nation at least one orbital slot (more than one for some) and 800 MHz of useable band width. There appear to be no reasons now known why this plan should not enjoy an effective, long life. The nature of the plan agreed and the improved procedures also offer a degree of flexibility sufficient to accommodate multi-administration systems. John Hampton, a Deputy Director General of Intelsat reported that Intelsat believes its interests are appropriately safeguarded by the Conference results.[12]

One of the major consequences of changes to the language in Article 11 is the clarification of intent that in the process of system coordination, accommodation of the other systems is a mutual obligation that rests on systems in place, as well as on arriving systems. The new regulations also make clear the available resort to an MPM in appropriate circumstances.

One observation made by a leading personality in the U.S. Delegation, who is a prominent telecommunication policy consultant, was that the FINAL ACTS of the second session are not self-executing -- neither self-implementing nor self-enforcing. All nations involved in or with interests in space services will have to contribute effort and attention to make the WARC-ORB-88 results workable.[13] It must be recognized by all the players that the presence of rules for a game does not ensure that the game will always be well and fairly played. In the process of coordination of space networks based on the GSO all nations must show good will, a sensitivity to equity and a willingness to share the burdens created by intersystem accommodations. That need is no less critical now than it was before WARC-ORB 85-88.

The Conference adopted the needed technical standards, parameters, and criteria to manage the FSS in the bands designated by the first session. The entire body of applicable regulatory procedures was reviewed, and where necessary, revisions and additions to procedures have been made. The Conference formulated and adopted Feeder Links for the BSS in ITU Regions 1 and 3 and it made appropriate adjustments to RR Appendix 30. The Feeder Link plan now in Appendix 30A will remain in force until at least January 1, 1994 or until modified.[14] Finally, the Conference considered the matter of sound broadcasting, but was not able to take definitive action. It is expected that India will conduct some experiments in this area and that the subject will be addressed again at a future WARC, possibly in 1992.[15] A similar disposition was made of the issue of a dedicated band for high definition television (HDTV).[16]

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12. These comments were made at a seminar held to assess outcomes of the Conference by the Center for Strategic and International Studies, Washington, D.C., *"After Space WARC: What Next?"* Nov. 10, 1988. The seminar was organized and chaired by Diana Lady Dougan, Chair of the International Communication Program of the Center. Proceedings were not published.

13. These comments by D. Jansky were made at the seminar cited at note 12.

14. See FINAL ACTS, *cit.* note 11, Appendix 30, Art. 11 mods, p. 75.

15. See FINAL ACTS, *cit.* note 11, RESOLUTION COM 5/1, Resolutions pp. 13-16.

16. See FINAL ACTS, *cit.* note 11, RESOLUTION COM 5/3, Resolutions pp. 17-20.

The major work product of the WARC-ORB-88 is a new appendix in the Radio Regulations, which is designated:

Appendix 30B

Provisions and Associated Plan for the Fixed-Satellite Service in the Frequency Bands 4 500 - 4 800 MHz, 6 725 - 7 025 MHz, 10.70 - 10.95 GHz, 11.20 - 11.45 GHz and 12.75 - 13.25 GHz*.
(*see also RESOLUTION COM 4/2)

The document itself is quite technical, and the plan is a columnated symphony of numbers, 10 pages in length, with coded column headings that defy memorization.[17] In essence the new provisions present a plan in two parts: A) the national allotments, and B) networks of existing systems. Within this plan, an allotment is:

- a nominal orbit position,
- 800 MHz (up link and down link),
- a service area for national coverage,
- generalized system technical parameters, and
- a predetermined arc.

The predetermined arc's size changes over time depending upon the degree of system definition attained by a planned system. A system in the pre-design stage has an arc of plus or minus 20° east or west of the nominal position; at the design stage the arc is reduced to plus or minus 5°; and when a system becomes operational, it is assigned a specific location with 0° of arc.[18] There is an article defining the process by which an allotment in the plan is converted to an assignment;[19] and another article explains procedures to add a new allotment to the plan.[20]

The duration of the plan is stipulated as a period of at least 20 years from the date of entry into force of these provisions (*i.e.* from March 16, 1990 to March 16, 2010).[21] The technical parameters used in characterizing the FSS Plan are set forth in Annex 1 to Appendix 30B.[22] The nature and details of data to be furnished in filings of notices related to the FSS Plan are set forth in Annex 2. Other Annexes to Appendix 30B deal with:

- criteria for determining when proposed assignments are considered in conformity with the Plan (Annex 3A);

- the macrosegmentation concept (Annex 3B);

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17. In the ADDENDUM to the preliminary edition of the FINAL ACTS see p. 39 *et. seq.*

18. FINAL ACTS, Addendum p. 42.

19. Article "L" in the FINAL ACTS, Addendum at pp. 44-52.

20. Article "K" in the FINAL ACTS, Addendum at p. 52.

21. FINAL ACTS, Addendum at p. 71.

22. *Id.* at 72-78.

- limits for determining whether an allotment or an assignment made in accordance with the provisions of Appendix 30B is considered to be affected (Annex 4);

- application of the predetermined arc (PDA) concept (Annex 5); and

- technical means which may be used to avoid incompatibilities between Fixed-Satellite Service Systems at their implementation stage (Annex 6).[23]

One RESOLUTION contained in the FINAL ACTS reviews all of the resolutions passed by various conferences since 1979 concerning WARC-ORB-85-88 and, where appropriate, identifies modified resolutions, as well as identifying those resolutions which are no longer useful or relevant, and they are cancelled.[24] There are a few additional technical matters contained in the FINAL ACTS and as a final page, there is a list of errata.

It should be borne in mind that the preliminary edition of the FINAL ACTS used to prepare this article will be superseded by a published book edition which may have other designations on article numbers, and on resolution and recommendation numbers, than those that appear herein. The titles, however, will be common and the substance of the provisions will not change.

IV. Concluding Observations

WARC-ORB-85-88 was a conference that might never had been held. The time, energy, stress and care devoted to it were required because, more than a decade ago, certain governments and organization officials were preoccupied with the letter of the law in the ITU regulations and they totally lost the spirit of the law. Much of what is now ITU RR Appendix 30B is an exercise in education and accommodation. It is an example of what happens when "national" positions are hardened, based on "sovereign interests." We all have to live together on this globe. The sooner we accept that simple fact, the sooner we will acknowledge that it is better to live in harmony than in conflict.

When the nations of the world begin to devote as much of their time, energy and resources to achieving and maintaining harmony, as we now devote to avoiding or preparing for conflict, we will be putting our energy and resources to better use. The century of global organization is entering its final decade, yet more than half of the world's nations are preoccupied with national prerogatives and maintenance of national sovereignty.

A famous American educator wrote:

> To develop international law and to teach governments and peoples how they can conduct international relations in accord with the prescriptions of that

23. *Id.* at 79-88.

24. RESOLUTION 92 (ORB-88), *id.* at 88-91.

> law is the greatest task which jurists can undertake. What processes or adjustments can the nations rely upon? What principles of justice can they accept? Until we can answer these questions, we cannot expect the nations, in the apt phrase of the Chief Justice, to abandon the law of force and abide by the force of law.[25]
>
> International law cannot be an extrapolation of our own faith or law, or of the faith or law of any nation. It must apply to the world as it is with its conflicts, it complexities, its changes and its dangers. To do this its principles must be universal, progressive, pragmatic and relative to changing conditions. We cannot expect law to descend upon the world through a stroke of genius or a grand design. Its progress depends upon the diligent work of many minds in many lands.[26]

In the view of this author, the "diligent work" of those engaged in international political and economic intercourse must be guided by the spirit of cooperation and accommodation to succeed. Unless we learn this soon, and move away from slavish adherence to the polarizing concept of absolute national sovereignty, our progress will be slow, if at all measurable.

The WARC that wasn't needed is now history. The strengthening of rules to try to legislate good sense is done in this area, for a while at least. Those who consider the GSO and related spectrum as "limited natural resources" are more secure. We tried to solve a political problem through law. But we will still have to apply some common sense.[27]

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25. Chief Justice Earl Warren, address at Urbana, Illinois, April 14, 1956.

26. Wright, Q., *"The Prospects of International Law,"* PROCEEDINGS OF THE AMERICAN SOCIETY OF INTERNATIONAL LAW 2, 11, Fiftieth Annual Meeting, Wash., D.C., April 25-28, 1956.

27. Doyle, S. E.,*"Equitable Aspects of Access to and Use of the Geostationary Satellite Orbit,"* 17:6 ACTA ASTRONAUTICA 637-646 (1988).