

1999

## Business-Driven Negotiations for Satellite System Coordination: Reforming the International Telecommunication Union to Increase Commercially Oriented Negotiations over Scarce Frequency Spectrum

Roscoe M. Moore III

---

### Recommended Citation

Roscoe M. Moore III, *Business-Driven Negotiations for Satellite System Coordination: Reforming the International Telecommunication Union to Increase Commercially Oriented Negotiations over Scarce Frequency Spectrum*, 65 J. AIR L. & COM. 51 (1999)  
<https://scholar.smu.edu/jalc/vol65/iss1/5>

This Article is brought to you for free and open access by the Law Journals at SMU Scholar. It has been accepted for inclusion in Journal of Air Law and Commerce by an authorized administrator of SMU Scholar. For more information, please visit <http://digitalrepository.smu.edu>.

# BUSINESS-DRIVEN NEGOTIATIONS FOR SATELLITE SYSTEM COORDINATION: REFORMING THE INTERNATIONAL TELECOMMUNICATION UNION TO INCREASE COMMERCIALY ORIENTED NEGOTIATIONS OVER SCARCE FREQUENCY SPECTRUM

CAPTAIN ROSCOE M. MOORE, III\*

## TABLE OF CONTENTS

I. INTRODUCTION.....	52
II. BACKGROUND.....	55
A. THE LIMITED RADIO FREQUENCY SPECTRUM .....	55
B. THE COMMERCIALY FUNDED SATELLITE COMMUNICATIONS REVOLUTION .....	56
1. <i>GEO, LEO, and MEO Satellites</i> .....	56
2. <i>The Market-Oriented and Commercially Funded             Satellite Revolution</i> .....	58
C. LOCAL TELECOMMUNICATION REGULATION .....	60
D. INTERNATIONAL TELECOMMUNICATION REGULATION .....	60
1. <i>The International Telecommunication Union</i> ..	60
2. <i>The Radio Regulations and the World Radio             Conference</i> .....	61
3. <i>The Table of Frequency Allocations</i> .....	61
4. <i>Priority Allocations</i> .....	62

---

\* The author is an Astronautical Engineer who received his degree from the U.S. Air Force Academy in Colorado Springs, Colorado. He left the U.S. Air Force as a Captain after working as a Nuclear Missile Treaty Inspector in Votkinski, Russia. The author is also a graduate of the Georgetown University Law Center in Washington, D.C. He presently works with the venture capital firm, SpaceVest, which pioneered institutional private equity investment in companies connected to the space and satellite industries.

The author would like to thank Ronald Repasi and Joseph F. Heaps of the Federal Communication Commission's Satellite Division. The author would also like to thank Professor Albert Halprin, Professor of International Telecommunications Regulation at the Georgetown University Law Center, and Stephen L. Goodman, Partner in the law firm of Halprin, Temple, Goodman, & Maher.

52	<i>JOURNAL OF AIR LAW AND COMMERCE</i>	[65
	5. <i>Master International Frequency Register</i> .....	63
III.	CURRENT SATELLITE COORDINATION PROCESS .....	63
	A. ALLOCATION OF GLOBAL SPECTRUM FOR INTENDED SATELLITE SERVICE .....	64
	B. ADVANCED PUBLICATION AND INTERFERENCE COORDINATION .....	65
	C. OBTAINING LICENSES WITHIN THE KEY NATIONS OF THE WORLD .....	67
IV.	THE PROBLEM .....	67
V.	A SOLUTION: BUSINESS-DRIVEN NEGOTIATIONS AT THE ITU .....	69
	A. SOLUTION 1: INTERFERENCE COORDINATION BECOMES THE RESPONSIBILITY OF THE ENTITY PROPOSING A SATELLITE SYSTEM.....	69
	B. SOLUTION 2: ENTITIES PROPOSING SATELLITE SYSTEMS CANNOT REPRESENT SOVEREIGN NATIONS AS DELEGATES .....	70
	C. NEITHER CHANGE WILL DECREASE THE POWER OF SOVEREIGN NATIONS BEFORE THE ITU .....	70
VI.	DISCUSSION: GLOBAL TRENDS AND THE SKYBRIDGE DISPUTE .....	72
VII.	CONCLUSION.....	75

## I. INTRODUCTION

THE INTERNATIONAL Telecommunication Union (ITU), which is a specialized agency under the United Nations, adopts international regulations and treaties governing all terrestrial and space use of the radio frequency spectrum.<sup>1</sup> The ITU, as an intergovernmental organization, has no authority to force the settlement of potential frequency conflicts between different communications systems. The only authorities with the power to settle these conflicts are the local telecommunications regulators and administrators who regulate the radio frequency spectrum within the nation's borders. The ITU provides an international venue where disputes are addressed and resolved. This venue becomes more important as frequency conflicts arise between communication systems and communication

---

<sup>1</sup> See Jannat C. Thompson, *Space for Rent: The International Telecommunications Union, Space Law, and Orbit/Spectrum Leasing*, 62 J. AIR L. & COM. 279, 286 (1996).

frequencies that are the responsibility of more than one sovereign nation.<sup>2</sup>

The accelerating development of commercially funded satellite communications systems over the last ten years presented the ITU with the problem of attempting to resolve frequency conflicts between satellite systems that are located and operated within different sovereign nations. Commercial satellite communication systems that operate over more than one country must coordinate with the ITU to prevent frequency conflicts with other communications networks,<sup>3</sup> but the ITU lacks the authority to force any of these entities to agree on a mutually beneficial use of the frequency spectrum. If these frequency conflicts arise between entities operating within one nation, the local telecommunications regulator has the sovereign's authority to resolve this conflict. Because conflicts between satellite systems occur over international boundaries, conflict resolution is achieved by sovereign diplomats, who are responsible to local telecommunications regulators, and by satellite system Chief Executive Officers (CEOs), who must protect their business interests. When these diverse interests converge at the ITU, an organization with no authority to enforce a negotiated settlement, disagreements and an inefficient use of the available radio frequency spectrum results.

Presently, several proposed multi-billion dollar commercial satellite systems are delayed because their corporations are unable to negotiate an agreement to share the frequency spectrum within important regions of the world that contain rich populations of potential customers.<sup>4</sup> These disagreements are disastrous to the commercial prospects of satellite communications companies and to the cooperative environment that the ITU attempts to foster. If the global telecommunications marketplace fractures into many different regulatory zones that only license spectrum to local communications systems, then the rapidly growing commercial satellite industry, which is global in nature,

---

<sup>2</sup> Inter-satellite links that carry information from one satellite to another in space are not the responsibility of any one nation.

<sup>3</sup> Other communications networks include satellite and terrestrial communications networks.

<sup>4</sup> ICO Global Communications in London offers a global mobile satellite phone system that is not licensed within the United States, and Skybridge, which is backed by Alcatel of France, proposes a satellite system, which may have a frequency conflict with many United States satellite systems. The United States represents about 38% of the world telecommunications market.

will cease to grow. The business plans of many new satellite systems, especially the low earth orbit constellations, depend upon obtaining frequency spectrum throughout most of the world. Without international agreement, hundreds of thousands of new high-paying jobs and tens of billions of dollars of privately funded telecommunications development will not occur.

The ITU must find a better way of encouraging commercially driven satellite systems to efficiently utilize the radio frequency spectrum. The ITU is presently a forum where sovereign ambassadors, who support the telecommunications policies of their sponsoring nations, negotiate the global use of radio frequency spectrum. Because most of these satellite systems are proposed by commercially motivated business entities, it could be argued that these ambassadors lack the authority or experience to negotiate the commercial issues inherent in the spectrum allocation process.

The ITU should allow global business entities to represent their own global interests at the ITU because the growing power of business entities in satellite communications cause many of the frequency conflicts before the ITU. Business people are more qualified than government appointed ambassadors to resolve frequency conflicts caused by other business people. A government appointed diplomat from Ghana probably lacks the authority to request that competing satellite systems share spectrum and customers in Latin America and compete elsewhere. Business negotiations and diplomatic negotiations differ. Business negotiations should be encouraged in an ITU venue that currently supports diplomatic negotiations, yet business people and business decisions currently tear the ITU apart.

The ITU Radio Communications Bureau attempts to avoid satellite system frequency conflicts through its satellite coordination process and its Radio Regulations. The satellite coordination process, which requires that a satellite system give advanced publication and notification of the global frequencies it intends to use, is controlled by the administration or country (notifying authority) deemed responsible for a satellite system. The same administrations and countries are also responsible for sending delegates to the World Radio Conferences, where changes are made to the Radio Regulations of the ITU.<sup>5</sup>

---

<sup>5</sup> See Convention of the International Telecommunication Union, *opened for signature* Oct. 25, 1973, ch. 1, § 5, art. 7, (visited Oct. 18, 1999) <<http://www.itu.int/publications/cchtm/cnvhtm>> [hereinafter ITU Convention].

The entities behind the commercially driven satellite systems theoretically receive adequate representation through the nations that choose to represent their interests before the ITU. In order to encourage more negotiation between these commercially driven entities, this paper suggests two proposals. First, the responsibility for coordinating a satellite system should belong to the entity that originally proposed the system, not to the administration or country that supports that entity's interests. Second, the ITU should allow only one delegate per nation to attend the World Radio Conference (WRC), which would prevent business entities from representing sovereign nations as delegates.<sup>6</sup> Neither of these suggestions applies to terrestrial communications systems, because conflicts with terrestrial systems should be addressed at the local regulatory level.<sup>7</sup>

These two suggestions will increase business-style negotiations at the ITU without upsetting the power of sovereign nations to control the spectrum allocation process. If business leaders remove their diplomatic masks, they may become more aggressive in making business decisions. This paper demonstrates how these two suggestions will result in minimal impact on the power of sovereigns at the ITU and a positive impact on the efficient allocation of the commercially available spectrum. This paper also demonstrates that implementation of these suggestions harmonizes with the global trend of decreased government control of commercially funded telecommunications development.

## II. BACKGROUND

### A. THE LIMITED RADIO FREQUENCY SPECTRUM

An electromagnetic radiowave carries voice, data, television, or other telecommunications content from one point to another without the use of wires or cables. In general, content

---

<sup>6</sup> Most nations have multi-party delegations providing them with a wide variety of technical and regulatory expertise and helping them deal with the diversity of issues presented at the WRC. As discussed later in this paper, these nations may keep their multi-party delegations as long as the voting head of the delegation is the only official representative of that nation at the WRC.

<sup>7</sup> Global balloon systems, such as the Sky Station system, are treated like satellites for the purposes of this paper. Even though local terrestrial systems present huge international spectrum issues for global satellite systems, these spectrum issues remain local. This paper addresses a global solution for the global spectrum problem of global satellite systems competing for the same spectrum across the globe. This paper asserts that a spectrum conflict between a terrestrial system and a satellite system is a local issue that should be handled by the local regulator within each nation.

must be carried over different frequencies, because two or more radiowaves sent at the same frequency interfere with one another.<sup>8</sup> Frequency interference leads to the cancellation or degradation of the telecommunications content carried on that frequency.

Frequency is the number of times a radio wave goes through its complete cycle in one second of time. One cycle per second is referred to as one hertz; one thousand cycles per second is referred to as one kilohertz (KHz); one million cycles per second is referred to as one megahertz (MHz); and one billion cycles per second is referred to as one gigahertz (GHz).<sup>9</sup> By transmitting telecommunications content over radio waves at different KHz, MHz, or GHz frequencies, the transmitter avoids interference with others transmitting at similar frequencies.

The radio frequency spectrum (or spectrum) is simply the range of electromagnetic radiowave frequencies used in the transmission of telecommunications content.<sup>10</sup> If an entity "has spectrum," the entity has a right to use a range of frequencies to deliver their telecommunications content. In general, spectrum is a limited resource because only one entity can use the frequencies within a slice of spectrum at any one time in the same geographical area. Rights to the limited resource of spectrum must be negotiated like the rights to precious minerals, oil, and fresh water.

## B. THE COMMERCIALY FUNDED SATELLITE COMMUNICATIONS REVOLUTION

### 1. *GEO, LEO, and MEO Satellites*

A satellite's speed prevents the earth's gravity from pulling it to earth. The great height of satellites allows them to cover large areas of the ground as they circle the earth. A communications satellite is essentially a tall cellular, microwave, or television tower that relays telecommunications signals in the form of radiowaves to receivers on the earth.<sup>11</sup> Satellite communications hold advantages over "terrestrial" or ground communications, because they do not require a large infrastructure investment in

---

<sup>8</sup> Multiple-access schemes and spread spectrum modulation architectures like CDMA or TDMA are not relevant to this basic explanation.

<sup>9</sup> See JOSEPH N. PELTON, *THE "HOW TO" OF SATELLITE COMMUNICATIONS* 212 (Silvano F. Payne ed., 2d ed. 1995).

<sup>10</sup> See *id.* at 226.

<sup>11</sup> See *id.* at 11.

cables, wires, or towers to enlighten large geographical regions with enhanced telecommunications services.<sup>12</sup>

Satellites are often classified by the altitude of their orbit. Low earth orbit (LEO) satellites fly at heights between 800 and 1600 kilometers; medium earth orbit (MEO) satellites fly at approximately 13,000 kilometers altitude; and geosynchronous earth orbit (GEO) satellites fly at 35,786 kilometers altitude.<sup>13</sup>

The orbital altitudes of communications satellites can assist or detract from their mission. The GEO satellites move with the rotation of the earth, which allows them to offer a stationary platform for telecommunications coverage relative to the surface of the earth.<sup>14</sup> Their height allows them coverage of a geographic area as large as one third of the earth, but this height also forces signals reaching them to experience at least a quarter of a second delay.<sup>15</sup> This delay can disrupt the flow of a telephone conversation or the complex "handshake" between computers connected to a communications network.<sup>16</sup>

The communications delay inherent in GEO satellites can be overcome by using LEO satellites, but the low altitude of LEO satellites forces many satellites to cover the same area that one GEO satellite could cover.<sup>17</sup> The LEO satellites, unlike the stationary GEO satellites, move in relation to the receivers on the ground below them.<sup>18</sup> The movement and low altitude of LEO satellites force system architects to design LEO systems that include multiple ground stations or the use of complex inter-satellite communication links between the satellites within the LEO constellation.<sup>19</sup> Unlike stationary GEO satellites built to serve one nation or one geographical region, the construction of a LEO or MEO system can only be justified if the potential operator intends to serve multiple nations over many geographical locations.<sup>20</sup>

---

<sup>12</sup> See PETER G.W. KEEN, *EVERY MANAGER'S GUIDE TO INFORMATION TECHNOLOGY* 243 (2d ed. 1995).

<sup>13</sup> See PELTON, *supra* note 9, at 11-12.

<sup>14</sup> See *id.* at 11.

<sup>15</sup> See *id.* at 167, 180.

<sup>16</sup> See *id.* at 131; see also *Global Satellite Marketplace 99—Clearing the Hurdles: The Satcom Industry Focuses on Execution*, MERILL LYNCH, PIERCE, FENNER, & SMITH, INC. 110 (April 14, 1999).

<sup>17</sup> See PELTON, *supra* note 9, at 180.

<sup>18</sup> See *id.* at 218.

<sup>19</sup> See *id.* at 168.

<sup>20</sup> If an entity wants to serve only one rich geographical region, it is less expensive to build and launch one GEO satellite than it is to construct multiple LEO



Attributes of MEO satellites are similar to LEO satellites except MEO satellites view more of the earth's surface.<sup>21</sup> Additionally, a disadvantage of MEO satellites compared to LEO satellites is that MEO satellites require more power and complexity to perform tasks than LEO satellites.<sup>22</sup>

## 2. *The Market-Oriented and Commercially Funded Satellite Revolution*

A revolution in communications satellites has occurred over the last ten years. Driven by tens of billions of dollars in private investment, thousands of new communications satellites were produced or proposed. Private businesses and business-oriented arms of intergovernmental organizations, such as the International Telecommunications Satellite Organization (INTELSAT)<sup>23</sup> and the International Maritime Satellite Organization (INMARSAT), proposed these new satellite system which use low and medium orbits that were not previously used for commercial communications.<sup>24</sup>

For the purposes of this paper, key aspects of this satellite communications revolution are the increased number of market-oriented participants and the increased desire for spectrum that is controlled by more than one nation. As stated above, most of the satellite systems proposed and developed over the last ten years were led by business-oriented entities. Private companies, like Iridium and Skybridge, and intergovernmental organizations, like INTELSAT and INMARSAT, compete for investment capital and international customers to justify the capital expenditure involved in building their global systems.<sup>25</sup> Whether motivated by dreams of huge profits or universal service to the world's poor, market forces steer and affect these entities. If a proposed satellite communications system cannot

---

satellites and ground stations. The justification for the construction of a LEO system originates from the potential to serve more than one geographical region.

<sup>21</sup> See PELTON, *supra* note 9, at 180.

<sup>22</sup> See *id.* at 183-84.

<sup>23</sup> See *id.* at 21, 23.

<sup>24</sup> See *id.* at 167-68.

<sup>25</sup> Satellite communications systems cost from hundreds of millions to the multiple billions of dollars to construct and launch. Because satellite systems cost so much to construct, it is logical to assume that those building these systems develop detailed plans to justify their construction. Private companies and intergovernmental organizations may have different motivations for building satellite systems, but neither have the resources to waste billions of dollars on satellite projects that do not have at least a perceived return on investment capital.

demonstrate a reasonable return on investment, then banks and other financial entities will not provide capital to fund it.<sup>26</sup> With only a handful of European banks currently providing financing for satellite communications projects and the Asian economies presently in turmoil, most of the investment capital for these new systems comes from banks within the United States.<sup>27</sup> Investment and commercial banks within the United States do not have the capital to fund all of the proposed satellite systems. The analysts within these banks, who decide which projects to finance, will evaluate each proposal for its ability to gain enough customers to earn a positive return on investment under market conditions. Potential operators must show they have a good business plan, and that they will serve a large market if they expect to receive investment capital for their satellite systems.

Almost all of the entities proposing global satellite systems realize that they must have a good business plan, and they must market their satellite services to customers throughout the globe. Acquiring the right to use radio frequency spectrum within many different nations is a prerequisite to funding most of the new satellite systems and all of the new LEO and MEO systems.<sup>28</sup> The use of inter-satellite links on some of the new LEO systems is a global spectrum issue that must also be resolved by many different nations, because these inter-satellite radio waves travel through globally shared and internationally regulated regions of outer space.<sup>29</sup> Whether the frequency spectrum is within the atmosphere or in outer space, operators of global satellite systems must show investment bankers that they

---

<sup>26</sup> Even organizations, like INTELSAT, that lack a true profit motive must convince their boards of directors that they will receive a return on investment that justifies the investment of the partner countries. Even so, most of the interference problems before the ITU are not associated with INTELSAT or INMARSAT, but with their commercial spin-offs like ICO Global Communications and New Skies.

<sup>27</sup> See *Satellite Projects*, INT'L SPACE INDUSTRY REP., Oct. 26, 1998, at 4.

<sup>28</sup> Since LEO and MEO satellite systems are not stationary, they will cover most of the globe. It is difficult to justify the construction of an inherently global satellite system if it does not access many of the potential customers below it.

<sup>29</sup> See Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, *opened for signature* Jan. 27, 1967, 18 U.S.T. 2410 (entered into force Oct. 10, 1967) [hereinafter *Outer Space Treaty*]. Article II of this treaty states, "Outer Space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means." *Id.* at art. II.

can acquire spectrum regulated by many different nations to secure capital to build their satellite systems.

### C. LOCAL TELECOMMUNICATIONS REGULATION

The use of the radio frequency spectrum within a nation's borders will always be a sovereignty issue. No nation should be able to bombard another nation with its radio, television, or other telecommunication signals without inviting conflict. The radio frequency spectrum within a nation is normally controlled and administered by an agency of the government, such as the Federal Communications Commission (FCC) within the United States, or a quasi-governmental organization called a Post, Telegraph, and Telephone (PTT).

A government agency, such as the FCC, usually regulates the use of spectrum by other government, private, domestic, and foreign entities within that nation. A local PTT usually regulates the use of spectrum and owns most or all of the entities providing telecommunications services within that nation. Because PTTs normally provide many of the telecommunications services within their nations, they frequently attempt to control the exploitation of the spectrum to impede the growth of potential competitors. The restrictive environment created by PTTs is currently loosening with the privatization of PTTs and the deregulation of telecommunications services within these nations.

### D. INTERNATIONAL TELECOMMUNICATION REGULATION

#### 1. *The International Telecommunication Union*

Many telecommunication signals and services do not stop at the borders of the nation where they originated. The International Telegraph Union was founded in 1865 to establish standards for the interconnection of telegraph networks across European boundaries.<sup>30</sup> In 1934, the name changed to the International Telecommunication Union (ITU) to reflect the inclusion of all forms of communication.<sup>31</sup> In 1947, the ITU became a specialized agency of the United Nations.<sup>32</sup>

---

<sup>30</sup> See International Telecommunication Union, *ITU's History* (visited Oct. 18, 1999) <<http://www.itu.int/aboutitu/history/history.html>> [hereinafter *ITU's History*].

<sup>31</sup> See *id.*

<sup>32</sup> See *id.*

The ITU is not a supranational organization, and it lacks a permanent charter.<sup>33</sup> The 1973 Convention of the ITU and the Radio Regulations of the ITU have the force of international treaties, but individual countries can make reservations or declarations adverse to agreements made at the ITU.<sup>34</sup> The ability to escape from unpopular agreements made at the ITU effectively allows individual nations to maintain sovereignty over the spectrum within their border. In spite of the ITU, control of the radio frequency spectrum is left firmly in the hands of the local regulator within each nation.

## 2. *The Radio Regulations and the World Radio Conference*

In 1903, the pre-ITU entity convened an International Radiotelegraph Conference to discuss the regulation of wireless telegraphy, and the first regulations governing wireless telegraphy were signed in 1906.<sup>35</sup> These regulations, which are known today as the Radio Regulations, were updated and amended continuously at other conferences since that first conference in 1906.<sup>36</sup> Changes to these regulations authorized the construction and implementation of new services, like satellite services, within particular frequency bands.

The WRC convenes approximately every two years to vote upon proposed changes to the Radio Regulations. Radio frequency spectrum for particular types of satellite and other wireless communications systems is determined at the WRC. Voting is accomplished by the member nations of the ITU where a maximum of one proxy vote is given to each nation.<sup>37</sup> Each nation may have more than one person on its delegation as long as the overall delegation has the power to represent its government without restriction and sign the Final Acts of the WRC.<sup>38</sup> The Final Acts of the WRC represent the changes that will eventually be implemented to the Radio Regulations.

## 3. *The Table of Frequency Allocations*

An International Frequency Registration Board (IFRB) was established to manage the radio frequency spectrum, and the Ta-

---

<sup>33</sup> See Thompson, *supra* note 1, at 286.

<sup>34</sup> See *id.* at 287.

<sup>35</sup> See *ITU's History*, *supra* note 30.

<sup>36</sup> See *id.*

<sup>37</sup> See ITU Convention, *supra* note 5, ch. 2, art. 31.

<sup>38</sup> See *id.*

ble of Frequency Allocations (TFA) became a mandatory register to all nations that are members of the ITU.<sup>39</sup> The TFA lists specific frequency bands allocated to particular types of communications services.<sup>40</sup> The specific frequency bands in the TFA were determined by the Radio Regulations or at WRCs.<sup>41</sup> The TFA's purpose was to prevent interference between communication stations in the air, in space, on the ground, or out at sea.<sup>42</sup> The TFA, however, did not list the actual communication systems that would utilize the spectrum set aside within the table.

#### 4. *Priority Allocations*

"Frequency allocations may be exclusive, primary, permitted, or secondary"<sup>43</sup> depending on the intended use of the set aside frequency band in the TFA. The highest classification is the exclusive allocation, which permits sole use of the assigned frequency band.<sup>44</sup> "[O]ther types of allocations involve some form of frequency sharing" between potentially interfering communications systems.<sup>45</sup>

The most common type of allocation is the multiple primary or co-primary allocation which allows two or more services to share the same frequency bands within the TFA.<sup>46</sup> A local regulator from a national administration maintains responsibility for coordinating systems within that nation if these systems share on a multiple primary basis.<sup>47</sup> Competing satellite systems that must share globally controlled spectrum on a multiple primary basis rely on the impotent ITU and the thousands of local regulators within each nation to complete the coordination of their systems. This coordination process, whether local or global, is controlled by the national administrations that regulate telecommunications within their local markets.

---

<sup>39</sup> See *ITU's History*, *supra* note 30.

<sup>40</sup> See *id.*

<sup>41</sup> See International Telecommunication Union, *Sharing The Spectrum: A Matter of International Negotiations* (visited Oct. 20, 1999) <<http://www.itu.int/new-sarchive/press/wrc97/sharing-the-spectrum.html>>.

<sup>42</sup> See *ITU's History*, *supra* note 30.

<sup>43</sup> GARY D. GORDON & WALTER L. MORGAN, *PRINCIPLES OF COMMUNICATIONS SATELLITES* 90 (1993).

<sup>44</sup> See *id.*

<sup>45</sup> *Id.*

<sup>46</sup> See *id.* at 92.

<sup>47</sup> See *id.* at 89.

### 5. *Master International Frequency Register*

The actual communications systems that use the frequency bands set aside in the TFA record and register their intended frequency assignment, and where appropriate, their orbital characteristics in the Master International Frequency Register (Master Register).<sup>48</sup> The national administration, government agency, or PTT of the country responsible for a communications system is responsible for publishing the technical specifications of its system in the Master Register.<sup>49</sup> Any entity may consult the Master Register and ascertain which communications systems are using a particular frequency and the country which is that system's notifying authority.

## III. CURRENT SATELLITE COORDINATION PROCESS

The operator of a satellite communications system must overcome local and global regulatory barriers if it intends to operate in more than one nation. Additionally, the system must be authorized by the ITU to use global spectrum, and the operator must obtain a license from the local regulator to use this spectrum within every nation that it wants to serve.<sup>50</sup> If a satellite system receives the ITU's authorization to use global spectrum, but it is not licensed within a particular country, then it lacks the authority to serve that country.<sup>51</sup>

The satellite system coordination process is the unofficial name for the set of procedures that an entity must follow through to get its system approved by the ITU and licensed in several key countries. Some may feel that this process ends when coordination with the ITU is complete, but a satellite system that can not obtain a license in a few rich countries may never get the investment capital to be built. The Radio Communication Bureau of the ITU desires to operate the maximum number of radio channels in those portions of the spectrum where harmful interference between satellite systems may occur.<sup>52</sup> If this goal is to be achieved, a satellite system's ability to

---

<sup>48</sup> See ITU Convention, *supra* note 5, ch. 1, § 5, art. 12.

<sup>49</sup> See *id.*

<sup>50</sup> See GORDON & MORGAN, *supra* note 43, at 89.

<sup>51</sup> Smaller hand-held communicators like Iridium phones and ORBCOMM pagers could operate without a license, but this would be a violation of that nation's sovereignty and customs laws. This paper assumes that satellite companies do not want to break the laws of sovereign nations.

<sup>52</sup> See ITU Convention, *supra* note 5, ch. 1, § 5, art. 12.

obtain local licenses and investment capital should be as valuable as its ability to use the available spectrum efficiently.

#### A. ALLOCATION OF GLOBAL SPECTRUM FOR INTENDED SATELLITE SERVICE

As discussed previously in sections II.D (2) and (3),<sup>53</sup> a satellite system operates within particular frequency bands only if that type of satellite service is allocated a frequency within the Radio Regulations and the TFA. An entity proposing a satellite system must ensure that sufficient spectrum is set aside within the Radio Regulations to enable the operation of the proposed service. In order to accomplish this, the entity must be able to effect changes to the Radio Regulations at the WRC.

Issues discussed and resolved at the WRC are proposed and voted upon by the representatives of national governments. The entity described above must be represented by a national government at the WRC if that entity wants spectrum set aside for its satellite service in the Radio Regulations.

Within the United States and Europe, the lobbying and negotiating that occurs between national governments and the satellite systems that they represent at the WRC are time consuming, expensive, and sometimes ineffective. In order to streamline this process, the United States established a World Radio Conference Advisory Committee (WRCAC), consisting primarily of satellite industry representatives, to assist the U.S. government in establishing an agenda beneficial to U.S. companies at the WRC.<sup>54</sup> The Europeans use a Conference Preparatory Group (CPG) to advise the European Conference of Postal and Telecommunications Administrations (CEPT)<sup>55</sup> to help establish an agenda beneficial to their companies at the WRC.<sup>56</sup> This preparation process normally lasts for two years before the actual WRC.

The WRCAC and the CPG are valiant attempts by the U.S. and European governments to represent their constituents effectively, but neither government is obligated or able to represent the desires of the satellite systems that assist their

---

<sup>53</sup> See *supra* notes 35-42 and accompanying text.

<sup>54</sup> See Scott Blake Harris, *Reform the WRC Process*, SATELLITE COMMS., Mar. 1998, at 16.

<sup>55</sup> CEPT forms an agenda that represents 43 countries, including the 15 countries of the European Union, at the WRC.

<sup>56</sup> See Gerald E. Oberst Jr., *Working on the WRC*, VIA SATELLITE, July 1998, at 14.

preparation for the WRC. Often, too many conflicting positions between national regulators and competing communications systems prevent one agenda from being agreeable to all parties. Other communication systems within these nations want to allocate spectrum for their terrestrial or satellite service, and the governments of these nations want to allocate spectrum for use by government agencies like the military.

After surviving this process, the entity proposing a satellite system will have its agenda included in the national agenda for the WRC. Additionally, the entity will probably be permitted to have one or more of its employees serve as an official member of that nation's delegation to the WRC. As mentioned previously in section II.D (2)<sup>57</sup> of this article, the delegates of a member nation must have the full authority of that nation to represent it at the WRC. Thus, a delegate from a U.S. satellite company represents the position of the United States at the WRC. Neither the U.S. government, nor any other member nation of the ITU, allows one of its delegates to espouse anything but the national position at the WRC, because anything less would undermine that nation's stance on key issues at the WRC. When employees of satellite systems attend the WRC as delegates, they are not permitted to promote their satellite system's agenda if it conflicts with the national agenda. They are not advocates for their business; rather, they are advocates for the nation.

If the U.S. government, the Europeans, or any other nation proposes an agenda at the WRC agreeable to the other member nations, then that agenda will be voted into approval. Hopefully, sufficient spectrum will be allocated in the Radio Regulations to allow the entity proposing a satellite system to offer its service. Otherwise, this entity can only hope that the nation<sup>58</sup> representing its agenda promote this agenda with more success at the next WRC in two years.

#### B. ADVANCED PUBLICATION AND INTERFERENCE COORDINATION

An entity proposing a satellite system must eventually publish, in the Master Register, its intent to operate that system within

---

<sup>57</sup> See *supra* notes 35-38 and accompanying text.

<sup>58</sup> Often, satellite companies have representatives serving on more than one national delegation during the WRC. This allows a satellite company to promote its agenda throughout the world, and it unofficially allows each national delegation to discover the intentions of other nations at the WRC. This paper proposes making some of these practices official in order to encourage negotiation and discourage unnecessary secrecy.



the frequency bands assigned to it in the Radio Regulations.<sup>59</sup> The Radio Regulations provide procedures for advanced publication, interference coordination, and notification to help resolve frequency conflicts between all potential communications systems that desire to operate within the frequency bands set aside.<sup>60</sup> Unless the Radio Regulations stipulate that the satellite services offered within this band are allocated on an exclusive basis, the entity proposing the satellite system must share the spectrum in this band with other users.<sup>61</sup> It is extremely unlikely that frequency bands appropriated to commercial satellite services will ever be allocated on an exclusive basis.

The advanced publication, interference coordination, and notification procedures helping satellite systems resolve conflicts over shared spectrum are controlled by national governments.<sup>62</sup> A national administration, also known as the "Notifying Authority," must give the Radio Communications Bureau of the ITU all of the relevant technical information for a satellite system proposed by one of its constituents.<sup>63</sup> The entity responsible for the satellite system may not do this on its own.<sup>64</sup>

When the advanced publication information for a proposed satellite system is filed with the ITU, other nations have four months to file their comments with the Bureau and the nation that is sponsoring the satellite system.<sup>65</sup> If another nation objects to the satellite system's proposed use of the frequency, then coordination procedures begin between the nation responsible for the system and any objecting nation.<sup>66</sup> In theory, over a time period of a few months (not years), the Notifying Authority will negotiate a spectrum-sharing plan with other nations that is agreeable to all of the coordinating nations. All parties can use the ITU-R technical standards or some other universally agreed upon technical standards to assist in this process. The ITU offers its assistance in resolving any disputes, but it lacks the authority to enforce any decision. Member nations of the ITU involved in the coordination proceedings are the only entities

---

<sup>59</sup> See *Procedural Aspects of Satellite Network Coordination*, ITU Doc. RES18-RI1-E (Sept. 6, 1996).

<sup>60</sup> See *id.*

<sup>61</sup> See *id.*

<sup>62</sup> See *id.*

<sup>63</sup> See *id.*

<sup>64</sup> See *id.*

<sup>65</sup> See *id.*

<sup>66</sup> See GORDON & MORGAN, *supra* note 43, at 89-90.

that possess the authority to enforce a spectrum-sharing plan for the proposed satellite system. The entity that originally proposes the satellite system must work through the nation that is its Notifying Authority if it hopes to receive an adequate sharing plan. If the Notifying Authority fails, then that satellite system may fail.

#### C. OBTAINING LICENSES WITHIN THE KEY NATIONS OF THE WORLD

When an adequate spectrum-sharing arrangement has been agreed upon at the ITU, the entity proposing a satellite system must still have its system licensed to operate within the nations that it desires to serve. If any of the previously mentioned steps in the satellite coordination process meet resistance from a particular nation, then an opportunity arises for that nation to deny a license to the offending satellite system. As mentioned in section II.D (1)<sup>67</sup> of this article, nations can opt out of agreements made before the ITU. If a nation opposed a particular type of satellite service offered in a particular frequency band, then that nation could ignore the decisions of the ITU, even if every other member nation of the ITU supported that service.

It is the responsibility of the entity that proposed the satellite system to acquire national licenses for the system. The entity leverages its own negotiating ability with the lobbying power of national governments to help it acquire licenses around the world. This is, however, an expensive process, and many satellite systems never acquire licenses in the key countries that they want to serve. Coordinating a satellite system with the ITU and coordinating the acquisition of national licenses are two separate matters. For the sake of the business-driven entities that propose these satellite systems, this is an unfortunate reality.

#### IV. THE PROBLEM

In order to acquire the use of global spectrum for a satellite system, the entity responsible for that system must complete a long and inflexible process. The entity proposing the satellite system must convince different nations to bless the operation of its system at the potential expense of other communications systems that those nations may want to champion. National government telecommunication regulators and diplomats will

---

<sup>67</sup> See *supra* notes 30-34 and accompanying text.

always control this long and inflexible process because this is presently the best way for them to provide for the needs of their citizens and constituents.

Whether a capitalist or a quasi-socialist entity proposes a satellite system, the need to please shareholders, investors, and paying customers drives that entity to make decisions which are more business driven than the decisions of a diplomat or telecommunications regulator. Making business decisions requires decisiveness, clarity, flexibility, and timeliness. A business entity proposing a satellite system cannot be decisive or clear if their regulatory position must harmonize with the interests of the nation that represents them before the ITU. A business entity cannot be timely or flexible when, over a two year period, it must confidentially coordinate its decision making with nations representing it at the WRC.<sup>68</sup>

Business-driven decisions encourage the entities proposing satellite systems to promote their own regulatory position at the ITU when the position of the nation that represents them before the ITU is not working. Business-driven decision making allows these entities to change their allegiance from one national regulatory agenda to another when it fits the business needs of the satellite system. Business-driven decision making may force these entities to negotiate spectrum-sharing arrangements with competitors that are represented by opposing nations.

Within the United States, the FCC is authorized to resolve spectrum conflicts between communications systems that compete for use of the same frequency spectrum.<sup>69</sup> Because clear winners and losers may emerge when the FCC resolves a spectrum conflict, the business-driven entities involved in these disputes will adjust their regulatory positions and business plans to salvage a solution that pleases their shareholders, investors, and potential customers. Adjustments in regulatory positions and business plans may occur hundreds of times over a period of months if the business entity wants its proposed satellite system to survive. Even though the ITU lacks the enforcement author-

---

<sup>68</sup> Global satellite systems are often represented by the delegates of many nations which gives these systems increased influence over the ITU process and also increases the level of secrecy where satellite companies must negotiate because having representatives on different nations' delegations presents satellite companies with conflicts of national loyalty and interest. Such secrecy does not stimulate increased and open negotiating.

<sup>69</sup> See GORDON & MORGAN, *supra* note 43, at 89.

ity that the FCC has within the United States, a regulatory regime could be developed at the ITU to encourage the flexibility and efficiency of business style negotiations.

## V. A SOLUTION: BUSINESS-DRIVEN NEGOTIATIONS AT THE ITU

In order to encourage more business-style negotiations at the ITU, two changes should be made. First, the responsibility for coordinating a satellite system through the ITU's advanced publication and interference coordination process should be upon the entity that originally proposed the system, not to the administration or country that supports that entity's interests. Second, the ITU should allow only one delegate per nation to attend the World Radio Conference, because this change would prevent business entities from representing sovereign nations as delegates.

### A. SOLUTION 1: INTERFERENCE COORDINATION BECOMES THE RESPONSIBILITY OF THE ENTITY PROPOSING A SATELLITE SYSTEM

As mentioned in section III.B<sup>70</sup> of this article, the advanced publication and interference coordination of a satellite system must be undertaken by a sovereign nation. A diplomat representing a sovereign nation lacks authority to change a satellite system's business plan or the flexibility to change the regulatory position of his nation on short notice. An entity proposing a satellite system possesses authority and flexibility to change the business plan, the spectrum-sharing plan, and the regulatory position of a proposed satellite system in order to negotiate the use of spectrum with others. The advanced publication and interference coordination process should be the responsibility of the business-driven entities that propose satellite systems, because these entities have the sole authority and flexibility to negotiate for spectrum-sharing arrangements that are in their own interests.

If this responsibility is given to these entities, they will have to coordinate the use of spectrum with every entity or national government that challenges the use of that spectrum. This change should increase business-driven negotiations over global spectrum sharing, because a business-driven entity would be directly

---

<sup>70</sup> See *supra* notes 59-66 and accompanying text.

responsible for these negotiations instead of a sovereign diplomat.

B. SOLUTION 2: ENTITIES PROPOSING SATELLITE SYSTEMS  
CANNOT REPRESENT SOVEREIGN NATIONS AS DELEGATES

Sovereign nations often send delegations to the WRC that include employees of proposed satellite systems with pressing issues before the WRC. All of the delegates that a sovereign nation sends to the WRC, regardless of their prior affiliation, must support the position of their nation before the ITU. As mentioned previously in section II.D (2)<sup>71</sup> of this article, a delegate espousing a position on an issue that is different than his nation's position is a traitor who could undermine the power of his nation before the ITU.

If each nation is only allowed one delegate at the WRC, then entities proposing satellite systems could not place their employees on national delegations. These entities would still coordinate their agendas with the agendas of other nations prior to the WRC, but they would not be locked into the position of one nation during at the WRC. If a particular nation's position is unsuccessful at the WRC, then the representatives of a proposed satellite system can immediately abandon the position of that nation at the WRC and find a solution that works for their satellite system's business. This could not occur if these representatives were delegates who had to support one nation's position.

C. NEITHER CHANGE WILL DECREASE THE POWER OF  
SOVEREIGN NATIONS BEFORE THE ITU

Many changes could be made to the ITU Convention that would improve the resolution of spectrum conflicts, but most of these changes would never be implemented because they would threaten the power of sovereign nations at the ITU. The two solutions presented above are designed to enhance the resolution of spectrum conflicts at the ITU without significantly affecting the present bureaucratic structure of the ITU or the power that sovereign nations wield at the ITU.

Neither of these changes affects the power that national governments possess at the ITU, because national governments will have the power to vote at WRC's and the power to deny local licenses to satellite systems. National governments will only lose

---

<sup>71</sup> See *supra* notes 35-38 and accompanying text.

the official power to represent entities in the interference coordination process (Solution 1) and the official power to place representatives of satellite systems on their WRC delegations (Solution 2).

Loss of official power is insignificant because national governments will be able to control and manipulate their incorporated entities and other national citizens. If a nation wants to control the interference coordination process of one of its satellite companies, it can nationalize that company or force that company to obey the sovereign's orders. If a nation fears that its citizens or companies will espouse positions different than the national position at a WRC, then that nation can order all of its citizens or companies to support the national position. If the entity proposing a global satellite system is completely or partially owned by a national government, then that entity may decide to have all of its actions before the ITU handled by the national government.

National governments should have the power to regulate the activities of satellite companies incorporated within their borders or satellite companies that desire to offer service within their borders. Within the United States, a U.S. registered satellite company will not be able to negotiate a spectrum-sharing deal with a foreign satellite company that might adversely affect other U.S. satellite companies or U.S. government communications policies. Removing a local government from the interference coordination process espoused in Solution 1 will not prevent that government from regulating the spectrum negotiations of one of its companies. This solution encourages a commercially oriented satellite company to lead in spectrum negotiations where government regulators do not excel.

Local government regulators should be involved in the negotiation process, because they will make the final decision of approval on any spectrum-sharing solution. Local government regulators should not, however, lead this process because they do not have the resources or the authority to lead commercially oriented spectrum negotiations involving the manipulation of a satellite company's business, marketing, or financial plans. Solution 1 encourages business-led negotiations over interference coordination, but it does so without removing the power of the local regulator to make the final decision.

Additionally, the local regulator will make the final decision in determining the composition of its WRC delegation. Solution 2 should not change the composition of WRC delegations,

because member nations of the ITU will be able to staff these delegations with the lawyers, engineers, and satellite company representatives that they need to effectively negotiate at the WRC. Solution 2 only changes the status of the support members of the WRC delegation by removing the ITU-created restriction that requires these delegates to represent their local nation. The single delegate who is allowed to vote at the WRC should be the only official representative of that nation's government at the WRC.

If a nation brings more than one delegate to the WRC, then that nation can still restrict and control the behavior of its delegates. Solution 2 only changes the perceived status of these delegates before the ITU, and it will not change the real relationship between the supporting delegates and their sponsoring nation. By lowering the diplomatic status of the supporting delegates at the WRC, Solution 2 encourages more open negotiation between supporting delegates who are no longer officially affiliated with one nation.

By encouraging satellite companies to represent their own interests before the ITU, Solutions 1 and 2 should actually increase the power of sovereign nations at the ITU. At worst, these changes should not decrease the power of sovereign nations at the ITU, because these nations could still undermine the independence of satellite companies through nationalization or other methods of control.

## VI. DISCUSSION: GLOBAL TRENDS AND THE SKYBRIDGE DISPUTE

Presently, a global trend toward decreased government restriction on commercially funded communications development exists, even when that development is funded by foreign entities.<sup>72</sup> Many nations claim that they offer advanced telecommunication services to their people, without overwhelming the national budget, by allowing commercial entities to fund the development of these services.<sup>73</sup> Many of the commercial entities

---

<sup>72</sup> Evidence of this reduced government restriction includes foreign nations privatizing their communications networks and foreign nations reducing restrictions on foreign ownership of local telecommunications networks. A good example of this is the merger between the British wireless telephone company, Vodafone, and the American wireless phone company, Air Touch, that recently was widely covered in the media.

<sup>73</sup> Many less developed nations have opened their local telecommunications markets to foreigners in an attempt to have foreign investors fund telecommuni-

that propose funding the development of advanced telecommunications services are foreign to the nations that they desire to serve. These nations protect their sovereign rights to their frequency spectrum by closely regulating the operation of foreign communications systems within their local borders. The modern relationship between local governments and foreign communications companies is still difficult, but it is an improvement over the era when local governments believed that any foreign communications system operating within their borders was an uncontrollable threat to their sovereignty.

The commercially funded satellite communications companies that propose offering advanced telecommunications services throughout the world benefit at the local government from this global trend. These satellite companies would relinquish a large base of potential customers if local governments instinctively felt they must exclude foreign communications companies from serving their local populations. A global satellite communication company's largest regulatory difficulty is not one local government with a vendetta against that company's satellite service.<sup>74</sup> Instead, it is caused by its inability to negotiate the use of one frequency allocation plan with many different local governments.

As an example, the Skybridge satellite communications system is a LEO system that serves the entire world with high-speed data services.<sup>75</sup> Skybridge LLC of the United States is the business entity supporting the Skybridge system, but this company is perceived to be a champion of France and other European states.<sup>76</sup> The Skybridge system's use of the Ku-Band frequencies of 12.75 to 18.1 GHz was accepted in principle by many of the nations of

---

cations development within their borders. Many nations in Africa and Latin America sell wireless spectrum licenses to foreign companies with the understanding that these companies will earn a profit after providing basic wireless services to that country's people.

<sup>74</sup> Some nations may actually have a vendetta against a foreign company serving its population, but the business entities proposing satellite systems should have such vendettas addressed within their business plans. As an example, a satellite company in the United States would not develop a business plan that has their satellite service depending on customers from a nation that is in armed conflict with the U.S.

<sup>75</sup> Skybridge is a company that has been covered extensively in the press. For more information see Skybridge's web site at <<http://www.skybridgesatellite.com>>.

<sup>76</sup> The French Space Agency, the Centre National d'Etudes Spatiales (CNES), backs Skybridge with money, and Alcatel Space of Paris is supposed to be the prime contractor for this system.



the world, because these nations do not have communications systems which would be unable to share this spectrum with Skybridge.<sup>77</sup> The use of these Ku-band frequencies was not immediately accepted by the United States, however, because U.S. companies offering direct-to-home (DTH) television services from GEO satellites use some of these same frequencies. Skybridge LLC can not dismiss the fears of the U.S. government, because the United States possesses the richest single market for communications services and holds great political power at the ITU.

Skybridge has been negotiating with the FCC, the local U.S. government regulator, to resolve this frequency conflict.<sup>78</sup> Additionally, Skybridge requested that the French government and other European entities put pressure on the FCC and U.S. satellite companies to agree to an adequate spectrum-sharing plan. This dispute has lasted years, and it will be difficult for U.S. and European government regulators to find solutions that are equitable to the commercial interests of both Skybridge and the U.S. DTH satellite companies. This conflict hurts U.S. satellite companies operating in other frequency bands, because local regulators within Europe and elsewhere may retaliate for the perceived lack of cooperation they are receiving from the U.S. government over Skybridge. In addition, this dispute could adversely affect spectrum negotiations at the WRC, the ITU, and at the local regulator level.

The two solutions presented in this paper are designed to address such disputes. By allowing satellite companies to lead interference coordination negotiations, Solution 1 places leaders of Skybridge and the conflicting U.S. DTH satellite companies face to face. These companies could modify their business and technical plans, under the guidance (not leadership) of national regulators, to find an equitable solution.<sup>79</sup> If no solution is found, the local regulators involved could continue the na-

---

<sup>77</sup> See Federal Communications Commission, *Public Notice*, DA 98-833 (May 1, 1998) (visited Nov. 21, 1999) <<http://www.fcc.gov/Bureaus/International/Public-Notices11998/da980833.html>>.

<sup>78</sup> See *id.*

<sup>79</sup> Skybridge LLC could give each of the U.S. DTH satellite companies an equity stake in Skybridge on the condition that the U.S. companies help Skybridge receive a license in the United States. The U.S. DTH companies and Skybridge are offering different types of communications services; therefore this dispute is over spectrum and not customers. There is no hurdle to a commercially motivated solution to this dispute.

tional level negotiations that have been inconclusive over the last few years.

By limiting WRC delegations to one official delegate, Solution 2 would encourage Skybridge-affiliated WRC delegates to openly negotiate solutions with the support level delegates of other nations. These negotiated solutions would not be perceived as one nation's diplomatic position, because the ITU would not misrepresent the discussions of lower level delegates as the negotiations of a member nation. These open negotiations should increase the number of possible solutions available to Skybridge at the WRC, while decreasing the environment of diplomacy and secrecy that prevents commercially oriented entities like Skybridge from communicating.

## VII. CONCLUSION

In conclusion, this paper presents two solutions to help resolve frequency spectrum conflicts between business-driven entities proposing global satellite communications systems. First, the responsibility for coordinating a satellite system through the ITU interference coordination process should be left to the entity that originally proposed the system and not to the administration or country that supports that entity's interests. Second, the ITU should allow only one delegate per nation to attend the World Radio Conference.

Business-driven entities are the force behind the communications satellite revolution, and they are driving many of the spectrum conflicts before the ITU. If national governments or the ITU had the capability or authority to resolve the spectrum conflicts between commercial satellite systems, then the changes proposed in this paper would be unnecessary. Changing the ITU Convention to allow satellite systems to represent themselves at the WRC and to lead the interference coordination process would encourage the business entities behind these systems to lead spectrum negotiations. These negotiations would still be under the tight control and approval of local regulators, but leadership would shift to the commercial entities that are most qualified to negotiate a commercial solution.

