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INTERNATIONAL MANAGEMENT OF THE RADIO SPECTRUM

by

ROBERT MILTON EVERTON

B.A. SIMON FRASER UNIVERSITY, 1988

THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF ARTS (COMMUNICATION)

in the DEPARTMENT OF COMMUNICATION

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ABSTRACT

Telecommunications have evolved throughout the course of this century largely owing to the ability to harness a unique natural resource - the radio spectrum. In order to prevent the otherwise inevitable generation of harmful interference in the use of this resource, there must exist forms of cooperation established among all users. The body which has been entrusted with international regulation of spectrum use is the International Telecommunications Union (ITU).

This paper proposes to assess the relations of power between core and peripheral nations within the ITU and the resulting distribution of spectrum among all nations. In doing so, it will review the evolution of the ITU, the agreements reached to regulate spectrum usage and the mechanisms employed to distribute this spectrum resource as well as to enforce compliance in spectrum management.

The thesis is divided into four parts, set out in nine chapters. Part I includes the first two chapters. Chapter 1 provides the introduction. Chapter 2 presents the uniqueness of the resource under study. The next three chapters make up Part II. Chapter 3 reviews the emergence of the international organization first convened to manage

this unique resource only a few years after it was first harnessed. The major organizational changes which were introduced to the ITU following World War II and which have given the ITU the basic structure it continues to enjoy today are the subject of Chapter 4. Chapter 5 traces the major conflicts of the last few decades between those forces contending for access to this resource.

Part III assesses international telecommunication law. Chapter 6 reviews the mechanisms employed to vest rights in the use of the radio spectrum and whether these procedures favour the more developed or less developed telecommunication nations. Those mechanisms which exist or have existed to resolve disputes over use of this resource are addressed in Chapter 7. This chapter also assesses how this affects power between nations in their use of the radio spectrum. Chapter 8 presents the legal status of the ITU today, the changes that are currently in process and the implications of these changes.

Part IV (Chapter 9) presents, of course, the conclusions.

This is, above all, a study of power in the use of one of the most unique and valuable resources in the field of human communication, during the last half of the twentieth century.

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PART I

INTRODUCTION

CHAPTER 1: INTRODUCTION

A. OVERVIEW

Telecommunications have evolved throughout the course of this century largely owing to the ability to harness a unique natural resource - the radio spectrum. In order to prevent the otherwise inevitable generation of harmful interference in the use of this resource, there must exist forms of cooperation established among all users. The body which has been entrusted with international regulation of spectrum use is the International Telecommunications Union (ITU).

This paper proposes to assess the relations of power between core and peripheral nations (1) within the ITU and the resulting distribution of spectrum among all nations. In doing so, it will review the evolution of the ITU, the agreements reached to regulate spectrum usage and the mechanisms employed to distribute this spectrum resource as well as to enforce compliance in spectrum management.

1. The concept of "core" and "peripheral" nations refers to the relationship between nations whereby the net flow of goods, services and capital favours the development of those nations considered to be "core" ones. Most often these distinctions are an outgrowth from earlier imperial and colonial relations, although now under circumstances where the dependent or peripheral nations enjoy nominal independence owing to their formal political sovereignty from the more industrialized and powerful nations.

To accomplish this, any available, relevant primary and secondary documents in the public domain will be reviewed. What changes were made to the ITU Convention from one conference to the next? What were the implications of these changes? How have these changes been interpreted and portrayed in the secondary sources available?

The thesis is divided into four parts, set out in nine chapters. Part I includes the first two chapters. Chapter 1 provides the introduction. Chapter 2 presents the uniqueness of the resource under study. The next three chapters make up Part II. Chapter 3 reviews the emergence of the international organization first convened to manage this unique resource only a few years after it was first harnessed. The major organizational changes which were introduced to the ITU following World War II and which have given the ITU the basic structure it continues to enjoy today are the subject of Chapter 4. Chapter 5 traces the major conflicts of the last few decades between those forces contending for access to this resource.

Part III assesses international telecommunication law. Chapter 6 reviews the mechanisms employed to vest rights in the use of the radio spectrum and whether these procedures favour the more developed or less developed telecommunication nations. Those mechanisms which exist or have existed to resolve disputes over use of this resource

are addressed in Chapter 7. This chapter also assesses how this affects power between nations in their use of the radio spectrum. Chapter 8 presents the legal status of the ITU today, the changes that are currently in process and the implications of these changes.

Part IV (Chapter 9) presents, of course, the conclusions.

This is, above all, a study of power in the use of one of the most unique and valuable resources in the field of human communication, during the last half of the twentieth century.

B. SOURCES:

ITU documents drawn upon include the Convention, Resolutions, Recommendations, Optional and Additional Protocols, Opinions, Radio Regulations and Additional Radio Regulations from the Plenipotentiary and Radio Conferences, as well as minutes from early International Telegraph Union's Plenipotentiary Conferences. Minutes of important recent Plenipotentiaries, as with the 1989 Conference, have also been used to provide greater insight into recent ITU negotiations. Other valuable, primary documents from the ITU were Final Acts from specialized World Administrative Radio Conferences. Finally, the ITU's monthly publication,

Telecommunications Journal, provided much useful information.

Texts used outlining the technical evolution in the harnessing of the radio spectrum include both those written at the time of radio's initial emergence and others written in more recent years. Trade journals, as well, have constituted a further useful source of information on which this thesis is based.

The earliest secondary sources analyzing developments within the ITU were found in U.S. legal journals. The first comprehensive analysis of the ITU's international management of spectrum use is provided by John D. Tomlinson's 1938 dissertation at the University of Geneva, The International Control of Radiocommunications. It was not until 1952 that another major work on the ITU, and the first to offer an overall historical and political analysis of the ITU, was published: George A. Coddington, Jr.'s The International Telecommunication Union. The next known major analytic work on the ITU is that of Dallas W. Smythe, The Structure and Policy of Electronic Communications, printed in 1957.

Anthony Michaelis' From Semaphore to Satellite was published by the ITU in 1965 as an authorized, yet unofficial version of its history, printed on the occasion of the ITU's centennial anniversary. Unlike the other works

cited here, it is unfortunately superficial and of limited value.

Perhaps the most authoritative legal analysis of the ITU and certainly the earliest comprehensive attempt at this is found in David M. Leive's International Telecommunications and International Law: the Regulation of the Radio Spectrum, printed in 1970. In 1982, Coddling collaborated with a member of the U.S. administration who was active in ITU affairs, Anthony M. Rutkowski to published The International Telecommunication Union in Changing World.

And finally, the U.S. Senate Hearings and other U.S. government documents have proven invaluable in providing insights into U.S. positions and concerns.

CHAPTER 2: THE TELECOMMUNICATIONS RESOURCE

International organizations based on negotiated resolution first came into existence in Europe last century. Today hundreds such bodies abound. Among this veritable plethora of international organizations which has flourished in the last few decades, there is one organization which upon scrutiny, should stand out above the rest, for it is **unique** in many senses. Surprisingly however, this body is not widely known.

It is surprising because, among other reasons, we are dealing with the **oldest** international organization in existence. Attached to the United Nations since 1947 (2), this organization predates the U.N. by 82 years. Indeed, this body was encouraged to affiliate with the United Nations not in order to acquire greater legitimacy for itself, but contrarily: to extend greater legitimacy to the fledgling U.N. This body is unique among U.N. organizations for although each nation is obliged to pay dues to maintain its membership, each member is free to determine its own level of contribution.

This is an organization that existed for 124 years without a Constitution, notwithstanding the influential role

2. Membership in the U.N. was agreed to at the first meeting authorized to do so, subsequent to the United Nations being formed.

it has played in international affairs, creating international legislation to apply not only **between**, but **within** nations! With its 166 member nations -- more than the United Nations itself! (Renaud, 1986, p20) -- it can be considered to possess virtually universal membership. No country has ever voluntarily withdrawn. Only one nation has recently (3) threatened to do so: the United States, during the Nixon (Ameri, p257), Carter and Reagan governments. This was viewed as no idle threat given that the U.S. government had already recently withdrawn from various other U.N. agencies. The political will to do so existed. But studies commissioned by the Reagan Administration into how to bring those plans to fruition concluded that this would not be feasible to do without enormous cost, probably sufficient to outweigh any advantages. This organization is clearly unlike any other.

Described as a technical organization (Ameri, pp46, 51), it can also be seen as one of the most political international organizations in existence. Politics, after all, are the relations of power. It is political not

3. In 1947, the imperial powers under the lead of France, Belgium and Portugal threatened to withdraw if they lost their use of "colonial votes" as a condition for membership in the United Nations. (Coddington, 1952, p277) Until 1932, the imperial powers enjoyed as many as 6 votes each. (Convention, 1906, Art.12, p347;) At that time, the imperialist nations had their "colonial votes" reduced to an extra single "colonial vote" per imperial power. (Convention, 1932, preamble and Art.5, pp3-4) They were able to retain this colonial vote until 1973! See Chapter 4.

because it provides a forum for endless political rhetoric as does the General Assembly of the United Nations, but rather because this organization is entrusted with the management of a world resource.

The nature of the resource which this body manages is in itself unique, thereby contributing to the uniqueness of the organization. It is an intangible and scarce resource; access to it is heavily contested by member nations. Efforts to establish private property rights over this resource have repeatedly proved to be futile.

What kind of resource is this with which we are dealing?

A. THE RESOURCE

Imagine that a natural resource such as gravity were able to be "harnessed" to fulfill human needs. Imagine furthermore that the physical properties of this resource were such that when harnessed, if unknowingly another were also to attempt to use it, neither party would be able to use it effectively. Instead for each user, the force would tend to veer off at an uncontrolled angle.

For some purposes this "interference" may be tolerable, but for most it would make effective use of the resource

impossible. The resulting awareness of the need for cooperation would soon tend to encourage the development of efforts in pursuit of interference-free use of the resource. At times this would require the cooperation of all potential users around the globe and call for the fashioning of some form of accord to apportion this resource. (4)

Cooperation would be essential. This need would be particularly acute if matters of safety were involved. To create such a body would be no easy task. It would require the building of a unique organization, which would tend to be a powerful one, for any body which controls a unique and limited resource would deal with real power, power that is effective at a global level. The more limited the resource and the greater the demand, so one would expect the power of the body to increase. If this organization were also to accommodate new demands as they arose, one could expect this to be a dynamic organization.

There **does** exist such an organization and such a resource. This resource is not, of course, gravity. But another natural resource similar to gravity. Gravity is one of four known physical forces found in the universe. The use of gravity by one party does not, however, generally

4. The ensuing process of negotiation would necessarily be one which achieves acceptance from all parties concerned, although it would not necessarily provide complete satisfaction to any party involved.

interfere with its use by another. Only occasionally is it the principal form of energy, harnessed for a specific purpose, as in the generating of hydro-electric power. In cases where interference occurs (5), one could anticipate the emergence of conflict. If this interference affected both parties, there would soon emerge strong pressure towards the resolution of this conflict.

These four (6) "basic" or primary forces detected to date in nature are gravity, electromagnetism, the "strong" (or nuclear (7)) force, and the "weak" (or radioactive) force. (8) (Ohanian, pp124-5) While the "strong" and "weak" forces operate only on a particle level, gravity and electromagnetism can exert a force over a great distance.

5. In the case of damming a river upstream, if this causes interference with activities downstream, one could anticipate considerable social and political conflict. Indeed coordination of the travel on European rivers, for purposes of transport and communication brought about organizational instances based on negotiated resolutions which served as the predecessor for the earliest forms of international organization. (Archer, p58)

6. A fifth force has been postulated as one which exerts a counter-vailing influence against gravity, although it has not as yet been demonstrated to exist. Yet a sixth force has been theoretically considered to be a possibility by others basing their claims on the probability that if the other known forces of nature each have a "balancing" or countervailing force, so too must electromagnetism.

7. As in nuclear fusion or fission.

8. That force involved in radioactivity and nuclear decay. (Grolier's On-line Encyclopedia, listed under "fundamental interactions"; entry 0114260-0)

(9) The force we are dealing with is, of course, the latter: electromagnetism.

Through the harnessing of water or steam to generate electrical energy or the creation of mechanical energy from internal combustion engines -- providing the material basis for the Industrial Revolution and its resulting social reorganization -- humans have increasingly employed a form of energy with properties many of which we are still unaware: electromagnetism. (10) Apart from the electrical or mechanical energy generated, there is other energy

9. Grolier, listed under "gravitational force"; entry 0125130-0.

10. See Paul Brodeur's Currents of Death and Dr. Robert Becker's The Body Electric: Electromagnetism and the Foundation of Life for a contemporary overview of these concerns. We are still remarkably ignorant of many of the properties of electromagnetism. Brodeur cites various authoritative studies from the past 15 years which increasingly suggest that exposure to some electromagnetic fields contributes to disruption of intercellular bonding, leaving such cells in a "pre-cancerous" state.

Becker makes a convincing argument for the need to heed the apparent dangers to which higher life forms are exposed from electromagnetic radiation. (See Chapters 13-15) These dangers seem most acute from the recently developed (post-WWII) and widely used frequencies at both ends of the radio spectrum: ELF (Extra-Low Frequency) and microwaves (UHF-Ultra-High Frequencies and SHF-Super-High Frequencies). This problem is markedly more serious in western societies than in the USSR or China, owing to early adoption by the latter countries of standards many times more cautious than in the West. (Battocletti, 1976)

Unfortunately, powerful vested interests in the United States (both military and corporate industrial) seem to have actively suppressed any findings and immediately cut research funding for studies which indicate potential danger from electromagnetic radiation. Both Brodeur's and Becker's books cite ample instances of such active opposition.

emitted: this is in the form of **electromagnetic waves**. (11)
 This is the specific resource with which we are concerned.

The properties of electromagnetic waves vary greatly in accordance to the wave-length on which they are generated. These wave-lengths vary in frequency along a continuum or spectrum. This spectrum has been essential to the development of human communication and subsequently to human intelligence. Earliest knowledge of this spectrum grew out of its primitive use near to both ends. On the one hand we have near the lower end of the electromagnetic spectrum, sound waves which form the basis of our auditory and oral forms of communication. (12) Near the other end, we have the "light spectrum", (13) which has provided the basis of

11. All machinery, for example, generates some form of electromagnetic wave, given that it employs electromagnetic energy. In the case of machinery prior to the latter half of the last century, electromagnetic waves were unwittingly being generated. Once radio waves were harnessed, these undesired emissions had to be dealt with in some manner, if they were not to generate "harmful interference" for receiving stations. Consequently, "disposal" channels were allocated for this undesired "noise" in order to ensure that it not interfere with intentional radio transmissions. (Smythe, 1957, pp74-5) No clearer example could be presented of the need for standards in order to effectively use the radio spectrum.

12. These are low frequency waves, between 30 and 20,000 cycles per minute. (Lessing, p39)

13. In 1831 Michael Faraday claimed that light probably operated on the same principle of "vibrations" as does magnetism, electricity and ripples in a pond. (Berkson, p73) But it was James Clerk Maxwell in 1861 who first postulated the existence of electromagnetic waves (ibid, p148), correctly calculated their velocity as that of the speed of light (ibid, pp165-8) and clarified that light itself was a form of electromagnetic energy. (Lodge, p22-24)

our visual perception and imagery, as well as the principal source of nutrition for plant life, the foundation of the food chain for most of the higher forms of life on this planet.

With the introduction of technology that could codify and transmit electromagnetic pulses (EMPs), the lower portion of this spectrum came into use for what was first termed "radiotelegraph" communication. This portion of the spectrum which uses "radio waves" (14) came to be known as the **radio spectrum**. (15) These electromagnetic waves were discovered to possess a surprising property: **interference**. (16) EMPs generated on a given frequency are susceptible to interference if another user, within a given range, also transmits on the same frequency, on a nearby frequency or sometimes even on a quite different frequency which is

14. The ITU defines "radio waves" as "electromagnetic waves of frequencies arbitrarily lower than 3,000 Ghz, propagated in space without artificial guide. (1982 Radio Regulations, Art.1.4, p."rr1-1") Radio Regulations are subsequently also referred to as "RR".

15. From near to 0 Hertz to 3,000 Ghz. (1982 Radio Regulations, Art. 1, paragraph #6) Above 3,000 Ghz are infrared, visible light, ultraviolet, x-rays and cosmic or gamma rays. (OTM, 1968, pA-4; Coddington & Rutkowski, p247)

16. Interference is usually attributed to first having been detected and demonstrated in 1887-8 by Heinrich Hertz, at the same time as he provided proof of the existence of electromagnetic waves. But in fact, D.E. Hughes had produced and detected electromagnetic waves 10 years earlier. (Berkson, pp238-9) What Hertz did, however, was to present a coherent theory of electromagnetic waves while demonstrating and measuring them. (Berkson, p240)

harmoniously related to the intended frequency. The range over which a transmission may suffer interference depends on a variety of factors, not least among them, are weather, power levels of transmission and the specific characteristics of the frequency under discussion. (17)

The radio spectrum is a unique resource in many senses. It is unique in that the cessation of use of this natural resource results in it becoming instantaneously renewed. It is no more depletable than is gravity. Yet while the use of the resource today in no way depletes it from being usable in the future, at the same time, this is a limited resource. It is limited precisely because operations on frequencies located too near one to another can result in "harmful interference". Given the very nature of the resource it is not possible that any individual, group or nation exert rights of private property over this resource. The radio spectrum has come to be acknowledged to be common property. To fail to do so would be to deny the conditions that could allow "guaranteed" access to its use. As common property, therefore, it becomes essential to address **how rights can be vested** for access by any given party in a given location to use of a specific portion of the radio spectrum, to the exclusion of all others.

17. Different frequencies along the radio spectrum possess different characteristics which result in any given range of frequencies (or "band") being either more or less suitable for any given function.

Clearly this potential to generate interference has demanded the establishment of a minimal level of cooperation among all those capable of employing the resource. This requirement has resulted in the emergence of an international organization which itself possesses a set of unusual characteristics. The organization is the **INTERNATIONAL TELECOMMUNICATIONS UNION (ITU)**.

Let us now briefly review some of the considerations which suggest the importance of this field of study in the first place.

B. THE IMPORTANCE OF TELECOMMUNICATIONS

The radio spectrum has served as the single most important element for the development of the telecommunications (18) sector. It is intimately linked to power as exercised in today's world. The importance of telecommunications can be seen in the role this sector plays in political, military and economic relations.

18. Telecommunications is defined by the ITU to be: "any transmission, emission or reception of signs, signals, writing, images and sound or intelligence of any nature by wire, radio, optical or other electromagnetic systems". (Convention, 1982, Annex 2, p150) This has been the definition used by the ITU since 1932. (Tomlinson, p70) It is over this field that the ITU has jurisdiction. Its domain is more importantly determined by the **need** to mediate in order to avoid conflict, than it is by any legalistic interpretation of its previously defined mandate.

The radio spectrum has come to be viewed by many, as an "instrument of national policy". (Smythe, 1957, p81) First crucial for the military, this resource has also assumed an importance for growing corporate sectors. Lesser industrialized nations (LINs) for their part, have come also to consider the spectrum as a highly valuable resource intimately linked to the level of development of a society. (19) (Hudson, 1983; World Bank, 1983)

Secondly, the largest single user of the radio spectrum since the end of the Second World War has been the United States government. (NTIA, 1983, p227) Those interests concerned with the preponderant influence exerted by the United States government internationally would do well to assess the role played by the radio spectrum in the maintenance of U.S. international military strength,

19. If one chooses not to employ the concept of "Third World", there seems to as yet be no single suitable alternative to adequately replace this term. At times, "peripheral" nations (as opposed to "core" ones) appears to be appropriate. At other times, descriptive forms such as "less powerful nations" have been employed. Frequently however it was necessary to employ other terms as well. For lack of a better alternative, the term "lesser industrialized nation" or "LIN" has been used, as opposed to the more commonly used "lesser developed country" or "LDCs". The term "LDC" was avoided because of its implications that it is desirable to be "developed" and its suggestion that it is possible through integration into a world market economy that a LIN could ultimately be transformed into a "developed" country. Development is not synonymous with industrialization. There are many forms of development; the term "LDC" privileges the equation of "development" with "industrialized".

espionage capacity, broadcasting and diplomatic effectiveness: all elements of international power.

It is the military which is the dominant of these four government uses, with over half of U.S. of the spectrum allocated for government use. (20) (U.S. DOC/NBS, pD-16) In fact, it has been research and development in pursuit of new military applications which has historically driven the harnessing of the radio spectrum. Civilian uses such as broadcasting have merely been coincidental off-shoots, which some sectors of capital found to be lucrative. (Williams, R., 1974, pp32-5) There was nothing inevitable about the emergence of broadcasting.

Thirdly, for those concerned with the power wielded today by transnational corporations (TNCs), it is worth making note of the extreme reliance of these organizations on the radio spectrum. Above all, **internal** communications within TNCs themselves was crucial to the emergence of TNCs, as it is to its preservation. Decision-making authority, heavily concentrated in a corporate head-office, can through telecommunication networks, provide administrative direction to branch offices, sales and marketing representatives and

20. In 1969 (the only year listed) Army, Air Force and Navy spectrum use totaled 56.8%; this did not include internal policing uses. The Coast Guard and Ministry of the Interior alone accounted for an additional 11%, bringing the total to over two-thirds. (U.S. DOC/NBS, pD-16)

servicing departments located throughout the world. These relations of extreme dependence of TNCs on the radio spectrum are, not surprisingly, seldom acknowledged or publicly discussed.

Fourthly, from a strictly economic point of view, the communications sector has increasingly come to play a growing role in latter-day developed capitalist economies. It is **the** sector in which we witness a continued growth in market economies (OECD, 1987) and described in U.S. Senate Hearings as the "most significant single factor" in the U.S. Gross National Product. (U.S. Senate Hearings, 17June82, p230) The communication sector is so integral to the latest stage in the development of capitalism that it screams out for the elaboration of a new theoretical framework. (Melody, 1988, pp19-20) The telecommunications infrastructure plays an increasingly vital role in the development of this sector of the economy. It is, if you like, one of the major arteries which allows the life-blood of information to flow. With the growing convergence within the telecommunications sector (between computing systems and satellites systems, on the one hand, and manufacturers and user systems on the other), comes a convergence between the telecommunications and broadcasting sectors (both in terms of increasingly compatible technology and of corporate ownership). In these latter stages of the development of capitalism, with increased concentration of capital, the political economy of

the telecommunications infrastructure assumes a crucial and growing importance.

And finally, we have newly emerging relations. As we humans finally come to realize the damage our activities have wrought on the very conditions which allow this planet to sustain higher life forms, we are obliged to measure the costs of our activities and enterprises in an entirely new light. Costs of any productive activity can no longer be viewed merely in terms of the financial costs required to produce and distribute a given product. Today there are growing demands to also "factor in" the costs of ecological damage incurred in the carrying out of any productive activity. With the devastating consequences of global warming finally becoming widely acknowledged, one can anticipate that the "costs" of those activities which contribute to the "greenhouse effect" will increasingly be called upon to bear responsibility in financial, as well as moral terms. As approximately 50% of the new "greenhouse gases" are made up of emissions of carbon dioxide from the burning of fossil fuels (Bolin et al; DOE, p1) (21), one can postulate that future energy costs might well soar in comparison to the levels of today, drastically increasing the cost of travel. It is probable, then, that demand for

21. Oppenheimer and Boyle, cite 60% of the greenhouse effect in 1990 as attributable to carbon dioxide. (fn. p38)

all forms of alternative, long distance communication will rise dramatically and remain elevated.

Demand for the radio spectrum, this "free" spectrum resource, already scarce and over-crowded in many of its bands, will inevitably surge in the foreseeable future. This would seem to be the case not only for continued military usage, but also for both broadcasting, with its economic, political and ideological importance and telecommunications, with its computer-links, voice, fax, tele-conferencing and video-conferencing applications.

C. SUMMARY

This thesis postulates that the International Telecommunication Union, in its management of the radio spectrum, has the characteristics to be one of the most, if not **the** most strategically important international organization to yet emerge. As an organization which manages a resource which by its very nature **requires** cooperation, how have demands for spectrum use been addressed? What are the relations of power within the ITU between the "have" and "have-not" nations? How has this spectrum resource been distributed among potential users? What nations hold most power within the ITU? How is this power exercised? What international law governs spectrum management? If there are inequities in spectrum use, how

are these inequities maintained? Any constraints which serve to maintain an inequitable situation deserve scrutiny from all those who consider their access to ITU resources to be unfairly apportioned.

PART II

MANAGING A NEW RESOURCE

CHAPTER 3: THE DEVELOPMENT OF THE ITU

Although the importance of the ITU lies in its role as mediator over use of a scarce and valuable resource, its **origin** was not in response to this demand. To understand the reasons for the emergence of the ITU we must momentarily locate ourselves in a world, which had as yet no international organizations.

A. THE EMERGENCE OF INTERNATIONAL ORGANIZATION

It was first in the areas of transportation for the purpose of commerce that Europeans established what can be seen as the earliest fore-runners of today's international organizations. The early nineteenth century saw the emergence of first bilateral, then multilateral "river commissions". (22) These "river commissions" established norms among those countries which shared access to and therefore control over a given river or a significant portion of it. Subsequent to the thrust to stabilize international trading routes, and intimately linked to it,

22. One of the most influential of these was the European Danube Commission, formed in 1856. The earliest such "river commission", however, was that established for the Central Rhine in 1804. (Riggs and Plano, p10; Archer, p58)

came the concern to protect and facilitate other means (23) of international communication. (Coddington, 1952, p4, 7, 449)

The first undertaking to coordinate international communication among all countries which chose to participate, came in 1865 when Napoleon III convened the first "public union" in Paris. (Riggs and Plano p4) In the wake of the Napoleonic Wars, the war-torn countries of Europe were prepared to entertain greater efforts at negotiating international cooperation. (Polanyi, pp5-19) The objective of the Paris meeting was to coordinate the international use of the telegraph wires.

B. INTERNATIONAL TELEGRAPHY

What is today known as telegraphy was first introduced in Britain in 1837 (24) and established for on-going service in that same country in 1839. During the following decade

23. Conceptually transportation and communication can be traced historically through usage to a common origin, with the latter initially as a subset of the former. To communicate something is indeed to transport it, but with the added quality of it having been "perceived" by an "other". Transportation focuses on one aspect of communication, that of its movement, as opposed to its content, its meaning or its impact.

24. From London to Birmingham, according to Coddington, 1952, p6; although Michaelis (p27) considers the first substantial, non-experimental telegraph line to be that constructed along the railway between London and West Drayton, beginning regular service as of 1839.

this form of long distance communication rapidly sprang up and superceded existing networks of visual signalling employed by the state for military and political ends. (25) Other wired telegraph networks were soon constructed between major European cities in Germany, France (1845), Austria-Hungary (1846), Italy (1847) Switzerland (1852) and Russia (1853). (Coddington, 1952, p7)

The initial concern that established and emerging European states alike displayed in promoting a telegraph system responded to military, political and economic factors. It enhanced military preparedness; it furthered political cohesion; and it allowed for the coordination of railway transport, contributing to both speed and safety. (Ibid) Only later, in response to efforts to procure additional sources of revenue to help defray the exorbitant costs involved, did the advocates of telegraph networks also endorse the widespread use of this new form of communication by private commercial and professional interests. (Ibid, p449) The first regular commercial users (apart from enterprises involved in the transportation of goods), were the newspapers, resulting in the innovative emergence of the

25. Until the establishment of wired telegraphy, most European nations had already been employing a form of visual signalling via relay stations located on hilltops and towers, which the inventor of the system, Claude Chappe, had termed "telegraphy". (Smythe, 1957, pp13-14)

"Reuter's Telegram" wire service as early as 1850.

(Michaelis, p29)

U.S. telegraphy, unlike that of Europe, developed and remained in the private sector. While European telegraphy became part of the postal system and was therefore widely used for "social correspondence", telegraphy in the U.S. remained limited to railway, commercial and press uses. (26) (DuBoff, pp465-76) The higher rates charged in the U.S. were largely responsible for maintaining this difference. (Ibid, p466) It was because of the inclusion of agreements on rates that the United States, with its telegraph services in private hands, never joined the International Telegraph Union.

By the 1850s, most major European states had already signed various bilateral treaties to allow for the first direct forms of operation of international wired communication across national borders. A common language, of course, had facilitated the evolution of the first of these early agreements, signed in 1849 between Austria and Prussia. (Coddington, 1952, p13) These bilateral treaties soon coalesced into regional agreements, resulting in the Austro-

26. The first of these uses in the U.S., railway, did not occur until 1851. (DuBoff, p465)

German Telegraph Union (1850) (27) and the Western European Telegraph Union. (1855) (28)

Prior to 1865, messages sent between European countries where no agreement existed, underwent a laborious process. Wired telegraph messages were received at a border post en route, transcribed, handed delivered to the counter-part from the neighbouring country, translated and finally re-transmitted. (Michaelis, p43) This process was repeated as many times as necessary until it reached its final destination. (Coddington, 1952, p14) The 1865 Paris conference sought to create a universal (29) organization with direct responsibility for operation, based initially on the fusion of the Austro-German and Western European Telegraph Unions which would allow for a single set of unified regulations and direct transmission over European borders. (Michaelis, pp49, 55) Negotiations at this historic meeting lasted for two and a half months! (Coddington and Rutkowski (30), p5) Not least among the ITU traditions established at the 1865

27. Austria, Bavaria, Prussia and Saxony. (Coddington, 1952, p13)

28. This treaty brought together Belgium, France, Sardinia, Spain and Switzerland. (Ibid, p14)

29. The 20 states attending the founding conference were: Austria, Baden, Bavaria, Belgium, Denmark, France, Greece, Hamburg, Hanover, Italy, the Netherlands, Portugal, Prussia, Russia, Saxony, Spain, Sweden--Norway, Switzerland, Turkey and Wurttemberg. (Coddington, 52, pp20-1)

30. The "Coddington and Rutkowski" citation will hereafter be referred to as "C&R".

founding conference seems to have been the duration of its meetings.

Why was the conference so lengthy? The reason lies with the nature of the negotiations involved. Unlike treaties which agreed upon a common set of objectives, yet left the signatories to their own resources to implement these goals, the ITU assumed a legislative function. At the end of this two and half month period of intense negotiations, a treaty was finally concluded which not only allowed for a more efficient form of what today would be deemed "trans-border data flow", but which saw the establishment of a new form of organization as well - the first universal (31) international organization - the **International Telegraph Union.**

C. THE ITU

The founding ITU meeting hammered out a treaty known as a "Convention" in which the summit conferences, such as the

31. What made the ITU "universal" was not merely the number of countries it represented. It did include most countries which already had some form of telegraphy, but it did not include, for example, the United States, given that in the U.S., the telegraph administrations were in private hands. Rather the ITU may be deemed "universal" owing to its decision to allow admission to the Union of any country which agreed to sign the Convention and to abide by its terms. (Coddington and Rutkowski, p6) (Telecommunication Journal, Mar90, p161) Telecommunication Journal is the official monthly publication of the ITU; henceforth it shall be referred to as TJ.

one then being held, were empowered to determine the mandate, the organization and the functioning of this unique organization. Delegations were headed by "ambassadors" and the conferences were accordingly named "Plenipotentiaries". The Convention defined the relations between its Members, as well as those between Members and non-Members, with regard to telegraph communication. (Michaelis, p67) The ITU was unique in that it allowed any nation to become a new member merely by committing itself to the Convention, by means of informing the French government through regular diplomatic channels. (C&R, p6) It was agreed that the member states would meet every few years in alternating capitals.

The next conference was held in Vienna in 1868. The major contribution of this Plenipotentiary was to create a **permanent** body, the International Bureau of Telegraph Administrations, concerned with matters of an operative and administrative nature. (Coddington, 1952, p48-9) This action was a highly innovative one for the development of international organization. (Michaelis, p63) The Bureau's permanent director is the direct forerunner of today's Secretary-General, while the Bureau itself was later to assume tasks for radiocommunication subsequently entrusted to today's IFRB (International Frequency Registration Board), following its creation in 1947. (Leive, p32, fn. 3) A financing system was agreed to (Coddington, 1952, p24), which is still the one employed today (1989 Constitution,

Art.15.1, 2 and 3, pA19; 1982 Convention, pp14-5): obligatory contributions based on a self-chosen class-unit system. Members could chose to commit themselves to any one of six possible "classes" of financial contributions; the amount each class represented was determined by the overall expenses incurred by the Union.

The third ITU Plenipotentiary, in Rome at year's end, 1871, introduced two significant changes to the Union. For one, it allowed private telegraph corporations full involvement in all ITU discussions, although not the privilege of voting. (Documents de la Conference Telegraphique, 1871-2, p236) Secondly, it introduced an article allowing any member to declare itself not bound by a particular part of the agreement, if that nation so declared at the time of the signing of the Convention. This was achieved by means of allowing a signatory state to make a "reservation" specifying the portion of the treaty to which that member refuses to be bound. (32) In the first six decades of the ITU this mechanism was seldom employed. In

32. The following provision first appeared in the Convention of 1871-2 and has been retained ever since:

"Chacune des Delegations des Etats contractements peut s'opposer a l'adoption d'une nouvelle disposition reglementaire, en declarant son refus formel d'y adherer.

"Ce veto peut etre absolu ou conditionnel et sous reserve de nouvelles instructions que la Delegation provoquerait de son Gouvernement. Il peut s'appliquer a un vote deja effectue et auquel le Delegation opposante n'aurait pu prendre part." (Documents de la Conference Telegraphique International de Rome, 1871-2; Article 13 of the "Projet de Reglement des Conference", p87)

fact, in the regulation of the wired services, Members have almost never made use of this innovative mechanism which they evolved. (33) (Michaelis, p73)

The St. Petersburg Conference of 1875 became the last conference to alter the terms of the Convention until 1932. At St. Petersburg there was a decision to separate the final documents which emerged from each ITU conference into two: a Convention which presented the principles of the organization; and the Telegraph Regulations, which governed the technical standards of international telegraphy and international rates. It is the former which most concerns us here -- the political and organizational text which defines the relations involved. The latter, however, is integrally bound to the former. It was, after all, owing to the inclusion of the rate regulations that the United States refused to sign the convention and become party to this international treaty. U.S. telegraph companies, privately owned unlike their European counter-parts, and enjoying higher rates than prevailed in Europe, insisted that only market forces would govern their rate levels. (Coddington, 1952, pp27-8) It was only the Regulations which were seen to require regular, periodic updating. The meetings called for this purpose were designated Administrative Conferences.

33. Even by the time of the 1925 Paris Conference there were still only three reservations made, although this was more than usually had occurred. One of these was later withdrawn after consultation between the delegation and the government it represented. (Coddington, 1952, p46, fn203)

Plenipotentiary Conferences were defined to be the political organ empowered to alter the Convention itself. This separation of functions between Administrative Conferences and Plenipotentiary Conferences allowed a government to send entirely different kinds of delegates to the two different meetings. (Coddington, 1952, p28)

Technically-oriented delegates could attend the former, while politically-oriented delegates could be sought for the latter. Between 1875 and 1908, there were seven Administrative Conferences (34); and after the Great War, yet another two. (Paris, 1925 and Brussels, 1928) But the next Plenipotentiary Conference was not to be called until 1932 -- 57 years later! (Michaelis, p67)

Why the long delay between the convening of Plenipotentiary Conferences? Part of the difficulty seems have lain with the emergence of a competing form of technology which threatened the heavy capital investment that had already been made in extensive telegraph lines. (Coddington, 1952, pp9-12) The competition came from the telephone. (C&R, p8) By delaying the holding of a Plenipotentiary Conference, the telegraph administrations could impede telephony from receiving from the ITU the very

34. St. Petersburg, 1875; London, 1879; Berlin, 1885; Paris, 1890; Budapest, 1896; London, 1903; and Lisbon, 1908. (Coddington, 1952, p30)

benefits which telegraphy had already received from the Union: international administrative coordination and standards-setting. (35)

The first post-WWI International Telegraph Union conference was called for 1925 in Paris. In order to provide for continuity in the study of technical questions, the 1925 Paris Administrative Conference established two semi-independent consultative bodies, the first of today's CCIs: the International Telegraph Consultative Committee (CCIT) and the International Telephone Consultative Committee (CCIF). (Coddington, 1952, pp35-6, 454) The former was to meet once every second year, while the latter met annually. (Michaelis, p72)

It was the Brussels Telegraph Conference of 1928, reiterating the 1925 Paris Conference's call for a Plenipotentiary Conference, which formally authorized a Plenipotentiary to be held in Spain in 1932. (Coddington, p37) This Conference updated the Convention with a series of pressing changes, but most importantly called for the formal

35. See Kieve, pp200-15 for a description of telegraph efforts in Great Britain to "hamper" the growth of telephony from the 1870s to 1911. The advent of telephony is interesting because the rate structure shifted from the number of words transmitted as in the case of telegraphy, to the length of time over which a wired connection is made. This was a shift from charging for the amount of information transmitted to charging for the communicative capacity employed.

unity of wired and wireless communication within a transformed ITU. In doing so it changed the name of the organization from the International Telegraph Union to the **International Telecommunications Union.** (Convention, 1932)

D. THE RADIO SPECTRUM

Almost a century ago, in 1896, Guglielmo Marconi filed the first patents for a "wireless" transmission apparatus, causing a furor among many who had contributed to both the theory and the hardware of radiocommunication throughout the preceding decades. (Schubert, p16) (36) In 1900 both the British and German navies began generalizing the use of radio on board their ships (Schubert, pp25-6, 30); they were soon followed by the other naval powers. (37) Only a few

36. There has been much debate as to whether Marconi should have been able to patent the "wireless" and whether Marconi or Popov is responsible for the first "wireless" transmission apparatus. (TJ, June90, p386). What Marconi did contribute was to apply much of what was already known (Lodge, p47), to supply the necessary capital (Dunlap, p34), to construct a transmission apparatus and to market the idea in England (Dunlap, p48). He subsequently purchased the patents that had been filed by others: Edison (Schubert, p30), Lodge (Lodge, p47), etc. and launched legal suits against others who failed to pay him royalties for the use of this technology. (Dunlap, pp227-36)

37. Germany later switched from Marconi sets to Slaby-Arco units, as too did Sweden. (Schubert, p35) The Russian navy used Popov sets (A.S. Popov is credited with the transmission of radio waves over a distance of 250 meters on an apparatus he designed, one full year before Marconi (TJ, June90, p386), and accredited in the USSR with having invented the radio in 1895. (Michaelis, p124) The French Navy used a version of the Popov set, adapted by Ducretet. (Schubert, p35)

years later, in 1903, the nine major powers of that time (38) met in Berlin to draft the first protocol to regulate use of the radio spectrum. It was already well understood that to fail to do so, given the nature of the resource, would have meant, as the host government described it in Hobbesian terms, "a war of all against all" (Protocole Final, 1903, pp15-6) and therefore the inability of any to effectively use the resource. (Tomlinson, p19)

Even the U.S. government, not yet a signatory to the ITU, recognized the need for international spectrum regulation and signed the 1906 Convention and Regulations, as it had the 1903 Final Protocol. Two key differences existed between wired telegraphy and "wireless" telegraphy (as it was originally known) which led to immediate U.S. participation in the regulation of the latter, unlike their steadfast refusal to do so with the former. The first is the very nature of the resource itself and the cooperation this demands in order to make effective use of it. The second is the fact that unlike U.S. telegraphy, there were as yet no U.S. private commercial interests involved in exploiting the radio spectrum. (39)

38. Austria, France, Germany, Great Britain, Hungary, Italy, Russia, Spain and the United States. (Coddington, 1952, fn13, p84)

39. The U.S. Navy purchased German Slaby-Arco radio sets, even until the time of the outbreak of the Great War in 1914. (Schubert, pp53-4, 95-6)

Use of the "wireless" was initially seen as a continuation of the "wired" communication network. At the turn of the century the radio spectrum was principally employed to extend the network of telegraph communication already in place on land to ships at sea. The 1903 Conference originally sought only to establish norms for ship-to-shore communication, but the 1906 Conference, called to expand the agreement into a Convention and accompanying Regulations, included some regulation of ship-to-ship communication as well. (Convention, 1906, Reglement, Art.41 as cited by Tomlinson, p24, fn3) The Final Protocol of 1903 specified that portions of the Telegraph Convention were to be applicable also to radio communication. (Protocole Final, 1903, Art.III, p84)

The 1903 draft agreement followed the International Telegraph Union's practice of allowing for the filing of "reservations". Indeed, two nations did submit declarations of opposition to the agreement. But as these nations did not also sign the final protocol (40), these may not be

40. The two countries which made these declarations were Great Britain and Italy. The issue around which the opposition arose lay at the very heart of the reason for calling the Conference in the first place: an effort to break the attempted Marconi monopoly which pivoted on this company's policy of prohibiting any party which used its radio transceivers to communicate with units made by its competitors. (Coddington, 52, pp84-7) This had been easily accomplished since only Marconi employees were authorized to operate its products. (Schubert, p31-2)

considered as "reservations" (or dissenting opinions of signatories), but merely as statements of opposition from participants which had refused to become signatories.

The remainder of this chapter will trace the highlights of the subsequent Plenipotentiary Conferences until 1947, at which time the ITU adopted the structure which it currently enjoys. During this time, the ITU was extended powers of a scope heretofore unknown to any other universal international organization.

i. The 1906 Conference

The conference called to ratify the 1903 Draft Protocol was to have been held in 1904, but it was postponed until 1906 owing to the outbreak of war between two of its members: Russia and Japan. (Coddington, 52, p87) The war was closely monitored by the other imperial powers (41) to assess its military use of radio communication. (42) This 1906 Berlin conference was attended by 27 founding members

41. The term "imperial" and "imperialist" are used interchangeably. Both refer to industrialized core capitalist countries whose productive capacity and accumulation of capital are fundamentally based upon and supported by the benefits accrued from unequal exchange with dependent, peripheral countries.

42. Each side employed the new technology. At least 6 or 7 systems of wireless were used, according to Tomlinson. This included 2 sets being used by the press to provide international news coverage: The London Times and The New York Times. (Tomlinson, p17)

and two observers. (Documents, 1906, pp50, 77) (43)

Although the primary focus of the Conference was on the breaking of the Marconi monopoly (44), it also established important principles in frequency allocation and the avoidance of interference. (Leive, p41, fn20)

After 4 weeks of deliberation the Berlin Conference had produced the first "Convention" and "Radio Regulations" to govern the use of the radio spectrum. The "Radiotelegraph" Convention, as suggested even by the very name, was closely modeled on the Telegraph Convention. (Tomlinson, p62)

Provisions of the International Telegraph Regulations, unless specified to the contrary, were to apply to

43. 29 nations were acknowledged as official delegations: Argentina, Austria, Belgium, Brazil, Bulgaria, Chile, Denmark, Egypt, France, Germany, Great Britain, Greece, Hungary, Italy, Japan, Mexico, Monaco, Netherlands, Norway, Persia, Portugal, Rumania, Russia, Siam, Spain, Sweden, Turkey, United States, and Uruguay (Convention, 1906, pp39-43) China and Montenegro later incorporated themselves into the conference as observers. (Ibid, pp50, 77) The signatories were all the official delegations listed above, except for Egypt and Siam. (Ibid, pp349-51) Two imperial powers, Great Britain and Germany, representing these last two colonies, chose not to sign the final accords on these colonies' behalf.

44. Opposition to this Marconi effort to establish a monopoly for itself was initially spearheaded by Germany, whose international Telefunken operations offered the major competition to Marconi prior to WWI. (Tomlinson, pp36-7) These very same major radio powers which most forcefully opposed the Marconi monopoly (Germany, the U.S. and France) soon joined Great Britain, which backed Marconi, in establishing in 1922 a cartel of the world's major radio corporations (Marconi, Telefunken, RCA and Compagnie Generale de T.S.F.) (Tomlinson, pp56-7)

radiocommunication as well. (Convention, 1906, Reglement XLIII, p372)

This conference established the same voting principle as the Telegraph Union of "one nation, one vote"; as with the Telegraph Union, the Radiotelegraph Union allowed for "colonial voting". (45) But whereas the Telegraph Union readily endorsed new membership from any nation or non-self-governing territory willing to accept the obligations of membership, the Radiotelegraph Union did not. It limited additional colonial votes to a maximum of five per imperial country. (46) (Convention, 1906, Art.12, p347) Entrusted with the management of a natural resource, and not merely international coordination, the Radiotelegraph Union evolved with a greater concern for "political" considerations and efforts to restrict membership to "sovereign" nations. (Coddington, 1952, p456)

As with the Telegraph Union, the Radiotelegraph Union provided for both Plenipotentiary Conferences and

45. The practise of "colonial voting" goes back to the Rome Telegraph Conference of 1871-72 where Britain was extended a vote for British India, and later a further vote for the British Isles once the British government nationalized its telegraph system. (Conference Telegraphique International de Rome, pp214, 223 and 263)

46. By 1912, 5 colonial votes each were allowed for France, Germany, Great Britain, Russia and the United States. Italy, the Netherlands and Portugal each had two additional votes; while Spain, Japan and Belgium each received one "colonial" vote. (Stewart, 1928, p37)

Administrative Conferences. But most important in tying this Radiotelegraph Union to the ITU was the decision to charge the Telegraph Bureau in Geneva with responsibility for the administrative and technical affairs of the newly-created Radiotelegraph Union. (47) The members of the Radiotelegraph Union agreed to pay one-half of the ITU Bureau's operating costs, entrusting it with the same tasks on behalf of the Radiotelegraph Union (48) as it already held for the Telegraph Union. (Convention, 1906, Reglement XXXVII, p371; Coddington, 1952, p53)

The functioning and the structure of the two Unions were almost identical. But while the Convention of the fledgling Radiotelegraph Union was very similar to that of the Telegraph Union, the technical regulations for radio were radically different, owing to the drastically different nature of the resource involved. Radio Regulations were drafted in great detail with a view to minimize interference among a growing number of users. Specific bands of frequencies were reserved only for two essential uses: maritime communication (both for ships at sea and for coastal stations serving them) and for "non-public

47. This new role for the ITU Bureau was ratified in 1907 through correspondence with ITU members. (Coddington, 1952, p51)

48. Although the terms "Radiotelegraph Union" and "Telegraph Union" are used here as in other literature, in fact no legally separate union was established under international law. (Coddington, 1952, p140)

correspondence", primarily military. (Tomlinson, p16) From this time on, all stations were expected to send details of their radio use for these operations to the ITU Bureau. (Michaelis, p146) In the future, this provision was not only retained, but strengthened, as will later be seen.

No legally distinct international organization was created by the 1906 Radiotelegraph Convention (Coddington, 1952, p140), but the two Unions did not formally merge until 1932. (Tomlinson, p60) Various reasons explain the delay over the intervening twenty-one years, including the outbreak of world war. But one underlying reason, not cited nor alluded to in any of the authoritative accounts, would seem to have been the same factor which delayed the incorporation of telephony for so many decades: as the owners and operators of telegraph networks zealously guarded their vested interests against the emerging competitive technology of telephony, so too did they attempt to guard against the emerging competitive technology that employed the radio spectrum. (49)

49. This aspect of vested interests operating to impede the introduction of new potentially competitive technology has occurred in numerous instances, although this issue is seldom discussed. One of the most notorious is the 28 year delay by the U.S. AM radio stations of the introduction of FM technology. (Lessing, ppix-x) FM has since come to be the dominant technology for many non-broadcasting uses, including many military, microwave and satellite services. (Ibid, pxi) Another example of vested interests opposing innovative technology has been the 60 year delay in the introduction of facsimile. (Smythe, 1981, pp83-4) Facsimile transmission, now popularly known as FAX, had been transmitted over the Pacific in 1926 and was first provided

With the London Radio Conference of 1912 opening a mere two months after the disastrous sinking of the Titanic, the last vestiges were eliminated of Marconi's efforts to obtain a monopoly through prohibiting communication with non-Marconi transceivers. (Coddington, 1952, p100) (50) This was the last Radio Conference to be held prior to the Great War, while the first one convened after WWI did not take place until 1927.

E. THE 1927 WASHINGTON RADIO CONFERENCE

Military use of frequencies, during wartime, greatly pushed the development of the upper reaches of the radio spectrum. Civilian spectrum usage was heavily affected in two ways. For one, the alarming thought of a cable merely being cut (with what then would have been irretrievable consequences were this a trans-oceanic cable), gave great motivation to proponents of a wireless form of telecommunication, for civilian as well as military uses; it

for as a service by the ITU at the 1927 Conference.
(Stewart, 1928, p40)

50. Those who survived the Titanic's collision with an iceberg were saved owing to radiocommunication. Other ships which were closer to the Titanic could have come to the rescue had they carried radio transceivers units on board. As well, another ship had already struck an iceberg in the same general vicinity and attempted to warn the Titanic by radio but could not do so owing to the absence of universal norms which could have guaranteed emergency communication. (Tomlinson, p29)

was simply less vulnerable. Secondly, there were new civilian services introduced from military applications. The most far-reaching of these to emerge from the First World War was aircraft radio. (Coddington, 1952, p109) The result was to both intensify congestion in some portions that were already heavily used and to extend congestion to increasingly wider portions of the spectrum.

The 1927 Washington Radio Conference is of special interest for a variety of important reasons. First, it ratified the resolution of the International Telegraph Conferences to formally unify the two bodies. (Tomlinson, p69) Secondly, it established a technical body for the radio spectrum, similar to the two other recently-created International consultative Committees for telephony and telegraphy: the International Radio Consultative Committee (CCIR). (51) (Tomlinson, pp269-72) The CCIR was mandated to meet every few years to "study technical and related questions" (Convention, 1927, Art.13bis, p8) (52) It was to

51. The idea for the creation of such a body was already widely accepted at a Preliminary Conference on Electric Communications held by the triumphant Allied powers in 1920 (France, Great Britain, Italy, Japan and the United States). (Stewart, 1928, p30) By 1927, some of these same powers feared that such a committee might hamper the development of technology and impose unnecessary restrictions over innovations in this emerging industry. (Ibid, p46. Also see Coddington, 1952, p122 or C&R, p86)

52. Note that the original French version of the 1927 Convention, published by the ITU, is cited throughout. Unlike the subsequent versions of this convention, it still employs the numbering of the articles as they were referred

consist of experts from administrations and authorized private enterprises which were also interested in participating. There was to be only one vote per country, but all participants (even non-voting private "operating companies") were to contribute equally towards the CCIR expenses. All other organizational issues were to be decided by the CCIR itself. (Coddington, 1952, p122)

Thirdly, the Washington Conference created the first **frequency allocation table**, for the major radiocommunication services employed at the time. (Convention, 1927, Reglement, Art5, p26) (See Chapter 6.A) The 1912 Conference had allocated frequency bands to radio beacons, time signals and weather reports. (Tomlinson, pp131-2) By 1927, long distance communication, broadcasting and air navigation (including weather, landing, traffic and other safety considerations) all required their own bands. (Coddington, p114) As well, the needs of amateur and private experimental stations were formally acknowledged by the ITU for the first time. (1927 Washington Regulations, Art.5.18 and 6, as quoted by Tomlinson, p107, fn3.) The designating of bands for international air services at the 1938 Cairo Plenipotentiary Conference was the first instance of ITU planning the allocation of bands in anticipation of a future need. (Coddington, 1952, p164)

to during the 1927 Conference itself. Subsequent versions have re-numbered the articles.

Fourthly, this was the formal introduction of the earliest principle for determining assignment of a specific frequency. (See Chapter 6.) This principle was first known as the "right of priority" (53), whereby all members would be obliged to respect the rights of priority extended to the party which first announced its use of that specific frequency for a stated purpose. (Coddington, p125) To invoke this right each country was required to notify the Bureau before authorizing the establishment of a new radio station. (Ibid, p187)

Fifthly, the Conference imposed **compulsory** arbitration on its members in an effort to regulate the radio spectrum. Although the right of priority was introduced, it did not automatically determine the right to use a given frequency. (TJ, Aug90, p559) Instead the Convention article dealing with dispute resolution was altered to read as follows:

"In the case of disagreement between two contracting Governments in respect to the interpretation or the execution of the present Convention or of the Regulations provided for by Article 13, the question in dispute **must**, at the request of one of these Governments, **be submitted to arbitration.**" (Convention, 1927, Art18, p9; translation from Senatorial Hearings, 1928, pp11-2; emphasis added.)

53. Later this came to be known as the "first come, first served" method.

No signatory to date has yet resorted to this mechanism.

(1989 Nice Minutes (54), p410) This issue will be explored in Chapter 7.

F. RADIO REGULATIONS: BINDING OR NOT?

With both the Telegraph and Radio Conferences finally held simultaneously in 1932, the two bodies could now formally elaborate a new working relationship within a unified telecommunications union. (55) But different regulatory regimes were in place for each, in response to the differences in the technologies themselves. Forms of communication which employ the radio spectrum are heavily dependent on agreements among other users and potential users. The mutual need to avoid interference drives both the established user and the new one to attempt to accommodate the interests of the other. This was **not** the situation with telegraphy and telephony. It is a difference which rises out of the very nature of the resource being employed.

54. Henceforth referred to as NM, for Nice Minutes.

55. This was the first diplomatic or Plenipotentiary Conference for the Telegraph Union since 1875; but the fourth such Plenipotentiary for the Radiotelegraph Union in only half that time.

i. The 1932 Plenipotentiary

All parties at the 1932 Conference ultimately agreed to a single Convention, but without the inclusion of any of the Regulations as part of that document. It was agreed that the telegraph and telephone regulations should be kept separate from the Convention so as to accommodate the objections of the U.S. and Canada. The United States, and to a lesser degree Canada, (56) have historically refused to sign any agreement which would place restrictions on the determination of telegraph rates by mechanisms other than purely market ones. (Coddington, 1952, p138) The rationale for this position was ideological: to allow "free market" competition to determine prices. It is interesting to note,

56. Canada first came to be registered as a member of the ITU as a result of Great Britain claiming its right to colonial votes in the 1906 conference. (Coddington, 1952, pp98-9) No Canadian, however, is known to have attended the event. (Documents, 1906) The same occurred at the 1912 London Plenipotentiary. It was not until the 1927 Conference that a Canadian delegate actually participated in ITU affairs. Although Canada had its own delegation in 1927, this is not to hold that Canada took an independent position. Officially the Canadian vote was listed as one of the British "colonial votes". (U.S. Senate Hearings, 1928, p9) Although Canada voted against the British position on the issue of the binding nature of Regulations, it only did so under the wing, and intimately linked to the position of the U.S. (Coddington, 1952, p137; U.S. Senate Hearings, 1928, p9)

The reason for the convergence of the U.S. and Canadian positions was the role that private corporations played in providing national wired communication services within both countries. (Ibid, p3) This was unlike the public role of telecommunications in Europe, much as the private vs. public roles soon to be developed in broadcasting would also initially separate Canadian government policy from that of the United States.

however, that by 1866, only one year after the ITU was established, this "free enterprise" in U.S. telegraphy resulted in the creation of the **first legal U.S. private monopoly** in any sector of the economy, the Western Union Telegraph Company. (DuBoff, p461) Thus monopoly capital, without competition, argued to retain its higher rate structure on grounds of letting the market decide! In justifying Western Union's purchase of its last two competitors, this company advanced the same arguments in favour of a single monopoly owner as European governments put forward in favour of nationalization. (Thompson, R.L., p426)

The position advanced to keep regulations separate from the Telegraph Convention was not, however, the same view these same nations held with regards to the inclusion of **Radio** Regulations in the Convention. Fundamental agreement with and adherence to the radio regulations was seen as crucial for the prevention of interference and "essential to the very existence of radio communication". (Coddington, 1952, p138)

A consensus almost existed in 1932 that the fundamental principles aimed at preventing interference be entrenched in this unified Convention. It was almost agreed to make the Radio Regulations binding on all signatories for it seemed unacceptable to most that a nation could opt to avoid its

obligations by merely refusing to sign the appended regulations. Unanimous agreement was prevented by a single country, owing to circumstances peculiar to that specific historical moment.

The opposition came from the USSR. It was motivated by fundamental political concerns of political survival, rather than any failure to appreciate the nature of the radio spectrum. The USSR insisted that more basic yet than the need for principles to prevent interference, was the right of national sovereignty, whereby any member could make a "reservation" to the binding nature of any article of any ITU document, including the Convention itself. (Ibid, p138) The USSR argued that if the telegraph and telephone regulations could be made optional to please the U.S. and Canada, so too could the Radio Regulations. Withdrawing from the working group that drafted this proposal, the USSR opted instead to lobby the Plenary, soon gathering widespread sympathy and support for this position. (Ibid.)

There was good reason for the USSR to be highly concerned over finding itself obliged to accept as binding a position which did not take Soviet interests into account. At the preceding Radio Conference (1927 in Washington), the USSR, although a signatory and adherent to the ITU Conventions and Regulations, was not even invited nor allowed to attend owing to international political hostility

spear-headed by the United States of America. (Tomlinson, p60) This action by the United States was in violation of Article 12 of the 1912 Convention, in force at that time. (Tomlinson, p60) Not only was the USSR subjected by the imperialist powers to international isolation, but only a few years prior to the 1927 Conference, the USSR had even been subject to invasion by foreign troops. (57) To add insult to injury, until 1932, the ITU had not only denied the sovereignty and the legitimacy of the USSR, but instead reserved representation of the Soviet Union within the ITU for a non-existent "Imperial Russia". (Smythe, 1981, p307)

Although denied participation in the Conference, the USSR did willingly respect and adhere to the provisions of the earlier Conventions and Regulations, signed by Imperial Russia. (Smythe, 1957, p66) Ostracized for 15 years since the 1917 Revolution, even in violation of international law, it is not surprising that the Soviet Union - - lone socialist country at that time in a hostile, capitalist world -- was reluctant to allow itself to be bound by conditions that might have been imposed on it by a simple majority vote.

As a result, the Radio Regulations were, like the Telegraph and Telephone Regulations, to be signed separately

57. Even Canada had an "expeditionary" force of thousands of soldiers penetrating into Siberia.

from the Convention itself. To be a signatory to the Convention required only the adherence to one of the three sets of regulations (telegraph, telephone or radio).

(Convention, 1932, Art.2.2, p2) This situation persisted until 1947. (1947 Convention, Art.13.2 and 13.3, p16-E)

ii. The 1947 Plenipotentiary

By the time of the next Plenipotentiary Conference in 1947, the USSR had lost its overriding fear of threats to its interests from a consortium of unified hostile imperialist powers. The Soviet Union, after the Second World War, was no longer isolated. Soviet military victory in its defense against Nazi aggression had left the USSR with a bloc of allied countries in Eastern Europe. Furthermore, the Second World War had also demonstrated that it was possible for inter-imperialist rivalry to surpass the anti-communist sentiment directed against the USSR. (58) Finally, the urgency to regulate the chaotic situation in the airwaves, which was widespread throughout post-WWII Europe, convinced the Soviet Union of the need to introduce more binding regulation of the spectrum.

58. This is not to question the qualitative difference between the First and Second World Wars, whereby the former is correctly understood to have been little more than an "inter-imperialist war", unlike the latter which, for interests other than imperialist ones, was primarily an "anti-fascist" war.

Thus by 1947 even the USSR came to promote the obligatory nature of the Radio Regulations for all ITU members. (Coddington, 52, p325; U.S. Delegations Report, 1947 (59); p62) In fact, the USSR arguably became the strongest proponent of its obligatory character. (C&R, p212) In doing so, the USSR successfully advocated all three sets of Regulations (Radio, Telegraph and Telephone) be binding on all members.

While the U.S. had long favoured the obligatory nature of the Radio Regulations, they still declared they had reservations regarding the regulation of telegraph and telephone, owing to the negotiation of international rates for both services. However, as this position of obligatory acceptance of all three sets of regulations received widespread support from almost every other delegation, the U.S. claimed it was important to not be seen as the "stumbling block" to making the Radio Regulations binding on all ITU members. (U.S. Del. Rep. 1947, p62) Since 1932 the U.S. delegation had offered to consider being bound by the telegraph and telephone regulations, if the Radio Regulations also became binding. (Tomlinson, p76)

59. The full title of the document is International Telecommunication Conferences; Atlantic City, New Jersey, May-October 1947; Report of the United States Delegations to the International Radio Conference, the International Telecommunication Conference and the International Conference on High Frequency Broadcasting, with selected Documents. Henceforth the document will be cited as U.S. Del. Rep. 1947.

This "concession" by the U.S. must be placed in its proper context. As early as 1927, the U.S. had **already** successfully siphoned off those matters dealing with rates into an optional set of "Additional Regulations" which it refused to sign. (Stewart, 1928, pp35-6) Furthermore, the U.S. had also succeeded in watering down the obligatory nature of the regulations and the Convention by altering the "musts" to "shoulds" and the "obligations" to "suggestions" for the regulations of both telegraph and telephone. (Tomlinson, pp65-6) Thus, this alleged "concession" by the U.S. actually involved the U.S. conceding precious little.

In 1947 only Chile and Saudi Arabia registered reservations to any of the Radio Regulations. (1947 Final Protocol, pp89-E and 92-E) A now heavily congested radio spectrum and a strong desire to accommodate new demands encouraged all other members to accept the Radio Regulations in their entirety, regardless of how great a compromise each suffered in hammering them out.

By 1947 international agreement regarding spectrum regulation and the need to seek legal mechanisms to oblige all users to comply with international law had reached its peak. From 1947 onward, the telecommunication powers, under the lead of the United States, would appear to have sought

the erosion of international legal mechanisms in favour of other forms of international power.

This would occur gradually in response to the emergence of a bloc of lesser industrialized nations exercising their claims of access to this international resource. This emergence will be analyzed in Chapter 4. But first let us review the organizational changes of 1947 which extended to the ITU its current structure.

CHAPTER 4: MANAGING THE POST-WORLD WAR TWO SPECTRUM

The Second World War left international telecommunications, especially that of Europe, in massive disarray. (U.S. Del. Rep. 1947, p98) Many peace-time stations which had ceased operations during the course of the war sought to reclaim frequencies that had been usurped by the victorious military powers. (Michaelis, p248) Above all others, the USA had come to dominate the airwaves. Indeed, U.S. usage of the spectrum **exceeded that of all other countries combined!** (60) Confronted by this extraordinary inequity in access to the radio spectrum, the post-war European nations rallied to seek a major redistribution of frequency assignment.

In anticipation of conflicts arising over spectrum congestion, two years before the war ended the U.S. government commissioned its telecommunications regulatory body (for non-governmental use), the Federal Communications

60. By the end of World War Two, the then-usable portions of the spectrum were divided into 3,200 of what were referred to at the time as "yardstick channels". These were required to fulfill the estimated need of 5,337 such channels. Of these 3,200 existing channels, the United States had registered and claimed permanent assignments on over half, 1,699! Further, of the more congested frequencies between 4 and 10 Mhz, where 73% of all world assignments existed in 1945, the United States had claimed over 75% of the frequencies (911 "yardstick channels" of a total of 1,200). (U.S. Senate Hearings, testimony of the Director of Naval Communications, Admiral Joseph R. Redman; as quoted by Smythe, 1957, p87)

Commission (the FCC), to assess probable post-war international spectrum needs. Its findings estimated a level of demand at least twice that of the supply. (Coddington, 1952, p195) Broadcasting, as well as military usage that mushroomed during the war, dominated this enormous growth in spectrum use. Far from ending with the cessation of open hostilities in 1945, this excessive usage of spectrum was exacerbated, rather than alleviated, in the subsequent decade, owing to the ensuing ideological Cold War and its barrage of shortwave propaganda. (Ibid, p378)

A. THE 1947 ATLANTIC CITY CONFERENCES

Subsequent to a 1946 Preparatory Conference in Moscow among the "Big Five" Allied victors, the United States, against the objections of most European nations, called for the next Plenipotentiary Conference to be held in Atlantic City in 1947. To do so legally required the written support of twenty other Member nations. The Bureau of the Union, in consulting with all Members, determined that twenty-four Members preferred the conference to be held in Switzerland, four others favoured another part of Europe and only nineteen supported the holding of the Conference in the United States. (61) The U.S. claimed the support of twenty-

61. A provision of the Convention (article 18), allowed for the calling of a Plenipotentiary when at least 20 members have informed the Bureau of their decision. (Convention 1938, or 1932, Art.18, p11)

one nations for the holding of the conference in the United States; but the Bureau was informed by these very governments that two of them in fact preferred Switzerland and one favoured another location in Europe, while four failed to even respond. (Coddington, 1952, p206, fn4) Legally, the United States was not in a position to call for the convening of a Plenipotentiary in the U.S. But the United States, at that time, had become not only the most powerful country in the field of telecommunications, but the most militarily and economically powerful of all nations.

The U.S. government refused to retract the invitation that it had earlier circulated announcing the 1947 Atlantic City Plenipotentiary Conference and the ITU Bureau chose not to boycott the event. So the Conference proceeded as planned. (Coddington, p206) As a result the debate continued at the Plenipotentiary itself. With the support of the USSR and with the U.S. pledging to run the conference in an entirely democratic manner "so that the interests of all, especially those of the smaller nations, would be safeguarded" (Atlantic City Documents, 1947, pp17-9, as cited by Coddington, 1952, p208), the conference got underway. But it was only once the United States had announced that they would not request moving the seat of the ITU from

Geneva to New York (62), that the tensions surrounding these issues subsided. (Coddington, 1952, p457)

Seeking a voting bloc within the ITU in support of U.S. proposals, the United States actively promoted the incorporation into the Union of numerous dependent LINCs, primarily Latin American countries. (63) Although incorporation of these countries into the ITU in this manner contravened legal procedures laid out in the Convention as none had yet deposited ratification of the Convention with the Union, these irregularities were sent to a committee for evaluation, but were ultimately overlooked by the Plenipotentiary. (64) One may assume that the political and economic influence of the United States over war-torn Europe, as exemplified by the Marshall Plan was not totally devoid of impact. At Atlantic City, most of the U.S. agenda

62. The concern of most European nations was the United States' previous attempts to move the ITU headoffice to New York. It was only after the Plenary voted that a two-third majority was necessary to move the seat of the Union and the realization by the U.S. delegation that they could not obtain this that the U.S. abandoned its efforts at locating the ITU headquarters in the United States. (U.S. Del. Rep. 1947, pp57-8)

63. The Latin American countries which joined at this time were Argentina, Chile, Costa Rica, Ecuador, El Salvador, Nicaragua, Honduras and Peru. (Coddington, 1952, pp209-10) As well, both the Philippines and Saudi Arabia were granted full status although neither had signed nor adhered to the Convention. (Ibid, p210)

64. The strongest objections came from Belgium and Switzerland. (Smythe, 1957, pp66-7) The issue was sent to a sub-committee, the "Special Committee on the Right to Vote"; but the Committee never did meet. (U.S. Del. Rep. 1947, p78)

was adopted (U.S. Del. Rep. 1947, p8) and ultimately incorporated into the final resolutions. (Ibid, p100)

The 1947 Plenipotentiary Conference endowed the ITU with basically the same structure that it continues to enjoy today. The remainder of this chapter outlines what those changes were. Two new crucial administrative bodies were created, both of which remain integral to the functioning of the ITU in the 1990s: the International Frequency Registration Board (IFRB) and the Administrative Council. The Union's structure henceforth consisted of these two organs, together with the CCIs (65) and the General Secretariat (headed by the elected positions of Secretary-General and Deputy Secretary-General). As well, the Plenipotentiary Conferences and the Administrative Conferences were retained as non-permanent organs of the Union, with the former being the "supreme organ of the Union". (1989 Constitution, Art.5, pA6; 1982 Convention; p4)

B. THE IFRB

By 1947, the pressure to reorganize the use of frequencies so as to eliminate harmful interference was so intense that a new organ was created to fulfill this

65. Until this time the International Consultative Committees (CCIs) had not yet been defined as permanent organs. (Coddington, 1952, p271)

function. Given the nature of the role assigned to the IFRB in managing this strategic resource, it is worth briefly reviewing the Board.

Since 1929, the CCIR had called for all members to register with the ITU the frequencies they used. (Coddington, 1952, p188) These notifications prior to 1947 were submitted to the Union's Bureau and recorded in the Master Frequency List (Coddington, 1952, p241) and subsequently published by the ITU for the information of all other existing or potential users. This procedure was strengthened and formally ratified by the Madrid Plenipotentiary in 1932. (Convention, 1932, Reglement, Art.7.5.1 and 7.5.2) The strengthening consisted of requiring that notice be served **prior** to usage of a frequency and that this notification be of 6 months duration if the frequency desired were located outside a band designated for that specific service. (Coddington, 1952, p150)

i. The Board's Powers

The Board was to list each frequency under one of two separate headings: "Notification" or "Registration". If a frequency was deemed to be in conformity with all ITU allocation requirements and not to produce harmful interference to existing registered operations it would be listed in the "Registration Column". (1947 Radio

Regulations, Art.11.2, p72-E and Art.11.7, pp74-E and 75-E) If it did not comply but "on the use of which the notifying country insists", then it was listed in the "Notification Column". (Ibid, Art.11.1.3, p72-E) (66)

It was not difficult for the 1947 Plenipotentiary to agree on the above. (U.S. Del. Rep. 1947, pp12-13) What was contentious, however, was that the Board's initial powers were to include the creating of an entirely new "engineered" or planned spectrum! (Ibid, pp25-33) It was not the IFRB itself which was to draft this new "engineered" spectrum, but a Provisional Frequency Board (PFB). The IFRB was not only empowered to register frequencies, but to cancel those registered which failed to be used. (Convention, 1947, Reglement, Art.11, Section VI, pp78-E and 79-E) In 1957 the Board defined its own process for accomplishing this on a trial basis; at the next Plenipotentiary, this became institutionalized. (1959 Radio Regulation #516, as quoted by Leive, p86)

To allay fears that a powerful organ was being created which would threaten the sovereignty of less powerful nations, it was clarified at the 1947 Conference that the focus of the IFRB was to be technical, as opposed to political, relegating the Board principally to a role of

66. Also see U.S. Del Rep. 1947, pp12-3 and Coddington, 1952, pp242-3.

"witness". (Coddington, 1952, p245) It was "not to invade the sovereignty of any state". (U.S. Del. Rep. 1947, p15) As the very nature of international regulation of this resource calls for a limitation of absolute sovereignty, this is a delicate distinction that over the years has proven to be anything but clear.

ii. The Provisional Frequency Board

The Provisional Frequency Board, established to create an "engineered spectrum", was composed of the members of the IFRB, plus one representative from each Member nation. The ITU's Geneva Bureau was mandated to collect the frequency demands from all member nations (U.S. Del. Rep. 1947, p32) for the spectrum between 10 KHz and 30MHz. (Ibid, pp20-1) The PFB was then expected to reconcile these demands and to satisfy them to the greatest degree possible. (Coddington, 1952, pp340-1)

The Chair of the PFB rotated among the major IFRB nations, with the U.S., Australia and the United Kingdom each serving a term. (Ibid, p342) The USSR first opposed, then boycotted the PFB process insisting upon the legitimacy of claims to frequencies already registered in the existing International Frequency List. As the USA had not, unlike the USSR, continued to register its new spectrum uses during WWII, the U.S. sought to deny any validity for the claims

from those nations which had done so. (President's Communications Policy Board; p31) (67)

Had there been a different international political climate among the world's powers, one might have anticipated an entirely different outcome, with efforts to accommodate the concerns of the USSR, as there had been to accommodate the concerns of much smaller nations. Ultimately the PFB was dissolved, but not before it had determined potential planned portions for various bands. (Coddington, 1952, pp363-4) An Extraordinary Administrative Radio Conference was called in 1951 to finalize the PRB's work of creating a "engineered" spectrum. (See Chapter 6.B)

iii. U.S. Motives

Why was it that the U.S. was interested in restructuring frequency assignment, when they already had control over more than half of the spectrum? Herein lies a clear example of the uniqueness of this resource. Were the resource petroleum, water, food or a mineral, one would anticipate a different response from an imperial power. One might expect any imperial nation to fiercely proclaim its right to control the resource, perhaps occasionally allowing others to use it, but only in exchange for something else.

67. Also subsequently referred to as "PCBP".

These conditions, however, do **not** apply to use of the radio spectrum.

Were the U.S. to not attempt to somehow accommodate the demands of those nations which had less access to the spectrum, one would imagine that ultimately these excluded nations would merely unilaterally and defiantly employ those frequencies deemed necessary to fulfill their national needs. Perhaps their channels would suffer considerable interference, but this would be preferable to no channels at all. These new stations, of course, would in turn cause interference to the existing ones.

In order to restrain any potential user from employing a frequency without authorization, two conditions must exist. First there must be an ITU Member which has legal jurisdiction or otherwise significant influence over such a potential user. Secondly, that Member nation must be motivated to exert constraint over such a potential user. Such motivation normally arises only when Member nations consider that they, too, have a stake in ensuring a minimal amount of interference, in order to protect their own authorized stations from being subjected to harmful interference. The concern, then, was that delay in seeking approval from ITU members over a revised frequency table would leave room for "squatters" to employ frequencies which the U.S. had already registered for future use; the problem

then would be how to dislodge such users. (Smythe, 1957, p98, citing FCC Commissioner E.M. Webster.)

High points of diplomatic statecraft were involved. The United States emerged from the Second World War as the most advanced nation in the use of the radio spectrum and the world's major supplier of radio equipment. (Ibid, p87) The U.S. was concerned lest its international leadership be questioned. (Ibid; p98) U.S. efforts to accommodate the interests of smaller nations in matter of frequency allocation and assignment had both political and economic implications. In both areas the U.S. sought to avoid negative repercussions if at all possible. After all, telecommunication is a two-way process, requiring cooperation in the receipt and transmission of messages, as well as offering international markets for sales by the telecommunication powers.

iv. The Board's Structure

At Atlantic City, the United States, with approximately one third of all the delegates (68) (a distinct advantage for lobbying), advocated that the Board be composed of

68. The U.S. delegation consists of 191 delegates (Coddington, 1952, p223) out of a total of "600 delegates" (TU, Nov90, p782). The U.S. Delegate Report to the 1947 Conferences noted 171 delegates at any one time as the maximum reached according to official records. (U.S. Del. Rep. 1947, p3)

technical professionals chosen exclusively for their "personal qualifications". (Coddington, 1952, p247) The majority of the 74 nations represented preferred instead (and won) a system based on regional representation, clarifying further that no IFRB member could "request or receive instructions" from any government or interested party. (1947 Convention, Art.6.5.2, p8-E) The Convention since 1947 has specified that:

The members of the IFRB shall serve, not as representing their respective Member States nor a region, but as custodians of an international public trust. (1947 Convention, Art.6.5.1, pp 7-E and 8-E) (69)

The original 11-member Board (Ibid, Art.10.3.1, p69-E) represented the most powerful and strategically important telecommunications nations of that time. (70)

v. The Board's Evolution

The IFRB had been envisioned by the U.S. as a form of international court of justice for disputes concerning the use of the radio spectrum. (Leive, p55) In the end, it was

69. This article has remained substantively unchanged since it was first introduced in 1947. (1989 Convention, Art.10.4, pA11)

70. Argentina, the USA and Cuba from the Americas; France, the U.K. and South Africa from western Europe and Africa; Czechoslovakia and the USSR from eastern Europe and north Africa; and India, China and Australia from Asia and the Pacific. (U.S. Del. Rep. 1947, p14)

much less. (C&R, p26) The reason for this lay with the inability of the Board to revamp the assignment of frequencies, while still accommodating all the demands of all Member states. This elaborate task, complicated by the initiation of the Cold War, ensured that the IFRB could not complete the task set before it at the time of its creation. (Smythe, 1957, p98)

In 1959, the ITU called its first World Administrative Radio Conference (WARC) with the objective of reviewing the allocations of the entire radio spectrum. The mandate of the 1959 Geneva WARC was to review the allocation for specific services of the entire spectrum and to reallocate whatever portions may have better accommodated the growing demands. By this time, hopes for an entirely new "engineered" frequency list drawn up by the IFRB had been abandoned. (Leive, p68)

At the 1965 Plenipotentiary in Montreux, the U.S. and other imperial powers called for the abolition of the IFRB, citing its failure to draft an entirely new frequency list. (Leive, p27) LINS, however, fought to preserve the Board, seeing in it an important ally for technical advice and support in resolving disputes with DCs over the registration of frequencies. (C&R, pp121-2) The compromise solution arrived at was the preservation of the IFRB, but with the

number of members reduced from eleven to five. (1965 Convention, Art.13.2, p19)

With the reduction in 1967, (71) in the number of members of the Board, not all the major, much less the secondary, powers could remain as Board members. As the United States and France continued to hold the directorships of the CCIR and the CCITT, respectively, (72) they were not allowed to retain a position on the IFRB as well. The subsequent Convention formalized this dominant sentiment. (1973 Convention, Art.13.2, p12)

Since 1975 the 5-person Board has always been composed of an "expert" from each of the following four nations: Canada, the U.K., Japan and the USSR. (73) (C&R, p136; TJ, Dec82, p804; TJ, Sept89, p546) First elected in 1947, the fifth member until 1989 had always been Abderrazak Berrada of Morocco. In 1989 he was finally replaced in a relatively close vote by M. Harbi from Algeria. (TJ, Sept89, p546)

71. The 1965 Convention came into effect on January 1, 1967. (1965 Convention, Art.53, p43) It is traditional that the date for when a new Convention come into effect be set on January 1, one full year after its signing.

72. France was finally obliged to yield the position of CCITT Director to the Federal Republic of Germany in 1984. (TJ, Dec84, p583) Germany continues to hold this position today. (TJ, Sept89, p546)

73. Japan has had representation on the Board continuously since 1960; the USSR since 1950. (C&R, p136)

The functions of the Board today are:

- 1. To record frequency assignments (1989 Convention, Art.10.5.a, pA12) and geo-stationary satellite locations (ibid, Art.10.5.b) in accordance with the Radio Regulations;
- 2. To advise Members seeking access to the spectrum and the GSO slots how best to fulfill their needs (ibid, Art.10.5.c) with a view to maximize use of both resources;
- 3. To assist in preparations for and fulfillment of resolutions from ITU Conferences (ibid, Art.10.5.d);
- 4. To provide assistance to LINS (ibid, Art.10.5.e);
- 5. To maintain records (ibid, Art.10.5.f) and to make copies of these available to Members upon request (ibid, Art.10.5.g).

C. THE ADMINISTRATIVE COUNCIL

By 1947 a clear need was perceived for another kind of organ within the ITU: one which could provide greater continuity and decision-making between Plenipotentiary Conferences, as well as ensuring ongoing supervision of ITU activities. (1947 Convention, Art.5.11.b, d-h, p6-E) Thus an Administrative Council was formed within the ITU, as existed in most other United Nations' organizations. (Coddington, 1952, pp270-1) Some consider the establishment of

the Administrative Council to be the single most important organizational innovation of the 1947 Conference. (Ibid, pp286, 459)

Mandated from its inception to meet annually (1947 Convention, Art.5.5, p5-E), it was the Administrative Council which initially elected and still continues to assume responsibility for overseeing the Secretary-General and the Secretariat. (1989 Convention, Art.3.10, ppB5-8) Prior to 1947, this task had been entrusted to the Swiss government, with most employees being Swiss nationals, apart from the notable exception of the Secretary-General, who was initially German. (Tomlinson, p276. Also see U.S. Del. Rep. 1947, p57) In 1959, the election itself of the Secretary-General passed from the Administrative Council to the more representative body of the Plenipotentiary Conference. (C&R, pp166-7)

In 1965, the Montreux Plenipotentiary Conference extended the mandate of the Administrative Council to include a third major objective: the promotion of international assistance for the provision of technical cooperation to the LINs. (1965 Convention, Art.9.13.r, p14) The excessive concerns which continually inundate the Administrative Council during the few weeks that it meets each year have worked to ensure that this responsibility of

the Council be given only token consideration. (C&R, pp150, 157)

Originally composed of 18 member nations (1947 Convention, Art.5.1, p4-E), the Administrative Council, unlike the IFRB, consisted of government representatives rather than individuals. (74) (1947 Convention, Art.5.1, p4-E) With the addition to the Union of increasing numbers of emerging nations over the following decades, and perhaps more importantly given that the more influential nations have not been willing to forego their own membership on the Council, (75) the size of the Council has tended to continuously expand in order to accommodate these new members. (76)

74. Indeed a nation elected to the Council may send more than one representative on its behalf. According to Coddling and Rutkowski, the average size of delegation has been two to three persons, although the range regularly spans from one member to seven. (C&R, p144)

75. 9 countries have held a seat on every yearly session of the Administrative Council since it was formed in 1947: Canada, the USA, France, the USSR, Italy, Switzerland, Argentina, Brazil and China. A tenth, the United Kingdom had been a member from 1947 until 1989. (Coddling, 1952, p396; C&R, p144; Telecommunications Journal (TJ), Dec82, p804; and TJ, Aug90, p503) Presumably the U.K.'s continued representation on the IFRB undermined the disposition of other western European nations to allow it to retain a seat on both bodies.

76. The Administrative Council grew from 18 to 25 members in 1959 (1959 Convention, Art.8.1(1)); to 29 in 1965 (1965 Convention, Art.9.1(r), p9); to 36 members by 1973 (1973 Convention, Art.8.1(1), p6); to 41 in 1982 (1982 Convention, Art. 8.1.(1), p7); and finally to 43 members in 1989 (1989 Convention, Art. 8.1(1), pA9)

So urgent was the perceived need for structural change in 1947 that as its last act, the IFRB and the Administrative Council were called into immediate existence. (1947 Convention, Additional Protocol, Protocol I, Art.1.1, 2.1 and 2.2, pp94-E and 95-E) This was so, in spite of the Convention itself not coming into force until January 1, 1949. (1947 Convention, Art49, p31-E).

D. RELATIONS WITH THE UNITED NATIONS

Although the ITU became a specialized agency of the United Nations at its 1947 Plenipotentiary, the relationship the ITU held with the U.N. is unlike that of most other U.N. affiliates. (Weissberg, pp42-8) In formalizing its relationship with the United Nations, the ITU insisted on preserving its long-standing autonomy as much as possible. (U.S. Del. Rep. 1947, pp64-66) In doing so, it managed to reserve for itself some unusual conditions which extended the ITU a "special status", as a U.N. "specialized agency". (Coddington, 1952, p318) To begin with, unlike other U.N. bodies, it was not mandatory for members of the ITU to even be members of the United Nations. (Atlantic City Documents, 1947, pp181-94, as quoted by Coddington, 1952, p316) Indeed, the Soviet proposal that at least the principal functionaries of the ITU be nationals of a country with

membership in the United Nations was not accepted. (Coddington, 1952, pp201-2)

The ITU's special status meant that it was not necessary for the ITU to adopt the contributory system required of other U.N. agencies: contributions proportional to each country's production level, as measured by its Gross Domestic Product. (Ibid, p320) Furthermore, the ITU was allowed to retain the use of "colonial voting" while affiliating with the U.N., maintaining the single additional colonial vote per imperial nation. In its negotiations, the ITU rejected the U.N. proposal that the ITU be described as "a specialized agency" of the United Nations, in the field of telecommunications and successfully insisted instead that it be nominated "**the** specialized agency" of the United Nations in the field of telecommunications. (Ibid, pp318-9)

Unlike most U.N. agencies, the ITU insisted on restricting the attendance of U.N. officials at regular ITU functions. The agreement between the two bodies does allow the U.N. to send delegates to the Plenipotentiary and Administrative Conferences, but obviously without the right to vote. (Agreement Between the U.N. and the ITU; 1947 Convention, (77) Annex 5, Art.II, pp80-1-E) The agreement does, however, prevent even the attendance of U.N.

77. Henceforth furthered to as "U.N. Agreement".

officials at other ITU meetings unless expressly invited.
(Coddington, 1952, p319)

Like other U.N. affiliates, the ITU is authorized to resort to the International Court of Justice for opinions regarding disputes within the ITU's jurisdiction. (U.N. Agreement, Art.VII, p83-E) But the ITU managed to refrain from being bound to reciprocally provide its services to the U.N. The ITU is one of less than a dozen U.N. bodies which was requested by the United Nations to have as part of its agreement with the United Nations, an obligation to provide special assistance to the Security Council "for the maintenance or restoration of international peace and security". (Weissberg, p45) The ITU refused to relinquish its independence, even to this degree and instead substituted a less obligatory clause that avoided any mention of the Security Council at all. (Chui, pp133-34)

Thus, what emerges is an image of the ITU that, on the one hand, has generally provided the model for the relationship between specialized agencies and the U.N. (Riggs & Plano, p344); while on the other, has reserved special privileges for itself because ITU membership in the United Nations was deemed to extend **increased prestige to the U.N., not to the ITU**. (Coddington, 1952, p200) Indeed, the ITU had even served as the pioneering organizational model

for the League of Nations, the immediate forerunner to the United Nations itself. (Michaelis, p63; C&R, p3)

In summary, after WWII, the United States, exerting its new-found and preponderant power, convened the necessary ITU Conferences to introduce new organs to regulate the radio spectrum. It was, however, unable to do so while ensuring the level of U.S. influence that it desired by means of hosting the conferences, without violating the legal procedures established under international law. To strengthen its hand in inter-imperial negotiations, the United States successfully encouraged the influx of numerous new Members in varying relations of dependence on the United States.

The IFRB was created with a role in regulating assignments of radio frequencies which was to change over the years. As with most U.N. organizations, an Administrative Council was established to oversee ITU administrative functions. When affiliating itself with the United Nations, indicative of the ITU's power relative to other international organizations, the ITU negotiated for itself a relatively autonomous stature.

CHAPTER 5: COMPETITION FOR FREQUENCIES

Competition for access to frequencies within the ITU occurs in one of two different manners: competition between services or competition among nations. The first is struggled over when there is debate over what bands are to be **allocated** to which services. (Leive, pp18-9) The second is struggled over in determining which nations are to be **assigned** which frequencies.

The former tends to occur within delegations of all nations that employ various radio services, while the latter occurs between the delegations of nations. It is this latter, the inter-national as opposed to the intra-national differences, which is the subject of discussion for this chapter. The United States took an interesting approach on this issue, which seems to have basically been one of unconditional support for frequency requests from all major corporate sectors. Indeed, at times the U.S. has demanded total frequency assignments within a given portion of the spectrum, that **even if no other nation received a single assignment**, could still not be met! Their frequency requests have simply "exceeded the total physical content of the bands". (PCPB, pp10, 188) This approach seems to reflect a total lack of concern over what amount of spectrum could reasonably be considered a "fair share". Obviously

such an approach can be expected to ultimately generate opposition.

A. FROM INTER-IMPERIAL DISPUTES TO ANTI-IMPERIALIST STRUGGLES

The membership ITU has grown from having a primarily European membership into an international body where the less powerful nations increasingly have a majority. In 1927, there were seventy-four signatories. Two-thirds of these were controlled from Europe: twenty-six European nations with their twenty-three colonial votes. The remainder consisted of Japan, together with its additional colonial vote, China, the United States, Liberia and twenty Latin American countries. (Convention, 1927, pp70-30) It can be readily seen why the U.S. sought to increase its voting bloc by incorporating more Latin American nations in 1947. By 1965, the 74 signatories had grown to 129. (1965 Convention, pp44-89) This meant not merely an additional fifty-five members, but a re-alignment within the membership as a whole.

By 1965 there were twenty-one western European members, plus their four colonial votes, together with Canada, Australia, New Zealand, Japan, Israel South Africa, the U.S. and its colonial vote, as well as eleven Soviet bloc and other eastern European nations. But most importantly were

the forty-five Arab and African nations, seventeen Asian and twenty-three Latin American countries. (Ibid.)

By 1965 a fragile alliance of newly emerged nations introduced to the ITU anti-colonial positions, as well as, more timidly, anti-imperialist ones. Although not unrelated, each of these two sets of concerns arose within the ITU as a result of different dynamic. First was the articulation within the ITU of anti-colonial positions arising from the commitment of recently decolonized nations to further decolonization in all international fora possible. In this sense, the ITU was an international forum like any other.

A different dynamic underlay concerns expressed by peripheral nations to achieve access to the unique, valuable resources which were managed by the ITU. Access to these resources was not readily available to these emerging nations, as they found themselves to be latecomers on a scene where the rules had largely been laid on a "first come, first served" basis. Those newly independent nations which found themselves confronted with this situation not only expressed "anti-imperialist" sentiment, but called for actions which would attempt to alter this inequitable state of affairs in spectrum resource distribution, thereby presenting "anti-imperialist" challenges. Such demands were specific to the ITU and the resources it manages.

B. ANTI-COLONIALISM AND ANTI-MILITARISM

Anti-colonial sentiment focused primarily on contesting the accreditation of the most flagrant racist regimes. Recently decolonized Members of the ITU stood firmly in their anti-colonial positions as early as 1965 and have henceforth remained adamant on this issue. At the 1965 Plenipotentiary, the newly emerging nations managed to successfully challenge the participation in the ITU of the Union of South Africa. By a vote of fifty-seven to twenty-nine, the conference determined South Africa should not only be excluded from the 1965 Plenipotentiary, but also not be invited to any further Plenipotentiary or regional conferences. (1965 Convention, pp227-9) The following year, subsequent to consultation with all members, the Administrative Council declared the white settler state of Rhodesia to be an illegal regime and struck its name from all ITU documents. (C&R, p45, fn.7)

This move was ratified at the 1973 Plenipotentiary in Malaga-Torremolinos. (C&R, p54) The 1973 Conference furthermore passed resolutions which excluded not only South Africa from all ITU activities (78) (1973 Convention, pp230-74. This decision was reiterated in 1982 and 1989 at the Nairobi and Nice Plenipotentiary Conferences. (1982 Convention, p243; TJ, Sept90, p549-50)

31), but Portugal as well, owing to its continuing colonial wars in Africa. (Ibid, pp229-30) The following year the Portuguese "flower revolution" unseated the Caetano regime and ended the colonial wars, thereby ending Portugal's international isolation.

To qualify for affiliation with the United Nations in 1947, the ITU was expected to end its practice of "colonial voting" -- a practice which dated back to 1868. (79) However, the terms regarding colonial voting which were ultimately negotiated only forbid this practice for **new** members entering the ITU. (80) (Coddington, 1952, p275-8) Six imperial powers had been allowed to retain one additional "colonial vote". (81) These direct colonial votes are, of

79. Britain attended the 1868 Vienna Conference and signed the Convention on behalf of India. (Coddington, 1952, p23, fn96) But it was only at the 1871-2 Rome Conference that Britain joined the ITU in her own name, sending two delegates to the Conference and insisting on two votes. (Documents, 1872, p263)

80. All major colonial powers were already in the ITU!

81. The 1912 London Convention replicated the voting criteria first established at St. Petersburg in 1878. (1878 Telegraph Convention, Art. 16.2 and 1912 Radiotelegraph Convention, Art. 16.2; as quoted by Tomlinson, pp261-2) At the request of the United States, the 1927 Conference postponed making **any** decision on the matter. (Stewart, 1928, p38) In 1932, with the unification of the two Unions into the International **Telecommunications** Union, colonial votes were limited to one per colonial power, although an additional vote was also assigned to Japan for its colonial possessions (Convention, 1932, Art. 21.1, p61), as well as to Germany and the USSR as consolation (Ibid, Art. 21.2, p61) Opposed to the practice of colonial voting, only once did the USSR ever use this vote -- in 1938 in defense of Spain against Mussolini's Italy. (Coddington, 1952, p136, fn20;

course, in addition to any neo-colonial influence that many of these same powers continued to exert over ex-colonies. It was not, however, until the ex-colonies constituted a clear voting majority in the ITU in 1973, that the practice of "colonial voting" was actually eliminated. The USA (82), Britain, France, Belgium, Spain and Portugal all retained a colonial vote until **1973**. (1973 Convention, pp131-33 and 1965 Convention, pp91-2)

i. Israel

The final major instance of the newly emerged nations challenging the accreditation of a settler regime came at the 1982 Plenipotentiary Conference in Nairobi. The member which was under fire was the state of Israel. The explicit terms of the challenge did not focus on a questioning of the right of Israel to exist as a settler state, as had been the case with Rhodesia, but rather on grounds similar to the case of Portugal nine years earlier, a questioning of its brutal use of force outside its borders. Coming in the wake of Israel's invasion of Lebanon (exacerbated by the

pl77, fn191) It is interesting to note that a separate vote, besides the British colonial vote was extended to Britain for India. (Convention, 1932, Art. 21.1).

82. ITU documents up to and including the 1938 Conference list the additional U.S. vote as on behalf of "U.S. colonies" (1938 Internal Regulations, Art. 21.1, p53), but as of 1947 the USA insisted that their colonies now be referred to as "possessions". (U.S. Del. Rep. 1947, pp52-3; Codding, 1952, pp134-5, fn19)

responsibility assigned to Israel for the massacres of Palestinian civilians at the refugees camps of Shatila and Sabra), the Arab nations at Nairobi were able to muster a clear majority within the ITU who were initially prepared to expel the Zionist state altogether. The 1973 Plenipotentiary had previously passed a resolution, #48, condemning Israel's "sabotage" of two submarine cables linking Lebanon to Europe, the Americas and Africa, and calling for:

"...sanctions, including the suspension, and even the exclusion of the State of Israel...in the event of any repetition of such acts contrary to the rules and practices governing international relations". (1973 Convention, pp249-50)

The expulsion of Israel was only prevented by the activities of the U.S. government, threatening in the Conference and at home (83) to withdraw from not only the ITU, but from the United Nations' General Assembly as well! (Broadcasting, 25Oct82, p25) U.S. adamancy in defending the settler state prevented the conference from preceding with its scheduled discussion for over half of its planned 6-week duration. (U.S. Senate Hearings, 11Mar1983, p39)

The Arab nations, citing Israel's repeated refusal to abide by resolutions of the Security Council and the United Nations General Assembly, ultimately resigned themselves to

83. Declaration of George Schultz, U.S. Secretary of State.

merely another resolution in condemnation of "the continuing violation by Israel of international law". (84) (1982 Convention, pp338-9)

C. ANTI-IMPERIALISM: LATECOMERS INSIST ON EQUITABLE ACCESS

Although the 1960s did not witness any significant controversies regarding management of the radio spectrum, changes were indeed occurring within the ITU. The anti-colonial disputes clearly signaled the changing nature of the growing (85) ITU membership. Although the imperial powers may have been dismayed at the LINS' challenging of accreditation as of 1965, it would not be until 1979 that they had to seriously confront the demands of the LINS for equitable access to ITU resources. The changing membership had set the stage for a substantial shift in the balance of power within the ITU. (C&R, p44) Initially the principal form this shift took in its anti-imperialist dimension was through the pursuit of technical assistance and cooperation

84. The 1989 Plenipotentiary passed another resolution to much the same effect, striking a fact-finding committee to enquire into Israel's violations of the ITU Convention and report to the Administrative Council before the end of 1990. (TJ, Aug90, p503)

85. By 1965, there were 129 members. (1965 Convention, pp91-2) 23 of these members had joined in the previous six years. By 1973, there were 140 members; although the shift in voting power was greater than the mere numbers suggest since 19 new nations had joined, while the six colonial votes extended to the imperial powers had been withdrawn, as had the vote from Rhodesia and the participation of South Africa and Portugal. (1973 Convention, pp131-3)

to the newly emerging nations: some form of assistance to allow the LINS to at least become minimally qualified participants in a struggle to obtain access to the radio spectrum. This was a form of economic cooperation that was necessary for dependent nations to receive in order to be able to advance any degree of independent policy in the development of a national telecommunications sector.

i. Technical Assistance and Cooperation

Although technical assistance and cooperation was widely discussed throughout much of the 1965 Plenipotentiary, no agreements were reached that provided substantive assistance in any form. (C&R, p44) The LINS ended up settling for a series of lengthy resolutions that encouraged all major executive bodies of the ITU to consider increases in technical assistance (1965 Convention, p207-12, 217-8), but failed to ensure the financing to carry out any specific activities.

The 1973 Conference continued to reaffirm these resolutions and to pass further ones - thirteen resolutions in all. (1973 Convention, pp210-14, 216-19, 223-5) This Conference even managed to create a special ITU Technical Assistance Fund, although intense U.S. lobbying successfully denied it the obligatory financial contributions that could have made the body an effective one. (Coddington, 1979b, p7)

The Nairobi Conference, as well, adopted a series of resolutions - eighteen in all - aimed at providing greater development assistance. (1982 Convention, pp245-72; also see Coddington, 1984a, p29) These resolutions, including a series of references to the ITU's obligation to provide such assistance, were even incorporated into the "Purposes" and "Expenses" articles of the Convention and the Regulations. (1982 Convention, Art.4.2.c, p3 and Art.15.1.c, p14) (86)

Indeed, this focus on technical assistance has continued to be a primary concern for the LINS to this day (1989 Convention; NM), perhaps to the detriment of appreciating the impact of other more strategic changes. This was an exceptionally "soft" form of demand. Yet surprisingly one which received recalcitrant opposition from the major powers. (87) One of the most consistent and adamant opponents to ITU-financed technical assistance has been the United States. (Jacobson, p71)

D. WARC-79

86. Also see Molina Negro, p815 and Probst, pp354-6.

87. One can only assume that those responsible in these DCs were motivated by very short-sighted financial and political concerns. This shortsightedness came to be rectified, but not until 1989.

With the reorganization of the ITU to meet post-WWII conditions, the 1947 Conferences had not only introduced organizational changes, but a reorganization in the use of the radio spectrum. In the future, separate conferences were to be called periodically to address each of these major areas of concern. Organizational changes remained the jurisdiction of the Plenipotentiary Conferences, while revisions of the use of the radio spectrum became the jurisdiction of a World Administrative Radio Conference or WARC. (88)

The first WARC was held in 1959 (known as WARC-59); the second was held in 1979 (WARC-79). It is assumed that a third general WARC will be held in 1999, although its date has yet to be fixed. (Honig) WARC-79 was a 10-week conference, attended by some 2,000 delegates from 140 nations, which entertained 14,000 proposals to amend nearly the entire body of Radio Regulations. (C&R, pp50-1; Mili, TJ, Oct79, p605)

To the degree that the 1965 Plenipotentiary served as a turning point for anti-colonialism, so WARC-79 served as a turning point for anti-imperial struggles within the ITU, by calling for a more equitable distribution of world spectrum resources. It was at WARC-79 that the LINS finally exerted

88. "Specialized WARCs" have also been held to deal exclusively with a particular service or services.

their voting majority within the ITU to effectively force acknowledgement of their spectrum needs and rights of "equitable access".

The challenge from the LINS was most pronounced in three distinct areas: the election of Union officials, access to the High Frequency (HF) Bands and access to the Geosynchronous Satellite Orbit (GSO). (89) These same three concerns remained the focal points for continued conflict at the Nairobi Plenipotentiary Conference in 1982. The first was basically resolved by 1982 and will be discussed in the remainder of this chapter. But struggle around the other two issues spanned the entire following decade.

i. Non-Aligned Nations

In preparation for the 1973 Plenipotentiary Conference, the Non-Aligned Nations (NANs) had requested the Secretary-General to schedule a meeting, prior to the opening of proceedings, for all ITU delegates from Non-Aligned Nations, with a view towards adopting a common stand on "certain subjects of vital concern". (C&R, p64) As this had not been done, the Non-Aligned Nations decided that in the future it would be necessary to rely on their own resources.

89. Also known as the Geostationary Satellite Orbit.

In preparation for WARC-79 the frustrated LINS called a special preparatory meeting of NANS in Yaounde, Cameroon, four months before the opening of the ITU Conference. The meeting developed a set of common positions for the LINS and created an ad-hoc group of eight Non-Aligned Nations (90) which committed themselves to meet occasionally and "bring out common or coordinated points of view" - a task which they carried out effectively both prior to and throughout the Conference. (C&R, p73) A few weeks prior to the opening of WARC-79, the Non-Aligned Nations called another meeting, this time in Havana, deciding then that it was now essential for the Chair of the Conference to come from a LIN. (C&R, p74) (91)

90. The eight countries were India, Cameroon, Algeria, Iraq, Cuba, Yugoslavia, Kenya and Senegal. (C&R, p73, fn23)

91. Coddling and Rutkowski do not list the sources from which they have drawn their information. In consulting with George A. Coddling for citations of any NAM documents (or other) regarding NAM activity in relation to the ITU, Professor Coddling responded by letter: "The question you raise is interesting and one that I have been attempting to answer for years. There is no question that the Non-Aligned Movement has been very active in ITU affairs...However their creation of a coordination bureau...at the 1979 WARC is about the only activity that I know that can be documented." (Private correspondence.)

E. THE ELECTION OF ITU OFFICIALS

i. The Conference Chair

Although the Non-Aligned Nations had a clear voting majority, the capitalist telecommunication powers, with the U.S. not least among them, refused at WARC-79 to follow the usual procedure of selecting by consensus the most widely endorsed candidate who had the support of a majority of Members, were the issue to have come to a vote. This favoured candidate was T.V. Srirangan, the head of the Indian delegation. (C&R, pp74-5) Instead, the U.S. adamantly insist on a variety of pro-Western candidates. Having delaying the opening of the conference by four days, the DCs finally managed to have a different LIN candidate accepted, J.P. Severini, the head of the Argentine delegation. (Ibid, p75) Argentina, at that time, was ruled by a military dictatorship.

It is important to note that the Convention anticipated a lack of consensus and laid out procedures for such a situation, although the Secretary-General opted not to follow them, in spite of having been a procedure used in the past. (C&R, p75, fn28) The Convention states that if there is no host country (as was the case at WARC-79), the Secretary-General is to consult all delegations to determine

who is the oldest head of a delegation. (92) This delegate is then entrusted with convening the Plenary Session (1973 Convention, Art.77.2.2(2), p62), and conducting the **election** of the Conference Chair at the first Plenary Session. (Ibid, Art.77.2.3(1-2), p62)

It is interesting to note that most U.S. accounts of the event portray the LINS as solely responsible for delaying proceedings, totally ignoring the dictates of the treaty (i.e. the ITU Convention) on the matter. No U.S. sources found even **suggest** any possible irregularities by the United States or the Secretary-General nor their failure to comply with the Convention.

In a spirit of compromise, the LINS chose not to exert the power of their voting majority, even though this be to fulfill an objective earlier agreed on in the NANS' preparatory meetings! They allowed instead a compromise candidate to chair the conference, yet in turn they received precious little from the U.S. Prior to the opening of the conference, the head of the U.S. delegation, Glen Robinson had anticipated WARC-79 to produce "an all-out North-South political confrontation". (93) It was not the LINS which

92. It appears this practice was even employed in 1927 in spite of there **being** a host nation. (Stewart, 1928, p31)

93. The Report of the Chairman of the United States Delegation to the World Administrative Radio Conference of the International Telecommunications Union, Geneva.

chose this course of head-on confrontation. For the less industrialized nations, their candidate was the technically most qualified one as he understood the needs of adapting existing technology to the economic, social and political realities of their nations, while the candidate of the telecommunication powers was one determined from a viewpoint of political considerations.

The election of officers at WARC-79 was limited only to the positions of chair and vice-chairs of the conference itself and its respective committees. Debate regarding procedure for the election of the Union's permanent officers had also come onto the agenda of the LINs, but discussion of this was relegated to the following Plenipotentiary Conference: Nairobi, 1982.

F. The CCIs

Back-room negotiators among the major imperialist powers in the ITU, who functioned since the earliest years of spectrum management, in Coddington's words as an "old boys' club", received a serious challenge at WARC-79. (Coddington, 1979b, p4) At Nairobi the scope for this practice was definitively altered. The 1982 Conference resolved that henceforth the Directors of both the CCIR and the CCITT

Switzerland, September 24 - December 6, 1979 or U.S. Dept. of State, 1980, as quoted by Coddington, 1984b, p439.

would be elected by the Plenipotentiary and not the CCIs themselves. As a compromise, it was agreed that the elections of both Directors would only come into effect as of the Nice Plenipotentiary Conference in 1989. Furthermore the Secretary-General, the Deputy Secretary-General and the CCI Directors could now only be re-elected for a single additional term. (1982 Convention, Art.58.1.c, p49)

Discussion was initiated at Nairobi, only to be resumed at Nice in 1989, over taking regional representation into account in the election of these positions. (Nice Minutes, p279, 296)

The International Consultative Committees had come to assume an increasing importance for the imperial powers, once the voting majority of the LINS had made itself felt in Plenipotentiary Conferences. In both the CCIR and the CCITT, private and public corporations are not only members, albeit non-voting, but its **most active** participants in determining CCI positions. (Renaud, 1987, p184) Most of the debate occurs in study groups and working committees; these are almost always chaired by executives (mostly Vice-Presidents) from large telecommunication corporations. (94)

The CCITT is entrusted with developing standards for the segments of telecommunications growing out of telegraphy and

94. See the "CCITT News" and "CCIR News" sections of the "Union Activities" in any issue of TJ to sample the degree to which this holds true.

telephony: fibre optics, cable, digital networks and the most recent state of the art, the Integrated Services Digital Network, the ISDN. (Rutkowski, pp121-6; Bocker, p448) The CCIR assumes this responsibility for standards using the radio spectrum.

As there is an increasingly convergence, not only among all these aspects, but between the wired and wireless services, so there is a growing convergence between the two Consultative Committees. (Larsson, TJ, Mar90, p173; 1989 Nice Minutes, p23, 120, 150, 167, 204 and 438) The intersection of these trends is thus far limited to joint CCITT-CCIR committees. As early as 1981, there were already three Joint Study Groups and two Joint Working Parties, compared to the CCITT's fifteen independent Study Groups. (NTIS, 1982a, pp19-20)

Although prior to 1989 CCI recommendations were in themselves non-binding, they did become binding once approved by a Plenipotentiary Conference, which was usually little more than a rubber-stamping process. (Coddington, 1984a, p20) The primary function of the CCIs is to promote greater standardization and to negotiate what these specific standards are to be. (Naslund, p108) As bodies which plan future standards and which couch their debates in highly technical terminology, the implications of many of these

policies are not easily anticipated by LINs before their practical impacts are felt.

The degree to which the imperial powers have valued the CCIs is reflected in the involvement they have had in their activities and, above all, the degree to which they have sought control of their directorships. Given that the corporations which participate in the CCIs are not permitted their own vote, there has been a strong tendency among them to rely on consensus decision-making. In any such consensus-seeking context, the role of the Chair is a crucial one. It is worth noting that if a country's political delegation is not present at a CCI meeting, the accredited telecommunications corporations from that country, acting in unison, have since the formation of CCIs been authorized to cast a vote at Plenary Sessions on that nation's behalf. (Stewart, 1928, p46; Jacobson, p62) How many inter-governmental organizations allow private corporations this extent of active involvement?

It must be remembered that no nation is permitted to hold more than one of the following offices: the Secretary-General, the Deputy Secretary-General, the members of the IFRB and the Directors of both CCIs. (95) (1982 Convention,

95. In 1965 this did not yet apply to the members of the IFRB. (1965 Convention, Art. 12.1, p18) In 1973, it was only "desirable" that this also include the IFRB. (1973 Convention, Art. 13.2, p12) By 1982, it became mandatory.

Art.13.2 , p13) The United States has historically placed greater importance on the CCIR than on the other CCIs. (96) Between 1947 and 1965, the U.S. held the position of either Deputy Secretary-General or Secretary-General of the Union. But once capturing the directorship of the CCIR in 1966, the United States has managed to retain it ever since. (Jacobson, p79; C&R, pp93, 131; TJ, Sept89, p546)

France has for its part placed its major importance on the CCITT since its creation in 1956 (C&R, p89) through the merger of the CCIF (telephone) and the CCIT (telegraph). Prior to this time the French had almost exclusively (97) held the directorship of the CCIF (Jacobson, p79), while West Germany held that of the CCIT. (Coddington, 1952, p37) As the importance of the telephone had come to outweigh that of the telegraph, the unified CCITT tended to follow the tradition of the CCIF, with France holding the directorship of the CCITT from its inception. (Jacobson, p79; TJ, 1976, pp730-1; TJ, 1978, p427; TJ, 1981, p175) In 1984, however, France was obliged to cede this position to a greater emerging telecommunications power: the Federal Republic of

96. The U.S. had prioritized the CCIR, alone among the CCIs, since its creation in 1927. (U.S. Del. Rep. 1947, p99) They would have liked to see the CCITT head-office established in New York, had that been possible in 1947, but had to settle for it being located in Geneva. (Ibid, p58)

97. Between 1950 and 1956, the United Kingdom had momentarily held the directorship of the CCIF. (Jacobson, p79)

Germany. (TJ 1984, Vol.51, p583) Germany by then had already established a key leadership role in the CCITT through its promoting of the ISDN, assuming the Chair of the CCITT Study Group #XVIII, created in 1981 to supervise the development of the ISDN. (NTIS, 1982a, pp74, 78-80) Indeed it was the very same German delegate who chaired this Study Group throughout the 1980s who was the German candidate for the CCITT directorship, Theodore Irmer. The Nice Plenipotentiary re-elected both the U.S. and German directors: the U.S. by a relatively narrow vote of only 72 in favour, compared to 63 for Yugoslavia; the German, unopposed. (Nice Minutes, p322)

It is not surprising to note overall that the directors (or Secretaries-General, as they were called before 1947) of the CCIs have **always** been from either the U.S. or a western European nation.

* * * * *

In summary, continual growth of ITU membership eventually resulted in a majority of lesser developed nations seeking equitable treatment. In 1965, this focused on anti-colonial concerns. By 1973, it eliminated the last vestiges of colonial voting. WARC-79 loomed as a turning point for anti-imperial struggles in calling for a more equitable distribution of ITU resources. By 1982, this

voting majority required the Chairs of even the corporate-dominated CCIs to be elected by Plenipotentiary Conferences. Chapter 8 assesses what came of this growing voting power of the LINS. But let us first review the development of rights vesting procedures employed by the ITU until this time.

PART III:

INTERNATIONAL SPECTRUM LAW

PART III: LEGAL ASPECTS OF THE ITU

Part III deals with the legal aspects of international regulation of the radio spectrum. Chapter 6 assesses the rights vesting mechanisms for distribution of the resources managed by the ITU. Chapter 7 looks at dispute resolution. Chapter 8 assesses how and why the ITU functions as international law-maker, the mechanisms employed and recent profound legal changes, the importance of which many LIRs are likely still unaware.

CHAPTER 6: RIGHTS VESTING MECHANISMS

Concern over rights vesting mechanisms in the ITU arose, then heightened in response to the increasing congestion that appeared in the radio spectrum as of the first decades in this century. The first significant attempt to address this issue came at the 1927 Plenipotentiary Conference in Washington, D.C. Coddington and Rutkowski maintain that the basis for establishing some guiding principle, however, had already been laid in 1903 with two provisions which continue to exist in all subsequent Conventions. (C&R, pp260-61) The first called for signatories to inform other Members of stations which functioned in their jurisdiction (Protocole Final 1903, Art.I.3, p83), while the second encouraged wireless stations to not cause harmful interference to other stations. (Ibid, Art.V, p84)

With the strengthening of these same provisions in the 1906 Convention, it became **obligatory** to follow this notification procedure (Convention, 1906, Art.6, p346; Reglement, Art.IV, pp361-2), as well as to not cause harmful interference to existing, registered stations. (Ibid, Art.8, p346)

A. "FIRST COME, FIRST SERVED"

By the time of the Washington Conference there were numerous stations that had already been in operation for many years. It is not surprising then that there would be agreement to extend preferential treatment to those stations already in existence. Thus what was known as a "right of priority", based on "previous usage", was usually accepted as underlying the agreed-upon procedures. David M. Leive characterizes the outcome as having granted merely "favoured status" to existing stations, "perhaps approaching a priority right". (Leive, p46) (98) The reason for the confusion is that owing to great reluctance from some and firm opposition from others (including the U.S.), the conference could not agree on any clear statement which would embody this principle. (Coddington, 1952, pp125-6; Leive, p46) This "right to priority" meant in practice that if a party had regularly used a particular frequency without causing interference to other existing stations and had notified the Union's Bureau, that party was deemed to have

98. David M. Leive's International Telecommunications and International Law: the Regulation of the Radio Spectrum, printed in 1970, is perhaps the most comprehensive study publicly available which analyzes the ITU as an **international legislative** body. Much of Leive's material was drawn from the collective work of a committee struck by the Society for International Law in 1969; unfortunately Leive fails to acknowledge the contributions he drew from this collective endeavor.

some sort of right, albeit qualified, in the continued use of that frequency.

Although all Plenipotentiary Conferences have been reluctant to address the issue of rights vesting too specifically (Coddington, 1952, pp186-91), the "right of priority" has come to be accepted as a *de facto* right, even if it is not a *de jure* one. (Tomlinson, p177) (Also see Coddington, 1952, p191) As late as 1932, the U.S., represented by Gerald C. Gross, who three decades later was to be the only U.S. Secretary-General of the ITU, argued that even previous recordation (i.e. registration by the ITU) extended **no** right of priority. (Leive, p50) For a broadcasting station to obtain a license in the United States, for example, applicants have even been required in the past to affirm under oath that they make no claim to ownership of any frequencies to which they are assigned.

At the 1927 Conference, the two 1903 provisions cited above were again strengthened, with the article on interference now reading:

All stations, whatever their purpose, **must**, so far as practicable, be established and operated so as **not** to **interfere** with the radio communications or services of other contracting Governments and of individuals or of private enterprises authorized by these contracting Governments to carry on public radio communication service. (Convention, 1927, Art. 8; emphasis added.)

The only other ways in which this "right to priority" was reflected in the legal instruments of the Union (Leive, pp46-7) was with the addition to the Radio Regulations of two clauses, one modifying the request for Administrations to notify the Bureau of the technical characteristics of their stations which "might cause international interference" and the other requiring that frequencies for **new** stations avoid generating interference to existing stations of which the Bureau has been notified. (Convention, 1927, Reglements, Art.5.16 and 5.17) This method for frequency allotment has come to be known as "a posteriori" method, although in much of the literature (99) it is more often referred to as the "first come, first served" principle.

Diametrically opposed to this form of rights vesting is the "a priori" method. Unlike the "first come, first served" approach, this method seeks to distribute access to scarce resources on a planned and equitable basis. Prior to the above-mentioned 1927 agreement for the assignment of frequencies, it was this "a priori" method which appeared to the U.S. Wilson Administration to be the fair and equitable

99. Discussions on rights vesting procedures for spectrum use may be found in legal, political and economic journals (e.g. The American Journal of International Law, The Journal of Law and Economics or The Business History Review). Reference to them may occasionally even be found in technical journals (e.g. Broadcasting or Microwave Journal).

method to manage the spectrum, if maximal usage of this scarce and valuable resource were to be obtained.

(Tomlinson, pp47-8) This was to be based on the needs of users, as opposed to those of private corporate interests.

(Rogers, (ed.); Baker, pp427-35) Here the U.S. was basically proposing the same "a priori" planning later advocated by the world's less powerful nations and opposed by the U.S. during the last two decades. Why was this?

At this historical juncture, the United States was not yet the world's major user of the spectrum. More than one European nation surpassed the U.S. in frequency uses and development. Within 20 years the United States would use more spectrum than all the European nations combined! Its position on rights vestings would soon change dramatically. In its early decades of spectrum use, "a priori" allocation was promoted by the United States as the most appropriate manner to distribute the spectrum resource. Indeed in its national administrative procedures for both civilian and military use, the U.S. government by both law and practice has favoured "a priori" allocation.

This promotion of "a priori" spectrum planning was also the position of France in 1920. (CSIS, 6) It continued to be their position throughout the 1927 Conference. But by the time of the opening of the Washington Conference, U.S. commercial users of the spectrum had managed to convince the

government to shift its position to one of "first come, first served". (Tomlinson, pp48, fn2 and 65)

A second major development of the 1927 Conference to have a fundamental impact on rights vesting procedures was the establishment of a **Frequency Allocation Table**.

(Convention, 1927, Reglement, Art.5.3, p26) From this a legal distinction eventually developed between stations operating on frequencies within the designated bands for any given service and those operating "out-of-band". This Frequency Allocation Table is a direct outgrowth of the original practice of reserving limited bands of frequencies for crucial services. (Convention, 1906, Reglement #II, and #III, p361) Over time it became an essential tool for spectrum management of all services and indeed of the entire radio spectrum.

The emergence of the Frequency Allocation Table was the result of preparatory work at the Preliminary Conference in Washington in 1920. (Tomlinson, p133). The recommendation to establish a Frequency Allocation Table had accompanied the initial U.S. and French desire to create an "engineered spectrum". Although by 1927 the U.S. no longer advocated an "a priori" method of allocating frequencies, it did still support the introduction of an Allocation Table, whereby priority was extended to a station providing a given service if a station operated within a specified band designated for

that particular service. Allocation of bands to specific services was understood to be necessary to reduce the level of harmful interference. (Tomlinson, p67) Whereas the 1927 Conference introduced the Allocation Table as a "guide", the 1932 Conference made adherence to it obligatory. (Leive, p51)

The Washington Conference allocated bands for 9 distinct services: Fixed, Mobile, Broadcasting, Radio Beacons, Air, Official (Military and diplomatic), Amateur, Direction finding, and International distress calls. (Tomlinson, pp107, 139) (100) Although there were radically different proposals for the Allocation Table submitted by seven countries (Tomlinson, p59), as well as submissions from at least 23 corporations, the final regulations were almost identical to those proposed in the draft prepared by the U.S. delegation during the Conference. (Ibid, pp137, 141) Not surprisingly this draft was remarkably similar to the original U.S. submission (ibid, pp139-40), as well as that of the private radio corporations. (Ibid, p141)

To balance the restrictive provisions which called for assigning frequencies in accordance with the Frequency

100. It is curious to note that Coddington and Rutkowski in reviewing the introduction of the Allocation Table totally omit any reference to "Official" services or bands designated for **military** use, although they do list the other services.

Allocation Table, the introduction to that same article allowed that any Administration may, **if it caused no harmful interference** to any service in any other country, assign any frequency it wished in any band. (Convention, 1927, Reglement, Art. 5.1, p26) The negative consequence of doing so, however, was that these assignments would receive no protection from future "in-band" assignments. While the 1927 Conference introduced limited forms of the "priority of use" based on the "first come, first served" principle, this priority, through the introduction of the Frequency Allocation Table, was limited only to stations operating within the bands allocated to that specific service.

Thus the first conference to adopt any form of rights vesting procedures, although heavily favouring the "first come, first served" principle, elaborated a very loose regime of rights vesting which was a negotiated compromise position located between (albeit not equidistant from) these opposing options. The very nature of this resource, demanding cooperation from all users and potential users, lends itself to the probability of compromise solutions in one form or another. The momentary correlation of forces between contending nations will undoubtedly be a major factor in determining the exact nature of this compromise.

Before exploring other rights vesting procedures employed within the ITU, it is appropriate to mention one

further resolution from the 1927 Conference, to which we will return shortly. (Chapter 7.B) Perhaps the greatest indication of the importance of international legislation in regulating spectrum use was the decision at the 1927 Plenipotentiary Conference that if harmful interference resulted from the establishment of a new station, the dispute would be solved by a process of **compulsory, binding arbitration**. (Convention, 1927, Art.18.1, p9)

B. OTHER RIGHTS VESTING PROCEDURES

Although not formally adopted as an official rights vesting principle within the ITU, the "a posteriori" principle has been widely relied upon by Administrations. Nonetheless other principles have also been employed over the decades in both bilateral and multilateral agreements, including numerous instances of outright "a priori" planning. If the potential interference generated by a given frequency does not pose a problem beyond limited regional boundaries, then either a bilateral or a multilateral conference of those nations affected is sufficient to resolve the issue. This is the situation for the first portion of the spectrum to be employed: the MF bands.

The first "a priori" plan for spectrum management was adopted in 1926 at a regional conference on Interference on

the Medium Frequency (MF) bands for the European broadcasting stations. (Tomlinson, pp179-80) This "a priori" planning for broadcasting continued at the subsequent similar conferences in Prague, 1929 (ibid, pp182-4), in Lucerne, 1933 (ibid, pp194-200) and in Montreux, 1939. (C&R, p272) The 1929 Prague Conference was the first formal conference to achieve an allotment plan acceptable to all participants.

In South America "a priori" planning was also adopted for broadcasting at the Rio de Janeiro regional conference as early as 1934. (Ibid, 271) The different areas of the South have varying experiences in regional planning for differing portions of the spectrum. Most of these regional agreements, as is also true for Europe with congestion arising from a high level of frequency use on a relatively small continent, are based on "a priori" planning. (101)

101. 4. These regional plans, cited by Coddington and Rutkowski, include the following agreements and the dates in which they came into effect:

-European Regional Convention for the Maritime Mobile Radio Service; 1950.

-North American Regional Broadcasting Agreement; 535-1605 KHz; 1959.

-Special Arrangement for the Use of Frequencies in the Bands 68-73 Mhz and 76.87.5 Mhz by the Broadcasting, Fixed and Mobile Services; 1961.

-Regional Agreement for the European Broadcasting Area; (radio and television); 41-230 Mhz and 470-960 Mhz; 1961.

-Regional Agreement for the African Broadcasting Area Concerning the Use of Frequencies by the Broadcasting Services in the Very High Frequency and Ultra High Frequency Bands; 1964.

-Regional Agreement Concerning the Establishment of an International VHF Radiotelephone Mobile Service for Rhine Navigation; 1970.

What about regional planning for the United States and Canada? As early as January - February, 1929, together with Cuba and Newfoundland, Canada and the U.S. also held a regional conference to allot High Frequencies: the Short Wave Radio Conference, called at the initiative of the United States. (Clark, p234) Here too frequencies were assigned on an "a priori" basis! There were 639 separate channels specified for five categories of services: mobile - 190, amateur - 134, television - 84, experimental - 3 and general - 228. These latter 228 channels were allotted as follows: the United States - 112, Canada and Newfoundland - 38, Cuba - 25, and Mexico - 8. (102) The remainder of the channels were to be shared in differing combinations. (Ibid, pp234-5)

Thus the U.S. itself had been one of the earliest proponents of "a priori" planning and one of the first to introduce the approach for regional spectrum management. By 1937, a North American Regional Broadcasting Agreement (NARBA) had been worked out in Havana, Cuba which allotted 106 broadcast channels "a priori" to the countries

-Regional Agreement Concerning the Use by the Broadcasting Service of Frequencies in the Medium Frequency Bands in Regions 1 and 3 and in the Low Frequency Bands in Region 1; 1978. (C&R, 275)

102. Although Mexico did not attend the conference it was still allotted channels. The notation to refer to these channels was "other nations", rather than specifying Mexico directly.

throughout the hemisphere, while designating a further 106 for "first come, first served" assignment. (NARBA, pp6, 22, 28, 30 and 32; also see C&R, p271)

The most profound change in rights vesting procedures occurred at the 1947 Conferences. This occurred with the creation of the IFRB and will be reviewed in the following chapter. At a global level, the "a posteriori" method of "notification and recordation" remained basically unchanged from its introduction until 1947. (C&R, 269-70) Although the 1947 Conferences formally abandoned the "first come, first served" principle for the unplanned bands, it did not replace this with another legal regime. (Leive, p158)

As the different bands became more congested, the need for planning drove more and more nations towards accepting the inevitability of some form of global planning. Since the High Frequency (HF) bands are of universal reach and were the least regulated, it is not surprising to find that it was here that non-broadcasting services managed to achieve the first global "a priori" application. This occurred in 1951 at the Extraordinary Administrative Radio Conference (EARC) in Geneva for the maritime and aeronautical mobile services. (C&R, 274)

How did this come about? The 1947 Conference had reallocated new frequency bands for the different recognized

services and at the U.S. proposal had mandated the IFRB to create an "engineered" spectrum between 10 KHz and 30 MHz. (Coddington, 1952, p340) This task proved impossible owing to excessive demand over the limited supply of frequencies available in many bands. Both the USA and the USSR mutually accused the other of exaggerating their requirements. It is interesting to note the U.S. position on this matter, given the subsequent about-face the U.S. would make later regarding an "engineered" spectrum:

"...In short, it was realized that in order to permit an **equitable use** of the available radio spectrum space by all nations of the world, distribution of frequencies must be made on the basis of actual **needs of each country**, as opposed to notifications made years ago when there were enough frequencies for all and when operating practices were notoriously wasteful of spectrum space." (U.S. delegate, PFB Document #43, pp21-1, as quoted by Coddington, 1952, p345; emphasis added.)

But the 1951 EARC was able to adopt a planned approach for only limited portions of the spectrum. (Coddington, 1952, pp363-4, 375) For other portions, countries assigned frequencies in one band were to "shift usage between its own stations carrying on different types of service". (Coddington, 1952, pp374-5) The planned approach allowed for each country to receive at least some frequencies in the less congested bands, if they employed the services which were being allotted. The latter approach ensured that the major users who had multiple services could maintain their existing inordinate number of assignments (above all, the

USA). Having accomplished this, the U.S. no longer entertained the notion of an engineered spectrum and quickly moved to become its major opponent. (This change in U.S. position was reviewed in discussion of the IFRB in Chapter 4.)

Subsequent maritime and aeronautical services have continued to employ "a priori" planning in their periodic conferences to up-date allotment and regulations.

(Aeronautical Mobile EARC, 1966; Maritime Mobile WARC, 1967)

At the 1974 Maritime Mobile WARC, an "a priori" plan for frequency assignment was adopted, incurring the opposition of the United States, in spite of the U.S. receiving 21% of the frequencies allotted. (C&R, p49)

In 1971, the Geneva World Administrative Radio Conference for Space Telecommunications called for a planning conference, this time, for broadcast-satellite planning. (Final Acts, 1971, Resolution # SPA F, pp251-1, also referred to as SPA 2-2. See Final Acts, 1977, Art.13.2, p74) This resulted, again in Geneva, in the 1977 World Administrative Broadcast-Satellite Radio Conference which agreed to an "a priori" plan for all regions except the Americas; the frequencies chosen for allotment were in the highly valued 11.7-12.2 GHz band. (C&R, p275) (103)

(Final Acts, 1977, p1) In Regions 1 and 3 (104), the allotments were proportional to the geographical size of countries. (Ibid, pp33-72; see also C&R, p50) U.S. objections to "a priori" planning could not prevent this from being adopted by the conference, but the U.S. was able to delay planning in the Americas, by calling for a separate Regional Conference for Region 2. This was to occur "not later than 1982", although in the end the RARC took place in 1983, and agreed also to a form of "a priori" planning. (Ibid, Art.12, pp73-4; Final Acts, 1983)

As both Broadcasting-Satellite Services (BSS) and Fixed Satellite Services (FSS) were intricately involved in this planning process and given that harmful interference from any region could easily spill-over to other regions, these regional plans were subjected to approval by the entire ITU membership. As a result, the 1983 Region 2 planning of BSS and FSS in the 12 Ghz bands had to be ratified by the ITU at a World Administrative Radio Conference, and not merely a Regional Conference. The WARCs which were mandated to do so, were the Space WARCs of 1985 and 1988 (Space WARC-ORB, 1985, Resolution #42, pp450-1), adding one more contentious

103. The bandwidth of 11.7-12.2 Ghz was only for Regions 2 and 3. Region 1 had a wider bandwidth yet, 11.7-12.5 Ghz. (Final Acts, 1977, p1)

104. Region 1 consists of Europe, the Near East, the USSR and Africa; Region 2 is the Americas; while Asia, Australia and Oceania make up Region 3. (RR, ppRR8-2 and RR8-3)

issue to an already potentially highly-charged political conference.

By WARC-79, the congestion in some bands, particularly to the unplanned portions of the HF band, was unbearable, leading again to the successful challenge of the "first come, first served" allocating principle. Access to GSO slots was equally a concern. The United States for its part, as the nation which already had access to more frequencies than any other, took extreme exception to planning conferences which were authorized to redistribute assignment of frequencies. However, the principle of equitable allocation of frequencies and GSO slots by means of "a priori" planning, as advocated by the LINs at WARC-79, was the very same one that had formed the U.S. position in the early 1920s and had already been implemented on numerous occasions for various portions of the spectrum. (Tomlinson, pp47-50; also see C&R, pp262-65) Furthermore, it was also the planning method employed by most countries domestically for frequency assignment.

The majority of Members outvoted the U.S. They agreed to two separate planning conferences which sought to equitably distribute two resources among all nations which requested them. The first was mandated to apportion frequencies in the HF bands; while the second sought to

distribute the bands employed for satellite services, as well as the GSO slots themselves.

Thus from 1947 to 1979, although a series of innovative legal procedures were elaborated (NM, p17), there was nevertheless a failure to introduce clearly articulated legal principles. (Leive, p22) This was not for lack of trying. There was a recognized need for increased clarity in international law governing use of the spectrum, yet conflicting interests did not allow for the establishment of clear, decisive principles. Compromises have proven to be inevitable for spectrum regulation; they are, after all, the only reasonable expectation for multilateral negotiations over a resource, the use of which **demands** cooperation. But the nature of these compromises can vary tremendously.

It was only very slowly that new principles favouring those nations with less access to the spectrum were introduced into the ITU accords. WARC-79 proved to be a clear turning point in this process. LDCs, in seeking technical assistance from the IFRB in the past few decades, obtained an innovative "preferential treatment" from the Board as a result of WARC-79 negotiations (C&R, p278), which since 1959 had been only in the form of reviews based on "urgent and essential need". (Leive, p117) At Nairobi, yet other changes furthered this shift. The duties of the IFRB, for example, were amended in 1982, so as to delete those

phrases which reinforce the rights' vesting procedure of "first come, first served". (White, p190)

In summary, an ill-defined "first come, first served" claim is oft-times asserted by major spectrum users, although this has never been established as a right in international law. "A priori" planning, once advocated by the U.S. when that nation did not yet dominate telecommunications, has recently been vehemently called for by the LINDs. In spite of the reluctance of the telecommunication powers, this approach has steadily come to be exercised over greater portions of the spectrum.

CHAPTER 7: DISPUTE RESOLUTION:

One important factor in the assessing of international rights regarding frequency use is the manner in which **disputes** are resolved regarding frequency assignment. Disputes usually arise when one administration finds that a frequency that it has assigned to a user is afflicted with harmful interference created by a station operating from within another nation's jurisdiction.

A. THE INTERNATIONAL FREQUENCY REGISTRATION BOARD (IFRB)

The original provision established in 1927 to resolve conflicts of this nature was one of compulsory, binding arbitration. This provision was replaced in 1947 by a non-binding set of procedures. This arbiter's function was to have been assumed by the newly-created IFRB, having been envisioned in 1947 to become what Coddington and Rutkowski described as a form of "international court of justice for disputes concerning the radio spectrum" (C&R, p24); but as we saw in Chapter 4, the Board was never given such powers. The functions and procedures of the IFRB as laid out in the Radio Regulations are extremely complex. They will necessarily be dealt with here in a simplified manner.

Over the years, the IFRB in its efforts to manage the spectrum has evolved intricate and innovative methods of

operating. Beyond the IFRB's functions stated in the Constitution similar to those of a recording office (Art. 10.5.a, b & f, pA12) and a technical development agency (Art. 10.5.e, pA12), over the years the Board has also been delegated some of the attributes of a court, a mediation service and a regulatory agency. (Leive, pp25-6) It possesses those of a court in defining the legal status of stations (1982 Radio Regulations, Art. 10.2.e, pRR10-2); of a mediator in its efforts to reconcile disputes (ibid, Art. 10.2.g); and of a regulatory agency in its adoption of technical standards (ibid, Art. 10.2.j), its formulation of procedures to execute its statutory tasks (ibid, Art. 10.7) and its determination of its own jurisdiction (ibid, Art. 10.2.o).

In all these capacities, however, the Board has assumed an extremely cautious approach; for some, it has been an **unduly restrictive** interpretation of its mandate, unnecessarily favourable to earlier assignments. (Leive, pp120, 123 and 169) Only through intense struggle has the mandate of the IFRB been expanded to assume some of the above attributes. Nonetheless, the Board has consistently been reluctant to assume what in the eyes of some of the member nations is a contentious posture. Although at times opposition has come only from a small number of nations, theirs has been the position the Board has adopted. Which are these nations that wield such influence?

Under the current procedures, the Board is allowed to act as mediator, but typically it does so only if the parties involved do not have diplomatic relations (Leive, p131) or if **bilateral efforts have first been exhausted.** (1982 Radio Regulations (105), Art. 22.3 to 22.20; ppRR22-1 to 22-4) Ostensibly this would appear to be aimed at reducing the work of the Board, but in practise it also seems to have had other, far-reaching consequences.

Even once the Board does receive a request for assistance in resolving a conflict that produces harmful interference for a station, there is no guarantee that a resolution will occur. Usually the Board limits its action to the sending of letters expressing its hope that the dispute will be settled cooperatively. (Leive, p137)

The Board does also have the option "in cases...of harmful interference" of implementing a study, if so requested by a party afflicted with interference from another country. This is what is known as a "Section VII" study. (1982 RR, Article 12.58.1, pRR12-32 to 12-33) These studies seek technical, rather than diplomatic, solutions. (Leive, p138) Furthermore, if one party refuses to respond or otherwise cooperate with the Board in its efforts to seek

105. Henceforth referred to also as "RR".

a mediated solution, the process is simply terminated and the Board dismisses the dispute as being outside its jurisdiction. No penalties are assessed for such non-cooperation. (Leive, pp129, 142)

Whose interests are served by such an arrangement? What are the consequences of such a set of procedures? What alternatives might be pursued?

Clearly this is a situation advantageous to the larger nations. With the resolution of a dispute between a small and a large nation limited to bilateral efforts, the outcome will seldom, if ever, favour the smaller nation. Undeniably most larger nations are more capable of threatening smaller ones with consequences if the conflict is not resolved in their favour (or at least neutrally). A smaller nation is much more inclined to feel itself subjected to potential, negative consequences, whether or not the larger nation explicitly states such consequences during the negotiation process.

Not surprisingly then, it is the smaller nations, rather than the more powerful ones, which are inclined to seek the assistance of the Board. The United States, for example, has never taken a dispute to the Board for mediation. (Leive, p131, fn81) Since 1961 the FCC has published the international disputes involving the United

States. Between 1961 and 1965, formal complaints of interference lodged by U.S. stations against stations from other countries varied between 318 and 350 per year. 90% of these were resolved within the year! (Ibid, p131, fn80) By 1969, 1,019 U.S. complaints of foreign interference were lodged for that year. 981 of these (97%!) were reported to "appear to have been resolved" satisfactorily for the U.S. **within** the year! (FCC, 1969, p99) An earlier report specified: "The time required for the successful resolution of such cases varies from a few hours to several months." (FCC, 1966, p178) Smaller nations simply do not have such an impressive success rate in resolving their disputes no matter **how** long they wait.

It is interesting to observe that initially the FCC also reported international complaints lodged against U.S. stations. These complaints numbered 72 in 1959 (FCC, 1959, p163), 85 in 1961, and 48 in both 1962 and 1963. (Leive, p131, fn,80) This is not to say that there were not other instances of interference generated by U.S. stations, but which simply went unreported as a formal complaint. Leive noted that as of 1963, the FCC discontinued its reporting of statistics of complains **against** the U.S., but not those made by the U.S. Be this as it may, a few years later, the FCC once again resumed its publishing of these figures of formal complaints against the U.S. One wonders why the Commission did so. Whatever the reason, it was **not** because the U.S.

has been meticulous in its observation of legalities concerning international interference. The U.S. did not even bother to register with the IFRB its Voice of America transmitters, which generated harmful interference to European stations. The U.S. even usurped frequencies for its stations which had already been allocated in Europe to other countries under the Copenhagen Plan. (Ibid, p132, fn83)

Less powerful nations have made efforts to alter these dispute resolution procedures, but to date they have met with little success. Proposals, such as that of Mexico as early as 1959 that disputes may be taken immediately to the Board for consideration, prior to bilateral efforts, have not yet been embraced by a majority of Members. (1959 Radio Conference, Book of Proposals, # 3798 and 3805, as quoted by Leive, p138)

Although Article 42, sections 2 and 3 of the new Constitution (as had the Conventions previously) allow for two forms of "binding" arbitration, which will be reviewed later in this chapter, neither has yet been invoked! (C&R, p211) That is, all instances of conflict arising from harmful interference have either been resolved bilaterally, resolved with the assistance of the Board (106), or not 106. This occurs most often if the parties in conflict do not have diplomatic relations. (Leive, p131)

resolved at all. Many of the disputes which are not resolved bilaterally are reportedly **not** forwarded to the Board, but **simply remain unresolved**. (Leive, pp129-30) As there are no sanctions for noncompliance with the Board's efforts to mediate disputes, there would seem to be little incentive for powerful nations to cooperate. As a result there would seem to be little incentive for peripheral nations to submit their disputes to the Board.

Thus a picture emerges of an inequitable situation for the resolution of international disputes over the use of the radio spectrum, beneficial to the larger telecommunications nations and detrimental to the smaller, less powerful ones. In this context, it is strategically important for the more developed nations to ensure that the IFRB provide considerable support to the smaller nations in locating some possible alternative, unused frequencies, albeit with less desirable characteristics. This is precisely what occurs. Without this assistance one would assume that the LINS' efforts to restructure the entire process of allocating frequencies would be much more vehement.

The "first come, first served" principle is often assumed to be the deciding factor in the resolution of harmful interference conflicts where there has been no allotment based on "a priori" planning. It seldom is. Only if both stations are operating in accordance with the legal

provisions and one is "in-band" while the other is not, does this factor carry any weight. (Leive, p23) What then of the situation where more than one "in-band" station is transmitting in a band designated for that particular service and harmful interference results? Which then has priority? The international legislation established by the ITU provides no definitive answer. (Leive, pp21-2)

Tomlinson considered that only a judicial decision would settle the matter. (Tomlinson, pp290-1) So too did the committee, headed by the U.S., entrusted to assess this problem at the 1932 Madrid Plenipotentiary. (Leive, p50) It concluded that if a question of priority were submitted to a court of arbitration, it would be necessary for the court to assess not only the date of notification, but also the date the station began functioning, the power of transmission, the importance of the service and the engineering techniques employed. (Madrid Radiotelegraph Documents, pp765-6, as quoted in Coddington, 1952, p190)

Leive too considered a judicial decision on this matter to be as necessary in recent years as it was in the 1930s. (Leive, p22) But the issue has never been presented to the International Court of Justice or to any other body in a process of binding arbitration. Had it been, the ruling which the United States, still an emerging nation in telecommunications, would have sought, say, in 1920 on "a

priori" rights is not the same ruling it would have sought after World War Two, once it had become the world's major telecommunication power. It is interesting to note that U.S. Supreme Court Judge and ex-President of the United States, William Howard Taft, regarded efforts to establish private property claims on parts of the radio spectrum in the following light:

"I have always dodged this radio question. I have refused to grant writs and have told the other justices that I hope to avoid passing on this subject as long as possible." (Coase, R.E., "The Federal Communications Committee", as cited by Smythe, 1984, pp6-7)

While this reflects both the importance of the radio spectrum and the degree to which it was understood to be unique, it also reflects the uncertainty which a prestigious figure in both the U.S. political and legal domains felt about making a definitive ruling on the radio spectrum. Although Taft may have preferred to see, for example, some form of private property rights extended to spectrum use, he could not rule accordingly given the nature of the resource. He therefore sought to avoid having to make any ruling at all.

As this "right of priority" has been a *de facto* right, if not a *de jure* one (Coddington, 1952, pp191-2), it is worth assessing what impact an international legal ruling would have on the legal status of this "right". According to

Alexandrowicz, international law in the management of the spectrum has an element of customary law to it.

(Alexandrowicz, 103-7) If a legal opinion from the International Court of Justice were to determine the legal perimeters of any particular practice and what is or is not legally binding, these practices would formally become part of international law. (Alexandrowicz, 98) Such current "usages" and practices would thereby assume greater legal weight as officially sanctioned customary law or alternatively other principles would be invoked to yield a different outcome. In either case, it would serve to bring discussion of these cases into the public domain.

Independent of the ruling, no longer could the international influence of the telecommunications heavyweights be the decisive factor in determining the outcome of disputes. Judicial rulings elevate resolution of conflict to a level above that of mere power relations. This desire to preserve precisely such international legal uncertainty in favour of an ability of the more powerful nations to invoke forms of non-judicial persuasion, is presumably the major reason why the telecommunication giants have sought to avoid binding arbitrations in any of the disputes to date. It is less clear why less powerful nations have not sought to determine and strengthen the rule of law in this area.

B. COMPULSORY ARBITRATION:

When compulsory arbitration was introduced to the ITU in 1927, it had the support of the United States. As noted in the 1928 U.S. Senate Hearings, this offered the U.S. some form of recourse to settle disputes were they to arise against the more powerful telecommunications competitor: Great Britain. (U.S. Senate Hearings, 1928, pp11-2)

The compulsory, binding arbitration introduced in 1927, has not disappeared entirely since 1947. Rather it has been split into two provisions. The first is a binding, yet non-compulsory arbitration found today in the 1989 Convention and applicable to all Member nations. (1989 Convention, Art. 42.2, pA35) The second provision **does** provide for compulsory arbitration, but it is no longer compulsory for all Members. Instead it is applicable only to those who have signed the current Optional Protocol on the Compulsory Settlement of Disputes. (Ibid, Art. 42.3) Since 1947, the International Court of Justice has been authorized in such cases, if requested, to act as arbitrator (U.S. Del. Rep. 1947, p68), as the Permanent Court of International Justice could have in the preceding 20 years. (Tomlinson, p286)

The 1989 Constitution and the Conventions since 1947 which preceded it, call for disputes in the priority of assignment of a given frequency to be resolved "through

diplomatic channels, or according to procedures established by bilateral or multilateral treaties...or by any other method mutually agreed upon." (1989 Constitution, Art. 42.1, pA35; previously 1982 Convention, Art.50, p31)

If none of the above is adopted, any Member may rely on either of the two other possible procedures: invoking the binding, but non-compulsory procedure laid out in Article 34 of the 1989 Convention (Article 82 of the 1982 Convention; previously Annex 3, in the 1965 Convention, p97; and Annex 4 of 1952 Convention, pp67-8) or Compulsory Arbitration for those signatories of this Optional Protocol. The arbitrator in the former process is either mutually agreed upon or selected by the Secretary-General by drawing lots between the two names submitted by the parties in conflict. (1982 Convention, Art.82.7, p87) But for the process to occur, each party must participate by naming a potential arbitrator. There is nothing in the article, however, which obliges any Member to do so. Neither are there sanctions for a party who fails to participate in this process. It is, simply, not compulsory.

The Optional Protocol on Compulsory Arbitration merely extends the procedure of binding arbitration outlined above to cover the potential circumstance of non-compliance by a Member who is party to a dispute. This Protocol authorizes the Secretary-General to name an arbitrator on behalf of a

Member if within three months that nation has not done so of its own accord. (1989 Convention, pB65 or 1982 Convention, 219-20)

In 1982, 131 member nations signed the Nairobi Convention; 91 of them also signed this Optional Protocol; that is, almost 70% of those members of the Union which attended the Plenipotentiary Conference chose to sign the Optional Protocol. Major telecommunications powers: the U.S., France, the Soviet Union and Germany all failed to sign the Protocol on Compulsory Arbitration. Most other major financial contributors to the ITU **did** sign the Optional Protocol: Canada, Japan, Britain, Australia, Sweden, Switzerland, Italy, Denmark and Brazil. (1982 Convention, p221) (107)

Israel did not sign; Cuba did. More surprisingly, neither India nor China would sign. Although half of those who did not sign were NANs, there were also eight Western European and eight Eastern European nations which chose not to become a party to the compulsory arbitration. (Ibid)

By sheer majority vote, which was the exclusive legal regime for determining such policy changes until 1989, this

107. The signatories to the 1982 Optional Protocol are analyzed here, since the more recent 1989 Optional Protocol failed to list which countries were signatories to it.

70% of the members, although it excludes most of the telecommunication giants, could have made compulsory arbitration an integral part of the ITU Convention. At that point it chose not to. As we will soon see, today it probably **could not**, even if this were the will of the majority.

It is worth noting that the article introducing compulsory arbitration in 1927 did not come about without opposition. Only 79% of the Members supported this measure. (Documents, 1927, 7th Plenary, pp237-8, as quoted by Stewart, 1928, p47, fn44) Not surprisingly, opposition to this measure was most vehement from Great Britain, as well as Japan. (Ibid) The former was still at that time the world's major power, while the latter was an emerging regional power along the Pacific coast of Asia. Both were early spectrum users and in 1927 held considerable military, economic and diplomatic influence (Britain globally and Japan regionally) which they were able to bring to bear in resolving spectrum disputes in their favour without the need to resort to measures of compulsory arbitration.

It is interesting to note that in neither the 1965 or 1973 Conventions was the Optional Protocol **even published** with the remainder of the conference documents. Although the Optional Protocols were listed in the indexes of both Conventions, their texts were not published nor were the

documents assigned a page number. (1965 Convention, p236; 1973 Convention, p258) This is a rather remarkable "oversight" given that the document is cited in both these Conventions as one of two official methods by which to settle a dispute! (1965 Convention, Art. 28.2, p33; 1973 Convention, Art. 50.2, p28)

One wonders whether these "oversights" suggest editorial efforts by politically-motivated Secretaries-General of those years to downplay the Optional Protocol, perhaps in an attempt to phase it out entirely. If so, this would seemingly have occurred against the wishes of the majority of the ITU Member nations, although presumably with the concurrence of those major telecommunications nations who refused to sign the Optional Protocol.

Thus it would appear that the 1927 provisions of compulsory, binding arbitration were gutted in exchange for the promised potential of a new arbitration process under the IFRB which never materialized. Instead a non-compulsory process evolved which fails to provide equitable treatment for smaller nations in their conflicts with the larger ones.

It would appear that dominant interests in spectrum use prefer the current undefined state of affairs without a clear legal interpretation. One assumes that such a situation would allow these interests greater room for

manoeuvre in seeking varying interpretations for different conflicts. Without uniform adherence to a set of clear, basic principles applicable to all nations equally, without an evaluation of each case exclusively on its own merits, the outcome is all too readily dependent on factors such as the relative degrees of power or influence exercised by those nations in conflict.

In summary, clear binding compulsory methods of arbitration were agreed to as early as 1927 to resolve disputes over frequency use. Since that time, these mechanisms have been eroded. Today there exists no binding legal avenue for a spectrum-impooverished nation to challenge its exclusion from frequencies assigned, for example, to a telecommunication power, if that power has refused to sign the Optional Protocol. Resolution of a dispute of this nature would occur in a context other than an international judicial ruling. This leaves the less powerful nations subject to forms of pressure beyond the rule of international law.

CHAPTER 8:

A. INTERNATIONAL LEGISLATION

Unlike most international organizations (which function in an advisory capacity), the ITU has international legislative functions. The legal instruments negotiated within the ITU, upon ratification by the Members of the Union, constitute instruments of international law. Indeed, the ITU has legal authority to assume legislative (Leive, p19), administrative and judicial responsibilities. Which of these responsibilities does the ITU actually assume and to what degree? What of this power does the ITU actually exercise?

International law differs from national legislation in that all national legislation is made by the same legislative body or bodies. In the absence of any globally constituted world legislative body, international legislation today in different areas of human activity arises out of different specialized organizations.

One would expect, of course, not merely a **technical** organization, but a **political** one, to assume a responsibility of this nature. In this legal capacity, the ITU is more similar to the diplomatic conferences of the Law of the Sea than to the other specialized agencies of the

United Nations with which the ITU is usually associated: the World Meteorological Association, the Universal Postal Union, the International Atomic Energy Agency, or the International Civil Aviation Organization. (Williams, D., pp36-7, 63-7, 131 and 196) (108)

The reason for this is that the ITU controls a scarce and valuable resource. The ITU has not been reluctant to insist on legal jurisdiction over that resource. The first article of the 1927 General Regulations, following the definitions, required all transmitting stations to have a **license**, issued by a signatory nation's government.

(Reglement General, 1927; Art.2.1) The requirement of national control over stations operating within each nation's jurisdiction dates back to 1903 (Protocole Final, 1903, Art.VI, p84) and more clearly articulated in the 1906 Convention (Art.I, p345) and Regulations (Art.VI, pp362-3). If a station committed an infraction of the Convention or its Regulations it could have its license withdrawn.

(Reglement, 1906, Art.VII, p363)

108. The UPU, founded in 1868, is the second oldest international organization after the ITU. (Coddington, 1952, p52, fn.231) In 1951, the WMO, was created replacing the International Meteorology Organization. Had the IMO (dating back to 1873) continued to exist, it would be the world's third oldest international organization. (Williams, D., p37)

Today this same obligation of licensing is found in Art. 24.1 of the (1982) Radio Regulations: under international law, all signatory nations are required to license all users operating within their national jurisdiction. Thus, the ITU creates international legislation which is applicable not only **between** nations, but **within** them as well! To U.S. analysts in the early decades of this century, it was clear that international spectrum management produced "one of the most binding forces in international relations"! (Clark, 1931, p190)

A nation becomes bound to international legislation by means of signing a treaty which is then ratified by the legislative body (or bodies) responsible for the national law of that country. Until 1989, these ITU "treaties" were in the form of Conventions and accompanying Regulations. (Leive, pp11-2) Prior to 1989 this has meant that the Convention, Regulations and the Additional Protocols became binding upon those signatory nations which had deposited their ratification with the ITU by an established date upon which the Convention and its Regulations would come into force. The Nairobi Convention of 1982, for example, came into force on January 1, 1984. (1982 Convention, Art.52, p32) As of this date, it became binding international legislation for all signatory nations which had ratified this treaty. If a nation ratified the Convention and Regulations after that date, it became effective for that

nation as of the time of depositing the instrument of ratification with the ITU. Signatories to the Convention could delay ratification for up to two years after the Convention came into force, without penalty. (Ibid, Art. 45.2.1, p29)

i. Why Be Bound by International Law?

Why would nations volunteer to be bound by international legislation if this could be avoided merely by failing to ratify the documents? Or at least why do they not frequently ratify them belatedly in order to emphasize discontent?

The only repercussion stipulated in the Convention is the loss of the right to vote. Those signatory nations which did not ratify the 1982 Nairobi Convention and Regulations by January 1, 1986, lost all voting privileges within the ITU. (Ibid, Art. 45.2.2, p29) It was in response to this concern that the U.S. government finally ratified the 1906 agreement in 1912, one month prior to the opening of the 1912 Plenipotentiary Conference. (Clark, p225) Failure to have done so would have excluded the U.S. from the 1912 London Conference. (Convention, 1906, Art.12, p347)

Initially some interests in the U.S. had felt that the 1906 Convention was still only for discussion purposes,

without any urgency to implement, and that pressure could be effectively exerted on other nations which did feel the urgency, since the U.S. "...had nothing to lose." (Clark, p219) But members of the U.S. delegation to the 1906 Berlin Conference felt that the tactic of delaying ratification was a counter-productive approach:

"Our policy might even be regarded in some quarters as bordering on a breach of faith. There were certain articles in the Convention adopted at our initiative which might not have been incorporated into the convention if there had been even a possibility of belief that the United States would be reluctant to agree to ratification." (Admiral Edwards, U.S. Senate Hearings, 21Feb1912, as quoted by Clark, p224)

But a second, more strategic threat is that, without ratification, the rule of law governing the spectrum would simply become ineffectual. To **any** user of the resources managed by the ITU, this would not be a matter to take lightly, for the spectrum cannot be effectively used without adequate management; and this management requires international cooperation. To the major users, the loss of this rule of law would be a crisis of phenomenal magnitude. All users have considerable interest in ITU agreements being ratified as widely as possible, for without it the usability of the resource would be uncertain. Any significant refusal to do so threatens to set a major precedent for all others that could undermine the entire system of international management of the spectrum and therefore the very existence of it **as** a resource. As the U.S. President clearly stated in his opening remarks to the 1927 Conference:

"...In many fields our country claims the right to be master of its own independent development. It cordially concedes the same right to others. But in the radio field the most complete success both at home and abroad lies in mutual concession and cooperation." (Coolidge, 1927, as quoted by Clark, p227)

Thus in the U.S., as **the** major user (CSIS, 19), it is significant that there was unanimous recommendation to the U.S. Congress to ratify the 1982 Convention (U.S. Senate Hearings, 1984, pp27-8), in spite of U.S. posturing until that time that it might withdraw from the Union. (NTIA, 1983, pp239-70)

What is the basic commitment a nation undertakes in being party to this international legislation? Above all else, it is to ensure within its domain of national, legal jurisdiction, that the use of the radio spectrum and the GSO is in accordance with the agreements of the ITU. (1989 Constitution, Art. 41)

This is the basic provision which requires ratification from all Members. This is the foundation of international law in the regulation of the radio spectrum. This is the prerequisite without which there would be no effective usage of the spectrum as we employ it today.

B. SELECTIVE AND LIMITED OPTING-OUT

There are some extremely novel practises employed by the ITU in its elaboration of international law, although not entirely unique to the ITU. (109) For example, any nation can merely serve notice that it will not abide by a particular portion (major or minor) of a Convention or of the Regulations. That nation has only to declare, then later enter, its **reservation** at the end of the agreement, as the last act before a conference closes. (110) (NM, p522) As reservations have been allowed for the Convention, so they are also permitted now to both the Convention and to the Constitution. (NM, p413)

Reservations may not be submitted after a conference closes (NM, pp452-4); for example, they cannot be introduced at the time the legislative body of a country is considering ratification. Understandably the fewer reservations, the greater international compatibility in spectrum use. But the restriction of reservations to the time of a conference bodes ill for those nations which can afford to send only a few technical personnel, as the smaller and less powerful countries complain. (NM, pp432, 478) Pressure is thereby

109. The UPU, created shortly after the ITU, has paralleled many of the mechanisms of the ITU. The use of reservations is one such similarity.

110. Normally this would occur one hour after the final meeting of the Closing Plenary. (NM, p522)

exerted, then, on these nations to send **political** representation to ITU conferences.

Often the ramifications of some of the provisions are not understood in the less powerful nations until after a conference has terminated. Take WARC-79, for example, which reviewed over 15,000 different proposals, submitted to the nine different conference committees. These committees, in turn, are divided into working groups or ad-hoc committees; Committee #5 on Frequency Allocation had, for example, sixty-five such sub-committees functioning throughout the conference. (Coddling, 1982, p70) While the United States, for its part had thirty-one delegates earmarked for this committee alone (Honig, p49), over half of the then-156 Member nations sent less than five delegates each to the entire Conference. (Segal, p11; Coddling, 1982, pp69-70). As Coddling wrote of this dilemma for the smaller nations:

"Each morning it was necessary to attempt to identify...areas and to assign individuals to sit in on those meetings....All the small delegations agreed that they could only keep up with a very small part of the work of the Conference and sometimes not too well on that small part. Another delegate from a less developed country described the majority of small delegations as "completely lost". (Coddling, 1982, p71)

As the smaller delegations are simply unable to attend all the committee meetings, they consequently do not get an opportunity to review all the discussions before they are

introduced into the Plenary for approval. Often the failure to address an issue effectively at committee-level is used to discredit a reluctant Member in a Plenary. (NM, p426)

It would seem that this process would tend, in the long run, to encourage the formation of coalitions or blocs of smaller, less powerful nations in order to share the tasks of monitoring the debate in all the committees during any major conference. The greatest potential so far for mutual support and collective analysis and articulation of interests by disempowered nations would seem to have been through the Non-Aligned Nations. To date, this is the only organization to demonstrate an ability within the ITU to unify the concerns of peripheral nations beyond a regional level.

C. FOOTNOTES: RESERVATIONS TO THE TABLE OF FREQUENCY ALLOCATIONS

Another unusual provision that is unique to the ITU is the ability of any signatory nation to make what is basically a reservation to a portion of the Table of Frequency Allocations. This occurs when a nation declares that it will not abide by the decision to reserve a particular band or portion of a band for a service as has been agreed upon by a majority of member nations. These

reservations to the Table of Frequency Allocations are known as **footnotes**.

The tolerance for footnotes provides a mechanism to allow for greater accommodation of all international interests when determining the use for which a band will be allocated. The draw-back to the use of footnotes is that uniform applicability and therefore the effectiveness of the Table comes into question. (Leive, pp166-7)

There are two general global situations where the use of frequencies is threatened by the introduction of footnotes. One obvious negative impact is on frequencies which themselves have a global reach. The other situation is where users wish to employ frequencies with a limited reach, but to do so throughout all parts of the globe. This latter would occur under either one of two different sets of circumstances.

Firstly, it would apply to the use of mobile communication for transportation such as airplanes or shipping. Although the reach of the frequencies employed might be limited, it is crucial that interference not be generated on bands allocated for these services when passing through any and all parts of the world. Precisely because these concerns of safety are universal concerns, there is

little dispute generated around such applications of universal standards.

Secondly, this would apply to interests which seek to operate given activities throughout all (or many) parts of the world. This might be the case for economic interests which aimed to operate on an international level. But most clearly this would apply to militarily powerful nations which seek to employ their arsenal of military hardware that is dependent upon the spectrum, in all parts of the globe. For such interests the use of footnotes could present a veritable disaster.

As the postmortem by the U.S. delegation on their participation in WARC-79 concluded, reservations, when coupled with footnotes result in degrading of the table of allocations, thereby making future coordination more difficult. (US WARC-79, p53) Use of these two mechanisms was described in the conclusions as serving "to reduce the value of the agreements and regulations for all users." (Ibid, p133) WARC-79 increased the footnotes to the Table to around 500, presenting a concern, above all, for the U.S. military, owing to increased future costs and reduced flexibility. (Ibid, p96)

Not surprisingly, the U.S. heavily discourages the use of both reservations and footnotes, although it resorts

itself to using these very mechanisms. At WARC-79 the U.S. filed six of the overall total of eighty-three reservations; four of these six U.S. reservations were attributed to national security concerns. (Ibid, pp20 and 82) The rationale given was that "military systems must be prepared to operate anywhere in the world". (Ibid, p81)

D. THE INTRODUCTION OF A CONSTITUTION

With the introduction of the Constitution there has been a significant legal change to the ITU. What had previously been renegotiated at each Plenipotentiary Conference by a majority of votes has now been divided into a Constitution, a Convention, Optional Protocol, Decisions, Resolutions, Recommendations and Opinions, each with differing legal force. The first, third and fourth are new categories introduced in 1989.

"Decisions" and "Optional Protocols" have replaced what were previously nominated "Additional Protocols" and "Optional Additional Protocol" respectively. Those categories which are new are not to be dismissed as merely changes in name; as they represent a change in legal status, one assumes this reflects also a change in relations.

The Constitution embodies what was largely found previously in Part One of the Convention, while the 1989

Convention basically consists of what had until then been Part Two of the Convention: the "General Regulations". (111) The Constitution assumes a highly elevated legal status, while the Convention maintains its previous status. The elimination of the term "General Regulations" allows for a clarification of the legal status of regulations as defined by the CCIs; the "General Regulations" of the Convention had referred only to structural and functional aspects of ITU operations, not to regulations governing the operation of stations employing the spectrum. This would seem to reflect some degree of up-grading in the status of the Regulations as well.

The legal instruments of the Union are now to become the Constitution, the Convention and the Administrative Regulations. (1989 Constitution, Art.36.1) Of these three, the Constitution is now the "basic instrument of the Union". If conflict exists between any of these, priority will be given to the Constitution (and to the Convention if the conflict is limited to the Convention and the Regulations). (Ibid, Art.36.4)

A very major change has occurred to the status of the Regulations: they are now binding on all Members (Ibid,

111. The 1973 Plenipotentiary had reorganized the Convention into these two parts, with the intention of eventually separating them into a Constitution and a Convention. (1973 Convention, Resolution #41, p241)

Art.36.3), unless a Member either declares itself to not be bound by a new set of Regulations or enters a reservation to a specific portion of a new Regulation. But to submit a reservation, a Member must now attend the CCI meetings as opposed to being able to do so at an Administrative Conference which had previously approved new regulations.

Members who were not present at CCI meetings which approve new Regulations, forfeit any opportunity to adopt a form of qualified approval, by means of a reservation. Their alternatives become limited now to either a simple "yes" or "no". They must inform the Secretariat whether they will or will not abide by and be bound by the new regulations. If they fail to respond at all in 36 months, the new Regulations **automatically become binding** on them! (Ibid, Art.40.5) (1989 NM, pp430-1) This is true whether or not a nation is a direct signatory to the new regulation! (Ibid, Art.40.6) Whereas in the past, a nation was only bound by a legislative change if that nation actively participated by signing and ratifying the new legislation, an ITU Member may now become subject to its binding nature by default. This is a **radical** change.

Obviously, this is convenient for those nations involved in the formulation of new regulations. If provisions are embodied in the Regulations, these aspects of international law may now be more easily and effectively

changed. The question is how many of the peripheral nations will be aware of the implications involved before new regulations become binding. Once regulations do become binding, there are no longer any avenues open to those nations unwittingly bound by them other than to reverse this decision or to withdraw from the Union!

As a result of this change, it is much more critical for all nations to attend the CCIs proceedings than it has been in the past. In this way, they would at least be able to enter reservations if need be. Unfortunately, however, most peripheral nations simply do not have the resources, human or financial, to continually attend regular CCI meetings. The CCIs have, then, received a qualitative increase in their power. And within them, the more powerful telecommunications nations have increased their room to manoeuvre and therefore their power as well.

Which are the nations most actively promoting a Constitution? Not surprisingly, the seeking of a Constitution has consistently come from the powerful telecommunication nations, and has been questioned by the less powerful ones. (NM, pp446) U.S. government documents, exploring possible changes to the ITU following WARC-79, have specified the U.S. aspiration to somehow "revise the voting formula". This option was assessed, however, to be unlikely to succeed "under the present structure". (US WARC-

79, pp15-6) The U.S. Senate Hearings into Long-Range Goals in International Telecommunications and Information

proposed, among other measures, to:

"Examine ways for the United States to change the ITU structure to one more amiable to U.S. interests and seek to improve U.S. influence and effectiveness under this modified structure." (U.S. Senate Hearings, 1983, p52)

But the U.S. was not alone in this position among the telecommunication powers. As early as 1965 the Plenipotentiary Conference had instructed the Administrative Council to establish a Study Group to consider the alternative of a Constitution. (1965 Convention, Res.#35, p219) But the Study Group's efforts only resulted in a reorganization of the Convention under the two parts which would ultimately be split into a Constitution and a Convention. (1973 Convention, Res.#41, p241) As the Administrative Council, dominated by peripheral nations, failed to submit specific recommendations to the 1982 Conference in accordance with the 1973 Resolution #41, the core countries successfully passed a resolution introduced by Japan at Nairobi which mandated the Administrative Council to draft a Constitution. (1982 Convention, Res.#62, p323) Prior to the Council addressing this issue, the U.S., Japan and some European nations on their own initiative undertook to draft a Constitution and review the implications. (CSIS, p33)

With the introduction of the Constitution, the existing provisions and principles of international regulation of the radio spectrum and the GSO have become institutionalized. The status quo has been enshrined in a Constitution. THIS CONSTITUTION WILL ONLY BE ABLE TO BE CHANGED WITH A **TWO-THIRDS MAJORITY**. (1989 Constitution, Art. 43.4) While previously the support of only two Members was required to discuss changes to the Convention (1982 Convention, Art. 77.10.1), under the Constitution, a **majority** of votes would be required to even **DISCUSS a proposed constitutional amendment**. (Ibid, Art. 43.3)

In negotiating a Constitution, it was agreed to use an entirely different process to bring the legal instrument into force than existed until then for the Convention. Conventions have come into force on January 1, at least one year, but not more than two years, after the closing of the Plenipotentiary Conference which negotiated the legal instrument. The Convention then comes into force among all those nations (but only those nations) which have ratified it.

The procedure agreed upon in 1989 in Nice was for the Constitution to become effective only after its ratification by a specific number of ITU Members. However, to date few nations have yet ratified. Thus, today the 1989 Convention is in force, but not the Constitution. Anticipating this

difficulty and given the historical difficulties in the ratification of international agreements in general, the proponents of an ITU Constitution successfully lobbied for ratification to be less than 50%. According to the Union's legal Advisor, ratification from only 55 of the 166 Members is sufficient, i.e. 33%! (NM, p480) It is extraordinary to note, however, that for any **amendments** to the Constitution to enter into force there must be **ratification by THREE-QUARTERS of the Members.** (1989 Constitution, Art. 43.6) It is therefore feasible to imagine that a constitutional amendment could, after extremely difficult struggle, achieve support from at least two-thirds of the Members, yet fail to come into force because less than three-quarters of the Members ratify that change.

Why then is there this pronounced discrepancy for ratification of amendments? Why do constitutional amendments require 75% ratification, when the Constitution itself only requires 33%? One is as lenient, as the other is severe. What is the rationale for there being **any** variation at all in the percentage of ratification required? Something is amiss. The consequences could be considerable. If the arguments in favour of 33% ratification for the Constitution itself are valid, then it would appear that **this three-quarters ratification provision would effectively work to prevent any future amendments** to the Constitution!

The only exception to this that is already provided for are constitutional changes relating to the Union's structure, which are to be made at the next Plenipotentiary Conference, defined by the 1991 Administrative Council to be an extraordinary Plenipotentiary between December 5 and 22, 1992. (1989 Final Acts, Resolutions PLEN/6, Res. p9 and COM7/1, Res. pp80-3)

How many of the less developed telecommunication nations are actually aware of what the historic implications are of the profound legal change of introducing a Constitution?

E. SUMMARY

In summary, the very nature of the radio spectrum has led to international legislation to regulate its use. The use of reservations and footnotes gives the appearance of accommodating the interests of all nations involved.

In response to the emergence of the LINS' voting majority, the telecommunication powers seem to have managed to effectively place that voting power in check with respect to such issues as the basic structure, functioning and rights within the ITU. This they have done by successfully introducing a Constitution to the ITU which requires a majority vote to **discuss** constitutional changes, a two-

thirds majority to alter the Constitution and a three-quarters majority to ratify such changes!

PART IV

CONCLUSIONS

CHAPTER 9: CONCLUSIONS

In this paper we have identified a valuable and unique resource which is also limited: the radio spectrum. This resource has likewise required an equally unique organization to provide for its international management: the International Telecommunication Union. Among other unusual characteristics, the ITU is the oldest of all international organizations and the only international, global organization that has direct and binding control over the planning of a vital resource. This mandate for the ITU is directly attributable to the nature of the resource under discussion, one which is common property to the people of the world.

Since 1947 there has been a continual growth in the number of decolonized nations to join the ITU. These nations first focused on anti-colonial concerns, effectively eliminating accreditation of some of the most flagrant racist regimes and challenging the representation of others. In 1973, this bloc finally successfully eliminated "colonial voting" within the ITU - one of the last U.N. bodies to tolerate this practise.

In addition to anti-colonial positions, this same bloc advanced anti-imperialist positions as well. The earliest and most persistent expressions of the latter have been the seeking of technical assistance for developing the telecommunications infrastructure of the lesser developed nations. Finally at WARC-79, the LINS came to also firmly challenge the lack of access for LINS to the most congested portions of the spectrum.

Rights vesting mechanisms have historically been a fundamental concern in international spectrum management. Since the 1920s, planned or "a priori" allotment of frequencies has been widely employed in regional negotiations to allot frequencies in the more congested portions of the spectrum. Just as the U.S. delegation asserted in 1947 that an engineered spectrum would be the most effective manner in which to satisfy the greatest amount of spectrum demand, so too did the LINS assert this very same position at WARC-79 and subsequently at the 1982 Plenipotentiary. Nevertheless, as the spectrum has become even more congested in recent years with greater numbers of nations than ever seeking access to frequencies, the imperial nations have vehemently opposed this approach. In doing so, these nations have managed to retain their heavily disproportionate access to spectrum use. Different efforts have been made by the telecommunication powers to preserve their advantages. These have included not only efforts to

reach consensus in momentarily overlooking procedures established by ITU protocol, but at times efforts which unilaterally violated such provisions of international law.

The nature of the spectrum is such that all nations except for the globally or regionally most powerful would tend to seek forms of compulsory arbitration for the resolution of international disputes in spectrum use. Between 1927 and 1947, under U.S. initiative, compulsory, binding arbitration became part of international law in regulating spectrum use. But once it became the world's major spectrum user, as well as the world's major economic and military power, the United States in 1947 successfully sought the dismantling of these provisions. The LINCOS in their conflict over spectrum use with the major telecommunication powers today have no recourse to universal, compulsory, binding arbitration.

There was a time when this state of affairs could have been altered by a simple majority vote of ITU Members at any Plenipotentiary session. Indeed the 1927 provision of binding arbitration was adopted with only 79% of the vote. In 1989 it was agreed to introduce a constitution. Once the Constitution is in effect, to even **discuss** constitutional amendments at a Plenipotentiary would require the same amount of support that was necessary prior to 1989 to alter

ITU agreements. Not only does this Constitution require a two-thirds majority to amend, but subsequent to a two-thirds approval of a constitutional amendment by a Plenipotentiary Conference, a three-quarters ratification would still be necessary to bring any such amendment into effect!

If the Constitution is finally adopted at the 1992 Extraordinary Plenipotentiary, the definitive provisions which make up this Constitution are **crucial** for the international management of the spectrum. As the Constitution currently stands, the three-quarters ratification provision would effectively freeze the ITU into the organizational structure and functioning which it currently possesses. The voting majority of the LNs will then effectively be of very limited importance for all issues defined by the Constitution. The inequities in distribution of this essential and highly valuable resource would appear to become definitively entrenched.

This raises a series of further provocative questions, which unfortunately cannot be addressed here, but which seem worthy of future consideration.

More specific case studies examining how struggle unfolds and how negotiation occurs within the ITU would seem to be useful in determining how power is held within this body. What took place at the Specialized WARCs held

throughout the 1980s as mandated by WARC-79 to meet LFNs needs in the HF bands and for possible future satellite needs?

Why is there so little public discourse on this, the oldest of all international organizations? How did this veil of secrecy come about? What are the implications of the ITU's unique form of financing?

Most importantly, how did the telecommunication powers manage to achieve a strategic victory through the introduction of a Constitution? What are the provisions that would tend to be entrenched by this Constitution? What are the specific implications of this?

Unfortunately these issues were not able to also be explored in this thesis. They remain, therefore, as questions which require future examination in a subsequent analysis.

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TABLE OF ACRONYMS AND ABBREVIATIONS

CCIs - International Consultative Committees
 CCIF - International Telephones Consultative Committee
 CCIR - International Radio Consultative Committee
 CCIT - International Telegraph Consultative Committee
 CCITT - International Telephone and Telegraph Consultative
 Committee
 ELF - Extra Low Frequency
 EARC - Extraordinary Administration Radio Conference
 GHz - Gigahertz - 1,000 MHz or one billion hertz
 Hertz - Cycles per seconds
 HF - High Frequency (3 to 30 MHz)
 IFRB - International Frequency Registration Board
 ITU - International Telegraph Union (1865 - 1932)
 ITU - International Telecommunication Union (1932 to
 present)
 LIN - Lesser Industrialized Nation
 LF - Low Frequency (30 to 300 KHz)
 MF - Medium Frequency (300 to 3000 KHz)
 MHz - Megahertz (one million hertz)
 PFB - Provisional Frequency Board (1947 to 1949)
 NARBA - North American Regional Broadcasting Agreement
 RR - Radio Regulations (1982 Regulations if not specified)
 SHF - Super High Frequencies (3 to 30 GHz)
 UHF - Ultra High Frequencies (300 to 3000 MHz)
 VHF - Very High Frequencies (30 to 300 MHz)
 VLF - Very Low Frequencies (3 30 KHz)
 WARC - World Administrative Radio Conference

TABLE OF ABBREVIATIONS:

C&R - Coddling and Rutkowski (authors of The International
 Telecommunication Union in a Changing World)
 CSIS - Center for Strategic and International Studies
 (Washington, D.C.)
 LDC - lesser developed country
 NAN - Non-Aligned Nations
 NM - Nice Minutes (1989 Plenipotentiary Conference)
 NTIA - National Telecommunications Information
 Administration (of the U.S. Dept. of Commerce)
 NTIS - National Telecommunications and Information Service
 (of the Department of Commerce)
 OTA - Office of Technical Assessment (of the U.S.
 Government)
 OTM - Office of Technical Management (of the U.S.
 Government)
 PBCP - President's Board on Communication Policy
 TJ - Telecommunication Journal (monthly publication of ITU)
 U.S. DOC - United States Department of Commerce
 U.S. Del. Rep. 1947 - U.S. Delegations Report to the 1947
 Conferences

ITU PLENIPOTENTIARY CONFERENCESYEAR: LOCATION:International Telegraph Union

1865	Paris
1868	Vienna
1871-2	Rome
1875	St. Petersburg
1932	Madrid

International Radiotelegraph Union

1903 (Preliminary)	Berlin
1906	Berlin
1912	London
1927	Washington, D.C.
1932	Madrid

International Telecommunication Union

1932	Madrid
1938	Cairo
1947	Atlantic City
1952	Buenos Aires
1959	Geneva
1965	Montreux
1973	Malaga-Torremolinos
1979	Geneva
1982	Nairobi
1989	Nice
(1992)	(Geneva)
(1994)	(Japan)