

1962

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Recommended Citation

J. H. Glazer, *The Law-Making Treaties of the International Telecommunication Union Through Time and in Space*, 60 MICH. L. REV. 269 (1962).

Available at: <https://repository.law.umich.edu/mlr/vol60/iss3/2>

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MICHIGAN LAW REVIEW

Vol. 60

JANUARY 1962

No. 3

THE LAW-MAKING TREATIES OF THE INTERNATIONAL TELECOMMUNICATION UNION THROUGH TIME AND IN SPACE

J. Henry Glazer*

"Our Sages taught, there are three sounds going from one end of the world to the other; the sound of the revolution of the sun, the sound of the tumult of Rome . . . and some say, as well, the sound of the Angel Rah-dio."¹

ON THE twenty-fifth of June, the Government of the United States of America received an invitation to attend in Russia a conference of plenipotentiaries to consider the revision of an important multilateral convention. Since the conference involved matters which, by American municipal practice, were solely within the competence of private enterprise and not subject to the control of government, the United States at first refused to attend. Russia, however, assured the United States that representatives of private enterprises would be welcome. Relations between these two countries were on such a friendly basis that the United States accepted the invitation extended by Russia and instructed a diplomat with the rank of minister to attend the conference.²

Consigned now to a startling and sardonic footnote to history, the foregoing passage describes the atmosphere which prevailed at the Fourth Plenipotentiary Conference of the International Telegraph Union, held at St. Petersburg, Russia during June and July of 1875.³ In the eighty-seven years which have elapsed since

* Member of the Bar of the District of Columbia.—Ed.

Grateful acknowledgement is extended to M. Jean Persin, I.T.U. Director of External Affairs and Information, and to Mme. Nelly Perusset, ITU Librarian, for their assistance.—J. H. G.

¹ THE TALMUD, *Tractate Yoma* 20 (b) (translated from the Hebrew). The authorities mentioned in the *Talmud*, a compilation of law and academic discussion, lived before 500 A.D.

² See CODDING, *THE INTERNATIONAL TELECOMMUNICATION UNION: AN EXPERIMENT IN INTERNATIONAL COOPERATION* 42 (1952); 2 U.S. DEP'T OF STATE, *FOREIGN RELATIONS OF THE UNITED STATES* 1875, 1070, 1076 (1875).

³ The United States attended the Conference as an observer. *Ibid.*

the St. Petersburg Conference, the United States and Russia have become antagonists; most telegraph businesses have become subject to regulation by the United States Government;⁴ and more importantly for the purpose of this article, the International Telegraph Union has become the International Telecommunication Union, a specialized agency of the United Nations,⁵ whose functions are indispensable to any rational plan for the orderly use of outer space.

Since the exploration of outer space and the exploitation of space technology depend critically upon reliable radiocommunication, it is hardly surprising that the first international rules of law applicable specifically to outer space activities involved agreements for radio frequencies. These were negotiated in 1959 when frequency allocations for newly-designated space radiocommunication services, and conditions for the use of such frequencies, were inserted in a revision of the ITU Radio Regulations. Modest in scope, these agreements should be viewed in their broader context as a precursor to future negotiations which will not be limited to technical frequency matters. These negotiations will undoubtedly strain the existing scheme of international frequency management, and test as never before the resilience of the ITU in responding to disparate needs of its sovereign members. To evaluate, within this context, the space aspects of the ITU law-making treaties and analyze their impact upon conventional and customary international law, it is essential first to review the history, evolution, and purpose of the ITU, a continuum of international collaboration unbroken for almost a century.

THROUGH TIME

While the space age raises to new dimensions the political and legal problems involved in achieving cooperation between nations "for the improvement and rational use of telecommunications,"⁶ these problems have always existed with an urgency which

⁴ See Federal Communications Act of 1934, 48 Stat. 1064, as amended, 47 U.S.C. §§ 151-222 (1958). See also 47 C.F.R. part 35 (1958).

⁵ See Agreement between the United Nations and the International Telecommunication Union, April 26, 1949, 30 U.N.T.S. 315. The ITU has been designated as a public international organization within the meaning of 59 Stat. 669 (1945), 22 U.S.C. § 288 (1958).

⁶ Art. 4, International Telecommunication Convention (Geneva Revision 1959). See note 67 *infra*. The term "telecommunication" is defined in Annex 3 of the Convention

demanding their solution. Prior to the advent of telegraph unions,⁷ the impediments to public telegraphic correspondence⁸ across European frontiers approached intolerable proportions. Telegraph wires from two countries would come to a common boundary and stop. Often the boundary was not a natural division of mountains or rivers, but merely a line of compromise, invisible except as toll houses made evident national rivalries.⁹ The situation was ripe for international action, accelerated, it has been suggested, by the ambitions of the Emperor Napoleon III who "at the height of his imperial glory, and neglecting no means which would centralize the world in France, moved to secure a European entente by the scarcely visible wires of telegraphic solidarity."¹⁰ In 1864 the French Imperial Government sent invitations to all the major countries in Europe to attend a conference in Paris to negotiate a convention which would provide a uniform international telegraph system.¹¹

The International Telegraph Union

The multilateral convention negotiated at Paris in 1865 established the International Telegraph Union. It included provisions which assured to everyone the right to correspond by means of in-

as "any transmission, emission or reception of signs, signals, writing, images and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic systems." The definition of the term "telecommunication" contained in the ITU Radio Regulations (Geneva 1959) annexed to the Convention differs slightly from the definition above since the word "visual" is substituted for "optical." The definition of "telecommunication" contained in a recent supplement to the *Code of Federal Regulations* deviates slightly in turn from the definition in the ITU Radio Regulations by substituting the conjunction "or" in place of "and" between words in a series. See 47 C.F.R. § 2.1 (Supp. 1961). Since it would appear that complete uniformity for so cardinal a term as "telecommunication" should exist, the wisdom of these deviations, however formal or slight, is questionable.

⁷ For history of early telegraph unions, see CLARK, *INTERNATIONAL COMMUNICATIONS* (1931).

⁸ The term "public correspondence" is defined in Annex 3 of the International Telecommunication Convention (Geneva Revision 1959) as "any telecommunication which the offices and stations must, by reason of their being at the disposal of the public, accept for transmission." See note 67 *infra*.

⁹ See CLARK, *op. cit. supra* note 7, at 91.

¹⁰ *Id.* at 93.

¹¹ The States of Austria, Baden, Bavaria, Belgium, Denmark, Spain, France, Greece, Hamburg, Hanover, Italy, the Netherlands, Portugal, Prussia, Russia, Saxony, Sweden-Norway, Switzerland, Turkey and Wurttemberg responded to the invitation and sent delegates to Paris. There was no representation from the Americas or from other continents. England was not invited because her telegraph services were still in the hands of private companies. See CODDING, *op. cit. supra* note 2, at 21.

ternational telegraph, provided for the secrecy of telegraphic correspondence, and required uniformity of tariffs and regulations.¹²

With rapid advances in communications science and increasing numbers of participating governments in its subsequent plenipotentiary and administrative conferences,¹³ the International Telegraph Union considerably enlarged the ranks of its membership, the range of its activities, and the scope of its authority. By its tenth anniversary, its membership included governments from Asia and Africa¹⁴ as well as Europe. Within that vital decade, private telegraph companies were accorded the advantages of the Convention and Regulations;¹⁵ a permanent organ of the Union, the "Bureau international des administrations télégraphiques" was created to discharge certain administrative functions;¹⁶ and

¹² See International Telegraph Convention of Paris (1865), 56 Brit. & For. St. Paps. 294. Although means by individuals to enforce the right created for them were not prescribed by the Convention, it is remarkable, nonetheless, that rights for persons were considered at all in so early a treaty when the tide of state sovereignty was running and not ebbing. A clear right was hardly established, however, since by the provisions of art. 2, States reserved a right to stop any telegram dangerous to security, or contrary to law, public order or good morals. A modified version of the right survives in the law-making treaties of the ITU along with a mandate for state censorship. See ITU Telegraph Regulations (Geneva), Nov. 29, 1958, art. 85 [1959] 10 U.S.T. & O.I.A. 2423, 2548, T.I.A.S. No. 4390. The mandate contained in the regulation is not recognized by the United States. See Final Protocol to Telegraph Regulations, [1959] 10 U.S.T. & O.I.A. 2613, T.I.A.S. No. 4390.

¹³ Delegates to plenipotentiary, or "diplomatic," conferences are empowered to consider, sign, or revise a basic convention instrument; delegates to administrative conferences are empowered to make revisions to "service regulations" annexed to some basic convention instrument. The First Plenipotentiary Conference of the International Telegraph Union was held at Paris in 1865, the Second at Vienna in 1868, the Third at Rome during 1871-72, and the Fourth at St. Petersburg in 1875. Administrative Conferences were held at London (1879), Berlin (1885), Paris (1890), Budapest (1896), London (1903), Lisbon (1908), and Paris (1925).

¹⁴ India, Egypt, and Persia. See International Telegraph Convention (Revision of Vienna 1868), 59 Brit. & For. St. Paps. 322; (Revision of Rome 1872), 66 Brit. & For. St. Paps. 975; (Revision of St. Petersburg 1875), 66 Brit. & For. St. Paps. 19, 57 L.N.T.S. 212. See CLARK, *op. cit. supra* note 7, at 110; 4 HACKWORTH, DIGEST OF INTERNATIONAL LAW 277 (1942).

¹⁵ See Vienna Telegraph Convention (1868), 59 Brit. & For. St. Paps. 322. Conditions governing private operating agencies are now contained in art. 101 of the Telegraph Regulations (Geneva Revision 1958), Nov. 29, 1958, [1959] 10 U.S.T. & O.I.A. 2425, 2573, T.I.A.S. No. 4390, annexed to the Telecommunication Convention. The principle of "sovereign immunity" recognized expressly in the International Telegraph Convention was held to extend to a private concessionaire of the State in *Nader v. Marconi Radio Tel. Co. of Egypt*, Civil Tribunal of Alexandria, Egypt, 1934, [1933-34] Ann. Dig. 471.

¹⁶ Vienna Telegraph Convention (1868), 59 Brit. & For. St. Paps. 322. "The Bureau was given the duties of: gathering all information relating to international telegraph; publishing a table of telegraph rates; collecting general statistics; undertaking special studies as directed; and publishing, in French, a journal on telegraph matters." In addition, "the

substantial impediments to international telegraphic correspondence were removed by a requirement that telegrams to or from a non-contracting state be treated in the same manner as telegrams between member states.¹⁷

But the strides in international collaboration achieved during that decade were being outpaced relentlessly, then as now, by the genius of man's invention. The ink had hardly dried on the documents signed at St. Petersburg¹⁸ when Alexander Graham Bell, in 1876, succeeded in transmitting speech over wires, and most of the conference delegates were still alive when Guglielmo Marconi succeeded in transmitting intelligible signals without wires. Although little innovation was required for the Telegraph Union to formulate within its structure regulations for telephone,¹⁹ the early measures which could be taken by the Union to adopt regulations for "radiotelegraph" were severely limited,²⁰ and a separate convention for "radiotelegraph" was ultimately negotiated.²¹

Bureau has had occasion to exercise its influence on matters of policy. The full extent to which this has been done is known only to those who were intimately connected with the Bureau's work. There are, however, a few examples known to the public. For instance, the Bureau drew up the draft Convention for the St. Petersburg Conference (1875) which was used as a basis for discussion and the final Convention did not differ very much from it. The *Journal Télégraphique* has also provided a means for the Bureau personnel to express their opinions." CODDING, *op. cit. supra* note 2, at 24, 51. The Bureau was a permanent organ of the Telegraph Union which itself was conceived to be a distinct juridical entity.

¹⁷ Art. 67, Vienna Telegraph Convention (1868), 59 Brit. & For. St. Paps. 322.

¹⁸ See note 13 *supra*.

¹⁹ At the Berlin Telegraph Conference (1885), an Administrative Conference, five general paragraphs involving telephone were added to the Telegraph Regulations; at the London Telegraph Conference (1903) the five paragraphs were expanded to fifteen articles containing over sixty paragraphs. "From 1903, therefore, the Union could be entitled the International Telegraph and Telephone Union." CODDING, *op. cit. supra* note 2, at 32.

²⁰ *Id.* at 79.

²¹ Although the meeting at St. Petersburg in 1875 was to be the last Plenipotentiary Conference of the Union prior to its dissolution in 1932, in the interregnum the Union continued to expand its activities through administrative conferences. In 1925, at one such conference in Paris, two semi-independent consultative bodies, the International Consultative Committee on Telegraphic Communications and the International Consultative Committee for Long-Distance Telephonic Communications were brought into relationship with the Union. Art. 71, sec. 11 of the Telegraphic Regulations (Paris Revision 1925), annexed to the St. Petersburg Telegraph Convention (1875), established the Telephone Committee and charged it with the duties of studying standards regulating technical and operating questions for international long-distance telephony. Art. 87 of the Regulations charged the Telegraph Committee with "the task of studying technical questions and working arrangements concerning international telegraphy, particularly as regards long-distance telegraphy, and the necessary measures for obtaining the best output for the installations."

The International Radiotelegraph Union

The impact of the radiotelegraph on the maritime industry was pronounced; its exploitation by commercial interests immediate. The initial formulation of international regulations for the radiotelegraph was dictated not by the need to allocate frequency bands,²² but by the buccaneering practices of the commercial wireless companies in business at the turn of the century. Unabashedly seeking a global monopoly over radio communications, the Marconi Wireless Company contracted with shipping concerns not only for the right to install patented Marconi radio sets on ships and to provide the radio operators therefor, but also for the right to refuse to communicate with any radio station not equipped with its patented apparatus. Faced with the demoralizing consequences of these practices,²³ delegates from the United States and seven other governments attended a preliminary radio conference at Berlin in 1903. Three years later, in 1906, with the benefit of the preliminary studies which had been undertaken in 1903, plenipotentiaries of the United States and twenty-six other governments assembled in Berlin to negotiate the first radiotelegraph convention.²⁴

The instruments which emerged from the Berlin Radiotelegraph Conference of 1906—a basic convention, service regulations, an additional agreement involving radiocommunication between ships, and a final protocol including reservations to the convention and service regulations annexed to the convention²⁵—went beyond merely dampening the aspirations of commercial wireless companies. Article 3 of the Convention, adopting a principle advanced

²² Today this is the central problem of international radio regulation. See note 54 *infra*.

²³ French radio stations on the coasts of France were rendered inactive by refusal of the Marconi Company to accept correspondence. An American ship under orders to search for a dangerous derelict in the shipping lanes, encountered a German ship equipped with a Marconi set, and asked whether it had seen the derelict along its route. The German ship refused to reply because it was not permitted to communicate by radio with a ship employing an apparatus other than that of the Marconi Company. CODDING, *op. cit. supra* note 2, at 84.

²⁴ Establishment of a "Radiotelegraph Bureau" was proposed by the German Government but rejected. Instead, the Bureau of the International Telegraph Union was designated by the Berlin Conference to act as the central administrative organ of the new Radiotelegraph Union. Unlike the International Telegraph Union, the International Radiotelegraph Union was never conceived, in the eye of the law, as a juridical entity separate and apart from its member States. See note 16 *supra*, and note 39 *infra*.

²⁵ See Berlin Radiotelegraph Convention, Nov. 3, 1906, 37 Stat. 1565, 1574, 1576, 1581, T.S. No. 568. See also 4 HACKWORTH, *op. cit. supra* note 14, at 276.

at the 1903 conference,²⁶ provided that coastal and ship stations were "bound to exchange wireless telegrams reciprocally without distinction of the wireless telegraph system adopted by such stations."²⁷ Under the terms of the final protocol each government could reserve the right to exempt certain stations from the obligation contained in article 3 on the condition that at least one or more coastal stations on its territory remained subject to the obligation. Eighteen of the twenty-seven signatories did not reserve this right, and twenty-one countries signed the supplementary agreement which extended the obligation of compulsory intercommunication, without regard to system, to *ship-to-ship* communication. The convention and service regulations contained rules concerning minimum technical standards for operators and apparatus, attempted to reduce interference, and dealt with certain rate questions as well as matters concerning the acceptance and transmission of radiotelegrams. Article 2 of the Regulations annexed to the Convention established two wave lengths for public correspondence, and required each of the contracting parties to forward to the International Telegraph Bureau "for publication, data on the coast and ship stations operating under its authority, including nationality, geographical location for coast station, call letters, range, radio system used, wave-lengths used, nature of service and hours of operation."²⁸

Revisions to the Berlin Radiotelegraph Convention of 1906 were made at the London Radiotelegraph Conference of 1912, which met less than two months after the sinking of the *Titanic*. The shock of this disaster compelled agreements which had been resisted six years before. While vigorous attempts to make compulsory the installation of radio sets and the maintenance of continuous radio watches aboard certain ships were still unsuccessful, provisions for such precautions were finally inserted in the first Safety of Life at Sea Convention²⁹ negotiated in 1913 only months

²⁶ See Protocole Final, Conférence Préliminaire concernant la Télégraphie sans Fil (Berlin 1903), discussed in 4 HACKWORTH, *op. cit. supra* note 14, at 276.

²⁷ The article did not require obligatory intercommunication between ship and ship. The United States delegate to the Conference proposed that such intercommunication be made obligatory but the British delegate warned that he would not sign any convention which contained such an article. Presumably the British delegate was engaged in preserving, as best he could, the interests of the Marconi Company, which was a British corporation.

²⁸ CODDING, *op. cit. supra* note 2, at 95.

²⁹ See 108 Brit. & For. St. Paps. 283. The United States first ratified the Convention

after the London Radiotelegraph Convention, and only months before the beginning of World War I.³⁰

After the war, advances in technology made it apparent that radical revisions to the International Radiotelegraph Convention were required, and that the creation of a single set of regulations for all electrical communications was desirable. Since the burgeoning problems presented by radio were beyond the competence of the "radiotelegraph" convention negotiated in 1906 and revised in 1912,³¹ it was inevitable that the scope of the International Radiotelegraph Convention was to be enlarged considerably by the delegates from more than eighty countries who assembled in Washington in 1927 to revise the Convention.

At Washington, the detailed regulations annexed to the new Radiotelegraph Convention, rather than the convention instrument itself, emerged as the tangible evidence of the monumental agreements reached. The Convention undertook to regulate all radio-communication stations; it established a consultative committee on radio,³² provided operating standards, and fixed responsi-

for Promoting Safety of Life at Sea in 1936. 50 Stat. 1121, T.S. No. 910. Today, "radio-communication to secure safety of life at sea . . . is governed partly by the International Telecommunication Convention and the Radio Regulations annexed thereto and partly by the Safety of Life at Sea Convention; conflict between these instruments is avoided by the inclusion in the Safety of Life at Sea Convention of appropriate references to the Telecommunication Convention and Radio Regulations. Aeronautical telecommunications are governed partly by the International Telecommunication Convention and the Radio Regulations annexed thereto and partly by the Aeronautical Telecommunications Annex to the International Civil Aviation Convention which embodies various provisions of and references to the Telecommunication Convention and Radio Regulations." Jenks, *The Conflict of Law-Making Treaties*, 30 BRIT. YB. INT'L L. 401, 416 (1953).

³⁰ The London Radiotelegraph Conference of 1912 adopted a radiotelegraph convention, final protocol, and service regulations. Various provisions of the Berlin convention were incorporated with little change. 4 HACKWORTH, *op. cit. supra* note 14, at 276-77. For texts of these instruments, see 38 Stat. 1672, 1707, 1714, 1718, T.S. No. 581.

³¹ In 1920, delegates from the United States, Great Britain, France, Italy, and Japan had convened at Washington to consider international aspects of telegraph, cable, and radio communication. A draft convention and a single set of regulations for telegraph, telephone, cable, and radio communications were formulated, and a unitary organization, the "Universal Electrical Communications Union," was proposed for consideration at a future diplomatic conference. Since, however, the United States had always considered impolitic, and refrained from, membership in the International Telegraph Union, which under the proposed scheme, would have been merged within the "Universal Electrical Communications Union," the prospect of American participation was at best speculative. In any event, the proposed "universal union" never materialized.

³² Art. 17, Washington Radiotelegraph Convention, 4 Treaties 5031, 5035 (Trenwith 1938). Although the CCIR is similar in concept to the former CCIT and former CCIF (*cf.* text at note 44 *infra*), historically, the legal posture of the three committees is confusing. Under art. 17, a Consultative Committee for Radio was "established" but a

bilities for interference from military³³ and non-military³⁴ installations. In the Regulations, the delegates dealt with the problems resulting from the development of radio broadcasting, the requirement of radio for air navigation, the accidental achievement by amateurs of intercontinental communications by means of short-wave transmissions, the radio interference caused by "home-

Radiotelegraph Union, as a distinct juridical entity, never was. See note 24 *supra*, and note 39 *infra*. Neither a Committee for Telegraph nor one for Telephone was established under any provision contained in the International Telegraph Convention. The Telephone Committee was "established" under Regulations annexed to the Telegraph Convention. The same regulations, while failing to "establish" a Telegraph Committee, proceeded, nonetheless, to define its functions. See note 21 *supra*. The Madrid Telecommunication Convention (1932), which abrogated the Washington Radiotelegraph Convention, contained in art. 16 permissive authority to "set up" Consultative Committees, but the convention instrument did not identify the three committees here involved. They were identified, charged with duties, but not "established" or "re-established" in the service regulations annexed to the Madrid Telecommunication Convention. Finally, under the provisions of art. 4 of the Atlantic City Telecommunication Convention (1947), the three Committees were identified and constituted as permanent organs of the ITU. In 1956 the CCIT and CCIF were merged into a single organ, the CCITT. See note 47 *infra*.

³³ Article 22: "The contracting Governments retain their *entire liberty* regarding radio installations not covered in Article 2, and *especially with reference to naval and military installations*. All these installations and stations must, *so far as practicable*, comply with the provisions of the regulations regarding help to be given in case of distress and measures to be taken to prevent interference. They must also, *so far as practicable*, observe such provisions of the regulations as concern the types of waves and the frequencies to be used, according to the kind of service which these stations carry on." Washington Convention, Nov. 25, 1927, 45 Stat. 2843, T.S. No. 767. (Emphasis added.) The Czechoslovakian delegation supported by the Mexican, Dutch, Greek and Chinese delegations suggested deletion of the words "so far as practicable" in order to prevent a military service of a neighboring country from being able to disturb the civil service of public correspondence. Giving assurances that no abuse would occur the British delegation supported by the Italian, Japanese and American delegations proposed retention of the words. The American delegation drew the attention of the Assembly to the provisions of article 10. See note 34 *infra*. The amendment suggested by Czechoslovakia was rejected. See MINUTES OF THE SEVENTH PLENARY SESSION RADIO CONFERENCE OF WASHINGTON (p. 239) forwarded with Presidential Message of Dec. 12, 1927, transmitting to Senate RADIOTELEGRAPH CONV. AND REGULATIONS, 70th Cong., 1st Sess., Executive B. Provisions essentially the same as Art. 22 (above) have been incorporated in all International Telecommunication Conventions and are now set forth in Art. 50 of the Telecommunication Convention (Geneva Revision 1959). See note 67 *infra*.

³⁴ Article 10: "The stations covered by Article 2 [stations established or operated by the contracting Governments, and open to the international service of public correspondence] must, *so far as practicable*, be established and operated under the best conditions known to the practice of the service and must be maintained abreast of scientific and technical progress. All stations, whatever their purpose, must, *so far as practicable*, be established and operated so as not to interfere with the radiocommunications or services of other contracting Governments and of individuals or of private enterprises authorized by these contracting Governments to carry on public radiocommunication service." Washington Convention, Nov. 25, 1927, 45 Stat. 2840, T.S. No. 767. (Emphasis added.) The equivocation, "so far as practicable," a shibboleth for possible avoidance of the Radio Regulations, was retained in modified form in art. 35 of the International Telecommunication Convention of Madrid (1932) but removed from all subsequent revisions

made" radio transmitters,³⁵ and the lack of circuit discipline.³⁶ They adopted the principle of allocating frequencies to radiocommunication services, rather than countries,³⁷ thus devising the basic scheme of international radio regulation which endures even today. Channels from 10 to 100 kilocycles per second³⁸ were set apart

thereto. Art. 47 of the International Telecommunication Convention (Geneva Revision 1959) provides that "All stations, whatever their purpose, *must be established* and operated in such a manner as not to result in harmful interference to the radio services of communications of other Members . . ." (emphasis added) while art. 3 of the Radio Regulations (Geneva Revision 1959) annexed to that Convention provides that "Administrations . . . *shall not* assign to a station any frequency in derogation of either the Table of Frequency Allocations . . . or the other provisions of these Regulations, *except on the express condition* that harmful interference shall not be caused to services carried on by stations operating in accordance with the provisions of the Convention and of these Regulations." (Emphasis added.) See notes 67, 68 *infra*.

³⁵ These were the so-called "spark sets" which, being of primitive design, wasted appreciable space in any frequency band in which they operated. When radio was in its infancy, crude emissions from "spark sets" did not have grave consequences. With the development of radio and a concomitant requirement for conservation and rational use of spectrum space, the use of "spark sets" was restricted progressively under regulations annexed to the Washington Radiotelegraph Convention and succeeding Telecommunication Conventions and finally curtailed completely under the provisions of art. 6 of the Atlantic City Radio Regulations (1947).

³⁶ Willful transmission of false and deceptive messages to vessels at sea were among notorious examples. This "practical joke" is now made a crime under the laws of most countries.

³⁷ See Stewart, *The International Radiotelegraph Conference of Washington*, 22 AM. J. INT'L L. 28, 48 (1928); 4 HACKWORTH, *op. cit. supra* note 14, at 279. Under the scheme of allocating to "services," rather than "sovereigns," bands of frequencies in the radio spectrum are identified by a type of radiocommunication service such as broadcasting, amateur, or maritime mobile. A number of non-adjacent bands in the spectrum are then allocated to the services so identified, in certain cases with different allocations for different geographic regions. Today, allocations by the ITU are made in three regions: Region I embraces Western Europe, all of the USSR and Africa; Region II includes all of the Western Hemisphere; and Region III roughly all of Asia excluding the USSR. The radio frequency spectrum then is occupied in three ways; in frequency, in time, and in geographic location.

³⁸ Owing to lack of precision in the term "wave length" (expressed in metres)—the official nomenclature for bands identified in the Berlin and London Radiotelegraph Regulations—the Conference adopted as a major designation the "kilocycle." The frequency of electromagnetic energy is the number of cycles per second that the intensity of the signal varies when passing successively from what may be considered a positive to a negative phase, in the fashion of a geometric sine wave. When the frequency becomes quite large the units commonly employed are kilocycles (1,000 cycles), megacycles (1 million cycles), and gigacycles (1 billion cycles) all referred to the time interval of 1 second. The spectrum coverage contained in the Washington Regulations (1927) extended from 10 kc/s to 23,000 kc/s, in the Madrid Regulations (1932) from 10 kc/s to 60,000 kc/s, in the Cairo Regulations (1938) from 10 kc/s to 200 Mc/s, in the Atlantic City Regulations (1947) from 10 kc/s to 10,500 Mc/s. Bands designated, for the first time, in the Gigacycle (Gc/s) range are contained in the Geneva (1959) revision of the Radio Regulations with spectrum coverage extending from 10 kc/s to 40 Gc/s. Nomenclature and subdivisions of these bands are identified in art. 2, § III of the Radio Regulations (Geneva 1959) which have been signed but are not yet ratified by the United States. See notes 67, 68 *infra*.

chiefly for long-distance transoceanic service, channels from 100 to 500 were set aside primarily for ship-to-shore and aircraft service, and those from 500 to 1500 for broadcasting. Largely through the efforts of Herbert Hoover, the chairman of the conference, the radio amateur was recognized for the first time by an international treaty which reserved frequency bands for his use.

The delegates at Washington agreed also that a combination of the Telegraph and Radiotelegraph Conventions would eliminate much unnecessary duplication, and would provide for closer collaboration on questions common to line and radio communications. As a result, a resolution was adopted inviting contracting governments to examine the possibility of combining the two conventions. Before adjourning, the delegates agreed to schedule the next Radiotelegraph Conference for 1932 in Madrid where, at the same time, a conference of the International Telegraph Union was to be held. When the delegates completed their deliberations at Madrid in 1932, the International Telegraph Union, venerable symbol of international collaboration, and the International Radiotelegraph Union³⁹ passed into history, and the International Telecommunication Union came into being.

The International Telecommunication Union

The most important achievement of the conferences of plenipotentiaries at Madrid in 1932 was the fusion of the Telegraph Convention of 1875 and the Radiotelegraph Convention of 1927 into a single International Telecommunication Convention, containing principles common to telegraph, telephone, and radio services. The nomenclature for the three services, "telecommunication," was defined as "any telegraphic or telephonic communication of signs, signals, writing, facsimiles and sounds of any kind, by wire, wireless or other systems or processes of electric signalling or visual signalling (semaphores)." ⁴⁰

³⁹ The existence of the International Telegraph Union, *qua* an international juridical entity, was terminated expressly by the provisions of art. 1, International Telecommunication Convention (Madrid 1932), Dec. 9, 1932, 49 Stat. 2393, T.S. No. 867. "Since a Radiotelegraph Union did not legally exist, it was impossible to replace it. However, article 8 provided for the abrogation and replacement of the International Radiotelegraph Conventions of Berlin (1906), of London (1912) and of Washington (1927) and the Regulations annexed to them Article 8 also abrogated and replaced the International Telegraph Conventions of Paris (1865), of Vienna (1868), of Rome (1872) and of St. Petersburg (1875) and the Regulations annexed to them." CODDING, *op. cit. supra* note 2, at 140.

⁴⁰ Dec. 9, 1934, 49 Stat. 2441, T.S. No. 867. For present definition see note 6 *supra*.

The General Provisions of the Convention, derived essentially from provisions of like import which were set forth in the Telegraph and Radiotelegraph Conventions, involved, *inter alia*, secrecy of telecommunications (article 24), constitution, operation, and protection of telecommunication installations and channels (article 25), stoppage of telecommunications (article 26), suspension of service (article 27), investigation of violations (article 28), charges and franking privileges (article 29), priority of transmission (article 30), secret language (article 31), monetary unit (article 32), and rendering of accounts (article 33). Article 17 established a "Bureau of the International Telecommunication Union" with duties similar to those of the former "Bureau international des administrations télégraphiques."⁴¹ Article 16 authorized the establishment of international consultative committees for telegraph (CCIT), telephone (CCIF), and radio (CCIR). Committee functions were detailed in the service regulations annexed to the Convention.⁴² Provision was made for arbitration in connection with questions concerning the execution of the Convention or its service regulations.⁴³

General Radio Regulations and a final protocol thereto, Additional Radio Regulations, Telegraph Regulations and protocol, Telephone Regulations, and a European radio protocol were annexed to the Convention. Of these instruments only the General Radio Regulations and protocol were signed and ratified by the United States.⁴⁴ With few exceptions, the table of fre-

⁴¹ See note 16 *supra*. It is interesting that staff members of the Telegraph Bureau, and not governments, formulated the first acceptable drafts for fusing the Telegraph and Radiotelegraph Conventions into one instrument, the Telecommunication Convention.

⁴² See notes 21, 32 *supra*. While the unusual functions of these committees were destined to be expanded considerably in later years, even before the Madrid Convention, their findings, set forth in the form of "opinions," had an immediate impact upon the national legislation and regulations of the principal nations. "An example of such an opinion which had a very important effect in the world allocation of frequencies was Opinion 18 issued by the first C.C.I.R. at The Hague recommending the world allocation of frequencies above 6,000 kc/s on a 0.1 percent frequency separation with the additional recommendation that such specific allocations be integral multiples of 5 kc/s. The effect of this in the United States was practically to double the number of channels available for assignment. It led to a general reallocation of the so-called short waves in January 1931." HERRING & GROSS, *TELECOMMUNICATIONS* 373 (1936).

⁴³ It would seem that recourse to arbitration occurs rarely. See 19 I.T.U. *TELECOMMUNICATIONS* J. 541 (1952). The General Secretariat has often been used, however, as an intermediary in cases of disputes over interference. CODDING, *op. cit. supra* note 2, at 191.

⁴⁴ See 4 HACKWORTH, *op. cit. supra* note 14, at 280.

quency allocations contained in the General Radio Regulations followed those contained in the regulations annexed to the Washington Radiotelegraph Convention.

Administrative telecommunication conferences held at Cairo in 1938 resulted in a revision of all service regulations annexed to the Madrid Convention. One of the most far-reaching results of the Cairo conference was the adoption of a plan of allocating radio channels in the band between 6500 and 23,380 kc/s for intercontinental air routes. This allocation was significant because the channels reserved for specific aeronautical routes included not only bands for air services which were in operation, but for those which were scheduled for future use. These were the first allocations made in anticipation of a future development, a marked contrast to the usual procedure of legalizing existing frequency uses.⁴⁵ Before adjourning, the delegates scheduled an administrative conference to be held in Rome in 1942. With the outbreak of World War II, of course, the proposed conference failed to materialize. Until the war ended, the Union remained virtually dormant, and only caretaker activities were performed by the Bureau of the Union at its seat in Bern, Switzerland.

While the second world war resulted, on the one hand, in widespread destruction of telecommunication facilities, it occasioned, on the other, the most comprehensive development of communications science ever known. The scale of this development, coupled with the political changes wrought by the war, necessitated many changes in the International Telecommunication Convention adopted at Madrid in 1932, and in the Service Regulations revised at Cairo in 1938. These changes were forthcoming when delegates to plenipotentiary and administrative conferences assembled in Atlantic City in 1947.

The Atlantic City Convention expressed for the first time in a convention the goal of the ITU to ensure the effectiveness of telecommunication while "fully recognizing the sovereign right of each country to regulate its [own] telecommunication."⁴⁶ The Bureau of the Union was replaced, under the provisions of arti-

⁴⁵ See CODDING, *op. cit. supra* note 2, at 164. The General Radio Regulations (Cairo Revision 1938) and Final Protocol (Cairo Revision 1938) annexed to the International Telecommunication Convention of Madrid (1932) may be found at 54 Stat. 1417, T.S. No. 948.

⁴⁶ Preamble; see note 114 *infra*. See also art. 3.

cle 9, by a General Secretariat under the direction of a Secretary-General. Article 4 made the General Secretariat, the CCIT, CCIF, and CCIR "permanent organs" of the Union, and established a new permanent organ, the International Frequency Registration Board (IFRB).⁴⁷ As set forth in the Atlantic City Convention the duties of the IFRB were, as they now remain:

"(a) to effect an orderly recording of frequency assignments made by the different countries so as to establish, in accordance with the procedure provided for in the Radio Regulations, the date, purpose and technical characteristics of each of these assignments, with a view to ensuring formal international recognition thereof;

"(b) to furnish advice to Members and Associate Members with a view to the operation of the maximum practicable number of radio channels in those portions of the spectrum where harmful interference may occur."⁴⁸

⁴⁷ The Atlantic City Convention was revised by a new International Telecommunication Convention negotiated at Buenos Aires in 1952, [1953] 6 U.S.T. & O.I.A. 1213, T.I.A.S. No. 3266, which authorized the merger of the CCIT and the CCIF into one permanent organ identified as the International Telegraph and Telephone Consultative Committee (CCITT). With the formation of the CCITT in 1956, the organization of the four permanent organs of the ITU, as they now exist, was completed. With the CCITT, the permanent organs are the General Secretariat, the CCIR and the IFRB. The non-permanent organs of the Union are the Plenipotentiary Conference, the Administrative Conferences, and the Administrative Council. See art. 5, International Telecommunication Convention (Geneva Revision 1959). In connection with functions of the Administrative Council, see note 119 *infra*.

⁴⁸ Additional duties of the IFRB are enumerated in art. 12, Geneva Convention (1959). See note 67 *infra*. The Soviet Union entered a reservation against the legality of the IFRB and the ITU Radio Regulations in a Protocol of reservations annexed to the Buenos Aires Convention (1952). See Aaronson, *Space Law* 228, S. Doc. No. 26, Symposium on Legal Problems of Space Exploration (1961) prepared for S. Comm. on Aeronautical and Space Sciences, 87th Cong., 1st Sess., reprinted from the *International Relations Journal* (April 1958). However, in the Final Protocol annexed to the Geneva Convention (1959) the Soviet Union maintained only "the reservations relating to the Radio Regulations" that were made in ratifying the Buenos Aires Convention. Moreover, in the Additional Protocol annexed to the 1959 ITU Radio Regulations the Soviet Union did not contest the legality of the IFRB as such but questioned the legal competence of the Board in dealing with certain matters. On January 1, 1962, Mr. N. I. Krasnosselski, a Soviet national, succeeded to the Chairmanship of the IFRB, and Mr. J. H. Gayer, a United States national, became the Board's Vice-Chairman. Commenting upon this refreshing circumstance in international collaboration, the official journal of the ITU noted that, "The Members of the IFRB, as is well known, *do not represent their countries* but are 'custodians of an international public trust.' It is, however, worth drawing attention to the fact that in 1962 the Board has a Chairman who is a citizen of the Soviet Union and a Vice-Chairman who is a citizen of the United States. This is a rare and welcome international event. It is a tribute to both men, to the Board which elected them and to the ITU as a whole." 29 I.T.U. TELECOMMUNICATIONS J. 4 (1962) (English version) (emphasis added).

While in the past the ITU had refrained from establishing any formal connection with the League of Nations, on the basis of decisions made at Atlantic City the ITU formally entered the growing family of specialized agencies brought into relationship with the United Nations.⁴⁹ As a result of these and other reforms, a greater emphasis was placed on politics, an area long avoided by the Union.

Of the service regulations, only the regulations applicable to radio were revised at Atlantic City.⁵⁰ An urgent necessity existed, of course, for establishing a completely new table of frequency allocations based upon requirements for various radiocommunication services developed during the war and since the Cairo Conference of 1938. The successful incorporation of these radiocommunication services into an enlarged allocation plan, coupled with creation of the IFRB, heralded clearly the role of the ITU as general agent for the world in the matter of allocating and managing radio frequencies.

To satisfy the need for new radiocommunication services, an additional portion of the radio frequency spectrum,⁵¹ developed since the Cairo Conference, was available for effective use, and was brought within the ambit of the Radio Regulations. The table

⁴⁹ See note 5 *supra*.

⁵⁰ Administrative conferences for telegraph and telephone were not convened at Atlantic City since the changes that had occurred in these services, while important, were less demanding of immediate attention than those which had occurred in the field of radio communication. Revision of the telegraph and telephone regulations adopted at Cairo in 1938 was vital nonetheless and, in consequence, an Administrative Conference for Telegraph and Telephone was held at Paris in 1949. As a result of accords reached at Paris, the United States signed and ratified, for the first time, the International Telegraph Regulations. See Telegraph Regulations (Paris Revision 1949) annexed to the International Telecommunication Convention and Final Protocol to the Telegraph Regulations, [1949] 2 U.S.T. & O.I.A. 17, T.I.A.S. No. 2175. The regulations adopted at Paris in 1949 were revised again in 1958 at an Administrative Telegraph Conference held in Geneva; these instruments, now in force, constitute the current international service regulations for telephone and telegraph. The 1958 Geneva Revision of the International Telegraph Regulations may be found in [1960] 10 U.S.T. & O.I.A. 2425, 2573, T.I.A.S. No. 4390. Since the United States has never ratified the Telephone Regulations and has not accepted many of the obligations in the Telegraph Regulations which were ratified relatively late in the history of the Union, [1949] 2 U.S.T. & O.I.A. 17, T.I.A.S. No. 2175, no protracted discussion of these instruments is contained in this article. The intentional omissions should not give rise to an inference that the rational use and management of radiocommunication services are problems of any greater importance to the Union than those involving the rational use and management of line communications. Radio is, among other things, a medium for telegraphy and telephony and to that extent is merely an alternative for cable or land line where point-to-point communications are concerned.

⁵¹ See notes 37, 38 *supra*.

in the Appendix identifies the radiocommunication services⁵² and the extent of spectrum coverage⁵³ brought progressively within the scope of international management from the time of the Washington Radiotelegraph Conference of 1927 and for all ITU Administrative Radio Conferences thereafter.

Complementing the various "world-wide" plenipotentiary and administrative conferences held by the ITU since its inception, a number of important Plenary Assemblies, meetings, and "regional conferences" have also been convened under the auspices of the Union or its constituent organs. Most in recent years have involved studies of means to accommodate the ever-increasing radiocommunication services in a finite frequency spectrum, saturated with validly licensed occupants, and best described as "bursting at the seams."⁵⁴ Against this bizarre setting of spectrum availability, the radio signals of Sputnik I announced not only the dawn of the Space Age but the threshold of a future in the affairs of men where demands for, and requirements of, radiocommunication promise to exceed anything known in the past. In 1959, two years after Sputnik, delegates to an Administrative Radio Conference met at Geneva—simultaneously with delegates to a Plenipotentiary Conference—there to adopt the first international rules of law applicable to activities in outer space.

IN SPACE

Ships and aircraft may perform without radiocommunication but the "jugular vein" of the artificial satellite, and indeed of any foreseeable method of exploring the cosmos, is the simple radio wave. Because of variations in propagation characteristics, only waves of certain lengths can pass through the atmosphere and ionosphere. Therefore, only selected frequencies within the radio spectrum can be used for communication between space vehicles and points on earth. Moreover, in addition to communication

⁵² In the Appendix, the services listed in brackets were not defined in the Radio Regulations under which they appear but were set forth as such in the frequency allocation plans contained in these regulations.

⁵³ See note 38 *supra*.

⁵⁴ "In one band alone, between 4-10 Mc/s, the world total of frequency listings has increased from 1,698 in 1929 to 6,658 in 1939, 21,456 in 1949, and 74,284 in 1959. Yet, dominating the picture is the availability of but a single radio spectrum." STAFF OF SENATE COMMITTEE ON AERONAUTICAL AND SPACE SCIENCES, 86TH CONG., 2D SESS., POLICY PLANNING FOR SPACE TELECOMMUNICATIONS 33 (Comm. Print. 1960) [hereinafter cited as SENATE STAFF REPORT].

with the vehicle itself, frequencies are required for point-to-point telecommunication on the surface of the earth as an adjunct to tracking the vehicle, point-to-point communication between space vehicles, and transmission to any part of the world of information received from space vehicles. While advances in the communications art may open up for occupancy new sectors of the radio spectrum, present frequency assignments for space communications are dependent upon the sharing, either on a primary or secondary basis,⁵⁵ of channels allocated internationally to existing terrestrial radiocommunication services. The United Nations Ad Hoc Committee on the Peaceful Uses of Outer Space⁵⁶ has considered the allocation of frequencies for space telecommunication purposes a *legal* problem meriting priority treatment.⁵⁷

Ensuring the integrity of space telecommunications in a guaranteed interference-free environment is corollary to the legal problem involving allocation. Foreseeable approaches here must depend upon negotiation and efficacy of international agreements calculated to secure global circuit discipline and maximum elimination of harmful interference caused to,⁵⁸ as well as by,⁵⁹ radio

⁵⁵ "I believe . . . that men of vision must recognize the fact that there have been and always will be certain uses of radio which cannot and should not be placed on a shared basis, at least not from a subsidiary point of view. I am convinced that space communications is one of those users [uses?]." Partial dissent of Commissioner T. A. M. Craven, In the Matter of Allocation of Frequencies in the Bands Above 890 Mc., (Report and Order) 20 P & F Radio Reg. 1602, 1632 (FCC 1960). *But cf.* comments on channel sharing submitted to the Federal Communications Commission on March 1, 1961 by the General Electric Company, In the Matter of an Inquiry into the Allocation of Frequency Bands for Space Communications, FCC Docket No. 13522. For methods of channel sharing adopted under international regulation, see art. 3 of the ITU Radio Regulations (Geneva Revision 1959).

⁵⁶ Established by the General Assembly of the United Nations at its Thirteenth Session by Resolution 1348 (XVIII) of Dec. 13, 1958. The Committee observed, among other things, that as a matter of principle the United Nations Charter and the Statute of the International Court of Justice were not limited in their operation to the confines of the Earth. See U.N. GEN. ASS. OFF. REC. 14th Sess., Annexes, Agenda Item No. 25, at 22 (1959). Delegates to the ITU Plenipotentiary and Administrative Conferences held in Geneva in 1959 did not hesitate to add to this classification the law-making treaties of the ITU.

⁵⁷ See *id.* at 24. The Committee also recognized "that the principles and procedures developed in the past to govern the use of such areas as the airspace and the sea deserved attentive study for possibly fruitful analogies that might be adaptable to the treatment of legal problems arising out of the exploration and use of outer space." *Id.* at 23. See in this connection comments of Danish delegate to ITU Radio Conference, note 115 *infra*.

⁵⁸ See WENK, REPORT FOR SENATE COMMITTEE ON AERONAUTICAL AND SPACE SCIENCES, 86TH CONG., 2D SESS., RADIO FREQUENCY CONTROL IN SPACE COMMUNICATIONS 87 (COMM. PRINT 1960) [hereinafter cited as WENK].

⁵⁹ See Haley, *Space Age Presents Immediate Legal Problems*, PROCEEDINGS, FIRST COLLOQUIUM ON THE LAW OF OUTER SPACE, THE HAGUE 1958, 16 (1959). "On October 16,

equipment in and for satellite vehicles. More importantly, hazards to life and property at launching pads from malfunction due to radio interference, as well as hazards to the safety of rocket-borne astronauts, are problems which are immediately apparent. There is also a real danger to life and property of the general public due to an accident at launching or during flight. Automatic destruction of devices if they tend to veer off course immediately after launching can be achieved only by radio.⁶⁰ A potential consequence of such radio failure was presented in the following rhetorical exchange appearing in an address delivered by the present Secretary-General of the ITU:

"What happens to a space satellite travelling at 18,000 miles an hour which unfortunately runs into technical trouble and starts heading for your house or my house?

"The answer was swift and intended to be reassuring:

'We will blow it up of course before it does any damage.'

'How?' I asked.

'By radio' was the reply. I then said:

'Where do you get the frequencies?'

'Oh, we have them—they are in the experimental band.'

'What happens,' I asked, 'if the broadcasters are using television on them or the airlines are practising navigation aids?

"Frankly they had not considered this point!"⁶¹

As the size and number of artificial satellites increase, the risk to the safety of all concerned will need special attention. Al-

1959 the [Federal Communications] Commission was advised by the National Aeronautics and Space Administration and by the Darmstadt Monitoring Station in West Germany that a U.S. station at Tangiers, Morocco, operating in the fixed (point-to-point) service on 19989.1 kilocycles was causing interference to the reception of [the Soviet satellite] IOTA transmitting on 19991.5 kilocycles. The fixed station was in an appropriate band, the satellite was not inasmuch as the band 19990-20010 kilocycles is allocated exclusively on a world-wide basis, to the standard frequency service. Since the satellite was thus being operated in derogation of the Atlantic City Radio Regulations, no claim could be made for its protection from harmful interference. Nonetheless, in a spirit of cooperation, the Tangiers station was adjusted to minimize the interference and no further complaints were received." Statement of Federal Communications Commission contained in SENATE STAFF REPORT 137.

⁶⁰ See discussion on hazards to public safety in WENK, at 89.

⁶¹ Excerpt from address delivered by the Hon. Gerald C. Gross at Ninth Plenary Assembly of the International Radio Consultative Committee of the ITU published in 26 I.T.U. TELECOMMUNICATIONS J. 121, 122 (1959) (English version).

though space vehicles are still in experimental stages, tragedy should not be a necessary prelude for the compulsion of safety precautions. Perhaps it is timely to remember that the tragedy of the *Titanic* could have been averted had not earlier international safety proposals involving radiocommunication been resisted.

The law-making treaties of the ITU now encompass limited sectors of space telecommunication as a result of action taken at Plenipotentiary and Administrative Conferences of the ITU held at Geneva during 1959.⁶² But the revisions of the Telecommunication Convention and Radio Regulations which were negotiated at these sessions are hardly adequate to cope with the formidable array of interdependent problems involving frequency allocation, integrity of communications, and safety assessments comparable in degree to the incidence of space activity promised for the foreseeable future.

In anticipation of future developments, several new operational space radiocommunication services were proposed for inclusion in the revised Table of Frequency Allocations scheduled for adoption at Geneva.⁶³ Not as responsive, however, as their predecessors at Cairo who were willing to anticipate future needs for aeronautical services,⁶⁴ the conference delegates at Geneva adhered to the usual practice of legalizing existing frequency uses and allocated bands "for research purposes" only. On the other hand, for theorists who may have wondered whether the law-making treaties of the ITU could extend at all to outer space and celestial bodies without basic revisions to the Convention, all doubt was removed by the same delegates when they negotiated radio regulations not only to govern earth-circling objects and lunar, solar, and plane-

⁶² The formal activities of the ITU in the area of space telecommunication, however, antedate the Geneva Conferences of 1959. During 1958, CCIR Study Groups, holding sessions in Moscow, studied questions involving protection of frequencies, used by artificial satellites. Meeting at Los Angeles in 1959, the CCIR formulated a "Recommendation on Selection of Frequencies Used for Telecommunication With and Between Space Vehicles." Significantly also, a special study group has been established by the CCITT to deal with data transmission, an area not only of general interest for purposes of terrestrial telecommunication, but one critically relevant to space telecommunication.

⁶³ New radiocommunication services proposed by the International Astronautical Federation are designated as Astronautical Mobile, Astronautical Mobile (Ionospheric propagation), Astronautical Mobile (Telemetry and Television), Astronautical Radiolocation, Astronautical Radiolocation (Tracking), and Astronautical Radionavigation (Command). See Statement of Andrew G. Haley, Esq., 28 I.T.U. TELECOMMUNICATIONS J. 9, 10 (1961) (English version).

⁶⁴ See note 45 *supra*.

tary probes, but also to protect the science of radio astronomy—engaged at last report in studying cosmic radio emissions from celestial bodies 270 million light years from earth! Commenting in 1892 upon the ITU's modest progenitor, the International Telegraph Union, the eminent jurist, Gustave Moynier, was moved to exclaim, "Elle est la loi universelle."⁶⁵ If not then, certainly now.

I. RESULTS OF THE GENEVA CONFERENCES OF 1959

Abrogating and replacing the International Telecommunication Convention of Buenos Aires (1952),⁶⁶ the International Telecommunication Convention of Geneva (1959) entered into force internationally on the first of January 1961.⁶⁷ As in the case of previous telecommunication conventions, the Geneva Convention is completed by Telegraph Regulations, Telephone Regulations, Radio Regulations and Additional Radio Regulations. Of these only the Radio Regulations and Additional Radio Regulations have been revised by delegates to an Administrative Radio Conference.

The Radio Regulations, which entered into force internationally on May 1, 1961,⁶⁸ contain for the first time in any multilateral agreement explicit provisions applicable to outer space activities.⁶⁹ Thirteen bands of radio frequencies are allocated under

⁶⁵ See CLARK, INTERNATIONAL COMMUNICATIONS 103 (1931).

⁶⁶ See note 47 *supra*.

⁶⁷ As of this writing instruments of ratification or accession have been deposited with the Secretary-General of ITU from Iceland, Israel, Dahomey, United Kingdom, Federation of Rhodesia and Nyasaland, Cyprus, Morocco, Federation of Nigeria, the Soviet Union, Central African Republic, Haiti, Pakistan, Chad, Union of South Africa, Republic of Viet-Nam, Denmark, Ivory Coast, Finland, Yugoslavia, Senegal, Sweden, Switzerland, Malagasy Republic, Bulgaria, Lebanon and New Zealand. The treaty representing the 1959 Geneva agreements was transmitted to the U.S. Senate on June 9, 1960 by the Department of State acting for the President. In contrast to the Radio Regulations the basic convention instrument does not contain provisions applicable explicitly to space telecommunications as such. There is annexed to the Convention, however, Plenipotentiary Conference Resolution No. 34 entitled, "Telecommunication and the Peaceful Uses of Outer Space Vehicles." See note 107 *infra*.

⁶⁸ As of this writing the following countries have approved the Radio Regulations and Additional Radio Regulations: Iran, Iceland, Federal Republic of Germany, Finland, Morocco, United Kingdom, Sweden, China, Denmark, Lebanon, Malaya, Belgium, Spain, Federation of Rhodesia and Nyasaland, Thailand, British East Africa and Pakistan. The Radio Regulations have been transmitted to the U.S. Senate for advice and consent to ratification. See note 67 *supra*. The United States neither signs nor ratifies the Additional Radio Regulations.

⁶⁹ In addition to actual allocation of frequencies for space radiocommunication purposes, the Radio Regulations contain several "Recommendations" applicable to space telecommunication and radio astronomy. There is a legal distinction in status between

shared channel arrangements,⁷⁰ on a world-wide or regional basis, to two new radiocommunication services identified in article 1 of the Radio Regulations as—

“Space Service: A radiocommunication service between space stations.

“Earth-Space Service: A radiocommunication service between earth stations and space stations.”

A “Space Station” is defined in article 1 of the Regulations as, “A station in the earth-space service or the space service located at an object which is beyond, or intended to go beyond the major portion of the earth’s atmosphere, and which is not intended for flight between points on the earth’s surface,” while an “Earth Station” is “A station in the earth-space service located either on the earth’s surface or on an object which is limited to flight between points on the earth’s surface.”⁷¹

By footnote reference in the Regulations, bands for the space and earth-space services are allocated “for research purposes”

an “allocation” which appears directly in the Radio Frequency Allocation Table, an allocation which appears as a “footnote” to the Table, a “conference resolution,” and a “conference recommendation.” These variations differ in the degree of protection from interference which an ITU Conference is willing to accord the service concerned. Inclusion in the Radio Frequency Allocation Table is the strongest. It, however, provides different degrees of protection depending upon whether the status is “primary” or “secondary.” Inclusion as a *footnote* to the Frequency Allocation Table gives the allocation treaty status, but the strength depends upon the nature of the footnote and is usually subordinate to inclusion in the Table itself. See Categories of Services and Allocations § II, art. 5, Radio Regulations (Geneva Revision 1959). Inclusion in a conference *resolution* indicates that administrations of the ITU have concurred in the desirability of allocation and implies a level of significance warranting attention; a conference resolution, however, has no force of a treaty. Inclusion in a conference *recommendation*, also without the force of treaty, expresses concurrence that administrations should plan for future action. Actions involving space service and radio astronomy, adopted at Geneva, fall into all of these categories. SENATE STAFF REPORT 46.

⁷⁰ Nine channels on a primary basis, three channels on a secondary basis, and the frequency 183.6 plus or minus 0.5 Mc/s as a footnote allocation on a “non-interference” basis. See notes 55, 69 *supra*. For discussion of this “footnote allocation,” see Document No. 746-E at 2, I.T.U. ADMINISTRATIVE RADIO CONFERENCE (Geneva) (Dec. 3, 1959).

⁷¹ “The 1959 Radio Regulations define ‘Earth-Space Service’ as ‘A radiocommunication service between earth stations and space stations.’ Is communication between two earth stations *by way of* a space vehicle an earth-space service, or is it a terrestrial service using an artificial propagation mode? What if the space vehicle be passive? What if it be launched for other purposes, and its use as a propagation medium be dispersed? [T]he status of space communication is not at all clear under the present Radio Regulations.” Comments submitted by General Electric Co. (para. 2-1.4) March 1, 1961 before the Federal Communications Commission, In the Matter of an Inquiry into the Allocation of Frequency Bands for Space Communications, Docket No. 13522.

only. Consequently, advanced developmental satellite systems associated with navigation, communication and meteorological services reported on the horizon are excluded from the scope of allocations and would, if sent aloft, operate "out-of-band"⁷² until such time as the Radio Regulations are revised. The limitation means that certain rights, such as protection from harmful interference, are secured by treaty for radiocommunication involving space vehicles sent aloft "for research purposes" but for no other space vehicles or systems.

Under provisions contained in article 9 of the Radio Regulations, any *frequency assignment* to an "Earth Station" must be reported by the national administration involved to the International Frequency Registration Board (IFRB):

"if the use of the frequency concerned is capable of causing harmful interference to any service of another administration; or

"if the frequency is to be used for international radiocommunication; or

"if it is desired to obtain international recognition of the use of the frequency."

Similar notice must be given for any frequency to be used for the reception "of . . . space stations by a particular . . . earth station in each case where one or more of the conditions specified [above] are applicable."⁷³

In addition to providing allocations for "Space" and "Earth-Space" radiocommunication services, the Radio Regulations adopted at Geneva *reserve* certain bands for another new service identified in article 1 as—

⁷² "Out-of-band" operations are not per se forbidden but are merely unprotected and are burdened with the corollary obligation to protect from harmful interference services carried on by stations operating in accordance with the provisions of the ITU Convention and Radio Regulations. See note 34 *supra*. For "military radio installations," see note 33 *supra* and art. 50, International Telecommunication Convention (Geneva Revision 1959).

⁷³ Art. 9, sec. I, Radio Regulations (Geneva Revision 1959). See note 68 *supra*. The United States and other signatories are treaty bound under the provisions of the ITU Radio Regulations to notify the IFRB of any radio frequency assignment which can cause interference to services of another administration; which is for international communication; or for which it desires international recognition and protection from interference. The vast majority of space frequency assignments fall in one or more of these categories and are, therefore, subject to international registration and regulations. See comments submitted by General Electric, *supra* note 71, at ¶ 2-1.1.

"Radio Astronomy Service: A service involving the use of radioastronomy."

The term "Radio Astronomy" is defined as "Astronomy based on the reception of radio waves of cosmic origin."

Provision for a "Radio Astronomy Service" presented the delegates at Geneva with a situation of novel impression. One observer described the situation in these terms:

"Compatible with the allocation of bands for different types of service by the I.T.U., various national administrations then make domestic assignments. A transmission on a specific frequency is thus an overt act, presumably consistent with and approved by the cognizant national authorities. In the case of radio astronomy, wherein the transmissions are of extra-terrestrial origin, they are not subject to human control. Allocations of frequencies for radio astronomy research can thus be made only by the inverse procedure of unambiguously denying certain parts of the spectrum to all other applicants. Channel sharing is also prohibited. The thorny problem of so reserving a portion of the already crowded spectrum amidst innumerable pressures is clear."⁷⁴

Models of brevity, the specific provisions which have been adopted for the whole of space telecommunications are neither mysterious nor enchanting in terms of their content or lack of it. The real mystery is seen when one considers the probable impact which future satellite systems already on the horizon will have upon certain "standing rules" applicable to radiocommunication, some imbedded in customary and conventional international law for over half a century. The following analysis of certain of these rules is indicative of the importance of the law-making treaties of the ITU.

The Von Kármán Line and the ITU

Determinable by engineering parameters, a threshold exists between "air space" and "outer space" where aerodynamic lift can no longer be maintained effectively and escape of an object into orbit can be achieved. The threshold is identified by Haley as the Von Kármán primary jurisdictional line,⁷⁵ and he suggests,

⁷⁴ WENK 74.

⁷⁵ See Haley, *Space Age Presents Immediate Legal Problems*, PROCEEDINGS, FIRST COLLOQUIUM ON THE LAW OF OUTER SPACE, THE HAGUE 1958, 9 (1959).

quite persuasively, that it is the logical line of demarcation between airspace within the sovereignty of States and outer space conceived by Jenks and others to be "*res extra commercium*, incapable of appropriation by the projection into such space of any particular sovereignty based on a fraction of the earth's surface."⁷⁶

Whether for purposes of tracking, guidance, or receipt of information, radio transmissions en route to, or emanating from, space vehicles must in many instances "pass through" the airspace of States other than the State which launches the vehicle. Unlike telegraph lines of the early nineteenth century,⁷⁷ radiowaves cannot be made by sovereign States to stop at frontiers or Von Kármán lines; yet these States, under international law in its present posture, may interdict, by right, the passage of radiowaves through their territorial airspaces.⁷⁸ Neither the law-making treaties of the ITU nor customary international law derogates from this principle.⁷⁹

"The right of a state to forbid the passage over its territory of waves emanating from a foreign radio station has been asserted.

"[T]he sending from one country of impulses or communications harmful to another would be an invasion of the sovereignty of the latter of which it might justly complain as in the case of other international injuries."⁸⁰

Nevertheless, the right of a territorial State to prevent the passage of radiowaves over its borders may be subject to the "abuse of right" principle.⁸¹ The right is abused when the State

⁷⁶ JENKS, *THE COMMON LAW OF MANKIND* 390 (1958). The Soviet jurist Korovin asserts that "[A]ny mechanical extension of the concept of sovereignty from the Earth or global atmosphere to the Cosmos would be little more than unscientific geocentrism, a return from Copernicus to Ptolemy. Therefore one is bound to agree with A. Haley who says that the problems facing mankind in conquering the Cosmos 'are by their nature different from those which concern maritime and air navigation, and possess little analogy to maritime or air law.'" Korovin, *International Status of Cosmic Space*, *Int'l Aff. (Moscow)* January, 1959, pp. 54-55.

⁷⁷ See CLARK, *op. cit. supra* note 65, at 91.

⁷⁸ "The principle of exclusive sovereignty in the airspace for the subjacent State, which has received general approval in connection with aerial navigation, enables that State to prohibit the disturbance of airspace over its territory by means of Herzian waves caused for the purpose of wireless communication and emanating from a foreign source." 1 OPPENHEIM, *INTERNATIONAL LAW* 529 (8th ed. Lauterpacht 1955). See also BRIGGS, *THE LAW OF NATIONS* 325 (2d ed. 1953).

⁷⁹ See 1 OPPENHEIM, *op. cit. supra* note 78, at 462, 529, 550.

⁸⁰ DAVIS, *RADIO COMMUNICATION* 182 (1927).

⁸¹ 1 OPPENHEIM, *op. cit. supra* note 78, at 462. Acts of interference with radio com-

avails itself of it "in an arbitrary manner in such a way as to inflict upon another State an injury which cannot be justified by a legitimate consideration of its own advantage."⁸² Thus, while deliberate interdiction without cause of simple radiocommunications to or from any object in space would appear to constitute abuse of right, abuse could hardly be asserted by a launching State against another State which attempts to, or does, interdict radio-waves passing through its territorial airspace to or from certain categories of space vehicles such as military satellites,⁸³ spy-in-the-sky satellites,⁸⁴ or vehicles which violate the "public policy" of the United Nations.⁸⁵

munication by a State constituting abuse of right cannot be fixed with precision, but certain criteria have emerged. Formal condemnation of a government in and of itself provides no license to interfere with "harmless" radio transmissions emanating from the territory controlled by that government. In this connection the Soviet delegate to the ITU Atlantic City Conference of 1947 suggested that members of the Union cause interference to radiowaves crossing the borders of Franco Spain, a Government then condemned by formal Resolution of the United Nations. This suggestion was "tabled" immediately by a majority of the other delegates. See CODDING, *THE INTERNATIONAL TELECOMMUNICATION UNION: AN EXPERIMENT IN INTERNATIONAL COOPERATION* 348 (1952). It is rather the *effects* of radio transmissions which may be regarded legitimately as injurious to the welfare of the State within whose domain they may be felt. See I HYDE, *INTERNATIONAL LAW CHIEFLY AS INTERPRETED AND APPLIED BY THE UNITED STATES* 605 (1945). Moreover, the proposition is advanced that "the State is likewise responsible if it does not employ the means at its disposition to prevent radio . . . emissions which, by their content, are of a nature to disturb the public order of another state when similar emissions have already been called to its attention by the latter." See Scott, *The Institute of International Law*, 21 AM. J. INT'L L. 716, 728 (1927). "To send harmful messages over a foreign State is just as clearly an invasion of its sovereignty as shooting a projectile across its territory." Biro, *The International Aspects of Radio Control*, 2 J. RADIO L. 45, 60 (1932).

⁸² 1 OPPENHEIM, *op. cit. supra* note 78, at 345.

⁸³ "Military aircraft may not fly over . . . the territory of another party without special authorization." *Id.* at 521. On principles of reasonable application radiocommunication "passing through" territorial airspace of States to or from "military satellites" would appear to require some color of authorization. If the public policy of the State involved is opposed *uniformly* to the injection of any military device into orbit, interdiction of radiowaves would not appear to constitute abuse of right.

⁸⁴ "Samos II: The objective of a reconnaissance satellite is to perform photographic missions comparable to that of the U-2 aircraft. Such a satellite, when perfected, could take photographs distinguishing objects measuring as little as five feet from a distance of 200 miles. . . . Samos II underscores the question of the sovereign rights of nations over which reconnaissance satellites pass." N.Y. Times, Feb. 5, 1961, § 4, p. 2, col. 2. "Rules governing the extent to which, and manner in which, national authorities may protect themselves against interference from space beyond the atmosphere *with matters within their territorial jurisdiction or interfere, by electronic or other means, with activities in space for the purpose of making such protection effective, or for other reasons, will be necessary.*" JENKS, *op. cit. supra* note 76, at 400. (Emphasis added.)

⁸⁵ "Latest idea in space weapons is BAMBI (Ballistic Missile Boost Intercept), a Pentagon scheme to use atomic-armed satellites to knock down enemy missiles. One

The "Peacetime Military Satellite"⁸⁶ and the ITU

The hope is shared with many that military satellites will one day be banned from outer space. The forceful international agreements necessary for the realization of this hope, however, are beyond the scope of this discussion. The existence of military satellites, now in mounting profusion, is not.

Usually "things military" are completely excluded from the scope of law-making treaties cognizable by Specialized Agencies of the United Nations; the law-making treaties of the ITU in this respect are exceptional.⁸⁷ Substantive distinctions between military and non-military telecommunications have appeared in every telecommunication convention⁸⁸ as well as antecedent radio conventions,⁸⁹ and some element of differentiation existed in the telegraph conventions of the last century.⁹⁰ The International Telecommunication Convention (Geneva Revision 1959), recent successor for maintaining the distinction, provides in article 50 that—

"1. Members and Associate Members retain their *entire freedom* with regard to military radio installations of their army, naval and air forces.

"2. Nevertheless, these installations must, *so far as possible, observe* statutory provisions relative to giving assistance in case of distress and to the measures to be taken to prevent

hitch: The U.S. promise to the U.N. that it would not put weapons into orbit." Newsweek, Jan. 16, 1961, p. 74. For a discussion of "international public policy" as formulated by the United Nations, see Glazer, *A Functional Approach to the International Finance Corporation*, 57 COLUM. L. REV. 1089, 1107 (1957).

⁸⁶ While relevant to the activities of ITU, rights and obligations of belligerents and neutrals in connection with telecommunication in wartime are subjects involving specialized aspects of customary and conventional international law, and form no part of this discussion. For a treatment of these subjects, see 2 OPPENHEIM, *op. cit. supra* note 78.

⁸⁷ See Radio Regulations (Geneva Revision 1959), art. 19, para. 6; Additional Radio Regulations, art. 4, para. 19. See also Telegraph Regulations (Geneva Revision 1958) Nov. 29, 1958, art. 64, [1959] 10 U.S.T. & O.I.A. 2425, 2515, T.I.A.S. No. 4390.

⁸⁸ See Madrid Convention (1932), Dec. 9, 1932, art. 39, 49 Stat. 2391, T.S. No. 867; Atlantic City Convention (1947), Oct. 2, 1947, art. 47, 63 Stat. 1451, T.I.A.S. No. 1901; Buenos Aires Convention (1952), Dec. 12, 1952, art. 48, [1953] 6 U.S.T. & O.I.A. 1213, 1251, T.I.A.S. No. 3266.

⁸⁹ See Berlin Radiotelegraph Convention, Nov. 3, 1906, art. 21, 37 Stat. 1571, T.S. No. 568; London Radiotelegraph Convention, July 7, 1912, art. 21, 38 Stat. 1711, T.S. No. 581; Washington Radiotelegraph Convention, Nov. 25, 1927, art. 22, 45 Stat. 2843, T.S. No. 767. See also Stewart, *The International Radiotelegraph Conference of Washington*, 22 AM. J. INT'L L. 28, 44, 47 (1928).

⁹⁰ See International Telegraph Convention of St. Petersburg, May 17, 1876, art. 5, 57 L.N.T.S. 201, 212.

harmful interference, and the provisions of the Regulations concerning the types of emission and *the frequencies to be used, according to the nature of the service performed by such installations.*

“3. Moreover, when these installations take part in the service of public correspondence or other services governed by the Regulations annexed to this Convention, they must, *in general*, comply with the regulatory provisions for the conduct of such services.” [Emphasis added.]

The “entire freedom” for military radio installations retained by States on the basis of paragraph 1 in article 50 above is not untrammelled freedom. The provisions of paragraphs 2 and 3, though emasculated by appropriate equivocations, nonetheless constitute a gloss upon the freedom which is retained.⁹¹ Moreover, the provisions of article 50 in no way derogate from the proposition previously advanced that a State, by right, may interdict radiowaves which transit its territorial airspace en route to, or emanating from, the *military* radio installations of other States.⁹² Even in seasons of peace, therefore, rights and obligations involving military radiocommunications differ abruptly from those applicable to non-military radiocommunications.⁹³

The legal distinctions between military and non-military radiocommunications prompt examination of the term “military radio installation” contained in article 50 above, a term which is not defined in the Geneva Convention. Prior to the advent of Sputnik such an inquiry might have been academic. No problem is encountered by the international community in identifying as military a radio installation contained in a warship. “The character of a man-of-war is in the first instance proved by its outward

⁹¹ Cf. note 33 *supra*. Unequivocal language in current Radio Regulations is applicable to radio installations *other than military* which operate out-of-band.

⁹² See note 83 *supra*.

⁹³ In addition to distinctions made on an international plane there exist many on a municipal plane as well. The law of the Soviet Union, for example, provides that “the local naval authorities shall be entitled to restrict the exchange of radio messages by foreign military vessels within the ten-mile limit in respect of time, the areas in which conversations may be conducted and wave length.” Act No. 431, Concerning the Use of Radio Equipment on Foreign Vessels within the Territorial Waters of the U.S.S.R., July 24, 1928, *Sobranie Zakonov i Rasporiazhenii* 1928, No. 48, p. 900. See Laws and Regulations on the Regime of the High Seas, U.N. Leg. Ser. (ST/LEG/Ser.B/1) Jan. 11, 1951, p. 122. Certain provisions of the Federal Communications Act applicable to radio equipment and radio operators on board ship are not applied by the United States to ships of war. See 50 Stat. 192 (1937), 47 U.S.C. § 352 (1958).

appearance.”⁹⁴ Similarly, military aircraft have distinctive lines and markings; moreover, their flights into foreign territorial airspace are authorized under conventional international law only on the basis of specialized agreements.⁹⁵ But military satellites in orbit elude identification as such and do not “pass over” States—if, indeed, they can be conceived to “pass over” them at all—on the basis of specialized agreements which sanction their flights.⁹⁶

Since “military satellites” are not banned categorically from outer space, and since all doubt has been removed that space telecommunications are within the existing scope of the law-making treaties of ITU, the provisions of article 50 must apply to “military radio installations” in and for outer space vehicles. The situation raises provocative questions. Bearing in mind that the term “military” is not a term automatically irreconcilable with the term “peaceful,”⁹⁷ it is observed that most of the space vehicles launched by the United States thus far have been launched by its military departments rather than the non-military National Aeronautics and Space Administration.⁹⁸ Adhering to the hallmark of

⁹⁴ 1 OPPENHEIM, *op. cit. supra* note 78, at 852. Art. 8 of the Final Act adopted by the United Nations Conference on the Law of the Sea (Geneva 1958) provides that “For purposes of these articles, the term ‘warship’ means a ship belonging to the naval forces of a State and bearing the external marks distinguishing warships of its nationality, under the command of an officer duly commissioned by the government and whose name appears in the Navy List, and manned by a crew who are under regular naval discipline.”

⁹⁵ “No [military aircraft] of a contracting State shall fly over the territory of another State or land thereon without authorization by special agreement or otherwise, and in accordance with the terms thereof.” Convention on International Civil Aviation, Chicago, Dec. 7, 1944, part I, ch. I, 61 Stat. 1181, T.I.A.S. No. 1591.

⁹⁶ The lack of means of identification and the absence of specialized agreements reopen in a new frame of reference older inquiries concerning long-distance radiocommunication. “This circumstance raises the problem touching the extent of the right of a State to safeguard itself by appropriate means against foreign radiocommunications which it seeks to thwart; and conversely touching the obligation of a State to prevent the transmission by radio from stations within its control of communications fairly to be deemed injurious to a foreign State, and from which the latter seeks to be safeguarded.” 1 HYDE, *INTERNATIONAL LAW CHIEFLY AS INTERPRETED AND APPLIED BY THE UNITED STATES* 606 (1945).

⁹⁷ “In my opinion the word ‘peaceful’ as used in the [National Aeronautics and Space Act of 1958] means ‘nonaggressive’ rather than ‘nonmilitary.’ That, I believe was the intent of Congress. The same meaning of the term may be found in international law. It also appears to be the most reasonable interpretation.” Feldman, *The Report of the United Nations Legal Committee on the Peaceful Uses of Outer Space: A Provisional Appraisal*, SECOND COLLOQUIUM ON THE LAW OF OUTER SPACE, LONDON 1959 PROCEEDINGS, 23 (1960).

⁹⁸ The Administration, an independent agency of government, has not been organized as a part of the U.S. Defense Department. See National Aeronautics and Space Act of 1958, 72 Stat. 426, 42 U.S.C. § 2472 (1958). For congressional declaration of policy and purpose, see 72 Stat. 426, 42 U.S.C. § 2451 (1958).

an open society, the United States identifies many space vehicles launched by its military departments, and, with few exceptions, the radio frequencies which they use, in official documents freely available to the public.⁹⁹ Under rubrics which all seem to involve the word "peace" the Soviet Union, on the other hand, does not officially associate its military departments with its space program, an omission of form which may hold some persuasion for the extremely naive.

In terms of article 50, precisely what does all this mean? It means that for space telecommunications the standard to be used for applying the term "military radio installation" is blurred, elusive, and not susceptible to proof. If the term "military radio installation" is conceived to mean for space telecommunications a radio installation contained in a space vehicle launched under the "official" auspices of a military department of government, then, on this basis, article 50 would appear to be available to the United States in connection with most of the space vehicles it launches but not available to the Soviet Union. If the article is conceived to encompass radio installations operated by military personnel in space vehicles, then Major Yuri Gagarin of the Soviet Airforce and Commander Alan B. Shepard, Jr. of the U.S. Navy were operating military radio installations in space, a suggestion at war with the spirit of their historic contributions. If, as some conceive and would have it, the same satellite communications system will be used in a dual capacity, both for military and for commercial civilian purposes,¹⁰⁰ when, under whose direction, and under what conditions will the system involved, like an alternating current in an electric motor, shift from commercial civilian to military purposes and vice versa? Now if the Soviet Union chooses to formulate its own standard for applying article 50 which, in the absence of any uniform standard, it is free to do, who has standing to complain? And if no uniform standard is formulated for applying the article, why are the nations of the world wasting their time inserting in the Radio Regulations provisions for space radiocommunications when such provisions can be avoided any time it proves convenient to do so? Paragraphs 2 and 3 of article 50 merely urge compliance with the Radio Regulations; they do not command!

⁹⁹ See, for example, information in WENK, and in the SENATE STAFF REPORT.

¹⁰⁰ See SENATE STAFF REPORT 78.

The extension of article 50 to space radiocommunications suggests a requirement that the term "military radio installation" be given a precise international definition, and that in seasons of peace, at least, radio installations in and for certain categories of satellite systems, though operated "officially" by military departments of governments,¹⁰¹ be required to observe, on a mandatory not permissive basis, specific allocations of the international Radio Regulations which might be made for future space telecommunications services.

The Communications Satellite and the ITU

On the basis of extensive studies, specifications for a communications satellite system have been developed in a form which lies within the present state of electronic art. The foreseeable advent of these systems has raised immediate questions in the United States which are of legitimate concern to the ITU. One of these involves the question of equitable, non-discriminatory access to the system, the exploration of which, to some extent, cuts across arguments as to whether the operation of future communication satellite systems should be lodged in the hands of public or private entities.¹⁰² In a statement made recently to the House Committee on Science and Astronautics, Mr. Edward R. Murrow, Director of the United States Information Agency, asserted:

"[T]he principle of 'Access' must be paramount. Every nation must be guaranteed this right of access to the system. Smaller countries must be assured that while the system is within the technical control of the United States we will not

¹⁰¹ The United States Navy plans to have in operation by 1962 a system, called TRANSIT, which will enable ships to fix their positions to within half a mile by receiving signals from four satellites. These satellites will transmit a very high frequency signal on a narrow band at stated times and would operate in any weather. See J. Int'l Transport Workers Federation, November 1960. If it is to be assumed that the benefits of TRANSIT will be available to vessels of *all nations* through publication of its radio frequencies and that the Project is not one of "stealth" the radiocommunications for the Project should be required to conform to specific band allocations assuming that allocations for some future "satellite navigation service" are established in the Radio Regulations.

¹⁰² "The aims of Government and industry may not be identical. Industry may have little interest in communications with Upper Volta, as there may be no profit forthcoming for years. Yet it is right that Upper Volta have as much potential use of the system as the United States. And if it is not the aim of private industry to serve the lean as well as the lucrative, then it must be the aim of Government." Statement of Mr. Edward R. Murrow, Director, U.S. Information Agency in *Hearings before the House Committee on Science and Astronautics*, 87th Cong., 1st Sess., pt. 2, at 587 (July 14, 1961).

turn the system on or off at will, limit or bar them from its use, or operate it in any way for capricious national advantage."¹⁰³

It is not apparent that questions involving access to communications satellite systems form a part of the current deliberations of the ITU. Clearly, however, a mandate for these deliberations exists since the purposes of the Union, as defined in article 4 of the Convention, include making telecommunication services, "so far as possible, generally available to the public"—presumably the public of the world—and harmonizing "the actions of nations in the attainment of those common ends." In these terms the principle of "access" should be deliberated fully by the Union as a necessary complement to discussions now being held at national levels.

A companion question for immediate discussion concerns global rate-making, a logical corollary to development of advanced communications satellite systems. Existing international rate structures take into account a complex of services provided by terrestrial relay linkages. Stated, perhaps, as an oversimplification, communication satellite systems will eliminate the need for recourse to vast networks of terrestrial linkages. The reduction of the number of terrestrial relays could result in beneficial rate adjustments applicable on a world-wide basis. The responsibilities of the ITU in this area are again set forth in article 4 of the International Telecommunication Convention (Geneva Revision 1959), which requires the Union *in particular* to "foster collaboration among its Members and Associate Members with a view to the establishment of rates at levels as low as possible consistent with an efficient service. . . ."

As in the case of access to communication satellite systems, the possibility of rate advantages flowing from them should be explored fully by the ITU, complementing studies underway at national levels.

The Broadcast Satellite and the ITU

A Committee To Study the United States Space Program has disclosed to President Kennedy that the by-product of the com-

¹⁰³ *Ibid.*

munication satellite, now on the horizon, will invariably be an international television relay system and sound broadcasting system linking all the nations of the world. A report forwarded to the United Nations by the ITU discloses that the broadcast satellite will offer the possibility of "total freedom of information, the freedom to see and hear at all times what is happening in any part of the world."¹⁰⁴ A respectable segment of opinion, however, warns that the same devices will offer, as never before, "the opportunity for unscrupulous people to play on the fears and suspicions of the less-well informed peoples of the world,"¹⁰⁵ and provide a field-day to extend the invective of "cold war" to activities in outer space.¹⁰⁶

There is a view articulated, but yet to be written into the articles of any international telecommunication convention, that technical competence alone marks the boundary of ITU jurisdiction.¹⁰⁷ It appears, however, that in the exercise of "technical competence" the ITU in categorical situations effectively *conditions* the use of radiocommunication stations, as demonstrated, for example, in the limitation of the "Earth" and "Earth-Space"

¹⁰⁴ ITU, *Annual Report to United Nations Economic and Social Council*, 26 I.T.U. TELECOMMUNICATION J. 188, 189 (English version 1959).

¹⁰⁵ Excerpt from statement made by Mr. James M. Skinner, Jr., President, Philco Corp. See SENATE STAFF REPORT 196. "[T]he content of radio broadcasts has been the subject of international regulation." 4 HACKWORTH, DIGEST OF INTERNATIONAL LAW 286 (1942). See International Convention Concerning the Use of Broadcasting in the Cause of Peace, Sept. 23, 1936, 186 L.N.T.S. 303. Signatories to the Convention, *which remains in force*, "recognised the need for preventing, by means of rules established by common agreement, broadcasting from being used in a manner prejudicial to good international understanding . . ." India, Great Britain and Northern Ireland, Denmark, New Zealand, Luxemburg, Brazil, France, Norway, Egypt, and Estonia signed and ratified the Convention; Australia, Burma, Southern Rhodesia, Union of South Africa, Ireland, Sweden, Salvador, Guatemala, and Finland acceded to the Convention; Albania, Argentina, Austria, Belgium, Chile, Colombia, the Dominican Republic, Greece, Lithuania, Mexico, New Zealand, the Netherlands, Roumania, Spain, Switzerland, Czechoslovakia, Turkey, the Union of Soviet Socialist Republics, and Uruguay signed the Convention.

¹⁰⁶ See Smythe, *Communications Satellites*, 17 BULL. ATOMIC SCIENTISTS 65, 68 (1961).

¹⁰⁷ "It is important to note that . . . the part to be played by the I.T.U. in the use of outer space will be limited to technical and operational aspects of the new telecommunications means to be developed. As regards the possible purposes for which these means are used, the I.T.U. is not responsible for contemplating any regulation or control." Draft Resolution, "Telecommunication and the Peaceful Uses of Outer Space Vehicles" prepared by ITU Secretariat and referred for advice to Administrative Radio Conf. at request of Plenipotentiary Conf. Doc. No. 778-E of 5 December 1959 (Administrative Radio Conf. Geneva 1959). Significantly the limitation above was *omitted* from the final Resolution adopted by the Plenipotentiary Conference. See Resolution No. 34, "Telecommunication and the Peaceful Uses of Outer Space Vehicles" annexed to the International Telecommunication Convention (Geneva Revision 1959).

Services to research projects.¹⁰⁸ On occasion the Union *prohibits* certain uses as well. Prohibition of a use was, in fact, written into the Geneva 1959 revision of the Radio Regulations. The history of that prohibition is of especial relevance to the future of satellite broadcasting.

Several years ago a vessel engaged in what has been described as an "astonishing enterprise" anchored at sea beyond the territorial waters of Denmark and Sweden there to begin, unencumbered by such things as frequency plans, transmission into these countries of commercial broadcasts. Since commercial broadcasting is the exception rather than the rule in Europe, the astonishing enterprise caught on, and soon other floating broadcast stations appeared in the European area. Although the provisions of the ITU Radio Regulations, then in force, prohibited, as they continue to do, "the operation of a broadcasting service by *mobile stations* at sea and over the sea,"¹⁰⁹ "mobile stations" was a term of technical meaning in the regulations,¹¹⁰ not conceived to extend to a "broadcast station"¹¹¹ which might happen to be located aboard a ship. The floating broadcast studios continued their operations. As a result the Governments of Denmark, Norway, Sweden, the Netherlands, and the Federal Republic of Germany introduced successfully the amendment now contained in article 7 of the Radio Regulations which provides that:

"The establishment and use of broadcasting stations (sound broadcasting and television broadcasting stations) on board ships, aircraft or any other floating or airborne objects outside national territories is prohibited."¹¹²

Article 7 was adopted not as an attempted remedy in response to

¹⁰⁸ "The Delegate of the United Kingdom said that it should be made abundantly clear that the space frequencies are for research purposes as directed by the Ad hoc group." Doc. No. 660-E of November 26, 1959 at 6, Admin. Radio Conf. (Geneva 1959).

¹⁰⁹ Radio Regulations (Geneva Revision 1959), art. 28, sec. I, para. 6. At the Cairo Radio Conference of 1938, a provision in the Radio Regulations was inserted at the insistence of Great Britain prohibiting maritime mobile stations from broadcasting programs intended for direct reception by the general public, while not preventing broadcasting from a ship via a national land broadcasting station. See MANCE, INTERNATIONAL TELECOMMUNICATIONS 40 (1944).

¹¹⁰ Radio Regulations (Geneva Revision 1959) art. 2, sec. II. See note 68 *supra*.

¹¹¹ *Ibid.*

¹¹² In connection with the prohibitions set forth in art. 7, Recommendation No. 16 annexed to the Radio Regulations urges Governments to "study possible means, direct or indirect, to prevent or suspend such operations, and where appropriate, take necessary action."

any specific complaint of harmful interference caused to stations operating within the Radio Regulations but rather on the basis of a determination that seaborne and airborne broadcasting beyond national territories is "contrary to the orderly use of the radio frequency spectrum and may result in chaotic conditions."¹¹³ A further exploration of the provision is also quite revealing. If the Administrative Radio Conference which met at Geneva in 1959 had attempted to formulate regulations prohibiting, for example, broadcasts from railroad cars, motor vehicles, or other mobile objects within national territories, there is little doubt that the authority to do so could have been assailed as beyond the existing competence of the Union. Among factors which would militate against such an attempt is the recognition in the Preamble of the International Telecommunication Convention of "the sovereign right of each country to regulate its telecommunication."¹¹⁴ But in situations where, as illustrated by article 7, the radio installation involved is *beyond* national territory, the capacity exists to prohibit or condition the establishment and use of such facilities.

If, as indeed they are, space vehicles in orbit are conceived to be beyond territorial airspace, then there can be no question that the provisions of article 7 could be extended, if necessary, to

¹¹³ Doc. No. 647-E of November 25, 1959, Admin. Radio Conf. (Geneva 1959). See also Doc. No. 222-E of September 11, 1959, at 4; Document No. 661-E of November 26, 1959, at 2.

¹¹⁴ "When considering the declared purposes of the Union, it is necessary to keep in mind the ideas expressed in the Preamble to the Atlantic City Convention. Therein it is stated that the Convention is concluded 'with a view to ensuring the effectiveness of telecommunication' but at the same time 'fully recognizing the sovereign right of each country to regulate its telecommunication.'"

"Inasmuch as the I.T.U., as has been the case with most other international organizations, has never in the past attempted to force any of its Members to accept any changes with respect to their internal telecommunication services, the necessity for such a declaration, which might give rise to an evasion of obligations, might not be clear. An explanation can be found in the minutes of the Organization Committee when it was considering the Preamble. The delegate of Belgium, at that time, strongly supported the insertion of the provision because it did, in his opinion, 'involve the independence of the telecommunications of certain countries.' In that respect he pointed out that it had been suggested in the Atlantic City Radio Conference that countries on the same continent should carry out their communications, both national and international, by wire instead of radio so that enough frequencies would be available for intercontinental communications. He felt that the insertion of the 'sovereignty clause' would guard smaller nations against such actions and would in general ensure 'the principle of sovereignty of telecommunications, not only within countries, but between countries as well.' After this intervention, the delegates agreed to the insertion of the clause in the Preamble." CODDING, *op. cit. supra* note 81, at 274.

broadcast satellites envisaged for the future. In fact, at the time the 1959 ITU Radio Conference was made aware of current abuses caused by seaborne and airborne broadcasting facilities, the question of jurisdiction over space broadcasting transmitters was raised but not resolved.¹¹⁵ It is a sound assumption, consequently, that if satellite broadcasting, as feared by some, will be used for the intensification of "cold war" rivalries, a future ITU Radio Conference, armed with the warrant of aroused world opinion, will be motivated to arrive at a "purely technical determination" that satellite broadcasting—like airborne and seaborne broadcasting—is "contrary to the orderly use of the radio frequency spectrum and may result in chaotic conditions." Moreover, while, as some reports disclose, "pirate broadcasts" from seaborne facilities continue undisturbed, if not actually with the informal imprimatur of a few of the governments railing most strongly against them,¹¹⁶ any scheme requiring the expenditure of money and effort to the extent necessary for establishing and operating a satellite broadcasting system—in contrast to some speculative investment in a seaborne transmitter—simply could not gamble with the possibility of being placed at some future time beyond the protection of the international Radio Regulations.

The residuum of competence in the ITU to prohibit or con-

¹¹⁵ In commenting upon the report formulated by the United Nations Ad Hoc Committee on the Peaceful Use of Outer Space, the Danish delegate to the Administrative Radio Conference asserted that "the information regarding the legal problems involved in space radio systems was rather disappointing. There was merely a reference to the existence of the I.T.U. and an indication that the principles and procedures valid in the air and on the sea could be used by analogy. The Danish Administration, however, had first-hand knowledge of the difficulties encountered when trying to stop illegal broadcasting transmissions from a ship in international waters and foresaw similar problems in connection with an illegal TV broadcasting service which was planned from an aeroplane seven thousand metres above the sea over international waters, and likely to cause serious interference in several countries. He, therefore, felt that the prospect of present conditions applying to outer space, by analogy, was not attractive and believed that the problem deserved serious consideration by the I.T.U. The question of jurisdiction for space transmitters should preferably be settled at the present Radio Conference." Doc. No. 330-E, Sept. 30, 1959, at 18. Administrative Radio Conference (Geneva 1959).

¹¹⁶ "Though international convention bars broadcasting from international waters, and the targeted countries always voice official protest, nothing much is done to halt the pirates. Reason: the pirate programs are too popular. Fortnight ago, Sweden issued an edict that it would confiscate Radio Nord's transmitting equipment if it came into Swedish waters. But authorities did not revoke the export permit that allows Nord to ferry its tapes out to the ship. Though Danish officials rail in print against Radio Mercur, the government's official newspaper, *Aktuelt*, sells the pirates its news service." Time International (Atlantic ed.) April 14, 1961, p. 23, col. 3.

dition the establishment and use of radio installations located beyond national territories may ultimately compel solutions on an international plane to those questions which have been raised concerning the use of broadcast satellites.

II. BEYOND THE GENEVA CONFERENCES

The incorporation of radiocommunication services into the Geneva revisions of the Radio Regulations placed these services automatically within the existing scheme of spectrum management applied by the ITU. Stated another way, by the incorporation of these services, the existing scheme of spectrum management was extended by operation of law into the dimension of outer space. It appears that while there have been several complete revisions of the law-making treaties of the ITU in the past three decades, and the permanent organic structure of the Union enlarged to meet the event, the basic "keel" of international spectrum management laid at the Washington Radiotelegraph Conference of 1927 has remained unchanged through these years.

As a result of a pattern which has endured since the Washington Radiotelegraph Conference of 1927, only a share in the task of spectrum management—whether involving radiocommunication services of world-wide application or otherwise—has been assigned to the ITU by its constituent members. Briefly, radiocommunication services and frequency allocations for them are negotiated within the framework of ITU Administrative Radio Conferences which succeed each other in intervals measured in years. The services and frequency allocation plans so negotiated are then inserted in the ITU Radio Regulations which in turn are forwarded to each member of the Union for approval or ratification, a practice consuming additional years. Actual assignment to radiocommunication stations of specific frequencies within approved ITU allocations remains the exclusive prerogative of *each* signatory to the Radio Regulations in force as to that signatory. At the time revised Radio Regulations are negotiated, each signatory is free to append to them an array of conditions or reservations which it unilaterally declares and imposes. Even the simplest type of ministerial change sought to be made to the Radio Regulations, a complex of detail now numbering 451 pages in the official ITU publication, can be accomplished only through

the cumbersome treaty-making process of convening a full-blown administrative radio conference and waiting through the years to collect signatures on documents.

Long before the use of radio for telecommunication to and from space vehicles became a matter of practical concern, the basic scheme of spectrum management perpetuated by the "dead hand" of the Washington Radiotelegraph Conference of 1927 was assailed as antiquated. In 1944, for example, when the subject of space telecommunication was left to writers of science fiction, and when the world had considerably fewer sovereign partners sharing in the management of the frequency spectrum as well as radiocommunication stations opting for occupancy in it, the transfer of some "rule-making" functions from the cumbersome mechanism of the ITU conference body was considered an administrative necessity:

"The criticism of the present organization is that it is too unwieldy, and the interval of five years between the Administrative Conferences—the only bodies that can issue or amend regulations—is too long having regard to the rapid evolution of wireless technique. This criticism can be met either by having the plenary meetings more frequently or by delegating some of the powers of decision to a smaller body meeting more frequently with rule-making functions. . . ."¹¹⁷

In commenting upon the many conflicting nationalistic and other vested interests which formed then, as now, a variable disruptive factor in spectrum management, the same commentator asserted with an unusual breadth of future vision that—

"If it were possible for allocations to be made, after hearing the rival claims, by an independent tribunal on the basis of technical efficiency with provisions for revision from time to time on technical grounds and to meet changes in demand, the problem would probably be quite soluble and the solution would, in the long run, benefit all parties. Failing some such measure of international regulation it may be expected that international rivalries will be revived in conditions more difficult than before the war. In any case some special ma-

¹¹⁷ MANCE, *op. cit. supra* note 109, at 76.

chinery would seem to be necessary. This might consist of a standing international organ of the Telecommunication Union for the international direction and control of frequency allocation.

"Such an organ might also deal with interference problems by the technical oversight of station performance with a view to the prevention of unauthorized, unnecessarily powerful or faulty transmissions."¹¹⁸

Since these criticisms were published, the International Frequency Registration Board has been made a part of the permanent ITU establishment. The Board's functions, however, remain far removed from those articulated by the commentator above,¹¹⁹ and its limited powers leave intact and unchallenged the basic scheme of spectrum management devised thirty-four years ago.

It is indeed far beyond the competence of the writer to suggest a new and untested scheme for spectrum management calculated to win the day among most of the membership of the ITU. In thinking in terms of the many desirable mechanisms which could be devised to discharge a sound type of international administrative radio law applied equitably to all nations, one encounters the harsh political realities of the day and in consequence is forced to

¹¹⁸ *Id.* at 77. The commentator's views are especially appropriate today in light of space age requirements. "[Communication] satellites . . . will be orbiting in an area which, so far as one may interpret current international law, is beyond the limits of national sovereignty. How are we to deal with such interferences, and who is best equipped to do so? The solution may depend in part on the type of interference and the sources from which it proceeds, but it is obvious that *there may be some instances which will require an effective authority to prevent such conduct or to adjudicate disputes*. Because we have gone beyond the limits of territorial jurisdiction and because the concern is international, we must consider the possibility of some new or existing international mechanism which can be employed for this purpose and which can be furnished, in some fashion, with the necessary facilities and rules." Statement of Hon. Nicholas deB. Katzenbach, Assistant Attorney General, U.S. Dep't of Justice, at *Hearings Before House Committee on Science and Astronautics*, 87th Cong., 1st Sess., pt. 2, at 716, 719-20, (Aug. 9, 1961). (Emphasis added.)

¹¹⁹ In addition to the IFRB, another ITU organ, the Administrative Council, was established under the Atlantic City Convention of 1947 and entrusted with the task of carrying on the administrative work of ITU between meetings of Plenipotentiary Conferences. While superior to the IFRB, the Council has no authority to exercise "rule-making" functions or even make ministerial changes to the ITU Service Regulations. Moreover, the Council, a non-permanent organ of ITU, meets but once a year and, in the interim, maintains no permanent facility at the seat of the Union. The ITU Convention authorizes the Plenipotentiary Conference of the Union to delegate powers to the Council; there are no corresponding provisions authorizing a delegation of powers from the ITU Administrative Conferences, the only bodies competent to modify or revise the ITU Radio, Telegraph, and Telephone Regulations.

dwelling upon how international law "ought to be." Suggestions which proceed upon this foundation are much too easy to make. But if the precision requirements and safety assessments for space radiocommunication involved in the operation of advanced satellite systems develop to be as exacting as now promised, one is hard put to find how they can be served by an arrangement conceived in 1927, devised with the dimensions of global spectrum management in mind,¹²⁰ and perpetuating as a fixed pattern compromises with vested national interests. One thing appears certain. The cardinal problems looming for the foreseeable future which involve the rational use of the radio frequency spectrum can no longer be solved by the expedient available in years past of simply inserting designations for new radiocommunication services with frequency allocations for them into the ITU Radio Regulations. The approach to the future problem of rational use of the spectrum is bound up inextricably with providing *the permanent establishment* of the International Telecommunication Union with a quantum of authority appreciably different in extent and quality from the limited grant now exercised.

SUMMARY CONCLUSIONS

In the history of multilateral treaty-making, the International Telegraph Conventions of the previous century emerge as rather unusual instruments. Rights and obligations appearing in them were not limited to States alone, but extended to legal and natural persons. Upon acceptance of certain obligations private telegraph enterprises, for example, were admitted to the advantages of the Telegraph Convention and Regulations. Admission of private telecommunication agencies to the advantages of the International Telecommunication Convention and Service Regulations is derived, consequently, from the early practice of the Telegraph Union.

In the case of natural persons, the Telegraph Conventions

¹²⁰ "We have long said that the dimensions available for spectrum management are frequency, time and space. Frequency and time are unidimensional. Before the advent of space technology, 'space' as a dimension in spectrum management consisted for practical purposes of two co-ordinates: the latitude and longitude of a point on the surface of the earth. Space technology makes available an additional spatial dimension for frequency management: vertical distance from the earth's surface. We now have five, instead of four variables at our command for spectrum management." Comments submitted by General Electric Co. to FCC, *supra* note 71, at para. 2-2.2.

explicitly recognized the right of each person to correspond by means of international telegraphs. A modified version of this right survives in the International Telecommunication Convention, although, regrettably, it coexists with a mandate for state censorship. In any event the insertion of provisions of this nature in the Telegraph and Telecommunication Conventions demonstrates clearly that technical competence alone has never marked the boundaries of ITU's jurisdiction or those of its venerable progenitor, the International Telegraph Union.

The international regulation of telegraph and telephone has stood the test of time with pertinent details for the rational organization of these services filled in over a period of many years. Technical and administrative regulations and regulations involving rates and routing have been observed adequately and fulfill their intended purposes. From an examination of the latest ITU Telegraph Regulations (Geneva Revision 1958) and ITU Telephone Regulations (Geneva Revision 1958), the sufficiency of international regulation of line-electrical communications seems apparent. Nonetheless, despite the advanced degree of international collaboration achieved in connection with the rational organization of telegraphic and telephonic services, more than eighty years elapsed before the United States ratified the Telegraph Regulations, and it has never signed or ratified the Telephone Regulations. Since private interests in this country operate more than one-half of all the telephones in the world, Coddington asserts that the ITU Telephone Regulations cannot be regarded as "truly international" until these regulations are ratified by the United States.¹²¹

No extensive discussion or evaluation of the Telegraph and Telephone Regulations has been attempted by the writer. These omissions are intentional and by no means suggest that the regulation of radio is a matter of any greater importance to the ITU than the regulation of line-electrical communications. The rational organization and international regulation of all forms of long-distance electrical communication comprehend a number of common problems and considerations, a fact which led irresistibly, thirty years ago, to the fusion of the Telegraph and Radiotelegraph Conventions into one multilateral treaty, the International Telecommunication Convention.

¹²¹ See CODDINGTON, *op. cit. supra* note 81, at 452.

Recent concern expressed over the prospect that a limited class of private corporations might conceivably monopolize communication satellite systems recalls to mind that the international regulation of radio was first necessitated as a defense against the aspirations of private companies. As a result of sharp commercial practices, early radio regulation was dominated by the need to establish compulsory intercommunication between maritime and coastal radio stations. No real requirement for frequency allocation existed. Under the Berlin (1906) and London (1912) Radiotelegraph Conventions and Regulations two *specific* wave-lengths were established for intercommunication between ships and coastal stations. Their designation in a multilateral treaty instrument approached, in rudimentary form, a concept at least akin to actual international *assignment* of wave-lengths, a competence denied the ITU. To a limited extent, therefore, the early Radiotelegraph Conventions might be conceived as furnishing legal precedent, albeit imperfect, to support a possible future technical requirement for the ITU to assign frequencies to certain categories of space radio stations. Assertions that the IFRB of the ITU could evolve into an "international FCC" have been made with this potential function in mind.¹²²

The basic scheme of international management of the radio spectrum resulted from the deliberations of the Washington Radiotelegraph Conference of 1927. Under this scheme the allocation of bands of frequencies to radiocommunication services became the subject of multilateral agreement while the assignment of frequencies within band allocations was, as it now is, reserved as an exclusive prerogative of each governmental administration. This division of labor in the management of the frequency spectrum applies today equally to space and to terrestrial radiocommunica-

¹²² In a staff report to the U.S. Senate Committee on Aeronautical and Space Sciences the statement is made that "the IFRB has been visualized as the medium through which an 'engineered' spectrum will emerge, thus providing spectrum occupancy to all valid applicants, with ample freedom from interference. . . . Eventually, the IFRB may (1) make frequency selections where requested, (2) indicate to Administrations concerned, apparent technical incompatibilities between frequency assignments, and (3) coordinate adjustment of assignments or schedules. The IFRB could become an international FCC. . . . The extension of this function to space communication is both clear and urgent so that radio signatures from a growing family of satellites may be readily identified, to locate possible sources of interference, but especially to minimize the hazard of an international 'incident' through misinterpretation of an unannounced space vehicle." WENK 21.

tion. It merits re-evaluation by lawyers and radio engineers alike along with another legacy inherited thirty-five years ago.

The object of the Washington Conferees was to provide a minimum number of absolute rules and a maximum number of "guides to action." The result was lack of legal precision.¹²³ Numerous examples of equivocal phrases such as "so far as possible," and "so far as practicable," which appear in the existing ITU Convention and Radio Regulations are merely a repetition of this philosophy. They constitute the perpetuation of radio management objectives conceived originally within a global frame of reference and accommodating vested national interests on a terrestrial scale. The extension of this philosophy into a regime totally devoid of such things as national territories, airspace, artificial frontiers, and oceans must be re-assessed not only from a juridical point of view but from the standpoint of emergent technical requirements for space. These requirements are different in kind, not merely degree, from past uses of radiocommunication. Equivocal regulations satisfying all of the nations all of the time may not prove technically reconcilable with the uses of radio for command and orientation of space vehicles, destruction of perilously errant vehicles, and safety of rocket-borne astronauts.¹²⁴ Only seventy-four governmental administrations were signatory to the General Radio Regulations of Washington. There are now no less than 114 sovereign

¹²³ See notes 33, 34 *supra*. "In the Berlin and London Regulations and Conventions there had been a moderate recognition of such a need [for legal precision] but its application was limited. In the Washington Convention and Regulations there are numerous examples of qualifying phrases such as 'so far as possible,' 'in so far as practicable,' 'in principle,' etc. . . . The United States Delegation at the Conference used its influence to 'water down' certain positive and formal obligations to elastic suggestive provisions. As stated by the American Delegate in one of the sub-commissions: 'It seems desirable that on every possible occasion the Regulations should be conceived in general terms, thus allowing us to draft a supple instrument whose provisions will be adaptable to the particular regime of each State. It would be desirable to substitute the word "should" for the word "must" as often as possible, and that the word "obligation" be replaced by one or several words expressing the idea of "suggestion."' A careful reading of the Washington Regulations as well as of the proceedings will show to what a large extent the United States was successful in imposing its will on the Conference." Tomlinson, "The International Control of Radio-communications," June 1938, at 66-67 (Thesis presented to University of Geneva; published copy in ITU Library.)

¹²⁴ "If orientation is achieved or influenced by command, there is an added hazard that the system will be activated by a foreign transmitter. If elaborate codes are used to avoid this, there is a great hazard that malfunction will make the equipment unresponsive to legitimate commands. These are not idle worries; space payloads and command systems have been sadly fallible in practice." Pierce, *Hazards of Communication Satellites*, 17 BULL. ATOMIC SCIENTISTS 181, 183 (1961).

members and associate members of the ITU, each competent to enunciate, interpret, and apply national exceptions to the Radio Regulations which themselves can be changed—even in slight detail—only by a formal conference of nations.

Long before the precision requirements for space radiocommunication became of practical concern, the basic scheme of international radio regulation was assailed as insufficient. The delegation of a modicum of rule-making functions to the permanent establishment of the ITU was proposed as early as 1944 to meet the problem. Arrangements along these lines may prove essential to the ITU in discharging space-age responsibilities. Were the Union to evolve in this direction, the IFRB appears as a possible mechanism among the permanent organs of ITU to discharge limited rule-making functions. If the idea emerges as too radical for across-the-board application, rule-making could be limited to radio emissions originating in transmitters beyond national territory. The Administrative Radio Conference of the ITU—a subordinate conference body—is now competent to condition and, in categorical situations, prohibit the use of such transmitters. Competence in a permanent organ of the Union to make *reviewable* rules for their use does not loom as too radical a step beyond the existing authority of the Radio Conference body to condition or prohibit uses. Moreover, the eventual evolution of the IFRB into an international administrative regulatory body has been foreseen. The delegate of Uruguay to the 1959 ITU Administrative Radio Conference asserted, for example:

“We believe that not only should the present structure of the I.F.R.B. be maintained but, so that its work may be even of greater benefit, that its authority should be increased insofar as possible, to convert it to some extent into an international court of justice, to decide on the most efficient and equitable distribution among the various countries of the common property of mankind which is the radio spectrum.”¹²⁵

¹²⁵ Doc. No. 55-E, August 19, 1959, at 87, Minutes of the Plenary Meetings, Administrative Radio Conference (Geneva 1959). Even now, however, the Board's working arrangements approach something akin to the concept in municipal administrative law of “quasi-judicial” functions. The Board is empowered to make “findings,” favorable or unfavorable, with respect to recordation in a Master International Frequency Register of frequency assignments notified to the ITU by national administrations. A “review of a finding” may be undertaken by the Board at the request of a notifying administration, at the request of any other administration interested in the question but in this

In supporting the entry of the IFRB into the area of administrative regulation, the writer would add that a right of direct appeal to the International Court of Justice on decisions of the Board which involve matters of law should form an integral part of these arrangements if their adoption is ultimately realized.

By negotiating frequency allocations for "Space" and "Earth-Space" services and reserving a part of the spectrum for a "Radio-astronomy Service," the 1959 ITU Administrative Radio Conference effectively expanded the scope of the ITU law-making treaties to include telecommunication in and for outer space as well as telecommunication to and from celestial bodies. In limiting the use of allocations in the "Space" and "Earth-Space" services to research purposes only, the Conference adhered to the usual practice of legalizing existing frequency uses. Inevitable advances in space technology, however, will not only require subsequent conferences to anticipate future uses, but to a large extent will dictate a need to introduce clear concepts of differentiation between space-oriented and terrestrially-oriented radiocommunication services. Space gliders along the lines of the proposed United States Project DYNA-SOAR, for example, will combine performances of conventional aircraft and outer space vehicles. Absent identifiable radiocommunication services for such craft, it is not clear whether radio installations in them would qualify as "Aircraft Stations"¹²⁶ within the "Aeronautical Mobile Service,"¹²⁷ "Space Stations" within the "Earth-Space Service,"¹²⁸ or stations within both services depending upon the performance of the glider at the time. Another illustration of the problem appears reminiscent of "Einstein's Theory of Relativity." Article 1 of the ITU Radio Regulations (Geneva 1959) defines a "Fixed Station" as

case only on the ground of actual harmful interference, or on the initiative of the IFRB itself when considered justified.

¹²⁶ Defined as, "A mobile station in the aeronautical mobile service on board an aircraft." Art. 1, ITU Radio Regulations (Geneva 1959). See note 68 *supra*.

¹²⁷ Defined as, "A mobile service between aeronautical stations and aircraft stations, or between aircraft stations, in which survival craft stations may also participate." Art. 1, ITU Radio Regulations (Geneva 1959). See note 68 *supra*.

¹²⁸ For definitions of "Space Station" and "Earth-Space Service," see art. 1, ITU Radio Regulations (Geneva 1959), note 68 *supra*. These definitions do not differentiate clearly between terrestrially-oriented and space-oriented services. The ambiguity has been pointed out, for instance, of whether "Earth-Space Service" regulations govern communication between two earth stations *by way of* a space station. See Statement of General Electric Co. quoted *supra* note 71.

"A station in the fixed service" and the "Fixed Service" as "A service of radiocommunication between specified fixed points." But what is a specified fixed point within the meaning of the regulations? The United States Project ADVENT contemplates use of active-type communication satellites injected into 24-hour synchronous orbits. To an earth-bound observer a vehicle in the system would appear to be constantly fixed at a specified point overhead while to an observer beyond earth the same vehicle would appear to be constantly moving. Since nowhere in the Radio Regulations is the definition for a "Fixed Station" in the "Fixed Service" limited to terrestrial stations, would communication between two terrestrial fixed points by way of a "fixed" satellite overhead qualify as radiocommunication in the "Fixed Service"? The problem for future ITU Conferences does not extend only to identifying and defining new space radiocommunication services but also to "delimiting" certain existing definitions and provisions in the Radio Regulations to terrestrial uses. There are many such provisions.

The appearance of military and para-military space vehicles elevates to a new frame of reference older unresolved inquiries concerning the right of a sovereign state to thwart certain categories of electromagnetic emissions originating in transmitters beyond its territory. Substantive distinctions are made in the ITU Convention between military and non-military radio installations but nowhere are these terms defined. The absence of a definition for the term "military radio installation" is of more than scholarly interest since military radio installations in orbit elude identification as such to all but the launching state. Moreover, the common identification of industrial organizations, military and non-military departments of government, and scientific bodies with all space experimentation and development obliterates any meaningful concept of the words "military radio installation" when applied to stations in space. This applies equally to the United States and the Soviet Union. Yuri Gagarin like Alan Shepard is a commissioned officer in a military department of government. Apart from ballistic missiles many so-called "non-aggressive" uses of space are of interdependent military, scientific and commercial value.

Following the pattern established under formal provisions inserted in the Washington Radiotelegraph Convention of 1927 the nations of the world today retain entire freedom with regard

to their military radio installations under surviving provisions in the Telecommunication Convention. This interdependence of military and non-military interests in all space exploration suggests not only that the words "military radio installation" be defined in the Telecommunication Convention but that radiocommunication for certain space projects under formal military auspices be made to follow on a mandatory, not permissive, basis the obligations of the Convention and Service Regulations. But there is the added possibility here of a bold stroke which can, and should, be taken by ITU to project reason rather than anarchy into the regime of outer space. For if lawyers have succeeded in converting the simple unadorned word "peaceful" into an artful term meaning "non-aggressive" rather than "non-military" uses of outer space,¹²⁹ why should they not, in a more realistic quest for peace, convert the conventional words "military radio installation" into a term of legal art applicable to categories of space installations *specifically* excluded from any shred of protection in the ITU Convention and Service Regulations? It is beyond the statutory mandate of the ITU to ban "aggressive-type" vehicles and systems from outer space, but it is decidedly within its existing competence to make telecommunication to and from such vehicles and systems exceedingly unattractive from a technological point of view and considerably expensive from a financial one.

Even with their imperfections, provisions in the ITU Radio Regulations are to a great extent self-enforcing. Nations avoid these regulations only if they are prepared to have their own radiocommunications disrupted by other nations injured through that avoidance. This "international fact of life" can be made to work in the cause of peace by "outlawing" the use of the frequency spectrum to types of vehicles and systems which violate the enunciated policies of the United Nations. Under this proposed scheme, in order to *qualify for the protections* set forth in the ITU Convention and Service Regulations, nations involved in launching space vehicles would be required to furnish the United Nations with technical details of the vehicles or systems to be launched and their intended purposes. Upon approval of such purposes, the United Nations would "register" the vehicle or system. Radio signatures for "registered" vehicles or systems would be pro-

¹²⁹ See note 97 *supra*.

vided by the ITU and the vehicles or systems identified in an official international document through publication of their frequencies, and their orbital and other technical characteristics. Vehicles or systems not "registered" by the United Nations would be deemed by operation of law as containing "military radio installations," and as such not entitled to protection from harmful radio interference whether caused deliberately or unintentionally. Abuses caused by "registered" vehicles or systems could be corrected by revoking through notice and publication their international radio signatures, after exhaustion of administrative due process and a right of appeal to the International Court of Justice.

In formulating the conclusions and advancing the proposals which appear in these pages the writer has felt somewhat of an interloper for entering an area where presumably lawyers have feared to tread. To the lawyer embarked upon the exploration of conventional air or maritime law or multilateral agreements concerning human rights, juridical patricians rise up to challenge and chart his course; their past expositions, in turn, supported or banished in the cold imprimatur of contemporary string citations. There is no comparable font of authority for conventional telecommunication law. It is no credit to the bar that a century of formulating rules for the international regulation and rational organization of world-wide telecommunication has been accomplished by communication engineers unlettered, perhaps, in the principles of law but armed fortunately with a sense of purpose in meeting the problems of their time. But technical decisions taken with respect to space-age telecommunication requirements are freighted with political and legal consequences considerably more pronounced than those of the past. There must be a greater sense of awareness in this regard on the part of lawyers and telecommunication engineers alike. The ITU is not only general agent for the world in the matter of allocating radio frequencies or in organizing international telegraphic and telephonic services; it is also a United Nations Specialized Agency, assigned a share in the common endeavor of preserving outer space for peaceful purposes. The challenge of identifying the means within its competence to "wage the peace" now confronts the International Telecommunication Union on the threshold of the second century of its existence. If the past is prologue, the Union will meet that challenge.

Washington
Radiotelegraph
Conference, 1927

Madrid
Radio Conference, 1932

APPENDIX
Cairo
Radio Conference, 1938

Atlantic City
Radio
Conference, 1947

Geneva
Radio Conference, 1959

RADIOCOMMUNICATION SERVICES

Fixed	Fixed	Fixed	Fixed	Fixed
			Aeronautical Fixed	Aeronautical Fixed
Mobile	Mobile	Mobile	Mobile	Mobile
(Maritime)	(Maritime Mobile)	(Maritime Mobile)	Maritime Mobile	Maritime Mobile
(Air)	Aeronautical	Aeronautical	Aeronautical Mobile	Aeronautical Mobile
			Land Mobile	Land Mobile
Broadcasting	Telephone Broadcasting	Radiotelephone	(
	Visual Broadcasting	Television	Broadcasting	Broadcasting
		Facsimile	(
(Amateur)	(Amateur)	(Amateur)	Amateur	Amateur
Special	Special	Special	Special	Special
	radiobeacons, time signals, direction finding, notice to navigators, frequency calibration, experimental, medical advice, press messages, standard, meteorological, others.		"A service not otherwise defined in [the Regulations] carried on exclusively for specific needs and not open to public correspondence."	
			Standard Frequency	Standard Frequency
			Meteorological Aids	Meteorological Aids
			Radiolocation	Radiolocation
			Radionavigation	Radionavigation
			Maritime Radionavigation ...	Maritime Radionavigation ...
			Aeronautical Radionavigation .	Aeronautical Radionavigation .
			Space Service	Space Service
			Earth-Space Service	Earth-Space Service
			Radio Astronomy Service	Radio Astronomy Service

SPECTRUM SPACE

10 kc/s
—to—
23,000 kc/s

10 kc/s
—to—
60,000 kc/s

10 kc/s
—to—
25,000 kc/s
—to—
200 Mc/s

10 kc/s
—to—
29,700 kc/s
—to—
10,500 Mc/s

10 kc/s
—to—
27,500 kc/s
—to—
10,500 Mc/s
—to—
40 Gc/s