THE ROLE OF ITU IN ESTABLISHING LEGAL CONTROL IN OUTER SPACE

© KANHAIYA LAL RATHI

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ABSTRACT OF THE THESIS

The International Telecommunication Union (ITU) as a regulatory body in the area of space telecommunications is often viewed by the democratic world as its parliament in telecommunication matters. The Union plays a significant role in the formulation of a legal regime to govern the use of outer space. The law governing Geostationary Orbit Satellite Communications (GSOS) has become more important since orbital slots are limited in number. The Union's role in the planning, coordination and distribution of orbital segments is indispensable for the international communications network under its authority.

The increasing demand for use of the orbit/frequency by the developed nations has caused concern among developing nations in view of the apparently limited nature of this natural resource. Outer Space Treaty, Telecommunication Convention and Radio Regulations are the main instruments governing space telecommunications. The decision-making process of the ITU is based on the sovereign equality of states. However, in this respect, it differs substantially from the UN COPUOS. In addition to technical and legal functions, the Union is also responsible for the harmonization and coordination of projects directed towards developing nations.

RESUME

Etant l'organisme de règlementation dans le domaine des télecommunications spatiales, l'UIT est considéré dans le monde démocratique comme le parlement en la matière. Elle joue un rôle primordial dans la constitution d'un régime juridique gouvernant l'utilisation de l'espace extra-atmosphérique. Le droit régissant les communications par satellite sur orbite géostationnaire a pris de l'importance depuis que des restrictions ont été élaborées en rapport à un accès libre à l'espace. Le rôle de l'Union que consiste en la planification, la coordination et la distribution des positions orbitales est indispensable aux réseaux internationaux de communication sous son égide.

La demande croissante des pays dévoloppés pour l'utilisation des fréquences de l'orbite géostationnaire a suscité une certaine inquiétude chez les pays en voie de développement; ces derniers craignent ne pas pouvoir satisfaire à leurs propres besoins présents et futurs, étant donné la nature limitée de cette ressource naturelle. Le droit à l'utilisation pacifique de l'espace extra-atmosphérique, la convention sur les télécommunications et les règlements visant l'exploitation radiophonique constituent les principaux instruments qui régissent les télécommunications spatiales. L'Union tient compte de l'égalité souveraine des pays dans sa prise de décision et plusieurs règlements en vigueur diffèrent sensiblement de ceux du CUPEEA. En plus de fournir les règles d'ordre technique et juridique, l'Union harmonise et coordonne les projets orientés vers les pays en voie de développement.

PREFACE

The United Nations has recognized the ITU as one of its specialized regulatory agencies. Space law is in the process of evolving a legal regime to deal with new technological developments and the use of outer space for telecommunications purposes has become a much disputed issue among sovereign states. Agreement is needed not only on the norms to govern use, but also on the international coordination of satellite communication systems in order to prevent harmful interference. Since its inception, the ITU has been a forum for international discussions on telephone, telegraph and radio communications. And the majority of states have demonstrated satisfaction with its activities and have shown interest in abiding by its technical standards and legal rules. Indeed, the ITU has gradually become an institution of space communication technology and a media through which to cultivate improved international telecommunication relations among nations.

In addition to the ITU, there are other regulatory bodies which are actively involved in space legislation. Moreover, international laws on the subject already exist which contribute towards the establishment of legal regime in outer space. With this in mind, the dissertation has been devided into three parts, in order to examine the subject from different perspectives. Part A deals with the ITU as an institutional framework of historic importance to international telecommunications. Part B deals with the institutionalization of

space communication and its legal mechanism at such forums as the UN COPUOS, UNESCO, INTELSAT, and INMARSAT. Part C deals with international resource development strategies for the equitable and efficient distribution of the geostationary orbit and electromagnetic spectrum.

This study is an attempt to clarify the problems concerning space telecommunications and to offer solutions. An examinations of the legal dimensions of the new frontiers of outer space activities requires a progressive outlook and an effort has therefore been made to point out the lacunae in the law-making process, its implementation and overall performance.

The importance of the study lies in the fact that telecommunications law must change and develop rapidly in order to keep pace with technological progress.

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PART - C

THE GEOSTATIONARY ORBIT AND ITS LEGAL CONTROL

AND

ABBREVIATIONS

CCIF	- International Telephone Consultative Committee
CCIR	- International Radio Consultative Committee
CCIT	- International Telegraph Consultative Committee
CCITT	- International Telegraph and Telephone Consultative Committee
COSPAR	- Committee on Space Research
COPUOS	- Committee on the Peaceful Uses of Outer Space
DBS	- Direct Broadcast Satellite
DSG	- Deputy Secretary General (ITU)
EARC	- Extraordinary Administrative Radio Conference
ECOSOC	- Economic and Social Council (UN)
GSOS	- Geo- stationary Orbit Satellite
ICAO	- International Civil Aviation Organization
ICJ	- International Court of Justice
ICSC	- Interim Communication Satellite Committee
ICSU	- International Council of Scientific Union
IEEE	- Institute of Electrical and Electronics Engineers
IFRB	- International Frequency Registration Board
INMARSAT	- International Maritime satellite System
INTELSAT	- International Telecommunication Satellite Organization
ITU	- International Telecommunication Union
PALPA	- Indonesian Communication Satellite Systems
RARC	- Regional Administrative Radio Conference

SG	- Secrtetary General
SITE	- Satellite Instructional Television Experiment
STEP	- Satellite Telecommunication Experimental Project
UN	- United Nations
UNCTAD	- United Nations Conference on Trade and Development
UNDP	- United Nations Development Project
UNESCO	- United Nations Educational, Scientific and Cultural Organization
UNGA	- United Nations General Assembly
UNTS	- United Nations Treaty Series
URSI	- International Union of Radio Science
WARC	- World Administrative Radio Conference
WARC-BS	- World Administrative Radio Conference for Boadcasting Satellite Service
WARC-ST	- World Administrative Radio Conference for Space Telecommunications
WIPO	- World Intellectual Property Organization
WMO	- World Meteorology Organization

PART - A

INTRODUCTION

A DISCUSSION ON THE TITLE

At first glance, the title of this dissertation may raise doubts about the role of the ITU in establishing legal control in outer space. But when one considers the utilization of outer space for telecommunications purposes and the role of the ITU as a regulatory body, there is no doubt that the Union has a definite part to play in establishing the legal regime to govern outer space activities for space telecommunications.

Communication and information play a paramount role in human development. Space telecommunication is the fastest means of connecting different parts of the Globe. Use of the Geostationary Orbit Satellite(GSOS) is a great leap forward in fulfilling global needs. Since such use is an international issue, coordination is required and this has been entrusted to the ITU. The Union is, therefore, attempting to provide technical and legal controls over space signals.

The object of this dissertation is to describe how space telecommunications are regulated in outer space, over which no sovereign state has jurisdiction. Existing international space law outlines the means by which this region can be purposefully utilized from the commercial point of view. However the responsibility for law-making in outer space is in the hands of those few member states who happen to be members of the United Nations General Assembly's

Committee for the Peaceful Uses of Outer Space (UN COPUOS). The ITU is not included in that particular regulatory mechanism as it has no competence to participate. But the law-making process is not confined to the UN COPUOS and its Legal Sub Committees. There are other participants who do play a very significant role in the development of international law, among them, the ITU, UNESCO, and ICJ.

Similar to highway traffic, space communication needs traffic standards to ensure the safety of communication. No state can take responsibility for, and impose its own laws over an area where no sovereign rights exist. Therefore, an organ which was international in character and with authority to deal with communication functions was needed to provide technical guidance and to promote space communication technology while ensuring the efficient use of the limited natural resources. The member states of the UN considered that the task of establishing legally controlled traffic in outer space for telecommunications purposes should be assigned to the ITU as one of the UN's specialized agencies.

The words "legal control" emphasise the binding nature of the norms-setting practice. The ITU Convention and the Radio Regulations have the same binding force as other international treaties. Under customary international law, the treaties and rules applicable to outer space are binding even on non-signatories, therefore, it can be argued that the ITU's norms are of universal application, which is ample justification for the title of this dissertation.

1. THE ITU; ITS ORIGIN AND DEVELOPMENT

The ITU is the oldest specialized agency of the UN. It is, strictly speaking, a technical organization and has contributed significantly to international cooperation in economic and social development, which is called for by the UN Charter.(1) The Union is the medium through which states regulate their international telecommunication activities. Initially, coordination of telecommunication was undertaken on a bilateral basis and many trans-national conventions were promulgated.(2)

The term "tele", which comes from ancient Greek, means "far off", so that "telecommunication" simply means long-distance communication. Radio and telegraph were the earliest forms of telecommunications, but electrical communication soon proved more successful in transmitting signals over long distances. Hence, mass communication telegraphy and radio signals are commonly used for long distance services. The ITU Convention defines telecommunication as follows:

> "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",(3)

The relevance of the present work stems from the advent of space communications and the emerging legal regime of outer space. The introduction of space telecommunication norms began in 1903. However, international cooperation in telecommunications goes back to the

foundation of the International Telegraph Union in 1865, the year which has been officially recognized as the birth of the ITU.(4) Its historical origin and development can be traced through the kinds of conferences which have periodically been held, starting with telegraph conferences, radio conferences and finally international telecommunication conferences.

1.1 Telegraph Conferences

The International Telegraph Union was created to develop uniform international rules for telegraph services. Twenty states met in Paris on May 17, 1865 (5) and agreed to enter into an arrangement and set of telegraph regulations, appointing special committees to discuss the text of proposed treaties. Each delegation was given one vote and a procedure of majority rule was adopted. The Convention came into force on January 1, 1866 and many attempts were made to amend it in conferences which followed. The conferences are listed below out of historical interest alone, since detailed discussion of their content would be too lengthy for the pruposes of this dissertation

------ The Vienna Telegraph Conference, 1868.

------ The Rome Telegraph Conference, 1871-72.

------ The St. Petersburg Telegraph Conference, 1875.

------ The International Telegraph Conference, 1879, London.

---------- -do- ----------, 1885, Berlin.

---------- -do- ----------, 1890, Paris.

---------- -do- ----------, 1896, Budapest.

---------- -do- ----------, 1903, London.

---------- -do- ----------, 1908, Lisbon.

---------- -do- ----------, 1925, Paris.

---------- -do- ----------, 1927, Washington

---------- -do- ----------, 1928, Brussels.

1.2 Radio Conferences

Radio communication became the subject of international debate primarily because of its inherent technicality. A radio signal needs a carrier called a "frequency" which can, however, be used simultaneously by other radio stations thus resulting in harmful interference to the originating message. In order to avoid such harmful interference coordination is necessary through agreed principles at an international level.(6) Secondly there were humanitarian reasons concerned with safety of life at sea. Thirdly, nations insisted on the protection of freedom of message correspondence and the maintenance of its secrecy.(7) Leive, D. M., has stated that these difficulties led the German Government, in 1903, to convene a conference in Berlin, to lay down certain guidelines to resolve such problems. The Final Protocol of this conference became the basis for the international radio communication regulations.(8)

The Berlin Preliminary Radio Conference, 1903

The Berlin conference of 1903 was merely a planning conference with nine countries participating in its discussions.(9) The main subject of debate was whether the new medium was an extension of telegraphy or was different enough to require a separate organization. A secondary issue was the cooperation needed by all makers and users of equipment in order to assure maritime safety. General agreement was reached on the first issue and a full-scale conference was planned

for the second. One question which was resolved was whether the Marconi company should be allowed to act only in its own interests. The conference reacted sharply to this issue and denied the right of any company to own a monopoly over science.(10) Another important matter, upon which no agreement could be reached dealt with the free and unrestricted interchange of wireless messages. Although there was a consensus that distress signals should be given priority, the exact meaning of "distress signal" was not defined.(11)

Radio Telegraph Conference, 1906

This conference was principally concerned with obligatory inter-communications between stations using different equipment. The conference prepared a Draft Convention on the International Radio Telegraph Union and on Radio Regulations, annexed to the Convention. The Berlin Convention was signed on the basis of majority votes.(12)

Second Radio Telegraph Conference 1912

This conference opened on June 4, 1912, in London. The main issues discussed were obligatory intercommunication, maritime service regulations, the allocation of frequencies for coast and ship stations, the regulation of new maritime radio services and the transmission of radio messages. A proposal for the obligatory installation of radio aboard all ships could not however, be adopted

since it was considered to be an infringement of the national jurisdiction of individual countries.(13)

Third Radio Telegraph Conference, 1927

The outset of World War I, prevented the holding of any further radio conferences. After the war and before the 1927 Radio Telegraph Conference in Washington, attempts were made by the Allies and Associate Powers to set up guidelines for radio services. They were interested in organizing a world-wide electric communication conference.

The 1927 Washington Conference, which might be called the first modern telecommunication conference(14), resulted in new general regulations comprising thirty four articles and eight appendices, as well as additional regulations composed of six articles and one appendix.(15) The main actions of the conference were to enlarge the scope of the Convention in two ways: Firstly, to include all radio communication stations established or operated by the contracting governments, for international or public correspondence; and to include a large number of services not open to public correspondence.(16) The second action was to assure the secrecy of radio correspondence. It also established the International Radio Consultative Committee. In addition, there were changes to the Radio Regulations concerning reservations on type B waves, allocation of frequencies to services and the regulation of aeronautical services.

The additional Radio Regulations were formulated, and a resolution passed concerning the unification of the Radio and Telegraph Unions. This unification was left to be completed at the next conference, to be held in Madrid in 1932.

1.3 International Telecommunication Conferences

The first joint telegraph and radio conference was held in Madrid in 1932. Prior to the Madrid Conference, there were three related basic conferences which laid the ground-work for this meeting. They were the Prague Plan Conference of 1929, the International Radio Consultative Committee (CCIR) at the Hague in 1929, and in Copenhagen in 1931.

The Madrid Conference 1932

The purpose of the meeting was to set up a joint convention committee and other joint committees. After long discussion, the name "International Telecommunication Union" was selected for the combined organization(17) and a new chapter dealing with radio, comprising six articles on intercommunication, interference, distress calls, false or deceptive distress signals, limited service and installations of national defence, was added to the ITU Convention. Other issues discussed were the allocation of additional frequencies to broadcasting stations in Europe and North America, technical considerations, and the composition of the radio committee. (18)

The Cairo Conference, 1938

The first Administrative Telegraph/Telephone and Radio Conference

of the new ITU was held in Cairo in 1938.(19) Prior to the Cairo Conference, two similar conferences were held in Brussels and Havana. The first was authorized, at the Madrid Conference(20), to establish the Madrid frequency allocation table and to call another European Conference of the broadcasting stations in the European region.(21) This meeting was held in Lucerne in May and June 1933, and a new European Broadcasting Convention and an annexed frequency allocation plan was drawn up and signed. The Final Act of the Inter-American Radio Conference held in 1937 also dealt with such issues.(22)

The second ITU Conference met in Cairo from February 1 to April 4, 1938, as agreed in Madrid. Telegraph and Radio Conferences met simultaneously but worked independently of each other except for questions of mutual interest, which related to voting rights. At the Cairo Radio Conference, decisions were taken on the allocation of frequencies, limitations on spark sets, regulation of the maritime mobile service, reorganization of the Radio Consultative Committee and changes in the additional Radio Regulations. On the other hand, the Cairo Telegraph and Telephone Conference took decisions on issues such as unification of rates, payment of international accounts, telephone regulations, reorganization of the Telegraph Consultative Committee and criticisms of the International Bureau.

The European Broadcasting Conference, Montreux, 1939

It was called to revise the European Broadcasting Convention and

frequency allocation plan established in Lucerne in 1933. It also set forth rules and regulations concerning the operation of European Broadcasting stations and the relationship of the International Berne Union (IBU) to the Plan. The Montreux Plan contained the actual allocation of frequencies to the individual broadcasting stations in the European area. Finally, the Conference succeeded in drafting a revised convention for itself and a new frequency assignment plan for its own members.

The Bermuda Telecommunication Conference, 1945

This conference was attended by the Allies. The main points on the agenda were the re-establishment in Europe of the international telephone communications that had been interrupted by the war, a general program for the realization of a more rapid, international telephone service in Europe and the scheduling of the future work of the International Telephone Consultative Committee (CCIF).(23)

The Moscow Preparatory Conference, 1946

This conference was attended by the "Victors" of World War II, its main purpose being to consider the time and place of the next ITU Conference and to discuss the problems which should be considered there. However, the question arose as to who should issue invitations for the forth-coming conference and to whom they should be sent.

Finally, it was decided that the UN Economic and Social Council, which came into being as a result of the 1945 UN Charter, should issue invitations to the conference being held in the US and that the telegraph section of the ITU Conference should be held in France. In the latter case, five committees were formed to deal with the convention, radio regulations, allocation, and telephone and telegraph regulations.(24) Its main emphasis was on the reorganization of the ITU. The major proposals were of two kinds; one, to eliminate recurring problems; and two, to provide the ITU with an organization capable of continuous administrative operation. The proposal was also made to establish a close relationship between the ITU and the newly created UN. The main results of the conference were to reach agreement on the need for a full-scale conference, and on the agenda for reorganization of the ITU to set up a Center of Frequency Registration Board and to settle some international frequency allocations, as well as to decide about the participation in the International Telegraph Consultative Committee (CCIT).

The Atlantic City Conference, 1947

The outbreak of World War II not only destroyed existing telecommunication facilities but also suspended the right of the public to use telecommunication services. Another problem was regulatory. First, the expansion of the aeronautical and high frequency broadcasting services for wartime purposes had been so great that there was neither room in the assigned bands for their proper

functioning nor for their planned future expansion. The two services needed revised allocation. The Atlantic City Conference of 1947 was convened with the aim of making international communication services a success. (25)

The conference approved the creation of the International Frequency Registration Board (IFRB) which was an entirely new type of administrative body for the Union, with a new way of regulating radio services.(26) The committee's responsibilities were policy matters, credentials, ITU organization, relations with the UN, Convention, General Regulations, drafting and voting. The major achievements of the conference included an Administrative Council, a change in the locations of offices of the International Radio Consultative Committee (CCIR) and CCIT and improved financial arrangements for the Union's Secretariat. The most important result was the links established with the UN. The Convention was signed on October 3, 1947, and came into force on January 1, 1948.

The International Telegraph and Telephone Conference, Paris, 1949

During this meeting, the telegraph and telephone regulations drawn up in Cairo in 1938, were revised. The next Administrative Conference was called in Buenos Aires in 1952, but it was postponed until seven conferences aimed at drawing up a new international frequency list in the band between 10 kcls and 30 Mcls had been held

(in the period 1948-1951). The work of the Provisional Frequency Board was reviewed by the Administrative Council at its fourth session,(August- September 1949.) It was decided to hold an Extraordinary Administrative Radio Conference(EARC) in September, 1950, but this too was postponed. Thus, the Administrative Council was able to call the EARC at any time between the ordinary Administrative Conferences.(27)

The Extra-Ordinary Administrative Radio Conference, 1951

It was held in Geneva from August 16 to December 3, 1951, and its main achievements were the adoption of new frequency lists in specific bands; the adoption of frequency allotment plans for various special services; interim measures to be taken by the administrations and the Board with respect to the transfer to the new list of older assignments and the bringing into force of various provisions of the 1947 Radio Regulations. Article 37 of the EARC authorized the IFRB to compile and maintain a master radio frequency record, designed to replace the old ITU frequency list originally published by the Berne Bureau. The IFRB implemented the decisions of the EARC which were later adopted by the 1959 Administrative Radio Conference and now form part of the Radio Regulations.

The Geneva Administrative Radio Conference, 1959

The Geneva Conference was faced with the task of adjusting the regulatory regime on the basis of new conditions. The ITU Convention of 1959 entered into force on January 1, 1961. For the first time in any multilateral agreement, it contained explicit provisions applicable to outer space activities. (28)

The Extraordinary Administrative Radio Conference (EARC), 1963

This conference dealt with the alocation of frequencies for space communications. The main items on the agenda were to examine the progress in the use of the CCIR's technical studies and those of other organizations and a proposal with respect to administration; to revise only such provisions of the 1959 Radio Regulations as were essential for the effective implementation of the decisions of the conference relating to the allocation, notification, recording and use of frequency for space, earth and radio astronomy; and to adopt such additional provisions as were necessary to implement conference decisions concerning the technical characteristics of the space services.

Space applications were developing in the field of communication, meteorology and navigational satellites. The much debated issue was frequency allocations, since there was a difference of opinion with respect to the basis for making such allocations.(29) The Board placed particular emphasis on the UNGA resolution on international cooperation in the peaceful uses of outer space(30) and accordingly,

consideration was given to coordination of the earth stations and satellite systems.

The Montreux, Conference, 1965

At the Plenipotentiary Conference held in Montreaux proposals were made to abolish the Board, but due to the strong opposition its strength was merely reduced to five members.(31) The developing countries opposed the abolition proposals because they saw an independent and impartial corporate Board directly elected by Administrative Conferences as an essential protector of their interests vis-a-vis the developed countries whose communication requirements had already been met. It was a dispute between the "haves" and the "have-nots"(32), and a compromise solution was reached. The conference proceedings entered into force on January 1, 1967.

The World Administrative Radio Conference for Space Telecommunication, Geneva, 1971

During 1971, the ITU's main activities with regard to outer space were carried out in the context of the WARC for space telecommunication. The conference was directed at issues arising from the extremely rapid development of space technology, the diversification of space radio communications, and the need for better

co-ordination between existing or planned world-wide systems and other regional/national systems. The conference was held in Geneva from June 7 to July 17, 1971.

Its purpose was to ensure that the technical provisions and radio regulations governing the use of space telecommunication by all users would be based on the most recent technical achievements.(33)

The Final Acts of the Plenipotentiary Conference (Malaga -Torremolinos, 1973)

The ITU held a Plenipotentiary Conference at Malaga- Torremolinos from September 14 to 25 October, 1973. The Convention was revised, and the role of telecommunications in terms of the peaceful uses of outer space was renewed. The conference did not introduce any basic changes to the Convention and it came into force on January 1, 1975. A number of provisions were adopted clarifying the role of the ITU in that field.(34)

The WARC Maritime Mobile Telecommunications, Geneva, 1974

The WARC for maritime mobile telecommunications opened in Geneva on 22 April 1974, and its proceedings came into force on January 1, 1976. It was a sequel to the maritime conference held in Geneva in

1967. The conference revised the radio regulations with respect to the procedure for the international use of selective calling in the maritime mobile service. (35)

WARC - 77

The conference for the planning of the broadcasting satellite service was held in Geneva from January 10 to February 12, 1977. Its main objective was the planning of satellite broadcasting in the 12 GHz band for future needs. A plan was drawn up for in regions 1 and 3. Provisions were adopted governing the satellite broadcasting satellite service in region 2. It was decided to publish the text concerning the re-arrangement of the radio regulations approved by the conference, and preparation of this text was entrusted to committee No. 7. It was to serve essentially as a basis for proposals to be presented by the telecommunication administrations of the ITU member countries at WARC-79.(36)

WARC - 79

Before WARC-79, there was a WARC on the aeronautical mobile(R) service which opened on February 6, 1978, in Geneva, in order to revise WARC- 77 on the basis of single side band operation. It was also called to review the provisions of the radio regulations and additional regulations governing the aeronautical mobile(R) service.

WARC-79 opened on September 24, 1979. It was organized under the auspices of the ITU in pursuance of Opinion No. 3 of the Plenipotentiary Conference of 1973. The purpose of the conference was to revise, harmonize and update international regulations applicable to all radio communication services. It was undoubtedly the most important radio conference to be held since the 1959 meeting in Geneva. Since then a specialized World Conference has been held to take account of new technical developments and frequency requirements for each particular radio service. The services using space techniques are the maritime mobile, the aeronautical mobile, sound and television broadcasting and direct satellite broadcasting services.(37) Radio Regulations came into force on January 1, 1982. The effect of the conference on ITU would be:

------ the frequency spectrum shall be used in an orderly manner, in accordance with the distribution of bands shown in a table of frequency allocations.

------ all countries would have free access with equal rights to any part of the spectrum.

------ no frequency assignment can be used by any individual or enterprise without a licence issued by the government of the country having jurisdiction over the individual or the enterprise.

------ the rights and obligations entailed by the use of a frequency are derived from its regulations by the IFRB as the result of a

technical examination, with specific characteristics and the date of its notification.

------ all problems of harmful interference between registered assignments must be settled through cooperation between countries concerned. The assistance of the IFRB may be requested in seeking a solution to such a problem.(38)

The Plenipotentiary Conference at Nairobi, 1982

ITU held its Plenipotentiary Conference in October-November 1982 at Nairobi(39) to determine: a) general policies for fulfilling the purpose of the Union prescribed in article 4 of the Convention(40); b) to consider the report by the Administrative Council on the activities of all the organs of the Union since the previous Plenipotentiary Conference; c) to establish the basis for the budget of the Union and determine a fiscal limit for the expenditure of the Union until the next Plenipotentiary Conference, after considering the program of the Administrative Conference and meetings of the Union foreseen in that period; and d) it has revised the provisions of the Convention considered necessary. It also delt with the matters of assistance and cooperation for developing countries mainly based on new world order of development.

The WARC for Mobile Telecommunications

Geneva, February 23, to March 18, 1983.

Resolution No. 22 of WARC-79 foresees a WARC for mobile telecommunications, which will revise the radio regulations in order to harmonize some provisions for aeronautical, maritime, and land mobile services, to improve distress and safety provisions and to take account of new technology and systems. The other things to be considered are, channelling plans for high frequency maritime mobile radio telephone service in bands effected by decisions of the WARC -79.(41)

The WARC for the Planning of the HF Bands Allocated to the Broadcasting Service First Session, July 84

Resolution No.508 of WARC-79 recommends a conference to plan the use of HF bands allocated to broadcasting. Its first session will consider the power appropriate for HF broadcasting, and the needs of each country for national and international service; the maximum number of frequencies to be used for one program zone; and the introduction of a single side-band system for future HF broadcasting.

The WARC on the Use of the GSO and Planning of the Space Services Uses, June, August, 1985/1988

Resolution No. 3 of WARC-79 provides for a further WARC relating to the use of the GSO and the planning of user space services. The main objective is to generate equitable access to the GSO and the frequency bands allocated to space services, for all countries.(42)

2. THE ITU AND ITS RELATIONSHIP WITH THE UN

Before the Atlantic City Conference, the ITU was not supervised by any other organ of the UN. Its purpose was to provide the nations of the world with the machinery necessary to keep pace with the rapid developments in telecommunications and to promote international cooperation.(43) However the conferences in the field of telecommunications were ineffective (44) and a decision was, therefore, taken to establish a body which could govern the ITU. (45) Moreover, this issue was also under active consideration within the UN Economic and Social Council (ECOSOC). Following a report submitted by the temporary Transport and Communications Commission at the second session of ECOSOC in June 1946, setting out its concerns about the ITU, it was generally agreed that in the absence of any permanent governing body,(46) the ITU should be reorganized. The next step was taken by ECOSOC on March 28, 1947, when its Committee on Negotiations with Specialized Agencies was authorized to enter into negotiations with the ITU at the appropriate time for the purposes of bringing it into line with the UN.(47) The negotiations took place on August 12, 13 and 14, 1947. The UN group was headed by Walter Kotschning of the US, who presented the UN proposal at the opening session of the ITU group on August 12, 1947. The ITU representatives came from eleven different nations and spoke various languages. However, they worked in complete unison and as a team representing the Union.(48) An agreement was concluded between the two, as a result of the US proposal at the Atlantic Conference. Formal arrangements were made

concerning the participation of UN telecommunications services in the ITU. The ITU thus became the only international telecommunication organ.(49) The Union was admitted to the UN as a specialized agency, by unanimous vote and without any abstentions. The date of completion of the relationship was set as January 1, 1949, when the Atlantic City Conference came into effect.

Before examining the main provisions of the agreement with the ITU, the relationship between the ITU and the League of Nations should be reviewed. From its inception, the International Telegraph and the Radio Telegraph Union, remained an independent body, although attempts were made by the League of Nations to enquire into legal, social, educational and coordination activities with respect to radio.(50) It is interesting to note that the League was merely represented at the Union's conferences, and the question of placing the ITU under the direction of the League was not raised after the 1932 Madrid Conference. However, the new UN Organization was more insistent that the Union should become one of its specialized agencies.(51)

In general, the relationship of the ITU with the UN can be briefly described in the following terms:

------ absolute technical independence and general coordination with the UN;

------ coercive political coordination, as provided in chapter VII of the UN Charter, binding only on those members with double ITU-UN

membership. (52)

The UN acted under the provisions of Article 57 of the UN Charter and the ITU, under Article 26 of the 1947 Atlantic City Convention. Since then, the Union has been accepted as a specialized agency.(53)

3. EVOLUTION OF THE ITU AND ITS POLICY MAKING PROCESS

The structure of the ITU has been in a process of constant change since the organization was created. Such changes are based primarily on new developments in space science and technology and secondly, on emerging conflicts and cooperation among states in the utilization of outer space for telecommunications purposes.

3.1 Organization and Membership

Prior to 1947, there was a lack of definite membership and it took a lot of time to decide on this particular issue. Among the many proposals that put forward by the USSR was quite attractive. It considered that a regular member of the Union should only be a country in a position to fulfil elementary conditions. Moreover, it would be in keeping with the fact that the world had grown more democratic since colonial voting had been permitted and, that the Atlantic City Conference was in the process of introducing new elements into the structure of the Union.(54) The USSR was alone in its stand and France and the UK stated that "sovereignty" should be the criterion for voting members. Finally the best solution seemed to be that put forward by the Committee (for convention) to the effect that all the countries which had been admitted to the conference should be retained

as voting members of the Union on the ground that they had a vested right thereto. The UNO group submitted the following article dealing with membership of the Union:

"The Union agrees that a country or territory shall be suspended from exercising its rights of membership in the Union so long as the exercise of those rights shall be contrary to a resolution of the General Assembly of the UN applicable to all specialized agencies brought to the relationship with UN",(55)

Finally the Assembly, by a vote of forty six to eight, with nine abstentions and fifteen absentees, approved the Committee's decision.

Presently, membership is defined by article 1 of the ITU Convention as follows:

"The ITU shall comprise Members which having regard to the principle of universality and the desirability of universal participation in the Union, shall be:

a) any country listed in Annex 1 which signs and ratifies, or accedes to, the Convention;

b) any country, not listed in Annex 1 which becomes a member of the UN and which accedes to the convention in accordance with Article 46;

c) any sovereign country, not listed in Annex 1 and not a member of the UN, which applies for membership of the Union and which after having secured approval of such application by two-thirds of the members of the union, accedes to the convention in accordance with Article 46.

For the purpose of 5, if an application for membership is made, by diplomatic channel and through the intermediary of the country of the seat of the Union, during the interval between two Plenipotentiary Conferences, the Secretary-General shall consult the members of the Union; a member shall be deemed to have abstained if it has not replied within four months after its opinion has been requested".

There were provisions for associate membership in the 1947

Convention. But no such provisions are found in the 1973 Convention.(56)

3.2 Structure of the Union

The Union is an Inter-Governmental organization which has 157 members and which comprises the following organs.(57)

a. The Plenipotentiary Conference

b. The Administrative Conferences

c. The Administrative Council

d. The Permanent Organs

d.1 The General secretariat

d.2 The International Frequency Registration Board (IFRB)

d.3 International Consultative Committees (CCIs)

(a) International Radio Consultative Committee (CCIR)

(b) International Telegraph and Telephone Consultative Committee (CCITT)

d.4 The Coordination Committee.

a. The Plenipotentiary Conference

It is the supreme organ of the Union and is responsible for laying down its basic policy. It revises the Convention, elects the members of the Administrative Council, the Secretary General, the Deputy Secretary General and members of the IFRB. It is composed of delegations representing the members of the Union and normally meets once every five years.(58) It determines the general policies for fulfilling the purposes of the Union prescribed in Article 4 of the Convention.

It establishes the basis for the budget of the Union and determines a fiscal limit for expenditure until the next Plenipotentiary Conference, after considering the program of Administrative Conferences and meetings of the Union, foreseen in that period. Its other functions are as follows:

------ to fix the basic salaries, the salary scales and the system of allowances and pensions for all the officials of the Union ; and, if necessary, provide any general directives dealing with the staffing of the Union ;

------ to examine the accounts of the Union and finally approve them, if appropriate,

------ to elect the members of the Union which are to serve on the Administrative Council ;

------ to elect the Secretary General and Deputy Secretary General and fixe the dates of their taking office;

------ to revise the Convention if it is considered necessary;

------ to conclude or revise, if necessary, agreements between the Union and other international organizations, examine any provisional agreements with such organization concluded on behalf of the Union by

the Administrative Council and take such measures in connection therewith as it deems appropriate;

------ to deal with such other telecommunication questions as may be necessary.(59)

b. The Administrative Conferences

The Administrative Conferences are generally convened to consider specific telecommunication matters. They are of two types:

a) The World Administrative Conferences.

b) The Regional Administrative Conferences.

The World Administrative Conferences are particularly competent to undertake partial or complete revision of the administrative regulations, i. e, the telegraph and telephone regulations. Article 7(2) of the Convention states that the Administrative Council shall normally be convened to consider specific telecommunication matters. Article 7(3) (1) limits the scope of the Council by providing that the agenda of a World Administrative Conference may include: (a) partial revision of the administrative regulations; b) exceptionally, the complete revision of one or more of those regulations; and (c) any other question of a world-wide character within the competence of the Conference. As for the Regional Administrative Conference, it may provide only for specific telecommunication questions of a regional nature, including instructions to the IFRB regarding its activities in respect of the region concerned, provided such instructions do not conflict with the interests of other regions. Furthermore, the

decisions of such a conference must in all circumstances be in conformity with the provisions of the Administative Regulations.

c. The Administrative Council

It has 36 members(60) who are elected by the Plenipotentiary Conference, with due regard to the need for equitable representation of all parts of the world. It meets annually and is responsible for taking steps to facilitate the implementation of the provisions of the Convention, the administrative regulations, the decisions of the Plenipotentiary Conference and, where appropriate, the decisions of the other conferences and meetings of the Union. It ensures the efficient co-cordination of the work of the Union, particularly from the administrative and financial points of view.

The members of the Council are elected with due regard to the need for equitable distribution of the seats of the Council among all regions of the world and hold office until the date on which a new Administrative Council is elected. They are eligible for re-election.(61) Each member of the Council shall appoint a person to serve on the Council who may be assisted by one or more advisers. The Council shall appoint its own rules and procedures in the interval between the Plenipotentiary Conferences. The Administrative Council shall act on behalf of the Plenipotentiary Conference, within the limits of the powers delegated to it by the latter.

d. The Permanent Organs

The ITU operates through four permanent organs comprising, the General Secretariat, IFRB, CCIs and the Cordination Committee.

d.1 The General Secretariat

The General Secretariat is directed by the Secretary General(SG) assisted by the Deputy Secretary General(DY SG). The SG is responsible to the Administrative Council for all administrative and financial aspects of the Union's work, with the advice and assistance of a "Co-ordination Committee". He coordinates the activities of the permanent organs. The co-ordination committee, which is presided over by the Secretary General, consists of the DY SG, the Directors of the CCIs and the Chairman of the IFRB. The SG acts as the legal representative of the Union. The General Secretariat is responsible for the administration of the Union, the publication of administrative regulations and other documents and the implementation of technical co-operation programmes within the framework of the UNDP.

The SG is authorized to take any action required to ensure the economic use of the Union's resources and is responsible to the Administrative Council for all the administrative and financial aspects of the Union's activities.

d.2 The International Frequency Registration Board (IFRB)

The IFRB consists of five independent radio experts, from different regions of the world, elected by the Plenipotentiary Conference and working on a full-time basis at the Union's headquarters in Geneva. They elect a chairman and a vice-chairman annually among their own numbers. The essential duties of the IFRB are:

------ to effect an orderly recording of frequency assignments made by the different countries with the procedure provided for in the radio regulations and in accordance with any decisions which may be taken by the competent conferences of the Union;

------ to effect, in the same conditions and for the same purpose, an orderly recording of the positions assigned by countries to the Geostationary Satellite Orbit (GSO);

------ to furnish advice to members with a view to the operation of the maximum practical number of radio channels in those portions of the spectrum where harmful interference may occur, and with a view to the equitable, effective and economical use of the GSO ;

------ to perform any additional duties, concerned with the assignment and utilization of the GSO, in accordance with the procedures provided for in the radio regulations, and as prescribed by a competent conference of the Union, in preparation for or in pursuance of the

decisions of such a conference,

------ to maintain such essential records as may be related to the performance of its duties.

In addition, the IFRB participates, at the request of governments, in the obligatory inter-governmental co-ordination of the use of frequencies involving space techniques, prior to their notification for recording in the Master Register; in the orderly recording of the positions assigned by countries to the GSO in order to ensure formal international recognition thereof; and in the technical preparation of radio conferences with a view to reducing their duration.(62)

The Board also collects and analyses the data received from monitoring stations spread throughout the world, with particulars of observations on the transmissions made by radio stations and which, in summarized form, are distributed to all administrations. The Board also compiles and publishes four seasonal schedules per year on high frequency broadcasting operations and assists administrations in finding suitable frequencies for their high frequency broadcasting services. The other important function of the Board is to carry out the technical preparation for radio conferences, assembling the necessary technical and operational data which may be required by the conferences for frequency planning, or other purposes related to the use of the radio frequency.

d.3 The International Consultative Committees (CCIs)

There are two separate bodies dealing respectively with technical radio problems, and technical telegraph and telephone problems. The two are called (a) the International Radio Consultative Committee(CCIR); and (b) the International Telegraph and Telephone Consultative Committee (CCITT).

CCIs normally hold plenary assemblies every three years, which set up study groups to examine technical, operating and tariff questions, issue recommendations and elect directors, who are assisted by specialized secretariats, equipped with technical apparatus and a laboratory. All member countries of the Union can participate in their work, as may certain private companies operating telecommunication services.(63)

The Plenary Assembly draws up a list of technical questions relating to telecomunications, the study of which should lead to improvements in radio communications or in telegraph and telephone services, particularly at the international level. These questions are then referred to a number of study groups composed of experts from different countries.

The CCIR has 11 study groups which are concerned with:

------ spectrum utilization and monitoring.

------- space research and radio-astronomy services.

------ fixed service at frequencies below about 30 MHz.

------ fixed service using satellites.

------ propagation in non-ionized media.

------ ionospheric propagation.

------ standard frequency and time signal services.

------ mobile services.

------ fixed service using radio-relay systems.

------ broadcasting service(sound) .

------ broadcasting service(television) .

The CCITT has seventeen groups which are concerned with:

------ telegraph operation and quality of service.

------ telephone operation and quality of service.

------ general tariff principles.

------ transmission maintenance of international lines, circuits and chains of circuits; maintenance of automatic and semi-automatic networks.

------ protection against dangers and disturbances of electro-magnetic origin.

------ protection and specifications of cable sheaths and poles.

------ new networks for data transmission.

------ telegraph and terminal equipment, local connecting lines.

------ telegraph transmission quality, specifications of equipment and rules for the maintenance of telegraph channels.

------ telegraph switching.

------ telephone switching and signaling.

------ telephone transmission performance and local telephone networks.

------ for group No. 13, no study group has been appointed.

------ facsimile telegraph transmission and equipment.

------ transmission systems.

------ telephone circuits.

------ data transmission.

------ digital networks.

In addition there are three joint CCIR/CCITT study groups; one is for television and sound transmission called CMTT, second is for definitions and symbols(vocabulary) called CMV, both are administered by the CCIR; and third is for circuit noise and availability called CMBD, administered by the CCITT.

These study groups draw up recommendations which are submitted to the next Plenary Assembly. If the Assembly adopts the recommendations, they are published in what are known as the CCI books, which are disseminated by the Union.(64) These committees prepare a general plan for the international telecommunication network to help in planning international telecommunication service. They refer questions to the ICCs, the study of which is of particular interest to the developing countries. However, special autonomous study groups (GAS) were set up to deal with questions of a documentary nature of particular concern to the developing countries.(65)

One of the study reports prepared by interim working party 4/1 is called the Provisional Technical Report for WARC-84.(66) It contains the background for changing the ITU Convention and other regulations. This report will have an important effect on Space WARC-85 and 88. The next step in the preparations for Space WARC-85, is the responsibility of the CCIR XV Plenary Assembly, which may decide to form a special joint study group, or to convene a special prepatory conference to develop further the IWP 4/1 report. In any event, the CCIR will be very much involved in preparations for both Space WARC-85 and 88.

d.4 The Coordination Committee

The Coordination Committee assists and advises the SG on all administrative, financial and technical cooperation matters affecting more than one permanent organ. The Committee also considers any important matters referred to it by the Administrative Council. After examination, the Committee reports through the SG to the Administrative Council.

3.3 The Purpose and Objectives of the ITU

The purposes of the Union as set forth in article 3 of its Convention are as follows:

------ to maintain and extend international cooperation for the improvement and rational use of telecommunication of all kinds.

------ to promote the development of technical facilities and their most efficient operation with a view to improving the efficiency of telecommunication services, increasing their usefulness and making them as far as possible, generally available to the public;

------ to harmonize the actions of nations in the attainment of those common ends.

Objectives of the Union

In furtherance of its purposes, the Union shall according to article 4 (2) (a) to (g) of the ITU Convention will keep doing to:

------ effect allocation of the radio frequency spectrum and registration of radio frequency assignments in order to avoid harmful interference between radio stations of the different countries;

------ co-ordinate efforts to eliminate harmful interference between

radio stations of different countries and to improve the use made of the radio frequency spectrum;

------ co-ordinate efforts with a view to harmonizing the development of telecommunications facilities, notably those using space techniques, with a view to full advantage being taken of their possibilities;

------ foster collaboration among its members with a view to the establishment of rates at levels as low as possible consistent with an efficient service and taking into account the necessity for maintaining independent financial administration of telecommunication on a sound basis;

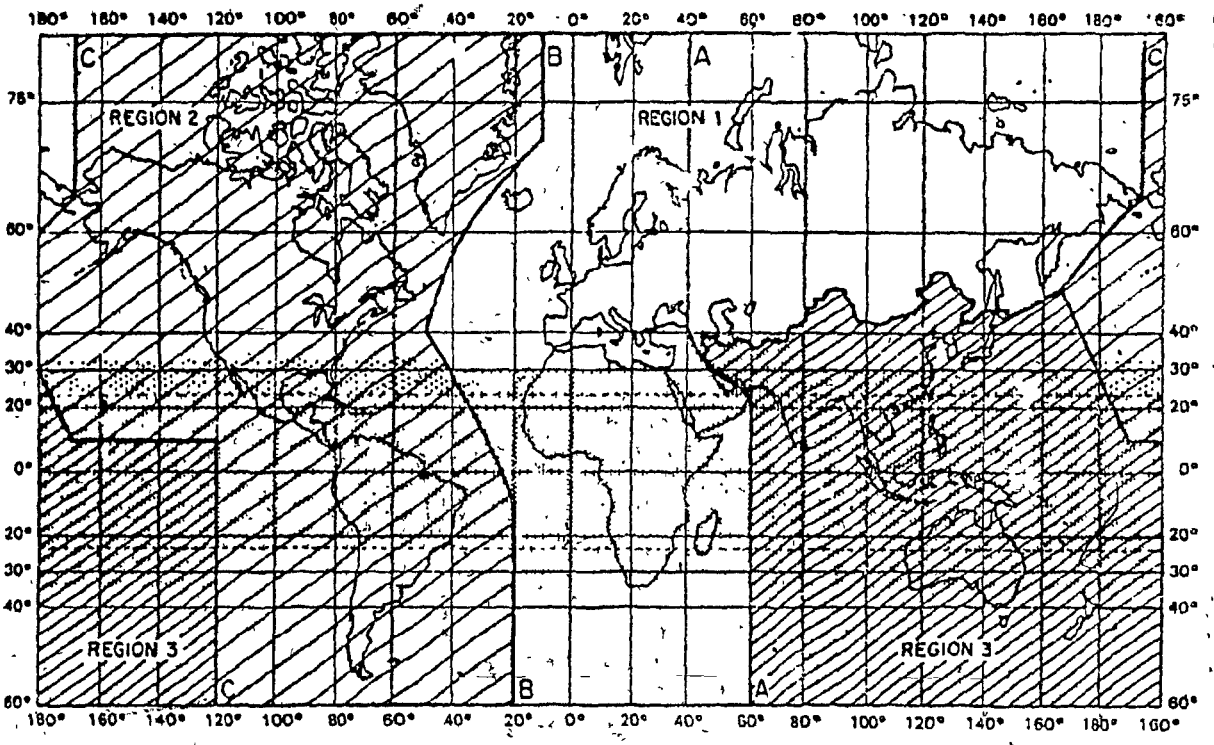
------ foster the creation, development and improvement of telecommunication equipment and networks in developing countries by every means at its disposal especially its participation in the appropriate programmes of the UN ;

------ promote the adoption of measures for ensuring the safety of life through the co-operation of telecommunication services;

------ undertake studies, make regulations, adopt resolutions, formulate recommendations and opinions and collect and publish information concerning telecommunication matters.(67)

The resource allocation of the radio frequency spectrum

For the purpose of the ITU, the globe has been divided up into three regions. These Regions as shown on the map, are described as follows:



The shaded part represents the Tropical Zone as defined in Nos. 406 to 410 and 411.

Region 1

Region 1 includes the area limited on the east by line A (68) and on the west by line B, excluding any of the territory of Iran which lies between these limits. It also includes that part of the territory of Turkey and the USSR lying beyond these limits, the territory of the Mongolian Peoples Republic, and the area to the North and the USSR which lies between lines A and C.

Region 2

Region 2 includes the area limited on the east by line B and on the west by line C.

Region 3

Region 3 includes the area limited on the east by line C and on the west by line A, except the territories of the Mongolian Pepoles Republic, Turkey, the territory of the USSR and the area to the north of the USSR. It also includes that part of the territory of Iran lying outside those limits.

Other organizational activities include standardization, joint planning, and technical cooperation for the advancement of telecommunication in developing countries, although these activities are influenced by political views in the organ. However, the ITU has developed several forms of planning for this purpose.(69) The Plan

Committees of the CCITT/CCIR, administered by the CCITT, produce separate books for the planning of inter-continental and inter-regional services.(70) The Union receives support from the UNDP funds to achieve its aims and objectives. Thus, continued high level technical cooperation activities in the ITU and, in particular, in its two Consultative Committees seems assured.(71)

3.4 The ITU and Formulation of its POlicy

a. Internal System

The ITU was the first world organization to legislate on activities concerning space utilization.(72) The Union has divided its organizational work as discussed earlier.(73) For ITU there are three types of conferences responsible for its periodic constitutional needs of maintaining the operation of the organ. There has been much discussion about their structure; however, a fresh look at their policy-making role is considered pertinent.

The Plenipotentiary Conference

It is generally called the General Assembly of the Union with powers to review the whole Constitution.(74) Article 6 of the Convention provides, inter alia, that the Plenipotentiary Conference shall determine the general policies for fulfiling the purposes of the Union prescribed in Article 4 of the Convention. However, the Conference does not carry out that role, particularly with respect to technical matters, in view of the infrequent meetings, its preoccupation with constitutional, administrative and financial matters and, justifiably the predominant role of the Administrative Conference.(75) It concludes and revises, if necessary, agreements between the Union and other international organs, examines any provisional agreements with such organizations concluded on behalf of the Union by the Administrative Council and takes such necessary measures it deems appropriate in connection therewith. It deals with such other telecommunication questions as may be necessary.

It should be emphasized that the Plenipotentiary Conference is less technical and more political in nature and can assume the responsibility, whenever necessary, to adopt resolutions and recommendations based on the work of national as well as international organizations. But, the purpose of the resolutions would not be to arrive at binding decisions. It would be merely to set out some general relevant factors which the appropriate organs should take into account when making the necessary technical decisions relating to systems planning, development and coordintion.

The General Secretariat

The General Secretariat is directed by the SG assisted by the DY SG.(76) The SG has only limited administrative powers over the other three organs,(77) (IFRB, CCIR, CCITT) and virtually no power over their substantive activities. The DY SG is also elected by the Plenipotentiary Conference. This cumbersome structure of the ITU seems to be a direct result of its history and the development of the different organs.(78)

As stated earlier, the SG shall take all the actions required to ensure economic use of the Union's resources and shall be responsible to the Administrative Council for all administrative and financial aspects. The DY SG is responsible to the SG and shall assist him. The SG acts as legal representative of the Union. In the absence of the SG, the DY SG acts as the SG on all administrative, financial and technical cooperation matters affecting more than one permanent organ, and on external relations and public information, he keeps himself fully abreast of the decisions of the Administrative Council and the interest of the Union as a whole.(79) The SG acts as the Union's spokesman in relation with other international bodies and is responsible for publications of the Union's research work and studies.

The Coordination Committee

The Coordination Committee is the organ which deals with all (80) administrative, financial and technical matters. It also keeps the public information, decisions of the Administrative Council and the interest of the Union as a whole. The Committee is also competent to consider important matters referred to it by the Administrative Council. However, they would be presented to the Council through the SG, only after having been examined by the Committee.(81) The root cause for the creation of the Coordination Committees was to preclude any possibility of conflict in presenting the policy of the Union through the Administrative Council.(82)

The Administrative Council

It holds an annual session at the seat of the Union. The SG, the Dy SG, the Chairman and the Vice-Chairman of the IFRB and the Directors of the ICCs may participate as a matter of right in the deliberations of the Administrative Council, but with no right to balloting. Nevertheless, the Council may confine the deliberations to its own members.

The Administrative Council seems to enjoy extensive administrative powers. It may, provisionally, resolve questions not necessarily covered by the Convention. Huszagh has explained this in the following way:

"The Administrative Council is very instrumental in shaping ITU policy. Its extensive powers of review, ability to authorize questionnaires to members soliciting a wide range of information, relatively small size and its frequent meetings enable it to evaluate accurately the needs of the Union and membership and subsequently reach agreement upon the appropriate approach".(83)

Thus the Administrative Council has a vital monopoly over its affairs and is well protected under the provisions of the Convention.(84)

The Administrative Conference

The Administrative Conferences are normally convened to consider specific matters pertaing to telecommunications. The decisions of such conferences must in all circumstances be in conformity with the provisions of the Convention and it is competent to revise administrative regulations.(85) A regional conference will consider questions of telecommunication only of a regional nature. These issues should not conflict with the interests of other regions. The agenda of the conference shall also include the questions decided upon by the Plenipotentiary Conference.(86) The World Administrative Conferences dealing with radio communication may include an item concerning instructions to the IFRB regarding its activities.

The International Frequency Registration Board(IFRB)

The elected members of the IFRB shall serve not as representatives of their respective countries, or any region, but as custodians of an international public trust.(87) The difficulties faced by the Board arise primarily from the fact that many countries do not obey the Board's findings when it is not in their best interests to do so. The IFRB does not have decisional powers in frequency matters, but its actions are, neverthless, very far reaching since it intervenes in the area of radio frequencies used by various radio services throughout the world. (88) Estep and Kearse are of the opinion:

> "that the IFRB has no further power except to ask the proposing country involved to examine its position. It has no real enforcement powers but it certainly provides a technical monitoring publication service to indicate whether stations are actually occupying their assigned frequency or whether other frequencies are being used that will cause disturbance to other users. It cooperates very closely with the UN and several of the UN specialized agencies such as the ICAO, WMO and UNESCO"(89)

The International Consultative Committees

The standards promulgated by these Committees enjoy unanimity and their observance is voluntary. CCITT and CCIR standards are known as "recommendations",(90) and they deal primarily with issues connected to the establishment, development and improvement of telecommunication in the developing countries. (91)

b. A General Policy Making Process

There are three kinds of regulations dealt with by the Union; (a) telephone (b) telegraph and (c) radio.

Recent telegraph and telephone regulations were drawn up by the World Administrative Telegraph and Telephone Conference held in Geneva in April 1973, which came into force on September 1, 1974. On the other hand the Radio Regulations which were adopted in 1959, have been revised many times. The most recent revision was at WARC-79, which came into force on January 1, 1982.

The Union is one of the institutional arrangements for space activities. The structure has reflected both states' unwillingness to concede powers to an international organization, and reluctance to strongly centralize controls within itself. The Union therefore, seems complex, untidy, and weak. In its field, it is not a rule-making leader but a catalyst. Its principal output is world-wide standards which are voluntary. However, it is important to mention that the Union is basically a technical organization, limited to the field of its jurisdictional competence, i. e. telecommunication. Matte explains it in a more judicious way:

"The ITU does not and cannot consider the economic, legal, political and social aspects of all outer space activities. But, within its competence it has been highly successful in assuring legal order in outer space and in implementing the principle of the Outer Space Treaty of 1967, according to which the exploration and use of outer space shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or

scientific developments. "(92)

b.1 Technical Rules

The ITU provides technical standards in international telephone, telegram and space communication. The operation of telecommunications throughout the world is now governed by the ITU Convention.

b.2 Administrative Regulations

Administrative regulations supplement the Convention and are drawn up at Administrative Conferences. These regulations contain detailed provisions applicable to telecommunications. Technological advances have increased rapidly in recent years, which has made realization of the concept of a global telecommunication network a practical possibility. However, it should be remembered that the Union does not operate international links. This is done through the Plan Committees, which may be described as (a) World Plan Committees and (b) Regional Committees. There are four Regional Committees at present for four different regions: Africa, Latin America, Asia and Oceania, and the European and Mediterranean Basin.(93)

The World Plan Committee is responsible, either directly or indirectly through its regional committees, for establishing a general plan for development of the international telecommunication network,

to assist administrations and recognized private operating agencies, in concluding ageements designed to organize and improve international services between their respective countries; and in examining the technical aspects, as well as questions of tariff regulations raised either directly or indirectly in the various regions of the world. It evolves an inventory of questions of interest to developing countries and sets such questions for study by the competent Consultative Committee, if necessary.(94)

Apart from the ITU Convention, there are other sets of regulations:

------ Telephone and Telegraph Regulations

------ Radio Regulations with Additional Radio Regulations.

The Telephone Regulations are applied in each country by the Administration and very often combine post, telegraph and telephone services. The existing Telegraph Regulations were essentially drawn up by the World Administrative Telegraph and Telephone Conference, held in Geneva, in April 1973 which came into force on September 1, 1974.

On the other hand, the Radio Regulations are helpful in the establishment of comunications between stations and also in preventing harmful interference. The various sections of these regulations deal with ways to avoid interference by providing the bands of frequencies

in the radio spectrum which are allocated to specific services such as broadcasting, the aeronautical mobile service, radio navigation, the space service, radio amateurs etc. The additional Radio Regulations contain supplementary instructions for radio-telegraphy and radio-telephone communication.

b.3 Legal Norms

Jerome Kravs has stated that the technical aspects of space communications and space surveillance reveal the following points which are potentially significant for legal development:

------ "Communications and surveillance technologies tend to merge as the entire range of the electromagnetic spectrum has been opened to both technologies by the development of the laser".

------ "The use of the coherent waves at frequencies above microwave (infra red, ultraviot etc.) permits the use of higher and higher concentrations of energy in communications and surveillance".

------ "The atmosphere of the earth severely attenuates frequencies above about 10 g/c".

------ "The development of coherent light generation potentially makes viable millions of new communication channels and much higher resolution action surveillance system".(95)

Moreover, the Preamble of the Convention while fully recognizing the sovereign rights of each country to regulate its telecommunications services assigns special responsibilities to the Union in the following matters:

" to effect allocation of the radio frequency spectrum and

registration of radio frequency spectrum and registration of the radio frequency assignments in order to avoid harmful interference between radio stations of different countries".

"another task is to eliminate harmful interference between radio stations of different countries and to improve the use made of the radio frequency spectrum".

These are technical rules which have legal implications,(96) and therefore, it is safe to say that the ITU's governing process is legislative and quasi-judicial.

i) The ITU's Legislative Process

Outer space utilization is in part governed by existing internationl law, space law and the Union's regulations. The ITU adopts, changes, and recommends the provisions of the radio regulations, which constitute an extra ordinarily intricate and interlocking corpus of law.(97) The methods for allocation of frequencies in international conferences, at which all members are represented clearly qualifies its legislative process. Professor Christol affirms that:

"Theoretically such assignments could be made by states as they might see fit. However, membership in the ITU obliges them to participate in the above mentioned legislative process. Assuming a willingness on the part of the signatories to the ITU conventions a state will notify the IFRB of the frequency assignment".(98)

ii) The ITU's Quasi-Judicial process

The ITU has a unique system whereby enforcement of the law occurs automatically. The IFRB merely registers a frequency but does not have enforcement authority. However this lack of legal authority does not necessarily mean that there is no legal compliance. All states generally observe frequency allocations since it is in their own best interests. Therefore, the ITU's laws are self-enforcing.(99) In the event of disputes over the distribution of a frequency and in settling disputes arising from interference the Board depends on the cooperation of its member states. Should member states not cooperate, the Board may use its discretionary powers and penalize the non-cooperative Administrations.(100) Christol has stated that:

> "The IFRB possesses regulatoy authority to examine the national notice, correspondence with the state, issue findings with respect to conformity to existing laws, identify the possibility that the noticed frequency would constitute harmful interference with previously recorded assignments, and record the national assignments in the Master International Frequency Register. This phase of the ITU's activities has been described as regulatory with the functions of the Board being quasi-judicial. This conclusion is supported by the fact that the legal status of a national assignments depends in part on the findings of the Board. "(101)

In practice, enforcement of the ITU's regulations depends primarily upon the efforts and goodwill of ITU members themselves, and disputes are resolved without resort to juridical concepts or the arbitral or judicial process.(102)

b.4 An Analysis of the ITU's Law Making Process

It is probably safe to say that initially, participants in the ITU's decision-making process were not equipped with the necessary legal expertise, and that while they may have made the best technological judgments, economic, social and cultural considerations were often forgotten. With the increased participation of lawyers in this process (103) new theories of sharing limited natural resources are being introduced, (104) and member states should now realize that many of the decisions being made by the ITU are merely technical but also economic, political, social, cultural and legal in nature.

If one examines the policy-making process of the Union, it is evident that a change is needed with respect to its aims and objectives in the light of emerging international law. Specifically, the present imbalance in international developments warrants examinations by the ITU of the injustices caused by excessive use of space platforms by the developed states. The ITU should take steps towards division frequency use. Global interdependence in which telecommunication plays a vital role, is widely acknowledged as a salient trait of the new world order. Therefore, the Union's conferences, meetings and study groups should not comprise merely technical personnel. National delegations should include experts with a comprehensive knowledge of the subject matter. These delegations must bring pressure to bear on the ITU's policy-making process not only with respect to technical, but also legal, economic, social and cultural considerations. Indeed, it is no longer possible to ignore

the economic and social cosequences of technical decisions in the field of telecommunications. The international community has a responsibility to address these policy issues systematically and explicitly, instead of resolving them as a by-product of technological decisions. The community of nations has an obligation to ensure that all countries have an equal voice in shaping global telecommunications and this objective should not be accomplished by merely tinkering with the present ITU mechanism. Reforms are needed together with a reassessment of the present and future needs of the developing countries.

4. FOOTNOTES OF PART - A

1. See Article 55 to 61 of the UN Charter, 1945.

2. Feldman, M. L. B., The US in the International Telecommunication Union and in pre ITU Conference, (Los Angles, 1976), pp.1-3.

3. See Annex 2 of the ITU Convention, 973, (hereinafter cited as the ITU Convention), in ITU, International Telecommunication Convention - Final Protocol, Additional Protocols, Resolutions, Recommendations and Opinions, (Malaga-Torremolinos, 1973), (Geneva, 1973), p. 137; Also printed in U.S.T., as T.I.A.S. No.8572.

4. Cros, G. C., "Forward", in, ITU, From Semaphore to Satellite, (Geneva, 1965), p.7.

5. The twenty countries which participated in the conference were Austria, Baden, Belgium, Denmark, France, Greece, Hamburg, Hanover, Italy, The Netherlands, Portugal, Prussia, Russia, Saxony, Spain, Sweden, Norway, Switzerland, Turkey and Wurttemberg.

6. Wgreely, A., Reminiscences of Adventure and Service, (New York, 1927), p.16.

7. Watebury, J., "The international preliminary conference to formulate regulations governing telegraphy", North American Review, CDXXVII, (November, 1903), pp.663-64.

8. Leive, D. M., International Telecommunications and International Law: The Regulations of the Radio Spectrum, (Leyden, 1970), p.40.

9. Countries which participated were Austria, France, Germany, Great Britain, Hungary, Italy, Russia, Spain and USA.

10. Soloman, M., "The Berlin Conference on Wireless Telegraphy", Nature, LXVIII, (1903), P.437.

11. Gleason, L. A., Big Business and Radio, (New York, 1930), p.64.

12. Codding, G. A,. The International Telecommunication Union, (Leyden, 1952), p. 88.

13. See Berne Union, Statistique generale de la radiotelegaphie, 1912, (Berne, 1914).

14. ITU, supra note 4, p.151.

15. Codding, supra note 12, p.118.

16. See IRU Conference, Convention radio internationale de Washington, (1927), Vol 2, p.63.

17. The word 'Telecommunication' was defined at Madrid as follows :

"any telegraph or telephone communications of signs, signals, writings, images and sound of any nature by wire, radio, or other system or process of electric or visual semaphore signalling." See ITU, supra note 4, pp-160-161.

18. Caldwell, L. G., "International Radio Chronicle", Journal of Radio law, II (July, 1932), pp.606-22.

19. ITU, supra note 4, p. 165.

20. Codding, supra note 12, p.157.

21 It was the first official attempt on the part of the Radio Telegraph Union, to bring about an allocation of frequencies by station, See, IRU Conference, (Documents) Radio electrique europeenne de Prague (1929), (Berne, 1929).

22. See ITU Conference internationale des radio communications, Documents de la conference internationale des radio communications du Caire, (1938), Vol. I, pp.509-519.

23. See for details, ITU, CCIF,XIIIe Assemblée Pleniere (London, October 29-30, 1945); Also see for a brief review of the meeting, Telecommunication Journal Vol. 2, No. 12, (December, 1945), pp.153-159.

24. See Moscow telecommunications conference Documents 1945, (Berne, 1946) Vol. I P. 16.

25. Miller, B. T., "The international telecommunications Conference of 1947", Bell Telephone Magazine, (Winter, 1947-48), pp.192-203.

26. Glazer, J. H., "INFELIX ITU the need for space age revisions to the international telecommunictions convention, 23 Federal Bar Journal, No.1, (1963), pp.1-36.

27. See Article 11, para 3 of the Atlantic City Convention 1947.

28. In addition to the actual allocation of frequencies for space radio communication purposes, the radio regulations contained several recommendations applicable to space telecommunications and radio astronomy. See, ITU administrative radio conference, Geneva (December 3, 1959), Document No. 746-E.

29. See Israesl's argument at the 1963 Space Conference, Document No. 39-E, September 27, 1963, p.2.

30. See UNGA, sixteenth sesson, Resolution No. 1721 (XVI), December

20, 1961.

31. See ITU Plenipotentiary Conference Montreux, 1965, Committee 4 (organization of the Union), proposals for the reorganization of the ITU permanent structure, Doc. No. DT 13, 17, September, 1965.

32. Leive, D. M., supra note 8.

33. Matte N. M., Aerospace Law from Scientific Exploration to Commercial Utilization (Toronto, 1977), pp.30-36.

34. See Articles 10 and 33 of the ITU Convention.

35 See Telecommunication Journal, Vol.41, No.VIII, (1974), pp. 466-521.

36. See, Telecommunication Journal, Vol. 44, No. II,(1977), pp.42-87.

37. See International Regulations as revised by WARC-79, ITU, The Final Acts of WARC, (Geneva, 1979).

38. Berrada, A., "The effect of the 1979 WARC on the ITU", Intermedia, (November, 1980),Vol. 8, No. 6, pp.32; Also see Brian Segal, "International Negotiations on telecommunications", ibid., pp.22-31.

39. See Official announcement in Telecommunications Journal, Vol. 49, NO.IV, (1982), p.257.

40. See Article 6 of the ITU Convention. Also for the ITU's Plenipotentiary Conference at Nairobi, 1982, see ITU Document No. 1-E, (Jannuary 28, 1982).

41. See CCIR XVth Plenary Assembly, 1982. Doc. PLEN/6- (November 18, 1981).

42. The resolution invites the CCIR to carry out preparatory studies for the first session in 1985 and to provide technical information concerning principles, criteria, and technical parameters including those required for planning space services. See CCIR XVth Plenary Assembly Geneva 1982, Doc. PLEN/IE and CCIR XVth IWP 4/1 provisional technical report for WARC-84, Doc. PLEN/10 E November 27, 1981.

43. Codding, supra note 12, p.220

44. See Moscow Conf. Doc. 1946 Vol.1, p.6.

45. Ibid.

46. See UNO, Economic and Social Council, first year, second session, official records, (New York, 1946), p.173.

47. See The UN department of public information, in, The Year Book

of the UN, 1946-47, (New York, 1947),p.827.

48. Year Book of the United Nations, (1947-48), pp. 924-954.

49. See Agreement between the UN and the ITU, ibid., pp.952-954.

50. See the minutes of the thirteenth session of the League of the Nations advisory and technical committee for communications and transit, (Geneva, 1929).

51. See the resolution of UN ECOSOC which was presented at the Moscow preparatory conference, supra note 24, pp. 25-26.

52. Atlantic City Conf.Doc. 1947, UN Doc. A /370/ Add., pp.25-26.

53. Articles 57 and 63 of the UN Charter.

54. Atlantic City Conf.Doc. supra note 52, pp.262-264.

55. Doc. 335 T R, p.4.

56. Articles 1 (4) and (5) of the ITU Convention.

57. Article 5 , ibid.

58. Article 6, ibid.

59. Ibid.

60. In 1982.

61. Article 8 (1) of the ITU Convention.

62. Article 57, ibid.

63. The private operating agencies must be duly authorized by their respective governments.

64. These books also contain a list of the questions under study, and programmes, reports and opinions adopted by the Plenary Assembly of each International Consultative Committee; See CCIR : 13 Volumes for the XIVth Plenary Assembly, Kyoto 1978; CCITT: 9 volumes for the VIth plenary Assembly, Geneva, 1976.

65. The study groups have published many hand-books on telecommunication issues by 1979.

66. See CCIR XVth Plenary Assembly Geneva, 1981, Doc PLEN/ 10-E, November 27, 1981, pp.1- 434.

67. Article 4 (2) (a) of the ITU Convention.

68. Lines A, B and C are defined as follows:

Line A extends from the North Pole along meridian 40 (degree) East of Greenwich to parallel 40 (degree) North; thence by great circle arc to the intersection of meridian 60 (degree) East and the Tropic of Cancer; thence along the meridian 60 (degree) East to the South pole.

Line B extends from the North Pole along meridian 10 (degree) West of Greenwich to its intersection with parallel 72 (degree) North; thence by great circle arc to the intersection of meridian 50 (degree) West parallel 40 (degree) North; thence by great circle arc to the intersection of meridian 20 (degree) West and parallel 10 (degree) South; thence along meridian 20 (degree) West to the South Pole.

Line C extends from the North Pole by great circle arc to the intersection of parallel 65 (degree) 30' North with the international boundary in being straight; thence by great circle are to the intersection of Meridian 165 (degree) East of Greenwich and parallel 50 (degree) North; thence by great circle arc to the intersection meridian 170 (degree) West and parallel 10 (degree) North; thence along parallel 10 (degree) North to its intersection with meridian 120 (degree) West; thence along meridian 120 (degree) West to the South Pole.

69. Article 4 of the ITU Convention.

70. However, the goal is the harmonisation of national plans, not centralization of authority for their implementation. Thus, planning for international telecommunication service expansion consists of coordination and reconciliation of country by country plans.

71. Wallenstein, G. D., "Bridges between international standardization and national telecommunications development", Telecommunication Journal, Vol 43, No. X, (October 1976), pp. 633-637.

72. Ibid.

73. Articles 51 to 59 of the ITU Convention.

74. The word plenipoentiary itself means that the delegates are fully authorized to sign and ratify the Convention, see Fowler and Fowler, The Concise Oxford Dictionary, (New Delhi:1975)

75. Leive, D. M., The Future of the ITU, Report for the 1973 Plenipotentiary Conference Panel on International Telecommunications Policy, (Leyden, 1972),pp.11-13.

76. Article 9 (1) (i) of the ITU Convention.

77. The work of the IFRB is determined by the Administrative Radio Conference which also elects the Board's members. The work of the CCIR and CCITT secretariat and study group is decided by their Plenary Assemblies, composed of technical representatives of the ITU member countries who also elect the directors of the Secretariat.

78. John and Mary R. Markle Foundation, Global Communications in the Space Age, towards a new ITU, Report of an International conference, sponsored by the John and Mary R. Markle Foundation and the Twentieth Century Fund. (John and Mary R Markle Foundation), (New York, 1972), pp.20 21.

79. Articles 12 1 (i), and 56 of the ITU Convention.

80. Ibid.

81. See Article 56 para 1 Sub para (s) of the ITU Convention.

82. Smith, D. D., International Telecommunication Control, Internationl law and the Ordering of Satellite and other forms of International Broadcasting, (Leyden, 1969), pp 26-27.

83. Huszagh, "The international law making process: A case study of the international regulations of space telecommunications", (Unpublished thesis),(University of Chicago, 1969), p.29.

84. Wallenstein, G. D., "Development of Policy in the ITU", Telecommunication Policy, (March, 1977), pp.145-46

85. See, article 7 para 3 (1) (a) of the ITU Convention.

86. See, article 7 para 3 (1) (b), ibid.

87. Article 10, ibid.

88. Cata, A. H., "The ITU as a regulatory body", 28, Telecommunication Journal, (1961), p.340.

89. Estep and Kearse, "Space Communications and the law, Adequate International Control after 1963", 60 Michigan Law Review, (1962) pp.887-88.

90. CCIs often adopt a choice of recommendations rather than forcing adoption of a single world-wide standard over the objections of a minority. While this solution is not the most efficient and economical, it is the only acceptable one in the face of rapid technological change and industrial rivalries; See Jones, W. T., "The Role of international standardization in telecommunications network development", Telecommunication Journal, Vol. 40, No.4, (April, 1973),pp 207-210.

91. Articles 11 para 4, and 58 of the ITU Convention.

92. Matte, N. M., "Institutional arrangements for space activities: an appraisal", Annals of Air and Space Law, (hereinafter cited as AASL), Vol. VI, (1981), pp.439-459.

93. There is no regional committee for North America. The administrations are recognized private operating agencies in the

region co-ordinate their regional activities by means of bilateral agreements, they play an active part in the work of the World Plan Committee which concerns international relations.

94. The World Plan Committee met in 1963 in Rome, in 1967 in Mexico City, in 1971 in Venice and in Geneva in 1975. The last meeting of the Committee was held in 1980.

95. These four principles are presented as a tentative code of the law of space communications and space surveillance once all of the principles are implicit in the literature of space law. See Samuel, D. E., "International law makers in a technological world, space communications and nuclear energy", 33 George Washington Law Review, (1964), pp.162-80.

96. Pepin, E., "General legal problems in Space Communicaions Telecommunications Journal, Vol. 38, No.V, (1971), pp.386-388.

97. Leive, D. M., supra note 8, p.12.

98. Christol, C. Q., "The International Telecommunication Union and the International Law of Outer Space, 79 Colloquium on the law of outer space, (hereinafter cited as Colloquium), pp.35-39.

99. Leive, D. M., supra note 8, p.24.

100. Ickowitz, A. H., "The role of ITU in the settlement of harmful interference disputes", Columbia Journal of Transnationl law, 13:1,(1974), pp.96-97.

101. Christol, C. Q., supra note 98, p.20.

102. Leive, D. M., supra note 8, p.25.

103. Samuel, D. E., supra note 95, p.162.

104. See UNGA Resolution, 3171 (XXVIII), on Permanent Sovereignty over Natural Resources, December 17, 1973, in, International Legal Materials, Vol. XIII, 1974, pp.238-240.

PART - B

INTERNATIONAL LAW OF SPACE TELECOMMUNICATIONS

1. INTRODUCTION TO THE SPACE AGE OF TELECOMMUNICATION

The years which followed the launching of the first Sputnik were marked by a steady improvement in space telecommunications. Point to point recalling of telephone and telegraph messages were matters of immediate engineering design. However, the question as to the desirability of communications satellites, is linked to economic, sociological and political factors. Before space broadcasting becomes generally acceptable, a number of problems must be resolved such as how to provide high quality broadcasting from space, and compatible broadcasting services in view of the differences in broadcasting standards around the world, and how to assure equitable operation of the GSOS.

Since 1958, the ITU has been concerned with the impact of artificial satellites on its technical development and regulations. Space communications received considerable attention at the Geneva Radio Conference in 1959 and at the Xth Plenary Assembly of the CCIR in Feburary 1963. In October and November 1963, the ERAC on space communications made extensive allocations for space services.(1)

1.1 Satellite Communication System and its Types

The future utility of a high capacity communication satellite depends largely on the growing demand for telephone and telegraph services and TV transmissions. Conventional radio signal techniques did little to contribute to the communication process, given the inherent quality of transmitting radio waves in a straight line, as in the case of light waves. High frequency radio systems depend on the ionized layers of the atmosphere at altitudes of 40 miles and up, to reflect or bend radio waves in accordance with the curvature of the earth. But this system is not dependable, being subject to the vagaries of the ionosphere which varies in altitude and intensity depending on its position over the earth. The capacity of any satellite communication system is measured in terms of its "bandwidth". The bandwidth of a system is a statement of the amount of information it can carry at a given moment. It is measured in terms of the numbers of cycles per second, that a system can faithfully convey. It is interesting to note that TV transmission requires approximately 1000 times more bandwidth than voice transmission. Generally, it takes a bandwidth of about 4000 cycles per second to carry and reasonably reproduce a voice over a communication system. Thus, a two way telephone "voice channel" requires a bandwith of twice 4000 cycles per second.(2)

Microwave systems also exist, which use extremely high frequency radio waves. This technique can be used over land for long distance communications, using the ionosphere as a reflector which can extend

from 3-30 megacycles per second in the radio frequency spectrum, microwave communication extends from 1000-to 10, 000 Megacycles per second.(3) Thus, a microwave system can serve only between two points which are visible by each other.(4) To place a microwave reapeater at a height from which the two opposite or multi directional points could be seen was the logical next step, although it was to be placed only above the high seas. Hence, the positioning of satellites at a certain height had begun and eventually, the whole globe would be covered by the positioning of three inter-linked satellites on the geostationary orbit.(5)

a. Active and Passive Satellites

The way in which a satellite system operates is more appropriately a field to be studied in engineering, than in law. But, in order to understand the intricate legal issues of technological developments at the international level, a lawyer must acquaint himself with the general functions of the system.

There are active and passive communication satellites. A radio signal might be reflected without amplification from a surface placed in a high orbit. A satellite used in this way is called passive. In the case of active satellites, a radio receiver picks up a signal being transmitted from a point on the earth, and a radio transmitter then transmits it back to earth.(6) The latter case allows for the use of amplification; that is, the received signal can be made many

times more powerful within the satellite through the use of electronic amplifiers.(7) This is not the case with passive satellites which is considered to be a disadvantage. Also, passive systems need powerful ground transmitters and sensitive ground receivers. In so far as active systems are concerned, there is always the prospect of failure of its electrical parts at a height at which they can not be repaired.

Telecommunication satellites can also be categorized according to their technical composition, place in the earth's orbit, and their radiation power.(8)

b. Non-Synchronous Satellites

On the basis of the orbital circle of a satellite two types of satellites may be distinquished; (a) satellites on synchronous equatorial orbits; and (b) satellites on a stretched inclined elliptical orbit. If a satellite is placed in a lower orbit, it is called a non-synchronous satellite.

c. Point to Point Satellites

Signals are transmitted via the satellite between earth stations connected to existing terrestrial telecommunications networks. However, various technical constraints still limit the provisions of electrical energy on board the satellites, and consequently the power

of the satellite transmitter through which the signal arrives becomes very weak. Therefore, an earth station antennae is needed which has high gain, which can capture a minimum of radio electric noise, and which can be pointed precisely in the direction of the satellite. Such point to point extensions of the terrestrial networks were made for the provision of long distance, wideband telecommunication services.

d. Distribution Satellites

Use of distribution satellites makes it possible to provide a stronger signal to a smaller region of the earth, and avoids certain constraints with regard to the earth stations. The signals emitted by such satellites are strong enough to be received by relatively smaller and simpler antennas, but are not yet strong enough to be received by conventional domestic radio and TV sets.(9) The signals which are emitted are distributed over a large area of the earth's surface and can be received by many earth stations, both mobile(10) and fixed(11) in that area. The use of distribution systems is wide - ranging since they can provide services over large countries, as seen in the USSR and in North America.

e. Broadcasting Satellites

In this case, satellite signals can be received directly by conventional radio and TV sets without the need for intermediate earth stations. The UN working group in 1969, reached the following conclusions with regard to the feasibility of satellite broadcasting:

"while it is considered that satellite technology has reached the stage at which it is possible to contemplate the future developments of satellites capable of direct broadcasting to the public at large, direct broadcasting TV signals into existing unaugmented home receivers on an operational basis is not foreseen for the period 1970-1985".(12)

1.2 Development of Space Communication Technology

Space communication technology is complicated and expensive to operate, but it is of tremendous value. It involves, ground facilities for transportation, and tracking, orbiting and earth stations to receive and broadcast signals. Very few countries have such facilities at their disposal or the technology to develop them.

a. Evolution of a Satellite Orbit

Communication satellite technology is one aspect of space activities that promises to have the greatest impact on future international operations and the use of radio spectrum resources. The advent of space technology in the early 1960's brought with it some of the basic principles of communication systems. The US and USSR provided practicable examples of the placing of satellites in lower orbit.(13) Choosing a place for a communication satellite depends on the requirements of the country concerned, but the choice must be made in such a way as not to cause harm in the present or in the future. This applies to satellites in a lower orbit. However, in so far as the GSO is concerned, choice has been on the basis of rational use of limited natural resources. What is rational in this context has not yet been defined by any Convention. In the author's opinion, rational use should not necessarily be confined to the criteria of utility and non-interference with other satellite networks. It should be made clear in any defination of rational use that positions on the GSO can

not be occupied in such a way as to ignore the sovereign participation of all states. This does not imply that portions of the GSO remain unused due to a country's lack of adequate technological expertise to place satellites in that orbit. Rather the concept of use of outer space for the benefit of all mankind should be given effect.(14) What is needed at this stage is international cooperation. If the Space Powers want to enjoy the benefit of using their technology in their own interests, they should be obliged to negotiate for excessive utilization, either by offering free communication services with the necessary cost sharing, or by providing compensation for the use of such a scarce and valuable natural resource.

While the GSO is considered as a limited natural resource it differs from other natural resources such as minerals found on earth. Future emphasis will be on extensive reuse of existing frequencies and widespread application of signal processing techniques for more efficient use of each unit of bandwidth. Ultimately, through the use of heavy vehicle transportation systems much larger spacecraft will be placed in orbit. These will have large, high power antennae for multiple frequency reuse. Signal processing will be done on the satellite and each satellite will accomodate a variety of missions.(15) Moreover, as an alternative to a single large platform, it has been proposed that two or more smaller spacecraft be clustered in a single geostationary orbit slot and tied together not by structure, but by microwave beams.(16) In order to provide adequate juridical status to the GSO, it should be considered as follows:(17)

------ As a region in outer space, as a place for the location of satellites, as a point for receiving and transmitting telecommunication, as an area for picking up and transmitting solar energy; and

------ as implying the right to follow a path, a flight path system and as a limited natural resource.

In view of political(18) legal and technological consequences the GSO has become the focal point of space telecommunication law with respect to the delimitation of outer space.

b. Characteristics of a Satellite Communication System

Communication via satellite is the outgrowth of developments in two main areas of activity; space technology and communication technology, (19) and is, generally speaking, nothing more than a radio relay station at a certain high altitude which is placed in orbit in order to cover long distance points over the earth.

The establishment of a communication satellite system requires consideration of many factors, including the technical feasibility of developing such a system. It is an expensive activity which has the potential to contribute towards human development, but certain legal obligations must be complied with. Satellite communication systems possess a number of unique features that have allowed them to quickly

establish their place along with the existing terrestrial systems. Often their role has been complementary, rather than competing.(20) However, they do possess characteristics that can create difficulties for the system designer particularly in respect to integration with terrestrial facilities.

Since the types of satellites have already been discussed, attention will focus on the characteristics of the system. It comprises both the satellite itself, and the necessary control and tracking facilities(ground segment). Its main characteristics are as follows:

b.1 Flexibility

The satellite based system is advantageous primarily in areas where the existing infrastructure is inadequate. The advantage lies in the satellite system's multiple route capability as opposed to the single route capability of terrestrial systems. Through this system, it is possible to serve multiple routes with a single facility and to reallocate channel capacity among the routes, which would have not been possible by the single terrestrial links. This available flexibility also makes possible the use of small transportable earth stations for service on occasional, as well as on a continuous, basis for remote locations without the need for physical connections. Furthermore, mobile terminals on ships, aircraft and space vehicles can be used for aeronautical, maritime, mobile or space services.

b.2 Size of the Coverage Area

A large surface area can be coverd by the use of satellite. Amongst other advantages, the satellite is also an effective means of national integration, as well as a source of security.

b.3 Number of Receivers Audience Size and Beneficiaries

Communication through a satellite system can be received by a large audience at different places simultaneously.

b.4 Geographical Features and Coverage

The problem of high altitude and the constraints of geographical features of a particular region, such as hilly terrain, can considerably reduce the range of transmission through conventional media.(21)

b.5 Other Services Available in the System

A satellite has a multidimensional role and can be effectively utilized for such purposes as meteorology, radio broadcasting, telephone, TV tramsmission, and reconnaissance.

b.6 Other technical characteristics

The instructional satellite system has a number of features among them, reliability, signal quality, link margins, system sensitivity, and system availability. Accountable disdvantages include possible interference, limited operational life time and inclination to damage on the surface and in the aerospace medium. It is an expensive apparatus and a malfuntion in the satellite can be a serious economic problem for its owner.

b.7 Its Application under a Network

There are certain operational considerations which must be borne in mind in opting for use of a satellite network. These are mainly: ground segments, space segments, orbital position, satellite capacity, energy flow, non-interference, launching capability, operational system and frequency allocation.

c. The ITU and Development of Space Technology

The development of space communication technology is one of the functional activities of the International Telecommunication Union, which is the focal point of international regulation in this field. It looks after the establishment of equipment operations, tariff

standards, and the exchange and publication of telecommunications information and data for the planning and operation of various services. (22)

It is important to realize that, given the sophistication of telecommunication technology, cooperative measures are essential for its efficient operation. This constitutes one of the main purposes of the ITU. For example, the CCIR and the CCITT make recommendations with respect to the Union, the standardazation of telecommunications systems, services and equipment. The Union is also involved in development, planning, and operations. The development of an international public network is of major concern to the world and Regional Plan Committees. These Committees set the parameters for the collection of data related to the expected growth of telecommunication services. Thus, the ITU serves almost as a world communication commission, acting as a servant of the peoples of the earth.(23)

c.1 Transfer of Satellite Communication Technology, through Institutional Arrangements.

The ethics of sharing space technology are developed through international institutional arrangements such as the ITU, INTELSAT, and INMARSAT.

i) The ITU as an Institutional Arrangement for the Transfer of Space Technology

The ITU seems to be actually involved in development, cooperation, and transfer of space technology programmes.(24) It has passed a number of resolutions and recommendations concerning technological cooperation, some of which are discussed below.

Resolution No. 5 of WARC-79, deals with the assistance provided for the developing countries by the Union in cooperation with other UN specialized agencies, such as the UNDP in the field of telecommunications.(25) Resolution 15 of the same Conference observed that a large number of countries, which are members of the ITU, are not capable of taking immediate advantage of the available satellite techniques. Such countries would now benefit immensely through the technical assistance programmes sponsored by the Union. Further, it recognizes that an international satellite communication system is subject to the Convention and is open to the participation of all countries.(26)

Resolution No. 16 also makes a significant contribution towards international cooperation in the transfer of space communication technology(27) by referring to Resolution 3362 (S-VII) of the seventh special session of the UNGA, which, inter-alia, requested member states to promote integral rural development in the developing countries.(28)

The Resolution also raises some interesting points with respect to socio-economic development which is the main thrust of the New International Economic Order (NIEO), and agrees that it is within the domain of the ITU. Satellite communication is also viewed as the best means for development in the developing countries.

Resolutions 103 and 316 advocate a similar kind of cooperation. They recognize that developing countries need assistance in this highly specialized field and that this assistance must often be obtained at short notice, particularly in relation to the fixed service (the HF bands). It is also recognized that technical knowledge and experience would be valuable to the developing countries.(29)

Resolution 316 relates to technical cooperation with developing countries in maritime telecommunications. The ITU has provided adequate and modest investment in the installation of maritime telecommunication facilities.(30)

Similarly, the Union has been much involved in technical cooperation programmes, providing training fellowships, infrastructure, and organizing conferences and seminars on technical matters. Moreover, international cooperation with respect to the broadcasting satellite service is essential, particularly in view of the inherent political, economic, social and cultural implications of this new technology. Nandasiri Jasentuliyana explains that:

"the main reasons that make international co-operation and coordinataion important are: (a) satellite in the geostationary orbit can illuminate up to one-third of the surface of the globe. Although directional antennae on the satellite can concentrate most of the power with in a comaratively small area of the earth's surface, say a few hundred kilometres in diameter, applicable power is, however, radiated outside the main beam; (b) the frequency bands available for satellite broadcasting are limited, as is the geostationary orbit that broadcasting satellite service will use; (c) the frequency bands available for the broadcasting satellite service are allocated with equal rights to terrestrial radio communication service which in many cases already use the bands extensively".(31)

ITU Resolution No. 14 of WARC-79 while recalling the UNGA resolutions on economic and social development, invites the governments of member countries, particularly those of the developing countries, and their administrations, to take steps to establish national telecommunication development policies, and to strengthen their technical cooperation activities in order to achieve the efficient transfer of telecommunication technology.

Apart from the resolutions, the ITU Convention contains provisions on technical cooperation. They include tutorial projects and studies, specially directed to problems encountered by the developing countries.(32) Further, Article 4 (e), (f) and (g) clearly advocates assistance to the developing countries in the development of technology.

The rationale for development assistance at the institutional level is persuasive. Although the resolutions are not legally binding, they do constitute moral considerations which can sometimes be of more value. In any event, communication technology requires cooperation more than the transfer of know-how, since it is not a

commodity to be sold within a nation but rather a facility to be used internationally.

ii) INTELSAT as an Institutional Arrangement for the Transfer of Space Technology

INTELSAT is an intergovernmental organization which is commercially involved in the provision of single global satellite communication service. On Februrary 12, 1973, two interrelated international agreements relating to satellite telecommunication entered into force; the INTELSAT Agreement (33) with its four annexes, concluded among the states; and the Operating Agreement relating to INTELSAT, (34) with one annex, signed by states for their telecommunication entity (public or private), designated by a State, party to the Agreement.

Examination of INTELSAT Agreement is appropriate at this stage in the context of the transfer of technology and international cooperation amongst developing countries. The Preamble of the Agreement provides thoughtful consideration of the aims of transferring communication technology. Moreover, due consideration has been given to UNGA resolution 1721 (XVI) and the provision of a practical global communication satellite service; and article 1 of the 1967 Outer Space Treaty, which states that outer space shall be used for the benefit of all countries. INTELSAT is, in fact, a practical example of sharing of technology since any country make use of a space

segment which belongs to the organ. The last paragraph of the Preamble of INTELSAT Agreement explains it more clearly:

> "Believing that satellite telecommuniction should be organized in such a way as to permit all peoples to have access to the global satellite system and those state members of the ITU so wishing to invest in the system with consequent participation in the design, development, construction including the provision of equipment, establishment, operation, maintenance and ownership of the system".

Thus, it is evident that the transfer of technology is within reach of the developing nations if they comply with the provisions of the INTELSAT Agreement. Investment in the organ could be facilitated through the UNDP. Hence communication satellite technology comprising design, development, and construction, the provision of equipment, establishment, operation, maintenance and even ownership of the space segment is accessible to all nations. Articles II and III of the INTELSAT Agreement clearly invite participation in the development of satellite communication technology(35) in order to provide communication services on a non-discriminatory basis to all parts of the globe.(36)

Other significant provisions with respect to this issue are found in the INTELSAT Operating Agreements. Article 17 sets out practical arrangements for sharing actual know-how(37) which implies that member states are actually prepared to share the available satellite communication technology for the benefit of all member states. However, participation in the INTELSAT arrangements is voluntary and permissible on an investment basis only. Moreover, the INTELSAT Agreements are binding and thereby represent a better guarantee for

the sharing of "know-how".

iii) INMARSAT as an Institutional Arrangement for the Transfer of Space Technology

INMARSAT was established on September 3, 1976 with the purpose of improving maritime communications. The INMARSAT Convention was signed in September 1976, in London, and came into force on July 16, 1979. Like INTELSAT, the INMARSAT Convention was also supplemented by an Operating Agreement which is binding on all members. It is important to note that the INMARSAT service was established for peaceful purposes only, Warships were excluded from access to any of its services.

The INMARSAT Convention also provides for the transfer of space communication technology, as follows:

------ Ships of all nations are entitled to use the services of INMARSAT's space segment.(38)

------ The earth stations located on structures operating in the marine environment other than ships.

------ Provisions are made for locating earth stations via the INMARSAT space segment on the land territory under a state's jurisdiction, which shall be wholly owned by parties or entities

subject to their jurisdiction.(39)

------ Any inventions and technical information gained through the operation of INMARSAT, shall be common and in the interest of all the signatories.(40)

------ According to its principles and objectives the significant elements of studies, research or development is ensured for itself on the basis of, (a) the right to disclose without payment all the inventions and technical information generated by such work, (b) the right to disclose such knowledge to the parties as well as to the singatories and to authorize the use of such inventions and technical information which would again be without any payment.(41)

The INMARSAT Convention authorizes the participants to let any know-how be made public on any inventions or technical information in which rights are acquired by the organization.(42) Disclosure and use of such know-how shall be on a non-discriminatory basis.(43)

The institutional arrangements described above, while promoting technical cooperation and technological transfer, only provide access to use of, and knowledge about space activities for the purposes of communication. But, the term 'transfer of technology' has far-reaching implications in terms of know-how which enables a state to develop its own technology locally and to generate a market, for its products. The space powers, of today, which seem to be primarily engaged in an arms' race in outer space, evidently have no desire to

share the kind of technology which they are developing. Moreover, the costs involved prevent developing nations from carrying out independent planning or research, and from constructing launching and operating facilities. For a real transfer of technology to take place, numerous political economic barriers have to be crossed. Laws cannot be created to enforce 'international cooperation' or 'mutual assistance'; they are merely political and philosophical concepts, which can not be brought with in the realm of legally binding doctrine. Of importance to developing countries is a sound national economy established through international programmes, and the readiness to accept, and learn from the available institutional arrangements. Matte made the following remark on this issue:

> "This is a matter which has received special attention within INTELSAT and INMARSAT. Both organizations provide an oportunity for the transfer of space technology among its members, including those states which have not previously participated in the planning or technological development of the organization's systems and including, especially, the developing countries".(44)

INTELSAT normally enters into contracats on the basis of the payment of royalties by the recipient, of the service subject, of course, to the approval of the Board of Governors and the terms and conditions of the Agreement.(45) On the other hand INMARSAT has its own rules and regulations with respect to the transfer of technology.(46)

c.2 General Considerations for the Transfer of Space Technology

An orderly approach to international cooperation has been actively undertaken by the ITU, INTELSAT and INMARSAT. However, it also occurs through the negotiations of agreements. What is essential at the present time is cooperation among developing countries themselves; for example, the Arab countries are planning an Arab satellite system, similar to the Palapa system for services to serve Indonesia, Singapore and Thailand. India's INSAT also has the capacity to serve neighbouring countries like Bangla Desh, Nepal, Burma, Pakistan, Sri Lanka, Afghanistan and even distant countries of Africa and Asia. INTERSPUTNIK is operative in the socialist states while a Nordic satellite will serve the needs of Denmark, Finland, Iceland, Norway and Sweden.(47) The Space Powers are ready to make their space segments available to countries which are anxious to avail themselves of such opportunities. India, for instance, undertook Satellite Instructional Telecommunication Experiments(SITE) with the US, and a Satellite Telecommunication Experimental Project (STEP) with France and Germany.

Funds are available through the UNDP, and the UN has largely assisted technical activities through a series of General Assembly resolutions. Mili explains that:

"the first, dating from 1946, authorized the provision of credits for advisory functions on social service matters. Four years, later, UNGA resolutions 418(v) established these functions on a permanent

footing. In 1948, the Assembly adopted resolution 200(III) , voting funds to enable the SG in cooperation with the specialized agencies, to undertake a technical development assistance programme for Governments".(48)

The UNDP was set up in 1949, by ECOSOC resolution 222(IX) an U UNGA Resolution 304 IV, in order to assist the developing countries. The ITU adopted many resolutions to remain within the framework of the UN and to comply with the directives of the Plenipotentiary Conference, which provide for participation of the Union in the UNDP. Resolution No. 17 envisages improvement of Union facilities to grant technical assistance to the developing countries.(49) In many cases, technical advice is needed by the developing countries and must often be obtained at short notice.(50) This technical expertise is made available by or through the International Consultative Committees and the IFRB.

The ITU has also arranged for technical experts to help, train personnel involved in telecommunication administration. Resolution 18 deals with the application of telecommunication science and technology for the benefit of developing countries.(51) Resolution 20 deals with inter-country projects financed by the UNDP in the field of telecommuniations. The wording of the resolution is noteworthy, since it makes clear that the transfer of space communication technology is a necessity for the development of a global telecommunication network.(52)

The general conditions for the transfer of space communication technology are many and varied. The transfer process is quite

distinct from the mere purchase or acquisition of hardware. What is needed is the actual transfer of the know-how, so that the technology can easily be maintained and developed, to meet the appropriate requirements of a particular country. Important considerations for the transfer of technology to be successful, must be examined, they may include feasibility studies and market surveys prior to investment, determination of the available range of technologies and, at the most, its range in the determination of appropriate techniques. It has to encompass the emerging design of production facilities, plant construction and installation of equipment, process technology, management and operation of production facilities, improvements in efficiency through minor innovations and adaptation. Other major factors to be taken into considerations are: (53)

------ the need to develop useful telecommunication relations among the peoples of the globe and among sovereign entities of the politically divided world;

------ to reduce the cost value of research and development of the technology;

------ to maximize better coordination in international satellite communication system;

------ to achieve the UN objectives for human development;

------ to ensure peaceful uses of outer space for the benefit and in

the common interest of all states;

------ to encourage more equitable, free, just and two-way flow of information;

------ to achieve the objectives of the NIEO, Declarations of friendly relations among nations, and the Charter of economic rights and duties of states.

It is this authour's belief that if space technology is adapted to the daily lives of individuals throughout the world, the concept of "One World", will be more easily attainable - something which was not possible earlier. However, initiatives must come from within the developing countries themselves in order to reform and improve their policies in the field of telecommunications.

c.3 Implications of the Utilization of an International Satellite Communications System

The introduction of communication satellites brought many implications at the international level. These were of a social, cultural, political, as well as a legal nature. Discusion will, therefore concentrate on the issues which are still being debated in the UN COPOUS, the ITU and UNESCO.

The use of satellites for direct broadcasting services (DBS)

encountered opposition from nation states in view of its cultural ramifications, and the fact that it could infringe on their sovereignty. Firstly, through use of national airspace; secondly, by the acquisation of orbital positions; and, thirdly, by unwanted transmission.

i) Social and Cultural Implications

The mass media have an immediate impact on human mind, and it is, of course, desirable that satellite technology in general and DBS in particular be used for an educationl purposes.(54) It should also serve to bring about social and cultural harmony among the people of different races, religions and linguistic origins. The problem becomes more serious when DBS is used on an international level. States are hardly ready to accept a cultural invasion via DBS, which they consider to be in contradiction to the general principles of international law. Moreover, issues such as cultural invasion have become extremely sensitive in the present state of world politics. It also appears that today's mass media no longer serve mankind but rather, "political heads". The degree of this "service" varies from nation to nation and continent to continent.

Socialist, capitalist and developing countries have different approaches to the use of mass media and in that sense no news agency or broadcasting organ can act soley on its own in a total freedom. What is to be disseminated, and to whom, are political arrangements

within a defined territory. And, ultimately, socio-economic and cultural considerations are bypassed in the development of soft-ware. The line between the freedom of information of "individuals" and the freedom of information of a "sovereign state" is a fine one. Allegations are often made that a particular state is violating the domian covered by the outside media, while, vice-versa, the media inside a country lay claim that there is an infringement on its interests by the outside media. Hence, the debate is a political one which ignores legal and human considerations.

ii) Political Implications

Political implications emerge from the moment of launching, to the utilization of a space object. Problems still exist with respect to the right of innocent passage to be granted to a satellite; and the extent to which a state can exercise its jurisdiction over such activities within its geographicl borders. The Chicago Convention of 1944, has recognized that a state has absolute sovereignty over its national airspace.(55) Since radiowaves transmit messages, which pass through national airspace, similar control will be needed under the concept of state liability.(56)

The UN is taking steps towards the solution of this problem, a task which has been divided between the UN and UNESCO. The latter is concerned with technical and pedagogical aspects plus prepatory work in the field of communication economics. The UN itself assumes

responsibility for the intricate political and legal questions that may arise as a result of the first Draft Convention on Freedom of Information. Organizations such as the Universal Postal Union (UPU), the ITU, and the General Agreement on Tariffs and Trade (GATT) have actively, co-operated and two other international agreements on the reduction of barriers for imports of educational, scientific, cultural and information materials are in force. But, the fact remains that the free flow of information among nations and within societies still represents inequalities which reflect political, ideological, social and cultural divergencies. A break-through in the form of acceptance of the free flow of information as a factor of world peace has yet to be achieved and will largely depend upon the political will of sovereign heads of states.

iii) Legal Implications

The role of international telecommunications is to develop international relations, and to foster peace to establish order and to advance mutual understanding and knowledge among peoples and sovereign entities.

DBS seems to stand on both sides of the banks of the socio-economic/cultural, and legal/political river. Negotiations are essential to bridge this gap. The UNGA resolution 1721 (XVI)D of December 20, 1961 declares that communication by means of satellites should be made available as soon as practicable on a global and

non-discriminatory basis; while the UNGA Resolution 110(II) of 3 November, 1947 condemns propaganda designed or likely to provoke or encourage any threat to peace, to the breach of peace or any act of aggression. This resolution is mentioned in the Outer Space Treaty of 1967.

Other legal considerations include the sharing of natural resources, technical coordination to avoid harmful interference, registration of space objects, liability for damage caused by such objects, prior consent, protection of distribution of programme - carrying signals transmitted by satellites, interference in the domestic jurisdiction of a state and providing a service to mankind under the concept of freedom of information. All of these problems have been tackled by the appropriate regulatory agencies but international rules and regulations will have to take into account various types of communication satellite activity which will require a cross-disciplinary approach. Factors which have to be assessed are other space applications, know-how, conventional systems within a country, international radio broadcasting services, space treaties, international telecommunication laws, and international copyright laws.

The world community seems intent upon making satellite communication a success, and the UN COPUOS, ITU and UNESCO have been developing their efforts towards this end.

Socio-cultural, political and legal issues are interconnected,

and the law must keep pace with the changing circumstances which emerge as a result of technological developments. The urgent need for a revitalized legal regime encompassing outer space is becoming increasingly evident since it is rapidly forming an integral part of our lives on earth.(56)

2. EMERGING LAW OF INTERNATIONAL COMMUNICATION SATELLITES

Any space activity for communication purposes, be it domestic, regional or international has international repercussions. It is an activity which has emerged only recently and states are considering a possible compromise with respect to its effects on their national sovereignty. New rules and regulations must, therefore, be formulated.

The introduction of space communication technology, which only few states possess, has further complicated the situation and has, consequently given rise to more conflicts. To link the globe via telecommunications is less important than the rational use of the resources needed for this purpose. Technology is used from North to South, but the South presently has no voice in how satellites should be used. A state may exploit information resources if it possesses the technology. Thus, international cooperation appears essential, in order to defuse chaos in the use of the orbit/frequency spectrum. The world community seems more involved in an ideological war than in seeking peaceful co-existence. Economic hardship in the developing nations often results in unconditional comprises being made with the super powers in their foreign policies and relations.

2.1 Conflict and Control of the Communication Satellite System

In order to recognize the conflict in the use of space technology, and to control it, two basic principles must be examined. The first concerns the principle of state sovereignty, and the second, universality of human dignity. A satellite communication service should not only be used to link two different regions of the globe, but it should also serve the broader purpose of bringing together the peoples of different regions. It should be oriented towards development in international relations, communication, and information, and in social and cultural relations. The conflicts which have arisen over use of space communication technology may be summarized as follows:

a. The Issue of Innocent Passage

If we look at the sequence of space activities in the field of the space telecommunication network, the first issue that needs to be negotiated is the right of innocent passage of a space object. There does not seem to be any problem with respect to the launching of a satellite and its journey to outer space, and until recently the problem of innocent passage did not arise because the vehicle used in the transportation of a satellite did not return. But, with the ability of a spacecraft to return to earth, innocent passage between nations may become a serious problem. The space shuttle which will be used for outer space transportation on a commercial basis has

multifold legal dimensions. It has overtaken existing regulations to such an extent that urgent revision is needed.

The national sovereignty of a state has implications only with respect to one planet of the Solar System, i.e., earth, and thus states can never assert sovereignty for the purposes of national appropriation in outer space.(57) The assertion of state sovereignty is well recognised in airspace(58) which should be defined as the height at which aeronautic engines are able to fly.

Aerospace technology has overtaken the concept of state sovereignty, as recognized in the 1944 Chicago Convention, and, as far as the space shuttle is concerned it need not be governed by the bilateral agreements reached in transportation by air. There is substantial disagreement in relation to how far territorial sovereignty should extend. Most writers have recognized that the extension of territorial sovereignty by the underlying state into the limitless regions of space is untenable.(59) And states have not shown any concrete interest in agreeing on a precise demarcation line with respect to the upward extent of national sovereignty. However, there has been no opposition to or declarations of violation of airspace boundaries by earth orbiting satellites crossing the national airspace of other countries.(60)

The Chicago Convention in effect establishes two freedoms: freedom of transit and freedom to overfly.(61) But this refers to civil aircraft. The space shuttle or any other launch vehicle

carrying a communication satellite is hard to categorize as civilian or military, therefore, the Chicago Convention is not applicable and can not be used as a defence to prevent space vehicles from passing through foreign national airspace.

The Outer Space Treaty also provides for freedom of use of outer space, but this should not be used as a pretext for violating sovereign rights on earth.(62) In view of the codification and present development of space law, states have agreed without protest that all countries should have access to outer space for peaceful purposes. Hence, it seems that when a state launches a satellite, recognition of its innocent passage is well established. The Bogota Declaration also recognizes the right to innnocent passage of a telecommunication satellite.(63)

There have been numerous attempts to establish where airspace ends and outer space begins, but so far without success. At the request of the UN Space Committee, COSPAR concentrated its efforts regarding the minimal perigees of man-made satellites to be 90-150 Km., above the earth.(64) The issue is not beyond settlement by a legal instrument and indeed, Vereshchetin recommends that "it is most probably within this range that the boundary between air and outer space should be set if states deem it necessary to have such a boundary".(65)

The principle of freedom of outer space has been invoked on the basis of freedom of the high seas and has thus become a customary rule

of international law and has been reasserted in the Outer Space Treaty.(66) The questions to be asked at are what is outer space, Where does it begin, and where does it end ? The boundary issue can be studied from two aspects; a) where state sovereignty of airspace ends; and b) where the principle of freedom of outer space begins. Those states which are primarily involved in discussion of what is legal and what is not, have not yet come up with a satisfactory answer. There is no doubt due to the fact that the space powers are anxious to pursue experiments in the military uses of outer space and that their territorial boundries are long distances apart. If the two super powers had been located on the same continent, sharing the same geographical boundaries, the possibility of a solution to the problem might be more readily available.

None of the present conventions, treaties or agreements have shed any light on the defination of the "outer space". Nevertheless, the 1958 Geneva Radio Regulations briefly describe space stations. Article 1. 84 AE states that:

"Space station; a station in the space service located on an object which is beyond, is intended to go beyond, or has been beyond, the major portion of the earth's atmosphere".

Further article 1.84 BA states that "Deep Space is the space at a distance from the earth equal to outer space and is greater than the distance between the Earth and the Moon". In Article 1, para 4.4 of the 1982 Radio Regulations space stations are described as a " Station located on an object which is beyond, is intended to go beyond, or has

been beyond, the major portion of the Earth's atmosphere". Hungdah Chiv offers the following view:

> "There is hardly any doubt that deep space is outside the sovereignty of state. The question rests mainly with the stipulation that outer space is beyond the major portion of the earth's atmosphere"..... a phrase requires further explanation to make sense. Therefore, we could only get therefrom a general idea with respect to the scope of outer space".(67)

The Soviet position with respect to this issue is that a boundary should be fixed at 100 or 110 Km.(68), while the US and the FRG argue that there is no immediate need for a boundary.(69)

The space shuttle has given multifold dimensions to the problem of delimitation of outer space. While the space shuttle has to be launched as a spacecraft by means of rocket propulsion, it will return to earth through the airspace as a glider. This fact has inevitably brought up the question of whether the shuttle, though obviously a space object during the initial stage of its flight and in fulfilling its space mission, may still be considered a space object when it arrives at the final stage of its flight using support in the atmosphere.(70)

b. The Issue of Direct Broadcasting Satellites (DBS)

Space technology has made possible the direct broadcast and reception of communications, everywhere in the world.(71) DBS are of two kinds: a) those that can provide a service on a community based

broadcast into an augmented community receiver; and b) those that can broadcast directly into home receivers. The Radio regulations define DBS as a "radio communication service in which signals transmitted or retransmitted by space stations are intended for direct reception by the general public. The direct reception shall encompass both individual reception and community reception".(72)

Community reception is the reception of emissions from a space station in the broadcasting satellite service by receiving equipment, which in some cases may be complex and have antenna larger than those used for individual reception. It is intended for use by the general public at one location or through a distribution system covering a limited area.(73)

On the other hand, individual reception is the "reception of emissions from a space station in the broadcasting satellite service by simple domestic installations and in particular those possessing small antenna".(74) These definitions and the regulations are applicable to both radio and TV satellite broadcasting.

Live broadcasting was faciliated the different regions of big nations such as the USSR, Canada, the USA and China. DBS is considered to be the most suitable media for the dissemination of information, but its use raises political, economic, cultural, legal and technological problems; attempts are being made to overcome these difficulties and to find solutions within the Legal Sub-Committee of the UN COPOUS.(75)

c. The Issue of Copyright and the Free Flow of Information

The introduction of satellite communication systems brought with it the problem of copyright protection of programmes distributed through DBS. Another problem was the inequitable flow of information. Copyright is one aspect of the freedom of information, being a privilege claimable by a person, be he an individual or a legal person, for having played a role in the information flow. The technological revolution in the field of mass communication is a pivotal event in the history of mankind and its full impact has been felt.(76) The fast adoption of the free flow of information introduced the modern laws on copyright. Article 27 of the Universal Declaration of Human Rights (UDHR) favours universal codification for the protection of copyright as is evident from the following:

> "Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits".
>
> "Everyone has the right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author".

Article 28 provides for every individual's right to a social and international order in which the rights and freedoms set forth in the Declaration can be fully realized. Copyright also pertains to the right of authors and the freedom of information for the common benefit of mankind.

The concept of copyright reflects two main arguments, one based

on social justice and the other on morality. In the first place, production of things beneficial to society should be encouraged by patronizing persons who have the necessary initiatives; society should also demonstrate its appreciation of such social contributions. Secondly, from a moral point of view, it is important to restrain, if not totally eliminate the elements which would try to take undue advantage, particularly in monetary terms, of the inventions made by certain persons who have invested therein a considerable amount of labour, funds and talent. Indeed, these diverse national laws can themselves form a subject of independent study. Most countries have by now recognised the concept of copyright in their national laws. There are a number of copyright laws, which date back to the Berne Convention of 1886, and more recently, the Universal Copyright Convention of 1952 and its further revisions.

UNESCO has been at the center of discussions on all kinds of problems relating to copyright such as those concerned with the distribution of program carrying signals transmitted by satellites. The objectives of UNESCO have been reflected in its Constitution. It was created for the purpose of "advancing through the educational and scientific and cultural relations of the peoples of the world, the objectives of peace and of the common welfare of mankind for which the UN organization was established". Its Charter proclaims that one of its fundamental aims is to make this right to culture an effective right, which will be done in two ways: firstly, by encouraging creativity through adequate protection of creative works within the societies for which they were created; and, secondly, by developing

and deepening the relationship between different cultures. Harmony in ideological divergencies and economic disparities is the cardinal principle for international understanding and cooperation.

UNESCO has elaborated other conventions such as, the Rome Convention of 1961 on Producers of Phonograms and Broadcasting Organizations; The Geneva Convention of 1971 on the Protection of Producers of Phonograms Against Unauthorized Duplication of their Phonograms; and the Brussels Convention of 1974 relating to the Distribution of Programme Carrying Signals Transmitted by Satellites.

The Brussels Convention is of more importance in the prevention of unauthorized distribution of programme carrying signals transmitted by satellite.(77) Its Preamble recalls the importance of copyright work and establishes a system under which measures would be provided to prevent distributors from distributing programme carrying signals transmitted by satellite which are not intended for those distributors.(78)

The participants at the Brussels conference were conscious of the need not to impair in any way the international agreements already in force, including the ITU Convention and the Radio Regulations and in no way to prejudice wider acceptance of the Rome Convention of October 26, 1961, which, affords protection to perform to producers of phonograms and broadcasting organizations.(79)

The basis and principal provisions of the Convention are

contained in its Article 2(1) which provides that:

"Each contracting state undertakes to take adequate measures to prevent the distribution on or from its territory of any programme carried by any distributor for whom the signal emitted to or passing through the satellite is not intended. This obligation shall apply where the originating organization is a national of another contracting state and where the signal distributed is a derived signal".

At the same time, it is made clear that the Convention shall not apply, in cases where the signals emitted from the satellite by or on behalf of the originating organization, are intended for direct reception by the general public.(80)

Article 4 refers to the distribution of signals on the territory of a signatory state. It shall in one way be interpreted as limiting the right of a contracting state to apply its domestic law in order to prevent abuses of monopoly.(81) Article 8 refers to the emission of signals from the territory of signatory states. Carl Q. Christol has stated that:

"Apparently the term territory was used in order to effect a distinction between the emission of signals from satellites in space and from territorial emission. Moreover, article 1 defines a satellite as any device in extra terrestrial space capable of transmitting signals".(82)

In fact, the Convention, which came into force on August 25, 1979 deals with signals and not with the messages they carry.(83) It does not offer states any authority over the formation or control of the program content transmitted by satellite.

2.2 From Conflict to Cooperation

There has been much discussion about conflict in the use of and control over space communications; but, in essence, obviously the best solution lies in state cooperation. Use of outer space would be more realistic if it was achieved through mutual cooperation among nations. All UNGA resolutions, and ITU resolutions and the UNESCO declarations concerning the use of outer space call for international cooperation and arrangements through INTELSAT, INMARSAT and other regional organizations are good examples. What is needed, is maximum adherence to, and ratification of, existing international instruments, and application of international law in the utilization of outer space for communication purposes. States should pay the same attention to the declarations and guiding principles of the ITU, UNESCO and UNGA, as they pay to the ratification of treaties. Therefore, it is concluded that state cooperation is needed at a political level, in the negotiation of texts pertaining to matters such as DBS and remote sensing; at a legal level, in observing treaty provisions, declarations and resolutions; and at a foreign policy level, in so far as the transfer of technology is concerned.(84)

2.3 Law Making and its Various Participants

Space applications have given rise to numerous issues, some of which are still under discussion in the UN COPUOS. Problems relating to global communications fall into two broad categories; those

pertaining to the field of technical regulations, and those dealing with the organization of services on a commercial basis.(85) Space communication has brought with it the realization that the international community would drive tremendous benefits from its use if it were applied for peaceful purposes. The development of space communication will be examined in two parts, first, through the various participants in the law-making process, and, secondly, through the application of the law to outer space activities.

The space law-making process can also be divided into two levels; non-governmental and inter-governmental organizations.(86)

(A) Non-Governmental

1. The Internationl Council of Scientific Unions and Committee on Space Research (COSPAR)

2. The International Astronautical Federation (IAF)

3. The International Institute of Space Law

4. The International Academy of Astronautics

5. The International Law Association

(B) Inter-Governmental Organizations

1. The UN COPUOS

2. The Outer Space Affairs Division

3. The International Telecommunication Union (ITU)

4. The UNESCO and World Intellectual Property Organization (WIPO)

5. The International Civil Aviation Organization(ICAO)

6. The International Maritime Consultative Organization

7. The International Atomic Energy Agency (IAEA)

8. The World Health Organization (WHO)

9. INTELSAT and INMARSAT

The main organizations involved in the development of space communication law are the UN COPUOS, the ITU, INTELSAT and INMARSAT, which are discussed infra, chapter 2.4.

2.4 Building of a Legal Regime for Satellite Communication Systems

It is generally understood that satellite communication is an activity taking place through outer space over a terrestrial body. Hence, it is not solely an outer space activity. Moreover, any human activity whether it is on continental earth, in airspace, on high seas, or in the Antarctic and Arctic regions, or in outer space, shall be subject to the laws which are applicable among the international community. It seems appropriate at this stage to briefly summarize the principles applicable to outer space activities.

a. Basis of the Legal Order

Since 1957, activities in outer space have been developing. Global telecommunication order has to be coordinated for better performance and for the rational utilization of outer space. Therefore, it is essential to have recourse to an organ equipped with regulatory procedures. More specifically, strict compliance is needed in order to attain a telecommunication service which is free from interference. The different legal principles which help in providing a legal order to international satellite communication service are discussed below.

a.1 Peaceful Uses Of Outer Space

As discussed earlier, the term 'peaceful uses of outer space' has been widely used in UNGA resolutions, treaties, and agreements. But, unfortunately there seems to be no agreement on what is peaceful. Outer space activities for military purposes, although conducted via peaceful means, can hardly be considered as "peaceful uses".

The advocate of peaceful uses of outer space is the UN, and as McDougal has rightly pointed out:

> "If the world community of space is to attain at least minimum public order the most inclusive community must centralise authoritative control of coercive instruments. The legal order does not depend upon pain of retaliation".(87)

Coercive instruments should, in his opinion, be in the hands of a general community, such as the UN, in the interest of achieving "minimum order", in the world. The UN has made considerable efforts towards this end, in its resolutions. The UNGA has concerned itself with principles and measures to promote international cooperation in the exploration and use of outer space, including the development and utilization of space communications.(88)

The Outer Space Treaty also makes provisions in its Preamble which touches on the concept of the peaceful uses of outer space. Of course literary and legislative interpretation is needed since any such provisions cannot remain within the ambit of peaceful uses of outer space unless they meet the requirements of human development at

large.

a.2 International Cooperation

Freedom of outer space becomes obsolete if there is no international cooperation among nations, which is another basis on which the legal regime of satellite communication could be achieved. It must be based on the equality of states and in accordance with international law.

a.3 The Need for International Agreements and their Strict Application

States can be asked to conduct their sovereign activities according to an agreed principle. A legal order, whether it is in the air, sea, outer space or in the geostationary orbit, should be universally applicable.

Resolutions, treaties and declarations of principle are ineffective unless a state as an entity agrees to abide by the law-making process. A more civilized approach to acceptance of the legal norms set by the internationl community is needed.

b. Application of Laws

b.1 The UN Charter and UNGA Declarations and Resolutions

The UNGA has recommended the following principles to states for their guidance in the exploration and use of outer space:(89)

------ International law, including the UN charter, is applicable to outer space and celestial bodies.

------ Outer space and celestial bodies are free for exploration and use by all states in conformity with international law and are not subject to national appropriation.

The principle that international law and the UN Charter apply to outer space activities is one of the fundamental provisions of the Outer Space Treaty. Article III stipulates that:

> "States parties to the treaty shall carry out activities in the exploration and use of outer space, including the moon and other celestial bodies, in accordance with international law including the Charter of the UN, in the interest of maintaining international peace and security and promoting international cooperation and understanding".

The application of international law and the UN Charter does not seem to be a cause for conflict in outer space. Bhatt calls the UN Charter a legal and diplomatic instrument;(90) and Goedhuis also supports it by saying that "international law is 'ipso jure' applicable extra-terrestrially".(91) Ogunsolao Ogunbanwo states that

"the main aim of international law is to regulate the behaviour of nations towards other nations and, therefore, must be applied with respect to the behaviour of nations in outer space",(92) while M. Lachs express the view that "the principles embodied in present space law conventions or agreements are complemented by those which already exist in international law; together they form a body of legal guidelines for conducting space activies".(93) Matte recommends a reassessment of the applicable available law in the light of the new scientific and technological developments which are taking place. He refers to earth-oriented space activity, "particularly in the orbital sector".(94) It may thus be concluded that UN Charter provisions are an expression of rules of general international law and that it has a solid legal basis.(95)

b.2 General Principles of International Space Law

Law-making took on new dimensions when man-made instruments moved into outer space. The rules applicable to outer space are firmly established as part of general international law, including the UN Charter. The other body of law which is applicable is customary international law. Space law developed along with the developments of activities in outer space, which include Sattelite Communication. The main legal issues which have emerged in this area are the right to launch space objects into outer space, innocent passage through the airspace of other states, allocation of orbital positions, safety and liability of space objects, coordination of frequency distribution,

registration of space objects and other policy matters with respect to the use of outer space for human development.

The UNGA resolutions are generally viewed as the source of inspiration in the law making process although they themselves are not binding on states in terms of sanctions. The 1963 Declaration of Legal Principles Governing the Activities of States in the Exploration and Uses of Outer Space, has been duly incorporated in the Outer Space Treaty 1967, which also provides that such activities should be in the interest of mankind.(96)

It is stated in the Treaty that freedom of outer space does not imply national appropriation and that strict compliance with international law is needed in the interest of maintaining peace and security, and to further the cause of cooperation and understanding. It also imposes responsibility on states for their acts and emphasises that there should be no harmful interference with the activities of other states.(97) A state retains jurisdiction over its objects in outer space.(98) The Treaty of Principles Governing the Activities of States in the Exploration and Use of Outer Space including the Moon and other Celestial Bodies,1967; Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects launched into Outer Space, 1969; International Liability for Damage Caused by the Space Objects, 1972; Convention of Registration of Objects Launched into Outer Space, 1975; Treaty Banning Nuclear Weapons Test in the Atmosphere in Outer Space and Water, 1963, and Agreement Governing the Activities of States on the Moom and other

Celestial Bodies, 1979, have duly invoked these principles in their respective texts.

Article 38 of the Statute of the International Court of Justice (ICJ) enumerates the generally accepted sources of law as follows:

"conventions, international customs, and the general principles of law recognized by civilized nations as a primary source; and judicial decisions and teachings of the most highly qualified publicists of the various nations, as a subsidiary means for the determination of rules of law".

It is to be noted that the space law-making process is not confined to the UN. On the contrary, the super powers did not want the Outer Space Treaty to be confined only to the UN members. They did not wish to place the competence of the UN above that of the treaty.(99) This is fairly clear from article XIV of the Outer Space Treaty, which invites the accession of all states. Other states, whether or not they are members of the UN are bound to abide by the legal order established by the so-called civilized nations, under customary international law.(100) Hence, the treaties and agreements applicable to outer space are more universal in scope than the UN Charter.(101)

b.3 Telecommunication Laws (the ITU Convention and the Radio Regulations)

Given the importance of the ITU, its functions, and powers, it has an active role to play in many objectives space utilization which can contribute towards human development. As discussed earlier, it has control over the Telegraph and Telegram Convention, the International Telecommunication Union Convention and The Radio Regulations, and rules and regulations are changed in accordance with developments in science and technology as well as in international cooperation. It works in close relationship with the UN COPUOS which in comparison, has been concerned with less tangible issues.(102) The two differ with respect to their decision-making process. The UN COPUOS works on the basis of consensus and the ITU on majority rule.(103)

The ITU passes resolutions and recommendations in conformity with UNGA resolutions, and while they are not legally binding, in actual practice, compliance is virtually universal.

The ITU Convention, 1973

This is the most comprehensive and widely accepted Convention. The significance of the pronouncements of the Union as a source of international telecommunication law, is demonstrated by its universal membership, and its competence in radio frequency distribution(104).

Indeed, the Union has a truly remarkable history of forging international consensus. The main provisions of the Convention applicable to space telecommunication are discssed as infra.

The Convention is referred to as the "Final Acts of the Plenpotentiary Conference (Malaga-Torremolinos), 1973". It came into force on January 1, 1974. Space telecommunication involves the participation of states and individual entities in providing a telecommunication service to the international community; in order to avoid harmful interference, the service must be regulated. Every state has an equal right to protect its telecommunication service, and international telecommunications will be facilitated through an instrument such as the ITU Convention.(105)

General Provisions of the Telecommunication Convention

The services provided for in the Convention are based on charges and safeguards being equal for all users, without any priority or preference.(106) A state shall have and enjoy full control over its telecommunication services,(107) and shall not bear any responsibility for damage claims. A state shall, however, take steps to establish operate and protect telecommunication channels and installations.(108)

The Convention grants the right to convene regional conferences, to make regional arrangements, and to form regional organizations. But such arrangements shall not be in conflict with the

Convention.(109)

Special Provisions for Space Telecommunications

Article 33 of the Convention makes special provision for radio and calls for the rational use of the orbit and frequency spectrum as follows:

"Members shall endeavour to limit the number of frequencies and the spectrum space used to the minimum essential to provide in a satisfactoy manner the necessary services. To that end they shall endeavour to apply the latest technical advances as soon as possible".

"In using frequency bands for space radio services members shall bear in mind that radio frequencis and the geostationary satellite orbit are limited natural resources, that must be used efficiently and economically so that countries or groups of countries may have equitable access to both in conformity with the provisions of the radio regulations according to their needs and the technical facilities at their disposal".(110)

With regard to harmful interference, article 35 of the ITU Convention provides that radio stations shall work in cooperation with other member radio services to avoid harmful interference. All private entities operating radio services are also subject to this rule.(111)

Settlement of disputes

Any dispute relating to the interpretation or application of the Convention or any other regulations regarding administrative norms may

be settled through diplomatic channels, or through any other methods mutually agreed upon. If this method does not work, then the dispute may be submitted to arbitration.(112)

General Regulations

Part two of the Convention deals with the function of the Union with respect to how the Plenipotentiaray Conference may be convened and how work should be assigned to the various organs.(113)

The Convention together with the Radio Regulations provide an interesting insight into legal developments and the Convention's universal applicability. It is emphasized that the ITU is fully entitled to invoke and revoke any regulation at its Plenipotentiary Conference. The Plenipotentiary Conference which is currently being held at Nairobi has succeeded in changing certain provisions of the ITU Convention.

The Radio Regulations 1982

The Radio Regulations came into force on Jannuary 1, 1982 as a result of the decision taken at the 1979 WARC. They comprise a total of 69 articles in XIII chapters with 44 Appendices, and list 87 resolutions with 90 recommendations. Article 1 deals with the terms and definitions related to frequency management and the radio service, and operational terms relating to frequency sharing and space. Articles 2 and 3 deal with the nomenclature of the frequency and wave length bands used in radio communication. Articles 4 and 5 deal with bandwidth and the technical characteristics of stations.

Chapter III is comprised of Articles 6 to 9 dealing with frequencies and the general rules for the assignment and use of frequencies, special agreements and frequency allocations in particular regions and areas, with the categories of services and allocations.

Chapter IV comprises articles 10 to 17 deals mainly with the IFRB, its functions and methods of work and coordination of frequency assignments to stations in a space radio communication service, except stations in the broadcasting satellite service. Articles 12 and 13 concerns notification and recording in the master international frequency register and also deal with concerning terrestrial radio communication stations except stations in the broadcasting satellite service.

Chapter V deals with the matter of measures against interference and tests. Article 20 to 22 deal with international monitoring of reports of infringements, and provides for procedures in cases of harmful interference. Chapter VI deals with the administrative provisions for stations. Chapter VII is for the publication of service documents.(114)

Part B of the Radio Regulations start with chapter VIII, in which provisions are made for groups of services and specific services and stations. Article 29 deals with special rules relating to space radio communication services, which include the control of interference to the GSOS, space stations, pointing accuracy of antenna, geostationary satellites power flux, density at the GSO, radio astronomy in the shielded zone of the moon, and earth station off-axis power limitations, etc, .

Broadcasting service and broadcasting satellite service, fixed service, amateur service and amateur satellite service, standard frequency and time signal service with experimental stations and radio satellite service are dealt with in articles 31 to 35.

Chapter IX deals with distress signals and safety,(115) Chapter X with the aeronautical mobile service,(116) and Chapter XI, with the maritime mobile service and maritime mobile satellite service. (117) Chapter XII deals with the land mobile service.(118)

b.4 UNESCO Declarations and Principles

Much has been said about the role of UNESCO in the space communication era. It has considered the use of space communications as a means to promote the free flow of information, the rapid spread of education and greater cultural exchange. The main UNESCO declarations affect international space communications are mentioned as below:

------ UNESCO Declaration of Guiding Principles on the Use of Satellite Broadcasting for the Free Flow of Information, the Spread of Education and Greater Cultural Exchange, 1972

------ Convention relating to the Distribution of Programme Carrying Signals Transmitted by Satellites, 1974.

------ Declaration of Fundamental Principles of the Mass Media to Strengthening Peace and International Understanding to the Promotion of Human Rights and Countering Racialism, Apartheid and Incitement to War, 1978.

While the UNESCO Declarations have no legal force, they do reflect the spirit of the law-makers. In so far as telecommunications is concerned, the elaboration of general codes and principles in advance of the functional achievement of international satellite broadcasting is needed (119) and the declarations do provide guiding principles for national and international policies in this respect.

b.5 Other International Agreements

The INTELSAT Agreement and INMARSAT Convention are binding upon signatories and establish the practice of exploitation of outer space in the field of telecommunications, based on commercial gain. They have certainly contributed towards the development of space communication law and are the major source of communication pathway dispersion.(120) The INMARSAT Convention is a less significant source of international law than the INTELSAT Agreement since it comprises only 37 members as compared to INTELSAT's over 100 members.

It is thus apparent that the ITU is not alone in establishing legal control in outer space. The flow of information across international borders requires legislation of a social, cultural, economic, political and legal nature. Different organs must join together to establish the legal regime governing satellite communication systems, which needs the adherence, acceptance and ratification of all sovereign states.

3. FOOTNOTES OF PART - B

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*END

PART - C

THE GEOSTATIONARY ORBIT AND ITS LEGAL CONTROL

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C O N C L U S I O N

THE GEOSTATIONARY ORBIT AND ITS LEGAL CONTROL

The shape of the earth was an impediment to long distance radio communications, and this problem engendered the idea of placing a transmitter in the sky so that a desired distance could be covered. When put into practice, the idea was a success. But, scientists and technologists were not satisfied in covering geographically disadvantaged areas alone; a single global telecommunication system was desired and hence, attention focussed finding a place in deep space. It was determined that if three communication satellites were placed at a certain distance from each other, a single global telecommunication system would be feasible. This was possible at a height of approximately 35,800 Km., in what has been called, the geostationary orbit.

What is a Geostationary Orbit

The UN uses the definition of the GSO as adopted by the ITU, it states that:

"a Geostationary Satellite is a satellite, the circular orbit of which lies in the plane of the Earth's equator and which turns about the polar axis of the earth in the same direction and with the same period as those of the Earth's rotation. The orbit on which a satellite should be placed to be a geostationary satellite is called the Geostationary Satellite Orbit".(1)

Satellites in the GSO are unique in that they remain fixed over

the same portion of the earth's surface. Although they appear to be stationary like the earth, both satellites and planet are travelling through space at a great speed. There is, in fact, a slight difference between the period of rotation of the earth, (about 1, 430 minutes) and the period of rotation of a geostationary satellite, which is approximately 1, 436 minutes. A GSOS cannot be permanently located at a fixed position due to the various forces acting upon it.(2) Therefore, it has to be maintained at its nominal position by propulsion. But the important factor is that the utility of a satellite is related to its capacity as well as to the use of the available radio frequencies for both telementry and command channels in controlling the satellite and in adjusting its position. A geosynchronous satellite has been defined by the ITU as an "earth satellite whose period of revolution is equal to the period of rotation of the earth about its axis".(3) The ITU Radio Regulations define orbit as follows:

> "The orbit on which a satellite should be placed to be a geostationary satellite is called as the 'geostationary satellite orbit'".(4)

1. LEGAL STATUS OF THE GSO

There are an infinite number of orbits in outer space. However, our concern is the GSO and its legal significance in terms of utilization and distribution among nations. The distant location of the GSO and its nature means that it cannot effectively be made subject to the rule of national jurisdiction. It is beyond any national sovereignty.(5) Thus, it may be stated that the GSO does not fall within the national airspace of any country,(6) which may be viewed as extending to an approximate height of 110 Km. Moreover, there is hardly any difference between the legal status of the GSO, outer space and other celestial bodies. The same rules and regulations are applicable. The UN COPUOS Legal Sub Committee has adopted a similar approach.(7) Discussion of the legal status of the GSO has shown that, among nation states, many different views prevail, and some of the equatorial states have proclaimed sovereignty over that part of the GSO which is located above their respective territories.(8)

1.1 Examination of the Bogota Declaration

The Equatorial countries met in Bogota on December 3, 1976, and the heads of the delegations became signatories to the Bogota Declaration.(9) Their claim was that "when a satellite describes this particular orbit, it is said to be geostationary; such a satellite

appears to be stationary in the sky when viewed from the earth, and is fixed on the zenith of a given point of the equator". Their second claim was that the GSO must not be considered as part of outer space and consequently the part of the GSO over their territorial airspace belonged to them. This argument appears to be without foundation and is far removed from reality. The concept of sovereignty over national airspace was recognised in 1944, when states ratifed Convention on the International Civil Aviation Organization.(10) Sovereignty over national airspace must, however, start from the land towards the sky, and not from outer space towards the land. Moreover, as stated earlier, in this author's opinion, airspace extends to a height of 110 Km. This limit is based on the capacity of an aircraft to fly at a certain height, but obviously cannot be applied when the new genre of spacecraft such as the shuttle became operational. A spacecraft differs from an aircraft in its manufacture, capacity, purposes and objectives. Moreover, astronauts travelling in a spacecraft are considered to be the representatives of mankind(11) whereas in the case of an aircraft, the pilot retains the same status he had, prior to take off.

The third argument put forward by the equatorial states is that the GSO is a limited natural resource, the importance and value of which, is increasing rapidly, as the demand for telecommunication services continues to grow. However, this argument is no longer viable given recent technological developments.(12) The GSO, as a natural resource, differs from other natural resources found on land and in the ocean since they cannot be further expanded by the use of

technological know-how. On the other hand, the GSO can be expanded and allocated among nations for rational use. Although the views of experts in this regard are very contradictory.

The growing demand for telecommunication services by a particular state does not entitle it to sovereign use of the GSO, although it does raise questions with respect to rational use(13) of such vital natural resource. Distribution must be based on factors such as population, territorial coverage, the capacity and power of transmitters used, changing necessities and the technical capability of a state. All these considerations have to meet the requirement of the concept of sovereign equality of states in outer space, which has been described as the province of mankind.(14) Therefore, it seems that states located on the equator line merit special consideration in the negotiation of orbital positions based on economic development. Technologically advanced nations should not be allowed to claim orbital positions permanently as a matter of sovereign right. This is viewed with apprehension by the developing nations, including the signatories of the Bogota Declaration.

Another weakness of the Declaration is its ambiguity. On the one hand states have proclaimed sovereignty over the GSO and on the other, have forgotten the legal meaning of sovereignty. Para 3(2) of the Declaration states that "the segments of the orbit corresponding to the open sea are beyond the national jurisdiction of states, and will be considered as the common heritage of mankind (CHM). Consquently, the competent international agencies should regulate its

use and exploitation for the benefit of mankind".(15) It seems that there is a contradiction in first proclaiming national sovereignty and then looking for an international agency to manage the GSO.

While the equatorial states deserve preferential treatment in their utilization of the GSO, a different set of criteria should be applied, such as cooperation in providing access to the space segment or compensation for shared use by particular states. A division based on the sovereign equality of states and required economic development is needed, and not the "first-come, first-served", approach. This argument has also been put forward by the UNGA resolution.(16)

1.2 Opposing Views of other states

Colombia's claim to a segment of the GSO above its natioal territory made at the 30th session of the UNGA must have come as a surprise to the signatories of the Outer Space Treaty.(17) Columbia reiterated its position at the session of UNGA in 1976.(18) Ecuador and Panama took a similar stand, and were later joined by the eight equatorial countries.

The great majority of states, including major super powers felt that the GSO is a part of outer space and that therefore, claims of sovereignty over the orbit as advanced in the Bogota Declaration were inadmissible as contrary to Article 2 of the Outer Space Treaty.(19) An overwhelming rejection came at the UN COPOUS in 1979. Countries

opposing the claim are: Australia, Belgium, Czechoslovakia, France, GDR, Iran, Italy, Mexico, USSR, UK and USA. Vlasic states that "the claim ran into strong opposition from the major users of the GSO".(20) These nations assert that the, "orbit is inseperable from the rest of outer space and therefore, fully governed by the principle of freedom established in the Outer Space Treaty".(21) The ITU also tried to resolve the dispute at WARC-79 but it was decided to convene another conference in 1984-85 to deal with the problem.(22) Moreover, national appropriation by claim of sovereignty has not, so far, occurred.(23) Serious doubt is also cast on the validity of national sovereignty claims in view of the following:

------ The line of demarcation between air - and outer space has not yet been legally defined;

------ the GSO as part of outer space can not be subject to appropriation by any state;

------ existing legal instruments must be respected until such time as they are changed in the light of developments;

------ the concept of the common heritage of mankind has no relevance unless the GSO is free from any kind of sovereign claim;

------ GSOS are not permanently located at the same point on the equatorial plane as claimed by the equatorial states.

It is evident that the GSO is the most valuable parking place in

space and rapid development is expected in stationing satellites for direct broadcasting purposes. Disputes with respect to sharing are thus well - founded.(24) A satellite not only needs to function properly but in the case of malfunction, it should be removed from the orbital slot. If the concept of rational uses of the GSO is to be applied, then states should be obliged to remove dead satellites from the orbit.

1.3 Importance of the GSO

The main advantages of the GSO are the following:

------ coverage area up to 1/3 of the earth's surface;

------ scope for a variety of services, point to point, point to multipoint, multipoint to point and broadcasting;

------ the possibility of fixed and transportable or mobile operations;

------ exceptionally high service reliablity and sensitivity to terrestrial distance;

------ a cost of service, independent of terrain condition or terrestrial distance, and growth of services which can respond more readily to priorities;

------ a rapid means of providing high quality service to any point where the terrestrial network and other infrastructure is limited or non-existant.

------ where a developed terrestrial network exists, vastly improved flexibility in service and network management through overlay of satellite derived facility;

------ simplified and economical earth stations with very little tracking;

------ can be used for meteorological and earth exploration purposes providing continuous observation.

2 ORBIT/SPECTRUM RESOURCE STRATEGIES

2.1 Planning of the Orbit

The effective planning and management of the orbit/spectrum is one of the major concerns of the ITU. Planned use would increas the effectiveness of this limited natural resource.

There are several approaches to the planning of satellite orbits. Among them are assignment planning of orbit slots, and frequency distribution. The choice depends on a number of factors such as the nature of the service, the demands and global distribution, the current status of technology, probabilities of orbit/spectrum frequency congestion and, most important, the relative needs and capabilities of countries of the developed and developing world. However the following technical criteria for orbit/spectrum utilization may be used:(25)

(a) Total data, rate;(b) number of satellites in orbit, (c) data rate per MHZ, (d)total data rate per degree of orbit per MHZ, and (e) the number of earth satellite communication links. The other criteria for orbit/spectrum planning would have to take into account several operational constraints such as ; permissible limit of interference level between satellite systems, utilization of systems having different characteristics, provisions for flexibility in the re-allocation of orbit/spectrum assignments and accomodation of

existing communication satellite services. There are other criteria such as economic, social, legal and political factors affecting the utilization and distibution of the orbit/spectrum.

2.2 Distribution of Frequencies

The GSO and electromagnetic spectrum involve simultaneous exploitation and, therefore, it has been considered as a most impontant reservoir.(26) Christol terms the orbit/spectrum as a valuable resource for commercial and security purposes.(27) Martin describes it as being fixed on a geostationary position and being extremely desirable since it allows the satellite to serve as a dependable relay platform for messages sent between large numbers of geographically isolated communicators.(28) Smith values it on the grounds that "satellites in geostationary positions will soon be replaced with larger permanent space information stations, which are an advantage over single purpose satellites in terms of conservation of orbital and spectrum resource economies of scale and greater capabilities".(29) Harvey J Levin regards it as a vital resource to develop telecommunication infrastructure.(30) Charles L Jackson (31), Leive,(32) Matte,(33) McDougal,(34) Vlasic,(35) Bhatt,(36) Lay and Taubenfeld,(37) all view the orbit/spectrum as a limited natural resources for providing global telecommunication links. The remarks of Charles L. Jackson resume the whole issue:

"Both equity and efficiency considerations are involved in the

allocation of the orbital frequency resource. A well designed market system should be able to separate these two problems. The efficiency questions - what services should be provided by satellite and how these systems should be built? is essentially a question of engineering and economics. The equity question - which nations should have the benefits from use of a limited international rsources? is essentially a political problem".(38)

It is also important to mention that there are three particular bands which, have especially desirable signal propagation characteristics: the C Band, the Ku Band and the Ka Band.(39) There seems to be general agreement that the radio frequency spectrum and the geostationary orbit are limited natural resources, which are accessible to all nations. Therefore, it is imperative that efforts be directed towards their development, as well as towards prudent administration, in order to promote a free, democratic society, and to stimulate the healthy growth of all the nations in the world, while at the same time ensuring the availability of this natural resource to serve future demands in the best interests of all concerned.

The actual nature of these resources makes it impossible for them to be exhausted or worn-out through use; however, careless or inefficient use can pollute them and can prevent the maximum benefits being desired. In recent years large demands have been made on the use of the GSO, mainly from countries of the developed world. These demands are expected to increase beyond manageable proportions when all the countries of the world start to use these resources. The orbit/spectrum must, therefore, be used effectively to derive optimum benefits. Effective use should not imply exclusive use by the "first-come" developed countries. Other factors, economic and social,

should be examined in the allocation of resources. Thus, the provisions of Article II of the Outer Space Treaty would be satisfied while any claim of national appropriation would be denied. Christol supports this view by saying that "resources of this kind traditionally have been open to common use and constitute a res communis".(40) Presently the applicable rule with regard to the distribution of the orbit/spectrum is "first-come, first served" which is contrary to the Outer Space Treaty. This method of distribution will most certainly deprive the developing countries of the capacity to develop their telecommunications network and will consequently, affect their national development. Those who use the resources excessively should bear the responsibility of improving the way in which they are used.(41)

2.3 The Orbit/Spectrum and a General Legal Regime

In conventional terrestrial radio communication, the frequency spectrum is the key element in regulation. But in space communication the orbital position, as well as the frequency spectrum of the space station are important, The general rule is that, before launching any communication satellite into the GSO, the orbital position must be allocated to that service; and secondly, the duration of assignment of the orbital position for a space station of any service to any country shall be limited in time.

As mentioned earlier, the frequency spectrum and orbital space

are complementary and are managed together. Management entails the application of international law, the ITU Convention and the Radio Regulations and technical recommendations.(42) The idea behind international regulation is in particular the economic use of the frequency spectrum and protection from interference.(43) These two reasons are interlinked. Rothblatt explains their importance as follows:

> "Geostationary Satellite communication is another clear example of resource development. In this case, however, two reservoirs of wealth are simultaneously unlocked, the GSO and the electromagnatic spectrum. Communication pathways are the concentrated values stored within these resources. The communication satellite liberates this hidden wealth and distributes the values of cmmunication pathways across the face of the earth and over the life of the satellite".(44)

Before discussing the law which is applicable to these two resources it is essential to clarify that according to this author, the orbit/frequency spectrum do not fall within the national airspace boundry of any country; rather, they fall within the ambit of outer space, which is a province of (all) mankind. In 1969 Mili stated that:

> "the frequency spectrum and orbital space are two natural resources which belong to all countries. These two natural resources are however interlinked and are unfortunately limited in nature, and it is the task of the ITU to ensure their rational use".(45)

The study of international legal norms governing the development of the orbit/spectrum is divided into two parts, general regulation and specific regulation by the ITU.

A General Legal Regime

Before considering the application of legal rules, it is essential to establish the constraints on the use of the orbit/spectrum *per se*, which are imposed by a large number of entities, and what considerations are to be taken into account in the formulation of an appropriate legal regime.

Constraints Leading to International Policy Making

There is clear interaction between the demand for telecommunication services and the various means which are able to satisfy that demand. Consequently, there are constraints such as economic viability, access to technolgy and service options, and media saturation. Unfortunately, the present system of allocation depends on the available technology and market pressures and thus jeopardies the concept of state equality with respect to access to the orbit/spectrum. However, the major elements determining the efficiency of orbit/spectrum utilization depends upon the following:

------ technical factors which affect the 'frequency reuse potential' of the GSO;

------ technical factors which affect the amount of information which may be transmitted in a given bandwidth;

------ other factors which facilitate or enhance the application of the technical factors with a view to conserving and increasing orbit/spectrum utilization.

Some of the important technical factors are enumerated below:

(i) Antennas radiation Characterstics for (a) Earth Station Antennas such as (1) Directional characteristics (2) Side Levels (3) Polarization Isolation. (b) Satellite Antennas.

(ii) interference considerations, carrier interleaving, and access considerations;

(iii) Receiving system noise temperature;

(iv) variations in satellite position and antenna beam pointing direction;

(v) propagation characteristics at different frequencies. It has two different effects (a) attenuation; and (b) depolarization.

(vi) modulation characteristics.

The homogeneous interference model used for analysis needs to be improved since it does not consider non-homogeneity, inhomogeneity on earth station antenna radiation characteristics, transmission characteristics, satellite receiving system sensitivities, single

entry interference, satellite deployment and bi-directional transmissions.

According to the above mentioned factors there are three kinds of allocations to be made: allocation of orbital slots, allocation of satellite transponders, and allocation of interference rights. These are discussed below.

Allocation of Orbital Slots

The growing demand for telecommunications on a domestic and international level has to be met within the available allocation of orbital slots. Therefore, a number of considerations must be taken into account, such as who obtains the positions and how much access should be made available. There is a potential market consideration in the allocation of orbital positions. Consumers will be best served by such an allocation procedure, and it is an important aspect of policy making.

Allocation of Satellite Transponders

The allocation of satellite transponders is a sub-division of the same positions and frequencies involved in the allocation of orbital slots. Therefore, problems of allocation of the orbit and transponders are basically the same when viewed from an economic

perspective, though they emerge in a distinct statutory context.

Allocation of Radio Frequencies

Radio frequencies must be allocated in such a way as to ensure technical non-interference. Once the allocation is made, it is also assumed that there shall be no interference with this right. The basis upon which the policy concerning radio frequency allocation is formulated are namely: (a) human considerations;(b) power and political considerations;(c) available market and economic considerations;(d) technical and legal considerations.

Sharing and distribution are two different aspects of the orbit/spectrum. A new approach is needed to the adoption, application and enforcement of laws. In examining the development of telecommunication law with special referencec to the GSO and the frequency spectrum, the following categories of laws and policies seem to have been developed:

------ fundamental principles of space law;

------ technical rules of the ITU;

------ economic laws.

These three types of law are explained under the following

headings;

------ a general legal regime.

------ a particular regime of the ITU.

------ the principle of economic distributive justice in the uses of outer space.

The general legal regime of the orbit/spectrum is founded on the basis that the GSO is an inseparable part of outer space and, therefore, more specifically governed by the principles of space law. Activities which take place in the utilization of the orbit/spectrum are considered to be space application activities. Lachs points out that "space is obviously a basic dimension, a constitutive element of any legal system".(46) The general principles of space law are discussed below:

Freedom of Outer Space

The freedom of outer space is a universally recognized principle, and exploration for scientific purposes should fall within the meaning of peaceful uses. However, this principle should not be taken for granted. No freedom is absolute. It has many checks and balances. The principle came to light in the UNGA Declaration of Legal Principles Governing the Activities of States in the Exploration and

Uses of Outer Space, 1963.(47) It was later incorporated in the Outer Space Treaty. Para 2 of the Declaration recognizes that "outer space and the celestial bodies are free for exploration and use by all states on the basis of equality and in accordance with international law".(48) The Outer Space Treaty, which has been duly accepted by states as the constitution of outer space, reaffirms the concept of freedom of outer space as follows:

> "Outer space, including the moon and other celestial bodies, shall be free for exploration and use by all states without discrimination of any kind on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies".
>
> "There shall be freedom of scientific investigation in outer space, including the moon and other celestial bodies, and states shall facilitate and encourage international cooperation in such investigation".(49)

The principle has become an international customary rule of law.(50) Thus, a state acquires free access to any area of space and the celestial bodies. On the other hand, one can conclude from article II of the Outer Space Treaty that the use of the GSO does not give any country the right to occupy any part of the orbit in perpetuity as this would be tantamount to national appropriation. As mentioned earlier, the principle has certain limitations:

(a) prohibition of national appropriation(51)

(b) benefits must be shared in the interest of all states;(52)

(c) recognition of the sovereign equality of states;(53)

(d) compliance with international law and the UN Charter.(54)

(e) promotion of international peace, understanding and cooperation.(55)

In accordance with the freedom principle it is clear that outer space is the province of all mankind and that states should explore and utilize it for the benefit of all mankind. The principle should not become an instrument to be used by the space powers thereby causing longer economic gaps and injustices to the "have-nots". It will only be possible to strictly comply with legal requirements when the orbit/frequency is planned, distributed and used in the econimic interests of all countries irrespective of their degree of economic and scientific development.(56)

Principle of Sovereign Equality of States

The concept of sovereignty of states is a well established principle of international law and the UN Charter.(57) Every state is in need of it and are considered to be equal. This quality varies in terms of liability and responsibility in the UN system. Outer space exploration is based on the sovereign equality of states,(58) which retain jurisdiction over their space objects. But, any claim of

sovereignty in outer space and over the celestial bodies or any other kind of natural resource such as the orbit/spectrum will be rejected. Gorove states that:

"while there is general belief, particularly on the part of lay audiences that sovereignty has been completely abolished in relation to outer space, it should be stressed that the outer space treaty prohibits only national appropriation by claim of sovereignty and not the exercise of all forms of sovereignty, sovereign rights or jurisdiction".(59)

The other conventions and agreements applicable to outer space adopt the same approach with respect to the sovereign equality of states.(60)

Peaceful Uses of Outer Space and International Cooperation

Outer space is declared to be the province of mankind(61) and mankind is a legal entity which can protect its province against use for military purposes. In order for mankind to avail itself of the basic freedoms of outer space, use should be limited to peaceful purposes only. McDougal and Florentino P. Felciano have explained the nature and scope of international cooperation among states in outer space as follows:

"Space activity is an another form of international relations which need regulations under internatioal law, when international law may be most realistically observed, and fruitfully conceived, as a process of authoritative decision transcending state lines by which the peoples of the world seek to clarify and implement their common

interests in both minimum order, in the sense of the promotion of the greater production and wider distribution of all values".(62)

The aspects of human development, international development, peaceful co-existence and friendly relations, are all recognised principles in the international treaties and declarations relating to outer space. Moreover, Articles X and XI of the Outer Space Treaty explicitly provide for the principle of international coopertion. Bhatt sees the direct relevence of these provisions to the information activity in outer space.(63) Article 1(3) of the UN Charter refers to the promotion of international cooperation in solving international problems of an economic, social, cultural or humanitarian character; while article X of the Outer Space Treaty further calls upon all states to promote international cooperation in the peaceful exploration and use of outer space and for this purpose to inform the Secretary General of the UN, as well as the public and the international scientific community, to the greatest extent feasible and practicable, of the nature, conduct, locations and results of such activities.

There are a number of resolutions of the UNGA and the ITU which make recommendations similar to those mentioned above.(64)

Principle of the Common Heritage of Mankind (CHM)

The CHM principle has become a doctrine of international law, drawing its inspiration from the regime governing the deep sea bed.

The first attempts to adopt this principle were by the UNGA resolutions(65) and those of the ITU (66) and in treaties applicable to outer space, the celestial bodies and the moon.(67) Initially, it was merely a political slogan but later acquired a legal framework.

The term "mankind" refers to the whole of humanity.(68) The UNGA adopted many resolutions in which the term "mankind" is used. 1963, the UNGA Declaration states that outer space exploration should be used only for the betterment of mankind; this principle was later incorporated in the preamble to the Outer Space Treaty. In this way, the concept seems to be acquiring legal force via the "back door" since the preamble is equally as important as the text of the Treaty.(69) It can be said, therefore, that the CHM concept has its origin in the constitution of outer space. For example, Article 1 of the Treaty states that:

> "the exploration and use of outer space including the moon and other celestial bodies, shall be carried out for the benefit and in the interest of all countries, irrespective of their degree of economic or scientific development, and shall be the province of mankind".

Moreover, Article V says that "states parties to the treaty shall regard astronauts as envoys of mankind in outer space". Such provisions are of assistance to astronauts since it is made clear that they are working for the benefit of mankind i. e. an envoy working on behalf of a state in outer space is granted the privilege of being the envoy of all human beings. Thus, it must be concluded that even if the benefits derived are in the interest of one particular state, CHM doctrine will not be changed.

Gorove, has defined the term, "mankind" as referring to "all human beings wherever they may be found and thus it includes both "men and women". However, mankind as a legal concept should be distinguished from the general meaning of "man". The former refers to the collective body of people, whereas, the latter stands for the individuals which make up that body. Therefore, the rights of mankind should, for instance, be distinguished from so called human rights. Human rights are those to which individuals are entitled simply because they belong to the human race; whereas, the rights of mankind relate to the rights of the individuals making up that entity.(70) Therefore, when sharing or utilizing outer space resources, the common benefit of all mankind must be taken into consideration. Unfortunately, no provisions exist as to how to share the benefits, how to determine the compensation for the expenses incurred, and to what extent benefits such as technological know-how and scientific discoveries can be shared. The developing countries are becoming vociferous in their objections to the current situation, as witnessed in the Legal Sub-Committe meetings and in the ITU. They argue that sharing 90 % of the orbit/spectrum resource among 10 % of the population is not acceptable.(71) While it is true that in space law and modern international law, "mankind" is becoming a subject of international law and is acquiring certain rights to protect itself against the violation of human dignity, the enforcement of property rights in outer space, through an international institution, for the benefit of one particular interest group of a given state will never be permitted. Article 2 prohibits national appropriation of the natural resources found in outer space irrespective of their nature.

The orbit/spectrum are phenomenal features which are considered to be useful for the whole of mankind, and have already been designated limited natural resources. Hence, they can not be used by the chosen few while over-crowding of orbital slots and the frequency spectrum works to the detriment of the "have-nots". Constant use of the orbit/spectrum by the same state perpetually will certainly deprive other nations of meeting the increased demand for telecommunications services. Clearly, a larger portion of humanity deserves a greater share of available resources for their economic development, as provided for by the Outer Space Treaty.

After prolonged debate over a long period of time (72) the Moon Treaty has incorporated some provisions relating to the CHM principle. Article 11 states that the moon and its natural resources are the common heritage of mankind which finds its expression in the provisions of this agreement and in particular in paragraph 5 of this Article".(73)

Although the Moon Treaty is not applicable to the orbit/spectrum, there is an indication that in the main text of the Moon Treaty the CHM doctrine is acquiring acceptance. Numerous differences exist with respect to article 11 of the Moon Treaty.(74) However, para 5 of article 11, goes one step further towards establishment of an international legal regime, including appropriate procedures to govern the exploitation of the natural resources of the moon. It is important here to recall the desires of the signatories of the Bogota Declaration who proposed that:

"the segments of the orbit corresponding to the open sea beyond the national jurisdiction of states, will be considered as the common heritage of mankind. Consequently, the competent international agencies should regulate its use and exploitation for the benefit of mankind".(75)

Nowadays a compromise solution is needed in order to derive maximum benefits from the technology which is currently available. The doctrine of res communis describes a continuum of legal regimes in which regulated resources, while free for all to utilize, can in no way be subject to claims of exclusive territorial or spatial sovereignty. At one end of the continuum lies the 'province of mankind' principle and at the other, the doctrine of res communis. The ITU has already accepted the position of the developing countries in relation to the orbit/spectrum problem and special consideration has been given to their needs in the centralized planning process.(76) In 1979, the Union moved closer towards adoption of the CHM.(77) Further efforts towards this end are scheduled for the 1985-88 WARC. It will provide all countries with equitable access to the GSO and will also determine the planning of space services and frequency bands.

2.4 The Orbit/Spectrum and a Particular Regime of the ITU

Utlization of the orbit/spectrum is a purely technical matter and needs standardization. The ITU provides a regulatory regime, defines categories of spectrum uses, develops technology, distributes the know-how among nations and undertakes allocation of orbit/spectrum resources. In certain cases,the Union allotes specific frequencies of the spectrum to each nation using telecommunication services.

Management of the Orbit/Spectrum

Planning of orbit and management of the frequency spectrum are carried out pursuant to the ITU's constitutional mandate to promote the development of telecommunications facilities, to effect allocation of the radio frequency spectrum, and, in particular, to encourage the development of space techniques so that full advantage is taken of its possibilities.(78)

There are a number of systems which function together, management requires the avoidance of interference between direct broadcasting and terrestrial ultra higner frequency (UHF) services and prevention of interference among direct broadcast systems. The ITU keeps two matters under active consideration, i.e. channel availability and interference. Channel allocation is made in the light of possible

developments. The applicant is required to adopt a combination of satellite power and antenna direction consistent with the bandwidth of the assigned channel.

Frequencies are interchangeable, which necessitates new intergovernmental agreements.

General Rules for Assignment and Use of Frequencies

The ITU regards itself as the international parliament for the formulation of laws concerning all aspects of telecommunications.(79) However, before discussing the rules relating to the allocation of frequencies, it seems appropriate to describe the nature of the spectrum. John Howkins explains it in the following terms:

> "The electromagnetic spectrum is a figurative thing, it does not exist until it is used. It is the range of rates at which electromagnetic energy can be oscillated. All electromegnetic waves travel with the same velocity in a vacuum; at 299, 000 Km., 186, 000 miles per second. What distinguishes the diferent waves is their oscillations".
>
> "Users of the spectrum measure the oscillations of waves in two different ways ; by frequency and by wave length. The frequency measures the number of waves which pass a given point per second, and the wave length measures the distance between one wave crest and the next. The shorter the wave length the higher the frequency ; conversely, the lower the frequncy, the larger the wavelength. The relationship is defined by saying that the frequency is equal to the speed devided by its wave length".(80)

The ITU possesses implied powers to regulate space communications.(81) The ITU Convention and the Radio Regulations are

within the absolute functions and competence of the ITU, to change, amend and govern all forms of Radio Regulations. Article 10 of the Convention and the Radio Regulations make the IFRB the custodian of an international public trust. The Board furnishes advice to members with a view to the equitable, effective and economical use of the GSO and also performs additional duties in relation to its assignment and utilization.(82) Four considerations are taken into account: rational use, engineering, resource development, and the availability of a market.(83)

The IFRB implements rules with respect to the frequency spectrum provided for under articles 6 to 9 of the 1982 Radio Regulations. These are general rules for the assignment and use of frequencies. A state should try its best to comply with the system while opting for a minimum number of frequencies and spectrum range through application of the most recent technical devices. The IFRB maintains a table of frequencies and states are obliged to cooperate in order to avoid harmful interference caused by the station of one country to that of another. This provision is applicable to any new assignment change of frequency or any other basic characteristic of an existing assignment.(84) Assignment of a frequency by a state administration to a station will not be made in derogation of either the table of frequency allocations provided by chapter III of the Radio 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 the Radio Regulations and shall observe the limitations of the Board's allocation.(85) Articles

8 (i) and (ii) establish the principle of equality of rights to operate a band of frequencies allocated to different services of the same category in adjacent regions or sub-regions but on condition that harmful interference is not caused to the services of other regions or sub regions. Further, article 9 provides special rules for the assignment and use of frequencies. States, while exercising the right to use a frequency have to observe other obligations in order not to interfere with the freedom of others.(86) The system provides for significant powers to "first-commers". They can never be forced to substantialy modify the system to make more room for a new system, whereas the "late-commers" can always be forced not to cause interference to the "first-comers".(87)

Coordination, Notification and Registration of Frequencies

Coordination

(a) Coordination of Frequency Assignments to Stations in a Space Radio Communications Service Except Station in BSS, and to Appropriate Terrestrial Stations

Article 10 and 57 of the Convention define the duties, powers and functions of the IFRB in the coordination of frequencies. The Board has the function of processing assignments and notices, including

information about any associated orbital locations on the GSOS. In this regard, a state has to inform the Board in advance, by publication of information not earlier than five years and preferably not later than two years before the date of bringing into service, each satellite network of the planned system.(88) Any information shall be made public to all administrations in order to examine any interference and decide upon acceptability. Such comments shall be made within four months after the date of the weekly circular, publishing the complete information listed in Appendix 4. Comments will be sent to the administrations concerned with a copy to the Board. But, if an administration does not notify its objections within the above mentioned period, it may be assumed that there is no objections of whatever kind. In the event of problems, efforts will be made by the administration responsible for the planned system to solve such problems. If no such means can be found, the matter will be left to other administrations concerned to effect suitable solutions. In case of unresolved difficulties, the administration concerned shall make every possible effort to resolve these difficulties by means of mutually acceptable adjustments, for example, to geostationary space station locations and to other characteristics of the systems involved, in order to provide for the normal operation of both the planned and existing systems.(89)

The administration of a state applying for coordination is also obliged to inform the Board within a period of four months, whether or not comments provided for by the objecting state have been received, and about the progress made in resolving any difficulties. All

relevant information in this context shall be sent to the Board. The Board is also under obligation to publish this information.(90)

(b) Coordination of Frequency Assignments to a Space Station on a Geostationary Satellite or an Earth Station Communicating with Such a Space Station in Relation to Stations of Other Geostationary Satellite network

Before using any frequency assignment for a space station of the above mentioned nature, negotiations must be undertken vis-a-vis other similar arrangements, with certain exceptions enshrined in Radio Regulations No. 1066 to 1071.(91)

The Board shall examine all the issues before negotiating such assistance between the adminstrations. But, in cases of continuing disagreement, the state seeking coordination will defer the submission of its notice concerning the proposed assignment by six months, from the date of publication of the request for coordination under Radio Regulation No. 1078.(92)

(c) Coordination of Frequency Assignments to an Earth Station in Relation to Terrestrial Stations

No coordination will be required in cases of frequency assignments to an earth station but, care should be taken that it does not cause any interference to the station of another administration. In such cases, the operation of a station shall be subject to agreement on coordination between the administrations concerned. Such

agreements are called upon to afford all possible assistance to the Board in order to contribute to the successful discharge of its duties.(93) But, the case will be different when an administration notifies the Board, or brings into use any frequency assignment to an earth station, whether for transmitting or receiving, in a particular band allocated with equal rights to space and terrestrial radio communication services in the frequency spectrum above 1GHZ. It shall need coordination of the assignment with each administration whose territory lies wholly or partially within the coordination area. (Appendix 3 refers to the process of notification and mutual assistance to and from the IFRB)

(d) Coordination of Frequency Assignment to a Terrestrial Station for Transmission in Relation to an Earth Station

In such cases no coordination is required. This would arise firstly, when an administration proposes to bring into use a terrestrial station in relation to an earth station, which is located outside the coordination area; secondly, when seeking change which causes no interference to other administration's earth stations; and thirdly, when bringing into use a terrestrial station with the coordination area of an earth station, provided that the proposed terrestrial station assignment is outside any part of a frequency band coordinated under Radio Regulation No.1122 for reception by that earth station.(94)

Notification

(a) Notification and Recording in the Frequency Register of Frequency Asignments to Terrestrial Radio Communication Stations

Any frequency assignments to the terrestrial radio communications station of whatever kind shall be notified to the IFRB. This may be to avoid harmful interference. Similar notice shall be given when an administration desires the assistance of the Board in selecting a frequency assignment. Such notice shall be examined by the Board which shall take action in conformity with the Convention. The Board, having selected a frequency, shall forthwith submit the selected frequency by telegram for the approval of the notifying administration, and shall make a provisional entry in the master register in accordance with Radio Regulations No. 1311. Accordingly, the date of receipt of the request to the Board shall be entered in the appropriate part of the register (Column 2). The notifying state may accept or reject such notified frequency but shall give its reasons for such rejection and, consequently, the Board may cancel it or make fresh attempts, if so requested by that state. But, if the Board is not informed of a provisional entry, it will be cancelled. If accepted, the Board shall treat it as a real allocation and enter it into the register in the name of the state seeking such allocations, subject to negotiating interference with the interfered state.

Modification, cancellation and review of entries in the master

register is done by the IFRB, In the event of any kind of permanent discontinuance of the use of any recorded frequency assignment, the notifying administrations shall inform the Board within three months of such discontinuance. Such entry shall be removed from the master register. Another mode of cancellation or modification will be used when the recorded frequency is not utilized according to its characteristics, or if it is not brought into regular operation. The Board may than consult the notifying administration and, subject to its agreement, shall cancel or modify the entry. An administration has to comply with the Board's directives or else it will act arbitrarily in notification and cancellation.(95)

(b) Notification and Recording in the Master International Frequency Register of Frequency Assignment to Radio Astronomy and Space Radiocommunication Station except Stations in the BSS

This kind of frequency assignment shall need notification on the same basis as stated above. Utilization of a specific band by a particular radio astronomer may be notified for inclusion in the master register, which has a simple deletion and modification procedure. However, a notice is required to be submitted not earlier than three years before the date on which the assignment is to be brought into use. In any event the notice should reach the Board within three months. The notifying state shall take this limit into account when deciding, in appropriate cases, to initiate the coordiation procedure. The exception to this rule is the case of assignment in the space research service, in bands allocated

exclusively for this purpose, or in shared bands in which this service is the sole primary objective. In such cases, the notice should not reach the Board later than thirty days after the date when it is actually brought into use. The Board examines such notices under Radio Regulations Nos. 1498 to 1557. A review of the findings may be undertaken by the Board under Radio Regulations Nos. 1561 to 68.

For modification, cancellation and review of entries in the master register, the Board ensures continuous utilization under the recorded characteristics, and takes similar action in cases of irregularities.(96)

Settlement of Harmful Interference Disputes

The ITU has a system of coordination for the electromagnatic spectrum, which has been duly recognized internationally. An administration has to qualify a system under articles 6 to 9 of the Radio Regulations. It is up to the IFRB to investigate and examine whether there is a probability of harmful interference to any existing entry of column 2a, before giving a column of protection to a particular assignment. Legality of protection comes from the provisions of frequency operations in the prescribed way and thus, also it grants similar protection to others. Alexandrowicz explains it in the following way:

"Because no state has a legal title to a frequency or even a

right of priority of usage, harmful interference, whenever it occurs, can not be considered a violation of a right inturn but is a disturbance of the public order of the spectrum, which is the responsibility of ITU. The purpose of such responsibility is to avoid spectrum anarchy, hence the significance of the adminstrative procedure under which member states must comply with the rules of co-operation as embodied in the ITU text".(97)

Once the frequency assignment is in the protection column, (2a) it is fully protected by the IFRB. Entries in column 2b do not have similar protection. Although not totally neglected, the IFRB must ensure non-interference to the entries in column 2a.

Article 38 of the Radio Regulations identifies the measures to be taken to eliminate interference caused by stations, which involves examinations of whether the particular complaint of harmful interference falls in the entry in column 2a, and whether the principle of conformity with the ITU Convention was observed, along with prior use and notification to the IFRB. A course of action has to be made known to the IFRB by a party before seeking help.

The IFRB acts as mediator. It does not offer a legal solution and only provides technical answers. It can register or resist registration in a particular column. Unfortunately, the ITU is not empowered to compel a party to modify or withdraw an obstructing frequency or its notification. However, its solutions are self enforcing.(98)

It is interesting to note that the Board's frequency assignment activities are so intimately connected to its role in the settlement

of interference disputes, that knowledge of that process is a prerequisite to an understanding of the operation of the conflict resolution system.(99) Moreover, the Union does not have adequate means to determine the incidence of harmful interference. Many stations which escape the IFRB's notice cannot be penalized.(100) The station seeking a solution can negotiate bilaterally before resorting to the IFRB, and the latter requires evidence that ettempts have already been made towards that end.(101)

Article 10 (3) of the Convention makes the ITU responsible for the orderly recording of frequency assignments made by different countries so as to comply with the procedure provided for in the Radio Regulations, and in accordance with the decisions which may be taken by competent conferences of the Union. The IFRB performs its functions according to the Convention and Radio Regulations. Therefore, it is concluded that there is an organ competent to deal with the subject under discussion, but without sanction.

States have a legal obligation to observe the standards established for use of the orbit/spectrum. Article 35 of the Convention stipulates that "the member states recognize the desirability of taking all practicable steps to prevent the operation of electrical apparatus and installations of all kinds from causing harmful interference to the radio services". Further, Article 50 severely limits the Board's role in the settlement of interference disputes.(102) If the dispute is not settled by negotiation then it can be settled through arbitration.(103) Article 18 of the Radio

Regulations also provides for measures against interference, through international monitoring systems nominated by the administrations which meet required technical standards. Participation in an international monitoring system must be notified to the SG of the ITU.(104) These systems may be operated by an administration, or in acccordance with an authorization granted by the appropriate administration to a public or a private enterprise.(105) The monitoring system shall report the infringements of the Convention and the Radio Regulations to the respective administrations according to the provisions of Appendix 22.(106) Such complaints can be made to the administrations of the country having jurisdiction over the station causing the interference by the administration which detects it. The administration of a station within a country is fully authorized to take action against a defaulter.(107) Moreover, members are supposed to exercise the utmost "good will" and mutual assistance in the application of the provisions of article 35 of the Convention and article 22 of the Radio Regulations. Finally, it is important to note that the Board invokes measures only in the case of unintentional interference. Cases of jamming a political disputes and are never submitted to the Board. Thus, it can be seen that the Board is a quasi-judicial body though it lacks most of the features necessary to guarantee any kind of solutions to the disputes which appear before it.(108)

The above mentioned structure is based on the "first-come, first-served" principle, which has been rejected to by the developing countries and which is likely to be changed in the future. The new

criterion will be based on article 33 of the ITU Convention, giving equitable access to all countries to the orbit/spectrum, and it is hoped that a frequency registered in column 2a can be re-coordinated in the light of equitable justice to all nations of the world. It is evident that the responsibility of the IFRB is relatively reduced due to the INTELSAT's coordination system with its member states in cases where a satellite communication system is needed for domestic purposes.

2.5 International Negotiations at the World Administrative Radio Conferences in 1959, 1963, 1971, 1977, and 1979.

The allocations of orbit/spectrum have been revised at various WARC's as follows:

First Attempt in 1959

Until 1959, the use of radio frequencies in space communication was not subject to any express or formal agreement.(109) Haley argues that the dissemination of radio signals from vehicles in outer space was not covered by any form of binding international law.(110) But, problems arose when communication started from earth to outer space and vice-versa capable of causing interference with radio uses in the airspace; consequently, a conference on radio regulations was convened in Geneva in 1959.

The conference introduced a new master register to which older recorded assignments were transferred. The interim master register of frequency assignments had been established in pursuance of the Extra Administrative Radio Conference held in 1951.(111) The conference did not deal with assignments in unplanned bands.(112) However, it established two new services and allocated thirteen frequency bands for space research in those services. The allocation became available for use on May 1, 1961 to the countries which approved the Geneva

Regulations of 1959.

Second Attempt, EARC-1963

This Conference was primarily concerned with non-synchronous satellites but also dealt with harmful interference. Significant changes were made to the 1959 Radio Regulations(113) with respect to general rules for coordination and use of frequencies assigned. The Final Act of the Conference entered into force on July 1, 1965, and became the guideline for the UN programme in space telecommunication. The UNGA in its resolution 1963(XVIII) adopted on December 13, 1963, welcomed the decisions of EARC under the auspices of the ITU.(114)

Third attempt, WARC-1971

This conference discussed the utilization of the frequency spectrum and Radio Regulations, changing article 9A.(115) The conference also considered resolution Spa 2-1 to the effect that all countries have equal rights in the use of the radio frequencies allocated to various space radio communication services. The Conference came into force on January 1, 1973.

Fourth Attempt, WARC-77

WARC-77 was mainly concerned with planning of the broadcasting satellite service in frequency bands. Countries signed the Final Acts of the Conference on Febuary 13, 1977 with the exception of the Equatorial countries (Indonesia apart) which refused to agree.(116) The Conference came into force on Jannuary 1, 1979.

Fifth Attempt, WARC-1979

This conference enacted changes of varying significance with respect to allocation, frequency sharing, criteria and coordination procedures.

It was also able to update and revise, as necessary, the ITU's Radio Regulations in response to changing global requirements. The conference focussed mainly on the orderly utilization of the orbit/spectrum on the basis of sovereign equality and certain procedures, such as, issuing proper licences by the concerned governments. The rights and obligations enacted by the use of a frequency are derived from its registration with the IFRB, following technical examintion. All problems of harmful interference between registered assignments must be settled through cooperation between the countries concerned. The assistance of the Board may be requested in seeking a solution to such a problem.(117)

2.6 Principle of International Economic Distributive Justice and Utilization of the Orbit/Spectrum

Outer space has vast resources for human development, and as mentioned earlier, the problem of sharing the benefits derived from space activities has been discussed repeatedly in the UN COPUOS, the ITU and UNESCO. Every international instrument confirms that outer space is the province of mankind, and hence the common heritage of mankind principle is applicable to the use which is made of outer space resources.

This dissertation is concerned with the utilization of the orbit/spectrum, and the issues involved in sharing an invaluable resource among nations which claim to be individually equal, but which are unequal as regards geography, population, language, religion and socio-cultural values, economic resources and technology. The doctrine of economic distributive justice will, therefore, be examined looking at these complex inequalities among nation states.

a. The Uses of the Orbit/Spectrum as an Opportunity in the Establishment of a New International Economic Order(NIEO) and a New International Information Order (NIIO)

Much has been discussed about telecommunications and development. It can improve the relationship among peoples and between rulers and the ruled. It can be used to bring about a revolution in the flow of

information social awareness and political consciousness, and for the maintenance of peace and order while ensuring national integrity and security. Rothblatt explains the impact of orbit/spectrum on international development as follows:

> "Societies satisfy basic drives by making nature more amenable to human will. Just as agriculture domesticates wild plant life to increase food production, "signalculture" domesticates electromagnetism to increase information channel capacity. Constant growth in channel capacity is as vital to our need to communicate as growth in crop yield is to our need to eat. Satellite communication represents an advanced form of signalculture and is part of a continuing response to the need for new pathways through which people can exchange messages".(118)

International development as seen in the Declarations concerning the NIEO and the NIIO can be achieved if telecommunication resources are redistributed among nations. Levin is of the opinion that a cultivated electromagnetic spectrum allows society to communicate great volumes of information.(119) The problem is one of closing the gap between the North and the South, and every nation, institution and scholar is working towards this end. Hence, success is dependent upon the maximum cooperation of the space powers. The national economic and information orders of the developing countries are gradually being reshaped as changes occur in national policies. The efforts of the UN and various nations bridge economic and information gaps and may succeed if the developing countries are assisted in the utilization of outer space. The two world orders are complementry to each other and the objectives can be achieved by similar means. It is suggested that if scarce resources were used bearing in mind the concept of the common heritage of mankind a larger part of humanity would be better

served. Rational use of the orbit/spectrum will certainly be achieved, if the theory of the new international economic order is retained.

b. Threat to the NIEO and the NIIO*

The existing gap between the North and the South in all aspects of life has widened so rapidly that only a few nations possess the technological know-how to undertake activities in outer space. It is certain that the gap will continue to widen unless the "have-nots" are assigned a place on the orbit/spectrum when technology permits them to join in the space venture. Developing nations are in a better position to reap the benefits of space telecommunications at a national and international level for the purpose of reception and dissemination of information, since they possess the required technology. The aims and objectives of the NIEO and the NIIO will never be achieved unless efforts are made towards equalizing use of the orbit/spectrum. This might occur through the transfer of technology, based on a code of conduct, or through volunteer cooperation agreements. A healthy, prosperous and developed world will only be possible when genuine efforts are made to distribute the international economic resources on an equal basis, whether they are the resources of the high seas, Arctic or Antarctic or outer space. The lack of technology, and cooperation in its transfer from one nation to another, should no longer be a problem to be settled by legal means, rather international institutions should deal with this

matter when establishing future policies.

c. International Resource Development Strategy

From the dawn of history, state relations have been characterized by strife and discord with occasional short periods of peace and cooperation. The UN Charter acknowedges this unfortunate reality and has made repeated provisions for maintaining international peace and order. Nation states followed this example and passed a number of resolutions and declarations to the same effect. The system which currently prevails is constantly evolving and no one can say for sure whether it will survive to the satisfaction of the UN Charter and other international declarations. A law needs implementation, interpretation and consideration, which depends on international politics, relations and understanding among nations. International law-making is not based on criteria such as human dignity, hunger, poverty, lack of know-how, illiteracy, disease and death. International cooperation for development is namely the result of bilateral and multilateral negotiations, and is based on a temporarily agreed strategy. Legal norms can only be said to have emerged if the diplomacy of law-making shifts from the "political art" to that of "dignity of man". This alone can bring morality to its highest level in international law-makings.

This is essential because international law rests upon the consensus of civilized nations,(120) and this consensus must be

ascertained as often as questions of rights are duly presented before it for determination.(121) Rothblatt, makes reference in the internatioal law-making consensus in the following terms:

"The most binding principle of international law which has been discussed much ealier are the Outer Space Treaty and ITU Convention which, repeatedly confirm the law of equal distribution of wealth and resources in outer space"(122)

Articles 1, 2, 3, and 5, of the Outer Space Treaty and article 4, 10(3) (a), 33 and 34 of the ITU Convention and Article 7 and 9 of the Radio Regulations have the most legal force and ensure the doctrine of economic distributive justice as enshrined in the NIEO and the NIIO Declarations.

Article 33 of the ITU Convention provides tremendous scope for application of the doctrine of economic distributive justice in the rational use of the radio frequency spectrum :

"Members shall endeavour to limit the number of frequencies and the spectrum space used to the minimum essential to provide in a satisfactory manner the necessary services. To that end they shall endeavour to apply the latest technical advances as soon as possible".

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

Numerous authors in the field of outer space activities and application of the law thereto are in agreement regarding the legally binding nature of the provisions of the Outer Space Treaty, the ITU

Convention and Radio Regulations. Among them can be mentioned I.A. Vlasic,(123) N.M. Matte,(124) Carl Christol,(125) Alex G Vicas,(126) H. Wassenbergh, (127) Samuel, E. Probst,(128) A. M. Rutkowski,(129) Erik, N. Valters, (130) Harvey J. Levin,(131) Karl, M. Meessen,(132) Charles Jackson,(133) D. Levie,(134) Smith David(135) Richard Bilder,(136) Olivier, St. Lager,(137) Clas Wihlborg and Per Magnus Wijkman,(138) who all state that the nations have legal obligation to apply the principle of equitable justice enshrined in most of the outer space treaties and telecommunication rules and regulations.

d. General International Policy Towards Equitable Uses of the Orbit/ Spectrum

Member states of the ITU have pledged that they will use the international machanism for the economic and social development of all people. Jenks agrees that there are a number of constitutional provisions and international conventions to this effect, specifically article 56 of the UN Charter which constitutes a legal obligation.(139) But, Goodrich and Hambro hold that recommendations have been made which are not binding.(140) The UNGA adopted an international development strategy on Jannuary 1, 1971,(141) based on concerted action by developing and developed countries in all spheres of economic and social life. The signatories unanimously recognized that international cooperation for development must be on a scale

commensurate with that of the problem itself.(142) Later, the Charter on economic rights and duties of states was declared.(143) The Declaration made states aware of the need for international economic cooperation and development.(144) Lall, K. B., expressed the following view:

> "It should also, in my view, be their concern to enable international organizations engaged in socio-economic sectors to take decisions and to have them carried out so as to promote a more efficient coordination, on a global basis, for the benefit of mankind, between skills, natural resources, technology and finance".(145)

The last decade has witnessed a shift in emphasis towards economic issues and gradual increase in international awareness of economic interdependece and of the interlocking responsibilities of nations can be discerned. Concepts such as collective economic security,(146) economic decolonization,(147) NIEO,(148) economic rights and duties of states, the NIIO,(149) and the Declaration of Friendly Relations of 1966, can all be conceived as part of an attempt to establish a just, fair and equitable order in the global community. To accomplish the objectives of the NIEO a change of orientation in the UN decisions-making process is also required. The ITU system is the best complement to the NIEO, the NIIO and to the application of the doctrine of economic distributive justice.

From its inception ITU has been actively involved in achieving economic equality in the use of the Orbit/Spectrum. It is for this reason that all the agendas of the various conferences must be agreed upon, in common. The voting system is also encouraging since it

demonstrates that steps are being taken towards a NIEO, while at the same time recognizing state sovereignty, which is the first requirement of the present world economic order.

The ITU began in 1959, as a general conference on radio regulations. At that time, delegate of Pakistan noted that the "first-come, first-served" method needed change.(150) Then, China took the lead in 1973, when its delegate stated that "the small and medium sized countries should unite to oppose the super powers' monopoly of radio resources and change this irrational state of affairs".(151) Later, in 1974, the developing countries joined force in voicing their concerns. The principal theme of the conference was equality for states for old and new users of frequencies.(152) In 1977, India spoke out as the leading developing nation at the ITU conference stating that:

"his administration strongly supported the adoption of an a priori plan for stellite broadcasting which would ensure for the future a fair share of the orbit and spectrum for those countries not yet in a position to commence a broadcasting satellite service".(153)

At the 1979 WARC, the ITU made substantial changes to the Radio Regulations in the light of the NIEO and the NIIO.

It appears that the developing countries have been reasonably successful in world diplomacy on account of the majority votes which they hold. If majority rule is adopted in other regulatory processes, the problem of economic development will be towards its solution.

3. CONCLUSION

Over the years the ITU's principal function has been to provide a forum and a procedure for the coordination of policies on telecommunication among nations. The Union has a long history, stretching back to the Paris Conference of 1865. Not the least of the Union's assets is a tradition of cooperation between countries of Eastern and Western Europe that long predates the cold war. As a result, the ITU has survived the wildly fluctuating climate of the last two decades better than most of the other international organizations.

The ITU has a history of international cooperation and assistance in the field of telecommunications. It was the first International Consultative Committee (CCI) in which, telecommunication engineers cooperated systematically and continuously at an international level. The first conference of telegraph and telephone engineers opened on September 22, 1908. At the conference it was agreed that science and technology should serve the interests of mankind. The second conference took place in Paris and dealt with the installation of long distance cables. The organization also emphasised the development of technology in order to provide the best international services. The Paris Conference of 1923, discussed the same matter and gave birth to the idea of creating an international consultative committee for continuous coordination between the administrations of various countries. Thus, the CCI was created and it proposed regulations

along with the International Telegraph Union and with the Advisory Committee on Communication and Transit of the League of Nations. In 1925, the Paris Conference endorsed the creation of the CCI and accepted it as one of the organs of the Union. It further decided to consider setting up the CCIT. Moreover, at the suggestion of the CCI, the joint international committee for tests relating to the protection of telephone lines, was set up at Berne in Feburary 1927.

World War II interrupted the smooth operation of the Union, but the CCIF reestablished the normal functioning of the organ. In 1947, the Atlantic City Conference decided on a new structure for the Union, and a change in its headquarters. It was brought within a fold of the UN and has since been actively involved in pursuit of its defined purposes and objectives. The Union has changed its Convention and the Radio Regulations on several occasions. The recent Plenipotentiary Conference ending in the first week of November, 1982, in Nairobi, had agreed to change certain provisions of the ITU Convention. Two key elements have been identified to meet the requirements for compatible international telecommunications facilities: the dispersal of technological capability among many nations, creating an expanding cornucopia of equally attractive, but necessarily mutually compatible solutions; and growth in the demand for and the actual availability of telecommunication services providing world-wide information interchange.

In analyzing the formulation of the ITU's policies the interdependence of nations must be taken into consideration. Smaller

nations do not enjoy freedom in the international decision making process and in this respect sovereignty in the real sense is not being upheld. Ignoring the sovereignty of small and poor nations will lead to chaos, in the world and the solutions which have already been provided in the UN Charter should be carefully examined by the super powers. In the Preamble to the Charter it is stated that:

"We the peoples of the UN determined to save succeeding generations from the scourge of war, which twice in our life time has brought untold sorrow to mankind, and to reaffirm faith in fundamental human rights, in the dignity and worth of the human person, in the equal rights of men and women and of nations large and small and to establish conditions under which justice and respect for the obligations arising from treaties and other sources of internatioal law can be maintained, and "

"to provide social progress and better standards of life in larger freedom, and for these ends to practice tolerance and live together in peace with one another as good neighbours, and to unite our strength to maintain international peace and security, and to ensure by the acceptance of principles and the institution of methods, that armed forces shall not be used, save in the common interest, and to employ international machinery for the promotion of the economic and social advancement of all peoples, "

Some of the developed nations argue that the provisions of the UN Charter are not legally binding and indeed, they seem to feel that there is no law to prevent them from carrying out economic activities which might be determental to the smaller nations. Consider, for example, remote sensing. Space powers are collecting data and utilizing it in their best economic interests while demanding that there is no existing law which expressly forbids remote sensing activities from outer space. It is evident that examination of the provisions of the UN Charter is long overdue.

It would be prudent if steps could be taken towards creation of the necessary laws to bridge the economic and information gaps. It would certainly constitute a major step forward if new laws were created in the field of information resources. There is a growing awareness among states of their interdependence and vulnerability, as a result of the application of information technologies, and issues related to the flow of information once thought of as purely technical are now clearly seen as economic, cultural and political. The use of advanced communication technology is a direct indication of the material development of nations. The information-rich nations tend to be materially rich and have the potential to become richer; on the other hand, the information-poor nations try to become richer in material terms but have less potential to shape in the most critical aspects of future global communications. The pressing need for a more equitably balanced flow of information and communication lie parallel with the need to achieve a new international economic order. It has already been stated that space technology, as used by developed nations, is aggravating the existing disparities between the North and the South. A new strategy is needed from individual groups at the non-governmental level, to take it upon themselves to influence world leaders towards the creation of an ideology of survival, based on belief, faith, trust and cooperation.

International satellite communications should be institutionalized on the basis of legal, political, economic, social, cultural and technical developments in the world. The necessity for an integrated multidisciplinary approach is obvious, if such seemingly

diversified matters as space technology, telecommunication, broadcasting, information, education, and sports, culture, and the arts are to be used for global dovelopment. The UN has allocated the work of providing technical and legal controls to the ITU, and the to the UN COPUOS. Problems relating to education, culture, the free flow of information and copyright are mostly in the competence of UNESCO. Provisions of telecommunication services has been undertaken by nations themselves, through their own domestic, regional and international arrangements such as INTELSAT and INMARSAT.

The evolution of satellite communication has brought singificant changes in the nature of the debate on the question of international communications and the use of outer space since 1970. These changes are a reflection of the overall distribution of power, especially as evidenced within the UN system. The monopoly of "know-how" could not be verified by the small and impoverished nations, under existing coercive economic hardship. A study of reactions at an international level clearly reveals this fact. The developing countries have raised their voice against DBS but not yet against remote sensing! The Third World has been successful in attaching political values to the concepts of cultural integrity and national identity. The technological vectors of the West have been arguing the freedom of information and the right to inform and not to inform, while creating controversy in the provision of human rights such as the right to inform and the right not to be informed. Discussions on, and action with respect to the DBS issues, will soon be reflected in concerete form in an emerging international regulatory process within the UN

COPUOS, the ITU and UNESCO.

Whatever the conflict in the space era, what is actually needed is a single global telecommunication network. Applicable laws are now in the process of establishing a legal order in outer space, and nations need to encourage this new order through their generous cooperation in law abiding practices. Disputes regarding the use of the orbit/spectrum should be settled as part of the global developments resulting from the Declarations of the NIEO and the NIIO bearing in mind that the orbit/spectrum is one of the world's economic resources. The ITU is working towards such a solution. Recent Plenipotentiary Conference at Nairobi witnesses this trend.

The regulations of the Union are to a large extent concerned with the link between the orbit and radio frequencies. They are based on the notion of one combined resource whose physical properties exempt them from national sovereignty and require international agreements on their allocation and use. It is not only law which will help in establishing order in the use of outer space in an area such as telecommunications, but also mutual cooperation, assistance and coordination of communication activities. The ITU is wholeheartedly devoted to this end. The Union's rules and regulationss place great emphasis on the sovereignty of individual state and maximum domestic flexibility and international cooperation among nations. Thus, it is concluded that the ITU as a specialized agency of the UN has been successful within its limits, in providing and maintaining a technical network of global telecommunications on certain agreed legal

principles relating to space communications.

4. FOOTNOTES OF PART - C

1. Final Acts of WARC-79; See also Gehrig, J. J., "Geostationary Orbit - Technology and Law, 76, Colloquium, p.267; Rothblatt, M. A., "Satellite communication and Spectrum Allocation", 76, American Journal of International Law, (AJIL) No.1,(January,1982), pp.53-54; See also UN Doc. A/AC 105/203.

2. One is man made; the propulsion system which operates at launch and later, to keep the satellite on station. The others are natural. The most important natural force acting on a GSOS is the attraction of the total mass of the earth. Other forces include the oblateness of the earth and the elliptic form of the equator, which causes important oscillations of a GSOS around the so called minor axis of the equator. The others are the attraction of the moon and the sun which exert a force which pushes the satellite out of the equatorial plane. Solar radiation pressure also causes a yearly oscillation in the eccentricity of the orbit. Further, Kries explains that "there are many Geostationary Orbit Satellites the ideal orbit as defined by the ITU being never really achieved with regard to varying orbit inclinations and different perigees and apogees. The GSO cannot in fact be regarded as a circular line to which satellites would cling like pearls to a string but as a torus-like three dimensional band or cooridor of space in which satellite fly at (sometimes only slightly) different speed, altitude and distance from each other"; See, Kries, W. V., "Legal Status of GSO, Introductory Report", 75 Colloquium, pp.27-28.

3. Final Acts, Supra note 1, p.5.

4. Ibid.

5. It is not important to acquire sovereign rights over a territory, but to effectively maintain those sovereign rights.

6. For a detailed account see Weber, L. J., The Legal status of outer space, the moon and other celestial bodies, Document prepared at the Centre for Research of Air and Space Law, McGill University, Montreal,(1981), pp.1-63.

7. UN Doc. A/AC. 105/271, paras 24, 29 and 69; See also UNGA Resolution 34/36.

8. Brazil, Colombia, Congo, Equador, Indonesia, Kenya, Uganda and Zaire.

9. For the text of the Declaration see ITU Document WARC-BS (1977).

10. Article 1 of the Chicago Convention, 1944.

11. Article V of the Outer Space Treaty.

12. See Edelson B. I., Marsten, R. B., and Morgan, W. L., "Large systems communications, Greater message capacity for satellites", IEEE Spectrum, (March, 1982), pp.56-64.

13. It has been explained in part B of this dissertation.

14. Article 1 of the Outer Space Treaty, 1967.

15. See para 3 (a) of the Bogota Declaration, 1976, in, Jasentuliyana, N., and Lee, R. S. K., (ed.) Manual on Space Law, Vol. II, (New York, 1979), pp 383-87.

16. See the NIEO Declaration and programme of action adopted by the sixth special session of the UNGA on May 1, 1974, the UNGA Resolution Special Session(A/9556)/3201 (S-VI); See also the UNESCO Declaration on the NIIO, the UNESCO Resolution 4/9.1/1 of the General Conference of UNESCO adopted on November 28, 1978, (20C/4/9/4/2).

17. Gorbiel, A., "The legal status of the GSO, some remarks", 6, Journal of Space Law, (1978), p.171.

18. U.N. Doc. A/C. 1/PV.,2376, October 6,1975, pp.37-38, and 81-82.

19. See the discussions in the Legal Sub-Committee of UN COPUOS: UN Doc.A/AC 105/248 (1979), para.47; Furthermore Hosenball, S. N., "The UN COmmittee on the Peaceful Uses of Outer Space: Past Accomplishments and Future Challenges", Journal of Space Law, Vol. 7, (1979), p.95 ff; See also UN Doc. 105/L 112 (USSR Working paper with Draft basic provisions of a General Assembly Resolution on the delimitation of airspace and outer space and on the legal status of the geostationary satellites' orbital space).

20. Vlasic, I. A, "Disarmament decade, outer space and international law", McGill Law Journal, Vol 26, No.2, (1981), pp.188-89.

21. The question of the legal status of the GSO has been on the agenda of the COPUOS since 1977. No significant programs in reconciling the opposing views has been made so far; see UN Doc. A/AC. 105/271, (April 10, 1980), p.9; for a more detailed account, see Gorove, S., "The GSO issues of law and policy, AJIL, Vol.73, (1979), pp.452-55.

22. See New York Times, (November 17, 1979) p. 31, col.1.

23. Markoff, M. G., "The international space agency project, the declaration of Bogota and the "Common Interest" Rule, 15, Diritto Aereo, (1976),pp.166-181.

24. At the ITU's 1977 world conference on satellite broadcasting, an

agreement was reached on orbital positions and frequency use for all countries in the ITU regions 1 and 3,(Europe, Africa, Asia and Oceania) and countries in region 2 (the Americas).

25. For a detailed account, see Conference papers on International Training Course on Frequency and Orbital Planning for Satellite Communication Systems held at Space Applications Center, Indian Space Research Organization, (ISRO),India,(hereinafter cited as ISRO, SAC GSO planning and Training Conference papers, 81), from February 16, to March 7, 1981, pp. 32.4 - 32.5; See also, Srirangan, T.V., "Some thoughts of techno-economic considerations and potentials of Orbit/Spectrum plannig for developing countries", ibid.; Also see Weis, H. J., "Relating to the Efficiency of Utilization of the GSO/Spectrum in the fixed satellite service", in, proceedings of the IEEE Vol. 68, No.12, (December,1980), pp.1484-1496.

26. Rothblatt, M. A., supra note 1, pp. 56-57; See also by the same author, "International legal norms governing development of the orbit spectrum resources", Telecommunication Policy, (June, 1981), pp.63-68,

27. Christol, C. Q., US and use of the orbit/spectrum resources", Document prepared at the Centre for Research of Air and Space Law, McGill University, Montreal, (1981), pp.1-23.

28. Martin, J., Communication Satellite System, (New Jersey, 1978), pp.41-61.

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30. Levin, H. J., "For orbit and spectrum resource strategies : Third world demands", Telecommunication Policy, (June, 1981), pp. 102-110.

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