



REGULATING SATELLITE COMMUNICATION SYSTEMS

1. Introduction

The international community faced, in the early 1960s, the need to create a legal regime applicable to the exploration and use of outer space. Since 1967 five treaties and several declarations of principles have been elaborated in the framework of the UN Committee for Peaceful Uses of Outer space (COPUOS), namely:

- 1.** The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies. It is also called the Outer Space Treaty (OST)
- 2.** The Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer space.
- 3.** The Convention on International Liability for Damage Caused by Space Objects.
- 4.** The Convention on Registration of Objects Launched into Outer space.
- 5.** The Agreement governing the activities of States on the Moon and other Celestial Bodies.

The principles adopted by the General Assembly were directed at direct television broadcasting, remote sensing, the use of nuclear power sources and principles governing the activities of states in the exploration and use of outer space which was latter clarified by a declaration in which was underlined the necessity to take into account the needs of developing countries. The term commercialization does not appear in any of the articles of the Treaty, which was also silent on telecommunications activities.

Later, the privatization of space programs shifted the focus from scientific exploration and national pride to the profitable exploitation of space resources. Telecommunication activities very quickly became one

of the major items on the agenda of governments, then the major players in the field. The UN Declarations and Resolutions preceding the OST mentioned the importance of communication by means of satellite, and affirmed that the service should be available "on a global and non-discriminatory basis" As a result, words "benefit of mankind" were introduced in relation to satellite communications in the 1962 Resolution on Space.

Telecommunication activities then became subject to regulations issued by the International Telecommunication Union. in the Convention. GSO and NGSO orbits and frequencies were declared "limited natural resources" that must be utilized in an efficient and economic manner, and to which the States have equitable access.

2. Regulating Telecommunication Satellite Systems

Satellite telecommunications are subject to different level of regulations compared to other telecommunication systems. First of all, being activities performed in outer space, they are governed by space law, in particular by the Outer Space Treaty. Additionally, satellite communications are subject to more specific regulations on telecommunications services. Some of this regulation is international, such as the Radio Regulations established by the International Telecommunication Union and the recent agreement on the liberalisation of telecommunications services within the framework of the World Trade Organisation. Additional regulation are often imposed at a national level by national regulatory authorities to govern domestic communication services, and establish rules for the authorisation and control of private activities as required by the Outer Space Treaty.

Since satellites operate in outer space, their operation surpass national boundaries. The suppression of communications; interference between satellites communications is therefore pursued at the international level and coordinated by the International Telecommunication Union.

The International Telecommunication Union's Radio Bureau Regulations divide the radio frequency spectrum in eleven frequency bands, which go from the extremely low (from three to 30 KHz) to the Extremely High (from 30 to 300 GHz). These frequencies have different physical and technical characteristics that lead to limitations in their appropriateness for satellite communications.

ITU Frequency Band Nomenclature			
ITU Band	Designation	Frequency	Wavelength
1	ELF	3 - 30 Hz	100,000 km - 10,000 km
2	SLF	30 - 300 Hz	10,000 km - 1000 km
3	ULF	300 - 3000 Hz	1000 km - 100 km
4	VLF	3 - 30 kHz	100 km - 10 km
5	LF	30 - 300 kHz	10 km - 1 km
6	MF	300 - 3000 kHz	1 km - 100 m
7	HF	3 - 30 MHz	100 m - 10 m
8	VHF	30 - 300 MHz	10 m - 1 m
9	UHF	300 - 3000 MHz	1 m - 10 cm
10	SHF	3 - 30 GHz	10 cm - 1 cm
11	EHF	30 - 300 GHz	1 cm - 1 mm

International Telecommunications Union (ITU) Radar Band Nomenclature (ITU classifications are based on region-2 radiolocation service allocations)	
Band Designation	Frequency
VHF	138 - 144 MHz 216 - 225 MHz
UHF	420 - 450 MHz 890 - 942 MHz
L	1.215 - 1.400 GHz
S	2.3 - 2.5 GHz 2.7 - 3.7 GHz
C	5.250 - 5.925 GHz
X	8.500 - 10.680 GHz
Ku	13.4 - 14.0 GHz 15.7 - 17.7 GHz
K	24.05 - 24.25 GHz 24.65 - 24.75 GHz
Ka	33.4 - 36.0 GHz
V	59.0 - 64.0 GHz
W	76.0 - 81.0 GHz 92.0 - 100.0 GHz
mm	126.0 - 142.0 GHz 144.0 - 149.0 GHz 231.0 - 235.0 GHz 238.0 - 248.0 GHz

From the foregoing, we can see that the radio spectrum is a physical phenomenon, limited in its nature and not always useful for commercial purposes. For this reason care is needed to efficiently use it and allow a greater number of users to benefit from it. The ITU Convention and Radio Regulations therefore define the radio spectrum as a limited natural resource, which has to be used "rationally, efficiently and economically" and to which all countries should have "equitable access."

It is for this reason that complex regulations are necessary for the allotment, allocation and assignment of frequency resources, and for the interest of the international (and national) community in a resource the value of which is proportional to the importance of telecommunications in the modern economy