

B2: Basics of Satellite Communications: Policy and Regulation

Policy Making bodies on Satellite communications

Communications satellites are an important delivery platform for information society services as diverse as interactive TV and mobile broadband internet access.

Communications satellites are particularly useful in rural and undeveloped regions, where other systems are difficult to deploy on a commercial basis.

Satellites can play a crucial role in ensuring that individuals, companies, organizations and Governments around the world can access and disseminate high quality information services.

National spectrum management

Governments control the use made of radio by stations within their jurisdiction, typically by making spectrum management a function of a civil service department or by setting up an agency for the purpose. These national regulating bodies are known as 'administrations'.

When it is necessary to take account of cross-frontier interference liabilities, these administrations collaborate with equivalent agencies in neighbouring countries.

National Regulation Agencies (NRAs) in Africa:

Eastern Africa

Uganda	www.ucc.co.ug
Kenya	www.cck.go.ke
Tanzania	http://www.tcra.go.tz/
Sudan	http://www.ntc.org.sd/
Rwanda	www.rura.gov.rw
Ethiopia	http://www.telecom.net.et/

Southern Africa

Botswana	http://www.bta.org.bw/
Lesotho	http://www.lta.org.ls/
Malawi	http://www.macra.org.mw/
Mozambique	http://www.incm.gov.mz/
Namibia	http://www.ncc.org.na/
South Africa	http://www.icasa.org.za/
Zambia	http://lirne.net/test/
Swaziland	http://www.swazi.net/
Angola	http://www.inacom.og.ao/
Madagascar	http://www.omert.mg/
Mauritius	http://www.icta.mu/ /

National Regulation Agencies (NRAs) in Africa (Cont'd_1)

West Africa

Nigeria	www.ncc.gov.ng
Burkina Faso	http://www.artel.bf/
Côte d'Ivoire	http://www.atci.ci/
Ghana	http://www.nca.gov.gh/
Senegal	http://www.artp-senegal.org/
Togo	http://www.artp.tg/
Sierra Leone	http://www.natcom.sl/ (under construction)
Niger	http://www.arm-niger.org
Mali	http://mali-reforme-telecom.mctmtl.com/
Liberia	http://www.lta.org.lr/index.php (under construction)
Guinea	Bissau http://www.icgb.org/
Benin	http://www.haacbenin.org/
Gambia	http://www.pura.gm

National Regulation Agencies (NRAs) in Africa (Cont'd_2)

Northern Africa

Algeria	http://www.arpt.dz/
Tunisia	http://www.intt.tn/
Egypt	http://www.tra.gov.eg/
Morocco	http://www.anrt.net.ma/
Libya	http://www.gptc-Libya.com
Mauritania	http://www.are.mr/

Central Africa

Chad	http://www.otrt.td/
Democratic Rep. of Congo	http://www.arptc.cd/
Congo	http://www.dgacpt.com
Equatorial Guinea	http://www.getesa.gq/
Gabon	http://www.artel.ga/
Cameroon	http://www.art.cm

ITU

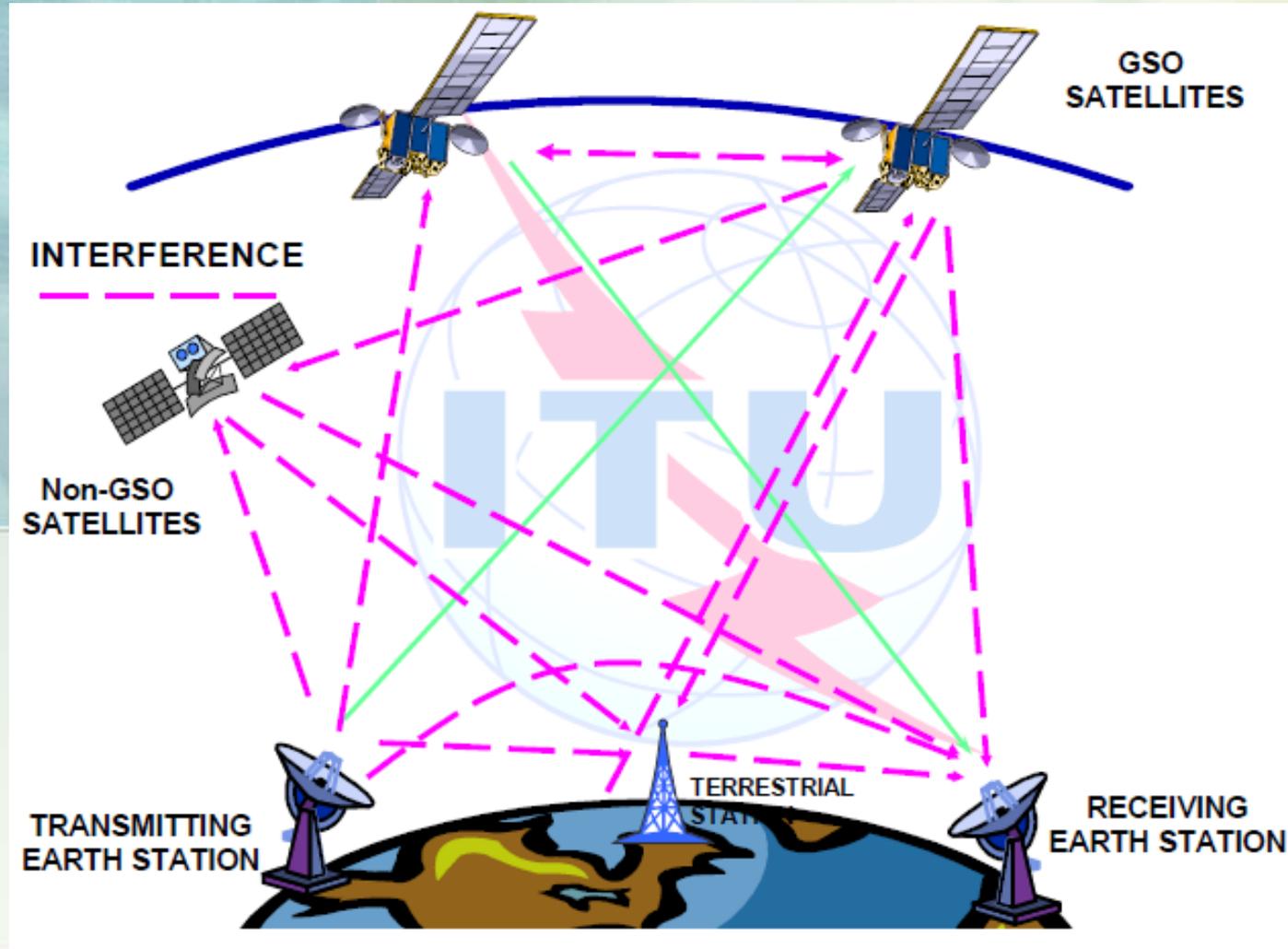
Where good use of the spectrum requires wider consultation or agreement to permanent policies and procedures, the administrations use the International Telecommunication Union (ITU) as their global forum.

Main decisions on policies and procedures are made at periodical World Radiocommunication Conferences (WRCs), held under the aegis of the ITU.

The ITU *Radio Regulations* (RR) bring together the decisions of past WRCs with any subsequent amendments.

Orbital positions and radio interferences

Interferences



ITU (Cont'd 1)

The International Telecommunication Union is an agency of the United Nations which regulates information and communication technology issues. As one of the most important organizations regulating telecommunications, the International Telecommunication Union (ITU) has a strong influence on the activities of National Regulatory Authorities (NRA)s.

In 2013 ITU had:

- 193 member countries
- More than 700 sector members
- More than 164 associates



ITU Organization

The ITU comprises four sectors, each managing a different aspect of the matters handled by the Union:

- **Radiocommunication (ITU-R)** Managing the international radio-frequency spectrum and satellite orbit resources is at the heart of the work of the ITU Radiocommunication Sector (ITU-R).
- **Standardization (ITU-T)** ITU-T's standards-making efforts are its best-known – and oldest – activity; known prior to 1992 as the International Telephone and Telegraph Consultative Committee or CCITT (from its French name "Comité *C*onsultatif *I*nternational *T*éléphonique et *T*élégraphique")
- **Development (ITU-D)** Established to help spread equitable, sustainable and affordable access to information and communication technologies (ICT).
- **ITU TELECOM** organizes events such as exhibitions.

A permanent **General Secretariat**, headed by the Secretary General, manages the day-to-day work of the Union and its sectors.

ITU Mission

ITU's mission is to enable the growth and sustained development of telecommunications and information networks, and to facilitate universal access so that people everywhere can participate in, and benefit from, the emerging information society and global economy. The ability to communicate freely is a pre-requisite for a more equitable, prosperous and peaceful world. And ITU assists in mobilizing the technical, financial and human resources needed to make this vision a reality.

A key priority lies in bridging the so called Digital Divide by building information and communication infrastructure, promoting adequate capacity building and developing confidence in the use of cyberspace through enhanced online security. Achieving cybersecurity and cyberpeace are amongst the most critical concerns of the information age, and ITU is taking concrete measures through its landmark Global Cybersecurity Agenda.

ITU Mission (Cont'd)

ITU also concentrates on strengthening emergency communications for disaster prevention and mitigation. While both developing and developed countries are equally vulnerable to natural disasters, poorer nations are hardest hit because of their already fragile economies and lack of resources.

Whether through developing the standards used to create infrastructure to deliver telecommunications services on a worldwide basis, through equitable management of the radio-frequency spectrum and satellite orbits to help bring wireless services to every corner of the world, or through providing support to countries as they pursue telecommunication development strategies, all the elements of ITU's work are centred around the goal of putting every human being within easy and affordable reach of information and communication and to contribute significantly towards economic and social development of all people.

ITU remains dedicated to helping the world communicate.

Some ITU Objectives

Specific objectives include:

- Regulation of satellite communications
- Coordinate and develop international communications
- Harmonizing national policies
- Technical assistance to developing countries in the domain of telecommunications and information access

Some ITU Tasks

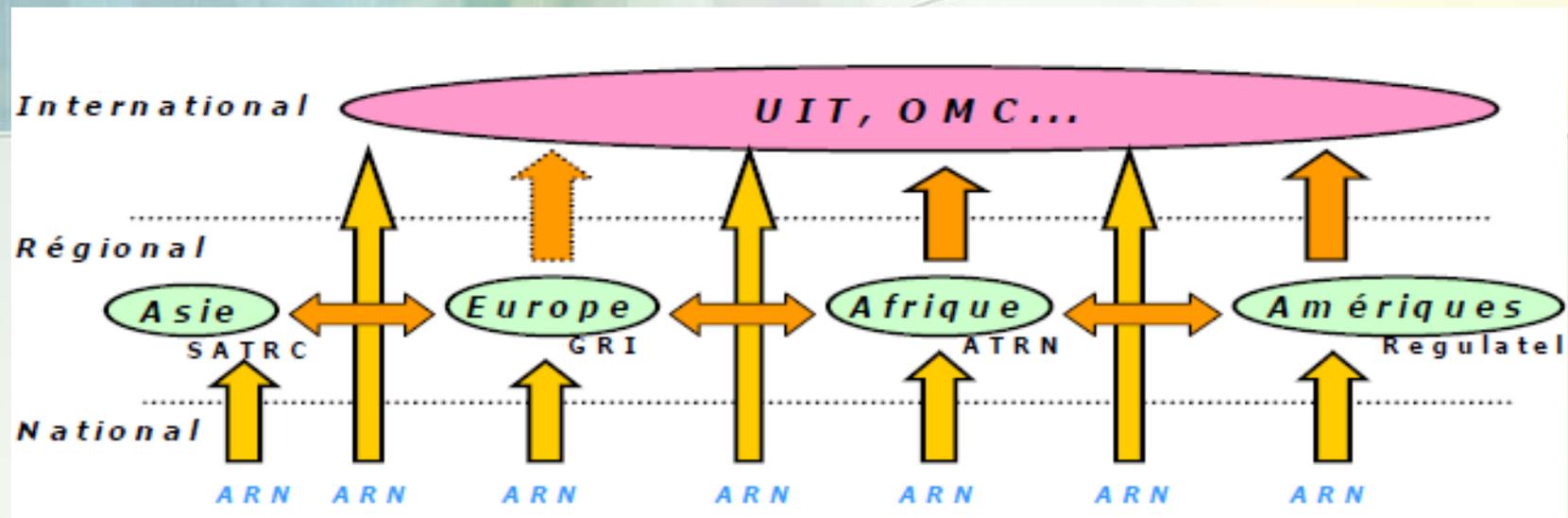
Amongst the tasks assigned to ITU we can mention:

- Electromagnetic spectrum frequency band allocation
- Register space orbital position of satellites
- Control of Radio interferences

Regional Bodies

Ultimately the responsibility for licensing falls to a National Regulatory Authority (a Government department), e.g.

- Ofcom in the United Kingdom
- FCC & NTIA in the USA



ITSO



ITSO is the continuation of INTELSAT, the intergovernmental organization established by treaty in 1973. On July 18, 2001, the satellite fleet, customer contracts and other operational assets of the Organization were transferred to Intelsat Ltd, a new private company now registered in Luxembourg and various amendments to the ITSO Agreement took effect.

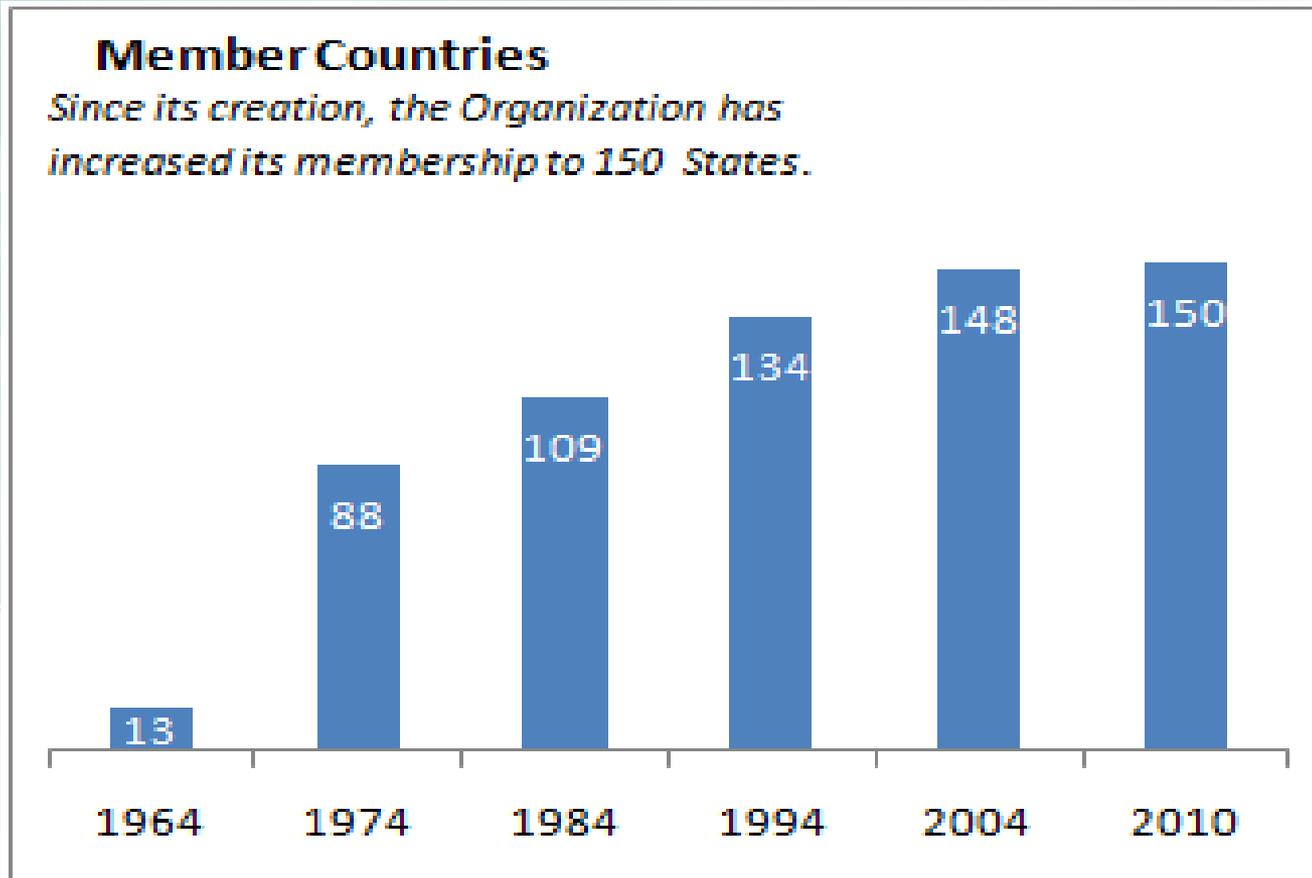
Under the ITSO Agreement, as amended, ITSO's primary role is that of supervising and monitoring Intelsat's provision of public telecommunications satellite services as specified in the Public Services Agreement (PSA) entered into between ITSO and Intelsat. In addition, the Director General, on behalf of the Organization, must consider all issues related to the Common Heritage. ITSO currently has 149 Member States.

ITSQ (Cont'd-1)

For this purpose, ITSQ transferred its global satellite system, including the geostationary-orbital locations, "landing rights" and the brand-name of "Intelsat," to Intelsat, Ltd. Since this transfer in 2001 up to 2010, Intelsat has invested over US\$ 2.6 billion to substantially improve the global connectivity and coverage that it offers. As a result, Intelsat's global communications network, which was composed of 19 satellites in 2001, has expanded to 50 plus satellites through new launches and acquisitions, while Intelsat simultaneously has expanded its terrestrial facilities, including teleports, points of presence and fiber connectivity.



ITSO (Cont'd-2)



**The current number of Member Countries is 149

Satellite policy principles

Non Discriminatory Market Entry

The first prerequisite for an open, competitive market is a legal and regulatory structure that does not discriminate in favour of existing service providers, or otherwise limit the number of independent service providers that are permitted to provide satellite and telecommunications services to consumers.

Many countries have already agreed to provide unlimited market access for satellite and other telecommunications services as a part of their commitments in the WTO GATS and its Fourth Protocol on Basic Telecommunications Services.

Satellite policy principles (Cont'd-1)

Open borders for competitive access

The second necessary measure for an open, competitive market is providing nondiscriminatory market access for both domestic and non-domestic satellite and telecommunications service providers. This is often referred to as an “Open Skies” policy.

For example, satellite service operators should not be required to have a corporate presence in a country in order to provide services in that country. Furthermore, if a satellite operator has already received a license for its space segment from its home country and has coordinated the satellite through the ITU, then no duplicate licensing requirement should be imposed on the use of that space segment to provide services in any other country.

Satellite policy principles (Cont'd-2)

Transparency of Telecommunication Rules and Policies

Another important principle included in the WTO Agreement is the need for countries to employ transparency in telecommunications regulation.

In compliance with the WTO Agreement, a significant number of regulators have undertaken the task of publishing regularly their laws and regulations on satellite licensing and permits. Making this information readily available to the public is an extraordinary step in advancing the transparency of a country's policies.

Satellite policy principles (Cont'd-3)

Content neutral regulation

Satellite networks can be effectively used to provide all forms of telecommunications services. As a result, administrations that regulate “content” often apply those regulations to satellite operators.

In any event, content restrictions that are imposed by a country should be technology-neutral - applying equally to satellite-based and wireline telecommunications service providers.

Since satellite networks can be used to provide all forms of telecommunications services, no country should limit the number of satellite licenses that are issued in an attempt to restrict certain types of content.

Satellite policy principles (Cont'd-4)

Technology-Neutral Regulations and Licensing Requirements

Modern telecommunications services are being provided to consumers using a number of different technologies, such as wireline, satellite and terrestrial wireless networks. In order to facilitate fair competition between these technologies, regulators must strive, to the extent possible, to make their regulations, licensing requirements and regulatory fees technically neutral.

In order to ensure that regulations are technology-neutral, regulators should strictly limit their regulations and licensing requirements for satellite services, using them solely to (1) protect the public safety and (2) manage scarce public resources, such as frequency spectrum when there is more than a negligible risk of harmful interference.

Legal framework

United Nations Outer Space Treaty (1967)

- Outer space free for exploitation and use by all states in conformity with international regulations
- States retain jurisdiction and control over objects they have launched into outer space
- International Telecommunication Union
 - Allocation of frequency bands
 - Instruments (CS, CV, RR, RoPs, Recs)
 - Procedures, Plans, operational measures

Key regulatory and licensing trends

The public policy principles discussed above provide a clear road map for administrations seeking to establish a licensing and regulatory structure for satellite services, or to reform existing regulatory structure in order to facilitate competition.

Non-discriminatory licensing requirements provide a country with a useful tool to ensure safety and keep up to date with technology developments and demands. Licensing requirements and their associated costs vary worldwide, but a significant trend has emerged toward adopting more streamlined, publicly accessible licensing arrangements for satellite network operators and service providers.

This trend reflects the fact that - as discussed above - licensing of satellite services should be used solely for two purposes -to protect public safety and to manage spectrum resources in order to prevent unreasonable interference.

Key regulatory and licensing trends

Space segment (Landing rights)

In the past, governments have developed policies to protect their countries' satellite systems. These "Closed Skies" policies required service providers to use only locally-owned satellite capacity when providing VSAT services.

But in the long run, governments are realizing that tremendous demand for Internet, data, voice, video and other essential services is best addressed by policies that permit open and direct access to all satellite resources assuming that they have been properly co-ordinated through the ITU.

Key regulatory and licensing trends

Space segment (Spectrum Management and Licensing)

The spectrum used via a satellite was historically distributed between the incumbent, military and related public service providers . As countries began implementing 'Open Skies' policies, licensing of spectrum became an issue nationally. Today, the ITU coordination process serves to avoid technical problems such as interference among global operators.

Exclusive bands are often allocated for FSS and MSS services and spectrum sub-segments are assigned to different operators through coordination. Once inter-satellite co-ordination is accomplished at the ITU level, there is no further need to license spectrum use by networks operating in these exclusive bands.

Key regulatory and licensing trends

Space segment (Spectrum Management and Licensing)

Radio Regulations

Lengthy & complex procedure

Decided by Administrations during WRC

Governed by:

- More sophisticated use of spectrum
- Individual requirements of administrations
- Trend towards simplification /improvement to certain procedures
- Efficient use of spectrum
- Equitable access
- Opportunity to resolve interference before operation
- Prevents loss of investment, customers & revenue by minimizing unusable capacity due to interference

Key regulatory and licensing trends

Space segment (Spectrum Management and Licensing)

Rights & obligations + applicable procedures

Two mechanisms of sharing orbit /spectrum:

Coordination Approach

- Efficiency \Leftrightarrow First come, first served for actual requirements

Planning Approach

- Equitable access \Leftrightarrow Plan for future use

Space segment (Spectrum Management and Licensing)

First Come, First Served Procedure

- Rights acquired through coordination with administrations concerning actual usage
- Efficient spectrum / orbit management
- Dense/irregular orbital distribution of space stations
- Continuing responsibility for the networks

Planning Procedure

- Congestion of the GSO
- Frequency / orbital position plans
- Guarantee for equitable access to the spectrum / orbital resources
 - Spectrum set aside for future use by all countries
 - Predetermined orbital position & frequency spectrum

Space segment (Spectrum Management and Licensing)

ORBITAL SLOT REGISTRATION

The UN agency that regulates the use of geosynchronous orbits is the International Telecommunications Union. Regulation of these satellites is necessary, because there are a limited number of places to put them in orbit without the risk of interference with other satellites or collision with space debris.

In addition, the “orbital slots” (where the satellites are placed) over industrialized areas are in much more demand than in less developed areas.

Slots over lesser developed countries with a location that would give a satellite coverage of industrialized countries are also in demand.

Space segment (Spectrum Management and Licensing)

ORBITAL SLOT REGISTRATION

In 1988, the ITU acknowledged that all countries, including less developed countries, have an equal right to orbital slots. However, Article II of the Outer Space Treaty forbids any claim of sovereignty by any country in space, which would not allow countries to establish dominion over the orbital slots above their territory. At conferences in 1985 and 1988, the ITU did give all countries the rights over an orbital slot directly over their territory, which would ensure at least some access to these satellites to all countries.

The actual orbital slots themselves are dispensed on what could be described as a first come, first served basis with some consideration given to the country making the request. There is no mandatory system to deal with disputes over orbital slots, but there are countries that have entered into an optional method to deal with disputes within the ITU.

Space segment (Spectrum Management and Licensing)

FREQUENCY REGISTRATION

The orbital slots issue is just one of the issues that the ITU addresses. The frequencies on which the satellites broadcast are also regulated by the ITU.

This aspect is important, because satellites that broadcast on the wrong frequencies can interfere with neighboring satellites or even radio or television transmissions on the ground.

Currently, the ITU has assigned about 87,000 frequencies to about 600 satellite networks in orbit (some of which are geosynchronous satellites).

End of B2:
Basics of Satellite Communications:
Policy and Regulation

Thank You!