

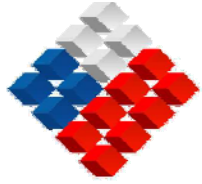
GOBIERNO DE CHILE
SUBSECRETARIA
DE TELECOMUNICACIONES

Subtel –Chile

MEETING OF THE COMMITTEE ON RADIO FREQUENCIES OF THE U.S. NATIONAL ACADEMY OF SCIENCES

Santiago, Agosto 2009

Mónica Rodríguez Miranda,
Ingeniería y Administración del Espectro Radioeléctrico
Subsecretaría de Telecomunicaciones
Ministerio de Transportes y Telecomunicaciones



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Spectrum management at SUBTEL

- General: Institutional and Legal Framework
- Frequency management.
- Regulatory Principles
- On ALMA case

Institutional and Legal Framework

- The Undersecretariat of Telecommunications (SUBTEL) was created in 1977.
- Under the organizational structure of the Ministry of Transport and Telecommunications.
- Created as a technical body in charge of regulating and promoting the development of telecommunications.

Institutional and Legal Framework

SUBTEL is in charge of:

- Developing telecommunications policies;
- Compliance with the laws, regulations, technical standards, as well as international treaties;
- Spectrum management;
- Issuance of technical standards on telecommunications and control compliance;
- Representing the country as the Chilean Telecommunication Administration before the International Telecommunication Union (UIT);
- Granting, modifying, denying, suspending or terminating concessions, permits, and licenses to provide telecommunication services in Chile;
- Applying the administrative penalties established by the law.

Institutional and Legal Framework

The legal telecommunication framework includes the General Law on Telecommunications (GLT), technical rules and standards.

In 1982 the General Law on Telecommunications came into force in order to regulate the installation, operation and exploitation of telecommunications services.

By GLT, the Chilean Administration of Telecomunicaciones is the Subsecretaría de Telecomunicaciones, and as that, is the government's service responsible for the compliance of the obligations settled by the ITU Constitution and Convention and their regulations.

Generalidades

La Ley General de Telecomunicaciones faculta a la Subsecretaría de Telecomunicaciones, para administrar espectro radioeléctrico, para lo cual:

- Elaborar el Plan de uso del espectro radioeléctrico, Dec. 15
- Representa al país ante la UIT y en suscripción de acuerdos internacionales de telecomunicaciones
- Elaborar de normas técnicas
- Otorgar autorizaciones
- Asignar frecuencias y mantiene un registro para su uso coordinado tanto a nivel nacional como internacional

Institutional and Legal Framework

The General Law on Telecommunications (GLT), gives to Subtel the faculties to manage the radioelectric spectrum:

- Define the Plan de Uso del Espectro Radioeléctrico, to allocate the bands.
- As the Chilean Telecommunication Administration before the International Telecommunication Union (UIT), to endorse international agreements on telecommunications.
- Issuance of technical rules to define the use of bands by particular services.
- Assign frequencies and keep a national record for a coordinate use national and international.



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Institutional Framework

Function	Ministry of Transport and Telecommunications (SUBTEL)	Ministry of Economy	Others
Services concessions	Grants concessions		Ministry of Defense is consulted Concessions for television broadcasting telecommunications services shall be granted by a Resolution issued by the CNTV.
Tariffs fixation	Signs tariffs decree Calculates the tariffs	Signs tariffs decree	TDLC decides if it is applicable the tariffs fixation
Spectrum management	Issuance of regulation Assignment of resources		
Issuance of technical rules	Issuance of regulation		
Subsides and promotion of the telecommunication services	Presides the FDT, entity in charge of the management of subsidies for low income sectors	Participates in the FDT Council	Ministry of Finance and Planning participates in the FDT Council
Fines and sanctions	Decides in 1 st and 2 nd instances the imposition of fines	ICT Division	Judicial authority acts as a last appeal instance

Institutional and Legal Framework

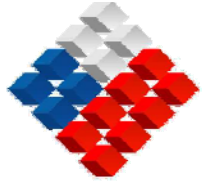
- The spectrum management and the numeric plan are part of the rules. The spectrum management determines the way that the frequencies will be allocated, allotted and assigned.
- Plan General de Uso del Espectro Radioeléctrico, Decreto N° 127 year 2006: settle the Table of frequency allocation, based on Article 5 of the ITU Radio Regulations, Region 2

Frequency management

Frequency ranges are allocated to specific services, with category primary or secondary.

Article 1 of the ITU Radio Regulations defines the terms:

- Allocation (of a frequency band): Entry in the Table of Frequency Allocations of a given band for the purpose of its use by one or more terrestrial or space radiocommunication services or the radio astronomy service under specified conditions.
- Allotment (of a radio frequency or radio frequency channel): entry of a designated frequency channel in an agreed plan, adopted by a competent conference, for use by one or more administrations for terrestrial or space radiocommunication services in one or more identified countries or geographical areas and under specified conditions.
- Assignment (of a radio frequency or radio frequency channel): Authorization given by an administration for a radio station to use a radio frequency or radio frequency channel under specified conditions.



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Frequency management

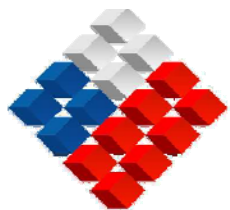
ITU Radio Regulations defines Categories of services:

–Services on a Primary basis: can claim protection form harmful interferences from stations of a primary service or from stations of a secondary service.

(Capital letters on the table)..

–Services on a Secondary basis: can not claim protection form harmful interferences from stations of a primary service, but they have the right to claim protection form harmful interferences from stations of a secondary service.

(Lower-case letters on the table)

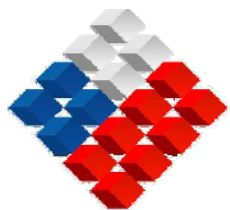


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Frequency management

Reglamento de Radicomunicaciones UIT

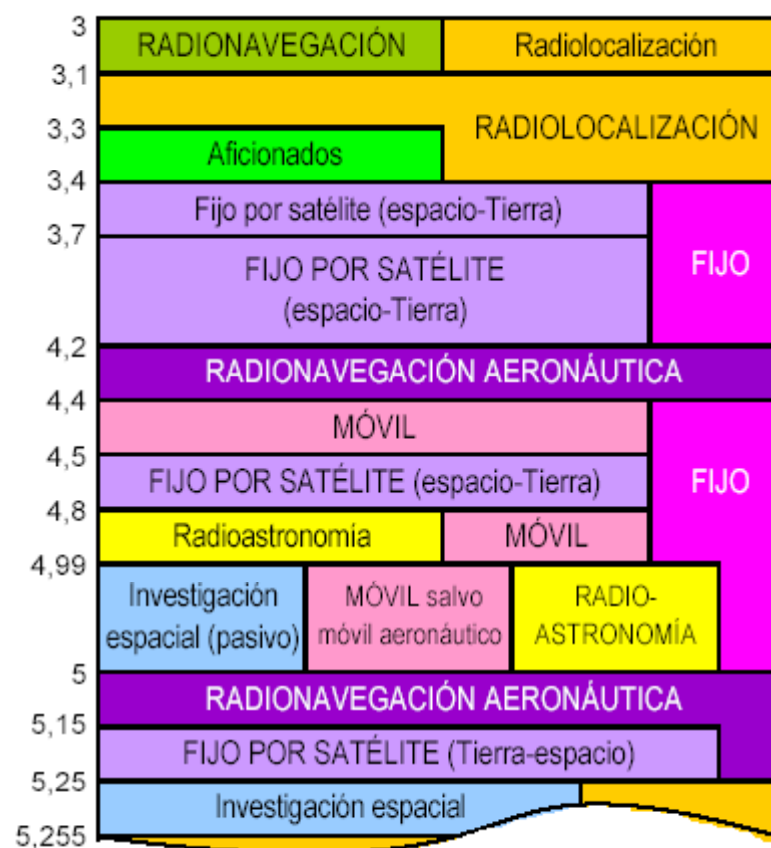
	INVESTIGACIÓN ESPACIAL (espacio-Tierra) 5.262 Operaciones espaciales (espacio-Tierra) 5.262 5.264
401-402	AYUDAS A LA METEOROLOGÍA OPERACIONES ESPACIALES (espacio-Tierra) EXPLORACIÓN DE LA TIERRA POR SATÉLITE (Tierra-espacio) METEOROLOGÍA POR SATÉLITE (Tierra-espacio) Fijo Móvil salvo móvil aeronáutico
402-403	AYUDAS A LA METEOROLOGÍA EXPLORACIÓN DE LA TIERRA POR SATÉLITE (Tierra-espacio) METEOROLOGÍA POR SATÉLITE (Tierra-espacio) Fijo Móvil salvo móvil aeronáutico
403-406	AYUDAS A LA METEOROLOGÍA Fijo Móvil salvo móvil aeronáutico
406-406,1	MÓVIL POR SATÉLITE (Tierra-espacio) 5.266 5.267
406,1-410	FIJO MÓVIL salvo móvil aeronáutico RADIOASTRONOMÍA 5.149

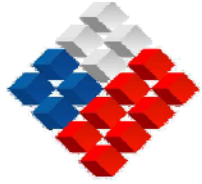


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Frequency management

Decreto N° 127, 2006

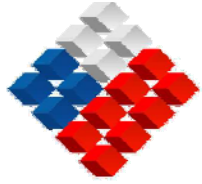




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Frequency management

- ITU Radio Regulations defines radioelectric spectrum as the range of hertzian waves arbitrarily lower than 3000 GHz, propagated in space without artificial guide.
- ITU Radiocommunication Sector (ITU-R) World Radiocommunication Conference 2007 (WRC-07) resolved to update the use of the spectrum for passive services on frequencies from 275 GHz to 3 000 GHz at the next conference in 2011.
- For Subtel frequency Plan, Decreto N° 127, frequencies over 275 GHz are not allocated to any service.

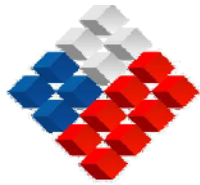


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Regulatory Principles

There are basically six fundamental principles of our telecommunication framework: freedom of entrepreneurship, no restriction on foreign investment, low entry barriers, minimum necessary regulation, technologically neutral regulation and universal access policy.

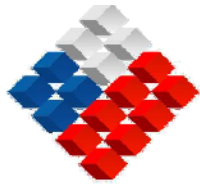
- Freedom of entrepreneurship: Any person can operate a telecommunication service in Chile and there is no limitation of any type, nor discrimination among nationals and foreigners in this matter. A corresponding license may be needed, depending on the type of service.
- No restriction to foreign investment: There is no restriction at all for foreign investment or foreign participation in the social capital of a telecommunication company.



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Regulatory Principles

- Low entry barriers: Licensing procedure is not an entry barrier, the procedure and technical criteria to obtain a license are established in detail in the GLT in an objective and nondiscriminatory manner. The license required depends on the type of the service, distinguished as:
 - Concession: For the purpose of installation, operation and exploitation of public telecommunication services and intermediate telecommunication services.
 - Permit: For the purpose of installation, operation and exploitation of limited telecommunication services. A natural or juridical person may request this type of license and it will be granted directly, through a simple and administrative procedure.
 - License: For the purpose of amateur radio services



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Regulatory Principles

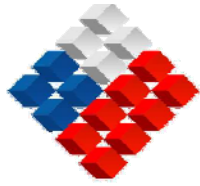
- Minimum necessary regulation: GLT defines as a general rule that prices of public telecommunication services and intermediate services will be freely established by the suppliers.
- Technological neutral regulation: Chilean regulatory framework regulates telecommunication services independently of the technology used to provide them, except for interoperability in the public services that needs it.
- Universal access policy: Chile has developed an Universal Access policy, having supply subsidies as a fundamental instrument financed by the Telecommunications Development Fund, created in 1994 in order to promote private investment, and increase coverage of some telecommunication services in rural and low income urban areas. This fund is comprised of annual contributions allocated by the National Budget Law, and operators do not have any kind of obligation to contribute to this fund in any form.



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Summary of Licences and procedures

GLT Service Classification	Type of Services	Type & lenght of license	Issued by
Public Telecommunications Service	<ul style="list-style-type: none"> - Fixed Telephony - Rural Telephony - Mobile Telephony - Data transmission 	Concession 30 years	Ministry of Transports and Telecommuni-cations (MTT)
Intermediate Service	<ul style="list-style-type: none"> - Long distance telephony - Transmission and switching 	Concession 30 years	MTT
Limited Telecommunications Service	<ul style="list-style-type: none"> - Radiocomunicaciones - Background music - Cable television - Satelital television - Experimental use - Others 	Permit from 10 years or indefinite time	SUBTEL
TV Broadcasting Service	<ul style="list-style-type: none"> - Broadcasting television services 	Concession 25 years	National Television Council
Radio Broadcasting services	<ul style="list-style-type: none"> - Frequency modulated (FM) sound broadcasting service - Amplitude modulated (AM) sound broadcasting service - Short wave (SW) - Low power FM sound broadcasting service 	Concession 3 - 25 years	MTT



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ALMA CASE

- AUI and ESO, as juridical person have a Permit of Limited Telecommunication Service, to install and operate the radiotelescope at Llano de Chajnantor, Atacama.
- Permit granted to Associated Universities Inc (AUI): Resolución Exenta N° 1055, 12 Aug 2004.
- Permit granted to European Southern Observatory (ESO): Resolución Exenta N° 1056, 12 Aug 2004.
- The permits define:
 - Reception frequencies
 - Location of the site by means of geographical coordinates
 - Type and number of antennas
 - Definition of protection zone and coordination zone
 - Length of the permit

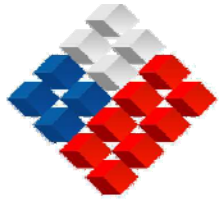
ALMA CASE

Reception frequencies authorized to AUI and ESO.

Assigned bands [GHz] on their permits	Allocated bands to radioastronomy service on primary basis [GHz] on Subtel Plan	Allocated bands to radioastronomy service on secondary basis [GHz] on Subtel Plan
31,3 - 45	31,3-31,8 / 42,4 - 43,5	
67 - 90	76-77,5 / 79 - 90	77,5 - 78
84 - 116	84 - 116	
125 - 163	130-134 / 136-158,5	125-130 / 134-136
163 - 211	164 - 167 / 182-185 / 200-211	
211 - 275	211-231,5 / 241-275	
275 - 370	Not allocated	
285 - 500	Not allocated	
602 - 720	Not allocated	
787 - 950	Not allocated	

The radiotelescope can operate on all the frequency bands authorized.

It is no possible to guarantee protection on the bands, or parte of them, not allocated to radioastronomy on primary basis, or in bands not allocated.



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ALMA CASE

As a notifying administration, Subtel submitted to ITU the information for the inclusion of the ALMA stations in the Master International Frequency Register, particularly in the Space Network System data base.

Earth stations - Windows Internet Explorer

http://www.itu.int/cgi-bin/htsh/sns/estn.sh?ntc_id=104500530&sat_type=E&le=

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Earth stations

ITU Radiocommunication

Space Network Systems Online

General Query System: earth station

SUMMARY INFORMATION

Station name	Category	Adm	Ntwk	Org	Provn	Date of receipt
ALMA_1	N	CHL	-	-	11.12	15.12.2004

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DETAILED INFORMATION


COUNTRY	LONGITUDE	LATITUDE	SATELLITE NAME	LONGITUDE (NOMINAL)	HORIZON DIAGRAM	MINIMUM ELEV.	AZIMUTH FROM	AZIMUTH TO	ANTENNA ALTITUDE	ACTIVE STATION
CHL	67 W 45 0	23 S 1 0	-	-	-	-	2	0	360	- A

Coordination Contour Diagram does not exist or not yet available

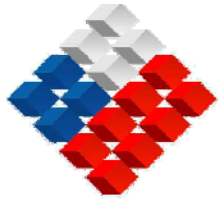
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Revised: 05 August 2009

 International Telecommunication Union, 1996-2008

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ALMA 2

ALMA CASE

Earth stations - Windows Internet Explorer

http://www.itu.int/cgi-bin/htsh/sns/estn.sh?ntc_id=104500531&sat_type=E&ie=

Google

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Earth stations

Radiocommunication

Space Network Systems Online

General Query System: earth station

SUMMARY INFORMATION

Station name	Category	Adm	Ntwk	Org	Provn	Date of receipt
ALMA_2	N	CHL	-	11.12	15.12.2004	

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DETAILED INFORMATION

COUNTRY	LONGITUDE	LATITUDE	SATELLITE NAME	LONGITUDE (NOMINAL)	HORIZON DIAGRAM	MINIMUM ELEV.	AZIMUTH FROM	AZIMUTH TO	ANTENNA ALTITUDE	ACTIVE STATION
CHL	67 W 45 0	23 S 1 0	-	-	-	-	2	0	360	- A

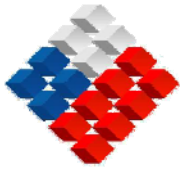
Coordination Contour Diagram does not exist or not yet available

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ALMA CASE

Reception frequencies authorized to AUI and ESO.

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275 - 370	Not allocated	
285 - 500	Not allocated	
602 - 720	Not allocated	
787 - 950	Not allocated	

ALMA CASE, coordination and protection Zone

Permits granted define Protection Zone and Coordination Zone.

Protection Zone:

30 km radius inside the national territory, centered at lat. $23^{\circ}01'$ S and long. $67^{\circ}45'$ W,

Conditions: Subtel will not authorize the instalation of radiocomunicaciones systems of third parties which operate in the reception bands of the radiotelescope.

ALMA CASE, coordination and protection Zone

Coordination Zone:

120 km radius inside the national territory, centered at latitude 23°01' S and longitude 67°45' W.

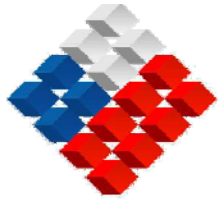
Conditions:

- ✓ Any authorization will be submitted to a coordination process by Subtel.
- ✓ Subtel will inform ESO and AUI about applications that could affect the operation of the radiotelescope, asking for their technical opinion.
- ✓ In any case ESO and AUI will detect emissions affecting the radiotelescope operation, they will inform Subtel for their coordination.

ALMA CASE, coordination and protection Zone

Coordination Zone:

- ✓The emissions from equipments authorized to licensees will be limited according to Rec. ITU-T 769 in the cases:



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ALMA CASE, miscellaneous

27.505 ha at Pampa Chajantor are declared “Zona de interés científico” by Ministerio de Bienes Nacionales, in order to guarantee the research project and to retain that territory for an optimum use by astronomy activities.