ECTEL REGIONAL SPECTRUM MANAGEMENT PLAN

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1.0 GENERAL

1.1 INTRODUCTION

The radio spectrum is an important but limited resource managed by the Eastern Caribbean Telecommunications Authority, ECTEL, for the people of the ECTEL Member States of the Eastern Caribbean. The radio spectrum provides a useful medium for the establishment of telecommunications and broadcasting services for the functioning and growth of the economy of the region.

The ECTEL Regional Spectrum Management Plan is a regional plan and divides the ECTEL radio frequency spectrum into a number of frequency bands and designates the general purposes for which each band may be utilized. This process is referred to as the allocation of frequency bands to radiocommunication services.

ECTEL is responsible for providing advice to the governments of the region on the allocation of the spectrum resource to meet the demands of existing and emerging technologies and services thereby ensuring that the radio spectrum provides the greatest economic and social benefit to the peoples of the region.

ECTEL Member States are signatories to the International Telecommunications Union, ITU, and the Caribbean Telecommunications Union, CTU, and collaborate with other intergovernmental and national telecommunications regulatory organizations in the Americas. Consequently, there is a need to have a regional spectrum framework that will inform the development of national telecommunications infrastructure within ECTEL Member States and will ensure that international treaties are addressed.

1.2 BACKGROUND

ECTEL was established by Treaty on 04 May 2000 and provides support for the management of the telecommunications affairs of five states, namely Commonwealth of Dominica, Grenada, St Kitts and Nevis, St Lucia, and St Vincent and the Grenadines. The management of the scarce resource is carried out under a multi-island spectrum management system. One of the basic principles applied is that of harmonizing the processes to ensure equitable distribution of the spectrum.

The five island states comprising ECTEL are to be found in the Eastern Caribbean, from St Kitts and Nevis on the northern extreme to Grenada at the most southern end. Some of the islands are bordered by other islands of English, French and Dutch speaking peoples and cultures. This unique juxtaposition of islands requires a sound and prudent spectrum management process for effectiveness.

ECTEL is comprised of a Council of Ministers (responsible for the formulation of policy for the management of telecommunications in the Contracting States) to whom a Board of

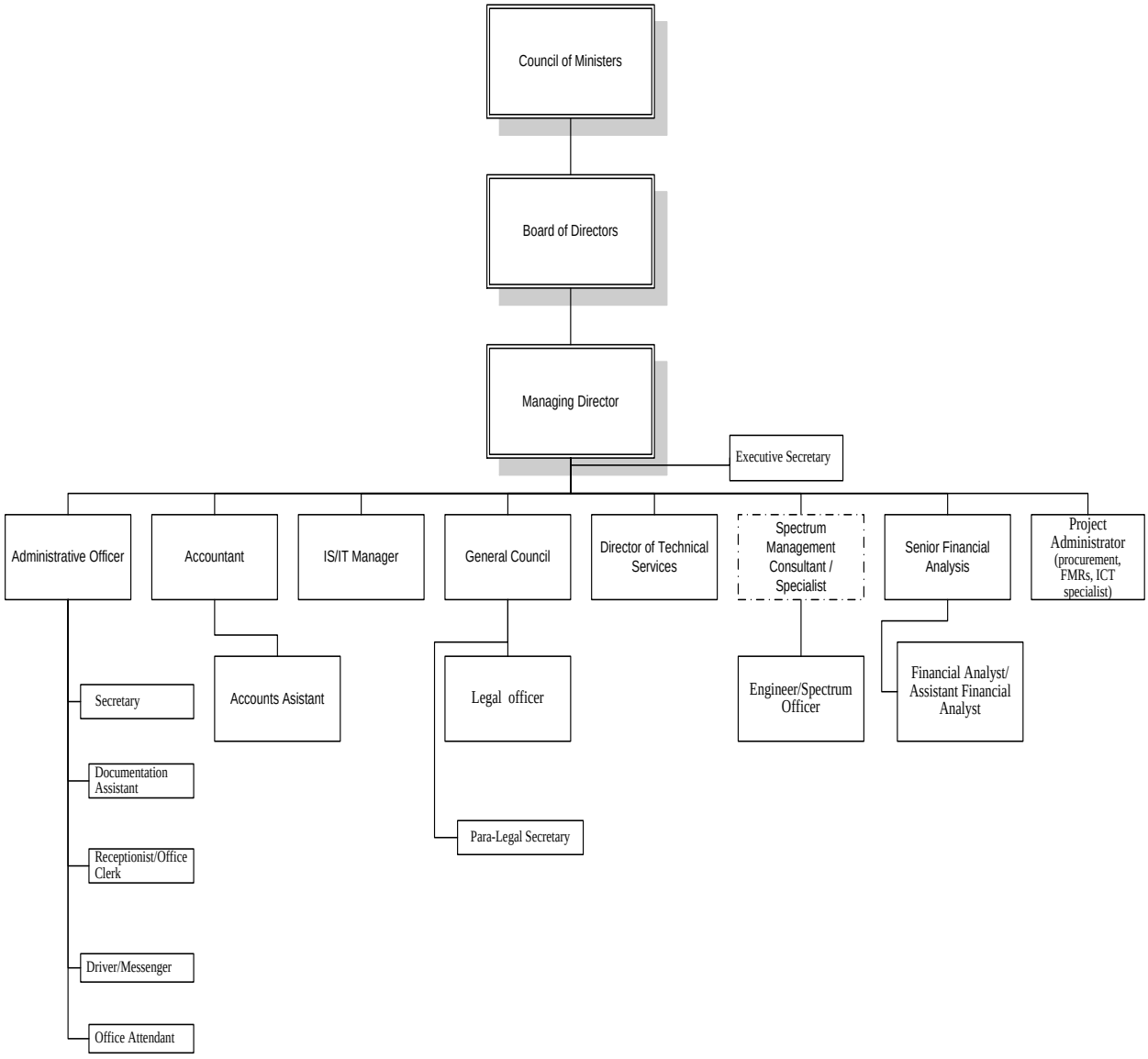
Directors is answerable, together with such staff as ECTEL requires for the performance of its functions under the supervision and control of a Managing Director.

1.3 LEGISLATIVE AND REGULATORY FRAMEWORK

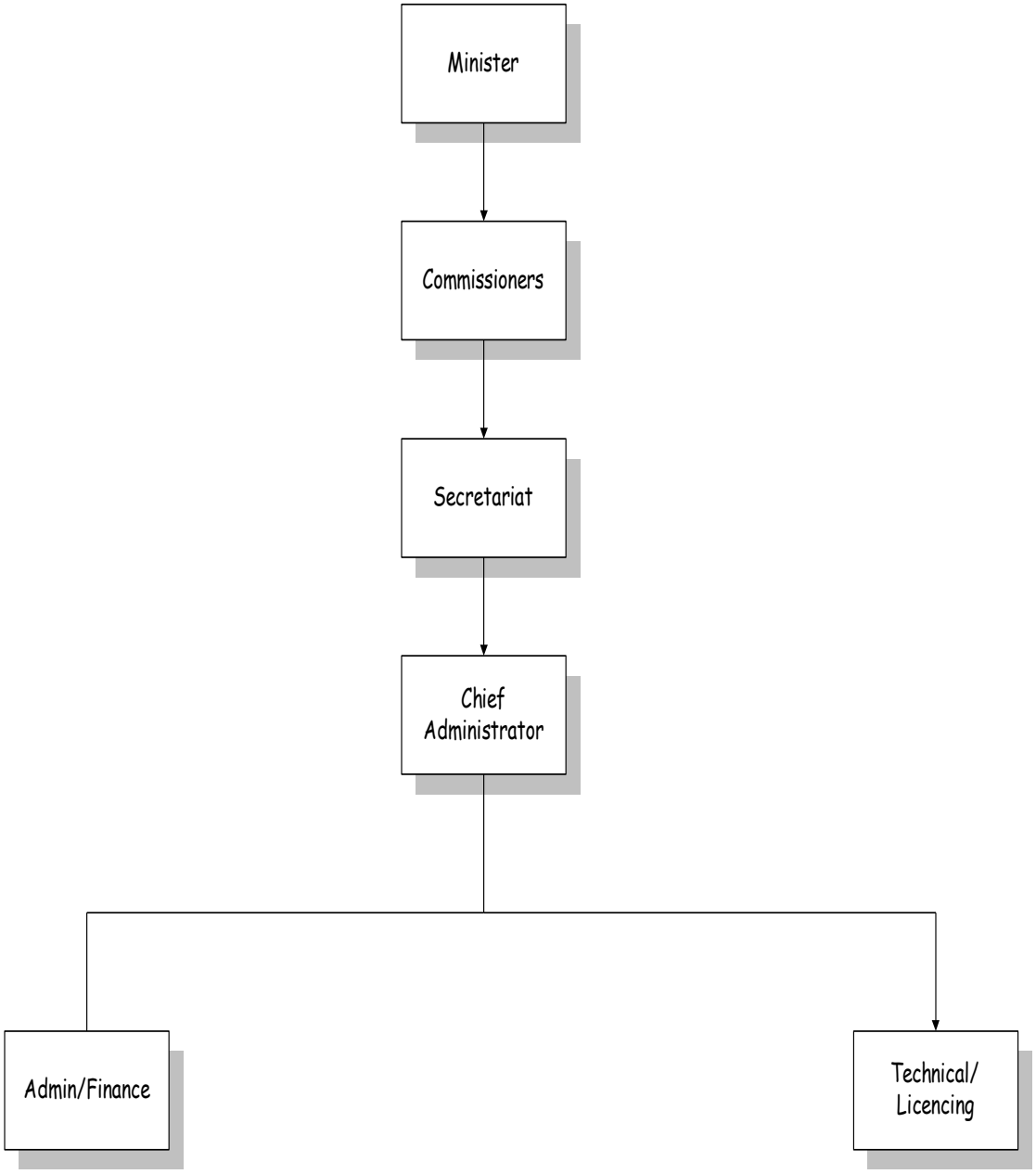
The principal mechanism for the management of the spectrum resource is the Telecommunications Act of 2000/2001. This legislation sets out the basic provisions granting authority to the Commission of its jurisdiction while establishing the prohibitions for directing the control of the use of the spectrum. The spectrum is regulated by the Eastern Caribbean Telecommunications Authority (ECTEL) and the National Telecommunications Regulatory Commission (NTRC) for each ECTEL Member State. Regulations made pursuant to the Act provide authority for the regulatory bodies in pursuit of prudent spectrum management.

1.4 STRUCTURE

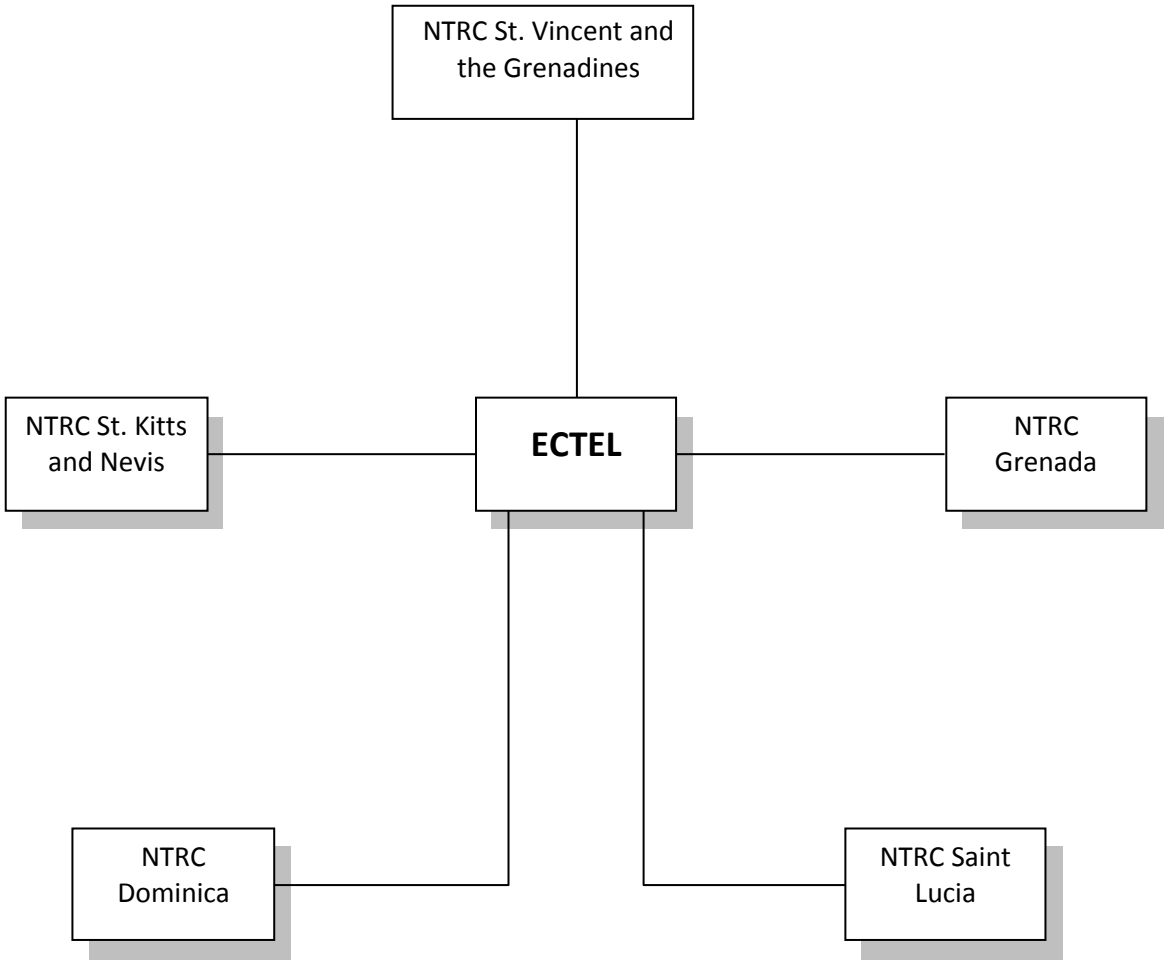
1.4.1 ECTEL Organisational Chart Showing Reporting Relationships



1.4.2 Organisational Chart for NTRC's



1.4.3 Relationship between NTRC's and ECTEL



2.0 NAME OF SPECTRUM PLAN

The spectrum plan is the ECTEL Regional Spectrum Management Plan.

3.0 COMMENCEMENT

The ECTEL Regional Spectrum Management Plan commenced on 3rd April 2006. This first amendment to the plan takes effect as of 18th June 2012.

4.0 DEFINITIONS OF TERMS AND SERVICES

The ITU has definitions for terms and services used throughout the ITU Radio Regulations that can be found in Article 1 of those regulations. The ECTEL Regional Spectrum Management Plan has incorporated the following ITU definitions for those terms and services used throughout the Plan.

4.1 TERMS AND DEFINITIONS

Introduction

For the purposes of the Plan, the terms used shall have the meanings defined below. These terms and definitions do not however necessarily apply for other purposes. Definitions identical to those contained in the Annex to the Constitution or the Annex to the Convention of the International Telecommunication Union (Geneva, 1992) are marked "(CS)" or "(CV)" respectively.

NOTE – If, in the text of a definition below, a term is printed in italics, this means that the term itself is defined in Article 1 of the ITU Radio Regulations.

4.2 GENERAL TERMS

Administration: Any governmental department or service responsible for discharging the obligations undertaken in the Constitution of the International Telecommunication Union, in the Convention of the International Telecommunication Union and in the Administrative Regulations (CS 1002).

***Telecommunications*:** Any form of transmission, emission, or reception of signs, text, images and sounds or other intelligence of any nature by wire, radio, optical or other electromagnetic means.

***Radio**:* A general term applied to the use of *radio waves*.

***Radio waves* or *hertzian waves**:* Electromagnetic waves of frequencies arbitrarily lower than 3000 GHz, propagated in space without artificial guide.

***Radiocommunication**: Telecommunication* by means of *radio waves* (CS) (CV).

Terrestrial radiocommunication: Any *radiocommunication* other than *space radiocommunication* or *radio astronomy.*

***Space radiocommunication**:* Any *radiocommunication* involving the use of one or more *space stations* or the use of one or more *reflecting satellites* or other objects in space.

Radiodetermination: The determination of the position, velocity and/or other characteristics of an object, or the obtaining of information relating to these parameters, by means of the propagation properties of *radio waves.*

Radionavigation: *Radiodetermination* used for the purposes of navigation, including obstruction warning.

Radiolocation: *Radiodetermination* used for purposes other than those of *radionavigation* .

***Radio direction -finding**: Radiodetermination* using the reception of *radio waves* for the purpose of determining the direction of a *station* or object.

Radio astronomy: Astronomy based on the reception of *radio waves* of cosmic origin.

Coordinated Universal Time (UTC): Time scale, based on the second (SI), as defined in Recommendation ITU-R TF.460-6. (WRC-03) For most practical purposes associated with the Radio Regulations, UTC is equivalent to mean solar time at the prime meridian (0° longitude), formerly expressed in GMT.

Industrial, scientific and medical (ISM) applications (of radio frequency energy): Operation of equipment or appliances designed to generate and use locally radio frequency energy for industrial, scientific, medical, domestic or similar purposes, excluding applications in the field of *telecommunications*.

4.3 SPECIFIC TERMS RELATED TO FREQUENCY MANAGEMENT

Allocation (of a frequency band)*:* Entry in the Table of Frequency Allocations of a given frequency band for the purpose of its use by one or more terrestrial or space *radiocommunication services* or the *radio astronomy service* under specified conditions. This term shall also be applied to the frequency band concerned.

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 a terrestrial or space *radiocommunication service* 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.

4.4 RADIO SERVICES

Radiocommunication service: A service as defined in this Section involving the transmission, *emission* and/or reception of *radio waves* for specific *telecommunication* purposes. In the Radio Regulations, unless otherwise stated, any *radiocommunication service* relates to *terrestrial radiocommunication*.

Fixed service: A *radiocommunication service* between specified fixed points.

Fixed-satellite service: A *radiocommunication service* between *earth stations* at given positions, when one or more *satellites* are used; the given position may be a specified fixed point or any fixed point within specified areas; in some cases this service includes satellite-to-satellite links, which may also be operated in the *inter-satellite service*; the fixed-satellite service may also include *feeder links* for other *space radiocommunication services*.

Inter-satellite service: A *radiocommunication service* providing links between artificial *satellites*.

Space operation service: A *radiocommunication service* concerned exclusively with the operation of *spacecraft*, in particular *space tracking*, *space telemetry* and *space telecommand*. These functions will normally be provided within the service in which the *space station* is operating.

Mobile service: A *radiocommunication service* between *mobile* and *land stations*, or between *mobile stations* (CV).

Mobile-satellite service: A *radiocommunication service:*

- between *mobile earth stations* and one or more *space stations*, or between *space stations* used by this service; or

– between *mobile earth stations* by means of one or more *space stations*. This service may also include *feeder links* necessary for its operation.

Land mobile service: A *mobile service* between *base stations* and *land mobile stations*, or between *and mobile stations*.

Land mobile -satellite service*:* A *mobile-satellite service* in which *mobile earth stations* are located on land.

Maritime mobile service: A *mobile service* between *coast stations* and *ship stations*, or between *ship stations*, or between associated *on-board communication stations*; *survival craft stations* and *emergency position-indicating radiobeacon stations* may also participate in this service.

Maritime mobile-satellite service*:* A *mobile-satellite service* in which *mobile earth stations* are located on board ships; *survival craft stations* and *emergency position -indicating radiobeacon stations* may also participate in this service.

Port operations service*:* A *maritime mobile service* in or near a port, between *coast stations* and *ship stations*, or between *ship stations*, in which messages are restricted to those relating to the operational handling, the movement and the safety of ships and, in emergency, to the safety of persons. Messages which are of a *public correspondence* nature shall be excluded from this service.

Ship movement service: A *safety service* in the *maritime mobile service* other than a *port operations service*, between *coast stations* and *ship stations*, or between *ship stations*, in which messages are restricted to those relating to the movement of ships. Messages which are of a *public correspondence* nature shall be excluded from this service.

Aeronautical mobile service: A *mobile service* between *aeronautical stations* and *aircraft stations*, or between *aircraft stations*, in which *survival craft stations* may participate; *emergency position-indicating radiobeacon stations* may also participate in this service on designated distress and emergency frequencies.

Aeronautical mobile (R*) service*:* An *aeronautical mobile service* reserved for communications relating to safety and regularity of flight, primarily along national or international civil air routes.

Aeronautical mobile (OR)** service*:* An *aeronautical mobile service* intended for communications, including those relating to flight coordination, primarily outside national or international civil air routes.

* (R): route

** (OR): off-route

Aeronautical mobile-satellite service: A *mobile-satellite service* in which *mobile earth stations* are located on board aircraft; *survival craft stations* and *emergency position-indicating radiobeacon stations* may also participate in this service.

Aeronautical mobile-satellite (R)* service: An *aeronautical mobile-satellite service* reserved for communications relating to safety and regularity of flights, primarily along national or international civil air routes.

Aeronautical mobile-satellite (OR)** service: An *aeronautical mobile-satellite service* intended for communications, including those relating to flight coordination, primarily outside national and international civil air routes.

Broadcasting service: A *radiocommunication service* in which the transmissions are intended for direct reception by the general public. This service may include sound transmissions, *television* transmissions or other types of transmission (CS).

Broadcasting-satellite service: A *radiocommunication service* in which signals transmitted or retransmitted by *space stations* are intended for direct reception by the general public.

In the broadcasting -satellite service, the term "direct reception" shall encompass both *individual reception* and *community reception*.

Radiodetermination service: A *radiocommunication service* for the purpose of *radiodetermination* .

Radiodetermination-satellite service: A *radiocommunication service* for the purpose of *radiodetermination* involving the use of one or more *space stations*. This service may also include *feeder links* necessary for its own operation.

Radionavigation service: A *radiodetermination service* for the purpose of *radionavigation* .

Radionavigation-satellite service: A *radiodetermination-satellite service* used for the purpose of *radionavigation*. This service may also include *feeder links* necessary for its operation.

Maritime radionavigation service: A *radionavigation service* intended for the benefit and for the safe operation of ships.

Maritime radionavigation-satellite service: A *radionavigation -satellite service* in which *earth stations* are located on board ships.

Aeronautical radionavigation service: A *radionavigation service* intended for the benefit and for the safe operation of aircraft.

Aeronautical radionavigation -satellite service: A *radionavigation-satellite service* in which *earth stations* are located on board aircraft.

***Radiolocation service**:* A *radiodetermination service* for the purpose of *radiolocation*.

Radiolocation-satellite service: A *radiodetermination-satellite service* used for the purpose of *radiolocation*. This service may also include the *feeder links* necessary for its operation.

Meteorological aids service: A *radiocommunication service* used for meteorological, including hydrological, observations and exploration.

Earth exploration-satellite service: A *radiocommunication service* between *earth stations* and one or more *space stations*, which may include links between *space stations*, in which:

- information relating to the characteristics of the Earth and its natural phenomena, including data relating to the state of the environment, is obtained from *active sensors* or *passive sensors* on Earth *satellites*;
- similar information is collected from airborne or Earth-based platforms;
- such information may be distributed to earth stations within the system concerned;
- platform interrogation may be included.

This service may also include *feeder links* necessary for its operation.

Meteorological-satellite service: An *earth exploration-satellite service* for meteorological purposes.

***Standard frequency and time signal service**:* A *radiocommunication service* for scientific, technical and other purposes, providing the transmission of specified frequencies, time signals, or both, of stated high precision, intended for general reception.

***Standard frequency and time signal-satellite service**:* A *radiocommunication service* using *space stations on* earth *satellites* for the same purposes as those of the *standard frequency and time signal service.* This service may also include *feeder links* necessary for its operation.

***Space research service**:* A *radiocommunication service* in which *spacecraft* or other objects in space are used for scientific or technological research purposes.

***Amateur service**:* A *radiocommunication service* for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest.

Amateur-satellite service: A *radiocommunication service* using *space stations* on earth *satellites* for the same purposes as those of the *amateur service.*

Radio astronomy service: A service involving the use of *radio astronomy.*

Safety service: Any *radiocommunication service* used permanently or temporarily for the safeguarding of human life and property.

Special service*:* A *radiocommunication service*, not otherwise defined in this Section, carried on exclusively for specific needs of general utility, and not open to *public correspondence*.

4.5 RADIO STATIONS AND SYSTEMS

Station*:* One or more transmitters or receivers or a combination of transmitters and receivers, including the accessory equipment, necessary at one location for carrying on a *radiocommunication service,* or the *radio astronomy service.* Each station shall be classified by the service in which it operates permanently or temporarily.

Terrestrial station*:* A *station* effecting *terrestrial radiocommunication*. In the Radio Regulations, unless otherwise stated, any *station* is a terrestrial station.

Earth station: A *station* located either on the Earth's surface or within the major portion of the Earth's atmosphere and intended for communication:

- with one or more *space stations*; or
- with one or more *stations* of the same kind by means of one or more reflecting *satellites* or other objects in space.

Space station: 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.

Survival craft station*:* A *mobile station* in the *maritime mobile service* or the *aeronautical mobile service* intended solely for survival purposes and located on any lifeboat, life-raft or other survival equipment.

Fixed station: A *station* in the *fixed service.*

High altitude platform station: A station located on an object at an altitude of 20 to 50 km and at a specified, nominal, fixed point relative to the Earth.

Mobile station*:* A *station* in the *mobile service* intended to be used while in motion or during halts at unspecified points.

***Mobile earth station**:* An *earth station* in the *mobile-satellite service* intended to be used while in motion or during halts at unspecified points.

***Land station**:* A *station* in the *mobile service* not intended to be used while in motion.

***Land earth station**:* An *earth station* in the *fixed-satellite service* or, in some cases, in the *mobile - satellite service,* located at a specified fixed point or within a specified area on land to provide a *feeder link* for the *mobile-satellite service*.

Base station: A *land station* in the *land mobile service*.

***Base earth station**:* An *earth station* in the *fixed-satellite service* or, in some cases, in the *land mobile -satellite service,* located at a specified fixed point or within a specified area on land to provide a *feeder link* for the *land mobile-satellite service*.

***Land mobile station**:* A *mobile station* in the *land mobile service* capable of surface movement within the geographical limits of a country or continent.

Land mobile earth station: A *mobile earth station* in the *land mobile-satellite service* capable of surface movement within the geographical limits of a country or continent.

Coast station: A *land station* in the *maritime mobile service*.

***Coast earth station**:* An *earth station* in the *fixed-satellite service* or, in some cases, in the *maritime mobile-satellite service,* located at a specified fixed point on land to provide a *feeder link* for the *maritime mobile-satellite service*.

***Ship station**:* A *mobile station* in the *maritime mobile service* located on board a vessel which is not permanently moored, other than a *survival craft station*.

Ship earth station: A *mobile earth station* in the *maritime mobile-satellite service* located on board ship.

On-board communication station: A low-powered *mobile station* in the *maritime mobile service* intended for use for internal communications on board a ship, or between a ship and its lifeboats and life-rafts during lifeboat drills or operations, or for communication within a group of vessels being towed or pushed, as well as for line handling and mooring instructions.

Port station: A *coast station* in the *port operations service.*

Aeronautical station: A *land station* in the *aeronautical mobile service.* In certain

instances, an aeronautical station may be located, for example, on board ship or on a platform at sea.

***Aeronautical earth station**:* An *earth station* in the *fixed-satellite service*, or, in some cases, in the *aeronautical mobile-satellite service*, located at a specified fixed point on land to provide a *feeder link* for the *aeronautical mobile-satellite service*.

***Aircraft station**:* A *mobile station* in the *aeronautical mobile service*, other than a *survival craft station*, located on board an aircraft.

Aircraft earth station: A *mobile earth station* in the *aeronautical mobile-satellite service* located on board an aircraft.

***Broadcasting station**:* A *station* in the *broadcasting service*.

***Radiodetermination station**:* A *station* in the *radiodetermination service*.

***Radionavigation mobile station**:* A *station* in the *radionavigation service* intended to be used while in motion or during halts at unspecified points.

Radionavigation land station: A *station* in the *radionavigation service* not intended to be used while in motion.

***Radiolocation mobile station**:* A *station* in the *radiolocation service* intended to be used while in motion or during halts at unspecified points.

***Radiolocation land station**:* A *station* in the *radiolocation service* not intended to be used while in motion.

Radio direction-finding station: A *radiodetermination station* using *radio direction-finding.*

***Radiobeacon station**:* A *station* in the *radionavigation service* the *emissions* of which are intended to enable a *mobile station* to determine its bearing or direction in relation to the radiobeacon station.

Emergency position-indicating radiobeacon station: A *station* in the *mobile service* the *emissions* of which are intended to facilitate search and rescue operations.

***Satellite emergency position-indicating radiobeacon**:* An *earth station* in the *mobile-satellite service the emissions* of which are intended to facilitate search and rescue operations.

***Standard frequency and time signal station**:* A *station* in the *standard frequency and time signal service.*

Amateur station: A *station* in the *amateur service.*

Radio astronomy station*:* A *station* in the *radio astronomy service.*

Experimental station*:* A *station* utilizing *radio waves* in experiments with a view to the development of science or technique. This definition does not include *amateur stations.*

Ship's emergency transmitter*:* A ship's transmitter to be used exclusively on a distress frequency for distress, urgency or safety purposes.

Radar*:* A *radiodetermination* system based on the comparison of reference signals with radio signals reflected, or retransmitted, from the position to be determined.

Primary radar*:* A *radiodetermination* system based on the comparison of reference signals with radio signals reflected from the position to be determined.

Secondary radar*:* A *radiodetermination* system based on the comparison of reference signals with radio signals retransmitted from the position to be determined.

Radar beacon (racon): A transmitter-receiver associated with a fixed navigational mark which, when triggered by a *radar,* automatically returns a distinctive signal which can appear on the display of the triggering *radar,* providing range, bearing and identification information.

Instrument landing system (ILS): A *radionavigation* system which provides aircraft with horizontal and vertical guidance just before and during landing and, at certain fixed points, indicates the distance to the reference point of landing.

Instrument landing system localizer: A system of horizontal guidance embodied in the *instrument landing system* which indicates the horizontal deviation of the aircraft from its optimum path of descent along the axis of the runway.

Instrument landing system glide path: A system of vertical guidance embodied in the *instrument landing system* which indicates the vertical deviation of the aircraft from its optimum path of descent.

Marker beacon: A transmitter in the *aeronautical radionavigation service* which radiates vertically a distinctive pattern for providing position information to aircraft.

Radio altimeter*:* *Radionavigation* equipment, on board an aircraft or *spacecraft,* used to determine the height of the aircraft or the *spacecraft* above the Earth's surface or another surface.

Radiosonde*:* An automatic radio transmitter in the *meteorological aids service* usually

carried on an aircraft, free balloon, kite or parachute, and which transmits meteorological data.

Adaptive system: A radiocommunication system which varies its radio characteristics according to channel quality.

Space system: Any group of cooperating *earth stations* and/or *space stations* employing *space radiocommunication* for specific purposes.

Satellite system: A *space system* using one or more artificial earth *satellites*.

Satellite network: A *satellite system* or a part of a *satellite system*, consisting of only one *satellite* and the cooperating *earth stations*.

Satellite link: A radio link between a transmitting *earth station* and a receiving *earth station* through one *satellite*. A satellite link comprises one up-link and one down-link.

Multi-satellite link: A radio link between a transmitting *earth station* and a receiving *earth station* through two or more *satellites*, without any intermediate *earth station*. A multi-satellite link comprises one up-link, one or more satellite-to-satellite links and one down-link.

Feeder link: A radio link from an *earth station* at a given location to a *space station*, or vice versa, conveying information for a *space radiocommunication service* other than for the *fixed- satellite service*. The given location may be at a specified fixed point, or at any fixed point within specified areas.

4.6 OPERATIONAL TERMS

Public correspondence: Any *telecommunication* which the offices and *stations* must, by reason of their being at the disposal of the public, accept for transmission (CS).

Telegraphy[1]: A form of telecommunication in which the transmitted information is intended to be recorded on arrival as a graphic document; the transmitted information may sometimes be presented in an alternative form or may be stored for subsequent use (CS 1016).

Telegram: Written matter intended to be transmitted by *telegraphy* for delivery to the addressee. This term also includes *radio telegrams* unless otherwise specified (CS). In this definition the term *telegraphy* has the same general meaning as defined in the Convention.

[1] A graphic document records information in a permanent form and is capable of being filed and consulted; it may take the form of written or printed matter or of a fixed image.

Radiotelegram: A *telegram*, originating in or intended for a *mobile station* or a *mobile earth station* transmitted on all or part of its route over the *radiocommunication* channels of the *mobile service* or of the *mobile-satellite service*.

Radiotelex call: A telex call, originating in or intended for a *mobile station* or a *mobile earth station*, transmitted on all or part of its route over the *radiocommunication* channels of the *mobile service* or the *mobile-satellite service*.

Frequency-shift telegraphy: *Telegraphy* by frequency modulation in which the telegraph signal shifts the frequency of the carrier between predetermined values.

Facsimile: A form of *telegraphy* for the transmission of fixed images, with or without half-tones, with a view to their reproduction in a permanent form.

Telephony: A form of *telecommunication* primarily intended for the exchange of information in the form of speech (CS 1017).

Radiotelephone call: A telephone call, originating in or intended for a *mobile station* or a *mobile earth station,* transmitted on all or part of its route over the *radiocommunication* channels of the *mobile service* or of the *mobile-satellite service*.

Simplex operation: Operating method in which transmission is made possible alternately in each direction of a *telecommunication* channel, for example, by means of manual control[2].

Duplex operation: Operating method in which transmission is possible simultaneously in both directions of a *telecommunication* channel[2].

Semi-duplex operation: A method which is *simplex operation* at one end of the circuit and *duplex operation* at the other.[2]

Television: A form of *telecommunication* for the transmission of transient images of fixed or moving objects.

Individual reception (in the broadcasting-satellite service)*:* The reception of *emissions* from a *space station* in the *broadcasting-satellite service* by simple domestic installations and in particular those possessing small antennae.

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[1] A graphic document records information in a permanent form and is capable of being filed and consulted; it may take the form of written or printed matter or of a fixed image.

[2] In general, *duplex operation* and *semi-duplex operation* require two frequencies in *radiocommunication* ; *simplex operation* may use either one or two.

Community reception (in the broadcasting-satellite service)*:* 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 antennae larger than those used for *individual reception* , and intended for use:

- by a group of the general public at one location; or
- through a distribution system covering a limited area.

Telemetry*:* The use of *telecommunication* for automatically indicating or recording measurements at a distance from the measuring instrument.

Radiotelemetry: *Telemetry* by means of *radio waves*.

Space telemetry: The use of *telemetry* for the transmission from a *space station* of results of measurements made in a *spacecraft,* including those relating to the functioning of the *spacecraft*.

Telecommand: The use of *telecommunication* for the transmission of signals to initiate, modify or terminate functions of equipment at a distance.

Space telecommand: The use of *radiocommunication* for the transmission of signals to a *space station* to initiate, modify or terminate functions of equipment on an associated space object, including the *space station* .

Space tracking: Determination of the *orbit,* velocity or instantaneous position of an object in space by means of *radiodetermination,* excluding *primary radar*, for the purpose of following the movement of the object.

4.7 CHARACTERISTICS OF EMISSIONS AND RADIO EQUIPMENT

Radiation: The outward flow of energy from any source in the form of *radio waves.*

Emission: *Radiation* produced, or the production of *radiation,* by a radio transmitting *station.* For example, the energy radiated by the local oscillator of a radio receiver would not be an emission but a *radiation.*

Class of emission*:* The set of characteristics of an *emission,* designated by standard symbols, e.g. type of modulation of the main carrier, modulating signal, type of information to be transmitted, and also, if appropriate, any additional signal characteristics.

Single-sideband emission*:* An amplitude modulated *emission* with one sideband only.

Full carrier single-sideband emission: A *single-sideband emission* without reduction of the carrier.

Reduced carrier single -sideband emission: A *single-sideband emission* in which the degree of carrier suppression enables the carrier to be reconstituted and to be used for demodulation.

Suppressed carrier single-sideband emission: A *single-sideband emission* in which the carrier is virtually suppressed and not intended to be used for demodulation.

Out-of-band emission: *Emission* on a frequency or frequencies immediately outside the *necessary bandwidth* which results from the modulation process, but excluding *spurious emissions*.

Spurious emission: *Emission* on a frequency or frequencies which are outside the *necessary bandwidth* and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic *emissions*, parasitic *emissions*, intermodulation products and frequency conversion products, but exclude *out-of-band emissions*.

Unwanted emissions: Consist of *spurious emissions* and *out-of-band emissions*.

Out-of-band domain (of an emission)*:* The frequency range, immediately outside the necessary bandwidth but excluding the *spurious domain*, in which *out-of-band emissions* generally predominate. *Out-of-band emissions*, defined based on their source, occur in the out-of-band domain and, to a lesser extent, in the *spurious domain*. *Spurious emissions* likewise may occur in the out-of-band domain as well as in the *spurious domain*. (WRC -03)

Spurious domain (of an emission): The frequency range beyond the *out-of-band domain* in which *spurious emissions* generally predominate. (WRC-03)

Assigned frequency band: The frequency band within which the *emission* of a *station* is authorized; the width of the band equals the *necessary bandwidth* plus twice the absolute value of the *frequency tolerance.* Where *space stations* are concerned, the assigned frequency band includes twice the maximum Doppler shift that may occur in relation to any point of the Earth's surface.

Assigned frequency: The centre of the frequency band assigned to a *station*.

Characteristic frequency: A frequency which can be easily identified and measured in a given *emission.* A carrier frequency may, for example, be designated as the characteristic frequency.

Reference frequency: A frequency having a fixed and specified position with respect to the *assigned frequency.* The displacement of this frequency with respect to the *assigned frequency* has the same absolute value and sign that the displacement of the *characteristic frequency* has with respect to the centre of the frequency band occupied by the *emission*.

Frequency tolerance: The maximum permissible departure by the centre frequency of the frequency band occupied by an *emission* from the *assigned frequency* or, by the *characteristic frequency* of an *emission* from the *reference frequency.* The frequency tolerance is expressed in parts in 10^6 or in hertz.

Necessary bandwidth: For a given *class of emission*, the width of the frequency band which is just sufficient to ensure the transmission of information at the rate and with the quality required under specified conditions.

Occupied bandwidth: The width of a frequency band such that, below the lower and above the upper frequency limits, the *mean powers* emitted are each equal to a specified percentage ß/2 of the total *mean power* of a given *emission.* Unless otherwise specified in an ITU-R Recommendation for the appropriate *class of emission,* the value of ß/2 should be taken as 0.5%.

Right-hand* (clockwise) *polarized wave: An elliptically- or circularly -polarized wave, in which the electric field vector, observed in any fixed plane, normal to the direction of propagation, whilst looking in the direction of propagation, rotates with time in a right-hand or clockwise direction.

Left-hand* (anticlockwise) *polarized wave: An elliptically- or circularly -polarized wave, in which the electric field vector, observed in any fixed plane, normal to the direction of propagation, whilst looking in the direction of propagation, rotates with time in a left-hand or anticlockwise direction.

Power: Whenever the power of a radio transmitter, etc. is referred to it shall be expressed in one of the following forms, according to the class of *emission*, using the arbitrary symbols indicated:

- *peak envelope power* (*P*X or *p* X);
- *mean power* (*P*Y or *p*Y);
- *carrier power* (*P*Z or *p*Z).

For different *classes of emission,* the relationships between *peak envelope power, mean power* and *carrier power,* under the conditions of normal operation and of no modulation, are contained in ITU-R Recommendations which may be used as a guide.

For use in formulae, the symbol *p* denotes power expressed in watts and the symbol *P* denotes power expressed in decibels relative to a reference level.

Peak envelope power (of a radio transmitter) *:* The average power supplied to the antenna transmission line by a transmitter during one radio frequency cycle at the crest of the modulation envelope taken under norm al operating conditions.

Mean power (of a radio transmitter)*:* The average power supplied to the antenna transmission line by a transmitter during an interval of time sufficiently long compared with the lowest frequency encountered in the modulation taken under normal operating conditions.

Carrier power (of a radio transmitter)*:* The average power supplied to the antenna transmission line by a transmitter during one radio frequency cycle taken under the condition of no modulation.

Gain of an antenna*:* The ratio, usually expressed in decibels, of the power required at the input of a loss-free reference antenna to the power supplied to the input of the given antenna to produce, in a given direction, the same field strength or the same power flux-density at the same distance. When not specified otherwise, the gain refers to the direction of maximum *radiation*. The gain may be considered for a specified polarization.

Depending on the choice of the reference antenna a distinction is made between:

a) absolute or isotropic gain (G_i), when the reference antenna is an isotropic antenna isolated in space;

b) gain relative to a half-wave dipole (G_d), when the reference antenna is a half - wave dipole isolated in space whose equatorial plane contains the given direction;

c) gain relative to a short vertical antenna (G_v), when the reference antenna is a linear conductor, much shorter than one quarter of the wavelength, normal to the surface of a perfectly conducting plane which contains the given direction.

Equivalent isotropically radiated power *(e.i.r.p.):* The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna *(absolute or isotropic gain)*.

Effective radiated power (e.r.p.) (in a given direction)*:* The product of the power supplied to the antenna and its *gain relative to a half-wave dipole* in a given direction.

Effective monopole radiated power (e.m.r.p.) (in a given direction)*:* The product of the power supplied to the antenna and its *gain relative to a short vertical antenna* in a given direction.

Troposphere scatter: The propagation of *radio waves* by scattering as a result of irregularities or discontinuities in the physical properties of the troposphere.

Ionospheric scatter: The propagation of *radio waves* by scattering as a result of

irregularities or discontinuities in the ionization of the ionosphere.

4.8 FREQUENCY SHARING

Interference: The effect of unwanted energy due to one or a combination of *emissions*, *radiations*, or inductions upon reception in a *radiocommunication* system, manifested by any performance degradation, misinterpretation, or loss of information which could be extracted in the absence of such unwanted energy.

Permissible interferencel[3]***:*** Observed or predicted *interference* which complies with quantitative *interference* and sharing criteria contained in the Radio Regulations or in ITU-R Recommendations or in special agreements as provided for in the Radio Regulations.

Accepted interference[3]***:*** *Interference* at a higher level than that defined as *permissible interference* and which has been agreed upon between two or more administrations without prejudice to other administrations.

Harmful interference: *Interference* which endangers the functioning of a *radionavigation service* or of other *safety services* or seriously degrades, obstructs, or repeatedly interrupts a *radiocommunication service* operating in accordance with Radio Regulations (CS).

Protection ratio* (R.F.)*: The minimum value of the wanted-to-unwanted signal ratio, usually expressed in decibels, at the receiver input, determined under specified conditions such that a specified reception quality of the wanted signal is achieved at the receiver output.

Coordination area: When determining the need for coordination, the area surrounding an *earth station* sharing the same frequency band with *terrestrial stations*, or surrounding a transmitting *earth station* sharing the same bidirectionally allocated frequency band with receiving *earth Stations*, beyond which the level of *permissible interference* will not be exceeded and coordination is therefore not required. (WRC-2000)

Coordination contour: The line enclosing the *coordination area*.

Coordination distance: When determining the need for coordination, the distance on a given azimuth from an *earth station* sharing the same frequency band with *terrestrial stations*, or from a transmitting *earth station* sharing the same bidirectionally allocated frequency band with receiving *earth stations*, beyond which the level of *permissible interference* will not be exceeded and coordination is therefore not required. (WRC-2000)

Equivalent satellite link noise temperature: The noise temperature referred to the output of the receiving antenna of the *earth station* corresponding to the radio frequency noise power

[3] The terms "permissible interference" and "accepted interference" are used in the coordination of frequency assignments between administrations.

which produces the total observed noise at the output of the *satellite link* excluding noise due to *interference* coming from *satellite links* using other *satellites* and from terrestrial systems.

Effective boresight area (of a steerable satellite beam)*:* An area on the surface of the Earth within which the boresight of a *steerable satellite beam* is intended to be pointed. There may be more than one unconnected effective boresight area to which a single *steerable satellite beam* is intended to be pointed.

Effective antenna gain contour (of a steerable satellite beam)*:* An envelope of antenna gain contours resulting from moving the boresight of a *steerable satellite beam* along the limits of the *effective boresight area*.

4.9 TECHNICAL TERMS RELATING TO SPACE

Deep space: Space at distances from the Earth equal to, or greater than, 2×10^6 km.

Spacecraft: A man -made vehicle which is intended to go beyond the major portion of the Earth's atmosphere.

Satellite*:* A body which revolves around another body of preponderant mass and which has a motion primarily and permanently determined by the force of attraction of that other body.

Active satellite*:* A *satellite* carrying a *station* intended to transmit or retransmit radiocommunication signals.

Reflecting satellite: A *satellite* intended to reflect radiocommunication signals.

Active sensor: A measuring instrument in the *earth exploration-satellite service* or in the *space research service* by means of which information is obtained by transmission and reception of *radio waves*.

Passive sensor*:* A measuring instrument in the *earth exploration -satellite service* or in the *space research service* by means of which information is obtained by reception of *radio waves* of natural origin.

Orbit: The path, relative to a specified frame of reference, described by the centre of mass of a *satellite* or other object in space subjected primarily to natural forces, mainly the force of gravity.

Inclination of an orbit (of an earth satellite): The angle determined by the plane containing the *orbit* and the plane of the Earth's equator measured in degrees between 0º and 180º and in counter-clockwise direction from the Earth's equatorial plane at the ascending node of the *orbit*. (WRC -2000)

Period (of a satellite)*:* The time elapsing between two consecutive passages of a *satellite* through a characteristic point on its *orbit.*

Altitude of the apogee **or** ***of the perigee****:* The altitude of the apogee or perigee above a specified reference surface serving to represent the surface of the Earth.

Geosynchronous satellite*:* An earth *satellite* whose period of revolution is equal to the period of rotation of the Earth about its axis.

Geostationary satellite*:* A *geosynchronous satellite* whose circular and direct *orbit* lies in the plane of the Earth's equator and which thus remains fixed relative to the Earth; by extension, a *geosynchronous satellite* which remains approximately fixed relative to the Earth. (WRC-03)

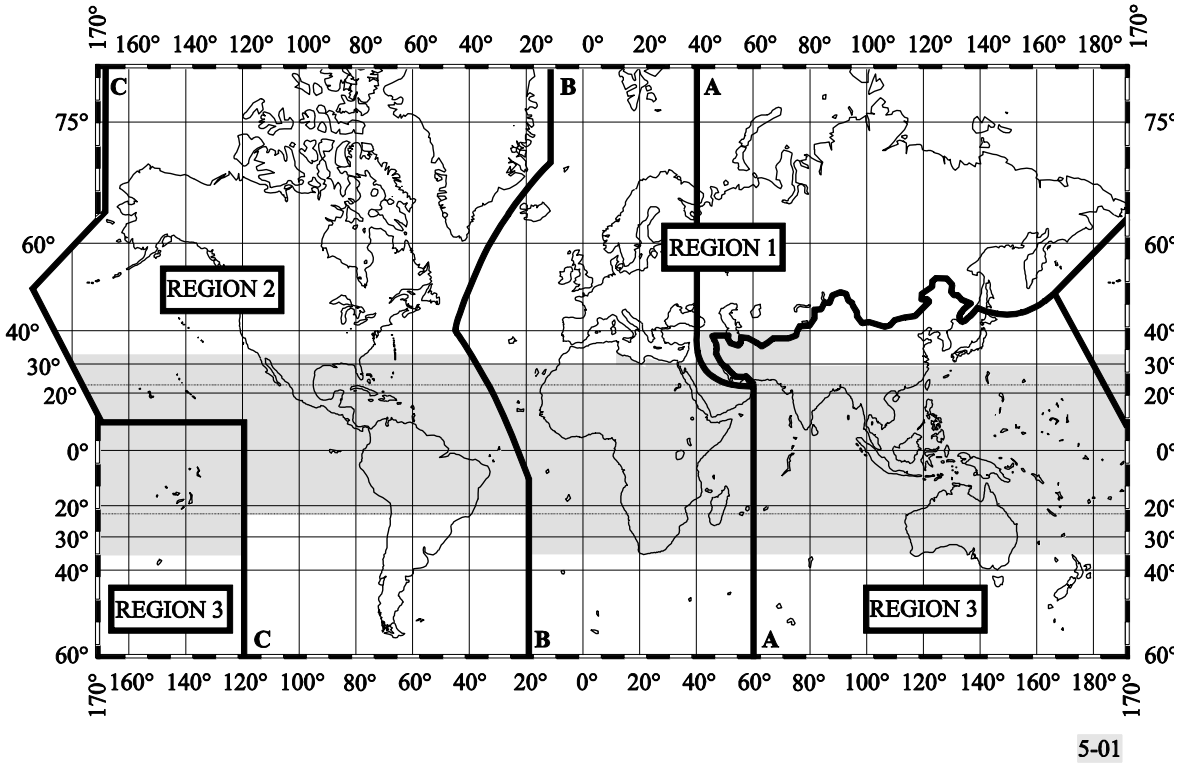
Geostationary-satellite orbit*:* The *orbit* of a *geosynchronous satellite* whose circular and direct *orbit* lies in the plane of the Earth's equator.

Steerable satellite beam: A *satellite* antenna beam that can be re-pointed.

5.0 ITU GEOGRAPHIC REGIONS

REGIONS AND AREAS

5.1 For the allocation of frequencies the world has been divided into three Regions[4] as shown on the following map and described in Nos. **5.2** to **5.8**:



[4] It should be noted that where the words "regions" or "regional" are without a capital "R" in this document, they do not relate to the three Regions here defined for purposes of frequency allocation.

5.2. *Region 1:* Region 1 includes the area limited on the east by line A (lines A, B and C are defined below) and on the west by line B, excluding any of the territory of the Islamic Republic of Iran which lies between these limits. It also includes the whole of the territory of Armenia, Azerbaijan, the Russian Federation, Georgia, Kazakhstan, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan, Turkey and Ukraine and the area to the north of Russian Federation which lies between lines A and C.

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

5.4 *Region 3:* Region 3 includes the area limited on the east by line C and on the west by line A, except any of the territory of Armenia, Azerbaijan, the Russian Federation, Georgia, Kazakhstan, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan, Turkey and Ukraine and the area to the north of Russian Federation. It also includes that part of the territory of the Islamic Republic of Iran lying outside of those limits.

5.5 The lines A, B and C are defined as follows:

5.6 *Line A:* Line A extends from the North Pole along meridian 40° East of Greenwich to parallel 40° North; thence by great circle arc to the intersection of meridian 60° East and the Tropic of Cancer; thence along the meridian 60° East to the South Pole.

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

5.8 *Line C:* Line C extends from the North Pole by great circle arc to the intersection of parallel 65° 30 North with the international boundary in Bering Strait; thence by great circle arc to the intersection of meridian 165° East of Greenwich and parallel 50° North; thence by great circle arc to the intersection of meridian 170° West and parallel 10° North; thence along parallel 10° North to its intersection with meridian 120° West; thence along meridian 120° West to the South Pole.

5.9 For the purposes of the Radio Regulations, the term "African Broadcasting Area" means:

5.10 *a)* African countries, parts of countries, territories and groups of territories situated between the parallels 40° South and 30° North;

5.11 *b)* islands in the Indian Ocean west of meridian 60° East of Greenwich, situated between the parallel 40° South and the great circle arc joining the

points 45° East, 11° 30 North and 60° East, 15° North;

5.12 *c)* islands in the Atlantic Ocean east of line B defined in No. **6.7** of the Radio Regulations, situated between the parallels 40° South and 30° North.

5.13 The "European Broadcasting Area" is bounded on the west by the western boundary of Region 1, on the east by the meridian 40° East of Greenwich and on the south by the parallel 30° North so as to include the northern part of Saudi Arabia and that part of those countries bordering the Mediterranean within these limits. In addition, Iraq, Jordan and that part of the territory of Syrian Arab Republic, Turkey and Ukraine lying outside the above limits are included in the European Broadcasting Area.

5.14 The "European Maritime Area" is bounded to the north by a line extending along parallel 72° North from its intersection with meridian 55° East of Greenwich to its intersection with meridian 5° West, then along meridian 5° West to its intersection with parallel 67° North, thence along parallel 67° North to its intersection with meridian 32° West; to the west by a line extending along meridian 32° West to its intersection with parallel 30° North; to the south by a line extending along parallel 30° North to its intersection with meridian 43° East; to the east by a line extending along meridian 43° East to its intersection with parallel 60° North, thence along parallel 60° North to its intersection with meridian 55° East and thence along meridian 55° East to its intersection with parallel 72° North.

5.15 1) The "Tropical Zone" (see map in No. **6.1**) is defined as:

5.16 *a)* the whole of that area in Region 2 between the Tropics of Cancer and Capricorn;

5.17 *b)* the whole of that area in Regions 1 and 3 contained between the parallels 30° North and 35° South with the addition of:

5.18 i) The area contained between the meridians 40° East and 80° East of Greenwich and the parallels 30° North and 40° North;

5.19 ii) that part of Libyan Arab Jamahiriya north of parallel 30° North.

5.20 2) In Region 2, the Tropical Zone may be extended to parallel 33° North, subject to special agreements between the countries concerned in that Region (see Article **6 RR**).

5.21 A sub-Region is an area consisting of two or more countries in the same Region.

6.0 FREQUENCY ALLOCATION

The ECTEL Regional Allocations are based on ITU Allocations made for region 2 as defined in the geographic regions. They are found in column 2 of the allocation table with Region 2 allocations shown in column 1.

The ECTEL allocations are closely aligned with ITU requirements of Region 2; however, there are some variations to ensure that national and regional policies are met. Where variations are made, cognisance is taken of Radio Regulation No. 4.4 which requires that any variation is subject to the condition that the associated radio installations do not cause harmful interference to the radio services or communications of other ITU Members that operate in accordance with the provisions of the Radio Regulations, and that the possibility of harmful interference from such services and communications is accepted.

The ECTEL Spectrum is allocated from 9 kHz to 1000 GHz. It is however not utilised beyond 40 GHz as the proliferation of radio equipment within the ECTEL Member States is limited to those devices operating below 40 GHz. It is anticipated that with the advent of new technologies utilization above 40 GHz will soon become necessary.

6.1 SPECTRUM PLAN DIVIDED INTO FREQUENCY BANDS

The spectrum plan is divided into frequency bands for the ITU Region 2 and the ECTEL Tables.

6.2 REFERENCES TO SERVICES MADE IN THE TABLE

i) Words in the ECTEL Table appearing in Upper Case refer to Primary Services of the type specified by those words.

ii) Words in the ECTEL table appearing in lower case refer to secondary services of the type specified by those words.

6.3 CONDITIONS THAT APPLY TO CERTAIN SERVICES

Where

(a) A frequency band is used for the purposes of a service in accordance with the Plan and

(b) The ITU Radio Regulations do not provide for the frequency band to be used for that service

Then the requirements for the coordination and notification of services by administrations apply to that use of the frequency band under this Plan

6.4 TABLE OF FREQUENCY ALLOCATIONS

Table of Frequency Allocations	
9-110 kHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
Below 9 (Not allocated)	**Below 9** (Not allocated)
53 54	53 54
9- 14	**9-14**
RADIONAVIGATION	RADIONAVIGATION
14-19.95 FIXED MARITIME MOBILE 57 55 56	**14-19.95** FIXED MARITIME MOBILE 57 55 56
19.95-20.05 STANDARD FREQUENCY AND TIME SIGNAL (20 kHz)	**19.95-20.05** STANDARD FREQUENCY AND TIME SIGNAL (20 kHz)
20.05-70 FIXED MARITIME MOBILE 57 56 58	**20.05-70** FIXED MARITIME MOBILE 57 56 58
70-90 FIXED MARITIME MOBILE 57 MARITIME RADIO-NAVIGATION 60 Radiolocation 61	**70-90** FIXED MARITIME MOBILE 57 MARITIME RADIO-NAVIGATION 60 Radiolocation 61
90-110 RADIONAVIGATION 62 Fixed 64	**90-110** RADIONAVIGATION 62 Fixed 64
110-255 kHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
110-130 FIXED MARITIME MOBILE MARITIME RADIO-NAVIGATION 60 Radiolocation 61 64	**110-130** FIXED MARITIME MOBILE MARITIME RADIO-NAVIGATION 60 Radiolocation 61 64
130-160 FIXED MARITIME MOBILE 64	**130-160** FIXED MARITIME MOBILE 64
160-190 FIXED	**160-190** FIXED
190-200 AERONAUTICAL RADIONAVIGATION	**190-200** AERONAUTICAL RADIONAVIGATION

200-495 kHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
200-275	**200-275**
AERONAUTICAL RADIONAVIGATION	AERONAUTICAL RADIONAVIGATION
Aeronautical mobile	Aeronautical mobile
275-285	**275-285**
AERONAUTICAL RADIONAVIGATION	AERONAUTICAL RADIONAVIGATION
Aeronautical mobile	Aeronautical mobile
Maritime radionavigation (radiobeacons)	Maritime radionavigation (radiobeacons)
285-315	**285-300**
AERONAUTICAL RADIONAVIGATION	AERONAUTICAL RADIONAVIGATION
MARITIME RADIONAVIGATION	
(radiobeacons) 73	**300-325**
	MARITIME RADIONAVIGATION
315-325	
MARITIME RADIONAVIGATION	
(radiobeacons) 73	
Aeronautical radionavigation	
325-335	**325-335**
AERONAUTICAL RADIONAVIGATION	AERONAUTICAL RADIO NAVIGATION
Aeronautical mobile	
Maritime radionavigation (radiobeacons)	
335-405	**335-405**
AERONAUTICAL	AERONAUTICAL
RADIONAVIGATION	RADIONAVIGATION
405-415	**405-415**
RADIONAVIGATION 76	RADIONAVIGATION 76
Aeronautical mobile	Aeronautical mobile
415-495	**415-495**
MARITIME MOBILE 79 79A	MARITIME MOBILE 79 79A
Aeronautical radionavigation 80	Aeronautical Radionavigation 80
495-1 800 kHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
495-505	**495-505**
MOBILE (distress and calling) 83	MOBILE (distress and calling) 83
505-510	**505-510**
MARITIME MOBILE 79	MARITIME MOBILE 79
510-525	**510-525**
MOBILE 79A 84	
AERONAUTICAL RADIONAVIGATION	AERONAUTICAL RADIONAVIGATION
525-535	**525-535**
BROADCASTING 86	STANDARD AM RADIO BROADCASTING 86

AERONAUTICAL RADIONAVIGATION	

535-1 605	**535-1 605**
BROADCASTING	BROADCASTING
1 605-1 625	**1 605-1 705**
BROADCASTING 89 90	BROADCASTING 89 90
1 625-1 705	
FIXED	BROADCASTING 89
MOBILE	E.1
BROADCASTING 89	
Radiolocation	
90	
1 705-1 800	**1 705-1 800**
FIXED	FIXED
MOBILE	MOBILE
RADIOLOCATION	RADIOLOCATION
AERONAUTICAL RADIONAVIGATION	AERONAUTICAL RADIONAVIGATION

1 800-2 194 kHz

Allocation to services	
ITU Region 2	**O.E.C.S**
1 800-1 850	**1 800-2 000**
AMATEUR	AMATEUR
1 850-2 000	
AMATEUR FIXED	 FIXED
MOBILE except aeronautical mobile	MOBILE except aeronautical mobile
RADIOLOCATION	RADIOLOCATION
RADIONAVIGATION	RADIONAVIGATION
102	102
2 000-2 065	**2 000-2 065**
FIXED	FIXED
MOBILE **2 065-2 107**	MOBILE **2 065-2 107**
MARITIME MOBILE 105	MARITIME MOBILE 105
106	106
2 107-2 170	**2 107-2 170**
FIXED	FIXED
MOBILE	MOBILE
2 170-2 173.5	**2 170-2 173.5**
MARITIME MOBILE	MARITIME MOBILE
2 173.5-2 190.5	**2 173.5-2 190.5**
MOBILE (distress and calling)	MOBILE (distress and calling)
108 109 110 111	108 109 110 111
	E.2
2 190.5-2 194	**2 190.5-2 194**

MARITIME MOBILE	MARITIME MOBILE
2 194-3 230 kHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
2 194-2 300 FIXED	**2 194-2 300** FIXED
MOBILE	MOBILE
112	112
2 300-2 495	**2 300-2 495**
FIXED	FIXED
MOBILE	MOBILE
BROADCASTING 113	BROADCASTING 113
2 495-2 501	**2 495-2 501**
STANDARD FREQUENCY AND TIME	STANDARD FREQUENCY AND TIME
SIGNAL (2 500 kHz)	SIGNAL
2 501-2 502	**2 501-2 502**
STANDARD FREQUENCY AND TIME	STANDARD FREQUENCY AND TIME
SIGNAL	SIGNAL
Space Research	
2 502-2 505	**2 502-2 505**
STANDARD FREQUENCY AND TIME	STANDARD FREQUENCY AND TIME
SIGNAL	SIGNAL
2 505-2 850	**2 505-2 850**
FIXED	FIXED
MOBILE	MOBILE
2 850-3 025	**2 850-3 025**
AERONAUTICAL MOBILE (R)	AERONAUTICAL MOBILE
111 115	111 115
3 025-3 155 AERONAUTICAL MOBILE (OR)	**3 025-3 155** AERONAUTICAL MOBILE
3 155-3 200	**3 155-3 200**
FIXED	FIXED
MOBILE except aeronautical mobile (R)	MOBILE
116 117	116 117
3 200-3 230	**3 200-3 230**
FIXED	FIXED
MOBILE except aeronautical mobile (R) BROADCASTING 113	MOBILE BROADCASTING 113
116	116
3 230-5 003 kHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
3 230-3 400	**3 230-3 400**
FIXED	FIXED
MOBILE except aeronautical mobile	MOBILE

BROADCASTING 113 116 118	BROADCASTING 113 116 118
3 400-3 500	**3 400-3 500**
AERONAUTICAL MOBILE (R)	AERONAUTICAL MOBILE
3 500-3 750	**3 500-4 000**
AMATEUR	AMATEUR
119	
3 750-4 000	
AMATEUR FIXED	FIXED
MOBILE except aeronautical mobile (R)	MOBILE except aeronautical mobile ®
122 125	122 125
4 000-4 063	**4 000-4 063**
FIXED	FIXED
MARITIME MOBILE 127	MARITIME MOBILE 127
126	126
4 063-4 438 MARITIME MOBILE 79A 109 110 130 131 132 128 129	**4 063-4 438** MARITIME MOBILE 79A 109 110 130 131 132 128 129
4 438-4 650	**4 438-4 650**
FIXED	FIXED
MOBILE except aeronautical mobile (R)	MOBILE
4 650-4 700	**4 650-4 700**
AERONAUTICAL MOBILE (R)	AERONAUTICAL MOBILE
4 700-4 750	**4 700-4 750**
AERONAUTICAL MOBILE (OR)	AERONAUTICAL MOBILE
4 750-4 850	**4 750-4 850**
FIXED	SHORT WAVE BROADCAST
MOBILE except aeronautical mobile (R)	
BROADCASTING 113	113
4 850-4 995	**4 850-4 995**
FIXED LAND MOBILE	FIXED LAND MOBILE
BROADCASTING 113	BROADCASTING 113
4 995-5 003	**4 995-5 003**
STANDARD FREQUENCY AND TIME SIGNAL (5 000 kHz)	STANDARD FREQUENCY AND TIME SIGNAL
5 003-7 450 kHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
5 003-5 005	**5 003-5 005**
STANDARD FREQUENCY AND TIME SIGNAL	STANDARD FREQUENCY AND TIME SIGNAL
Space research	
5 005-5 060	**5 005-5 060**
FIXED	SHORTWAVE BROADCAST
BROADCASTING 113	
5 060-5 250	**5 060-5 250**

FIXED Mobile except aeronautical mobile 133	FIXED MOBILE
5 250-5 450	**5 250-5 450**
FIXED	FIXED
MOBILE except aeronautical mobile	MOBILE
5 450-5 480	**5 450-5 730**
AERONAUTICAL MOBILE (R)	AERONAUTICAL MOBILE
5 480-5 680	TRANSOCEANIC FLIGHTS
AERONAUTICAL MOBILE (R) 111 115	
5 680-5 730	
AERONAUTICAL MOBILE (OR)	
111 115	111 115
5 730-5 900	**5 730-5 900**
FIXED	FIXED
MOBILE except aeronautical mobile (R)	MOBILE
5 900-5 950	**5 900-6 200**
BROADCASTING 134 136	SHORT WAVE BROADCAST
5 950-6 200	
BROADCASTING	
6 200-6 525	**6 200-6 525**
MARITIME MOBILE 109 110 130 132 137	MARITIME MOBILE 109 110 130 132 137
6 525-6 685	**6 525-6 685**
AERONAUTICAL MOBILE (R)	AERONAUTICAL MOBILE
6 685-6 765	**6 685-6 765**
AERONAUTICAL MOBILE (OR)	AERONAUTICAL MOBILE
6 765-7 000	**6 765-7 000**
FIXED	FIXED
MOBILE except aeronautical mobile (R)	MOBILE
138 138A 139	138 138A 139
7 000-7 100 AMATEUR	**7 000-7 300** AMATEUR
AMATEUR-SATELLITE	
140 141 141A	
7 100-7 200	
AMATEUR	
141A 141B 141C 142	
7 200-7 300	
AMATEUR	
142	140 141 141A 141B 141C 142
7 300-7 400	**7 300-7 350**
BROADCASTING 134	BROADCASTING 134 143A 143B 143C 143D
143 143A 143B 143C 143D	**7 350-7 450**
	FIXED
7 400-7 450	MOBILE
FIXED	
MOBILE except aeronautical mobile (R)	
7 450-13 360 kHz	

Allocation to services	
ITU Region 2	**O.E.C.S**
7 450-8 100	**7 450-8 100**
FIXED	FIXED
MOBILE except aeronautical mobile (R)	MOBILE except aeronautical mobile (R)
143E 144	143E 144
8 100-8 195	**8 100-8 195**
FIXED	FIXED
MARITIME MOBILE	MARITIME MOBILE
8 195-8 815	**8 195-8 815**
MARITIME MOBILE 109 110 132 145 111	MARITIME MOBILE 109 110 132 145 111
8 815-8 965	**8 815-8 965**
AERONAUTICAL MOBILE (R)	AERONAUTICAL MOBILE
8 965-9 040	**8 965-9 040**
AERONAUTICAL MOBILE (OR)	AERONAUTICAL MOBILE
9 040-9 400	**9 040-9 400**
FIXED	FIXED
9 400-9 500	**9 400-9 900**
BROADCASTING 134 146	SHORT WAVE BROADCAST
9 500-9 900	
BROADCASTING 147 **9 900-9 995**	 **9 900-9 995**
FIXED	FIXED
9 995-10 003	**9 995-10 003**
STANDARD FREQUENCY AND TIME	STANDARD FREQUENCY AND TIME SIGNAL
SIGNAL (10 000 kHz) 111	111
10 003-10 005	**10 003-10 005**
STANDARD FREQUENCY AND TIME SIGNAL	STANDARD FREQUENCY AND TIME SIGNAL
Space research 111	
10 005-10 100	**10 005-10 100**
AERONAUTICAL MOBILE (R) 111	AERONAUTICAL MOBILE 111
10 100-10 150	**10 100-10 150**
FIXED	FIXED
Amateur	Amateur
10 150-11 175	**10 150-11 175**
FIXED	FIXED
Mobile except aeronautical mobile (R)	
11 175-11 275	**11 175-11 275**
AERONAUTICAL MOBILE (OR)	AERONAUTICAL MOBILE
11 275-11 400	**11 275-11 400**
AERONAUTICAL MOBILE (R)	AERONAUTICAL MOBILE
11 400-11 600	**11 400-11 600**
FIXED	FIXED
11 600-11 650 BROADCASTING 134 146	**11 600-12 050** SHORT WAVE BROADCAST
11 650-12 050	
BROADCASTING 147	
12 050-12 100	**12 050-12 100**
BROADCASTING 134 146	BROADCASTING 134 146

12 100-12 230 FIXED	**12 100-12 230** FIXED
12 230-13 200	**12 230-13 200**
MARITIME MOBILE 109 110 132 145	MARITIME MOBILE 109 110 132 145
13 200-13 260	**13 200-13 260**
AERONAUTICAL MOBILE (OR)	AERONAUTICAL MOBILE
13 260-13 360 AERONAUTICAL MOBILE (R)	**13 260-13 360** AERONAUTICAL MOBILE
13 360-18 030 kHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
13 360-13 410	**13 360-13 410**
FIXED	FIXED
RADIO ASTRONOMY 149	RADIO AST RONOMY 149
13 410-13 570	**13 410-13 570**
FIXED	FIXED
Mobile except aeronautical mobile (R)	
15	
13 570-13 600	**13 570-13 800**
BROADCASTING 134 151	SHORT WAVE BROADCAST
13 600-13 800	
BROADCASTING	
13 800-13 870	**13 800-13 870**
BROADCASTING 134 151	BROADCASTING 134 151
13 870-14 000	**13 870-14 000**
FIXED	FIXED
Mobile except aeronautical mobile (R)	
14 000-14 250	**14 000-14 350**
AMATEUR	AMATEUR
AMATEUR-SATELLITE	
14 250-14 350	
AMATEUR 152	152
14 350-14 990	**14 350-14 990**
FIXED	FIX ED
Mobile except aeronautical mobile (R)	
14 990-15 005	**14 990-15 005**
STANDARD FREQUENCY AND TIME SIGNAL (15 000 kHz) 111	STANDARD FREQUENCY AND TIME SIGNAL 111
15 005-15 010	**15 005-15 010**
STANDARD FREQUENCY AND TIME SIGNAL	STANDARD FREQUENCY AND TIME SIGNAL
Space research	
15 010-15 100	**15 010-15 100**
AERONAUTICAL MOBILE (OR)	AERONAUTICAL MOBILE
15 100-15 600	**15 100-15 800**
BROADCASTING	SHORT WAVE BROADCAST
15 600-15 800	
BROADCASTING 134 146	

15 800-16 360 FIXED 153	**15 800-16 360** FIX ED 153
16 360-17 410	**16 360-17 410**
MARITIME MOBILE 109 110 132 145	MARITIME MOBILE 109 110 132 145
17 410-17 480	**17 410-17 480**
FIXED	FIXED
17 480-17 550	**17 480-17 900**
BROADCASTING 134 146	SHORT WAVE BROADCAST
17 550-17 900	
BROADCASTING	
17 900-17 970	**17 900-17 970**
AERONAUTICAL MOBILE (R)	AERONAUTICAL MOBILE
17 970-18 030	**17 970-18 030**
AERONAUTICAL MOBILE (OR)	AERONAUTICAL MOBILE
18 030-23 350 kHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
18 030-18 052 FIXED	**18 030-18 052** FIXED
18 052-18 068	**18 052-18 068**
FIXED	FIXED
Space research	
18 068-18 168	**18 068-18 168**
AMATEUR	AMATEUR
AMATEUR-SATELLITE 154	17 METER BAND
18 168-18 780	**18 168-18 780**
FIXED	FIXED
Mobile except aeronautical mobile	
18 780-18 900	**18 780-18 900**
MARITIME MOBILE	MARITIME MOBILE
18 900-19 020	**18 900-19 020**
BROADCASTING 134 146	SHORT WAVE BROADCAST
19 020-19 680	**19 020-19 680**
FIXED	FIXED
19 680-19 800	**19 680-19 800**
MARITIME MOBILE 132	MARITIME MOBILE
19 800-19 990	**19 800-19 990**
FIXED	FIXED
19 990-19 995	**19 990-19 995**
STANDARD FREQUENCY AND TIME SIGNAL Space research 111	STANDARD FREQUENCY AND TIME SIGNAL
19 995-20 010	**19 995-20 010**
STANDARD FREQUENCY AND TIME SIGNAL (20 000 kHz) 111	STANDARD FREQUENCY AND TIME SIGNAL 111
20 010-21 000	**20 010-21 000**

FIXED Mobile	FIXED
21 000-21 450	**21 000-21 450**
AMATEUR	AMATEUR
AMATEUR-SATELLITE	
21 450-21 850	**21 450-21 850**
BROADCASTING	SHORT WAVE BROADCAST
21 850-21 870	**21 850-21 870**
FIXED 155A 155	FIXED 155A 155
21 870-21 924	**21 870-21 924**
FIXED 5.155B	FIXED 5.155B
21 924-22 000	**21 924-22 000**
AERONAUTICAL MOBILE (R)	AERONAUTICAL MOBILE
22 000-22 855	**22 000-22 855**
MARITIME MOBILE 132 156	MARITIME MOBILE 132 156
22 855-23 000	**22 855-23 000**
FIXED 156	FIXED 156
23 000-23 200	**23 000-23 200**
FIXED Mobile except aeronautical mobile (R)	FIXED
156	
23 200-23 350	**23 200-23 350**
FIXED 156A	FIXED 156A
AERONAUTICAL MOBILE (OR)	AERONAUTICAL MOBILE
23 350-27 500 kHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
23 350-24 000	**23 350-24 000**
FIXED	FIXED
MOBILE except aeronautical mobile 157	MOBILE
24 000-24 890	**24 000-24 890**
FIXED LAND MOBILE	FIXED LAND MOBILE
24 890-24 990	**24 890-24 990**
AMATEUR	AMATEUR
AMATEUR-SATELLITE	
24 990-25 005	**24 990-25 005**
STANDARD FREQUENCY AND TIME SIGNAL (25000 kHz)	STANDARD FREQUENCY AND TIME SIGNAL
25 005-25 010 STANDARD FREQUENCY AND TIME SIGNAL	**25 005-25 010** STANDARD FREQUENCY AND TIME SIGNAL
Space research	
25 010-25 070	**25 010-25 070**
FIXED	FIXED
MOBILE except aeronautical mobile	MOBILE
25 070-25 210	**25 070-25 210**
MARITIME MOBILE	MARITIME MOBILE

25 210-25 550	**25 210-25 550**
FIXED MOBILE except aeronautical mobile	FIXED MOBILE
25 550-25 670	**25 550-25 670**
RADIO ASTRONOMY	RADIO ASTRONOMY
149	149
25 670-26 100	**25 670-26 100**
BROADCASTING	SHORTWAVE BROADCAST BAND
26 100-26 175 MARITIME MOBILE 132	**26 100-26 175** MARITIME MOBILE 132
26 175-27 500	**26 175-27 500**
FIXED	FIXED
MOBILE except aeronautical mobile 150	MOBILE
	Citizens Band
27.5-47 MHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
27.5-28	**27.5-28**
METEOROLOGICAL AIDS	METEOROLOGICAL AIDS
FIXED	FIXED
MOBILE	MOBILE
28-29.7	**28-29.7**
AMATEUR	AMATEUR
AMATEUR-SATELLITE	AMAT EUR-SATELLITE
29.7-30.005	**29.7-30.005**
FIXED	FIXED
MOBILE	MOBILE
30.005-30.01	**30.005-30.01**
SPACE OPERATION(satellite identification)	SPACE OPERATION
FIXED MOBILE	FIXED MOBILE
SPACE RESEARCH	SPACE RESEARCH
30.01-37.5	**30.01-37.5**
FIXED	FIXED
MOBILE	MOBILE
37.5-38.25	**37.5-38.25**
FIXED	FIXED
MOBILE Radio astronomy 149	MOBILE
38.25-39.986	**38.25-39.986**
FIXED	FIXED
MOBILE	MOBILE
39.986-40.02	**39.986-40.02**
FIXED	FIXED
MOBILE	MOBILE
Space research **40.02-40.98**	 **40.02-40.98**
FIXED	FIXED

MOBILE 150	MOBILE 150

40.98-41.015	**40.98-41.015**
FIXED	FIXED
MOBILE	MOBILE
Space research 160 161	
41.015-44	**41.015-44**
FIXED	FIXED
MOBILE 160 161	MOBILE 160 161
44-47	**44-47**
FIXED	FIXED
MOBILE 162 162A	MOBILE 162 162A
47-75.2 MHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
47-50	**47-50**
FIXED	FIXED
MOBILE	MOBILE
50-54	**50-54**
AMATEUR	AMATEUR (10 METER BAND)
162A 166 167 168 170	
	162A 166 167 168 170
54-68	**54-72**
BROADCASTING Fixed	BROADCASTING VHF TELEVISION **(Channel 2-4)**
Mobile	
172	
68-72	
BROADCASTING	
Fixed	
Mobile 173	
72-73	**72-74.8**
FIXED	FIXED
MOBILE	MOBILE
73-74.6	
RADIO ASTRONOMY 178	
74.6-74.8	
FIXED	
MOBILE	
74.8-75.2 AERONAUTICAL RADIONAVIGATION 180 181	**74.8-75.2** AERONAUTICAL RADIONAVIGATION 180 181
75.2-137.175 MHz	
Allocation to services	
ITU Region 2	**O.E.C.S**

75.2-75.4	**75.2-75.4**
FIXED	FIXED
MOBILE 179	MOBILE 179

75.4-76 FIXED	**75.4-76** FIXED
MOBILE	MOBILE
76-88	**76-88**
BROADCASTING	VHF TELEVISION BROADCASTING
Fixed	**(Channel 5-6)**
Mobile 185	
88-100	**88-108**
BROADCASTING	FM RADIO BROADCASTING
100-108	E.3
BROADCASTING 192 194	
108-117.975	**108-117.975**
AERONAUTICAL RADIONAVIGATION 197 197A	AERONAUTICAL RADIONAVIGATION 197 197A
117.975-137	**117.975-137**
AERONAUTICAL MOBILE (R)	AERONAUTICAL MOBILE
111 198 199 200 201 202	111 198 199 200 201 202
203 203A 203B	203 203A 203B
137-137.025	**137-138**
SPACE OPERATION (space-to-Earth)	METEOROLOGICAL-SATELLITE
METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 208A 209	MOBILE-SATELLITE 208A 209
SPACE RESEARCH (space-to-Earth)	
Fixed	
Mobile except aeronautical mobile (R)	
204 205 206 207 208	
137.025-137.175	
SPACE OPERATION (space-to-Earth)	
METEOROLOGICAL-SATELLITE (space-to-Earth)	
SPACE RESEARCH (space-to-Earth) Fixed	
Mobile-satellite (space-to-Earth) 208A 209	
Mobile except aeronautical mobile (R)	
204 205 206 207 208	
137.175-148 MHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
137.175-137.825	
SPACE OPERATION (space-to-Earth)	
METEOROLOGICAL-SATELLITE (space-to-Earth)	
MOBILE-SATELLITE (space-to-Earth) 208A 209	
SPACE RESEARCH (space-to-Earth)	
Fixed	
Mobile except aeronautical mobile (R) 204 205 206 207 208	

137.825-138 SPACE OPERATION (space-to-Earth)	
METEOROLOGICAL-SATELLITE (space-to-Earth)	
SPACE RESEARCH (space-to-Earth)	
Fixed	
Mobile-satellite (space-to-Earth) 208A 209	
Mobile except aeronautical mobile (R)	
204 205 206 207 208	
138-143.6	**138-144**
FIXED MOBILE	FIXED MOBILE
RADIOLOCATION	RADIOLOCATION
Space research (space-to-Earth)	
143.6-143.65	
FIXED	
MOBILE	
RADIOLOCATION	
SPACE RESEARCH	
(space-to-Earth)	
143.65-144	
FIXED	
MOBILE	
RADIOLOCATION	
Space research (space-to-Earth)	
144-146	**144-148**
AMATEUR	AMATEUR
AMATEUR-SATELLITE 216 **146-148**	
AMATEUR	
217	217
148-223 MHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
148-149.9	**148-150.050**
FIXED	FIXED
MOBILE MOBILE-SATELLITE (Earth-to-space)	MOBILE
218 219 221	E.14
149.9-150.05	
MOBILE-SATELLITE (Earth-to-space) 209 224A	
RADIONAVIGATION-SATELLITE 224B	
220 222 223 **150.05-156.7625**	 **150.050-156.025**
FIXED	FIXED
MOBILE 225 226 227	MOBILE 225 226 227
	E.14
	156.025-162.025
	MARITIME MOBILE

156.7625-156.8375	111 226
MARITIME MOBILE (distress and calling)	
111 226	E.14
156.8375-174	
FIXED	
MOBILE 226 230 231 232	**162.025-174**
	FIXED
	MOBILE 226 230 231 232
	E.14
174-216	**174-216**
BROADCASTING	VHF TLEVISION BROADCAST
Fixed Mobile 234	**(Channel 7-13)**
216-220	**216-220**
FIXED	FIXED
MARITIME MOBILE	MARITIME MOBILE
Radiolocation 241 242	
220-335.4 MHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
220-225	**220-225**
AMATEUR	AMATEUR
FIXED	FIXED
MOBILE	MOBILE
Radiolocation 241	
225-235	**225- 235**
FIXED	FIXED
MOBILE	MOBILE
235-267	**235-267**
FIXED	DIGITAL AUDIO BROADCAST
MOBILE	E.4
111 199 252 254 256 256A	
267-272 FIXED	**267- 328.6** FIXED
MOBILE	MOBILE
Space operation (space-to-Earth)	
254 257	
272-273	
SPACE OPERATION (space-to-Earth)	
FIXED	
MOBILE	
254	
273-312	
FIXED	
MOBILE	
254	
312-315	
FIXED	
MOBILE	

Mobile-satellite (Earth-to-space) 254 255	
315-322	
FIXED	
MOBILE	
254	
322-328.6	
FIXED	
MOBILE	
RADIO ASTRONOMY 149	
328.6-335.4	**328.6-335.0**
AERONAUTICAL RADIONAVIGATION	AERONAUTICAL RADIONAVIGATION
258 259	258 259
335.4-410 MHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
	335-399.9
335.4-387	(STUDIO TO TRANSMITTER LINK) E.5
FIXED	
MOBILE 254	
387-390	
FIXED	
MOBILE	
Mobile-satellite (space-to-Earth) 208A 254 255	
390-399.9	
FIXED MOBILE 254	
399.9-400.05	**399.9-400.05**
MOBILE-SATELLITE (Earth-to-space) 209 224A	MOBILE-SATELLITE 209 224A
RADIONAVIGATION-SATELLITE 222 224B 260 220	RADIONAVIGATION-SATELLITE 222 224B 260 220
400.05-400.15	**400.05-400.15**
STANDARD FREQUENCY AND TIME	STANDARD FREQUENCY AND TIME
SIGNAL-SATELLITE (400.1 MHz)	SIGNAL-SATELLITE
261 262	261 262
400.15-401	**400.15-403**
METEOROLOGICAL AIDS	METEOROLOGICAL AIDS
METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE
MOBILE-SATELLITE (space-to-Earth) 208A 209	
SPACE RESEARCH (space-to-Earth) 263	
Space operation (space-to-Earth)	
262 264	
401-402 METEOROLOGICAL AIDS	
SPACE OPERATION (space-to-Earth)	
EARTH EXPLORATION-SATELLITE (Earth-to-space)	
METEOROLOGICAL-SATELLITE (Earth-to-space)	
Fixed	

Mobile except aeronautical mobile	
402-403	
METEOROLOGICAL AIDS EARTH EXPLORATION-SATELLITE (Earth-to-space)	
METEOROLOGICAL-SATELLITE (Earth-to-space)	
Fixed	
Mobile except aeronautical mobile	
403-406	**403-406**
METEOROLOGICAL AIDS	METEOROLOGICAL AIDS
Fixed	
Mobile except aeronautical mobile	
406-406.1	**406-406.1**
MOBILE-SATELLITE (Earth-to-space)	MOBILE-SATELLITE
266 267 **406.1-410**	266 267 **406.1-410**
FIXED	FIXED
MOBILE except aeronautical mobile	MOBILE
RADIO ASTRONOMY	RADIO ASTRONOMY
149	149
410-460 MHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
410-420 FIXED	**410-420** FIXED
MOBILE except aeronautical mobile	MOBILE
SPACE RESEARCH (space-to-space) 268	SPACE RESEARCH 268
420-430	**420-430**
FIXED	FIXED
MOBILE except aeronautical mobile	MOBILE
Radiolocation 269 270 271	
430-432 RADIOLOCATION	**430-440** RADIOLOCATION
Amateur 271 276 277 278 279	Amateur 271 276 277 278 279
432-438	
RADIOLOCATION	
Amateur	
Earth exploration-satellite (active) 279A	
271 276 277 278 279 281 282	
438-440	
RADIOLOCATION	
Amateur	
271 276 277 278 279	
440-450	**440-454.675**
FIXED	FIXED
MOBILE except aeronautical mobile	MOBILE
Radiolocation	

269 270 271 284 285 286	
450-455	
FIXED	
MOBILE	**454.675-454.975**

209 271 286 286A 286B 286C 286D 286E	MOBILE TELEPHONE AIR (BASE)
	454.975-462.5625
455-456	(OUTSIDE BROADCAST TELEVISION/RADIO) E.6
FIXED	
MOBILE	
MOBILE-SATELLITE	
(Earth-to-space) 286A 286B 286C	
209	
456-459	
FIXED	
MOBILE	
271 287 288	
459-460 FIXED	
MOBIL`E	
MOBILE-SATELLITE	
(Earth-to-space) 286A 286B 286C	
209	
460-890 MHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
460-470	
FIXED	
MOBILE	**462.5625-467.7125**
Meteorological -Satellite (space-to-Earth)	Family Radio Service E.7
	(OUTSIDE BROADCAST TELEVISION/RADIO) E.6
287 288 289 290	**467.7125-470**
	(OUTSIDE BROADCAST TELEVISION/RADIO) E.6
470-512	**470-512**
BROADCASTING	BROADCASTING
Fixed	(UHF TELEVISION/RADIO)
Mobile 292 293	**(Channel 14-20)**
512-608	**512-608**
BROADCASTING	BROADCASTING
297	297
608-614	**608-614**
RADIO ASTRONOMY	MOBILE
Mobile-satellite except	
aeronautical mobile-satellite	
(Earth-to-space)	
614-806	**614-698**
BROADCASTING	BROADCASTING
Fixed	Fixed

Mobile 293 309 311	Mobile 293 309 311
	698 -806
	(BROADBAND WIRELESS ACCESS) E.16
806-890	**806-824.040**
	E.15
FIXED	LAND MOBILE
MOBILE 317A	**824.040-890**
BROADCASTING	MOBILE
890-1 300 MHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
890-902	**890-902**
FIXED	MOBILE (P-GSM)
MOBILE except aeronautical mobile 317A	
Radiolocation	
318 325	
902-928	**902-928**
FIXED	FIXED
Amateur	Amateur
Mobile except aeronautical mobile 325A	Mobile except aeronautical mobile 325A
Radiolocation 150 325 326	E.8
928-942	**928-935**
FIXED	MOBILE
MOBILE except aeronautical mobile 317A	
Radiolocation	
325	**935-947**
942-960	MOBILE
FIXED	
MOBILE 5.317A	**947-960**
	MOBILE 5.317A
960-1 164	**960-1 215**
AERONAUTICAL RADIONAVIGATION 328	AERONAUTICAL NAVIGATION 328
1 164-1 215	
AERONAUTICAL RADIONAVIGATION 328	
RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 328B 328A	
1 215-1 240	**1 215-1 240**
EARTH EXPLORATION-SATELLITE (active)	RADIOLOCATION
RADIOLOCATION	RADIONAVIGATION-SATELLITE 328B 329 329A
RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 328B 329 329A	
SPACE RESEARCH (active) 330 331 332	

1 240-1 300	**1 240-1 260**
EARTH EXPLORATION-SATELLITE (active)	RADIOLOCATION
RADIOLOCATION	RADIONAVIGATION-SATELLITE
RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 328B 329 329A	
SPACE RESEARCH (active)	
Amateur	Amateur
282 330 331 332 335 335A	282 330 331 332 335 335A
	1 260-1 300
	RADIOLOCATION
	Amateur 282 330 331 332 335 335A
1 300-1 525 MHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
1 300-1 350	**1 300-1 350**
AERONAUTICAL RADIONAVIGATION 337	AERONAUTICAL RADIONAVIGATION 337
RADIOLOCATION RADIONAVIGATION SATELLITE (Earth-to-space)	
149 337A	
1 350-1 400	**1 350-1 400**
RADIOLOCATION	RADIOLOCATION
149 334 339 339A	149 334 339 339A
1 400-1 427	**1 400-1 427**
EARTH EXPLORATION-SATELLITE (passive)	RADIO ASTRONOMY
RADIO ASTRONOMY	
SPACE RESEARCH (passive)	
340 341	
1 427-1 429	**1 427-1 429**
SPACE OPERATION (Earth-to-space)	FIXED (Point to Point Microwave)
FIXED	SPACE OPERATION
MOBILE except aeronautical mobile 341	MOBILE
1 429-1 452 FIXED	**1 429-1 452** FIXED
MOBILE 343 339A 341	MOBILE 343 339A 341
1 452-1 492	**1 452-1 492**
FIXED	FIXED
MOBILE 343	MOBILE 343
BROADCASTING 345 347	BROADCASTING 345 347
BROADCASTING-SATELLITE 345 347 347A 341 344	
1 492-1 518 FIXED	**1 492-1 525** FIXED
MOBILE 343 341 344	MOBILE 343 341 344
	MOBILE-SATELLITE
1 518-1 525	
FIXED	
MOBILE 343	
MOBILE-SATELLITE	
(space-to-Earth) 348 348A 348B 348C 341 344	

1 525-1 610 MHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
1 525-1 530	**1 525-1 530**
SPACE OPERATION (space-to-Earth)	MOBILE-SATELLITE 5.347A 5.351A
MOBILE-SATELLITE (space-to-Earth)	
5.347A 5.351A	
Earth exploration-satellite Fixed	
Mobile 343 341 351 354	
1 530-1 535	**1 530-1 535**
SPACE OPERATION (space-to-Earth)	MARITIME MOBILE-SATELLITE
MOBILE-SATELLITE (space-to-Earth) 347A 351A 353A	
Earth exploration-satellite	
Fixed	
Mobile 343 341 351 354	
1 535-1 559	**1 535-1 559**
MOBILE-SATELLITE (space-to-Earth)	MOBILE-SATELLITE
347A 351A 341 351 353A 354	347A 351A 341 351 353A 354
355 356 357 357A 359 362A	355 356 357 357A 359 362A
1 559-1 610	**1 559-1 610**
AERONAUTICAL RADIONAVIGATION	AERONAUTICAL RADIONAVIGATION
RADIONAVIGATION-SATELLITE	1600
(space-to-Earth) (space-to-space) 328B	*GMDSS (Satellite EPIRBs)*
329A 341 362B 362C 363	
1 610-1 660 MHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
1 610-1 610.6	**1 610-1 621.350**
MOBILE-SATELLITE (Earth-to-space)	Mobile Satellite (GMPCS) (Earth-to-space)
351A	351A
AERONAUTICAL RADIONAVIGATION	
RADIODETERMINATION - SATELLITE	
(Earth-to-space)	
341 364 366 367 368 370 372	
1 610.6-1 613.8	
MOBILE-SATELLITE (Earth-to-space)	
351A	
RADIO ASTRONOMY	
ERONAUTICAL	
RADIONAVIGATION	
RADIODETERMINATION -SATELLITE	
(Earth-to-space)	
149 341 364 366 367 368 370 372	

1 613.8-1 626.5	
MOBILE-SATELLITE (Earth-to-space) 351A	

AERONAUTICAL RADIONAVIGATION	**1 621.350 -1 660.500**
RADIODETERMINATION -SATELLITE	MOBILE - SATELLITE 351A
(Earth-to-space)	
Mobile-satellite (space-to-Earth)	
347A	
341 364 365 366 367 368 370 372	
1 626.5-1 660	
MOBILE-SATELLITE (Earth-to-space) 351A 341 351 353A 354 355	351A 341 351 353A 354 355
357A 359 362A 374 375 376	357A 359 362A 374 375 376
1 660-1 710 MHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
1 660-1 660.5	
MOBILE-SATELLITE (Earth-to-space) 351A	
RADIO ASTRONOMY	
149 341 351 354 362A 376A	
1 660.5-1 668 RADIO ASTRONOMY	**1 660.500 -1 668.400**
SPACE RESEARCH (passive)	RADIO ASTRONOMY
Fixed	149 341 351 354 362A 376A
Mobile except aeronautical mobile	
149 341 379 379A	
1 668-1 668.4	
MOBILE-SATELLITE (Earth-to-space)	
348C 379B 379C	
RADIO ASTRONOMY SPACE RESEARCH (passive)	
Fixed	
Mobile except aeronautical mobile	
149 341 379 379A 379D	
1 668.4-1 670	**1 668.4-1 710**
METEOROLOGICAL AIDS	METEOROLOGICAL AIDS
FIXED	FIXED
MOBILE except aeronautical mobile	MOBILE
MOBILE-SATELLITE (Earth-to-space) 348C 379B 379C	
RADIO ASTRONOMY	
149 341 379D 379E	
1 670-1 675	
METEOROLOGICAL AIDS	

FIXED	
METEOROLOGICAL-SATELLITE (space-to-Earth)	
MOBILE 380	
MOBILE-SATELLITE (Earth-to-space) 348C 379B 341 379D 379E 380A	
1 675-1 690	
METEOROLOGICAL AIDS FIXED	
METEOROLOGICAL-SATELLITE (space-to-Earth)	
MOBILE except aeronautical mobile	
341	
1 690-1 700	
METEOROLOGICAL AIDS	
METEOROLOGICAL-SATELLITE (space-to-Earth)	
289 341 381	
1 700-1 710	
FIXED	
METEOROLOGICAL-SATELLITE (space-to-Earth)	
MOBILE except aeronautical mobile 289 341	
1 710-2 170 MHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
1 710-1 930	**1 710-1 990**
FIXED	GSM 1800
MOBILE 380 384A .388A 388B	GSM1900
149 341 385 386 387 388	EGSM, PGSM
1 930-1 970	E.9
FIXED	
MOBILE 388A 388B	
Mobile-satellite (Earth-to-space) 388	
1 970-1 980	
FIXED	
MOBILE 388A 388B 388	
1 980-2 010	
FIXED	
MOBILE	**1990-2025**
MOBILE-SATELLITE (Earth-to-space) 351A	MOBILE
388 389A 389B 389F **2 010-2 025**	E.10
FIXED	
MOBILE	
MOBILE-SATELLITE (Earth-to-space)	
388 389C 389E 390	
2 025-2 110	**2 025-2 110**
SPACE OPERATION (Earth-to-space) (space-to-space)	BROADCAST STUDIO TO TRANSMITTER LINKS
EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space)	MOBILE

FIXED	
MOBILE 391	

SPACE RESEARCH (Earth-to-space) (space-to-space) 392	
2 110-2 120	**2110-2200**
FIXED	MOBILE 388A 388B
MOBILE 388A 388B	
SPACE RESEARCH (deep space) (Earth-to-space) 388	
2 120-2 160	
FIXED	
MOBILE 388A 388B	
Mobile-satellite (space-to-Earth) 5.388	
2 160-2 170	
FIXED	
MOBILE	
MOBILE-SATELLITE (space-to-Earth)	
388 389C 389E 390	
2 170-2 520 MHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
2 170-2 200	
FIXED	
MOBILE	
MOBILE-SATELLITE (space-to-Earth) 351A	
388 389A 389F 392A	
2 200-2 290	**2 200-2300**
SPACE OPERATION (space-to-Earth) (space-to-space)	FIXED
EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space)	MOBILE
FIXED	MOBILE-SATELLITE
MOBILE 391	
SPACE RESEARCH (space-to-Earth) (space-to-space)	
392	
2 290-2 300	
FIXED	
MOBILE except aeronautical mobile	
SPACE RESEARCH (deep space) (space-to-Earth)	
2 300-2 450	**2 300-2 450**
FIXED	FIXED
	MOBILE
RADIOLOCATION	Amateur
Amateur 150 282 393 394 396	E.12

2 450-2 483.5	**2 450-2 483.5**
FIXED	FIXED (Fixed Wireless Access, FWA) LINKS
MOBILE	E.12
RADIOLOCATION 150 394	
2 483.5-2 500	**2 483.5-2 500**
FIXED	GMPCS (Space to Earth) 351A
MOBILE	FIXED
MOBILE-SATELLITE	MOBILE
(space-to-Earth) 351A	
RADIOLOCATION	
RADIODETERMINATION-SATELLITE	
(space-to-Earth) 398 150 402	
2 500-2 520	**2 500-2 520**
FIXED 409 411	FIXED 409 411
FIXED-SATELLITE (space-to-Earth) 415	FIXED-SATELLITE 415
MOBILE except aeronautical mobile 384A	MOBILE 384A
MOBILE-SATELLITE (space-to-Earth) 351A 403	MOBILE-SATELLITE 351A 403
404 407 414 415A	404 407 414 415A
2 520-2 700 MHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
2 520-2 655	**2 520-2 690**
FIXED 409 411	BROADBAND SERVICES
FIXED-SATELLITE (space-to-Earth) 415	E.11
MOBILE except aeronautical mobile 384A	E.13
BROADCASTING-SATELLITE 413 416	
339 403 417C 417D 418B 418C	
2 655-2 670	
FIXED 409 411	
FIXED-SATELLITE (Earth-to-space) (space-to-Earth)	
347A 415	
MOBILE except aeronautical mobile 384A	
BROADCASTING-SATELLITE	
347A 413 416	
Earth exploration-satellite (passive)	
Radio astronomy Space research (passive) 149 420	
2 670-2 690	
FIXED 409 411	
FIXED-SATELLITE	
(Earth-to-space) (space-to-Earth) 347A 415	
MOBILE except aeronautical mobile 384A	
MOBILE-SATELLITE (Earth-to-space) 351A	
Earth exploration-satellite (passive)	
Radio astronomy Space research (passive)	
149 419 420	
2 690-2 700	**2 690-2 700**
EARTH EXPLORATION-SATELLITE (passive)	FIXED

RADIO ASTRONOMY SPACE RESEARCH (passive) 340 422	FIXED -SATELLITE MOBILE
	BROADCASTING -SATELLITE
2 700-4 800 MHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
2 700-2 900	**2 700-2 900**
AERONAUTICAL RADIONAVIGATION 37	AERONAUTICAL RADIONAVIGATION 37
Radiolocation 423 424	E.13
2 900-3 100	**2 900-3 100**
RADIOLOCATION 424A	RADIOLOCATION 424A
RADIONAVIGATION 426 425 427	
3 100-3 300	**3 100-3 300**
RADIOLOCATION	RADIOLOCATION
Earth exploration-satellite (active)	
Space research (active) 149 428	
3 300-3 400	**3 300-3 400**
RADIOLOCATION	RADIOLOCATION
Amateur	
Fixed	FIXED (Fixed Wireless Access Links)
Mobile 149 430	E.13
3 400-3 500 FIXED	**3 400-3 700**
FIXED -SATELLITE (space-to-Earth)	BROADBAND SERVICES
Amateur	
Mobile Radiolocation 433 282 432	E.11
3 500-3 700	
FIXED	
FIXED -SATELLITE (space-to-Earth)	
MOBILE except aeronautical mobile	
Radiolocation 433 435	
3 700-4 200	**3 700-4 200**
FIXED	FIXED
FIXED -SATELLITE (space-to-Earth)	FIXED -SATELLITE (space-to-Earth)
MOBILE except aeronautical mobile	MOBILE
4 200-4 400	**4 200-4 400**
AERONAUTICAL RADIONAVIGATION 438	AERONAUTICAL RADIONAVIGATION 438
439 440	439 440
4 400-4 500	**4 400-4 500**
FIXED	FIXED
MOBILE	MOBILE
4 500-4 800	**4 500-4 800**
FIXED	FIXED
FIXED -SATELLITE (space-to-Earth) 441 MOBILE	FIXED -SATELLITE MOBILE

4 800-5 570 MHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
4 800-4 990	**4 800-4 990**
FIXED	FIXED
MOBILE 442 Radio astronomy 149 339 443	MOBILE 442
4 990-5 000	**4 990-5 000**
FIXED MOBILE except aeronautical mobile	FIXED MOBILE
RADIO ASTRONOMY Space research (passive) 149	
5 000-5 010	**5 000-5 091**
AERONAUTICAL RADIONAVIGATION	AERONAUTICAL RADIONAVIGATION
RADIONAVIGATION-SATELLITE (Earth-to-space)	
367	
5 010-5 030	
AERONAUTICAL RADIONAVIGATION	
RADIONAVIGATION-SATELLITE (space-to-Earth) (space-space) 328B 443B 367	
5 030-5 150	
AERONAUTICAL RADIONAVIGATION	
367 444 444A	**5 091-5 250**
5 150-5 250	MOBILE SATELLITE
AERONAUTICAL RADIONAVIGATION	GMPCS (Earth to Space Communications)
FIXED -SATELLITE (Earth-to-space) 447A	E.12
MOBILE except aeronautical mobile 446A 446B 446 447 447B 447C	Fixed
5 250-5 255	**5 250-5 350**
EARTH EXPLORATION-SATELLITE (active)	RADIOLOCATION
RADIOLOCATION	E.12
SPACE RESEARCH 447D	
MOBILE except aeronautical mobile 446A 447F	Fixed
447E 448 448A	
5 255- 5 350	
EARTH EXPLORATION-SATELLITE (active)	
RADIOLOCATION	
SPACE RESEARCH (active)	
MOBILE except aeronautical mobile 446A 447F	
447E 448 448A	
5 350-5 460	**5 350-5 460**
EARTH EXPLORATION-SATELLITE (active) 448B	AERONAUTICAL RADIONAVIGATION 449
SPACE RESEARCH (active) 448C	
AERONAUTICAL RADIONAVIGATION 449	Fixed
RADIOLOCATION 448D	
5 460-5 470	**5 460-5 470**
RADIONAVIGATION 449	RADIONAVIGATION 449
EARTH EXPLORATION-SATELLITE (active)	
SPACE RESEARCH (active)	Fixed
RADIOLOCATION 448D 448B	

5 470-5 570	**5 470-5650**
MARITIME RADIONAVIGATION	MARITIME RADIONAVIGATION
MOBILE except aeronautical mobile 446A 450A EARTH EXPLORATION-SATELLITE (active)	
SPACE RESEARCH (active)	
RADIOLOCATION 450B 448B 450 451	
5 570-7 250 MHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
5 570-5 650	
MARITIME RADIONAVIGATION	
MOBILE except aeronautical mobile 446A 450A	
RADIOLOCATION 450B 450 451 452	
5 650-5 725	**5 650-5 725**
RADIOLOCATION	RADIOLOCATION
MOBILE except aeronautical mobile 446A 450A	
Amateur	Fixed
Space research (deep space)	
282 451 453 454 455	
5 725-5 830	**5 725-5 850**
RADIOLOCATION	
Amateur	FIXED (Fixed Wireless Access links)
150 453 455	(802.11b applications)
5 830-5 850	E.12 E.13
RADIOLOCATION	
Amateur	
Amateur-satellite (space-to-Earth)	
150 453 455	
5 850-5 925	**5 850-6 700**
FIXED	FIXED
FIXED -SATELLITE(Earth-to-space)	FIXED -SATELLITE
MOBILE	MOBILE
Amateur	Amateur
Radiolocation	E.12
.150	
5 925-6 700	
FIXED	
FIXED -SATELLITE (Earth-to-space) 457A 457B	
MOBILE 149 440 458	
6 700-7 075 FIXED	**6 700-7 075** GMPCS (Space to Earth Communications)
FIXED -SATELLITE (Earth-to-space) (space-to-Earth) 441	
MOBILE	
458 458A 458B 458C	
7 075-7 145	**7 075-7 250**
FIXED	FIXED
MOBILE	MOBILE

458 459	458 459
7 145-7 235	
FIXED	
MOBILE	
SPACE RESEARCH (Earth-to-space) 460	
458 459	
7 235-7 250	
FIXED	
MOBILE	
458	
7 250-8 500 MHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
7 250-7 300	**7 250-7 300**
FIXED	FIXED -SATELLITE
FIXED -SATELLITE (space-to-Earth)	MOBILE
MOBILE 461	461
7 300-7 450	**7 300-7 450**
FIXED	FIXED
FIXED -SATELLITE (space-to-Earth)	FIXED -SATELLITE
MOBILE except aeronautical mobile 461	
7 450-7 550	**7 450-7 550**
FIXED	FIXED
FIXED -SATELLITE (space-to-Earth)	FIXED -SATELLITE
METEOROLOGICAL-SATELLITE (space-to-Earth)	METEOROLOGICAL-SATELLITE
MOBILE except aeronautical mobile 461A	MOBILE
7 550-7 750 FIXED	**7 550-7 750** FIXED
FIXED -SATELLITE (space-to-Earth)	FIXED -SATELLITE
MOBILE except aeronautical mobile	METEOROLOGICAL-SATELLITE
7 750-7 850	**7 750-7 850**
FIXED	FIXED
METEOROLOGICAL-SATELLITE (space-to-Earth) 461B	METEOROLOGICAL-SATELLITE 461B
MOBILE except aeronautical mobile	
7 850-7 900	**7 850-7 900**
FIXED	FIXED
MOBILE except aeronautical mobile	MOBILE
7 900-8 025	**7 900-8 025**
FIXED	FIXED
FIXED -SATELLITE (Earth-to-space)	FIXED -SATELLITE
MOBILE 461	MOBILE 461
8 025-8 175	**8 025-8 175**
EARTH EXPLORATION-SATELLITE (space-to-Earth)	EARTH EXPLORATION-SATELLITE
FIXED	FIXED
FIXED -SATELLITE (Earth-to-space)	FIXED -SATELLITE

MOBILE 463 462A	MOBILE 463 462A
8 175-8 215	**8 175-8 215**
EARTH EXPLORATION-SATELLITE (space-to-Earth)	EARTH EXPLORATION-SATELLITE
FIXED	FIXED
FIXED -SATELLITE (Earth-to-space)	FIXED -SATELLITE
METEOROLOGICAL-SATELLITE (Earth-to-space)	METEOROLOGICAL-SATELLITE
MOBILE 463 462A	
8 215-8 400	**8 215-8 400**
EARTH EXPLORATION-SATELLITE (space-to-Earth)	EARTH EXPLORATION-SATELLITE
FIXED	FIXED
FIXED -SATELLITE (Earth-to-space)	FIXED -SATELLITE
MOBILE 463 462A	MOBILE 463 462A
8 400-8 500	**8 400-8 500**
FIXED	FIXED
MOBILE except aeronautical mobile	MOBILE
SPACE RESEARCH (space-to-Earth) 465 466	
8 500-10 000 MHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
8 500-8 550 RADIOLOCATION 468 469	**8 500-8 550** RADIOLOCATION 468 469
8 550-8 650	**8 550-8 650**
EARTH EXPLORATION-SATELLITE (active)	EARTH EXPLORATION-SATELLITE
RADIOLOCATION	RADIOLOCATION
SPACE RESEARCH (act ive) 468 469 469A	SPACE RESEARCH 468 469 469A
8 650-8 750	**8 650-8 750**
RADIOLOCATION 468 469	RADIOLOCATION 468 469
8 750-8 850 RADIOLOCATION	**8 750-8 850** RADIOLOCATION
AERONAUTICAL RADIONAVIGATION 470 471	AERONAUTICAL RADIONAVIGATION 470 471
8 850-9 000	**8 850-9 000**
RADIOLOCATION	RADIOLOCATION
MARITIME RADIONAVIGATION 472 473	MARITIME RADIONAVIGATION 472 473
9 000-9 200	**9 000-9 200**
AERONAUTICAL RADIONAVIGATION 337	AERONAUTICAL RADIONAVIGATION RADIOLOCATION
Radiolocation 471	337 471
9 200-9 300	**9 200-9 300**
RADIOLOCATION	RADIOLOCATION
MARITIME RADIONAVIGATION 472 473 474	MARITIME RADIONAVIGATION 472 473 474
9 300-9 500	**9 300-9 500**
RADIONAVIGATION 476	RADIONAVIGATION 476
Radiolocation 427 474 475	Radiolocation 427 474 475
9 500-9 800	**9 500-9 800**
EARTH EXPLORATION-SATELLITE (active)	EARTH EXPLORATION-SATELLITE
RADIOLOCATION	RADIOLOCATION
RADIONAVIGATION	RADIONAVIGATION
SPACE RESEARCH (active) 476A	SPACE RESEARCH 476A

9 800-10 000	**9 800-10 000**
RADIOLOCATION Fixed 477 478 479	RADIOLOCATION Fixed 477 478 479
10-11.7 GHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
10-10.45	**10-10.45**
RADIOLOCATION	RADIOLOCATION
Amateur 479 480	Amateur 479 480
10.45-10.5	**10.45-10.5**
RADIOLOCATION	Amateur
Amateur	Amateur-satellite 481
Amateur-satellite 481	
10.5-10.55	**10.5-10.55**
FIXED	FIXED
MOBILE	MOBILE
RADIOLOCATION	RADIOLOCATION
10.55-10.6	**10.55-10.6**
FIXED	FIXED
MOBILE except aeronautical mobile Radiolocation	MOBILE
	RADIOLOCATION
10.6-10.68	**10.6-10.68**
EARTH EXPLORATION-SATELLITE (passive) FIXED	EARTH EXPLORATION-SATELLITE FIXED
MOBILE except aeronautical mobile	MOBILE
RADIO ASTRONOMY	RADIO ASTRONOMY
SPACE RESEARCH (passive)	SPACE RESEARCH
Radiolocation 149 482	RADIOLOCATION 149 482
10.68-10.7	**10.68-10.7**
EARTH EXPLORATION-SATELLITE (passive)	EARTH EXPLORATION-SATELLITE
RADIO ASTRONOMY	RADIO ASTRONOMY
SPACE RESEARCH (passive) 340 483	SPACE RESEARCH 340 483
10.7-11.7	**10.7-11.7**
FIXED	FIXED
FIXED -SATELLITE	FIXED -SATELLITE
(space-to-Earth) 441 484A	MOBILE 441 484A
MOBILE except aeronautical mobile	E.13
11.7-14 GHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
11.7-12.1	**11.7-12.1**
FIXED 486	FIXED 486
FIXED -SATELLITE	FIXED -SATELLITE
(space-to-Earth) 484A Mobile except aeronautical mobile 485 488	MOBILE
12.1-12.2	**12.1-12.2**
FIXED -SATELLITE	FIXED -SATELLITE

(space-to-Earth) 484A 485 488 489	
12.2-12.7	**12.2-12.7**
FIXED	FIXED
MOBILE except aeronautical mobile	MOBILE
BROADCASTING	BROADCASTING
BROADCASTING-SATELLITE 487A 488 490 492	BROADCASTING-SATELLITE 487A 488 490 492
12.7-12.75	**12.7-12.75**
FIXED	FIXED
FIXED-SATELLITE (Earth-to-space)	FIXED-SATELLITE
MOBILE except aeronautical mobile	MOBILE
12.75-13.25	**12.75-13.25**
FIXED	FIXED
FIXED-SATELLITE (Earth-to-space) 441	FIXED-SATELLITE 441
MOBILE	MOBILE
Space research (deep space) (space-to-Earth)	
13.25-13.4	**13.25-13.4**
EARTH EXPLORATION-SATELLITE (active)	EARTH EXPLORATION-SATELLITE
AERONAUTICAL RADIONAVIGATION 497 SPACE RESEARCH (active) 498A 499	AERONAUTICAL RADIONAVIGATION 497 SPACE RESEARCH 498A 499
13.4-13.75	**13.4-13.75**
EARTH EXPLORATION-SATELLITE (active)	EARTH EXPLORATION-SATELLITE
RADIOLOCATION	RADIOLOCATION
SPACE RESEARCH 501A	SPACE RESEARCH 501A
Standard frequency and time signal-satellite (Earth-to-space)	
499 500 501 501B	
13.75-14	**13.75-14** 484A
FIXED-SATELLITE (Earth-to-space) 484A	FIXED-SATELLITE
RADIOLOCATION	RADIOLOCATION
Standard frequency and time signal-satellite (Earth-to-space)	
Space research 499 500 501 502 503	
14-15.4 GHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
14-14.25	**14-14.25**
FIXED-SATELLITE (Earth-to-space) 457A 457B 484A 506 506B	FIXED-SATELLITE 457A 457B 484A 506 506B
RADIONAVIGATION 504	RADIONAVIGATION 504
Mobile-satellite (Earth-to-space) 504C 506A	
Space research 504A 505	
14.25-14.3	**14.25-14.3**
FIXED-SATELLITE (Earth-to-space) 457A 457B	FIXED-SATELLITE 457A 457B 484A 506 506B
484A 506 506B RADIONAVIGATION 504	RADIONAVIGATION 504 MOBILE-SATELLITE 506A 508A
Mobile-satellite (Earth-to-space) 506A 508A	SPACE RESEARCH 504A 505 508 509

Space research 504A 505 508 509	
14.3-14.4 FIXED -SATELLITE	**14.3-14.4** FIXED -SATELLITE 457A 484A 506 506B
(Earth-to-space) 457A 484A 506 506B	MOBILE-SATELLITE 506A
Mobile-satellite (Earth-to-space) 506A	RADIONAVIGATION-SATELLITE 504A
Radionavigation -satellite 504A	
14.4-14.47	**14.4-14.47**
FIXED	FIXED
FIXED -SATELLITE (Earth-to-space) 457A 457B	FIXED -SATELLITE 457A 457B 484A 506 506B
484A 506 506B	MOBILE
MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 506A 509A	MOBILE-SATELLITE 506A 509A SPACE RESEARCH 504A
Space research (space-to-Earth) 504A	
14.47-14.5	**14.47-14.5**
FIXED	FIXED
FIXED -SATELLITE (Earth-to-space) 457A 457B	FIXED -SATELLITE 457A 457B 484A 506 506B
484A 506 506B	MOBILE
MOBILE except aeronautical mobile	MOBILE-SATELLITE
Mobile-satellite (Earth-to-space) 504B 506A 509A	RADIO ASTRONOMY 149 504A
Radio astronomy 149 504A	
14.5-14.8	**14.5-14.8**
FIXED	FIXED
FIXED -SATELLITE (Earth-to-space) 510	FIXED -SATELLITE 510
MOBILE	MOBILE
Space research	
14.8-15.35	**14.8-15.35**
FIXED	FIXED
MOBILE	MOBILE
Space research 339	SPACE RESEARCH
15.35-15.4	**15.35-15.4**
EARTH EXPLORATION-SATELLITE (passive)	EARTH EXPLORATION-SATELLITE
RADIO ASTRONOMY	RADIO ASTRONOMY
SPACE RESEARCH (passive) 340 511	SPACE RESEARCH 340 511
15.4-18.4 GHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
15.4-15.43	**15.4-15.43**
AERONAUTICAL RADIONAVIGATION 511D	AERONAUTICAL RADIONAVIGATION 511D
15.43-15.63	**15.43-15.63**
FIXED -SATELLITE (Earth-to-space) 511A	FIXED -SATELLITE 511A
AERONAUTICAL RADIONAVIGATION 511C	AERONAUTICAL RADIONAVIGATION 511C
15.63-15.7	**15.63-15.7**
AERONAUTICAL RADIONAVIGATION 511D	AERONAUTICAL RADIONAVIGATION 511D
15.7-16.6	**15.7-16.6**
RADIOLOCATION 512 513	RADIOLOCATION 512 513
16.6-17.1	**16.6-17.1**
RADIOLOCATION Space research (deep space) (Earth-to-space) 512 513	RADIOLOCATION

	SPACE RESEARCH 512 513
17.1-17.2	**17.1-17.2**
RADIOLOCATION 512 513	RADIOLOCATION 512 513
17.2-17.3 EARTH EXPLORATION-SATELLITE (active)	**17.2-17.3** EARTH EXPLORATION-SATELLITE
RADIOLOCATION	RADIOLOCATION
SPACE RESEARCH (active) 512 513 513A	SPACE R ESEARCH 512 513 513A
17.3-17.7	**17.3-17.7**
FIXED -SATELLITE (Earth-to-space) 516	FIXED -SATELLITE 516
BROADCASTING -SATELLITE	BROADCASTING -SATELLITE
Radiolocation 514 515 517	RADIOLOCATION 514 515 517
17.7-17.8	**17.7-17.8**
FIXED	FIXED
FIXED -SATELLIT E (space-to-Earth) (Earth-t o-space) 516	FIXED -SATELLITE
BROADCASTING -SATELLITE	BROADCASTING -SATELLITE
Mobile 518 515 517	MOBILE 518 515 517
17.8-18.1	**17.8-18.1**
FIXED	FIXED
FIXED -SATELLITE (space-to-Earth) 484A (Earth-to-space) 516	FIXED -SATELLITE 516 MOBILE
MOBILE **18.1-18.4**	 **18.1-18.4**
FIXED	FIXED
FIXED -SATELLITE (space-to-Earth) 484A 516B	FIXED -SATELLITE 484A 516B
(Earth-to-space) 520	MOBILE 521
MOBILE 519 521	
18.4-22 GHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
18.4-18.6	**18.4-18.6**
FIXED	FIXED
FIXED -SATELLITE (space-to-Earth) 484A 516B MOBILE	FIXED -SATELLITE 484A 516B MOBILE
18.6-18.8	**18.6-18.8**
EARTH EXPLORATION-SATELLITE (passive)	EARTH EXPLORATION-SATELLITE
FIXED	FIXED
FIXED -SATELLITE (space-to-Earth) 516B 522B	FIXED -SATELLITE 516B 522B
MOBILE except aeronautical mobile	MOBILE
SPACE RESEARCH (passive) 522A	SPACE RESEARCH 522A
18.8-19.3	**18.8-19.3**
FIXED FIXED -SATELLITE (space-to-Earth) 516.B 523A	FIXED FIXED -SATELLITE 516.B 523A
MOBIL E	MOBILE
19.3-19.7	**19.3-19.7**
FIXED	FIXED
FIXED -SATELLITE (space-to-Earth) (Earth-t o-space)	FIXED -SATELLITE 523B 523C 523D 523E
523B 523C 523D 523E	MOBILE
MOBILE	
19.7-20.1	**19.7-20.1**

FIXED -SATELLITE (space-to-Earth) 484A 516B	FIXED -SATELLITE 484A 516B
MOBILE-SATELLITE (space-to-Earth)	MOBILE-SATELLITE
524 525 526 527 528 529	524 525 526 527 528 529
20.1-20.2 FIXED -SATELLITE (space-to-Earth) 484A 516B	**20.1-20.2** FIXED -SATELLITE) 484A 516B
MOBILE-SATELLITE (space-to-Earth)	MOBILE-SATELLITE
524 525 526 .527 528	524 525 526 .527 528
20.2-21.2	**20.2-21.2**
FIXED -SATELLITE (space-to-Earth)	FIXED -SATELLITE
MOBILE-SATELLITE (space-to-Earth)	MOBILE-SATELLITE
Standard frequency and time signal-satellite (space-to-Earth) 524	
21.2-21.4 EARTH EXPLORATION-SATELLITE (passive)	**21.2-21.4** EARTH EXPLORATION-SATELLITE
FIXED	FIXED
MOBILE	MOBILE
SPACE RESEARCH (passive)	SPACE RESEARCH
21.4-22	**21.4-22**
FIXED	FIXED
MOBILE	MOBILE
22-24.75 GHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
22-22.21	**22-22.21**
FIXED	FIXED
MOBILE except aeronautical mobile 149	MOBILE 149
22.21-22.5	**22.21-22.5**
EARTH EXPLORATION-SATELLITE (passive)	EARTH EXPLORATION-SATELLITE
FIXED	FIXED
MOBILE except aeronautical mobile	MOBILE
RADIO ASTRONOMY	RADIO ASTRONOMY
SPACE RESEARCH (passive) 149 532	SPACE RESEARCH 149 532
22.5-22.55	**22.5-22.55**
FIXED	FIXED
MOBILE	MOBILE
22.55-23.55	**22.55-23.55**
FIXED	FIXED
INTER-SATELLITE	INTER-SATELLITE
MOBILE 149	MOBILE 149
23.55-23.6	**23.55-23.6**
FIXED	FIXED
MOBILE	MOBILE
23.6-24	**23.6-24**
EARTH EXPLORATION-SATELLITE (passive)	EARTH EXPLORATION-SATELLITE
RADIO ASTRONOMY	RADIO ASTRONOMY
SPACE RESEARCH (passive) 340	SPACE RESEARCH 340
24-24.05	**24-24.05**
AMATEUR	AMATEUR
AMATEUR-SATELLITE 150	AMATEUR-SATELLITE 150

24.05-24.25	**24.05-24.25**
RADIOLOCATION	RADIOLOCATION
Amateur	AMATEUR

Earth exploration-satellite (active) 150	
24.25-24.45	**24.25-24.45**
RADIONAVIGATION	RADIONAVIGATION
24.45-24.65	**24.45-24.65**
INTER-SATELLITE	INTER-SATELLITE
RADIONAVIGATION 533	RADIONAVIGATION 533
24.65-24.75	**24.65-24.75**
INTER-SATELLITE	INTER-SATELLITE
RADIOLOCATION-SATELLITE (Earth-to-space)	RADIOLOCATION-SATELLITE
24.75-30.0 GHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
24.75-25.25 FIXED-SATELLITE (Earth-to-space) 535	**24.75-25.25** FIXED-SATELLITE 535
25.25-25.5	**25.25-25.5**
FIXED	FIXED
INTER-SATELLITE 536	INTER-SATELLITE 536
MOBILE Standard frequency and time signal-satellite (Earth-to-space)	MOBILE
25.5-27	**25.5-27**
EARTH EXPLORATION-SATELLITE (space-to Earth)	EARTH EXPLORATION-SATELLITE 536A 536B
536A 536B FIXED	FIXED INTER-SATELLITE 536
INTER-SATELLITE 536	MOBILE
MOBILE	
SPACE RESEARCH (space-to-Earth) 536A 536C	
Standard frequency and time signal-satellite (Earth-to-space)	
27-27.5	**27-27.5**
FIXED	FIXED
FIXED-SATELLITE (Earth-to-space) INTER-SATELLITE 536 537	FIXED-SATELLITE INTER-SATELLITE 536 537
MOBILE	MOBILE
27.5-28.5	**27.5-28.5**
FIXED 537A	FIXED
FIXED-SATELLITE (Earth-to-space) 484A 516B 539	FIXED-SATELLITE 484A 516B 539
MOBILE 538 540	MOBILE 538 540
28.5-29.1	**28.5-29.1**
FIXED	FIXED
FIXED-SATELLITE (Earth-to-space) 484A 516B 523A 539	FIXED-SATELLITE) 484A 516B 523A 539
MOBILE	MOBILE
Earth exploration-satellite (Earth-to-space) 541 540	
29.1-29.5	**29.1-29.5**
FIXED	FIXED

FIXED -SATELLITE (Earth-to-space) 516B 523C	FIXED -SATELLITE 516B 523C 523E 535A 539 541A
523E 535A 539 541A	MOBILE
MOBILE	
Earth exploration-satellite (Earth-to-space) 541 540	
29.5-30	**29.5-30.0**

FIXED -SATELLITE (Earth-to-space) 484A 516B 539	FIXED -SATELLITE MOBILE-SATELLITE
MOBILE-SATELLITE (Earth-to-space)	EARTH EXPLORATION-SATELLITE 541
Earth exploration-satellite (Earth-to-space) 541	525 526 527 529 540 542
525 526 527 529 540 542	
30.0.9-34.2 GHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
30-31	**30-31**
FIXED -SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space)	FIXED -SATELLITE MOBILE-SATELLITE
Standard frequency and time signal-satellite (space-to-Earth) 542	
31-31.3	**31-31.3**
FIXED 543A	FIXED 543A
MOBILE	MOBILE
Standard frequency and time signal-satellite (space-to-Earth)	
Space research 544 545 149 **31.3-31.5**	 **31.3-31.5**
EARTH EXPLORATION-SATELLITE (passive)	EARTH EXPLORATION-SATELLITE
RADIO ASTRONOMY	RADIO ASTRONOMY
SPACE RESEARCH (passive) 340	SPACE RESEARCH 340
31.5-31.8	**31.5-31.8**
EARTH EXPLORATION-SATELLITE (passive)	EARTH EXPLORATION-SATELLITE
RADIO ASTRONOMY	RADIO ASTRONOMY
SPACE RESEARCH (passive)	SPACE RESEARCH
340	340
31.8-32	**31.8-32**
FIXED 547A	FIXED 547A
RADIONAVIGATION	RADIONAVIGATION
SPACE RESEARCH (deep space) (space-to-Earth)	SPACE RESEARCH
547 547B 548	547 547B 548
32-32.3	**32-32.3**
FIXED 547A	FIXED 547A
RADIONAVIGATION	INTER-SATELLITE
SPACE RESEARCH (deep space) (space-to-Earth)	RADIONAVIGATION
547 5.47C 548	SPACE RESEARCH 547 5.47C 548
32.3-33	**32.3-33**
FIXED 547A	FIXED 547A
INTER-SATELLITE	INTER-SATELLITE
RADIONAVIGATION 547 547D 548	RADIONAVIGATION 547 547D 548
33-33.4	**33-33.4**
FIXED 547A	FIXED 547A

RADIONAVIGATION 547 547E	RADIONAVIGATION 547 547E
33.4-34.2	**33.4-34.2**
RADIOLOCATION 549	RADIOLOCATION 549
34.2-40 GHz	
Allocation to services	
ITU Region 2	**O.E.C.S**
34.2-34.7	**34.2-34.7**
RADIOLOCATION	RADIOLOCATION
SPACE RESEARCH (deep space) (Earth-to-space) 549	SPACE RESEARCH 549
34.7-35.2	**34.7-35.2**
RADIOLOCATION	RADIOLOCATION
Space research 550 549	SPACE RESEARCH 550 549
35.2-35.5	**35.2-35.5**
METEOROLOGICAL AIDS	METEOROLOGICAL AID S
RADIOLOCATION 549	RADIOLOCATION 549
35.5-36	**35.5-36**
METEOROLOGICAL AIDS	METEOROLOGICAL AIDS
EARTH EXPLORATION-SATELLITE (active)	EARTH EXPLORATION-SATELLITE
RADIOLOCATION	RADIOLOCATION
SPACE RESEARCH (active) 549 549A	SPACE RESEARCH 549 549A
36-37	**36-37**
EARTH EXPLORATION-SATELLITE (passive)	EARTH EXPLORATION-SATELLITE
FIXED	FIXED
MOBILE	MOBILE
SPACE RESEARCH (passive) 149	SPACE RESEARCH 149
37-37.5 FIXED	**37-37.5** FIXED
MOBILE	MOBILE
SPACE RESEARCH (space-to-Earth) 547	SPACE RESEA RCH 547
37.5-38	**37.5-38**
FIXED	FIXED
FIXED -SATELLITE (space-to-Earth)	FIXED -SATELLITE
MOBILE	MOBILE
SPACE RESEARCH (space-to-Earth)	SPACE RESEARCH
Earth exploration-satellite (space-to-Earth) 547	
38-39.5	**38-39.5**
FIXED	FIXED
FIXED -SATELLITE (space-to-Earth)	FIXED -SATELLITE
MOBILE	MOBILE
Earth exploration-satellite (space-to-Earth) 547	
39.5-40	**39.5-40**
FIXED	FIXED
FIXED -SATELLITE (space-to-Earth) 516B	FIXED -SATELLITE 516B
MOBILE	MOBILE
MOBILE-SATELLITE (space-to-Earth)	MOBILE-SATELLITE
Earth exploration-satellite (space-to-Earth) 547	

40-47.5 GHz	
Allocation to services	
ITU region 2	**OECS**
40-40.5	
EARTH EXPLORATION-SATELLITE (Earth-to-space)	
FIXED	
FIXED-SATELLITE (space-to-Earth) 516B	
MOBILE	
MOBILE-SATELLITE (space-to-Earth) SPACE RESEARCH (Earth-to-space)	
Earth exploration-satellite (space-to-Earth)	
40.5-41	
FIXED	
FIXED-SATELLITE (space-to-Earth) 516B	
BROADCASTING	
BROADCASTING-SATELLITE	
Mobile	
Mobile-satellite (space-to-Earth) 547	
41-42.5	
FIXED	
FIXED-SATELLITE (space-to-Earth) 516B	
BROADCASTING	
BROADCASTING-SATELLITE	
Mobile	
547 551F 551H 551I **42.5-43.5**	
FIXED	
FIXED-SATELLITE (Earth-to-space) 552	
MOBILE except aeronautical mobile	
RADIO ASTRONOMY	
149 547	
43.5-47	
MOBILE 553	
MOBILE-SATELLITE RADIONAVIGATION	
RADIONAVIGATION-SATELLITE	
554	
47-47.2	
AMATEUR	
AMATEUR-SATELLITE	
47.2-47.5	
FIXED	
FIXED-SATELLITE (Earth-to-space) 552	
MOBILE	
552A	

47.5-51.4 GHz	
Allocation to services	
ITU region 2	**OECS**
47.5-47.9	
FIXED	
FIXED-SATELLITE	
(Earth-to-space) 552	
(space-to-Earth) 516B 554A	
MOBILE	
47.9-48.2	
FIXED	
FIXED-SATELLITE (Earth-to-space) 552	
MOBILE	
552A	
48.2-48.54	
FIXED	
FIXED-SATELLITE (Earth-to-space) 552	
(space-to-Earth) 516B	
554A 555B	
MOBILE	
48.54-49.44	
FIXED	
FIXED-SATELLITE	
(Earth-to-space) 552	
MOBILE 149 340 555	
49.44-50.2	
FIXED	
FIXED-SATELLITE	
(Earth-to-space) 552	
(space-to-Earth) 516B	
554A 555B	
MOBILE	
149 340 555	
50.2-50.4	
EARTH EXPLORATION-SATELLITE (passive)	
SPACE RESEARCH (passive)	
34	
50.4-51.4	
FIXED	
FIXED-SATELLITE (Earth-to-space)	
MOBILE Mobile-satellite (Earth-to-space)	

51.4-55.78 GHz	
Allocation to services	
ITU region 2	**OECS**
51.4-52.6	
FIXED	
MOBILE	
547 556	
52.6-54.25	
EARTH EXPLORATION-SATELLITE (passive)	
SPACE RESEARCH (passive)	
340 556	
54.25-55.78	
EARTH EXPLORATION-SATELLITE (passive)	
INTER-SATELLITE 556A	
SPACE RESEARCH (passive)	
556B	
55.78-66 GHz	
Allocation to services	
ITU region 2	**OECS**
55.78-56.9 EARTH EXPLORATION-SATELLITE (passive)	
FIXED 557A	
INTER-SATELLITE 556A	
MOBILE 5.558	
SPACE RESEARCH (passive)	
547 557	
56.9-57 EARTH EXPLORATION-SATELLITE (passive)	
FIXED	
INTER-SATELLITE 558A	
MOBILE 558	
SPACE RESEARCH (passive)	
547 557	
57-58.2 EARTH EXPLORATION-SATELLITE (passive)	
FIXED	
INTER-SATELLITE 556A	
MOBILE 5.558	
SPACE RESEARCH (passive)	
547 557	
58.2-59 EARTH EXPLORATION-SATELLITE (passive) FIXED	
MOBILE	
SPACE RESEARCH (passive)	
547 556	
59-59.3 EARTH EXPLORATION-SATELLITE (passive)	
FIXED	
INTER-SATELLITE 556A	
MOBILE 558	
RADIOLOCATION 559 SPACE RESEARCH (passive)	

59.3-64 FIXED

INTER-SATELLITE
MOBILE 558
RADIOLOCATION 559
138
64-65 FIXED
INTER-SATELLITE
MOBILE except aeronautical mobile
547 556
65-66 EARTH EXPLORATION-SATELLITE
FIXED
INTER-SATELLITE
MOBILE except aeronautical mobile
SPACE RESEARCH
547
66-81 GHz
Allocation to services

ITU region 2	**OECS**
66-71 INTER-SATELLITE	
MOBILE 553 558	
MOBILE-SATELLITE	
RADIONAVIGATION	
RADIONAVIGATION-SATELLITE	
554	
71-74 FIXED	
FIXED-SATELLITE (space-to-Earth)	
MOBILE	
MOBILE-SATELLITE (space-to-Earth)	
74-76 FIXED	
FIXED-SATELLITE (space-to-Earth)	
MOBILE	
BROADCASTING	
BROADCASTING-SATELLITE	
Space research (space-to-Earth)	
559A 561	
76-77.5 RADIO ASTRONOMY	
RADIOLOCATION	
Amateur	
Amateur-satellite	
Space research (space-to-Earth)	
149	
77.5-78 AMATEUR	
AMATEUR-SATELLITE	
Radio astronomy	
Space research (space-to-Earth)	
149	
78-79 RADIOLOCATION	

Amateur	
Amateur-satellite	
Radio astronomy Space research (space-to-Earth)	
149 560	
79-81 RADIO ASTRONOMY	
RADIOLOCATION	
Amateur	
Amateur-satellite	
Space research (space-to-Earth)	
149	
81-86 GHz	
Allocation to services	
ITU region 2	**OECS**
81-84 FIXED	
FIXED-SATELLITE (Earth-to-space)	
MOBILE	
MOBILE-SATELLITE (Earth-to-space)	
RADIO ASTRONOMY	
Space research (space-to-Earth)	
149 561A	
84-86 FIXED	
FIXED-SATELLITE (Earth-to-space) 5.561B	
MOBILE	
RADIO ASTRONOMY	
149	
86-111.8 GHz	
Allocation to services	
ITU region 2	**OECS**
86-92 EARTH EXPLORATION-SATELLITE (passive)	
RADIO ASTRONOMY	
SPACE RESEARCH (passive)	
34 **92-94** FIXED	
MOBILE	
RADIO ASTRONOMY	
RADIOLOCATION	
149	
94-94.1 EARTH EXPLORATION-SATELLITE (active)	
RADIOLOCATION	
SPACE RESEARCH (active)	

Radio astronomy 562 562A	
94.1-95 FIXED	
MOBILE	
RADIO ASTRONOMY	
RADIOLOCATION	
149	
95-100 FIXED MOBILE	
RADIO ASTRONOMY	
RADIOLOCATION	
RADIONAVIGATION	
RADIONAVIGATION-SATELLITE	
149 554	
100-102 EARTH EXPLORATION-SATELLITE (passive)	
RADIO ASTRONOMY	
SPACE RESEARCH (passive) 340 341	
102-105 FIXED	
MOBILE	
RADIO ASTRONOMY	
149 341	
105-109.5 FIXED	
MOBILE	
RADIO ASTRONOMY	
SPACE RESEARCH (passive) 5.562B	
149 341	
109.5-111.8 EARTH EXPLORATION-SATELLITE (passive)	
RADIO ASTRONOMY	
SPACE RESEARCH (passive)	
340 341	
111.8-119.98 GHz	
Allocation to services	
ITU region 2	**OECS**
111.8-114.25 FIXED	
MOBILE	
RADIO ASTRONOMY	
SPACE RESEARCH (passive) 562B	
149 341	
114.25-116 EARTH EXPLORATION-SATELLITE (passive)	
RADIO ASTRONOMY	
SPACE RESEARCH (passive)	
340 341	
116-119.98 EARTH EXPLORATION-SATELLITE (passive)	
INTER-SATELLITE 5.562C	
SPACE RESEARCH (passive)	
341	

119.98-151.5 GHz	
Allocation to services	
ITU region 2	**OECS**
119.98-122.25 EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 562C	
SPACE RESEARCH (passive)	
138 341	
122.25-123 FIXED INTER-SATELLITE	
MOBILE 558	
Amateur	
138	
123-130 FIXED-SATELLITE (space-to-Earth)	
MOBILE-SATELLITE (space-to-Earth)	
RADIONAVIGATION	
RADIONAVIGATION-SATELLITE	
Radio astronomy 562D 149 554	
130-134 EARTH EXPLORATION-SATELLITE (active) 562E	
FIXED	
INTER-SATELLITE	
MOBILE 558	
RADIO ASTRONOMY	
149 562A	
134-136 AMATEUR	
AMATEUR-SATELLITE	
Radio astronomy	
136-141 RADIO ASTRONOMY	
RADIOLOCATION	
Amateur	
Amateur-satellite	
149	
141-148.5 FIXED	
MOBILE RADIO ASTRONOMY	
RADIOLOCATION	
149	
148.5-151.5 EARTH EXPLORATION-SATELLITE (passive)	
RADIO ASTRONOMY	
SPACE RESEARCH (passive)	
34	
151.5-158.5 GHz	
Allocation to services	
ITU region 2	**OECS**
151.5-155.5 FIXED	
MOBILE	

RADIO ASTRONOMY RADIOLOCATION	
149	
155.5-158.5 EARTH EXPLORATION-SATELLITE (passive) 562F	
FIXED	
MOBILE	
RADIO ASTRONOMY	
SPACE RESEARCH (passive) 562B	
149 562G	
158.5-202 GHz	
Allocation to services	
ITU region 2	**OECS**
158.5-164 FIXED	
FIXED-SATELLITE (space-to-Earth)	
MOBILE	
MOBILE-SATELLITE (space-to-Earth) **164-167** EARTH EXPLORATION-SATELLITE (passive)	
RADIO ASTRONOMY	
SPACE RESEARCH (passive)	
34	
167-174.5 FIXED	
FIXED-SATELLITE (space-to-Earth)	
INTER-SATELLITE	
MOBILE 558	
149 562D	
174.5-174.8 FIXED	
INTER-SATELLITE	
MOBILE 558	
174.8-182 EARTH EXPLORATION-SATELLITE (passive)	
INTER-SATELLITE 562H	
SPACE RESEARCH (passive)	
182-185 EARTH EXPLORATION-SATELLITE (passive)	
RADIO ASTRONOMY SPACE RESEARCH (passive)	
34	
185-190 EARTH EXPLORATION-SATELLITE (passive)	
INTER-SATELLITE 562H	
SPACE RESEARCH (passive)	
190-191.8 EARTH EXPLORATION-SATELLITE (passive)	
SPACE RESEARCH (passive)	
34 **191.8-200** FIXED	
INTER-SATELLITE	
MOBILE 558	
MOBILE-SATELLITE	
RADIONAVIGATION	
RADIONAVIGATION-SATELLITE	
149 341 554	

200-202 EARTH EXPLORATION-SATELLITE (passive)	
RADIO ASTRONOMY SPACE RESEARCH (passive)	
340 341 563A	
202-248 GHz	
Allocation to services	
ITU region 2	**OECS**
202-209 EARTH EXPLORATION-SATELLITE (passive)	
RADIO ASTRONOMY	
SPACE RESEARCH (passive) 340 341 563A	
209-217 FIXED	
FIXED-SATELLITE (Earth-to-space)	
MOBILE	
RADIO ASTRONOMY	
149 341	
217-226 FIXED	
FIXED-SATELLITE (Earth-to-space)	
MOBILE	
RADIO ASTRONOMY	
SPACE RESEARCH (passive) 562B	
149 341	
226-231.5 EARTH EXPLORATION-SATELLITE (passive)	
RADIO ASTRONOMY	
SPACE RESEARCH (passive)	
34	
231.5-232 FIXED	
MOBILE Radiolocation	
232-235 FIXED	
FIXED-SATELLITE (space-to-Earth)	
MOBILE	
Radiolocation	
235-238 EARTH EXPLORATION-SATELLITE (passive)	
FIXED-SATELLITE (space-to-Earth)	
SPACE RESEARCH (passive) 563A 563B	
238-240 FIXED	
FIXED-SATELLITE (space-to-Earth)	
MOBILE	
RADIOLOCATION	
RADIONAVIGATION	
RADIONAVIGATION-SATELLITE	
240-241 FIXED	
MOBILE	
RADIOLOCATION	
241-248 RADIO ASTRONOMY	
RADIOLOCATIO N	

Amateur	
Amateur-satellite	
138 149	
248-1 000 GHz	
Allocation to services	
ITU region 2	**OECS**
248-250 AMATEUR	
AMATEUR-SATELLITE	
Radio astronomy	
149	
250-252 EARTH EXPLORATION-SATELLITE (passive)	

RADIO ASTRONOMY SPACE RESEARCH (passive)
340 563A
252-265 FIXED
MOBILE
MOBILE-SATELLITE (Earth-to-space)
RADIO ASTRONOMY
RADIONAVIGATION
RADIONAVIGATION-SATELLITE
149 554
265-275 FIXED
FIXED-SATELLITE (Earth-to-space)
MOBILE
RADIO ASTRONOMY
149 563A
275-1 000 (Not allocated) 565

6.5 FOOT NOTES APPLICABLE TO REGION 2

53 Administrations authorizing the use of frequencies below 9 kHz shall ensure that no harmful interference is caused thereby to the services to which the bands above 9 kHz are allocated.

54 Administrations conducting scientific research using frequencies below 9 kHz are urged to advise other administrations that may be concerned in order that such research may be afforded all practicable protection from harmful interference.

55 *Additional allocation:* in Armenia, Azerbaijan, Bulgaria, the Russian Federation, Georgia, Kyrgyzstan, Tajikistan and Turkmenistan, the band 14-17 kHz

is also allocated to the radionavigation service on a primary basis. (WRC-2000)

56 The stations of services to which the bands 14-19.95 kHz and 20.05-70 kHz and in Region 1 also the bands 72-84 kHz and 86-90 kHz are allocated may transmit standard frequency and time signals. Such stations shall be afforded protection from harmful interference. In Armenia, Azerbaijan, Belarus, Bulgaria, the Russian Federation, Georgia, Kazakhstan, Mongolia, Kyrgyzstan, Slovakia, the Czech Rep., Tajikistan and Turkmenistan, the frequencies 25 kHz and 50 kHz will be used for this purpose under the same conditions. (WRC-03)

57 The use of the bands 14-19.95 kHz, 20.05-70 kHz and 70-90 kHz (72-84 kHz and 86-90 kHz in Region 1) by the maritime mobile service is limited to coast radiotelegraph stations (A1A and F1B only). Exceptionally, the use of class J2B or J7B emissions is authorized subject to the necessary bandwidth not exceeding that normally used for class A1A or F1B emissions in the band concerned.

58 *Additional allocation:* in Armenia, Azerbaijan, the Russian Federation, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan, the band 67-70 kHz is also allocated to the radionavigation service on a primary basis. (WRC-2000)

60 In the bands 70-90 kHz (70-86 kHz in Region 1) and 110-130 kHz (112-130 kHz in Region 1), pulsed radionavigation systems may be used on condition that they do not cause harmful interference to other services to which these bands are allocated.

61 In Region 2, the establishment and operation of stations in the maritime radionavigation service in the bands 70-90 kHz and 110-130 kHz shall be subject to agreement obtained under No. **9.21** with administrations whose services, operating in accordance with the Table, may be affected. However, stations of the fixed, maritime mobile and radiolocation services shall not cause harmful interference to stations in the maritime radionavigation service established under such agreements.

62 Administrations which operate stations in the radionavigation service in the band 90-110 kHz are urged to coordinate technical and operating characteristics in such a way as to avoid harmful interference to the services provided by these stations.

63 (SUP - WRC-97)

64 Only classes A1A or F1B, A2C, A3C, F1C or F3C emissions are authorized for stations of the fixed service in the bands allocated to this service between 90 kHz and 160 kHz (148.5 kHz in Region 1) and for stations of the maritime mobile service in the bands allocated to this service between 110 kHz and 160 kHz (148.5 kHz in Region 1). Exceptionally, class J2B or J7B emissions are also authorized in the bands between 110 kHz and 160 kHz (148.5 kHz in Region 1) for stations of the maritime mobile service.

76 The frequency 410 kHz is designated for radio direction-finding in the maritime radionavigation service. The other radionavigation services to which the band 405-415 kHz is allocated shall not cause harmful interference to radio direction-finding in the band 406.5-413.5 kHz.

79 The use of the bands 415-495 kHz and 505-526.5 kHz (505-510 kHz in Region 2) by the maritime mobile service is limited to radiotelegraphy.

80 In Region 2, the use of the band 435-495 kHz by the aeronautical radionavigation service is limited to non-directional beacons not employing voice transmission.

83 The frequency 500 kHz is an international distress and calling frequency for Morse radiotelegraphy. The conditions for its use are prescribed in Articles 31 and **52,** and in Appendix **13**.

84 The conditions for the use of the frequency 518 kHz by the maritime mobile service are prescribed in Articles **31** and **52** and in Appendix **13**. (WRC-97)

86 In Region 2, in the band 525-535 kHz the carrier power of broadcasting stations shall not exceed 1 kW during the day and 250 W at night.

89 In Region 2, the use of the band 1605-1 705 kHz by stations of the broadcasting service is subject to the Plan established by the Regional Administrative Radio Conference (Rio de Janeiro, 1988).

The examination of frequency assignments to stations of the fixed and mobile services in the band 1625-1 705 kHz shall take account of the allotments appearing in the Plan established by the Regional Administrative Radio Conference (Rio de Janeiro, 1988).

90 In the band 1 605-1 705 kHz, in cases where a broadcasting station of Region 2 is concerned, the service area of the maritime mobile stations in Region 1 shall be limited to that provided by ground-wave propagation.

102 Alternative *allocation:* in Argentina, Bolivia, Chile, Mexico, Paraguay, Peru, Uruguay and Venezuela, the band 1 850-2 000 kHz is allocated to the fixed, mobile except aeronautical mobile, radiolocation and radionavigation services on a primary basis.

106 In Regions 2 and 3, provided no harmful interference is caused to the maritime mobile service, the frequencies between 2065 kHz and 2 107 kHz may be used by stations of the fixed service communicating only within national borders and whose mean power does not exceed 50 W. In notifying the frequencies, the attention of the Bureau should be drawn to these provisions.

108 The carrier frequency 2182 kHz is an international distress and calling frequency for radiotelephony. The conditions for the use of the band 2 173.5-2 190.5 kHz are prescribed in Articles 31 and **52** and in Appendix **13**.

109 The frequencies 2 187.5 kHz, 4207.5 kHz, 6312 kHz, 8 414.5 kHz, 12 577

kHz and 16 804.5 kHz are international distress frequencies for digital selective calling. The conditions for the use of these frequencies are prescribed in Article **31.**

110 The frequencies 2174.5 kHz, 4177.5 kHz, 6268 kHz, 8376.5 kHz, 12 520 kHz and 16695 kHz are international distress frequencies for narrow- band direct-printing telegraphy. The conditions for the use of these frequencies are prescribed in Article **31**.

111 The carrier frequencies 2 182 kHz, 3 023 kHz, 5680 kHz, 8364 kHz and the frequencies 121.5 MHz, 156.8 MHz and 243 MHz may also be used, in accordance with the procedures in force for terrestrial radiocommunication services, for search and rescue operations concerning manned space vehicles. The conditions for the use of the frequencies are prescribed in Article **31** and in Appendix **13**.

The same applies to the frequencies 10003 kHz, 14 993 kHz and 19993 kHz, but in each of these cases emissions must be confined in a band of 3 kHz about the frequency.

112 *Alternative allocation:* in Bosnia and Herzegovina, Denmark, Malta, Serbia and Mont enegro. and Sri Lanka, the band 2194-2 300 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-03)

113 For the conditions for the use of the bands 2 300-2 495 kHz (2 498 kHz in Region 1), 3200- 3 400 kHz, 4750-4 995 kHz and 5 005- 5 060 kHz by the broadcasting service, see Nos. **5.16** to **5.20**, **5.21** and **23.3** to **23.10**.

115 The carrier (reference) frequencies 3023 kHz and 5680 kHz may also be used, in accordance with Article **31**and Appendix **13** by stations of the maritime mobile service engaged in coordinated search and rescue operations.

116 Administrations are urged to authorize the use of the band 3 155 -3 195 kHz to provide a common worldwide channel for low power wireless hearing aids. Additional channels for these devices may be assigned by administrations in the bands between 3 155 kHz and 3 400 kHz to suit local needs.

It should be noted that frequencies in the range 3 000 kHz to 4 000 kHz are suitable for hearing aid devices which are designed to operate over short distances within the induction field.

117 *Alternative allocation:* in Bosnia and Herzegovina, Côte d'Ivoire, Denmark, Egypt, Liberia, Malta, Serbia and Montenegro, Sri Lanka and Togo, the band 3 155-3 200 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-03)

118 Additional *allocation:* in the United States, Mexico, Peru and Uruguay, the band 3230 -3 400 kHz is also allocated to the radiolocation service on a secondary basis.

(WRC-03)

119 Additional *allocation:* in Honduras, Mexico, Peru and Venezuela, the band 3500-3 750 kHz is also allocated to the fixed and mobile services on a primary basis.

122 *Alternative allocation:* in Argentina, Bolivia, Chile, Ecuador, Paraguay, Peru and Uruguay, the band 3750-4000 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

123 *Additional allocation:* in Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe, the band 3 900-3 950 kHz is also allocated to the broadcasting service on a primary basis, subject to agreement obtained under No. **9.21**.

125 *Additional allocation:* in Greenland, the band 3 950-4 000 kHz is also allocated to the broadcasting service on a primary basis. The power of the broadcasting stations operating in this band shall not exceed that necessary for a national service and shall in no case exceed 5 kW.

126 In Region 3, the stations of those services to which the band 3995-4 005 kHz is allocated may transmit standard frequency and time signals.

128 In Afghanistan, Argentina, Armenia, Azerbaijan, Belarus, Botswana, Burkina Faso, the Central African Rep., China, the Russian Federation, Georgia, India, Kazakhstan, Mali, Niger, Kyrgyzstan, Tajikistan, Chad, Turkmenistan and Ukraine, in the bands 4 063-4 123 kHz, 4 130-4 133 kHz and 4 408-4 438 kHz, stations of limited power in the fixed service which are situated at least 600 km from the coast may operate on condition that harmful interference is not caused to the maritime mobile service. (WRC-97)

130 The conditions for the use of the carrier frequencies 4125 kHz and 6 215 kHz are prescribed in Articles **31** and **52** and in Appendix **13**.

132 The frequencies 4 210 kHz, 6314 kHz, 8416.5 kHz, 12 579 kHz, 16 806.5 kHz, 19 680.5 kHz, 22 376 kHz and 26 100.5 kHz are the international frequencies for the transmission of maritime safety information (MSI) (see Appendix **17**).

137 On condition that harmful interference is not caused to the maritime mobile service, the bands 6 200-6 213.5 kHz and 6220.5-6 525 kHz may be used exceptionally by stations in the fixed service, communicating only within the boundary of the country in which they are located, with a mean power not exceeding 50 W. At the time of notification of these frequencies, the attention of the Bureau will be drawn to the above conditions.

138 The following bands:

6765-6 795 kHz (centre frequency 6780 kHz),

433.05-434.79 MHz	(centre frequency 433.92 MHz) in Region 1 except in the countries mentioned in No. **5.280**,
61-61.5 GHz	(centre frequency 61.25 GHz),
122-123 GHz	(centre frequency 122.5 GHz), and
244-246 GHz	(centre frequency 245 GHz)

are designated for industrial, scientific and medical (ISM) applications. The use of these frequency bands for ISM applications shall be subject to special authorization by the administration concerned, in agreement with other administrations whose radiocommunication services might be affected. In applying this provision, administrations shall have due regard to the latest relevant ITU-R Recommendations.

138A Until 29 March 2009, the band 6765-7 000 kHz is allocated to the fixed service on a primary basis and to the land mobile service on a secondary basis. After this date, this band is allocated to the fixed and the mobile except aeronautical mobile (R) services on a primary basis. (WRC-03)

139 *Different category of service:* until 29 March 2009, in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Latvia, Lithuania, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 6765-7 000 kHz to the land mobile service is on a primary basis (see No. **5.33**). (WRC-03)

140 Additional *allocation:* in Angola, Iraq, Kenya, Rwanda, Somalia and Togo, the band 7 000-7 050 kHz is also allocated to the fixed service on a primary basis. (WRC-03)

141 Alternative *allocation:* in Egypt, Eritrea, Ethiopia, Guinea, the Libyan Arab Jamahiriya and Madagascar, the band 7 000-7 050 kHz is allocated to the fixed service on a primary basis. (WRC-97)

141A Additional *allocation:* in Uzbekistan and Kyrgyzstan, the bands 7000-7 100 kHz and 7 100-7 200 kHz are also allocated to the fixed and land mobile services on a secondary basis. (WRC-03)

142 Until 29 March 2009, the use of the band 7100-7 300 kHz in Region 2 by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3. After 29 March 2009 the use of the band 7 200-7 300 kHz in Region 2 by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3. (WRC-03)

143 The band 7 300-7 350 kHz is allocated, until 1 April 2007, to the fixed service on a primary basis and to the land mobile service on a secondary basis, subject to application of the procedure referred to in Resolution **21 (Rev.WRC-95)*** . After 1 April 2007, frequencies in this band may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are

located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies for these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

143A In Region 3, the band 7350-7 450 kHz is allocated, until 29 March 2009, to the fixed service on a primary basis and to the land mobile service on a secondary basis. After 29 March 2009, frequencies in this band may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies for these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations. (WRC-03)

143B In Region 1, the band 7350-7 450 kHz is allocated, until 29 March 2009, to the fixed service on a primary basis and to the land mobile service on a secondary basis. After 29 March 2009, on condition that harmful interference is not caused to the broadcasting service, frequencies in the band 7350-7 450 kHz may be used by stations in the fixed and land mobile services communicating only within the boundary of the country in which they are located, each station using a total radiated power that shall not exceed 24 dBW. (WRC-03)

143C Additional allocation: after 29 March 2009 in Algeria, Saudi Arabia, Bahrain, Comoros, Djibouti, Egypt, United Arab Emirates, Iran (Islamic Republic of), the Libyan Arab Jamahiriya, Jordan, Kuwait, Morocco, Mauritania, Oman, Qatar, the Syrian Arab Republic, Sudan, Tunisia and Yemen, the bands 7350-7 400 kHz and 7 400-7 450 kHz are also allocated to the fixed service on a primary basis. (WRC-03)

143D In Region 2, the band 7350-7 400 kHz is allocated, until 29 March 2009, to the fixed service on a primary basis and to the land mobile service on a secondary basis. After 29 March 2009, frequencies in this band may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies for these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations. (WRC-03)

143E Until 29 March 2009, the band 7 450-8 100 kHz is allocated to the fixed service on a primary basis and to the land mobile service on a secondary basis. (WRC-03)

144 In Region 3, the stations of those services to which the band 7 995-8 005 kHz is allocated may transmit standard frequency and time signals.

145 The conditions for the use of the carrier frequencies 8291 kHz, 12 290 kHz and 16 420 kHz are prescribed in Articles **31** and **52** and in Appendix **13**.

146 The bands 9400-9 500 kHz, 11 600-11 650 kHz, 12 050-12 100 kHz, 15 600-15 800 kHz, 17480-17 550 kHz and 18 900 -19 020 kHz are allocated to the fixed service on a primary basis until 1 April 2007, subject to application of the procedure referred to in Resolution **21 (Rev.WRC -95)** *. After 1 April 2007, frequencies in these bands may be used by stations in the fixed service, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies in the fixed service, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

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* *Note by the Secretariat:* This Resolution was revised by WRC -03.

* *Note by the Secretariat:* This Resolution was revised by WRC -03.

147 On condition that harmful interference is not caused to the broadcasting service, frequencies in the bands 9775-9 900 kHz, 11 650-11 700 kHz and 11 975-12 050 kHz may be used by stations in the fixed service communicating only within the boundary of the country in which they are located, each station using a total radiated power not exceeding 24 dBW.

149 In making assignments to stations of other services to which the bands:

13 360-13 410 kHz,

25 550-25 670 kHz,

37.5-38.25 MHz,

73-74.6 MHz in Regions 1 and 3,

150.05-153 MHz in Region 1,

322-328.6 MHz,

406.1-410 MHz,

608-614 MHz in Regions 1 and 3,

1330-1400 MHz,

1610.6-1613.8 MHz,

1660-1670 MHz,

1718.8-1722.2 MHz,

2655-2690 MHz,

3260-3267 MHz,

3332-3339 MHz,

3345.8-3352.5 MHz,

4825-4835 MHz,

4950-4990 MHz,

4990-5000 MHz,

6650-6675.2 MHz,

10.6-10.68 GHz,

14.47-14.5 GHz,

22.01-22.21 GHz,

22.21-22.5 GHz,

22.81-22.86 GHz,

23.07-23.12 GHz,

31.2-31.3 GHz,

31.5-31.8 GHz in Regions 1 and 3,

36.43-36.5 GHz,

42.5-43.5 GHz,

42.77-42.87 GHz,

43.07-43.17 GHz,

43.37-43.47 GHz,

48.94-49.04 GHz,

76-86 GHz,

92-94 GHz,

94.1-100 GHz,

102-109.5 GHz,

111.8-114.25 GHz,

128.33-128.59 GHz,

129.23-129.49 GHz,

130-134 GHz,

136-148.5 GHz,

151.5-158.5 GHz,

168.59-168.93 GHz,

171.11-171.45 GHz,

172.31-172.65 GHz,

173.52-173.85 GHz,

195.75-196.15 GHz,

209-226 GHz,

241-250 GHz,

252-275 GHz

are allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from spaceborne or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. **4.5** and **4.6** and Article **29**). (WRC-2000)

150 The following bands:

13 553-13 567 kHz	(centre frequency 13 560 kHz),
26 957-27 283 kHz	(centre frequency 27 120 kHz),
40.66-40.70 MHz	(centre frequency 40.68 MHz),
902-928 MHz	in Region 2 (centre frequency 915 MHz),
2 400-2 500 MHz	(centre frequency 2 450 MHz),
5 725-5 875 MHz	(centre frequency 5 800 MHz), and
24-24.25 GHz	(centre frequency 24.125 GHz)

are also designated for industrial, scientific and medical (ISM) applications. Radiocommunication services operating within these bands must accept harmful interference which may be caused by these applications. ISM equipment operating in these bands is subject to the provisions of No. **15.13**.

151 The bands 13 570-13 600 kHz and 13 800-13 870 kHz are allocated, until 1 April 2007, to the fixed service on a primary basis and to the mobile except aeronautical mobile (R) service on a secondary basis, subject to application of the procedure referred

152 *Additional allocation:* in Armenia, Azerbaijan, China, Côte d'Ivoire, the Russian Federation, Georgia, Iran (Islamic Republic of), Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 14 250-14 350 kHz is also allocated to the fixed service on a primary basis. Stations of the fixed service shall not use a radiated power exceeding 24 dBW. (WRC-03)

154 *Additional allocation:* in Armenia, Azerbaijan, the Russian Federation, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 18 068-18 168 kHz is also allocated to the fixed service on a primary basis for use within their boundaries, with a peak envelope power not exceeding 1 kW. (WRC-03)

155 *Additional allocation:* in Armenia, Azerbaijan, Belarus, Bulgaria, the Russian Federation, Georgia, Kazakhstan, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Slovakia, the Czech Rep., Tajikistan, Turkmenistan and Ukraine, the band 21 850-21 870 kHz is also allocated to the aeronautical mobile (R) services on a primary basis. (WRC-03)

156 *Additional allocation:* in Nigeria, the band 22 720-23 200 kHz is also allocated to the meteorological aids service (radiosondes) on a primary basis.

157 The use of the band 23 350-24 000 kHz by the maritime mobile service is limited to inter-ship radiotelegraphy.

160 *Additional allocation:* in Botswana, Burundi, Lesotho, Malawi, Dem. Rep. of the Congo, Rwanda and Swaziland, the band 41-44 MHz is also allocated to the aeronautical radionavigation service on a primary basis. (WRC-2000)

161 *Additional allocation:* in Iran (Islamic Republic of) and Japan, the band 41-44 MHz is also allocated to the radiolocation service on a secondary basis.

162 *Additional allocation:* in Australia and New Zealand, the band 44-47 MHz is also allocated to the broadcasting service on a primary basis.

162A *Additional allocation:* in Germany, Austria, Belgium, Bosnia and Herzegovina, China, Vatican, Denmark, Spain, Estonia, the Russian Federation, Finland, France, Ireland, Iceland, Italy, Latvia, The Former Yugoslav Republic of Macedonia, Liechtenstein, Lithuania, Luxembourg, Moldova, Monaco, Norway, the Netherlands, Poland, Portugal, Slovakia, the Czech Rep., the United Kingdom, Sweden and Switzerland the band 46-68 MHz is also allocated to the radiolocation service on a secondary basis. This use is limited to the operation of wind profiler radars in accordance with Resolution **217**

(WRC-97). (WRC-2000)

166 *Alternative allocation:* in New Zealand, the band 50-51 MHz is allocated to the fixed, mobile and broadcasting services on a primary basis; the band 53-54 MHz is allocated to the fixed and mobile services on a primary basis.

167 *Alternative allocation:* in Bangladesh, Brunei Darussalam, India, Indonesia, Iran (Islamic Republic of), Malaysia, Pakistan, Singapore and Thailand, the band 50-54 MHz is allocated to the fixed, mobile and broadcasting services on a primary basis.

168 *Additional allocation:* in Australia, China and the Dem. People's Rep. of Korea, the band 50-54 MHz is also allocated to the broadcasting service on a primary basis.

170 *Additional allocation:* in New Zealand, the band 51-53 MHz is also allocated to the fixed and mobile services on a primary basis.

172 *Different category of service:* in the French Overseas Departments in Region 2, Guyana, Jamaica and Mexico, the allocation of the band 54-68 MHz to the fixed and mobile services is on a primary basis (see No. **5.33**).

173 *Different category of service:* in the French Overseas Departments in Region 2, Guyana, Jamaica and Mexico, the allocation of the band 68-72 MHz to the fixed and mobile services is on a primary basis (see No. **5.33**).

178 *Additional allocation:* in Colombia, Costa Rica, Cuba, El Salvador, Guatemala, Guyana, Honduras and Nicaragua, the band 73-74.6 MHz is also allocated to the fixed and mobile services on a secondary basis.

181 *Additional allocation:* in Egypt, Israel and the Syrian Arab Republic, the band 74.8-75.2 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. **9.21**. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedure invoked under No. **9.21**. (WRC-03)

185 *Different category of service:* in the United States, the French Overseas Departments in Region 2, Guyana, Jamaica, Mexico and Paraguay, the allocation of the band 76-88 MHz to the fixed and mobile services is on a primary basis (see No. **5.33**).

192 *Additional allocation:* in China and Korea (Rep. of), the band 100-108 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-97)

194 *Additional allocation:* in Azerbaijan, Lebanon, the Syrian Arab Republic, Kyrgyzstan, Somalia and Turkmenistan, the band 104-108 MHz is also allocated to the

mobile, except aeronautical mobile (R), service on a secondary basis. (WRC-97)

197 *Additional allocation:* in Japan, Pakistan and the Syrian Arab Republic, the band 108-111.975 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. **9.21**. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedures invoked under No. **9.21**. (WRC-2000)

197A The band 108-117.975 MHz may also be used by the aeronautical mobile (R) service on a primary basis, limited to systems that transmit navigational information in support of air navigation and surveillance functions in accordance with recognized international aviation standards. Such use shall be in accordance with Resolution **413 (WRC-03)** and shall not cause harmful interference to nor claim protection from stations operating in the aeronautical radionavigation service which operate in accordance with international aeronautical standards. (WRC-03)

198 *Additional allocation:* the band 117.975-136 MHz is also allocated to the aeronautical mobile-satellite (R) service on a secondary basis, subject to agreement obtained under No. **9.21**. (WRC-97)

199 The bands 121.45-121.55 MHz and 242.95-243.05 MHz are also allocated to the mobile-satellite service for the reception on board satellites of emissions from emergency position-indicating radiobeacons transmitting at 121.5 MHz and 243 MHz (see Appendix **13**).

200 In the band 117.975-136 MHz, the frequency 121.5 MHz is the aeronautical emergency frequency and, where required, the frequency 123.1 MHz is the aeronautical frequency auxiliary to 121.5 MHz. Mobile stations of the maritime mobile service may communicate on these frequencies under the conditions laid down in Article **31** and Appendix **13** for distress and safety purposes with stations of the aeronautical mobile service.

201 *Additional allocation:* in Angola, Armenia, Azerbaijan, Belarus, Bulgaria, Estonia, the Russian Federation, Georgia, Hungary, Iran (Islamic Republic of), Iraq, Japan, Kazakhstan, Latvia, Moldova, Mongolia, Mozambique, Uzbekistan, Papua New Guinea, Poland, Kyrgyzstan, Slovakia, the Czech Rep., Romania, Tajikistan, Turkmenistan and Ukraine, the band 132-136 MHz is also allocated to the aeronautical mobile (OR) service on a primary basis. In assigning frequencies to stations of the aeronautical mobile (OR) service, the administration shall take account of the frequencies assigned to stations in the aeronautical mobile (R) service. (WRC-97)

202 *Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Belarus, Bulgaria, the United Arab Emirates, the Russian Federation, Georgia, Iran (Islamic Republic of), Jordan, Latvia, Moldova, Oman, Uzbekistan, Poland, the Syrian Arab Republic, Kyrgyzstan, Slovakia, the Czech Rep., Romania, Tajikistan, Turkmenistan and Ukraine, the band 136-137 MHz is also allocated to the aeronautical mobile (OR) service on a primary basis. In assigning frequencies to stations of the aeronautical mobile (OR) service, the administration

shall take account of the frequencies assigned to stations in the aeronautical mobile (R) service. (WRC-2000)

203 In the band 136-137 MHz, existing operational meteorological satellites may continue to operate, under the conditions defined in No. **4.4** with respect to the aeronautical mobile service, until 1 January 2002. Administrations shall not authorize new frequency assignments in this band to stations in the meteorological-satellite service. (WRC-97)

203A *Additional allocation:* in Israel, Mauritania, Qatar and Zimbabwe, the band 136-137 MHz is also allocated to the fixed and mobile, except aeronautical mobile (R), services on a secondary basis until 1 January 2005.(WRC-97)

203B *Additional allocation:* in Saudi Arabia, United Arab Emirates, Oman and Syrian Arab Republic, the band 136 -137 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis until 1 January 2005. (WRC-03)

204 Different *category of service:* in Afghanistan, Saudi Arabia, Bahrain, Bangladesh, Bosnia and Herzegovina, Brunei Darussalam, China, Cuba, the United Arab Emirates, India, Indonesia, Iran (Islamic Republic of), Iraq, Malaysia, Oman, Pakistan, the Philippines, Qatar, Serbia and Montenegro, Singapore, Thailand and Yemen, the band 137 -138 MHz is allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis (see No. **5.33**). (WRC-03)

205 *Different category of service:* in Israel and Jordan, the allocation of the band 137-138 MHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (see No. **5.33**).

206 *Different category of service:* in Armenia, Azerbaijan, Belarus, Bulgaria, Egypt, the Russian Federation, Finland, France, Georgia, Greece, Kazakhstan, Lebanon, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, the Syrian Arab Republic, Slovakia, the Czech Rep., Romania, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 137-138 MHz to the aeronautical mobile (OR) service is on a primary basis (see No. **5.33**). (WRC-2000)

207 *Additional allocation:* in Australia, the band 137 -144 MHz is also allocated to the broadcasting service on a primary basis until that service can be accommodated within regional broadcasting allocations.

208 The use of the band 137-138 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**. (WRC-97)

208A In making assignments to space stations in the mobile-satellite service in the bands 137 -138 MHz, 387-390 MHz and 400.15-401 MHz, administrations shall take all practicable steps to protect the radio astronomy service in the bands 150.05-153 MHz, 322-328.6 MHz, 406.1-410 MHz and 608-614 MHz from harmful interference from unwanted emissions. The threshold levels of interference detrimental to the radio astronomy service are shown in Table 1 of Recommendation ITU-R RA.769-1. (WRC-97)

209 The use of the bands 137-138 MHz, 148-150.05 MHz, 399.9-400.05 MHz, 400.15-401 MHz, 454-456 MHz and 459-460 MHz by the mobile-satellite service is limited to non-geostationary-satellite systems. (WRC-97)

217 *Alternative allocation:* in Afghanistan, Bangladesh, Cuba, Guyana and India, the band 146-148 MHz is allocated to the fixed and mobile services on a primary basis.

218 *Additional allocation:* the band 148-149.9 MHz is also allocated to the space operation service (Earth-to-space) on a primary basis, subject to agreement obtained under No. **9.21**. The bandwidth of any individual transmission shall not exceed 25 kHz.

219 The use of the band 148-149.9 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**. The mobile-satellite service shall not constrain the development and use of the fixed, mobile and space operation services in the band 148 - 149.9 MHz.

220 The use of the bands 149.9-150.05 MHz and 399.9-400.05 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**. The mobile-satellite service shall not constrain the development and use of the radionavigation-satellite service in the bands 149.9-150.05 MHz and 399.9-400.05 MHz. (WRC-97)

221 Stations of the mobile-satellite service in the band 148 -149.9 MHz shall not cause harmful interference to, or claim protection from, stations of the fixed or mobile services operating in accordance with the Table of Frequency Allocations in the following countries: Albania, Algeria, Germany, Saudi Arabia, Australia, Austria, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Benin, Bosnia and Herzegovina, Botswana, Brunei Darussalam, Bulgaria, Cameroon, China, Cyprus, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Croatia, Cuba, Denmark, Egypt, the United Arab Emirates, Eritrea, Spain, Estonia, Ethiopia, the Russian Federation, Finland, France, Gabon, Ghana, Greece, Guinea, Guinea Bissau, Hungary, India, Iran (Islamic Republic of), Ireland, Iceland, Israel, Italy, the Libyan Arab Jamahiriya, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kuwait, The Former Yugoslav Republic of Macedonia, Lesotho, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malaysia, Mali, Malta, Mauritania, Moldova, Mongolia, Mozambique, Namibia, Norway, New Zealand, Oman, Uganda, Uzbekistan, Pakistan, Panama, Papua New Guinea, Paraguay, the Netherlands, the Philippines, Poland, Portugal, Qatar, the Syrian Arab Republic, Kyrgyzstan, Slovakia, Romania, the United Kingdom, Senegal, Serbia and Montenegro, Sierra Leone, Singapore, Slovenia, Sri Lanka, South Africa, Sweden,

Switzerland, Swaziland, Tanzania, Chad, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Ukraine, Viet Nam, Yemen, Zambia, and Zimbabwe. (WRC-03)

224 (SUP - WRC-97)

224A The use of the bands 149.9-150.05 MHz and 399.9-400.05 MHz by the mobile-satellite service (Earth-to-space) is limited to the land mobile-satellite service (Earth-to-space) until 1 January 2015. (WRC-97)

224B The allocation of the bands 149.9-150.05 MHz and 399.9-400.05 MHz to the radionavigation- satellite service shall be effective until 1 January 2015. (WRC-97)

226 The frequency 156.8 MHz is the international distress, safety and calling frequency for the maritime mobile VHF radiotelephone service. The conditions for the use of this frequency are contained in Article **31** and Appendix **13**.

In the bands 156-156.7625 MHz, 156.8375-157.45 MHz, 160.6-160.975 MHz and 161.475-162.05 MHz, each administration shall give priority to the maritime mobile service on only such frequencies as are assigned to stations of the maritime mobile service by the administration (see Articles **31** and **52**, and Appendix **13**).

Any use of frequencies in these bands by stations of other services to which they are allocated should be avoided in areas where such use might cause harmful interference to the maritime mobile VHF radio- communication service.

However, the frequency 156.8 MHz and the frequency bands in which priority is given to the maritime mobile service may be used for radiocommunications on inland waterways subject to agreement between interested and affected administrations and taking into account current frequency usage and existing agreements.

230 *Additional allocation:* in China, the band 163-167 MHz is also allocated to the space operation service (space-to-Earth) on a primary basis, subject to agreement obtained under No. **9.21**.

231 *Additional allocation:* in Afghanistan, China and Pakistan, the band 167-174 MHz is also allocated to the broadcasting service on a primary basis. The introduction of the broadcasting service into this band shall be subject to agreement with the neighbouring countries in Region 3 whose services are likely to be affected.

232 *Additional allocation:* in Japan, the band 170-174 MHz is also allocated to the broadcasting service on a primary basis.

234 *Different category of service:* in Mexico, the allocation of the band 174-216 MHz to the fixed and mobile services is on a primary basis (see No. **5.33**).

241 In Region 2, no new stations in the radiolocation service may be authorized in the band 216-225 MHz. Stations authorized prior to 1 January 1990 may continue to operate on a secondary basis.

242 *Additional allocation:* in Canada, the band 216-220 MHz is also allocated to the land mobile service on a primary basis.

252 *Alternative allocation:* in Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe, the bands 230-238 MHz and 246-254 MHz are allocated to the broadcasting service on a primary basis, subject to agreement obtained under No. **9.21**.

254 The bands 235-322 MHz and 335.4-399.9 MHz may be used by the mobile-satellite service, subject to agreement obtained under No. **9.21**, on condition that stations in this service do not cause harmful interference to those of other services operating or planned to be operated in accordance with the Table of Frequency Allocations except for the additional allocation made in footnote No. **5.256A**. (WRC-03)

255 The bands 312-315 MHz (Earth-to-space) and 387-390 MHz (space-to-Earth) in the mobile-satellite service may also be used by non-geostationary-satellite systems. Such use is subject to coordination under No. **9.11A**.

256 The frequency 243 MHz is the frequency in this band for use by survival craft stations and equipment used for survival purposes (see Appendix **13**).

256A *Additional allocation:* in China, the Russian Federation, Kazakhstan and Ukraine, the band 258-261 MHz is also allocated to the space research service (Earth-to-space) and space operation service (Earth-to-space) on a primary basis. Stations in the space research service (Earth-to-space) and space operation service (Earth-to-space) shall not cause harmful interference to, nor claim protection from, nor constrain the use and development of the mobile service systems and mobile-satellite service systems operating in the band. Stations in space research service (Earth-to-space) and space operation service (Earth-to-space) shall not constrain the future development of fixed service systems of other countries. (WRC-03)

257 The band 267-272 MHz may be used by administrations for space telemetry in their countries on a primary basis, subject to agreement obtained under No. **9.21**.

260 Recognizing that the use of the band 399.9-400.05 MHz by the fixed and mobile services may cause harmful interference to the radionavigation satellite service, administrations are urged not to authorize such use in application of No. **4.4**.

261 Emissions shall be confined in a band of 25 kHz about the standard frequency 400.1 MHz.

262 *Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Bosnia and Herzegovina, Botswana, Bulgaria, Colombia, Costa Rica, Cuba, Egypt, the United Arab Emirates, Ecuador, the Russian Federation, Georgia, Hungary, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kazakhstan, Kuwait, Liberia, Malaysia, Moldova, Uzbekistan, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, Kyrgyzstan, Romania, Serbia and Montenegro, Singapore, Somalia, Tajikistan, Turkmenistan and Ukraine, the band 400.05 -401 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-03)

263 The band 400.15-401 MHz is also allocated to the space research service in the space-to- space direction for communications with manned space vehicles. In this application, the space research service will not be regarded as a safety service.

264 The use of the band 400.15-401 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**. The power flux-density limit indicated in Annex 1 of Appendix **5** shall apply until such time as a competent world radiocommunication conference revises it.

266 The use of the band 406-406.1 MHz by the mobile-satellite service is limited to low power satellite emergency position-indicating radiobeacons (see also Article **31** and Appendix **13**).

267 Any emission capable of causing harmful interference to the authorized uses of the band 406 -406.1 MHz is prohibited.

268 Use of the band 410-420 MHz by the space research service is limited to communications within 5km of an orbiting, manned space vehicle. The power flux-density at the surface of the Earth produced by emissions from extra-vehicular activities shall not exceed –153 dB(W/m^2) for 0 5 , 153 0.077 (– 5) dB(W/m^2) for 5 70 and –148 dB(W/m^2) for 70 , where is the angle of arrival of the radio-frequency wave and the reference bandwidth is 4 kHz. No. **4.10** does not apply to extra-vehicular activities. In this frequency band the space research (space-t o-space) service shall not claim protection from, nor constrain the use and development of, stations of the fixed and mobile services. (WRC-97)

269 *Different category of service:* in Australia, the United States, India, Japan and the United Kingdom, the allocation of the bands 420-430 MHz and 440-450 MHz to the radiolocation service is on a primary basis (see No. **5.33**).

270 *Additional allocation:* in Australia, the United States, Jamaica and the Philippines, the bands 420-430 MHz and 440-450 MHz are also allocated to the amateur service on a secondary basis.

271 *Additional allocation:* in Azerbaijan, Belarus, China, India, Latvia, Lithuania, Kyrgyzstan and Turkmenistan, the band 420-460 MHz is also allocated to the aeronautical radionavigation service (radio altimeters) on a secondary basis. (WRC-03)

276 *Additional allocation:* in Afghanistan, Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Burkina Faso, Burundi, Egypt, the United Arab Emirates, Ecuador, Eritrea, Ethiopia, Greece, Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Italy, Libyan Arab Jamahiriya, Jordan, Kenya, Kuwait, Lebanon, Liechtenstein, Malaysia, Malta, Nigeria, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Somalia, Switzerland, Tanzania, Thailand, Togo, Tur key and Yemen, the band 430 -440 MHz is also allocated to the fixed service on a primary basis and the bands 430 -435 MHz and 438-440 MHz are also allocated to the mobile, except aeronautical mobile, service on a primary basis. (WRC-97)

277 *Additional allocation:* in Angola, Armenia, Azerbaijan, Belarus, Cameroon, Congo (Rep. of the), Djibouti, the Russian Federation, Georgia, Hungary, Israel, Kazakhstan, Mali, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., Romania, Rwanda, Tajikistan, Chad, Turkmenistan and Ukraine, the band 430 -440 MHz is also allocated to the fixed service on a primary basis. (WRC-03)

278 *Different category of service:* in Argentina, Colombia, Costa Rica, Cuba, Guyana, Honduras, Panama and Venezuela, the allocation of the band 430-440 MHz to the amateur service is on a primary basis (see No. **5.33**).

279 *Additional allocation:* in Mexico, the bands 430-435 MHz and 438-440 MHz are also allocated on a primary basis to the land mobile service, subject to agreement obtained under No. **9.21**.

281 *Additional allocation:* in the French Overseas Departments in Region 2 and India, the band 433.75-434.25 MHz is also allocated to the space operation service (Earth-to-space) on a primary basis. In France and in Brazil, the band is allocated to the same service on a secondary basis.

282 In the bands 435-438 MHz, 1260-1 270 MHz, 2400 -2 450 MHz, 3400-3 410 MHz (in Regions 2 and 3 only) and 5650-5 670 MHz, the amateur-satellite service may operate subject to not causing harmful interference to other services operating in accordance with the Table (see No. **5.43**). Administrations authorizing such use shall ensure that any harmful interference caused by emissions from a station in the amateur - satellite service is immediately eliminated in accordance with the provisions of No. **25.11**. The use of the bands 1260-1 270 MHz and 5650-5 670 MHz by the amateur -satellite service is limited to the Earth-to-space direction.

284 *Additional allocation:* in Canada, the band 440-450 MHz is also allocated to the amateur service on a secondary basis.

285 *Different category of service:* in Canada, the allocation of the band 440-450 MHz to the radiolocation service is on a primary basis (see No. **5.33**).

286 The band 449.75-450.25 MHz may be used for the space operation service (Earth-to-space) and the space research service (Earth-to-space), subject to agreement obtained under No. **6.21**.

286A The use of the bands 454-456 MHz and 459-460 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**. (WRC-97)

286B The use of the band 454-455 MHz in the countries listed in No. **286D**, 455-456 MHz and 459-460 MHz in Region 2, and 454-456 MHz and 459-460 MHz in the countries listed in No. **286E**, by stations in the mobile-satellite service, shall not cause harmful interference to, or claim protection from, stations of the fixed or mobile services operating in accordance with the Table of Frequency Allocations. (WRC-97)

286C The use of the band 454-455 MHz in the countries listed in No. **286D**, 455-456 MHz and 459-460 MHz in Region 2, and 454-456 MHz and 459-460 MHz in the countries listed in No.**286E**, by stations in the mobile-satellite service, shall not constrain the development and use of the fixed and mobile services operating in accordance with the Table of Frequency Allocations. (WRC-97)

286D *Additional allocation:* in Canada, the United States, Mexico and Panama, the band 454-455 MHz is also allocated to the mobile-satellite service (Earth-to-space) on a primary basis. (WRC-97)

287 In the maritime mobile service, the frequencies 457.525 MHz, 457.550 MHz, 457.575 MHz, 467.525 MHz, 467.550 MHz and 467.575 MHz may be used by on-board communication stations. Where needed, equipment designed for 12.5 kHz channel spacing using also the additional frequencies 457.5375 MHz, 457.5625 MHz, 467.5375 MHz and 467.5625 MHz may be introduced for on–board communications. The use of these frequencies in territorial waters may be subject to the national regulations of the administration concerned. The characteristics of the equipment used shall conform to those specified in Recommendation ITU-R M.1174 (see Resolution **341 (WRC-97)***). (WRC-97)

288 In the territorial waters of the United States and the Philippines, the preferred frequencies for use by on-board communication stations shall be 457.525 MHz, 457.550 MHz, 457.575 MHz and 457.600MHz paired, respectively, with 467.750 MHz, 467.775 MHz, 467.800 MHz and 467.825 MHz. The characteristics of the equipment used shall conform to those specified in Recommendation ITU-R M.1174-1. (WRC-03)

289 Earth exploration-satellite service applications, other than the meteorological-satellite service, may also be used in the bands 460-470 MHz and 1 690-1 710 MHz for space-to-Earth transmissions subject to not causing harmful interference to stations operating in accordance with the Table.

290 *Different category of service:* in Afghanistan, Azerbaijan, Belarus, China, the Russian Federation, Japan, Mongolia, Uzbekistan, Kyrgyzstan, Slovakia, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 460-470 MHz to the meteorological-satellite service (space-to-Earth) is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **6.21**. (WRC-2000)

292 *Different category of service:* in Mexico and Venezuela, the allocation of the band 470-512 MHz to the fixed and mobile services, and in Argentina and Uruguay to the mobile service, is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **6.21**.

293 *Different category of service:* in Canada, Chile, Colombia, Cuba, the United States, Guyana, Honduras, Jamaica, Mexico, Panama and Peru, the allocation of the bands 470-512 MHz and 614-806 MHz to the fixed and mobile services is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **6.21**. In Argentina and Ecuador, the allocation of the band 470-512 MHz to the fixed and mobile services is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **6.21**. (WRC-2000)

297 *Additional allocation:* in Costa Rica, Cuba, El Salvador, the United States, Guatemala, Guyana, Honduras, Jamaica and Mexico, the band 512-608 MHz is also allocated to the fixed and mobile services on a primary basis, subject to agreement obtained under No. **6.21**. (WRC-2000)

309 *Different category of service*: in Costa Rica, El Salvador and Honduras, the allocation of the band 614-806 MHz to the fixed service is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **6.21**.

311 Within the frequency band 620-790 MHz, assignments may be made to television stations using frequency modulation in the broadcasting-satellite service subject to agreement between the administrations concerned and those having services, operating in accordance with the Table, which may be affected (see Resolutions **33 (Rev.WRC-03)** and **507 (Rev.WRC-03)**). Such stations shall not produce a power flux-density in excess of the value –129 dB(W/m^2) for angles of arrival less than 20 (see Recommendation **705**) within the territories of other countries without the consent of the administrations of those countries. Resolution **545 (WRC-03)** applies. (WRC-03)

317 *Additional allocation*: in Region 2 (except Brazil and the United States), the band 806-890 MHz is also allocated to the mobile-satellite service on a primary basis, subject to agreement obtained under No. **9.21**. The use of this service is intended for operation within national boundaries.

317A Administrations wishing to implement International Mobile Telecommunications-2000 (IMT-2000) may use those parts of the band 806-960 MHz which are allocated to the mobile service on a primary basis and are used or planned to be used for mobile systems (see Resolution **224 (WRC-2000)**). This identification does not preclude

the use of these bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. (WRC-2000)

318 *Additional allocation*: in Canada, the United States and Mexico, the bands 849-851 MHz and 894-896 MHz are also allocated to the aeronautical mobile service on a primary basis, for public correspondence with aircraft. The use of the band 849-851 MHz is limited to transmissions from aeronautical stations and the use of the band 894-896 MHz is limited to transmissions from aircraft stations.

325 *Different category of service*: in the United States, the allocation of the band 890-942 MHz to the radiolocation service is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**.

325A *Different category of service:* in Cuba, the allocation of the band 902-915 MHz to the land mobile service is on a primary basis. (WRC-2000)

326 *Different category of service*: in Chile, the band 903-905 MHz is allocated to the mobile, except aeronautical mobile, service on a primary basis, subject to agreement obtained under No. **9.21**.

328 The use of the band 960-1 215 MHz by the aeronautical radionavigation service is reserved on a worldwide basis for the operation and development of airborne electronic aids to air navigation and any directly associated ground-based facilities. (WRC-2000)

328A Stations in the radionavigation-satellite service in the band 1164-1 215 MHz shall operate in accordance with the provisions of Resolution **609 (WRC-03)** and shall not claim protection from stations in the aeronautical radionavigation service in the band 960-1 215 MHz. No. **5.43A** does not apply. The provisions of No. **21.18** shall apply. (WRC-03)

328B The use of the bands 1 164-1 300 MHz, 1 559-1 610 MHz and 5 010-5 030 MHz by systems and networks in the radionavigation-satellite service for which complete coordination or notification information, as appropriate, is received by the Radiocommunication Bureau after 1 January 2005 is subject to the application of the provisions of Nos. **9.12**, **9.12A** and **9.13**. Resolution **610** **(WRC-03)** shall also apply. (WRC-03)

329 Use of the radionavigation-satellite service in the band 1 215-1 300 MHz shall be subject to the condition that no harmful interference is caused to, and no protection is claimed from, the radionavigation service authorized under No. **331**. Furthermore, the use of the radionavigation-satellite service in the band 1 215-1 300 MHz shall be subject to the condition that no harmful interference is caused to the radiolocation service. No. **5.43** shall not apply in respect of the radiolocation service. Resolution **608 (WRC-03)** shall apply. (WRC-03)

329A Use of systems in the radionavigation -satellite service (space-t o-space) operating in the bands 1 215-1 300 MHz and 1 559-1 610 MHz is not intended to provide safety service applications, and shall not impose any additional constraints on other systems or services operating in accordance with the Table. (WRC-2000)

330 *Additional allocation:* in Angola, Saudi Arabia, Bahrain, Bangladesh, Cameroon, China, the United Arab Emirates, Eritrea, Ethiopia, Guyana, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, the Libyan Arab Jamahiriya, Japan, Jordan, Kuwait, Lebanon, Mozambique, Nepal, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, Somalia, Sudan, Chad, Togo and Yemen, the band 1215-1 300 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-03)

331 *Additional allocation:* in Algeria, Germany, Saudi Arabia, Australia, Austria, Bahrain, Belarus, Belgium, Benin, Bosnia and Herzegovina, Brazil, Burkina Faso, Burundi, Cameroon, China, Korea (Rep. of), Croatia, Denmark, Egypt, the United Arab Emirates, Estonia, the Russian Federation, Finland, France, Ghana, Greece, Guinea, Equatorial Guinea, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Ireland, Israel, Jordan, Kenya, Kuwait, The Former Yugoslav Republic of Macedonia, Lesotho, Latvia, Liechtenstein, Lithuania, Luxembourg, Madagascar, Mali, Mauritania, Nigeria, Norway, Oman, the Netherlands, Poland, Portugal, Qatar, the Syrian Arab Republic, Slovakia, the United Kingdom, Serbia and Montenegro, Slovenia, Somalia, Sudan, Sri Lanka, South Africa, Sweden, Switzerland, Thailand, Togo, Turkey, Venezuela and Viet Nam, the band 1215-1 300 MHz is also allocated to the radionavigation service on a primary basis. In Canada and the United States, the band 1 240 -1 300 MHz is also allocated to the radionavigation service, and use of the radionavigation service shall be limited to the aeronautical radionavigation service. (WRC-03)

332 In the band 1215-1 260 MHz, active spaceborne sensors in the Earth exploration-satellite and space research services shall not cause harmfu l interference to, claim protection from, or otherwise impose constraints on operation or development of the radiolocation service, the radionavigation-satellite service and other services allocated on a primary basis.(WRC-2000)

335 In Canada and the United States in the band 1 240-1 300 MHz, active spaceborne sensors in the earth exploration-satellite and space research services shall not cause interference to, claim protection from, or otherwise impose constraints on operation or development of the aeronautical radionavigation service. (WRC-97)

335A In the band 1260-1 300 MHz, active spaceborne sensors in the Earth exploration-satellite and space research services shall not cause harmful interference to, claim protection from, or otherwise impose constraints on operation or development of the radiolocation service and other services allocated by footnotes on a primary basis. (WRC-2000)

337 The use of the bands 1300-1 350 MHz, 2700-2 900 MHz and 9000-9 200 MHz by the aeronautical radionavigation service is restricted to ground-based radars and to associated airborne transponders which transmit only on frequencies in these bands and only when actuated by radars operating in the same band.

337A The use of the band 1 300-1 350 MHz by earth stations in the radionavigation-satellite service and by stations in the radiolocation service shall not cause harmful interference to, nor constrain the operation and development of, the aeronautical-radionavigation service. (WRC-2000)

339 The bands 1 370-1 400 MHz, 2 640-2 655 MHz, 4 950-4 990 MHz and 15.20-15.35 GHz are also allocated to the space research (passive) and Earth exploration-satellite (passive) services on a secondary basis.

339A *Additional allocation:* the band 1390-1 392 MHz is also allocated to the fixed-satellite service (Earth-to-space) on a secondary basis and the band 1430-1 432 MHz is also allocated to the fixed- satellite service (space-to-Earth) on a secondary basis. These allocations are limited to use for feeder links for non-geostationary-satellite networks in the mobile-satellite service with service links below 1 GHz, and Resolution **745 (WRC -03)** applies. (WRC-03)

340 All emissions are prohibited in the following bands:

1 400-1 427 MHz,	
2 690-2 700 MHz,	except those provided for by No. **422**,
10.68-10.7 GHz,	except those provided for by No. **483**,
15.35-15.4 GHz,	except those provided for by No. **511**,
23.6-24 GHz,	
31.3-31.5 GHz,	
31.5-31.8 GHz,	in Region 2,
48.94-49.04 GHz,	from airborne stations
50.2-50.4 GHz[2],	
52.6-54.25 GHz,	
86-92 GHz,	
100-102 GHz,	
109.5-111.8 GHz,	
114.25-116 GHz,	
148.5-151.5 GHz,	
164-167 GHz,	
182-185 GHz,	
190-191.8 GHz,	
200-209 GHz,	
226-231.5 GHz,	
250-252 GHz.	(WRC-03)

341 In the bands 1400-1 727 MHz, 101-120 GHz and 197 -220 GHz, passive research is being conducted by some countries in a programme for the search for intentional emissions of extraterrestrial origin.

343 In Region 2, the use of the band 1435-1 535 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile service.

344 *Alternative allocation:* in the United States, the band 1 452-1 525 MHz is allocated to the fixed and mobile services on a primary basis (see also No. **343**).

345 Use of the band 1 452-1 492 MHz by the broadcasting-satellite service, and by the broadcasting service, is limited to digital audio broadcasting and is subject to the provisions of Resolution **528 (WARC -92)** *.

347 *Different category of service:* in Bangladesh, Bosnia and Herzegovina, Botswana, Bulgaria, Burkina Faso, Cuba, Denmark, Egypt, Greece, Ireland, Italy, Mozambique, Portugal, Serbia and Montenegro, Sri Lanka, Swaziland, Yemen and Zimbabwe, the allocation of the band 1 452-1 492 MHz to the broadcasting-satellite service and the broadcasting service is on a secondary basis until 1 April 2007. (WRC-03)

347A In the bands:

1 452-1 492 MHz,
1 525-1 559 MHz,
1 613,8-1 626,5 MHz,
2 655-2 670 MHz,
2 670-2 690 MHz,
21.4-22 GHz,

Resolution **739 (WRC -03)** applies. WRC-03)

348 The use of the band 1 518-1 525 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**. In the band 1 518 -1 525 MHz stations in the mobile-satellite service shall not claim protection from the stations in the fixed service. No. **43A** does not apply. (WRC-03)

348A In the band 1 518-1 525 MHz, the coordination threshold in terms of the power flux-density levels at the surface of the Earth in application of No. **9.11A** for space stations in the mobile-satellite (space-to-Earth) service, with respect to the land mobile service use for specialized mobile radios or used in conjunction with public switched telecommunication networks (PSTN) operating within the territory of Japan, shall be – 150 dB(W/m^2) in any 4 kHz band for all angles of arrival, instead of those given in Table 5-2 of Appendix **5**. In the band 1 518 -1 525 MHz stations in the mobile-satellite service shall not claim protection from stations in the mobile service in the territory of Japan. No. **43A** does not apply. (WRC-03)

348B In the band 1 518-1 525 MHz, stations in the mobile-satellite service shall not claim protection from aeronautical mobile telemetry stations in the mobile service in the territory of the United States (see Nos. **343** and **344**) and in the countries listed in No. **342**. No. **43A** does not apply. (WRC-03)

348C For the use of the bands 1518-1 525 MHz and 1668-1 675 MHz by the mobile-satellite service, see Resolution **225 (Rev.WRC -03)**. (WRC-03)

351 The bands 1 525-1 544 MHz, 1 545-1 559 MHz, 1 626.5-1 645.5 MHz and 1 646.5 -1 660.5 MHz shall not be used for feeder links of any service. In exceptional circumstances, however, an earth station at a specified fixed point in any of the mobile-satellite services may be authorized by an administration to communicate via space stations using these bands.

351A For the use of the bands 1 525 -1 544 MHz, 1545-1 559 MHz, 1610-1 626.5 MHz, 1626.5 -1 645.5 MHz, 1646.5-1 660.5 MHz, 1980-2 010 MHz, 2170-2 200 MHz, 2483.5-2 500 MHz, 2500-2 520MHz and 2 670-2 690 MHz by the mobile-satellite service, see Resolutions **212 (Rev.WRC -97)** and **225 (WRC-2000)***. (WRC-2000)

353 (SUP - WRC-97)

353A In applying the procedures of Section II of Article **9** to the mobile-satellite service in the bands 1 530-1 544 MHz and 1 626.5 -1 645.5 MHz, priority shall be given to accommodating the spectrum requirements for distress, urgency and safety communications of the Global Maritime Distress and Safety System (GMDSS). Maritime mobile-satellite distress, urgency and safety communications shall have priority access and immediate availability over all other mobile satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to, or claim protection from, distress, urgency and safety communications of the GMDSS. Account shall be taken of the priority of safety-related communications in the other mobile -satellite services. (The provisions of Resolution **222 (WRC-2000)** shall apply.) (WRC-2000)

354 The use of the bands 1525-1 559 MHz and 1626.5-1 660.5 MHz by the mobile-satellite services is subject to coordination under No. **9.11A**.

355 *Additional allocation:* in Bahrain, Bangladesh, Congo (Rep. of the), Egypt, Eritrea, Iraq, Israel, Kuwait, Lebanon, Malta, Qatar, Syrian Arab Republic, Somalia, Sudan, Chad, Togo and Yemen, the bands 1 540-1 559 MHz, 1 610-1 645.5 MHz and 1 646.5 -1 660 MHz are also allocated to the fixed service on a secondary basis. (WRC-03)

356 The use of the band 1544 -1 545 MHz by the mobile-satellite service (space-to-Earth) is limited to distress and safety communications (see Article **31**).

357 Transmissions in the band 1545-1 555 MHz from terrestrial aeronautical stations directly to aircraft stations, or between aircraft stations, in the aeronautical mobile (R) service are also authorized when such transmissions are used to extend or supplement the satellite-to-aircraft links.

357A In applying the procedures of Section II of Article **9** to the mobile-satellite service in the bands 1 545-1 555 MHz and 1646.5-1 656.5 MHz, priority shall be given to accommodating the spectrum requirements of the aeronautical mobile-satellite (R) service providing transmission of messages with priority 1 to 6 in Article **44**. Aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article **44** shall have priority access and immediate availability, by pre-emption if necessary, over all other mobile-satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to, or claim protection from, aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article **44**. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services. (The provisions of Resolution **222 (WRC-2000)** shall apply.) (WRC-2000)

359 *Additional allocation:* in Germany, Saudi Arabia, Armenia, Austria, Azerbaijan, Belarus, Benin, Bosnia and Herzegovina, Bulgaria, Cameroon, Spain, the Russian Federation, France, Gabon, Georgia, Greece, Guinea, Guinea-Bissau, Hungary, the Libyan Arab Jamahiriya, Jordan, Kazakhstan, Kuwait, Lebanon, Lithuania, Mauritania, Moldova, Mongolia, Uganda, Uzbekistan, Pakistan, Poland, the Syrian Arab Republic, Kyrgyzstan, the Dem. People's Rep. of Korea, Romania, Swaziland, Tajikistan, Tanzania, Tunisia, Turkmenistan and Ukraine, the bands 1 550-1 559 MHz, 1 610-1 645.5 MHz and 1 646.5-1 660 MHz are also allocated to the fixed service on a primary basis. Administrations are urged to make all practicable efforts to avoid the implementation of new fixed-service stations in these bands. (WRC-03)

362A In the United States, in the bands 1 555-1 559 MHz and 1 656.5-1 660.5 MHz, the aeronautical mobile-satellite (R) service shall have priority access and immediate availability, by pre-emption if necessary, over all other mobile-satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to, or claim protection from, aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article **44**. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services. (WRC-97)

362B *Additional allocation:* The band 1 559-1 610 MHz is also allocated to the fixed service on a primary basis until 1 January 2005 in Germany, Armenia, Azerbaijan, Belarus, Benin, Bosnia and Herzegovina, Bulgaria, Spain, the Russian Federation, France, Gabon, Georgia, Greece, Guinea, Guinea-Bissau, Hungary, Kazakhstan, Lithuania, Moldova, Mongolia, Nigeria, Uganda, Uzbekistan, Pakistan, Poland, Kyrgyzstan, the Dem. People's Rep. of Korea, Romania, Senegal, Swaziland, Tajikistan, Tanzania, Turkmenistan and Ukraine, and until 1 January 2010 in Saudi Arabia, Cameroon, the

Libyan Arab Jamahiriya, Jordan, Kuwait, Lebanon, Mali, Mauritania, the Syrian Arab Republic and Tunisia. After these dates, the fixed service may continue to operate on a secondary basis until 1 January 2015, at which time this allocation shall no longer be valid. Administrations are urged to take all practicable steps to protect the radionavigation-satellite service and the aeronautical radionavigation service and not authorize new frequency assignments to fixed-service systems in this band. (WRC-03)

362C *Additional allocation:* in Bahrain, Bangladesh, Congo (Rep. of the), Egypt, Eritrea, Iraq, Israel, Jordan, Kuwait, Lebanon, Malta, Morocco, Qatar, the Syrian Arab Republic, Somalia, Sudan, Chad, Togo and Yemen, the band 1 559-1 610 MHz is also allocated to the fixed service on a secondary basis until 1 January 2015, at which time this allocation shall no longer be valid. Administrations are urged to take all practicable steps to protect the radionavigation -satellite service and not authorize new frequency assignments to fixed-service systems in this band. (WRC-2000)

363 *Alternative allocation:* in Sweden, the band 1 590-1 626.5 MHz is allocated to the aeronautical radionavigation service on a primary basis.

364 The use of the band 1610-1 626.5 MHz by the mobile-satellite service (Earth-to-space) and by the radio determination -satellite service (Earth-t o-space) is subject to coordination under No. **9.11A**. A mobile earth station operating in either of the services in this band shall not produce a peak e.i.r.p. density in excess of 15 dB(W/4 kHz)in the part of the band used by systems operating in accordance with the provisions of No. **366** (to which No. **4.10** applies), unless otherwise agreed by the affected administrations. In the part of the band where such systems are not operating, the mean e.i.r.p. density of a mobile earth station shall not exceed –3 dB(W/4 kHz). Stations of the mobile-satellite service shall not claim protection from stations in the aeronautical radionavigation service, stations operating in accordance with the provisions of No. **366** and stations in the fixed service operating in accordance with the provisions of No. **359**. Administrations responsible for the coordination of mobile-satellite networks shall make all practicable efforts to ensure protection of stations operating in accordance with the provisions of No. **366.**

366 The band 1 610-1 626.5 MHz is reserved on a worldwide basis for the use and development of airborne electronic aids to air navigation and any directly associated ground-based or satellite-borne facilities. Such satellite use is subject to agreement obtained under No. **9.21**.

368 With respect to the radiodetermination -satellite and mobile-satellite services the provisions of No. **4.10** do not apply in the band 1 610-1 626.5 MHz, with the exception of the aeronautical radionavigation-satellite service.

370 *Different category of service:* in Venezuela, the allocation to the radiodetermination-

satellite service in the band 1 610-1 626.5 MHz (Earth-to-space) is on a secondary basis.

372 Harmful interference shall not be caused to stations of the radio astronomy service using the band 1610.6-1 613.8 MHz by stations of the radiodetermination-satellite and mobile-satellite services (No. **29.13** applies).

374 Mobile earth stations in the mobile-satellite service operating in the bands 1 631.5-1 634.5 MHz and 1 656.5-1 660 MHz shall not cause harmful interference to stations in the fixed service operating in the countries listed in No. **359**. (WRC-97)

375 The use of the band 1645.5-1 646.5 MHz by the mobile-satellite service (Earth-to-space) and for inter-satellite links is limited to distress and safety communications (see Article **31**).

376 Transmissions in the band 1646.5-1 656.5 MHz from aircraft stations in the aeronautical mobile (R) service directly to terrestrial aeronautical stations, or between aircraft stations, are also authorized when such transmissions are used to extend or supplement the aircraft-to-satellite links.

2007, frequencies in these bands may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on the condition that harmful interference is not caused to the broadcasting service. When using frequencies in these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

376A Mobile earth stations operating in the band 1660-1 660.5 MHz shall not cause harmful interference to stations in the radio astronomy service. (WRC-97)

379 *Additional allocation:* in Bangladesh, India, Indonesia, Nigeria and Pakistan, the band
1 660.5-1 668.4 MHz is also allocated to the meteorological aids service on a secondary basis.

379A Administrations are urged to give all practicable protection in the band 1 660.5-1 668.4 MHz for future research in radio astronomy, particularly by eliminating air-to-ground transmissions in the meteorological aids service in the band 1 664.4-1 668.4 MHz as soon as practicable.

379B The use of the band 1 668-1 675 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**. (WRC-03)

379C In order to protect the radio astronomy service in the band 1 668-1 670 MHz, the aggregate power flux-density values produced by mobile earth stations in a network of the mobile-satellite service operating in this band shall not exceed –181 dB(W/m^2) in 10 MHz

and 194 dB(W/m^2) in any 20 kHz at any radio astronomy station recorded in the Master International Frequency Register, for more than 2% of integration periods of 2 000 s. (WRC-03)

379D For sharing of the band 1 668-1 675 MHz between the mobile-satellite service and the fixed, mobile and space research (passive) services, Resolution **744 (WRC-03)** shall apply. (WRC-03)

379E In the band 1668.4-1 675 MHz, stations in the mobile-satellite service shall not cause harmful interference to stations in the meteorological aids service in China, Iran (Islamic Republic of), Japan and Uzbekistan. In the band 1668.4-1 675 MHz, administrations are urged not to implement new systems in the meteorological aids service and are encouraged to migrate existing meteorological aids service operations to other bands as soon as practicable. (WRC-03)

380 The bands 1670-1 675 MHz and 1800-1 805 MHz are intended for use, on a worldwide basis, by administrations wishing to implement aeronautical public correspondence. The use of the band 1 670-1 675 MHz by stations in the systems for public correspondence with aircraft is limited to transmissions from aeronautical stations and the use of the band 1 800-1 805 MHz is limited to transmissions from aircraft stations.

380A In the band 1 670-1 675 MHz, stations in the mobile-satellite service shall not cause harmful interference to, nor constrain the development of, existing earth stations in the meteorological-satellite service notified in accordance with Resolution **670 (WRC-03)**. (WRC-03)

381 *Additional allocation:* in Afghanistan, Costa Rica, Cuba, India, Iran (Islamic Republic of) and Pakistan, the band 1690-1 700 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-03).

384 *Additional allocation:* in India, Indonesia and Japan, the band 1700-1 710 MHz is also allocated to the space research service (space-to-Earth) on a primary basis. (WRC-97)

384A The bands, or portions of the bands, 1 710-1 885 MHz and 2 500-2 690 MHz, are identified for use by administrations wishing to implement International Mobile Telecommunications-2000 (IMT-2000) in accordance with Resolution 223 (WRC-2000). This identification does not preclude the use of these bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations (WRC-2000).

385 *Additional allocation:* the band 1 718.8-1 722.2 MHz is also allocated to the radio astronomy service on a secondary basis for spectral line observations. (WRC-2000)

386 *Additional allocation:* the band 1750-1 850 MHz is also allocated to the space

operation (Earth-to-space) and space research (Earth-to-space) services in Region 2, in Australia, Guam, India, Indonesia and Japan on a primary basis, subject to agreement obtained under No. **9.21**, having particular regard to troposcatter systems. (WRC-03)

387 *Additional allocation:* in Azerbaijan, Belarus, Georgia, Kazakhstan, Mongolia, Kyrgyzstan, Slovakia, Romania, Tajikistan and Turkmenistan, the band 1 770-1 790 MHz is also allocated to the meteorological-satellite service on a primary basis, subject to agreement obtained under No. **9.21**. (WRC-03)

388 The bands 1885-2 025 MHz and 2110-2 200 MHz are intended for use, on a worldwide basis, by administrations wishing to implement International Mobile Telecommunications-2000 (IMT-2000). Such use does not preclude the use of these bands by other services to which they are allocated. The bands should be made available for IMT-2000 in accordance with Resolution **212 (Rev.WRC-97)**. (See also Resolution **223 (WRC-2000)**.) (WRC-2000)

388A In Regions 1 and 3, the bands 1885-1 980 MHz, 2 010-2 025 MHz and 2 110-2 170 MHz and, in Region 2, the bands 1885-1 980 MHz and 2110-2 160 MHz may be used by high altitude platform stations as base stations to provide International Mobile Telecommunications-2000 (IMT-2000), in accordance with Resolution **221 (Rev.WRC-03)**. Their use by IMT-2000 applications using high altitude platform stations as base stations does not preclude the use of these bands by any station in the services to which they are allocated and does not establish priority in the Radio Regulations. (WRC-03)

388B In Algeria, Saudi Arabia, Bahrain, Benin, Burkina Faso, Cameroon, Comoros, Côte d'Ivoire, China, Cuba, Djibouti, Egypt, United Arab Emirates, Eritrea, Ethiopia, Gabon, Ghana, India, Iran (Islamic Republic of), Israel, the Libyan Arab Jamahiriya, Jordan, Kenya, Kuwait, Mali, Morocco, Mauritania, Nigeria, Oman, Uganda, Qatar, the Syrian Arab Republic, Senegal, Singapore, Sudan, Tanzania, Chad, Togo, Tunisia, Yemen, Zambia and Zimbabwe, for the purpose of protecting fixed and mobile services, including IMT-2000 mobile stations, in their territories from co-channel interference, a high altitude platform station (HAPS) operating as an IMT-2000 base station in neighbouring countries, in the bands referred to in No. **5.388A**, shall not exceed a co-channel power flux-density of 127 dB(W/(m^2 · MHz)) at the Earth's surface outside a country's borders unless explicit agreement of the affected administration is provided at the time of the notification of HAPS.(WRC-03)

389 Not used.

389A The use of the bands 1 980-2 010 MHz and 2 170-2 200 MHz by the mobile-satellite service is subject to coordination under No. **9.11A** and to the provisions of Resolution **716 (WRC-95)***. The use of these bands shall not commence before 1 January 2000; however the use of the band 1 980-1 990 MHz in Region 2 shall not commence before 1 January 2005.

389B The use of the band 1 980-1 990 MHz by the mobile-satellite service shall not cause harmful interference to or constrain the development of the fixed and mobile services in Argentina, Brazil, Canada, Chile, Ecuador, the United States, Honduras, Jamaica, Mexico, Peru, Suriname, Trinidad and Tobago, Uruguay and Venezuela.

389C The use of the bands 2 010-2 025 MHz and 2 160-2 170 MHz in Region 2 by the mobile-satellite service shall not commence before 1 January 2002 and is subject to coordination under No. **9.11A** and to the provisions of Resolution **716 (WRC -95)***. (WRC-97)

389D (SUP – WRC-03)

389E The use of the bands 2 010-2 025 MHz and 2 160-2 170 MHz by the mobile-satellite service in Region 2 shall not cause harmful interference to or constrain the development of the fixed and mobile services in Regions 1 and 3.

389F In Algeria, Benin, Cape Verde, Egypt, Iran (Islamic Republic of), Mali, Syrian Arab Republic and Tunisia, the use of the bands 1 980-2 010 MHz and 2 170-2 200 MHz by the mobile-satellite service shall neither cause harmful interference to the fixed and mobile services, nor hamper the development of those services prior to 1 January 2005, nor shall the former service request protection from the latter services. (WRC-2000)

390 In Argentina, Brazil, Chile, Colombia, Cuba, Ecuador, Suriname and Uruguay, the use of the bands 2010-2 025 MHz and 2160-2 170 MHz by the mobile-satellite services shall not cause harmful interference to stations in the fixed and mobile services before 1 January 2005. After this date, the use of these bands is subject to coordination under No. **9.11A** and to the provisions of Resolution **716 (WRC-95)***. (WRC-2000)

391 In making assignments to the mobile service in the bands 2 025-2 110 MHz and 2200-2 290MHz, administrations shall not introduce high-density mobile systems, as described in Recommendation ITU-R SA.1154, and shall take that Recommendation into account for the introduction of any other type of mobile system. (WRC-97)

392 Administrations are urged to take all practicable measures to ensure that space-to-space transmissions between two or more non-geostationary satellites, in the space research, space operations and Earth exploration-satellite services in the bands 2 025-2 110 MHz and 2200-2 290 MHz, shall not impose any constraints on Earth-to-space, space-to-Earth and other space-to-space transmissions of those services and in those bands between geostationary and non-geostationary satellites.

392A *Additional allocation:* in the Russian Federation, the band 2 160-2 200 MHz is also allocated to the space research service (space-to-Earth) on a primary basis until 1 January

2005. Stations in the space research service shall not cause harmful interference to, or claim protection from, stations in the fixed and mobile services operating in this frequency band.

393 *Additional allocation:* in the United States, India and Mexico, the band 2 310-2 360 MHz is also allocated to the broadcasting-satellite service (sound) and complementary terrestrial sound broadcasting service on a primary basis. Such use is limited to digital audio broadcasting and is subject to the provisions of Resolution 528 (WARC-92)*, with the exception of *resolves* 3 in regard to the limitation on broadcasting-satellite systems in the upper 25 MHz. (WRC-2000)

394 In the United States, the use of the band 2 300-2 390 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile services. In Canada, the use of the band 2300-2 483.5 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile services.

396 Space stations of the broadcasting-satellite service in the band 2 310-2 360 MHz operating in accordance with No. **393** that may affect the services to which this band is allocated in other countries shall be coordinated and notified in accordance with Resolution **33 (Rev.WRC-97)***. Complementary terrestrial broadcasting stations shall be subject to bilateral coordination with neighbouring countries prior to their bringing into use.

402 The use of the band 2483.5-2 500 MHz by the mobile-satellite and the radiodetermination-satellite services is subject to the coordination under No. **9.11A**. Administrations are urged to take all practicable steps to prevent harmful interference to the radio astronomy service from emissions in the 2 483.5-2 500 MHz band, especially those caused by second-harmonic radiation that would fall into the 4 990-5 000 MHz band allocated to the radio astronomy service worldwide.

409 Administrations shall make all practicable efforts to avoid developing new tropospheric scatter systems in the band 2 500-2 690 MHz.

411 When planning new tropospheric scatter radio-relay links in the band 2 500-2 690 MHz, all possible measures shall be taken to avoid directing the antennae of these links towards the geostationary-satellite orbit.

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* *Note by the Secretariat:* This Resolution was revised by WRC-2000.

* *Note by the Secretariat:* This Resolution was revised by WRC-2000.

414 The allocation of the frequency band 2 500-2 520 MHz to the mobile-satellite service (space- to-Earth) shall be effective on 1 January 2005 and is subject to coordination under No. **9.11A**.

415 The use of the bands 2 500-2 690 MHz in Region 2 and 2 500-2 535 MHz and 2655-2 690 MHz in Region 3 by the fixed-satellite service is limited to national and regional systems, subject to agreement obtained under No. **9.21**, giving particular attention to the broadcasting-satellite service in Region 1. In the direction space-to-Earth, the power flux-density at the Earth's surface shall not exceed the values given in Article **21**, Table **21-4**.

415A *Additional allocation*: in India and Japan, subject to agreement obtained under No. **9.21**, the band 2 515-2 535 MHz may also be used for the aeronautical mobile-satellite service (space-to-Earth) for operation limited to within their national boundaries. (WRC-2000)

416 The use of the band 2520-2 670 MHz by the broadcasting-satellite service is limited to national and regional systems for community reception, subject to agreement obtained under No. **9.21**. (WRC-03)

417 (SUP - WRC-2000)

417A In applying provision No. **418**, in Korea (Rep. of) and Japan, *resolves* 3 of Resolution **528 (Rev.WRC-03)** is relaxed to allow the broadcasting-satellite service (sound) and the complementary terrestrial broadcasting service to additionally operate on a primary basis in the band 2 605-2 630 MHz. This use is limited to systems intended for national coverage. An administration listed in this provision shall not have simultaneously two overlapping frequency assignments, one under this provision and the other under No. **416**. The provisions of No. **416** and Table **21-4** of Article **21** do not apply. Use of non-geostationary-satellite systems in the broadcasting-satellite service (sound) in the band 2 605-2 630 MHz is subject to the provisions of Resolution **539 (Rev.WRC-03)**. The power flux-density at the Earth's surface produced by emissions from a geostationary broadcasting-satellite service (sound) space station operating in the band 2 605-2 630 MHz for which complete Appendix **4** coordination information, or notification information, has been received after 4 July 2003, for all conditions and for all methods of modulation, shall not exceed the following limits:

130	dB(W/(m^2 · MHz))	for	0	5
130	0.4 (5) dB(W/(m^2 · MHz))	for	5	25
122	dB(W/(m^2 · MHz))	for	25	90

* *Note by the Secretariat:* This Resolution was revised by WRC-03.

where is the angle of arrival of the incident wave above the horizontal plane, in degrees. These limits may be exceeded on the territory of any country whose administration has so agreed. In the case of the broadcasting-satellite service (sound) networks of Korea (Rep. of), as an exception to the limits above, the power flux-density value of 122 dB(W/(m^2 · MHz)) shall be used as a threshold for coordination under No. **9.11** in an area of 1000 km around the territory of the administration notifying the broadcasting-satellite service (sound) system, for angles of arrival greater than 35 . (WRC-03)

417B In Korea (Rep. of) and Japan, use of the band 2605 -2 630 MHz by non-geostationary - satellite systems in the broadcasting-satellite service (sound), pursuant to No. **417A**, for which complete Appendix **4** coordination information, or notification information, has been received after 4 July 2003, is subject to the application of the provisions of No. **9.12A**, in respect of geostationary -satellite networks for which complete Appendix **4** coordination information, or notification information, is considered to have been received after 4 July 2003, and No. **22.2** does not apply. No. **22.2** shall continue to apply with respect to geostationary -satellite networks for which complete Appendix **4** coordination information, or notification information, is considered to have been received before 5 July 2003. (WRC-03)

417C Use of the band 2 605 -2 630 MHz by non -geostationary -satellite systems in the broadcasting- satellite service (sound), pursuant to No. **417A**, for which complete Appendix **4** coordination information, or notification information, has been received after 4 July 2003, is subject to the application of the provisions of No. **9.12**. (WRC-03)

417D Use of the band 2605-2 630 MHz by geostationary -satellite networks for which complete Appendix **4** coordination information, or notification information, has been received after 4 July 2003 is subject to the application of the provisions of No. **9.13** with respect to non-geostationary -satellite systems in the broadcasting-satellite service (sound), pursuant to No. **417A**, and No. **22.2** does not apply. (WRC-03)

418 *Additional allocation:* in Korea (Rep. of), India, Japan, Pakistan and Thailand, the band 2 535-2 655 MHz is also allocated to the broadcasting-satellite service (sound) and complementary terrestrial broadcasting service on a primary basis. Such use is limited to digital audio broadcasting and is subject to the provisions of Resolution **528 (Rev.WRC -03)**. The provisions of No. **416** and Table **21-4** of Article **21**, do not apply to this additional allocation. Use of non-geostationary -satellite systems in the broadcasting-satellite service (sound) is subject to Resolution **539 (Rev.WRC -03)**. Geostationary broadcasting-satellite service (sound) systems for which complete Appendix **4** coordination information has been received after 1 June 2005 are limited to systems intended for national coverage. The power flux- density at the Earth's surface produced by emissions from a geostationary broadcasting-satellite service (sound) space station operating in the band 2 630 -2 655 MHz, and for which complete Appendix **4**

coordination information has been received after 1 June 2005, shall not exceed the following limits, for all conditions and for all methods of modulation:

130	dB(W/(m^2 · MHz))	for 0 5
130	0.4 (5) dB(W/(m^2 · MHz))	for 5 25
–122	dB(W/(m^2 · MHz))	for 25 90

where is the angle of arrival of the incident wave above the horizontal plane, in degrees. These limits may be exceeded on the territory of any country whose administration has so agreed. As an exception to the limits above, the pfd value of –122 dB (W/(m^2 · MHz)) shall be used as a threshold for coordination under No. **9.11** in an area of 1500 km around the territory of the administration notifying the broadcasting-satellite service (sound) system. In addition, the power flux-density value shall not exceed 100 dB(W/(m^2 · MHz)) anywhere on the territory of the Russian Federation.

In addition, an administration listed in this provision shall not have simultaneously two overlapping frequency assignments, one under this provision and the other under No. **416** for systems for which complete Appendix **4** coordination information has been received after 1 June 2005. (WRC-03)

418A In certain Region 3 countries listed in No. **418**, use of the band 2630-2 655 MHz by non-geostationary-satellite systems in the broadcasting-satellite service (sound) for which complete Appendix **4** coordination information, or notification information, has been received after 2 June 2000, is subject to the application of the provisions of No. **9.12A**, in respect of geostationary-satellite networks for which complete Appendix **4** coordination information, or notification information, is considered to have been received after 2 June 2000, and No. **22.2** does not apply. No. **22.2** shall continue to apply with respect to geostationary-satellite networks for which complete Appendix **4** coordination information, or notification information, is considered to have been received before 3 June 2000. (WRC-03)

418B Use of the band 2 630-2 655 MHz by non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. **418**, for which complete Appendix **4** coordination information, or notification information, has been received after 2 June 2000, is subject to the application of the provisions of No. **9.12**. (WRC-03)

418C Use of the band 2630-2 655 MHz by geostationary-satellite networks for which complete Appendix **4** coordination information, or notification information, has been received after 2 June 2000 is subject to the application of the provisions of No. **9.13** with respect to non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. **418** and No. **22.2** does not apply. (WRC-03)

419 The allocation of the frequency band 2 670-2 690 MHz to the mobile-satellite service shall be effective from 1 January 2005. When introducing systems of the mobile-satellite service in this band, administrations shall take all necessary steps to protect the satellite

systems operating in this band prior to 3 March 1992. The coordination of mobile-satellite systems in the band shall be in accordance with No. **9.11A**.

420 The band 2 655-2 670 MHz (until 1 January 2005 the band 2 655-2 690 MHz) may also be used for the mobile-satellite (Earth-to-space), except aeronautical mobile-satellite, service for operation limited to within national boundaries, subject to agreement obtained under No. **9.21**. The coordination under No. **9.11A** applies.

420A *Additional allocation:* in India and Japan, subject to agreement obtained under No. **9.21**, the band 2 670 -2 690 MHz may also be used for the aeronautical mobile-satellite service (Earth-to-space) for operation limited to within their national boundaries. (WRC-2000)

422 *Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Bosnia and Herzegovina, Brunei Darussalam, Congo (Rep. of the), Côte d'Ivoire, Cuba, Egypt, the United Arab Emirates, Eritrea, Ethiopia, the Russian Federation, Gabon, Georgia, Guinea, Guinea-Bissau, Iran (Islamic Republic of), Iraq, Israel, Jordan, Lebanon, Mauritania, Moldova, Mongolia, Nigeria, Oman, Uzbekistan, Pakistan, the Philippines, Qatar, Syrian Arab Republic, Kyrgyzstan, the Dem. Rep. of the Congo, Romania, Serbia and Montenegro, Somalia, Tajikistan, Tunisia, Turkmenistan, Ukraine and Yemen, the band 2690-2 700 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. Such use is limited to equipment in operation by 1 January 1985. (WRC-03)

423 In the band 2700-2 900 MHz, ground-based radars used for meteorological purposes are authorized to operate on a basis of equality with stations of the aeronautical radionavigation service.

424 *Additional allocation:* in Canada, the band 2 850-2 900 MHz is also allocated to the maritime radionavigation service, on a primary basis, for use by shore-based radars.

424A In the band 2900-3 100 MHz, stations in the radiolocation service shall not cause harmful interference to, nor claim protection from, radar systems in the radionavigation service. (WRC-03)

425 In the band 2 900-3 100 MHz, the use of the shipborne interrogator-transponder (SIT) system shall be confined to the sub-band 2 930 -2 950 MHz.

426 The use of the band 2 900 -3 100 MHz by the aeronautical radionavigation service is limited to ground-based radars.

427 In the bands 2 900 -3 100 MHz and 9 300-9 500 MHz, the response from radar transponders shall not be capable of being confused with the response from radar beacons (racons) and shall not cause interference to ship or aeronautical radars in the

radionavigation service, having regard, however, to No. **4.9**.

428 *Additional allocation:* in Azerbaijan, Cuba, Mongolia, Kyrgyzstan, Romania and Turkmenistan, the band 3100-3 300 MHz is also allocated to the radionavigation service on a primary basis. (WRC-03)

430 *Additional allocation:* in Azerbaijan, Cuba, Mongolia, Kyrgyzstan, Romania and Turkmenistan, the band 3300-3 400 MHz is also allocated to the radionavigation service on a primary basis. (WRC-03)

432 *Different category of service:* in Korea (Rep. of), Japan and Pakistan, the allocation of the band 3 400-3 500 MHz to the mobile, except aeronautical mobile, service is on a primary basis (see No. **5.33**). (WRC-2000)

433 In Regions 2 and 3, in the band 3 400-3 600 MHz the radiolocation service is allocated on a primary basis. However, all administrations operating radiolocation systems in this band are urged to cease operations by 1985. Thereafter, administrations shall take all practicable steps to protect the fixed-satellite service and coordination requirements shall not be imposed on the fixed-satellite service.

435 In Japan, in the band 3 620-3 700 MHz, the radiolocation service is excluded.

438 Use of the band 4200-4 400 MHz by the aeronautical radionavigation service is reserved exclusively for radio altimeters installed on board aircraft and for the associated transponders on the ground. However, passive sensing in the Earth exploration-satellite and space research services may be authorized in this band on a secondary basis (no protection is provided by the radio altimeters).

440 The standard frequency and time signal-satellite service may be authorized to use the frequency 4 202 MHz for space-to-Earth transmissions and the frequency 6 427 MHz for Earth-to-space transmissions. Such transmissions shall be confined within the limits of 2 MHz of these frequencies, subject to agreement obtained under No. **9.21**.

441 The use of the bands 4500-4 800 MHz (space-to-Earth), 6725-7 025 MHz (Earth-to-space) by the fixed-satellite service shall be in accordance with the provisions of Appendix **30B**. The use of the bands 10.7-10.95 GHz (space-to-Earth), 11.2-11.45 GHz (space-to-Earth) and 12.75-13.25 GHz (Earth-to-space) by geostationary-satellite systems in the fixed-satellite service shall be in accordance with the provisions of Appendix **30B**. The use of the bands 10.7-10.95 GHz (space-to-Earth), 11.2-11.45 GHz (space-to-Earth) and 12.75-13.25 GHz (Earth-to-space) by a non-geostationary-satellite system in the fixed-satellite service is subject to application of the provisions of No. **9.12** for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the fixed-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete

coordination or notification information, as appropriate, for the non-geostationary - satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary -satellite networks, and No. **43A** does not apply. Non-geostationary - satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated. (WRC-2000)

443 *Different category of service:* in Argentina, Australia and Canada, the allocation of the bands 4 825-4 835 MHz and 4 950-4 990 MHz to the radio astronomy service is on a primary basis (see No. **5.33**).

443A (SUP - WRC-03)

443B In order not to cause harmful interference to the microwave landing system operating above 5 030 MHz, the aggregate power flux-density produced at the Earth's surface in the band 5 030-5 150 MHz by all the space stations within any radionavigation-satellite service system (space-to-Earth) operating in the band 5010-5 030 MHz shall not exceed –124.5 dB (W/m^2) in a 150 kHz band. In order not to cause harmful interference to the radio astronomy service in the band 4990-5 000 MHz, radionavigation -satellite service systems operating in the band 5 010-5 030 MHz shall comply with the limits in the band 4 990-5 000 MHz defined in Resolution **741 (WRC -03)**. (WRC-03)

444 The band 5030-5 150 MHz is to be used for the operation of the international standard system (microwave landing system) for precision approach and landing. The requirements of this system shall take precedence over other uses of this band. For the use of this band, No. **444A** and Resolution **114 (Rev.WRC -03)** apply. (WRC-03)

444A *Additional allocation:* the band 5091 -5 150 MHz is also allocated to the fixed-satellite service (Earth-to-space) on a primary basis. This allocation is limited to feeder links of non-geostationary mobile-satellite systems in the mobile-satellite service and is subject to coordination under No. **9.11A**.

In the band 5 091-5 150 MHz, the following conditions also apply:

– prior to 1 January 2018, the use of the band 5 091-5 150 MHz by feeder links of non-geostationary -satellite systems in the mobile-satellite service shall be made in accordance with Resolution **114 (Rev.WRC -03)**;

– prior to 1 January 2018, the requirements of existing and planned international standard systems for the aeronautical radionavigation service which cannot be met in the 5 000 -5 091 MHz band, shall take precedence over other uses of this band;

– after 1 January 2012, no new assignments shall be made to earth stations providing feeder links of non-geostationary mobile -satellite systems;

– after 1 January 2018, the fixed-satellite service will become secondary to the aeronautical radionavigation service. (WRC-03)

447 *Additional allocation:* in Israel, Lebanon, Pakistan, the Syrian Arab Republic and Tunisia, the band 5 150-5 250 MHz is also allocated to the mobile service, on a primary basis, subject to agreement obtained under No. **9.21**. In this case, the provisions of Resolution **229 (WRC-03)** do not apply. (WRC-03)

447A The allocation to the fixed-satellite service (Earth-to-space) is limited to feeder links of non-geostationary-satellite systems in the mobile-satellite service and is subject to coordination under No. **9.11A**.

447B *Additional allocation*: the band 5 150-5 216 MHz is also allocated to the fixed-satellite service (space-to-Earth) on a primary basis. This allocation is limited to feeder links of non-geostationary-satellite systems in the mobile-satellite service and is subject to provisions of No. **9.11A**. The power flux-density at the Earth's surface produced by space stations of the fixed-satellite service operating in the space-to-Earth direction in the band 5 150-5 216 MHz shall in no case exceed –164 dB(W/m^2) in any 4 kHz band for all angles of arrival.

447C Administrations responsible for fixed-satellite service networks in the band 5 150-5 250 MHz operated under Nos. **447A** and **447B** shall coordinate on an equal basis in accordance with No. **9.11A** with administrations responsible for non-geostationary-satellite networks operated under No. **446** and brought into use prior to 17 November 1995. Satellite networks operated under No. **446** brought into use after 17 November 1995 shall not claim protection from, and shall not cause harmful interference to, stations of the fixed-satellite service operated under Nos. **447A** and **447B**.

447D The allocation of the band 5250-5 255 MHz to the space research service on a primary basis is limited to active spaceborne sensors. Other uses of the band by the space research service are on a secondary basis. (WRC-97)

447E *Additional allocation:* The band 5 250-5 350 MHz is also allocated to the fixed service on a primary basis in the following countries in Region 3: Australia, Korea (Rep. of), India, Indonesia, Iran (Islamic Republic of), Japan, Malaysia, Papua New Guinea, the Philippines, Sri Lanka, Thailand and Viet Nam. The use of this band by the fixed service is intended for the implementation of fixed wireless access systems and shall comply with Recommendation ITU-R F.1613. In addition, the fixed service shall not claim protection from the radiodetermination, Earth exploration-satellite (active) and space research (active) services, but the provisions of No. **43A** do not apply to the fixed service with respect to the Earth exploration-satellite (active) and space research (active) services. After implementation of fixed wireless access systems in the fixed service with protection for the existing radiodetermination systems, no more stringent constraints should be imposed on the fixed wireless access systems by future radiodetermination implementations. (WRC-03)

447F In the band 5 250-5 350 MHz, stations in the mobile service shall not claim protection from the radiolocation service, the Earth exploration-satellite service (active) and the space research service (active). These services shall not impose on the mobile service more stringent protection criteria, based on system characteristics and interference criteria, than those stated in Recommendations ITU-R M.1638 and ITU-R SA.1632. (WRC-03)

448 *Additional allocation:* in Azerbaijan, Libyan Arab Jamahiriya, Mongolia, Kyrgyzstan, Slovakia, Romania and Turkmenistan, the band 5 250-5 350 MHz is also allocated to the radionavigation service on a primary basis. (WRC-03)

448A The Earth exploration-satellite (active) and space research (active) services in the frequency band 5250-5 350 MHz shall not claim protection from the radiolocation service. No. **5.43A** does not apply.(WRC-03)

448B The Earth exploration-satellite service (active) operating in the band 5350-5 570 MHz and space research service (active) operating in the band 5 460-5 570 MHz shall not cause harmful interference to the aeronautical radionavigation service in the band 5 350-5 460 MHz, the radionavigation service in the band 5 460-5 470 MHz and the maritime radionavigation service in the band 5 470-5 570 MHz. (WRC-03)

448C The space research service (active) operating in the band 5350-5 460 MHz shall not cause harmful interference to nor claim protection from other services to which this band is allocated. (WRC-03)

448D In the frequency band 5 350-5 470 MHz, stations in the radiolocation service shall not cause harmful interference to, nor claim protection from , radar systems in the aeronautical radionavigation service operating in accordance with No.**449**. (WRC-03)

449 The use of the band 5 350-5 470 MHz by the aeronautical radionavigation service is limited to airborne radars and associated airborne beacons.

450 *Additional allocation:* in Austria, Azerbaijan, Iran (Islamic Republic of), Mongolia, Kyrgyzstan, Romania, Turkmenistan and Ukraine, the band 5470-5 650 MHz is also allocated to the aeronautical radionavigation service on a primary basis. (WRC-03)

450A In the band 5 470-5 725 MHz, stations in the mobile service shall not claim protection from radiodetermination services. Radiodetermination services shall not impose on the mobile service more stringent protection criteria, based on system characteristics and interference criteria, than those stated in Recommendation ITU-R M.1638. (WRC-03)

450B In the frequency band 5 470-5 650 MHz, stations in the radiolocation service, except ground-based radars used for meteorological purposes in the band 5600-5 650 MHz,

shall not cause harmful interference to, nor claim protection from, radar systems in the maritime radionavigation service. (WRC-03)

451 *Additional allocation:* in the United Kingdom, the band 5 470-5 850 MHz is also allocated to the land mobile service on a secondary basis. The power limits specified in Nos. **21.2**, **21.3**, **21.4** and **21.5** shall apply in the band 5 725-5 850 MHz.

452 Between 5 600 MHz and 5 650 MHz, ground-based radars used for meteorological purposes are authorized to operate on a basis of equality with stations of the maritime radionavigation service.

453 *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Egypt, the United Arab Emirates, Gabon, Guinea, Equatorial Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, the Libyan Arab Jamahiriya, Japan, Jordan, Kenya, Kuwait, Lebanon, Madagascar, Malaysia, Nigeria, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Sri Lanka, Swaziland, Tanzania, Chad, Thailand, Togo, Viet Nam and Yemen, the band 5650-5 850 MHz is also allocated to the fixed and mobile services on a primary basis. In this case, the provisions of Resolution **229 (WRC-03)** do not apply. (WRC-03)

454 *Different category of service:* in Azerbaijan, the Russian Federation, Georgia, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan and Turkmenistan, the allocation of the band 5 670-5 725 MHz to the space research service is on a primary basis (see No. **5.33**). (WRC-03)

455 *Additional allocation:* in Armenia, Azerbaijan, Belarus, Cuba, the Russian Federation, Georgia, Hungary, Kazakhstan, Latvia, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 5 670-5 850 MHz is also allocated to the fixed service on a primary basis. (WRC-03)

457 Not used.

457A In the bands 5925-6 425 MHz and 14-14.5 GHz, earth stations located on board vessels may communicate with space stations of the fixed-satellite service. Such use shall be in accordance with Resolution **902 (WRC-03)**. (WRC-03)

457B In the bands 5925-6 425 MHz and 14-14.5 GHz, earth stations located on board vessels may operate with the characteristics and under the conditions contained in Resolution **902 (WRC-03)** in Algeria, Saudi Arabia, Bahrain, Comoros, Djibouti, Egypt, United Arab Emirates, the Libyan Arab Jamahiriya, Jordan, Kuwait, Morocco, Mauritania, Oman, Qatar, the Syrian Arab Republic, Sudan, Tunisia and Yemen, in the maritime mobile-satellite service on a secondary basis. Such use shall be in accordance with Resolution **902 (WRC-03)**. (WRC-03)

458 In the band 6 425-7 075 MHz, passive microwave sensor measurements are carried out over the oceans. In the band 7075 -7 250 MHz, passive microwave sensor measurements are carried out. Administrations should bear in mind the needs of the Earth exploration-satellite (passive) and space research (passive) services in their future planning of the bands 6 425 -7 025 MHz and 7 075-7 250 MHz.

458A In making assignments in the band 6 700-7 075 MHz to space stations of the fixed-satellite service, administrations are urged to take all practicable steps to protect spectral line observations of the radio astronomy service in the band 6 650-6 675.2 MHz from harmful interference from unwanted emissions.

458B The space-to-Earth allocation to the fixed-satellite service in the band 6700-7 075 MHz is limited to feeder links for non-geostationary satellite systems of the mobile-satellite service and is subject to coordination under No. **9.11A**. The use of the band 6 700-7 075 MHz (space-to-Earth) by feeder links for non-geostationary satellite systems in the mobile -satellite service is not subject to No. **22.2**.

458C Administrations making submissions in the band 7025-7 075 MHz (Earth-to-space) for geostationary -satellite systems in the fixed-satellite service after 17 November 1995 shall consult on the basis of relevant ITU-R Recommendations with the administrations that have notified and brought into use non-geostationary -satellite systems in this frequency band before 18 November 1995 upon request of the latter administrations. This consultation shall be with a view to facilitating shared operation of both geostationary -satellite systems in the fixed-satellite service and non-geostationary-satellite systems in this band.

459 *Additional allocation:* in the Russian Federation, the frequency bands 7100-7 155 MHz and 7 190-7 235 MHz are also allocated to the space operation service (Earth-to-space) on a primary basis, subject to agreement obtained under No. **9.21**. (WRC-97)

461 *Additional allocation:* the bands 7250-7 375 MHz (space-t o-Earth) and 7900-8 025 MHz (Earth-to-space) are also allocated to the mobile -satellite service on a primary basis, subject to agreement obtained under No. **9.21**.

461A The use of the band 7450-7 550 MHz by the meteorological-satellite service (space-t o-Earth) is limited to geostationary -satellite systems. Non-geostationary meteorological-satellite systems in this band notified before 30 November 1997 may continue to operate on a primary basis until the end of their lifetime. (WRC-97)

461B The use of the band 7750-7 850 MHz by the meteorological-satellite service (space-t o-Earth) is limited to non-geostationary satellite systems.(WRC-97)

462 (SUP - WRC-97)

462A In Regions 1 and 3 (except for Japan), in the band 8 025-8 400 MHz, the Earth exploration - satellite service using geostationary satellites shall not produce a power

flux-density in excess of the following provisional values for angles of arrival ( ), without the consent of the affected administration:

174 dB(W/m^2) in a 4 kHz band for 0 5º

–174 + 0.5 (– 5) dB(W/m^2) in a 4 kHz band for 5º 25º

–164 dB(W/m^2) in a 4 kHz band for 25º 90º These values are subject to study under Resolution **124 (WRC-97)***. (WRC-97)

463 Aircraft stations are not permitted to transmit in the band 8 025-8 400 MHz. (WRC-97)

465 In the space research service, the use of the band 8 400-8 450 MHz is limited to deep space.

466 *Different category of service:* in Israel, Singapore and Sri Lanka, the allocation of the band 8 400-8 500 MHz to the space research service is on a secondary basis (see No. **5.32**). (WRC-03)

468 *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Burundi, Cameroon, China, Congo (Rep. of the), Costa Rica, Egypt, the United Arab Emirates, Gabon, Guyana, Indonesia, Iran (Islamic Republic of), Iraq, the Libyan Arab Jamahiriya, Jamaica, Jordan, Kenya, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, Qatar, Syrian Arab Republic, the Dem. People's Rep. of Korea, Senegal, Singapore, Somalia, Swaziland, Tanzania, Chad, Togo, Tunisia and Yemen, the band 8 500-8 750 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-03)

469 *Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Hungary, Lithuania, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, the Czech Rep., Romania, Tajikistan, Turkmenistan and Ukraine, the band 8 500-8 750 MHz is also allocated to the land mobile and radionavigation services on a primary basis. (WRC-03)

469A In the band 8550-8 650 MHz, stations in the Earth exploration -satellite service (active) and space research service (active) shall not cause harmful interference to, or constrain the use and development of, stations of the radiolocation service. (WRC-97)

470 The use of the band 8 750 -8 850 MHz by the aeronautical radionavigation service is limited to airborne Doppler navigation aids on a centre frequency of 8 800 MHz.

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* *Note by the Secretariat:* This Resolution was revised by WRC-2000.

471 *Additional allocation:* in Algeria, Germany, Bahrain, Belgium, China, the United Arab Emirates, France, Greece, Indonesia, Iran (Islamic Republic of), the Libyan Arab Jamahiriya, the Netherlands, Qatar and Sudan, the bands 8825-8 850 MHz and 9 000-9 200 MHz are also allocated to the maritime radionavigation service, on a primary basis, for use by shore-based radars only.

474 In the band 9 200-9 500 MHz, search and rescue transponders (SART) may be used, having due regard to the appropriate ITU-R Recommendation (see also Article **31**).

475 The use of the band 9 300 -9 500 MHz by the aeronautical radionavigation service is limited to airborne weather radars and ground-based radars. In addition, ground -based radar beacons in the aeronautical radionavigation service are permitted in the band 9 300-9 320 MHz on condition that harmful interference is not caused to the maritime radionavigation service. In the band 9300-9 500 MHz, ground- based radars used for meteorological purposes have priority over other radiolocation devices.

476 In the band 9300-9 320 MHz in the radionavigation service, the use of shipborne radars, other than those existing on 1 January 1976, is not permitted until 1 January 2001.

476A In the band 9500-9 800 MHz, stations in the Earth exploration -satellite service (active) and space research service (active) shall not cause harmful interference to, or constrain the use and development of, stations of the radionavigation and radiolocation services. (WRC-97)

480 *Additional allocation:* in Argentina, Brazil, Chile, Costa Rica, Cuba, El Salvador, Ecuador, Guatemala, Honduras, Mexico, Paraguay, Peru, Uruguay and Venezuela, the band 10 -10.45 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-2000)

481 *Additional allocation:* in Germany, Angola, Brazil, China, Costa Rica, Côte d'Ivoire, El Salvador, Ecuador, Spain, Guatemala, Hungary, Japan, Kenya, Morocco, Nigeria, Oman, Uzbekistan, Paraguay, Peru, the Dem. People's Rep. of Korea, Tanzania, Thailand and Uruguay, the band 10.45-10.5 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-03)

482 In the band 10.6-10.68 GHz, stations of the fixed and mobile, except aeronautical mobile, services shall be limited to a maximum equivalent isotropically radiated power of 40 dBW and the power delivered to the antenna shall not exceed –3 dBW. These limits may be exceeded subject to agreement obtained under No. **9.21**. However, in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Bangladesh, Belarus, China, the United Arab Emirates, Georgia, India, Indonesia, Iran (Islamic Republic of), Iraq, Japan, Kazakhstan, Kuwait, Latvia, Lebanon, Moldova, Nigeria, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, Tajikistan and Turkmenistan, the restrictions on the fixed and mobile, except aeronautical mobile, services are not applicable. (WRC-03)

483 *Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Bosnia and Herzegovina, China, Colombia, Korea (Rep. of), Costa Rica, Egypt, the United Arab Emirates, Georgia, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kazakhstan, Kuwait, Lebanon, Mongolia, Uzbekistan, Qatar, Kyrgyzstan, the Dem. People's Rep. of Korea, Romania, Serbia and Montenegro, Tajikistan, Turkmenistan and Yemen, the ban d 10.68-10.7 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. Such use is limited to equipment in operation by 1 January 1985.(WRC-03)

484 In Region 1, the use of the band 10.7-11.7 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links for the broadcasting-satellite service.

484A The use of the bands 10.95-11.2 GHz (space-to-Earth), 11.45-11.7 GHz (space-t o-Earth), 11.7-12.2 GHz (space-to-Earth) in Region 2, 12.2-12.75 GHz (space-to-Earth) in Region 3, 12.5-12.75 GHz (space-t o-Earth) in Region 1, 13.75-14.5 GHz (Earth-to-space), 17.8-18.6 GHz (space-to-Earth), 19.7-20.2 GHz (space-to-Earth), 27.5-28.6 GHz (Earth-to-space), 29.5-30 GHz (Earth-t o-space) by a non-geostationary-satellite system in the fixed-satellite service is subject to application of the provisions of No. **9.12** for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the fixed-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and No. **5.43A** does not apply. Non-geostationary-satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated. (WRC-2000)

485 In Region 2, in t he band 11.7-12.2 GHz, transponders on space stations in the fixed-satellite service may be used additionally for transmissions in the broadcasting-satellite service, provided that such transmissions do not have a maximum e.i.r.p. greater than 53 dBW per television channel and do not cause greater interference or require more protection from interference than the coordinated fixed-satellite service frequency assignments. With respect to the space services, this band shall be used principally for the fixed-satellite service.

486 *Different category of service:* in Mexico and the United States, the allocation of the band 11.7-12.1 GHz to the fixed service is on a secondary basis (see No. **5.32**).

488 The use of the band 11.7-12.2 GHz by geostationary-satellite networks in the fixed-satellite service in Region 2 is subject to application of the provisions of No. **9.14** for coordination with stations of terrestrial services in Regions 1, 2 and 3. For the use of the band 12.2-12.7 GHz by the broadcasting-satellite service in Region 2, see Appendix **30**.

(WRC-03)

489 *Additional allocation:* in Peru, the band 12.1-12.2 GHz is also allocated to the fixed service on a primary basis.

490 In Region 2, in the band 12.2-12.7 GHz, existing and future terrestrial radiocommunication services shall not cause harmful interference to the space services operating in conformity with the broadcasting-satellite Plan for Region 2 contained in Appendix **30**.

492 Assignments to stations of the broadcasting-satellite service which are in conformity with the appropriate regional Plan or included in the Regions 1 and 3 List in Appendix **30** may also be used for transmissions in the fixed-satellite service (space-to-Earth), provided that such transmissions do not cause more interference, or require more protection from interference, than the broadcasting-satellite service transmissions operating in conformity with the Plan or the List, as appropriate. (WRC-2000)

497 The use of the band 13.25-13.4 GHz by the aeronautical radionavigation service is limited to Doppler navigation aids.

498 (SUP - WRC-97)

98A The Earth exploration-satellite (active) and space research (active) services operating in the band 13.25-13.4 GHz shall not cause harmful interference to, or constrain the use and development of, the aeronautical radionavigation service. (WRC-97)

499 *Additional allocation:* in Bangladesh, India and Pakistan, the band 13.25-14 GHz is also allocated to the fixed service on a primary basis.

500 *Additional allocation:* in Algeria, Angola, Saudi Arabia, Bahrain, Brunei Darussalam, Cameroon, Egypt, the United Arab Emirates, Gabon, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kuwait, Lebanon, Madagascar, Malaysia, Mali, Malta, Morocco, Mauritania, Nigeria, Pakistan, Qatar, the Syrian Arab Republic, Singapore, Sudan, Chad and Tunisia, the band 13.4-14 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-03)

501 *Additional allocation:* in Azerbaijan, Hungary, Japan, Mongolia, Kyrgyzstan, Romania, the United Kingdom and Turkmenistan, the band 13.4-14 GHz is also allocated to the radionavigation service on a primary basis. (WRC-03)

501A The allocation of the band 13.4-13.75 GHz to the space research service on a primary basis is limited to active spaceborne sensors. Other uses of the band by the space research service are on a secondary basis. (WRC-97)

501B In the band 13.4-13.75 GHz, the Earth exploration-satellite (active) and space research (active) services shall not cause harmful interference to, or constrain the use and development of, the radiolocation service. (WRC-97)

502 In the band 13.75-14 GHz, an earth station of a geostationary fixed-satellite service network shall have a minimum antenna diameter of 1.2 m and an earth station of a non-geostationary fixed-satellite service system shall have a minimum antenna diameter of 4.5 m. In addition, the e.i.r.p., averaged over one second, radiated by a station in the radiolocation or radionavigation services shall not exceed 59 dBW for elevation angles above 2° and 65 dBW at lower angles. Before an administration brings into use an earth station in a geostationary-satellite network in the fixed-satellite service in this band with an antenna size smaller than 4.5 m, it shall ensure that the power flux-density produced by this earth station does not exceed:

– –115 dB(W/(m^2 · 10 MHz)) for more than 1% of the time produced at 36 m above sea level at the low water mark, as officially recognized by the coastal State;

– –115 dB(W/(m^2 · 10 MHz)) for more than 1% of the time produced 3m above ground at the border of the territory of an administration deploying or planning to deploy land mobile radars in this band, unless prior agreement has been obtained.

For earth stations within the fixed-satellite service having an antenna diameter greater than or equal to 4.5 m, the e.i.r.p. of any emission should be at least 68 dBW and should not exceed 85 dBW. (WRC-03)

503 In the band 13.75-14 GHz, geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 shall operate on an equal basis with stations in the fixed-satellite service; after that date, new geostationary space stations in the space research service will operate on a secondary basis. Until those geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 cease to operate in this band:

– in the band 13.77-13.78 GHz, the e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in geostationary-satellite orbit shall not exceed:

i) 4.7*D* 28 dB(W/40 kHz), where *D* is the fixed-satellite service earth station antenna diameter (m) for antenna diameters equal to or greater than 1.2 m and less than 4.5 m;

ii) 49.2 20 log(*D* /4.5) dB(W/40 kHz), where *D* is the fixed-satellite service earth station antenna diameter (m) for antenna diameters equal to or greater than 4.5 m and less than 31.9 m;

iii) 66.2 dB(W/40 kHz) for any fixed-satellite service earth station for antenna diameters (m) equal to or greater than 31.9 m;

iv) 56.2 dB(W/4 kHz) for narrow -band (less than 40 kHz of necessary bandwidth) fixed-satellite service earth station emissions from any fixed-satellite service earth station having an antenna diameter of 4.5 m or greater;

– the e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in non-geostationary -satellite orbit shall not exceed 51 dBW in the 6 MHz band from 13.772 to 13.778 GHz.

Automatic power control may be used to increase the e.i.r.p. density in these frequency ranges to compensate for rain attenuation, to the extent that the power flux-density at the fixed-satellite service space station does not exceed the value resulting from use by an earth station of an e.i.r.p. meeting the above limits in clear-sky conditions. (WRC-03)

503A (SUP - WRC-03)

504 The use of the band 14-14.3 GHz by the radionavigation service shall be such as to provide sufficient protection to space stations of the fixed-satellite service.

504A In the band 14-14.5 GHz, aircraft earth stations in the secondary aeronautical mobile-satellite service may also communicate with space stations in the fixed-satellite service. The provisions of Nos. **5.29**, **5.30** and **5.31** apply. (WRC-03)

504B Air craft earth stations operating in the aero nautical mobile-satellite service in the band 14 -14.5 GHz shall comply with the provisions of Annex 1, Part C of Recommendation ITU-R M.1643, with respect to any radio astronomy station performing observations in the 14.47-14.5 GHz band located on the territory of Spain, France, India, Italy, the United Kingdom and South Africa. (WRC-03)

504C In the band 14-14.25 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, Botswana, Côte d'Ivoire, Egypt, Guinea, India, Iran (Islamic Republic of), Kuwait, Lesotho, Nigeria, Oman, the Syrian Arab Republic and Tunisia by any aircraft earth station in the aeronautical mobile-satellite service shall not exceed the limits given in Annex 1, Part B of Recommendation ITU-R M.1643, unless otherwise specifically agreed by the affected administration(s). The provisions of this footnote in no way derogate the obligations of the aeronautical mobile-satellite service to operate as a secondary service in accordance with No. **5.29**. (WRC-03)

505 *Additional allocation:* in Algeria, Angola, Saudi Arabia, Bahrain, Bangladesh, Botswana, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Korea (Rep. of),

Egypt, the United Arab Emirates, Gabon, Guatemala, Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lesotho, Lebanon, Malaysia, Mali, Morocco, Mauritania, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, Swaziland, Tanzania, Chad and Yemen, the band 14-14.3 GHz is also allocated to the fixed service on a primary basis. (WRC-03)

506 The band 14-14.5 GHz may be used, within the fixed-satellite service (Earth-to-space), for feeder links for the broadcasting-satellite service, subject to coordination with other networks in the fixed- satellite service. Such use of feeder links is reserved for countries outside Europe.

506A In the band 14-14.5 GHz, ship earth stations with an e.i.r.p. greater than 21 dBW shall operate under the same conditions as earth stations located on board vessels, as provided in Resolution **902 (WRC-03)**. This footnote shall not apply to ship earth stations for which the complete Appendix **4** information has been received by the Bureau prior to 5 July 2003. (WRC-03)

506B Earth stations located on board vessels communicating with space stations in the fixed- satellite service may operate in the frequency band 14-14.5 GHz without the need for prior agreement from Cyprus, Greece and Malta, within the minimum distance given in Resolution **902 (WRC-03)** from these countries. (WRC-03)

508 *Additional allocation:* in Germany, Bosnia and Herzegovina, France, Italy, Libyan Arab Jamahiriya, The Former Yugoslav Rep. of Macedonia, the United Kingdom, Serbia and Montenegro and Slovenia, the band 14.25-14.3 GHz is also allocated to the fixed service on a primary basis. (WRC-03)

508A In the band 14.25-14.3 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, Botswana, China, Côte d'Ivoire, Egypt, France, Guinea, India, Iran (Islamic Republic of), Italy, Kuwait, Lesotho, Nigeria, Oman, the Syrian Arab Republic, the United Kingdom and Tunisia by any aircraft earth station in the aeronautical mobile-satellite service shall not exceed the limits given in Annex 1, Part B of Recommendation ITU-R M.1643, unless otherwise specifically agreed by the affected administration(s). The provisions of this footnote in no way derogate the obligations of the aeronautical mobile-satellite service to operate as a secondary service in accordance with No. **5.29**.

(WRC-03)

509 *Additional allocation:* in Japan the band 14.25-14.3 GHz is also allocated to the mobile, except aeronautical mobile, service on a primary basis. (WRC-2000)

509A In the band 14.3-14.5 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, Botswana, Cameroon, China, Côte d'Ivoire, Egypt, France,

Gabon, Guinea, India, Iran (Islamic Republic of), Italy, Kuwait, Lesotho, Morocco, Nigeria, Oman, the Syrian Arab Republic, the United Kingdom, Sri Lanka, Tunisia and Viet Nam by any aircraft earth station in the aeronautical mobile-satellite service shall not exceed the limits given in Annex 1, Part B of Recommendation ITU-R M.1643, unless otherwise specifically agreed by the affected administration(s). The provisions of this footnote in no way derogate the obligations of the aeronautical mobile-satellite service to operate as a secondary service in accordance with No. **5.29**. (WRC-03)

510 The use of the band 14.5-14.8 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links for the broadcasting-satellite service. This use is reserved for countries outside Europe.

511 *Additional allocation:* in Saudi Arabia, Bahrain, Bosnia and Herzegovina, Cameroon, Egypt, the United Arab Emirates, Guinea, Iran (Islamic Republic of), Iraq, Israel, the Libyan Arab Jamahiriya, Kuwait, Lebanon, Pakistan, Qatar, Serbia and Montenegro, the Syrian Arab Republic, Slovenia and Somalia, the band 15.35-15.4 GHz is also allocated to the fixed and mobile services on a secondary basis. (WRC-97)

511A The band 15.43-15.63 GHz is also allocated to the fixed-satellite service (space-to-Earth) on a primary basis. Use of the band 15.43-15.63 GHz by the fixed-satellite service (space-to-Earth and Earth-to-space) is limited to feeder links of non-geostationary systems in the mobile-satellite service, subject to coordination under No. **9.11A**. The use of the frequency band 15.43-15.63 GHz by the fixed-satellite service (space-to-Earth) is limited to feeder links of non-geostationary systems in the mobile-satellite service for which advance publication information has been received by the Bureau prior to 2 June 2000. In the space-to-Earth direction, the minimum earth station elevation angle above and gain towards the local horizontal plane and the minimum coordination distances to protect an earth station from harmful interference shall be in accordance with Recommendation ITU-R S.1341. In order to protect the radio astronomy service in the band 15.35-15.4 GHz, the aggregate power flux-density radiated in the 15.35-15.4 GHz band by all the space stations within any feeder-link of a non-geostationary system in the mobile-satellite service (space-to-Earth) operating in the 15.43-15.63 GHz band shall not exceed the level of 156 dB(W/m^2) in a 50 MHz bandwidth, into any radio astronomy observatory site for more than 2% of the time. (WRC-2000)

511B (SUP - WRC-97)

511C Stations operating in the aeronautical radionavigation service shall limit the effective e.i.r.p. in accordance with Recommendation ITU-R S.1340. The minimum coordination distance required to protect the aeronautical radionavigation stations (No. **4.10** applies) from harmful interference from feeder-link earth stations and the maximum e.i.r.p. transmitted towards the local horizontal plane by a feeder-link earth station shall be in accordance with Recommendation ITU-R S.1340. (WRC-97)

511D Fixed-satellite service systems for which complete information for advance publication has been received by the Bureau by 21 November 1997 may operate in the bands 15.4-15.43 GHz and 15.63-15.7 GHz in the space-to-Earth direction and 15.63-15.65 GHz in the Earth-to-space direction. In the bands 15.4-15.43 GHz and 15.65-15.7 GHz, emissions from a non-geostationary space station shall not exceed the power flux-density limits at the Earth's surface of –146 dB(W/(m^2 MHz)) for any angle of arrival. In the band 15.63-15.65 GHz, where an administration plans emissions from a non-geostationary space station that exceed –146 dB(W/(m^2 MHz)) for any angle of arrival, it shall coordinate under No. **9.11A** with the affected administrations. Stations in the fixed-satellite service operating in the band 15.63-15.65 GHz in the Earth-to-space direction shall not cause harmful interference to stations in the aeronautical radionavigation service (No. **4.10** applies). (WRC-97)

512 *Additional allocation:* in Algeria, Angola, Saudi Arabia, Austria, Bahrain, Bangladesh, Bosnia and Herzegovina, Brunei Darussalam, Cameroon, Congo (Rep. of the), Costa Rica, Egypt, El Salvador, the United Arab Emirates, Eritrea, Finland, Guatemala, India, Indonesia, Iran (Islamic Republic of), the Libyan Arab Jamahiriya, Jordan, Kenya, Kuwait, Malaysia, Mali, Morocco, Mauritania, Mozambique, Nepal, Nicaragua, Oman, Pakistan, Qatar, Serbia and Montenegro, Singapore, Slovenia, Somalia, Sudan, Swaziland, Tanzania, Chad, Togo and Yemen, the band 15.7-17.3 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-03)

513 *Additional allocation:* in Israel, the band 15.7-17.3 GHz is also allocated to the fixed and mobile services on a primary basis. These services shall not claim protection from or cause harmful interference to services operating in accordance with the Table in countries other than those included in No. **5.512**.

513A Spaceborne active sensors operating in the band 17.2-17.3 GHz shall not cause harmful interference to, or constrain the development of, the radiolocation and other services allocated on a primary basis. (WRC-97)

514 *Additional allocation:* in Algeria, Angola, Saudi Arabia, Austria, Bahrain, Bangladesh, Bosnia and Herzegovina, Cameroon, Costa Rica, El Salvador, the United Arab Emirates, Finland, Guatemala, India, Iran (Islamic Republic of), Iraq, Israel, Italy, the Libyan Arab Jamahiriya, Japan, Jordan, Kuwait, Lithuania, Nepal, Nicaragua, Nigeria, Oman, Uzbekistan, Pakistan, Qatar, Kyrgyzstan, Serbia and Montenegro, Slovenia and Sudan, the band 17.3-17.7 GHz is also allocated to the fixed and mobile services on a secondary basis. The power limits given in Nos. **21.3** and **21.5** shall apply. (WRC-03)

515 In the band 17.3-17.8 GHz, sharing between the fixed-satellite service (Earth-to-space) and the broadcasting-satellite service shall also be in accordance with the provisions of § 1 of Annex 4 of Appendix **30A**.

516 The use of the band 17.3-18.1 GHz by geostationary-satellite systems in the fixed-satellite service (Earth-to-space) is limited to feeder links for the broadcasting-satellite service. The use of the band 17.3-17.8 GHz in Region 2 by systems in the fixed-satellite service (Earth-to-space) is limited to geostationary satellites. For the use of the band 17.3-17.8 GHz in Region 2 by feeder links for the broadcasting-satellite service in the band 12.2-12.7 GHz, see Article **11**. The use of the bands 17.3-18.1GHz (Earth-to-space) in Regions 1 and 3 and 17.8-18.1 GHz (Earth-to-space) in Region 2 by non-geostationary-satellite systems in the fixed-satellite service is subject to application of the provisions of No. **9.12** for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the fixed-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and No. **5.43A** does not apply. Non-geostationary-satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated. (WRC-2000)

516A In the band 17.3-17.7 GHz, earth stations of the fixed-satellite service (space-to-Earth) in Region 1 shall not claim protection from the broadcasting-satellite service feeder-link earth stations operating under Appendix **30A**, nor put any limitations or restrictions on the locations of the broadcasting- satellite service feeder-link earth stations anywhere within the service area of the feeder link. (WRC-03)

516B The following bands are identified for use by high-density applications in the fixed-satellite service:

17.3-17.7 GHz	(space-to-Earth) in Region 1,
18.3-19.3 GHz	(space-to-Earth) in Region 2,
19.7-20.2 GHz	(space-to-Earth) in all Regions,
39.5-40 GHz	(space-to-Earth) in Region 1,
40-40.5 GHz	(space-to-Earth) in all Regions,
40.5-42 GHz	(space-to-Earth) in Region 2,
47.5-47.9 GHz	(space-to-Earth) in Region 1,
48.2-48.54 GHz	(space-to-Earth) in Region 1,
49.44-50.2 GHz	(space-to-Earth) in Region 1, and
27.5-27.82 GHz	(Earth-to-space) in Region 1,
28.35-28.45 GHz	(Earth-to-space) in Region 2,
28.45-28.94 GHz	(Earth-to-space) in all Regions,
28.94-29.1 GHz	(Earth-to-space) in Region 2 and 3,
29.25-29.46 GHz	(Earth-to-space) in Region 2,
29.46-30 GHz	(Earth-to-space) in all Regions,
48.2-50.2 GHz	(Earth-to-space) in Region 2.

This identification does not preclude the use of these bands by other fixed-satellite service applications or by other services to which these bands are allocated on a co-primary basis and does not establish priority in these Radio Regulations among users of the bands. Administrations should take this into account when considering regulatory provisions in relation to these bands. See Resolution **143 (WRC-03)**. (WRC-03)

517 In Region 2, the allocation to the broadcasting-satellite service in the band 17.3-17.8 GHz shall come into effect on 1 April 2007. After that date, use of the fixed-satellite (space-to-Earth) service in the band 17.7-17.8 GHz shall not claim protection from and shall not cause harmful interference to operating systems in the broadcasting-satellite service.

518 *Different category of service:* in Region 2, the allocation of the band 17.7-17.8 GHz to the mobile service is on a primary basis until 31 March 2007.

519 *Additional allocation:* the band 18.1-18.3 GHz is also allocated to the meteorological-satellite service (space-to-Earth) on a primary basis. Its use is limited to geostationary satellites and shall be in accordance with the provisions of Article **21**, Table **21-4**.

520 The use of the band 18.1-18.4 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links of geostationary-satellite systems in the broadcasting-satellite service.(WRC-2000)

521 *Alternative allocation:* in Germany, Denmark, the United Arab Emirates and Greece, the band 18.1-18.4 GHz is allocated to the fixed, fixed-satellite (space-to-Earth) and mobile services on a primary basis (see No. **5.33**). The provisions of No. **519** also apply. (WRC-03)

522 (SUP - WRC-2000)

522A The emissions of the fixed service and the fixed-satellite service in the band 18.6-18.8 GHz are limited to the values given in Nos. **21.5A** and **21.16.2**, respectively. (WRC-2000)

522B The use of the band 18.6-18.8 GHz by the fixed-satellite service is limited to geostationary systems and systems with an orbit of apogee greater than 20 000 km. (WRC-2000)

5.522C In the band 18.6-18.8 GHz, in Algeria, Saudi Arabia, Bahrain, Egypt, the United Arab Emirates, the Libyan Arab Jamahiriya, Jordan, Lebanon, Morocco, Oman,

Qatar, the Syrian Arab Republic, Tunisia and Yemen, fixed-service systems in operation at the date of entry into force of the Final Acts of WRC-2000 are not subject to the limits of No. **21.5A**. (WRC-2000)

5.523 (SUP - WRC-2000)

523A The use of the bands 18.8-19.3 GHz (space-to-Earth) and 28.6-29.1 GHz (Earth-to-space) by geostationary and non-geostationary fixed-satellite service networks is subject to the application of the provisions of No. **9.11A** and No. **22.2** does not apply. Administrations having geostationary-satellite networks under coordination prior to 18 November 1995 shall cooperate to the maximum extent possible to coordinate pursuant to No. **9.11A** with non-geostationary-satellite networks for which notification information has been received by the Bureau prior to that date, with a view to reaching results acceptable to all the parties concerned. Non-geostationary-satellite networks shall not cause unacceptable interference to geostationary fixed-satellite service networks for which complete Appendix **4** notification information is considered as having been received by the Bureau prior to 18 November 1995. (WRC-97)

523B The use of the band 19.3-19.6 GHz (Earth-to-space) by the fixed-satellite service is limited to feeder links for non-geostationary-satellite systems in the mobile-satellite service. Such use is subject to the application of the provisions of No. **9.11A**, and No. **22.2** does not apply.

523C No. **22.2** shall continue to apply in the bands 19.3-19.6 GHz and 29.1-29.4 GHz, between feeder links of non-geostationary mobile-satellite service networks and those fixed-satellite service networks for which complete Appendix **4** coordination information, or notification information, is considered as having been received by the Bureau prior to 18 November 1995. (WRC-97)

523D The use of the band 19.3-19.7 GHz (space-to-Earth) by geostationary fixed-satellite service systems and by feeder links for non-geostationary-satellite systems in the mobile-satellite service is subject to the application of the provisions of No. **9.11A**, but not subject to the provisions of No. **22.2**. The use of this band for other non-geostationary fixed-satellite service systems, or for the cases indicated in Nos. **523C** and **523E**, is not subject to the provisions of No. **9.11A** and shall continue to be subject to Articles **9** (except No. **9.11A**) and **11** procedures, and to the provisions of No. **22.2**. (WRC-97)

523E No. **22.2** shall continue to apply in the bands 19.6-19.7 GHz and 29.4-29.5 GHz, between feeder links of non-geostationary mobile-satellite service networks and those fixed-satellite service networks for which complete Appendix **4** coordination information, or notification information, is considered as having been received by the Bureau by 21 November 1997. (WRC-97)

524 *Additional allocation:* in Afghanistan, Algeria, Angola, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Costa Rica, Egypt, the United Arab Emirates, Gabon, Guatemala, Guinea, India, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, Tanzania, Chad, Togo and Tunisia, the band 19.7-21.2 GHz is also allocated to the fixed and mobile services on a primary basis. This additional use shall not impose any limitation on the power flux-density of space stations in the fixed-satellite service in the band 19.7-21.2 GHz and of space stations in the mobile-satellite service in the band 19.7-20.2 GHz where the allocation to the mobile-satellite service is on a primary basis in the latter band. (WRC-2000)

525 In order to facilitate interregional coordination between networks in the mobile-satellite and fixed-satellite services, carriers in the mobile-satellite service that are most susceptible to interference shall, to the extent practicable, be located in the higher parts of the bands 19.7-20.2 GHz and 29.5-30 GHz.

526 In the bands 19.7-20.2 GHz and 29.5-30 GHz in Region 2, and in the bands 20.1-20.2 GHz and 29.9-30 GHz in Regions 1 and 3, networks which are both in the fixed-satellite service and in the mobile-satellite service may include links between earth stations at specified or unspecified points or while in motion, through one or more satellites for point-to-point and point-to-multipoint communications.

527 In the bands 19.7-20.2 GHz and 29.5-30 GHz, the provisions of No. **4.10** do not apply with respect to the mobile-satellite service.

528 The allocation to the mobile-satellite service is intended for use by networks which use narrow spot-beam antennas and other advanced technology at the space stations. Administrations operating systems in the mobile-satellite service in the band 19.7-20.1 GHz in Region 2 and in the band 20.1-20.2 GHz shall take all practicable steps to ensure the continued availability of these bands for administrations operating fixed and mobile systems in accordance with the provisions of No. **524**.

529 The use of the bands 19.7-20.1 GHz and 29.5-29.9 GHz by the mobile-satellite service in Region 2 is limited to satellite networks which are both in the fixed-satellite service and in the mobile- satellite service as described in No. **526**.

532 The use of the band 22.21-22.5 GHz by the Earth exploration-satellite (passive) and space research (passive) services shall not impose constraints upon the fixed and mobile, except aeronautical mobile, services.

535 In the band 24.75-25.25 GHz, feeder links to stations of the broadcasting-satellite

service shall have priority over other uses in the fixed-satellite service (Earth-to-space). Such other uses shall protect and shall not claim protection from existing and future operating feeder-link networks to such broadcasting satellite stations.

535A The use of the band 29.1-29.5 GHz (Earth-to-space) by the fixed-satellite service is limited to geostationary-satellite systems and feeder links to non-geostationary-satellite systems in the mobile-satellite service. Such use is subject to the application of the provisions of No. **9.11A**, but not subject to the provisions of No. **22.2**, except as indicated in Nos. **523C** and **523E** where such use is not subject to the provisions of No. **9.11A** and shall continue to be subject to Articles **9** (except No. **9.11A**) and **11** procedures, and to the provisions of No. **22.2**. (WRC-97) **536** Use of the 25.25-27.5 GHz band by the inter-satellite service is limited to space research and Earth exploration-satellite applications, and also transmissions of data originating from industrial and medical activities in space.

536A Administrations operating earth stations in the Earth exploration-satellite service or the space research service shall not claim protection from stations in the fixed and mobile services operated by other administrations. In addition, earth stations in the Earth exploration-satellite service or in the space research service should be operated taking into account Recommendations ITU-R SA.1278 and ITU-R SA.1625, respectively. (WRC-03)

536B In Germany, Saudi Arabia, Austria, Belgium, Brazil, Bulgaria, China, Korea (Rep. of), Denmark, Egypt, United Arab Emirates, Spain, Estonia, Finland, France, Hungary, India, Iran (Islamic Republic of), Ireland, Israel, Italy, the Libyan Arab Jamahiriya, Jordan, Kenya, Kuwait, Lebanon, Liechtenstein, Lithuania, Moldova, Norway, Oman, Uganda, Pakistan, the Philippines, Poland, Portugal, the Syrian Arab Republic, Slovakia, the Czech Rep., Romania, the United Kingdom, Singapore, Sweden, Switzerland, Tanzania, Turkey, Viet Nam and Zimbabwe, earth stations operating in the Earth exploration-satellite service in the band 25.5-27 GHz shall not claim protection from, or constrain the use and deployment of, stations of the fixed and mobile services. (WRC-97)

536C In Algeria, Saudi Arabia, Bahrain, Botswana, Brazil, Cameroon, Comoros, Cuba, Djibouti, Egypt, United Arab Emirates, Estonia, Finland, Iran (Islamic Republic of), Israel, Jordan, Kenya, Kuwait, Lithuania, Malaysia, Morocco, Nigeria, Oman, Qatar, Syrian Arab Republic, Somalia, Sudan, Tanzania, Tunisia, Uruguay, Zambia and Zimbabwe, earth stations operating in the space research service in the band 25.5-27 GHz shall not claim protection from, or constrain the use and deployment of, stations of the fixed and mobile services. (WRC-03)

537 Space services using non-geostationary satellites operating in the inter-satellite service in the band 27-27.5 GHz are exempt from the provisions of No. **22.2**.

537A In Bhutan, Korea (Rep. of), the Russian Federation, Indonesia, Iran (Islamic Republic of), Japan, Kazakhstan, Lesotho, Malaysia, Maldives, Mongolia, Myanmar, Uzbekistan, Pakistan, the Philippines, Kyrgyzstan, the Dem. People's Rep. of Korea, Sri Lanka, Thailand and Viet Nam, the allocation to the fixed service in the band 27.5-28.35 GHz may also be used by high altitude platform stations (HAPS). The use of HAPS within the band 27.5-28.35 GHz is limited, within the territory of the countries listed above, to a single 300 MHz sub-band. Such use of 300 MHz of the fixed-service allocation by HAPS in the above countries is further limited to operation in the HAPS-to-ground direction and shall not cause harmful interference to, nor claim protection from, other types of fixed-service systems or other co-primary services. Furthermore, the development of these other services shall not be constrained by HAPS. See Resolution **145 (WRC-03)**. (WRC-03)

538 *Additional allocation:* the bands 27.500-27.501 GHz and 29.999-30.000 GHz are also allocated to the fixed-satellite service (space-to-Earth) on a primary basis for the beacon transmissions intended for up-link power control. Such space-to-Earth transmissions shall not exceed an equivalent isotropically radiated power (e.i.r.p.) of 10 dBW in the direction of adjacent satellites on the geostationary-satellite orbit. In the band 27.500-27.501 GHz, such space-to-Earth transmissions shall not produce a power flux-density in excess of the values specified in Article **21**, Table **21-4** on the Earth's surface.

539 The band 27.5-30 GHz may be used by the fixed-satellite service (Earth-to-space) for the provision of feeder links for the broadcasting-satellite service.

540 *Additional allocation:* the band 27.501-29.999 GHz is also allocated to the fixed-satellite service (space-to-Earth) on a secondary basis for beacon transmissions intended for up-link power control.

541 In the band 28.5-30 GHz, the earth exploration-satellite service is limited to the transfer of data between stations and not to the primary collection of information by means of active or passive sensors.

541A Feeder links of non-geostationary networks in the mobile-satellite service and geostationary networks in the fixed-satellite service operating in the band 29.1-29.5 GHz (Earth-to-space) shall employ uplink adaptive power control or other methods of fade compensation, such that the earth station transmissions shall be conducted at the power level required to meet the desired link performance while reducing the level of mutual interference between both networks. These methods shall apply to networks for which Appendix **4** coordination information is considered as having been received by the Bureau

after 17 May 1996 and until they are changed by a future competent world radiocommunication conference. Administrations submitting Appendix **4** information for coordination before this date are encouraged to utilize these techniques to the extent practicable. (WRC-2000)

542 *Additional allocation:* in Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Egypt, the United Arab Emirates, Eritrea, Ethiopia, Guinea, India, Iran (Islamic Republic of), Iraq, Japan, Jordan, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Nepal, Pakistan, Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Somalia, Sudan, Sri Lanka and Chad, the band 29.5 -31 GHz is also allocated to the fixed and mobile services on a secondary basis. The power limits specified in Nos. **21.3** and **21.5** shall apply. (WRC-2000)

543 The band 29.95-30 GHz may be used for space-to-space links in the Earth exploration - satellite service for telemetry, tracking, and control purposes, on a secondary basis.

543A In Bhutan, Korea (Rep. of), the Russian Federation, Indonesia, Iran (Islamic Republic of), Japan, Kazakhstan, Lesotho, Malaysia, Maldives, Mongolia, Myanmar, Uzbekistan, Pakistan, the Philippines, Kyrgyzstan, the Dem. People's Rep. of Korea, Sri Lanka, Thailand and Viet Nam, the allocation to the fixed service in the band 31-31.3 GHz may also be used by systems using high altitude platform stations (HAPS) in the ground-to-HAPS direction. The use of the band 31-31.3 GHz by systems using HAPS is limited to the territory of the countries listed above and shall not cause harmful interference to, nor claim protection from, other types of fixed-service systems, systems in the mobile service and systems operated under No. **545**. Furthermore, the development of these services shall not be constrained by HAPS. Systems using HAPS in the band 31-31.3 GHz shall not cause harmful interference to the radio astronomy service having a primary allocation in the band 31.3-31.8 GHz, taking into account the protection criterion as given in Recommendation ITU-R RA.769. In order to ensure the protection of satellite passive services, the level of unwanted power density into a HAPS ground station antenna in the band 31.3-31.8 GHz shall be limited to 106 dB(W/MHz) under clear-sky conditions, and may be increased up to 100 dB(W/MHz) under rainy conditions to take account of rain attenuation, provided the effective impact on the passive satellite does not exceed the impact under clear-sky conditions as given above. See Resolution **145 (WRC-03)**. (WRC-03)

544 In the band 31-31.3 GHz the power flux-density limits specified in Article **21**, Table **21-4** shall apply to the space research service.

545 *Different category of service:* in Armenia, Azerbaijan, Georgia, Mongolia, Kyrgyzstan, Tajikistan and Turkmenistan, the allocation of the band 31-31.3 GHz to the space research service is on a primary basis (see No. **5.33**). (WRC-03)

547 The bands 31.8-33.4 GHz, 37-40 GHz, 40.5-43.5 GHz, 51.4-52.6 GHz, 55.78-59 GHz and 64-66 GHz are available for high-density applications in the fixed service (see Resolutions **75 (WRC-2000)** and **79 (WRC-2000)**). Administrations should take this into account when considering regulatory provisions in relation to these bands. Because of the potential deployment of high-density applications in the fixed-satellite service in the bands 39.5-40 GHz and 40.5-42 GHz (see No. **516B**), administrations should further take into account potential constraints to high-density applications in the fixed service, as appropriate. (WRC-03)

547A Administrations should take practical measures to minimize the potential interference between stations in the fixed service and airborne stations in the radionavigation service in the 31.8-33.4 GHz band, taking into account the operational needs of the airborne radar systems. (WRC-2000)

547B *Alternative allocation*: in the United States, the band 31.8-32 GHz is allocated to the radionavigation and space research (deep space) (space-to-Earth) services on a primary basis. (WRC-97)

547C *Alternative allocation*: in the United States, the band 32-32.3 GHz is allocated to the radionavigation and space research (deep space) (space-to-Earth) services on a primary basis. (WRC-03)

547D *Alternative allocation*: in the United States, the band 32.3-33 GHz is allocated to the inter-satellite and radionavigation services on a primary basis. (WRC-97)

547E *Alternative allocation*: in the United States, the band 33-33.4 GHz is allocated to the radionavigation service on a primary basis. (WRC-97)

548 In designing systems for the inter-satellite service in the band 32.3-33 GHz, for the radionavigation service in the band 32-33 GHz, and for the space research service (deep space) in the band 31.8-32.3 GHz, administrations shall take all necessary measures to prevent harmful interference between these services, bearing in mind the safety aspects of the radionavigation service (see Recommendation **707**). (WRC-03)

549 *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Egypt, the United Arab Emirates, Gabon, Indonesia, Iran (Islamic Republic of), Iraq, Israel, the Libyan Arab Jamahiriya, Jordan, Kuwait, Lebanon, Malaysia, Mali, Malta, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, Singapore, Somalia, Sudan, Sri Lanka, Togo, Tunisia and Yemen, the band 33.4-36 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-03)

549A In the band 35.5-36.0 GHz, the mean power flux-density at the Earth's surface, generated by any spaceborne sensor in the Earth exploration-satellite service (active) or space research service (active), for any angle greater than 0.8° from the beam centre shall not exceed 73.3 dB(W/m^2) in this band. (WRC-03)

550 *Different category of service:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan and Turkmenistan, the allocation of the band 34.7-35.2 GHz to the space research service is on a primary basis (see No. **5.33**). (WRC-03)

551 (SUP - WRC-97)

551A (SUP - WRC-03)

551AA (SUP - WRC-03)

551B (SUP - WRC-2000)

551C (SUP - WRC-2000)

551D (SUP - WRC-2000)

551E (SUP – WRC - 2000)

551F *Different category of service*: in Japan, the allocation of the band 41.5-42.5 GHz to the mobile service is on a primary basis (see No. **5.33**).(WRC-97)

551G (SUP - WRC-03)

551H The equivalent power flux-density (epfd) produced in the band 42.5 -43.5 GHz by all space stations in any non-geostationary -satellite system in the fixed-satellite service (space-to-Earth), or in the broadcasting-satellite service (space-to-Earth) operating in the 42-42.5 GHz band, shall not exceed the following values at the site of any radio astronomy station for more than 2% of the time:

- 230 dB(W/m^2) in 1 GHz and –246 dB(W/m^2) in any 500 kHz of the 42.5-43.5 GHz band at the site of any radio astronomy station registered as a single-dish telescope; and
- 209 dB(W/m^2) in any 500 kHz of the 42.5 -43.5 GHz band at the site of any radio astronomy station registered as a very long baseline interferometry station.

These epfd values shall be evaluated using the methodology given in

Recommendation ITU-R S.1586 and the reference antenna pattern and the maximum gain of an antenna in the radio astronomy service given in Recommendation ITU-R RA.1631 and shall apply over the whole sky and for elevation angles higher than the minimum operating angle θ_{min} of the radiotelescope (for which a default value of 5° should be adopted in the absence of notified information).

These values shall apply at any radio astronomy station that either:

- was in operation prior to 5 July 2003 and has been notified to the Bureau before 4 January 2004; or
- was notified before the date of receipt of the complete Appendix **4** information for coordination or notification, as appropriate, for the space station to which the limits apply.

Other radio astronomy stations notified after these dates may seek an agreement with administrations that have authorized the space stations. In Region 2, Resolution **743 (WRC -03)** shall apply. The limits in this footnote may be exceeded at the site of a radio astronomy station of any country whose administration so agreed. (WRC-03)

551I The power flux-density in the band 42.5 -43.5 GHz produced by any geostationary space station in the fixed-satellite service (space-t o-Earth), or the broadcasting-satellite service (space-t o-Earth) operating in the 42-42.5 GHz band, shall not exceed the following values at the site of any radio astronomy station:

- 137 dB(W/m^2) in 1 GHz and –153 dB(W/m^2) in any 500 kHz of the 42.5-43.5 GHz band at the site of any radio astronomy station registered as a single-dish telescope; and
- 116 dB(W/m^2) in any 500 kHz of the 42.5 -43.5 GHz band at the site of any radio astronomy station registered as a very long baseline interferometry station.

These values shall apply at the site of any radio astronomy station that either:

- was in operation prior to 5 July 2003 and has been notified to the Bureau before 4 January 2004; or
- was notified before the date of receipt of the complete Appendix **4** information for coordination or notification, as appropriate, for the space station to which the limits apply.

Other radio astronomy stations notified after these dates may seek an agreement with administrations that have authorized the space stations. In Region 2, Resolution **743 (WRC -03)** shall apply. The limits in this footnote may be exceeded at the site of a radio astronomy station of any country whose administration so agreed. (WRC-03)

552 The allocation of the spectrum for the fixed-satellite service in the bands 42.5-43.5

GHz and 47.2-50.2 GHz for Earth-to-space transmission is greater than that in the band 37.5-39.5 GHz for space-to-Earth transmission in order to accommodate feeder links to broadcasting satellites. Administrations are urged to take all practicable steps to reserve the band 47.2-49.2 GHz for feeder links for the broadcasting-satellite service operating in the band 40.5-42.5 GHz.

552A The allocation to the fixed service in the bands 47.2-47.5 GHz and 47.9-48.2 GHz is designated for use by high altitude platform stations. The use of the bands 47.2-47.5 GHz and 47.9-48.2GHz is subject to the provisions of Resolution **122 (WRC-97)** *. (WRC-97)

553 In the bands 43.5-47 GHz and 66-71 GHz, stations in the land mobile service may be operated subject to not causing harmful interference to the space radiocommunication services to which these bands are allocated (see No. **5.43**). (WRC-2000)

554 In the bands 43.5-47 GHz, 66-71 GHz, 95-100 GHz, 123-130 GHz, 191.8-200 GHz and 252-265 GHz, satellite links connecting land stations at specified fixed points are also authorized when used in conjunction with the mobile-satellite service or the radionavigation-satellite service.(WRC-2000)

554A The use of the bands 47.5-47.9 GHz, 48.2-48.54 GHz and 49.44-50.2 GHz by the fixed-satellite service (space-to-Earth) is limited to geostationary satellites. (WRC-03)

555 *Additional allocation:* the band 48.94-49.04 GHz is also allocated to the radio astronomy service on a primary basis. (WRC-2000)

555A (SUP - WRC-03)

555B The power flux-density in the band 48.94-49.04 GHz produced by any geostationary space station in the fixed-satellite service (space-to-Earth) operating in the bands 48.2-48.54 GHz and 49.44-50.2 GHz shall not exceed –151.8 dB(W/m^2) in any 500 kHz band at the site of any radio astronomy station. (WRC-03)

556 In the bands 51.4-54.25 GHz, 58.2-59 GHz and 64-65 GHz, radio astronomy observations may be carried out under national arrangements. (WRC-2000)

556A Use of the bands 54.25-56.9 GHz, 57-58.2 GHz and 59-59.3 GHz by the inter-satellite service is limited to satellites in the geostationary-satellite orbit. The single-entry power flux-density at all altitudes from 0km to 1000 km above the Earth's surface produced by a station in the inter-satellite service, for all conditions and for all methods of

* *Note by the Secretariat:* This Resolution was revised by WRC-03.

modulation, shall not exceed 147 dB(W/(m^2 100 MHz)) for all angles of arrival. (WRC-97)

556B *Additional allocation:* in Japan, the band 54.25-55.78 GHz is also allocated to the mobile service on a primary basis for low-density use. (WRC-97)

557 *Additional allocation:* in Japan, the band 55.78-58.2 GHz is also allocated to the radiolocation service on a primary basis. (WRC-97)

557A In the band 55.78-56.26 GHz, in order to protect stations in the Earth exploration-satellite service (passive), the maximum power density delivered by a transmitter to the antenna of a fixed service station is limited to 26 dB(W/MHz). (WRC-2000)

558 In the bands 55.78-58.2 GHz, 59-64 GHz, 66-71 GHz, 122.25-123 GHz, 130-134 GHz, 167-174.8 GHz and 191.8-200 GHz, stations in the aeronautical mobile service may be operated subject to not causing harmful interference to the inter-satellite service (see No. **5.43**). (WRC-2000)

558A Use of the band 56.9-57 GHz by inter-satellite systems is limited to links between satellites in geostationary-satellite orbit and to transmissions from non-geostationary satellites in high-Earth orbit to those in low-Earth orbit. For links between satellites in the geostationary-satellite orbit, the single entry power flux-density at all altitudes from 0 km to 1000 km above the Earth's surface, for all conditions and for all methods of modulation, shall not exceed –147 dB(W/(m^2 100 MHz)) for all angles of arrival. (WRC-97)

559 In the band 59-64 GHz, airborne radars in the radiolocation service may be operated subject to not causing harmful interference to the inter-satellite service (see No. **5.43**). (WRC-2000)

559A The band 75.5-76 GHz is also allocated to the amateur and amateur-satellite services on a primary basis until the year 2006. (WRC-2000)

560 In the band 78-79 GHz radars located on space stations may be operated on a primary basis in the Earth exploration-satellite service and in the space research service.

561 In the band 74-76 GHz, stations in the fixed, mobile and broadcasting services shall not cause harmful interference to stations of the fixed-satellite service or stations of the broadcasting-satellite service operating in accordance with the decisions of the appropriate frequency assignment planning conference for the broadcasting-satellite service. (WRC-2000)

561A The 81-81.5 GHz band is also allocated to the amateur and amateur-satellite services on a secondary

561B In Japan, use of the band 84-86 GHz, by the fixed-satellite service (Earth-to-space) is limited to feeder links in the broadcasting-satellite service using the geostationary -satellite orbit. (WRC-2000)

562 The use of the band 94-94.1 GHz by the Earth exploration-satellite (active) and space research (active) services is limited to spaceborne cloud radars. (WRC-97)

562A In the bands 94 -94.1 GHz and 130-134 GHz, transmissions from space stations of the Earth exploration-satellite service (active) that are directed into the main beam of a radio astronomy antenna have the potential to damage some radio astronomy receivers. Sp ace agencies operating the transmitters and the radio astronomy stations concerned should mutually plan their operations so as to avoid such occurrences to the maximum extent possible. (WRC-2000)

562B In the bands 105-109.5 GHz, 111.8 -114.25 GHz, 155. 5-158.5 GHz and 217-226 GHz, the use of this allocation is limited to space-based radio astronomy only. (WRC-2000)

562C Use of the band 116 -122. 25 GHz by the inter-satellite service is limited to satellites in the geostationary -satellite orbit. The single-entry power flux-density produced by a station in the inter -satellite service, for all conditions and for all methods of modulation, at all altitudes from 0 km to 1 000 km above the Earth's surface and in the vicinity of all geostationary orbital posit ions occupied by passive sensors, shall not exceed −148 dB(W/(m^2 MHz)) for all angles of arrival. (WRC-2000)

562D *Additional allocation*: In Korea (Rep. of), the bands 128-130 GHz, 171-171.6 GHz, 172.2 -
172.8 GHz and 173.3-174 GHz are also allocated to the radio astronomy service on a primary basis until 2015. (WRC-2000)

562E The allocation to the Earth exploration-satellite service (active) is limited to the band 133.5 -134 GHz. (WRC-2000)

562F In the band 155.5 -158.5 GHz, the allocation to the Earth exploration-satellite (passive) and space research (passive) services shall terminate on 1 January 2018. (WRC-2000)

562G The date of entry into force of the allocation to the fixed and mobile services in the band 155.5-158.5 GHz shall be 1 January 2018. (WRC-2000)

562H Use of the bands 174.8-182 GHz and 185 -190 GHz by the inter-satellite service is limited to satellites in the geostationary -satellite orbit. The single-entry power flux-density produced by a station in the inter-satellite service, for all conditions and for all

methods of modulation, at all altitudes from 0 to 1 000 km above the Earth's surface and in the vicinity of all geostationary orbital positions occupied by passive sensors, shall not exceed 144 dB(W/(m^2 MHz)) for all angles of arrival. (WRC-2000)

563 (SUP - WRC-03)

563A In the bands 200-209 GHz, 235-238 GHz, 250-252 GHz and 265-275 GHz, ground-based passive atmospheric sensing is carried out to monitor atmospheric constituents. (WRC-2000)

563B The band 237.9-238 GHz is also allocated to the Earth exploration-satellite service (active) and the space research service (active) for spaceborne cloud radars only. (WRC-2000)

565 The frequency band 275-1 000 GHz may be used by administrations for experimentation with, and development of, various active and passive services. In this band a need has been identified for the following spectral line measurements for passive services:

- radio astronomy service: 275-323 GHz, 327-371 GHz, 388-424 GHz, 426-442 GHz, 453-510 GHz, 623-711 GHz, 795-909 GHz and 926-945 GHz;
- Earth exploration-satellite service (passive) and space research service (passive): 275-277 GHz, 294-306 GHz, 316-334 GHz, 342-349 GHz, 363-365 GHz, 371-389 GHz, 416-434 GHz, 442-444 GHz, 496-506 GHz, 546-568 GHz, 624-629 GHz, 634-654 GHz, 659-661 GHz, 684-692 GHz, 730-732 GHz, 851-853 GHz and 951-956 GHz.

Future research in this largely unexplored spectral region may yield additional spectral lines and continuum bands of interest to the passive services. Administrations are urged to take all practicable steps to protect these passive services from harmful interference until the date when the allocation Table is established in the above-mentioned frequency band. (WRC-2000)

6.6 FOOTNOTES EXCLUSIVE TO ECTEL MEMBER STATES

E.1

The range 1605-1705 kHz is allocated to Broadcasting on an exclusive basis. Assignments require ITU coordination.

E.2

The following frequencies are allocated for the provision of Maritime Health and Safety Services

21 74.5 kHz:	for Search and Rescue (SAR)
2 182 kHz :	for GMDSS
21 87.5 kHz :	for Distress and Safety Radio Communication Services using DSC

E.3

The band 88.0-89.6 MHz is allocated to Community Radio Service on a primary basis. Any FM Broadcast Services that have existing assignments in this band on May 1st 2011 may continue on their existing assigned frequencies. The power limit for the use of this band by Community Radio Service is 25 W.

The occupied Bandwidth for FM broadcast stations is limited to 150 kHz unless otherwise authorized by the NTRC.

E.4

The band **235-267 MHz**. is allocated to Digital Audio Broadcast services.

E.5

The band 335 MHz – 399.9 MHz is allocated to Broadcasting services for Studio to Transmitter Links, STL

E.6

The band 454.975 MHz - 470 MHz is allocated to Broadcasting for Radio and Television outside Broadcast operation on a primary basis.

E.7

The band 462.5625-467.7125 is allocated to Family Radio Services on a secondary basis.

E.8

In the Commonwealth of Dominica the band 912-915 is allocated to GSM Services

E.9

The band 1710-1990 is allocated for GSM services

E.10

The band 1990-2025 MHz is allocated for future mobile services; e.g. 3G mobile services.

E.11

The following bands are allocated for the provision of broadband services on a primary basis:

2520 - 2690 MHz

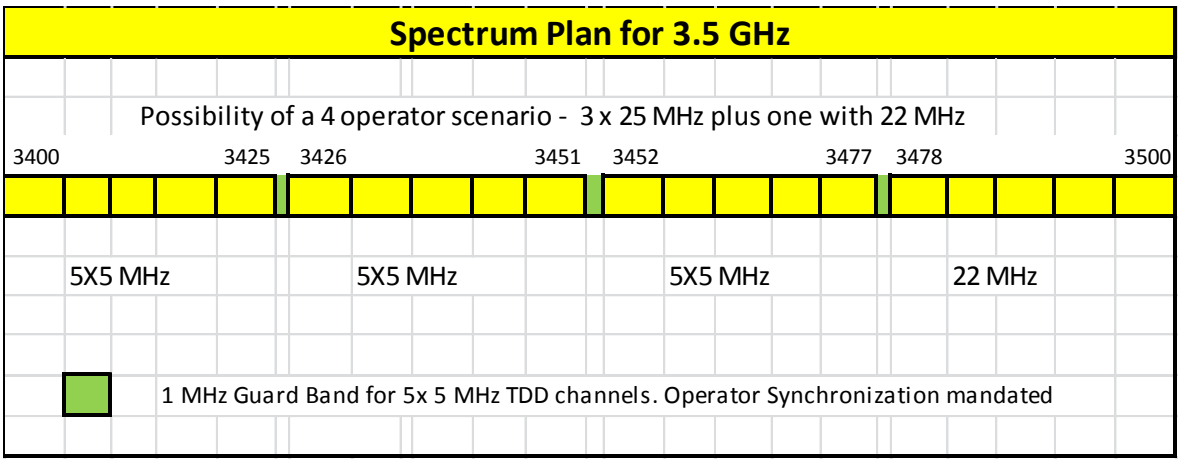
3 400 - 3700 MHz

Band Plans for Broadband Services

3.5 GHz band

The 3.5 GHz band plan for the ECTEL Member States is outlined in the table below. There is provision for licences to be awarded to four providers: 3 with 25 MHz each (5 blocks of 5 MHz each) plus one with 22 MHz.

TABLE 1:



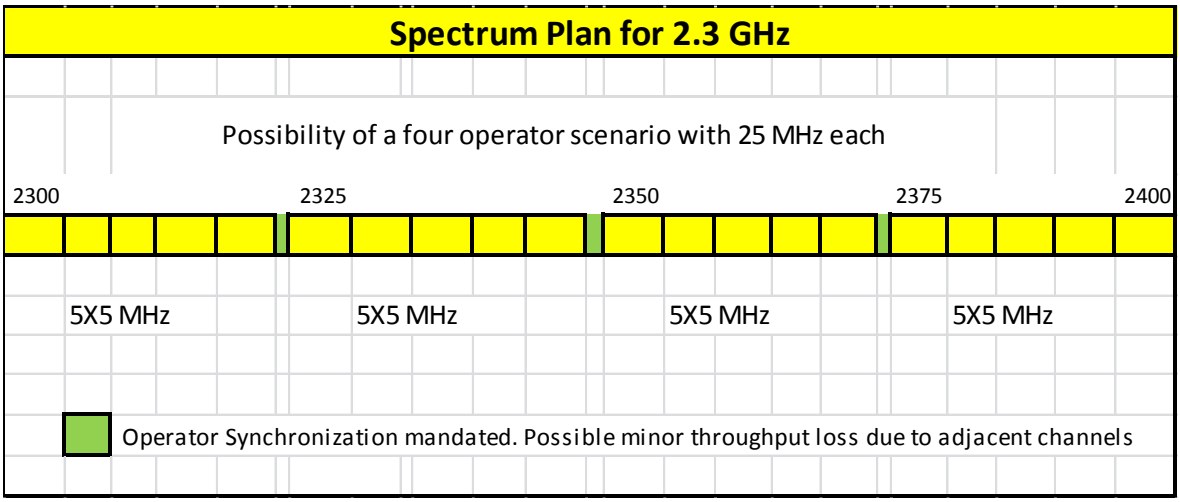
2.5 GHz band

The range 2520 - 2690 MHz is allocated for mobile broadband. 40MHz is assignable per operator with 5/10 MHz channels with both TDD and FDD options.

2.3 GHz band

The 2.3 GHz band plan for the ECTEL Member States is outlined in the table below. There is provision for licences to be awarded to four providers with 25 MHz each (5 blocks of 5 MHz each).

TABLE 2:



E.12

The following bands are proposed for Spread Spectrum in the ECTEL Member States and do not require a licence for low powered equipment being used for non-commercial purposes with appropriately specified technical parameters:

2.4 – 2.4835 GHz.

5.150 - 5.350 GHz; and

5.725 - 5.875 GHz (Indoor use)

E.13

The following bands are allocated for LMDS/ MMDS (including broadband wireless) applications:

2.5 GHz (2535 - 2655 MHz)

2.7 - 2.9 GHz

3.3 - 3.4 GHz

5.0 GHz (5725 - 5825 MHz)

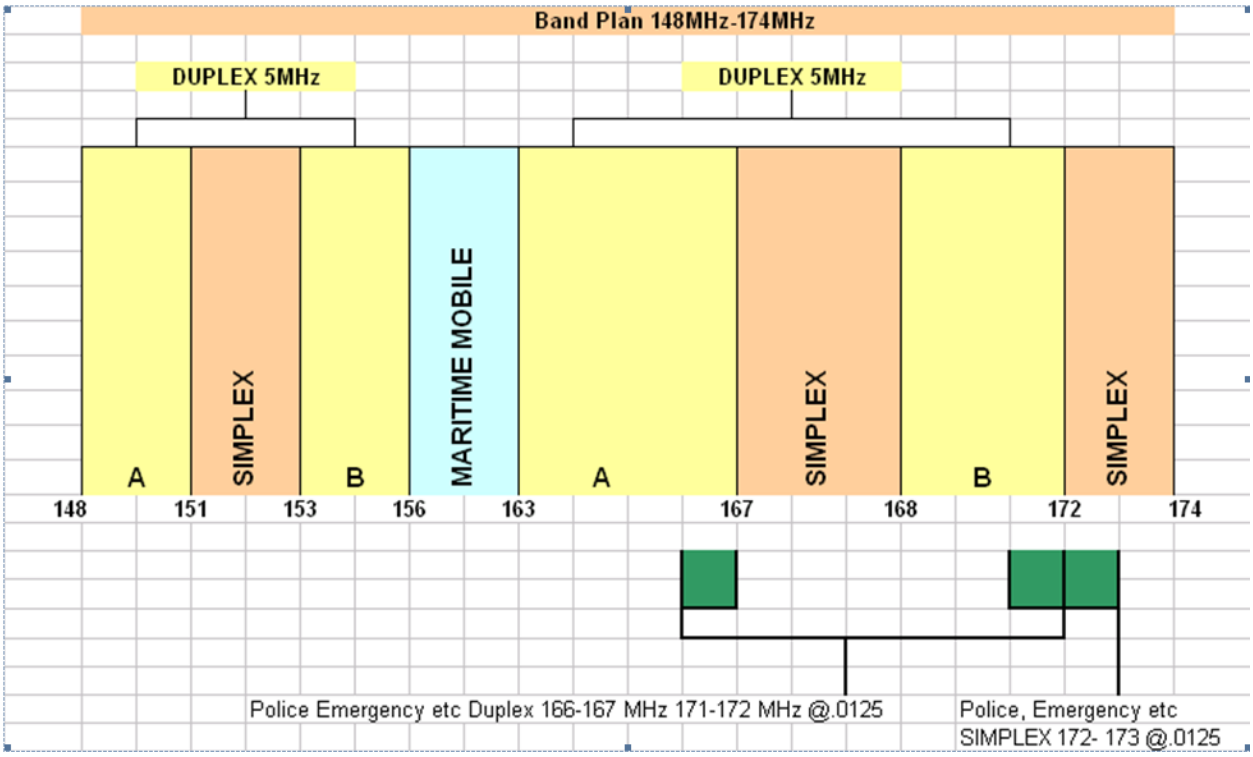
10.7 – 11.7 GHz

E.14

The allocation for the VHF land mobile band is 148 MHz to 174 MHz, with 156 MHz to 163 MHz allocated for maritime mobile use (this is a standard channelized band with international standards). The land mobile band is further divided into 2 duplex band with 5MHz separation between the transmit frequencies and the receive frequencies, and 3 bands allocated for simplex operation. The channel spacing will be 12.5 kHz.

3 MH (2 MHz for duplex operation and 1 MHz for simplex operation) is allocated for emergency and NGO use as seen in the table below.

Land Mobile Band Plan



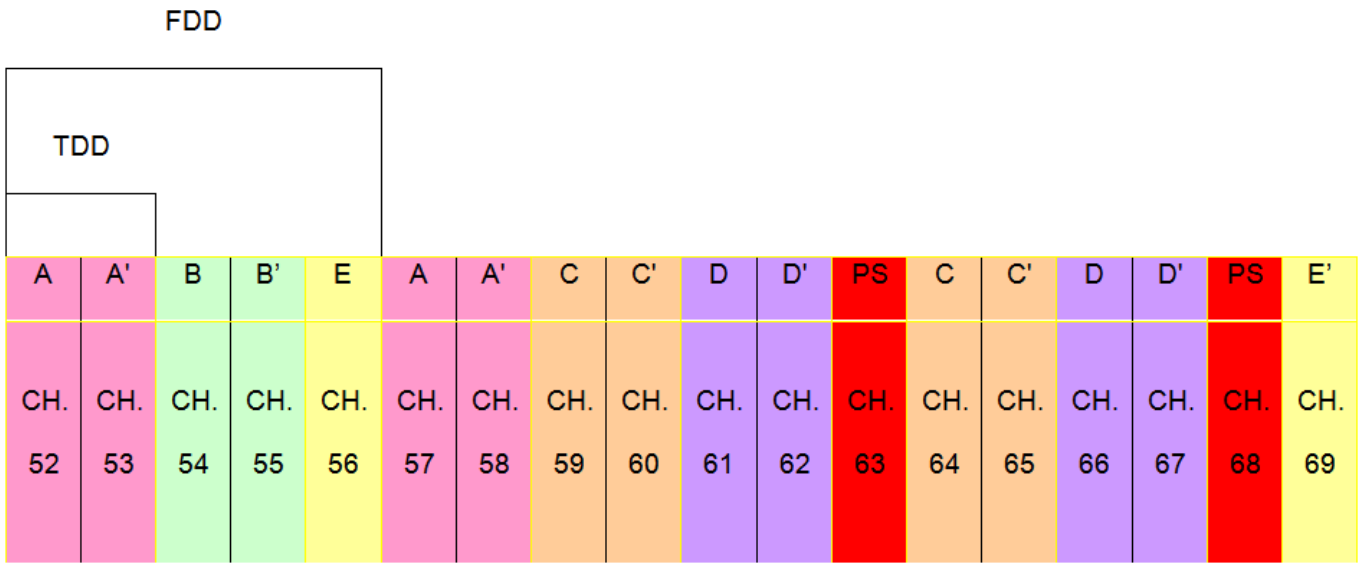
E.15

The band 806MHz to 824.040 MHz is allocated for UHF Land Mobile Service

E.16

The range 698 to 806 MHz is allocated to wireless broadband access services.

700 MHz BAND PLAN



BLOCK	Bandwidth	Frequency and Pairing	
A:	12 MHz	(698-704 MHz and 728-734 MHz)	2x6 MHz
A':	12 MHz	(704-710 MHz and 734-740 MHz)	2x6 MHz
*B:	6 MHz	(710-716 MHz)	6 MHz
*B':	6 MHz	(716-722 MHz)	6 MHz
*E:	6 MHz	(722-728 MHz)	6 MHz
*E':	6 MHz	(800-806 MHz)	6 MHz

C:	12 MHz	(740-746 MHz and 770-776 MHz)	2x6 MHz
C':	12 MHz	(746-752 MHz and 776-782 MHz)	2x6 MHz
D:	12 MHz	(752-758 MHz and 782-788 MHz)	2x6 MHz
D':	12 MHz	(758-764 MHz and 788-794 MHz)	2x6 MHz
**PS:	6 MHz	(764-770 MHz)	6 MHz
**PS':	6 MHz	(794-800 MHz)	6 MHz

* Reserved for future use

** Public and Private Safety Network (emergency, police etc)

Technical Specifications

In order to operate BWA equipment to offer service in the 700 MHz band all operators using the radio spectrum must adhere to and shall not exceed the maximum technical specifications identified below. These standards are adopted from the FCC, industry Canada and ESTI standardization for BWA service in the 700 MHz band.

Maximum Effective Radiated Power (E.R.P.)[5]

Base Station – 30dBW

Fixed and Mobile Station – 14.8 dBW

Portable (handheld) Station – 4.8 dBW

Modulation scheme

Digital (BPSK, QPSK etc.)

[5] Notwithstanding these parameters identified, amended or additional technical operating conditions may be instituted and identified in the respective schedule of the licence document for the specific radiocommunications system deployed.

7.0 SPECTRUM MANAGEMENT IN ECTEL MEMBER STATES

7.1 TECHNICAL PLANNING TOOLS

The Spectrum plan is the principal technical document providing authority to the information on the allocation of frequency bands to the different types of services used in radiocommunication. The Plan in its formulation takes into account the policy and objectives related to the future use of radio frequency in the Member States. The Spectrum Plan provides valuable information for radio system planning and implementation within the ECTEL Member States. System designers must consult the NTRC prior to any system designs utilizing spectrum resource as there are critical elements which are integral in the spectrum management process within the ECTEL States.

The critical elements which comprise the planning tools in spectrum management are:
- o Bands: allocated exclusively to broadcasting.
- o Band plans and Channel assignment plans.
- o Designation of licensed and unlicensed bands.
- o Requirements for frequency assignments in legal instruments.
- o Conditions applicable to spectrum licensing, apparatus licensing, equipment authorization, licence types viz. Individual licence, Class license, requirements for standards compliance, spectrum harmonization.

Electronic access to the spectrum database is available to the public from the ECTEL Web Site at http://www.ectel.int

The management and control of the electromagnetic spectrum are carried out by the National Telecommunications Regulatory Commission in each Member State.

8.0 BROADCASTING SERVICES

The ECTEL Regional Spectrum Management Plan makes provision for the allocation of spectrum for the provision of broadcasting services in keeping with the relevant provisions of the Telecommunications Act 2000.

The bands as designated under the plan are:

a) 525-1705 kHz.AM radio transmitters are assigned frequencies in this band

b) 44-50 MHz and 54-72 MHz. Analog Television transmitters are assigned frequencies in this band.(TV channels 2,3 and 4)

c) 76-88 MHz. Analog television transmitters are assigned frequencies in this band (TV channels 5 and 6)

d) 88-108 MHz. FM radio transmitters are assigned frequencies in this band. FM radio broadcasting is allocated 100 channels from 88.1 to 107.9 MHz.

e) The frequencies assigned in the 88-108 MHz band are for the delivery of FM broadcasting and are not intended to be used for the purpose of linking one broadcast transmitter site to another broadcast transmitter site.

f) 335-399 MHz Studio to Transmitter Links are assigned frequencies in this band.

g) 174-216 MHz. Analog television transmitters are assigned frequencies in this band.

h) 470-512 MHz. Analog television providing UHF television broadcast are assigned frequencies in this band.

i) The assignment of frequencies in the respective broadcast bands are made subject to the adoption of the relevant standards promulgated under the Broadcast Regulations.

8.1 AM STANDARDS

The standards contained in the AM Standards document are the conditions necessary for the establishment of sound broadcasting in the Medium Wave (AM) band and in addition for the issuance of a Type Approval Certification for AM transmitters.

Type Approval Certification will be issued in accordance with accepted International Standards that the equipment has met or test carried by the applicant and certified by a professional engineer.

The Authority reserves the right to require adjustments to be made to the equipment should it cause interference notwithstanding having been certified previously.

The assignment of a broadcast channel is made in conformity with the Americas Regional Plan, RJ81.

8.2 DEFINITIONS

8.2.1 AM broadcast Channel

The band of frequencies occupied by the carrier and the upper and lower sidebands of an AM broadcast signal with the carrier frequency at the centre. Channels are designated by their assigned carrier frequencies. The 117 carrier frequencies assigned to AM broadcast stations begin at 540 kHz and progress in 10 kHz steps to 1700 kHz.

8.2.2 Class A Station.

A Class A station is an unlimited time station (that is, it can broadcast 24 hours per day) that operates on a clear channel. The operating power shall not be less than 10 kilowatts (kW) or more than 50 kW.

8.2.3 Class B Station.

A Class B station is an unlimited time station. Class B stations are authorized to operate with a minimum power of 0.250 kW (250 watts) and a maximum power of 50 kW. (If a Class B station operates with less than 0.250 kW, the RMS must be equal to or greater than 141 mV/m at 1 km for the actual power.) If the station is authorized to operate in the expanded band (1610 to 1700 kHz), the maximum power is 10 kW.

8.2.4 Class C Station.

A Class C station is an unlimited time station that operates on a local channel. The power shall not be less than 0.25 kW nor more than 1 kW. Class C stations that are licensed to operate with 0.100 kW may continue to operate as licensed.

8.2.5 Class D Station.

A Class D station operates either daytime, limited time, or unlimited time with a nighttime power less than 0.250 kW and an equivalent RMS antenna field less than 141 mV/m at 1 km for the actual power. Class D stations shall operate with *daytime* powers not less than 0.250 kW or more than 50 kW. NOTE: If a station is an existing daytime-only station, its class will be Class D.

8.3 FM STANDARDS

8.3.1 The standards contained in the FM Standards document are the conditions necessary for the establishment of sound broadcasting in the FM band and in addition for the issuance of a Type Approval Certification for FM transmitters.

8.3.2 Type Approval Certification will be issued in accordance with accepted international standards that the equipment has met or test carried by the applicant and certified by a professional engineer.

8.3.3 The Authority [NTRC] reserves the right to require adjustments to be made to the equipment should it cause interference notwithstanding having been certified previously

8.3.4 Major changes in design made to the equipment, other than for the replacement of defective parts, will void the certification unless notified and approved by the Authority.

8.3.5 Transmitters will be authorized for power levels which will provide the minimum

accepted field strength of 70 dBu (3.16μV/m) but shall not exceed 1KW transmitter power and an ERP of 3dBK

8.3.6 Licensees of FM stations will not be permitted to operate same programming in multiple sub-bands

8.3.7 The use of prime (broadcast) frequencies (88-108 MHz) for program rebroadcast will not be permitted.

9.0 PUBLIC MOBILE TELEPHONE SERVICES BANDS

The Public Mobile Telephone or Cellular services in the ECTEL Member States utilize two types of technologies. These technologies are based on global standards and provide for domestic and international use. The technologies are (i) Time Division Multiple Access (TDMA) and (ii) Global Standard for Mobile System (GSM). Other cellular technologies are not presently used in the provision of public mobile telephone services in ECTEL Member States.

The spectrum allocated to the service providers is provided on an equitable basis thereby ensuring that, in each island, all service providers have the same amount of bandwidth. The spectrum used by the service providers follows international practices ensuring that equipment can be sourced from suppliers anywhere in the world.

There are four bands of spectrum allocated for the provision of cellular services in the ECTEL region. These are; the 800 MHz, 900 MHz, 1800 MHz and 1900 MHz. The actual bands allocated in the plan are associated with the following types of technologies.

TDMA – 800 is established in the band 825-835 MHz for Mobile transmit and 870 – 880 MHz for Base Transmit

GSM - 900 is established in the band 890-915 MHz and 935-960 MHz
GSM -1800 is established in the band 1710-1785 MHz and 1805-1880 MHz
GSM -1900 is established in the band 1870-1910 and 1950-1990 MHz

In this region the GSM 900 has been extended to provide a larger frequency range. The extender region starts from 880 MHz and creates a new band 880-915 MHz (Uplink) and 925-960 MHz down link. The new band 880-890 MHz and 925-935 MHz is called E- GSM.

A new GSM band which uses the 450-MHz band and known as the GSM-400 will be allocated for future use in the ECTEL Member States.

10 LINK LENGTH POLICY

The use of Fixed Local Loop connections in providing wireless access is a new trend in providing voice and data as an alternative to cable based networks. The role of point-to- point digital Microwave radio is becoming extremely important in creating successfully run Wireless Local Loop networks.

The need for efficiency in the utilization of spectrum makes appropriate planning and management for the prevention of misuse and interference between operators high on the agenda of the spectrum manager. The achievement of this goal is made possible with the selection and implementation of appropriate radio equipment for deployment within the network. The radio equipment chosen must employ designs having characteristics/specification as outlined below.

- High Spectral efficiency for the minimization of large channel bandwidth
- Radio performance of a high standard created by modern radio design utilizing facilities for the enhancement of radio wave propagation.
- High system gain at the output stage in addition to received signal threshold
- High environmental specification for reliable operation in harsh operating condition
- Equipment reliability and maintainability for low life cycle cost

The implementation of a Link Length Policy ensures that the length of the particular path will determine the frequency bands which will be made available for the operator to choose from. The rule of thumb is that the shorter the path length the higher the frequency to be chosen. Conversely, if the path length is very long the operator will be given the choice of lower frequencies.

For the policy to be effective, site selection will become a very important determinant. The plan is geared to efficiency in the use of the spectrum and operators will be advised to select sites that match the frequency which are available. Other factors influencing the choice of frequency band within the policy are the capacity of the link to be established, the terrain, and rainfall and antenna size.

11.0 UNLICENSED SPECTRUM

The spectrum bands identified as ISM bands and designated in the Plan as 902-928 MHz, 2.4–2.483 GHz and 5.775-5.83 GHz are under consideration for use as license exempt spectrum in the ECTEL Member States.

12.0 CHANNELIZATION PLAN

The radio frequency spectrum in the ECTEL Member States is allocated to operators on a harmonized basis. This ensures that those spectrum bands, which are used for broadband networks, are available to as many operators as possible.

This harmonization is achieved by using a standardized channelization scheme in determining the channel spacing or transmits to transmit separation for the respective bands. The separation between transmit and receive frequencies is also determined by the same arrangements as set out in the ITU-R F-Series publications. To ensure compliance with the channelization plan the technical characteristics of radio equipment must conform to ITU-R Radio Regulations in force and any technical parameters specified in documents such as Frequency authorization or Type Approval issued by the NTRC.

The establishment of channel schemes is based on homogenous arrangement within a particular band and may result in different number of channels depending on the channel capacity required. The derived channels are established in the lower part of the band as the Go channels and Return channels in the upper part of the band. The use of different polarization is employed to create reuse of frequencies where the demand for that band is great. In a number of cases the application of interstitial channeling is also employed for spectrum optimization.

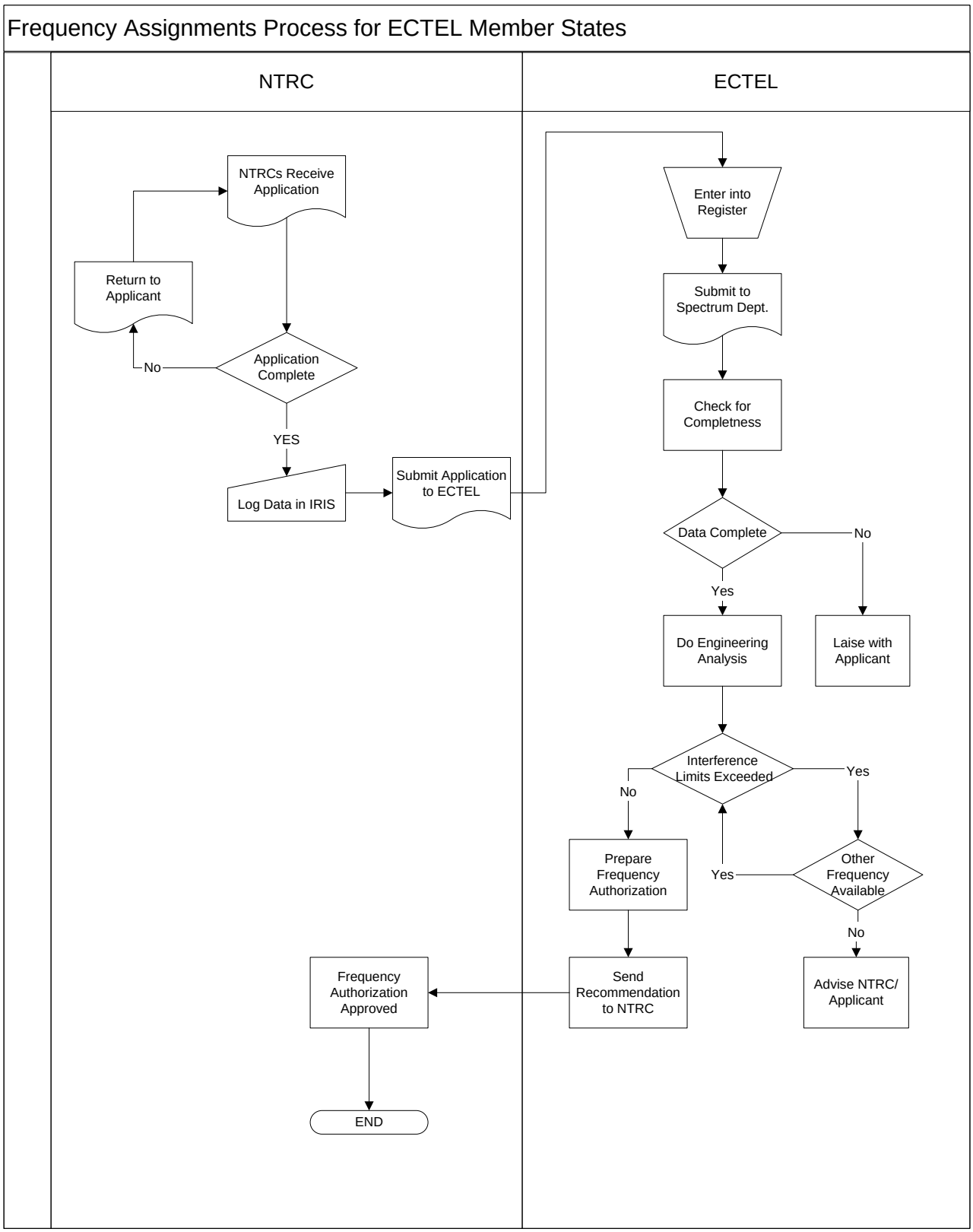
13.0 ASSIGNMENT PROCESS

The assignment of spectrum is carried out after an applicant has been issued one or more of the three types of licences. The different types of licences are known as:

1. Individual Licence
2. Class Licence
3. Special Licence

The process by which spectrum is granted to the applicant is called Frequency Authorization. An applicant desirous of obtaining spectrum for a wireless network or communication applies to the NTRC for one of the above types of licence and the appropriate frequency authorization. Having been granted the licence the NTRC submits the request for frequency authorization to ECTEL where the technical evaluation is conducted. The basis of the determination is to ensure that the operation of the network will not contribute to electro-magnetic incompatibility within the spectrum. The evaluation also ensures that the new operator would not affect radio systems in operation when the network comes on stream.

Upon completion, a recommendation is made to the minister responsible for telecommunications. The minister taking account of the recommendation grants or rejects the request.


Frequency Assignments Process for ECTEL Member States
NTRC
ECTEL
NTRCs Receive Application
Return to Applicant
Application Complete
No
YES
Log Data in IRIS
Submit Application to ECTEL
Enter into Register
Submit to Spectrum Dept.
Check for Completness
Data Complete
No
Yes
Do Engineering Analysis
Laise with Applicant
Interference Limits Exceeded
Yes
No
Prepare Frequency Authorization
Yes
Other Frequency Available
No
Send Recommendation to NTRC
Advise NTRC/ Applicant
Frequency Authorization Approved
END

14.0 SPECIAL RECALL

The authorisation to use the spectrum is based on the need to use the spectrum and the availability of the spectrum. The plan allocates spectrum to various services as dictated by the policy and objectives of the Member State. The assignment of spectrum to operators is always subject to the availability of spectrum and the need to develop the telecommunications infrastructure in the respective Member State.

The Minister may upon the advice of the Commission and consistent with the Spectrum management plan, reassign frequencies

a) to allow for the introduction of new technologies
b) where it is necessary to ensure the efficient use of the spectrum
c) where the overall demand for spectrum for a particular service cannot be met
d) where by virtue of expediency another licensee requests and the Minister considers it necessary to do so
e) where spectrum has not been utilized for a particular service after an extended period