Communications Regulatory Authority
State of Qatar

هيئة تنظيم الاتصالات
دولة قطر

Qatar National Frequency Allocation Plan and Specific Assignments

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QNFAP - PART 1
GENERAL INFORMATION

1. Introduction

The National Frequency Allocation Plan (NFAP) serves as a binding basis for the organizational units of the Administration responsible for frequency assignment so that they can fulfil their responsibilities in relation to frequency assignment. Frequency allocation in the NFAP includes the allocation of the frequency spectrum to the various radio services categories in accordance with the Radio Regulations of the International Telecommunication Union (ITU). The processes and mechanisms relevant to the preparation of the NFAP are presented and explained in the following chapters.

2. Principals of Spectrum Management

2.1 National level

As radio frequencies are limited resource, efficient use of this resource is essential for the functioning of modern communication societies. The Emiree Decree No. (42) of 2014 and the Telecommunications Law No. (34) of 2006 as amended by Law No. (17) of 2017 include a direct mandate for the body responsible for frequency management to act appropriately in order to ensure efficient and interference-free use of frequency. Regulation is fundamentally concerned with combining the various interests of frequency users and manufacturers within the aforementioned legal mandate.

In order for frequency regulation to be as target-oriented as possible, the sometimes-conflicting interests of the various frequency users must be recorded as accurately as possible and weighed against each other. The requirements of industry and the associated civil uses are largely tabled via the international working groups of the ITU. Individual project groups then examine the tabled requirements; the relevant bodies then draw up and adopt appropriate basic documentation. These jointly developed principles then serve to allow regionally and internationally harmonized use of frequency resources. The activity of these working groups is usually limited to civil frequency use. Discussion of military requirements does not take place within the bodies in question. To record the needs of military and civil defense, CRA convened a permanent coordination committee. This committee deals with the coordination of frequency use in bands, which are currently subject to joint, use according to the NFAP though which in future will also be subject to joint use. The aforementioned activities are ultimately reflected in the NFAP, which as mentioned above, must be considered as a legal basis document for the assignment of individual frequency rights by the relevant authorities.

As radio signals propagate across international borders, cross-border agreements regarding frequency use are vital both between neighboring countries and between economic interest blocks on a global scale. The use of all frequency resources is harmonized at the international level at the ITU World Radiocommunication Conferences in order to ensure efficient and interference-free use of the frequency spectrum. The respective decisions of the World Radiocommunication Conferences are stipulated in the Radio Regulations of 17 November 1995, specifically in Article 5 “Frequency allocations”.

2.2 International level

CRA analyses the spectrum requirements for existing and planned radio services in Qatar. This is necessary for efficient and equitable planning and coordination of frequencies in order to avoid interference. It is also necessary because CRA represents Qatar in regional and international bodies in the frequency sector, where it safeguards Qatar interests in order to promote them on an international (regional and global) level.

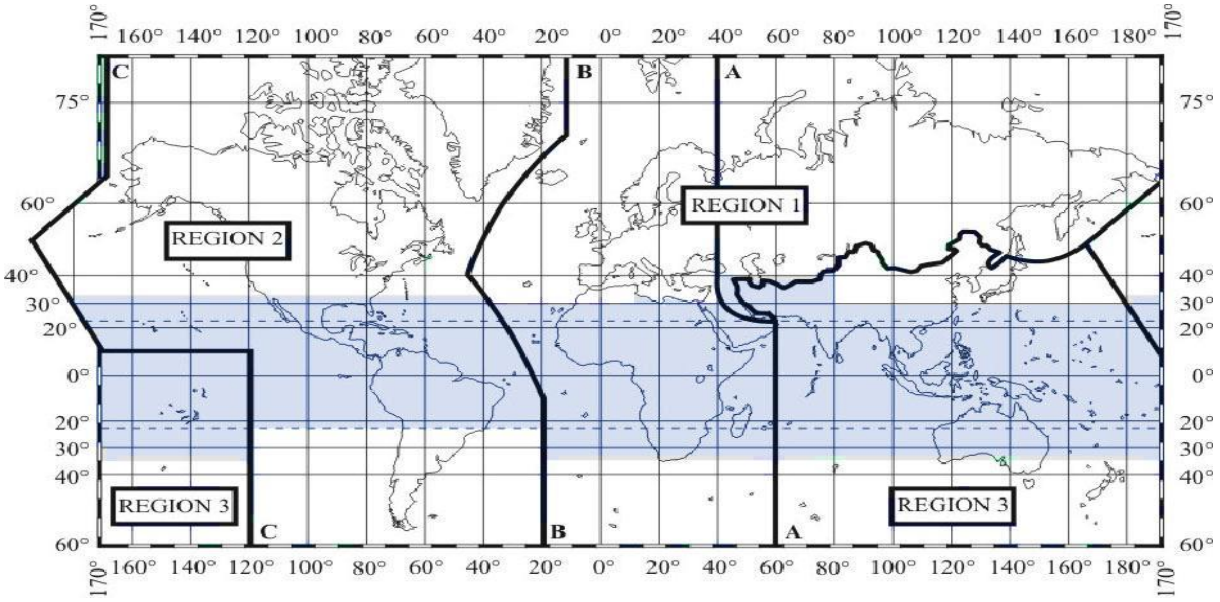
The Qatar strategy aims to regulate access to the frequency spectrum (for both commercial and non-commercial radio services) on a national and international level in a coordinated manner. It aims to ensure that Qatar rights are respected in accordance with international law. International bodies aim to harmonize the use of the spectrum by the various radio services. Any international decisions taken therefore play a part in national spectrum management.

The regional contact for harmonization of the frequency spectrum in the region is the Telecommunication Bureau of Gulf Countries Council. The Telecommunications Bureau provides a framework within administrations can develop provisions according to which the conditions for spectrum use can be harmonized with regard to market demand and technological developments.

The International Telecommunication Union Radiocommunication Sector (ITU-R) allocates worldwide frequencies to radio services in accordance with the Radio Regulations (RR). The RR is an international agreement, which regulates the use of frequency resources for all radio applications, as well as the orbital positions of geostationary and non-geostationary satellites. This agreement is binding for ITU member states. The RR are revised in the World Radiocommunication Conferences (WRC) to adapt the existing framework to spectrum requirements in order to refine existing applications or facilitate the introduction of new applications.

The NFAP assumes and supplements the relevant provisions of the RR for Qatar. International planning and harmonization work within the ITU results in “resolutions” and “recommendations”. The results of ITU World Conferences are set forth in “final acts”. With the adoption of the final acts, Qatar commits itself to comply with the new provisions of international law.

For the allocation of frequencies, International Telecommunication Union (ITU), a subsidiary of the United Nations, which deals with the Telecommunication sector, has divided the world into three Regions as shown on the following map:



The State of Qatar is signatory to International Telecommunication Union (ITU) convention and situated in 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. Whereas the lines A, B and C are defined as follows:

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.

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.

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.

The areas marked in blue (shaded area near around equator line) in the above map are the defined as tropical areas.

3. Definition of terms used

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.
Telecommunication:	Any transmission, emission or reception of signs, signals, writings, images and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic systems.
Radio:	A general term applied to the use of radio waves.
Radio waves or Hertzian waves:	Electromagnetic waves of frequencies arbitrarily lower than 3 000 GHz, propagated in space without artificial guide.
Radiocommunication:	Telecommunication by means of radio waves.
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.
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
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
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 Astronomy:	Astronomy based on the reception of radio waves of cosmic origin.
Radiocommunication service:	A service involving the transmission, emission and/or reception of radio waves for specific telecommunication purposes. 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.
Geostationary Satellite Orbit:	The orbit of a geosynchronous satellite whose circular and direct orbit lies in the plane of the Earth's equator
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.
Mobile service:	A radiocommunication service between mobile and land stations, or between mobile stations.
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.
Land mobile service:	A mobile service between base stations and land mobile stations, or between land 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 cost 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.
Global Maritime Distress and Safety System (GMDSS):	An internationally agreed-upon set of safety procedures, types of equipment, and communication protocols used to increase safety and make it easier to rescue distressed ships, boats and aircraft.
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.

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.
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.
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.
Amateur service:	A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs that are, 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.
Industrial, Scientific and Medical (ISM) applications:	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.
Citizens' Band radio:	A system of short-distance radio communications between individuals on a selection of 40 channels within the 27 MHz (11 m) band.
Radio astronomy service:	A service involving the use of radio astronomy.
Special service:	A radiocommunication service, not otherwise defined in this Section, carried on exclusively for specified needs of general utility, and not open to public correspondence
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.
Terrestrial station:	A station effecting terrestrial radiocommunication.
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 space station or other space object.
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.
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.
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.
Port station:	A coast station in the port operations 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.
Aeronautical station:	A land station in the aeronautical mobile service.
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 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.
Amateur station:	A station in the amateur service.
Radio astronomy station:	A station in the radio astronomy service.
Radar:	A radiodetermination system based on the comparison of reference signals with

radio signals reflected, or retransmitted, from the position to be determined.

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

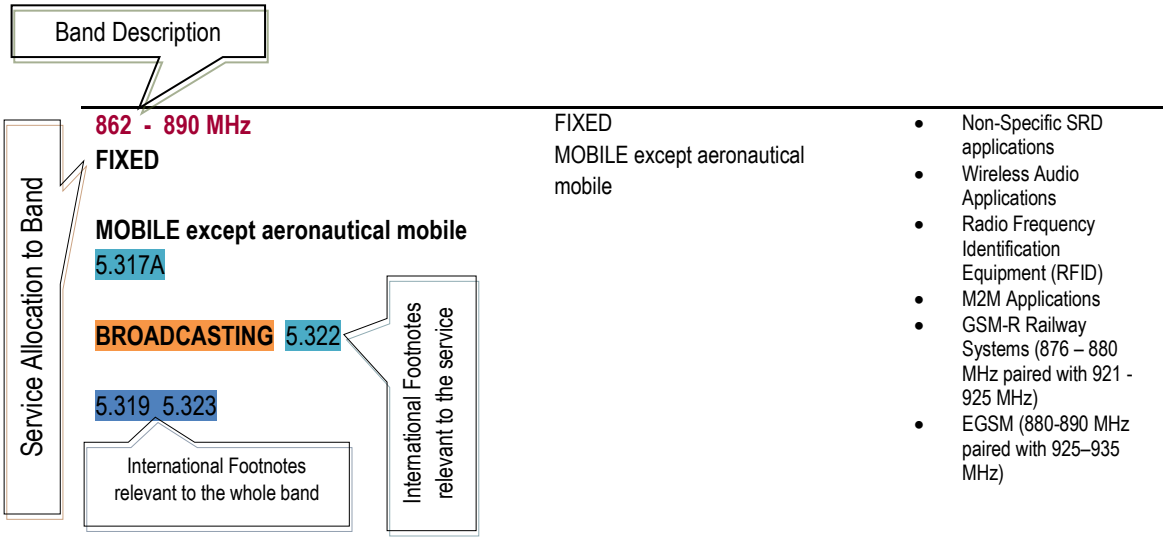
Satellite network: A satellite system or a part of a satellite system, consisting of only one satellite and the cooperating earth stations.

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

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.

Short Range Devices (SRD): The radio transmitters which provide either uni-directional or bi-directional communications, which have low capability of causing interference to other radio equipment. SRDs are used with either integral, dedicated or external antennas, and all modes of modulation are permitted subject to relevant standards. Applications include, but not exhaustively, tele-command, alarms data communication, meter reading, asset tracking, aids for hearing, movement detection and alert, remote controls and inductive systems.

4. How to read the frequency allocation table



Where, in a box of Table of Frequency Allocations a band is indicated as allocated to more than one service, either on a worldwide or Regional basis, such services are listed in the following order:

a) Services the names of which are printed in "capitals" (example: FIXED); these are called "primary" services.

b) Services the names of which are printed in "normal characters" (example: Mobile); these are called "secondary" services.

c) Additional remarks shall be printed in normal characters (example: MOBILE except aeronautical mobile).

Stations of a secondary service:

a) Shall not cause harmful interference to stations of primary services to which frequencies are already assigned or to which frequencies may be assigned at a later date.

b) Cannot claim protection from harmful interference from stations of a primary service to which frequencies are already assigned or may be assigned at a later date.

c) Can claim protection, however, from harmful interference from stations of the same or other secondary service(s) to which frequencies may be assigned at a later date.

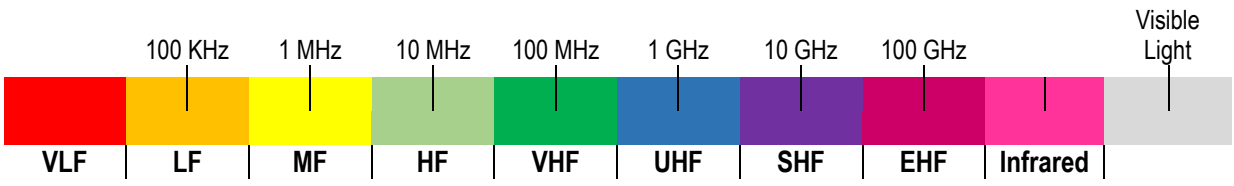
Note:

1. Where a band is indicated in an International footnote of the Table as allocated to a service "on a secondary basis" in an area smaller than a Region, or in a particular country, this is a secondary service.

2. Where a band is indicated in an International footnote of the Table as allocated to a service "on a primary basis", in an area smaller than a Region, or in a particular country, this is a primary service only in that area or country.
3. Where a band is indicated in an International footnote of the Table as "also allocated" to a service in an area smaller than a Region, or in a particular country, this is an "additional" allocation, i.e. an allocation which is added in this area or in this country to the service or services which are indicated in the Table.
4. If the international footnote does not include any restriction on the service or services concerned apart from the restriction to operate only in a particular area or country, stations of this service or these services shall have equality of right to operate with stations of the other primary service or services indicated in the Table.
5. If restrictions are imposed on an additional allocation in addition to the restriction to operate only in a particular area or country, this is indicated in an International footnote of the Table.
6. Where a band is indicated in an International footnote of the Table as "allocated" to one or more services in an area smaller than a Region, or in a particular country, this is an "alternative" allocation, i.e. an allocation which replaces, in this area or in this country, the allocation indicated in the Table.
7. If the footnote does not include any restriction on stations of the service or services concerned, apart from the restriction to operate only in a particular area or country, these stations of such a service or services shall have an equality of right to operate with stations of the primary service or services, indicated in the Table, to which the band is allocated in other areas or countries.
8. If restrictions are imposed on stations of a service to which an alternative allocation is made, in addition to the restriction to operate only in a particular country or area, this is indicated in the International and National footnote.
9. Where it is indicated that a service or stations in a service may operate in a specific frequency band subject to not causing harmful interference to another service or to another station in the same service, this means also that the service which is subject to not causing harmful interference cannot claim protection from harmful interference caused by the other service or other station in the same service.
10. Where it is indicated that a service or stations in a service may operate in a specific frequency band subject to not claiming protection from another service or from another station in the same service, this means also that the service which is subject to not claiming protection shall not cause harmful interference to the other service or other station in the same service.

5. Radio Wave Spectrum

In the below figure the **Radio Wave Frequency** spectrum is shown.



As shown in above diagram, the radio wave band is divided into several different categories. The below chart show different frequencies and their corresponding **Radio Wave Wavelength**.

ITU Band No	Band	Frequency Range	Wavelength Range
	Tremendously Low Frequency (TLF)	< 3 Hz	> 1000 Mm
	Extremely Low Frequency (ELF)	3 – 30 Hz	100 Mm – 10 Mm
	Super Low Frequency (SLF)	30 – 300 Hz	10 Mm – 1Mm
	Ultra Low Frequency (ULF)	300 – 3000 Hz	1000 km – 100 km
4	Very Low Frequency (VLF)	3 - 30 kHz	100 km – 10 km
5	Low Frequency (LF)	30 - 300 kHz	10 km – 1 km
6	Medium Frequency (MF)	300 - 3000 kHz	1 km – 100 m
7	High Frequency (HF)	3 – 30 MHz	100 m – 10 m
8	Very High Frequency (VHF)	30 – 300 MHz	10 m – 1 m
9	Ultra High Frequency (UHF)	300 – 3000 MHz	1 m – 100 mm
10	Super High Frequency (SHF)	3 – 30 GHz	100 mm – 10 mm
11	Extremely High Frequency (EHF)	30 – 300 GHz	10 mm – 1 mm
12	Tremendously High Frequency (THF)	300 – 3000 GHz	1 mm – 100 μm

Table of IEEE bands

Band	Origin of Name	Frequency Range
L Band	**L**ong wave	1 to 2 GHz
S band	**S**hort wave	2 to 4 GHz
C band	**C**ompromise between S and X	4 to 8 GHz
X band	X for cross	8 to 12 GHz
K_u band	**K**urz-**u**nder	12 to 18 GHz
K band	German **K**urz (short)	18 to 27 GHz

K_a band	**K**urz-**a**bove	27 to 40 GHz
V band		40 to 75 GHz
W band	**W** follows V in the alphabet	75 to 110 GHz
G band		110 to 300 GHz

EU, NATO, US ECM Frequency Designations

Band	Frequency Range
A band	0 to 0.25 GHz
B band	0.25 to 0.5 GHz
C band	0.5 to 1.0 GHz
D band	1 to 2 GHz
E band	2 to 3 GHz
F band	3 to 4 GHz
G band	4 to 6 GHz
H band	6 to 8 GHz
I band	8 to 10 GHz
J band	10 to 20 GHz
K band	20 to 40 GHz
L band	40 to 60 GHz
M band	60 to 100 GHz
R band	1.70 to 2.60 GHz
D band	2.20 to 3.30 GHz
S band	2.60 to 3.95 GHz
E band	3.30 to 4.90 GHz
G band	3.95 to 5.85 GHz

F band	4.90 to 7.05 GHz
C band	5.85 to 8.20 GHz
H band	7.05 to 10.10 GHz
X band	8.2 to 12.4 GHz
Ku band	12.4 to 18.0 GHz
K band	15.0 to 26.5 GHz
Ka band	26.5 to 40.0 GHz
Q band	33 to 50 GHz
U band	40 to 60 GHz
V band	50 to 75 GHz
W band	75 to 110 GHz
Y band	325 to 500 GHz

QNFAP - PART 2
FREQUENCY ALLOCATION PLAN

Qatar Frequency Allocation Plan

RR Region 1 Allocation	Qatar's Allocation	Main Use	Notes
Below 8.3 kHz **(Not allocated)** 5.53 5.54	(Not allocated)		
8.3 - 9 kHz **METEOROLOGICAL AIDS** 5.54A 5.54B 5.54C	METEOROLOGICAL AIDS	– Inductive SRD Applications – Wireless Application in Healthcare & Listening Devices	Also allocated for radionavigation, fixed and mobile services on a primary basis (No. 5.54B)
9 - 11.3 kHz **METEROLOGICAL AIDS 5.54A** **RADIONAVIGATION**	RADIONAVIGATION	– Inductive SRD Applications – Wireless Application in Healthcare & Listening Devices	
11.3 – 14 kHz **RADIONAVIGATION**	RADIONAVIGATION	– Inductive SRD Applications – Wireless Application in Healthcare & Listening Devices	
14 - 19.95 kHz **FIXED** **MARITIME MOBILE** 5.57 5.55 5.56	FIXED MARITIME MOBILE	– Inductive SRD Applications – Wireless Application in Healthcare & Listening Devices – Maritime applications	The use by the maritime mobile service is limited to coast radiotelegraph stations (A1A and F1B only) (No. 5.57)
19.95 - 20.05 kHz **STANDARD FREQUENCY AND TIME SIGNAL (20 kHz)**	STANDARD FREQUENCY AND TIME SIGNAL (20 kHz)	– Inductive SRD Applications – Wireless Application in Healthcare & Listening Devices	
20.05 - 70 kHz **FIXED** **MARITIME MOBILE** 5.57 5.56 5.58	FIXED MARITIME MOBILE	– Inductive SRD Applications – Wireless Application in Healthcare & Listening Devices – Maritime applications	The use by the maritime mobile service is limited to coast radiotelegraph stations (A1A and F1B only) (No. 5.57)

70 - 72 kHz **RADIONAVIGATION** 5.60	RADIONAVIGATION	– Inductive SRD Applications – Wireless Application in Healthcare & Listening Devices	
72 - 84 kHz **FIXED** **MARITIME MOBILE** 5.57 **RADIONAVIGATION** 5.60 5.56	FIXED MARITIME MOBILE RADIONAVIGATION	– Inductive SRD Applications – Wireless Application in Healthcare & Listening Devices – Maritime applications	The use by the maritime mobile service is limited to coast radiotelegraph stations (A1A and F1B only) (No. 5.57)
84 - 86 kHz **RADIONAVIGATION** 5.60	RADIONAVIGATION	– Inductive SRD Applications – Wireless Application in Healthcare & Listening Devices	
86 - 90 kHz **FIXED** **MARITIME MOBILE** 5.57 **RADIONAVIGATION** 5.56	FIXED MARITIME MOBILE RADIONAVIGATION	– Inductive SRD Applications – Wireless Application in Healthcare & Listening Devices – Maritime applications	The use by the maritime mobile service is limited to coast radiotelegraph stations (A1A and F1B only) (No. 5.57)
90 - 110 kHz **RADIONAVIGATION** 5.62 **Fixed** 5.64	RADIONAVIGATION Fixed	– Inductive SRD Applications – Wireless Application in Healthcare & Listening Devices	
110 - 112 kHz **FIXED** **MARITIME MOBILE** **RADIONAVIGATION** 5.64	FIXED MARITIME MOBILE RADIONAVIGATION	– Inductive SRD Applications – Wireless Application in Healthcare & Listening Devices – Maritime applications	
112 - 115 kHz **RADIONAVIGATION** 5.60	RADIONAVIGATION	– Inductive SRD Applications – Wireless Application in Healthcare & Listening Devices – Maritime applications	
115 - 117.6 kHz	RADIONAVIGATION Fixed	– Inductive SRD Applications – Wireless Application in Healthcare &	

RADIONAVIGATION 5.60 **Fixed** **Maritime mobile** 5.64 5.66	Maritime mobile	Listening Devices – Maritime applications	
117.6 - 126 kHz **FIXED** **MARITIME MOBILE** **RADIONAVIGATION** 5.60 5.64	FIXED MARITIME MOBILE RADIONAVIGATION	– Inductive SRD Applications – Wireless Application in Healthcare & Listening Devices – Maritime applications	
126 - 129 kHz **RADIONAVIGATION** 5.60	RADIONAVIGATION	– Inductive SRD Applications – Wireless Application in Healthcare & Listening Devices – Maritime applications	
129 - 130 kHz **FIXED** **MARITIME MOBILE** **RADIONAVIGATION** 5.60 5.64	FIXED MARITIME MOBILE RADIONAVIGATION	– Inductive SRD Applications – Wireless Application in Healthcare & Listening Devices – Maritime applications	
130 - 135.7 kHz **FIXED** **MARITIME MOBILE** 5.64 5.67	FIXED MARITIME MOBILE	– Inductive SRD Applications /Vehicle Fitted Radio Equipment – Wireless Application in Healthcare & Listening Devices – Maritime applications	
135.7 - 137.8 kHz **FIXED** **MARITIME MOBILE** **Amateur** 5.67A 5.64 5.67 5.67B	FIXED MARITIME MOBILE Amateur	– Amateur applications – Inductive SRD Applications /Vehicle Fitted Radio Equipment – Wireless Application in Healthcare & Listening Devices – Maritime applications	Stations in the amateur service using frequencies in the band 135.7-137.8 kHz shall not exceed a maximum radiated power of 1 W (e.i.r.p.) (No. 5.67A)
137.8 - 148.5 kHz **FIXED**	FIXED MARITIME MOBILE	– Inductive SRD Applications /Vehicle Fitted Radio Equipment – Wireless Application in Healthcare &	

MARITIME MOBILE 5.64 5.67		– Listening Devices – Maritime applications	
148.5 - 255 kHz **BROADCASTING** 5.68 5.69 5.70	BROADCASTING	– Broadcasting GE-75 – Wireless Application in Healthcare & Listening Devices	
255 - 283.5 kHz **BROADCASTING** **AERONAUTICAL RADIONAVIGATION** 5.70	BROADCASTING AERONAUTICAL RADIONAVIGATION	– Aeronautical Radio Beacons – Broadcasting GE-75 – Wireless Application in Healthcare & Listening Devices	
283.5 - 315 kHz **AERONAUTICAL RADIONAVIGATION** **MARITIME RADIONAVIGATION (radiobeacons)** 5.73 5.74	AERONAUTICAL RADIONAVIGATION MARITIME RADIONAVIGATION (radiobeacons)	– Aeronautical Radio Beacons – Maritime Radio Beacons – IALA GPS – Wireless Application in Healthcare & Listening Devices	The frequency band 285.3-285.7 kHz is also allocated to the maritime radionavigation service (other than radiobeacons) on a primary basis (No. 5.74)
315 - 325 kHz **AERONAUTICAL RADIONAVIGATION** **Maritime radionavigation (radiobeacons)** 5.73 5.72 5.75	AERONAUTICAL RADIONAVIGATION Maritime radionavigation (radiobeacons)	– Aeronautical Radio Beacons – Maritime Radio Beacons	
325 - 405 kHz **AERONAUTICAL RADIONAVIGATION** 5.72	AERONAUTICAL RADIONAVIGATION	– Aeronautical Radio Beacons	
405 - 415 kHz **RADIONAVIGATION** 5.76 5.72	RADIONAVIGATION	– Maritime Radio Beacons	
415 - 435 kHz **MARITIME MOBILE** 5.79	MARITIME MOBILE AERONAUTICAL RADIONAVIGATION	– Aeronautical Radio Beacons – Maritime applications	

AERONAUTICAL RADIONAVIGATION			
435 - 472 kHz **MARITIME MOBILE** 5.79 **Aeronautical radionavigation** 5.77 5.82	MARITIME MOBILE Aeronautical radionavigation	– Maritime applications – Detection of avalanche victims 457kHz – Receiver IF	NAVTEX Transmissions (national language) The use of the frequency band 472-479 kHz is limited to the maritime mobile and aeronautical radionavigation services The amateur service shall not be used in the above-mentioned countries in this frequency band (No. 5.50B) No. 5.82)
472 – 479 kHz **MARITIME MOBILE** 5.79 **Amateur** 5.80 A **Aeronautical radionavigation** 5.77 5.80 5.80B 5.82	MARITIME MOBILE Aeronautical radionavigation		
479 – 495 kHz **MARITIME MOBILE** 5.79 5.79A **Aeronautical radionavigation** 5.77 5.82	MARITIME MOBILE Aeronautical radionavigation		
495 - 505 kHz **MARITIME MOBILE 5.82C**	MARITIME MOBILE	– Maritime GMDSS – International NAVDAT system	NAVDAT transmitting stations are limited to coast stations
505 - 526.5 kHz **MARITIME MOBILE** 5.79 5.79A 5.84 **AERONAUTICAL RADIONAVIGATION**	MARITIME MOBILE AERONAUTICAL RADIONAVIGATION	– Aeronautical Radio Beacons – Maritime applications – International NAVTEX transmissions at 518 kHz	
526.5 - 1 606.5 kHz **BROADCASTING** 5.87 5.87A	BROADCASTING	– Broadcasting GE-75	

1 606.5 - 1 625 kHz **FIXED** **MARITIME MOBILE** 5.90 **LAND MOBILE** 5.92	FIXED MARITIME MOBILE LAND MOBILE	– Maritime applications – Radio-determination applications	
1 625 - 1 635 kHz **RADIOLOCATION** 5.93	RADIOLOCATION	– Radio-determination applications	
1 635 - 1 800 kHz **FIXED** **MARITIME MOBILE** 5.90 **LAND MOBILE** 5.92 5.96	FIXED MARITIME MOBILE LAND MOBILE	– Maritime applications – Radio-determination applications	
1 800 - 1 810 kHz **RADIOLOCATION** 5.93	RADIOLOCATION	– Radio-determination applications	
1 810 - 1 850 kHz **AMATEUR** 5.98 5.99 5.100 5.101	AMATEUR	– Amateur applications	
1 850 - 2 000 kHz **FIXED** **MOBILE except aeronautical mobile** 5.92 5.96 5.103	FIXED MOBILE except aeronautical mobile	– Radio-determination applications	
2 000 - 2 025 kHz **FIXED** **MOBILE except aeronautical mobile (R)** 5.92 5.103	FIXED MOBILE except aeronautical mobile (R)	– Radio-determination applications	

2 025 - 2 045 kHz **FIXED** **MOBILE except aeronautical mobile (R)** **Meteorological aids** 5.104 5.92 5.103	FIXED MOBILE except aeronautical mobile (R) Meteorological aids	– Radio-determination applications	The use by meteorological aids service is limited to oceanographic buoy stations. (No. 5.104)
2 045 - 2 160 kHz **FIXED** **MARITIME MOBILE** **LAND MOBILE** 5.92	FIXED MARITIME MOBILE LAND MOBILE	– Maritime applications	International telephony frequencies - (Ship TX) in accordance with RR 52.202 - 52.204/ ETSI EN 300 373
2 160 - 2 170 kHz **RADIOLOCATION** 5.93 5.107	RADIOLOCATION	– Radio-determination applications	
2 170 - 2 173.5 kHz **MARITIME MOBILE**	MARITIME MOBILE	– Maritime applications	
2 173.5 - 2 190.5 kHz **MOBILE (distress and calling)** 5.108 5.109 5.110 5.111	MOBILE (distress and calling)	– DSC distress and calling at 2187.5 kHz - Maritime GMDSS (Radiotelephony distress and Calling) at 2182 kHz – Telex distress traffic 2174.5 kHz	
2 190.5 - 2 194 kHz **MARITIME MOBILE**	MARITIME MOBILE	– Maritime applications	
2 194 - 2 300 kHz **FIXED** **MOBILE except aeronautical mobile (R)** 5.92 5.103 5.112	FIXED MOBILE except aeronautical mobile (R)	– Maritime applications	
2 300 - 2 498 kHz **FIXED** **MOBILE except aeronautical mobile (R)**	FIXED MOBILE except aeronautical mobile (R) BROADCASTING	– Maritime applications	

BROADCASTING 5.113 5.103			
2 498 - 2 501 kHz **STANDARD FREQUENCY AND TIME SIGNAL (2 500 kHz)**	STANDARD FREQUENCY AND TIME SIGNAL (2 500 kHz)		
2 501 - 2 502 kHz **STANDARD FREQUENCY AND TIME SIGNAL** **Space Research**	STANDARD FREQUENCY AND TIME SIGNAL Space Research		
2 502 - 2 625 kHz **FIXED** **MOBILE except aeronautical mobile (R)** 5.92 5.103 5.114	FIXED MOBILE except aeronautical mobile (R)	– Maritime applications – Radio-determination applications	
2 625 - 2 650 kHz **MARITIME MOBILE** **MARITIME RADIONAVIGATION** 5.92	MARITIME MOBILE MARITIME RADIONAVIGATION	– Maritime applications	
2 650 - 2 850 kHz **FIXED** **MOBILE except aeronautical mobile (R)** 5.92 5.103	FIXED MOBILE except aeronautical mobile (R)	– Radio-determination applications	
2 850 - 3 025 kHz **AERONAUTICAL MOBILE (R)** 5.111 5.115	AERONAUTICAL MOBILE (R)	– Aeronautical Mobile (R) applications – SAR (communications)	- Appendix 27 Allotment Plan - Radiotelephony distress traffic and calling frequency by rescue centers (3023 kHz)
3 025 - 3 155 kHz **AERONAUTICAL MOBILE (OR)**	AERONAUTICAL MOBILE (OR)	– Aeronautical Mobile (OR) applications – Inductive SRD Applications/ Vehicle Fitted Radio Equipment	Appendix 26 Allotment Plan

3 155 - 3 200 kHz **FIXED** **MOBILE except aeronautical mobile (R)** 5.116 5.117	FIXED MOBILE except aeronautical mobile (R)	– Inductive SRD Applications/ Vehicle Fitted Radio Equipment – Maritime applications	
3 200 - 3 230 kHz **FIXED** **MOBILE except aeronautical mobile (R)** **BROADCASTING** 5.113 5.116	FIXED MOBILE except aeronautical mobile (R) BROADCASTING	– Inductive SRD Applications/ Vehicle Fitted Radio Equipment – Maritime applications	
3 230 - 3 400 kHz **FIXED** **MOBILE except aeronautical mobile** **BROADCASTING** 5.113 5.116 5.118	FIXED MOBILE except aeronautical mobile BROADCASTING	– Inductive SRD Applications/ Vehicle Fitted Radio Equipment – Maritime applications	
3 400 - 3 500 kHz **AERONAUTICAL MOBILE (R)**	AERONAUTICAL MOBILE (R)		Appendix 27 Allotment Plan
3 500 - 3 800 kHz **AMATEUR** **FIXED** **MOBILE except aeronautical mobile** 5.92	AMATEUR FIXED MOBILE except aeronautical mobile	– Amateur applications	
3 800 - 3 900 kHz **FIXED** **AERONAUTICAL MOBILE (OR)** **LAND MOBILE**	FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE		
3 900 - 3 950 kHz **AERONAUTICAL MOBILE (OR)**	AERONAUTICAL MOBILE (OR)	– Aeronautical Mobile (OR) applications	Appendix 26 Allotment Plan

5.123			
3 950 - 4 000 kHz **FIXED** **BROADCASTING**	FIXED BROADCASTING		
4 000 - 4 063 kHz **FIXED** **MARITIME MOBILE** 5.127 5.126	FIXED MARITIME MOBILE	– Maritime applications	Appendix 17 Channeling Plan Appendix 25 Allotment Plan
4 063 - 4 438 kHz **MARITIME MOBILE** 5.79A 5.109 5.110 5.130 5.131 5.132 5.128	MARITIME MOBILE	– DSC Calling (4208, 4208.5, 4209, 4219.5, 4220, 4220.5 kHz) – DSC distress traffic 4207.5 kHz – Maritime Safety Information (MSI) 4210 kHz – Meteorological and navigational warnings 4209.5 kHz – Telephony distress traffic and calling by rescue centers 4125 kHz – Telex distress traffic 4177.5 kHz	Appendix 17 Channeling Plan Appendix 25 Allotment Plan The conditions for the use of the carrier frequencies 4 125 kHz and 6 215 kHz are prescribed in Articles 31 and 52 (No. 5.130)
4 438 - 4 488 kHz **FIXED** **MOBILE except aeronautical mobile (R)** **Radiolocation 5.132A** **5.132B**	FIXED MOBILE except aeronautical mobile (R) Radiolocation		
4 488 - 4 650 kHz **FIXED** **MOBILE except aeronautical mobile (R)**	FIXED MOBILE except aeronautical mobile (R)		
4 650 - 4 700 kHz **AERONAUTICAL MOBILE (R)**	AERONAUTICAL MOBILE (R)		Appendix 27 Allotment Plan Including HF Data Links
4 700 - 4 750 kHz **AERONAUTICAL MOBILE (OR)**	AERONAUTICAL MOBILE (OR)	– Aeronautical Mobile (OR)	Appendix 26 Allotment Plan
4 750 - 4 850 kHz	FIXED		

FIXED **AERONAUTICAL MOBILE (OR)** **LAND MOBILE** **BROADCASTING** 5.113	AERONAUTICAL MOBILE (OR) LAND MOBILE BROADCASTING		
4 850 - 4 995 kHz **FIXED** **LAND MOBILE** **BROADCASTING** 5.113	FIXED LAND MOBILE BROADCASTING		
4 995 - 5 003 kHz **STANDARD FREQUENCY AND TIME SIGNAL (5 000 kHz)**	STANDARD FREQUENCY AND TIME SIGNAL (5 000 kHz)		
5 003 - 5 005 kHz **STANDARD FREQUENCY AND TIME SIGNAL** **Space research**	STANDARD FREQUENCY AND TIME SIGNAL Space research		
5 005 - 5 060 kHz **FIXED** **BROADCASTING** 5.113	FIXED BROADCASTING		
5 060 - 5 250 kHz **FIXED** **Mobile except aeronautical mobile** 5.133	FIXED Mobile except aeronautical mobile		
5 250 - 5 275 kHz **FIXED** **MOBILE except aeronautical mobile** **Radiolocation** 5.132A 5.133A	FIXED MOBILE except aeronautical mobile		
5 275-5 351.5 kHz **FIXED** **MOBILE except aeronautical mobile**	FIXED MOBILE except aeronautical mobile		

5 351.5-5 366.5 kHz **FIXED** **MOBILE except aeronautical mobile** **Amateur** 5.133B	FIXED MOBILE except aeronautical mobile Amateur		Stations in the amateur service using the frequency band 5 351.5-5 366.5 kHz shall not exceed a maximum radiated power of 15 W (e.i.r.p.). (see No. 5.133B)
5 366.5-5 450 kHz **FIXED** **MOBILE except aeronautical mobile**	FIXED MOBILE except aeronautical mobile		
5 450 - 5 480 kHz **FIXED** **AERONAUTICAL MOBILE (OR)** **LAND MOBILE**	FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE		
5 480 - 5 680 kHz **AERONAUTICAL MOBILE (R)** 5.111 5.115	AERONAUTICAL MOBILE (R)	- Aeronautical Mobile (R) - SAR (communications)	Appendix 27 Allotment Plan Including HF Data Links Telephony distress traffic and calling by rescue centers (5 680 kHz)
5 680 - 5 730 kHz **AERONAUTICAL MOBILE (OR)** 5.111 5.115	AERONAUTICAL MOBILE (OR)	Aeronautical Mobile (OR)	Appendix 26 Allotment Plan
5 730 - 5 900 kHz **FIXED** **LAND MOBILE**	FIXED LAND MOBILE		
5 900 - 5 950 kHz **BROADCASTING** 5.134 5.136	BROADCASTING		WARC92 bands for broadcasting
5 950 - 6 200 kHz **BROADCASTING**	BROADCASTING		ITU RR Article 12 planning procedure
6 200 - 6 525 kHz **MARITIME MOBILE**	MARITIME MOBILE	– DSC Calling (6312.5, 6313, 6313.5, 6331, 6331.5, 6332 kHz) – DSC distress traffic 6312 kHz	Appendix 17 channeling plan. Appendix 25 allotment plan The conditions for the use of the carrier frequencies 4 125 kHz and 6 215 kHz

5.109 5.110 5.130 5.132 5.137		– Maritime Safety Information (MSI) 6314 kHz – Telephony distress traffic and calling by rescue centers 6215 kHz – Telex distress traffic 6268 kHz	are prescribed in Articles 31 and 52 (No. 5.130)
6 525 - 6 685 kHz **AERONAUTICAL MOBILE (R)**	AERONAUTICAL MOBILE (R)		Appendix 27 Allotment Plan including HF Data Links
6 685 - 6 765 kHz **AERONAUTICAL MOBILE (OR)**	AERONAUTICAL MOBILE (OR)	– Aeronautical Mobile (OR)	Appendix 26 Allotment Plan
6 765 - 7 000 kHz **FIXED** **MOBILE except aeronautical mobile (R)** 5.138	FIXED MOBILE except aeronautical mobile (R)	– Inductive SRD Applications – Non-Specific SRD applications	
7 000 - 7 100 kHz **AMATEUR** **AMATEUR - SATELLITE** 5.140 5.141 5.141A	AMATEUR AMATEUR - SATELLITE	– Amateur Applications	
7 100 - 7 200 kHz **AMATEUR** 5.141A 5.141B	AMATEUR	– Amateur Applications	Also allocated to the fixed and the mobile, except aeronautical mobile (R), services on a primary basis (No. 5.141B)
7 200 - 7 300 kHz **BROADCASTING**	BROADCASTING		ITU RR Article 12
7 300 - 7 400 kHz **BROADCASTING** 5.134 5.143 5.143A 5.143B 5.143C 5.143D	BROADCASTING		- WARC92 bands for broadcasting - The band 7 350 – 7 400 kHz is also allocated to the fixed services on primary basis (No. 5.143C)
7 400 - 7 450 kHz **BROADCASTING** 5.143B 5.143C	BROADCASTING	- Inductive SRD Applications	- ITU RR Article 12 - Also allocated to the fixed services on primary basis (No. 5.143C)

7 450 - 8 100 kHz **FIXED** **MOBILE except aeronautical mobile (R)**	FIXED MOBILE except aeronautical mobile (R)	- Inductive SRD Applications	
8 100 - 8 195 kHz **FIXED** **MARITIME MOBILE**	FIXED MARITIME MOBILE	– Inductive SRD Applications – Maritime applications	Appendix 17 channeling plan
8 195 - 8 815 kHz **MARITIME MOBILE** 5.109 5.110 5.132 5.145 5.111	MARITIME MOBILE	– DSC Calling (8415, 8415.5, 8416, 8436.5, 8437, 8437.5 kHz) – DSC distress traffic 8364 kHz and 8414.5 kHz – Maritime Safety Information (MSI) 8416.5 kHz – Telephony distress traffic and calling by rescue centers 8291 kHz – Telex distress traffic 8376.5 kHz – Inductive SRD Applications	Appendix 17 channeling plan. Appendix 25 allotment plan The conditions for the use of the carrier frequencies 8 291 kHz, 12 290 kHz and 16 420 kHz are prescribed in Articles 31 and 52 (No. 5.145)
8 815 - 8 965 kHz **AERONAUTICAL MOBILE (R)**	AERONAUTICAL MOBILE (R)		Appendix 27 Allotment Plan including HF Data Links
8 965 - 9 040 kHz **AERONAUTICAL MOBILE (OR)**	AERONAUTICAL MOBILE (OR)	– Aeronautical Mobile (OR)	Appendix 26 Allotment Plan
9 040 - 9305 kHz **FIXED**	FIXED		
9305 – 9355kHz **FIXED** **Radiolocation** 5.145A 5.145B	FIXED		Applications of the radiolocation service are limited to oceanographic radars operating in accordance with Resolution 612 (Rev.WRC-12)
9355 – 9400 kHz **FIXED**	FIXED		
9 400 - 9 500 kHz **BROADCASTING** 5.134 5.146	BROADCASTING		WARC92 bands for broadcasting

9 500 - 9 900 kHz **BROADCASTING** 5.147	BROADCASTING		Article 12 planning procedure
9 900 - 9 995 kHz **FIXED**	FIXED		
9 995 - 10 003 kHz **STANDARD FREQUENCY AND TIME SIGNAL (10 000 kHz)** 5.111	STANDARD FREQUENCY AND TIME SIGNAL (10 000 kHz)		
10 003 - 10 005 kHz **STANDARD FREQUENCY AND TIME SIGNAL** **Space research** 5.111	STANDARD FREQUENCY AND TIME SIGNAL Space research		
10 005 - 10 100 kHz **AERONAUTICAL MOBILE (R)** 5.111	AERONAUTICAL MOBILE (R) 5.111		Appendix 27 Allotment Plan including HF Data Links
10 100 - 10 150 kHz **FIXED** **Amateur**	FIXED Amateur		
10 150 - 11 175 kHz **FIXED** **Mobile except aeronautical mobile (R)**	FIXED Mobile except aeronautical mobile (R)	– Inductive SRD	
11 175 - 11 275 kHz **AERONAUTICAL MOBILE (OR)**	AERONAUTICAL MOBILE (OR)	– Aeronautical Mobile (OR)	Appendix 26 Allotment Plan
11 275 - 11 400 kHz **AERONAUTICAL MOBILE (R)**	AERONAUTICAL MOBILE (R)		Appendix 27 Allotment Plan including HF Data Links

11 400 - 11 600 kHz **FIXED**	FIXED		
11 600 - 11 650 kHz **BROADCASTING** 5.134 5.146	BROADCASTING		WARC92 bands for broadcasting
11 650 - 12 050 kHz **BROADCASTING** 5.147	BROADCASTING		Article 12 planning procedure
12 050 - 12 100 kHz **BROADCASTING** 5.134 5.146	BROADCASTING		WARC92 bands for broadcasting
12 100 - 12 230 kHz **FIXED**	FIXED		
12 230 - 13 200 kHz **MARITIME MOBILE** 5.109 5.110 5.132 5.145	MARITIME MOBILE	– DSC Calling (12577.5, 12578, 12578.5, 12657, 12657.5,12658 kHz) – DSC distress traffic 12577 kHz – Maritime Safety Information (MSI) 12579 kHz – Telephony distress traffic and calling by rescue centers 12290 kHz – Telex distress traffic 12520 kHz	Appendix 17 channeling plan. Appendix 25 allotment plan The conditions for the use of the carrier frequencies 8 291 kHz, 12 290 kHz and 16 420 kHz are prescribed in Articles 31 and 52 (No. 5.145)
13 200 - 13 260 kHz **AERONAUTICAL MOBILE (OR)**	AERONAUTICAL MOBILE (OR)	– Aeronautical Mobile (OR)	Appendix 26 Allotment Plan
13 260 - 13 360 kHz **AERONAUTICAL MOBILE (R)**	AERONAUTICAL MOBILE (R)		Appendix 27 Allotment Plan including HF Data Links
13 360 - 13 410 kHz **FIXED** **RADIO ASTRONOMY** 5.149	FIXED RADIO ASTRONOMY	– Radioastronomy	

13 410 - 13450 kHz **FIXED** **Mobile except aeronautical mobile (R)**	FIXED Mobile except aeronautical mobile (R)	– Inductive SRD Applications/ Vehicle Fitted Radio Equipment – Radio Frequency Identification Equipment (RFID) – Non-Specific SRD applications	ISM and Non-specific SRDs within the band 13 553-13 567 kHz
13 450 – 13 550 kHz **FIXED** **Mobile except aeronautical mobile (R)** **Radiolocation** 5.132A **5.149A**	FIXED Mobile except aeronautical mobile (R)		
13 550 – 13 570 kHz **FIXED** **Mobile except aeronautical mobile (R)** 5.150	FIXED Mobile except aeronautical mobile (R)	- ISM within 13.553 – 13.567 MHz	
13 570 - 13 600 kHz **BROADCASTING** 5.134 5.151	BROADCASTING	– Broadcasting	
13 600 - 13 800 kHz **BROADCASTING**	BROADCASTING	– Broadcasting	Article 12 planning procedure
13 800 - 13 870 kHz **BROADCASTING** 5.134 5.151	BROADCASTING	– Broadcasting	
13 870 - 14 000 kHz **FIXED** **Mobile except aeronautical mobile (R)**	FIXED Mobile except aeronautical mobile (R)		
14 000 - 14 250 kHz **AMATEUR** **AMATEUR - SATELLITE**	AMATEUR AMATEUR - SATELLITE	– Amateur applications	Amateur applications within the band 14 000-14 350 kHz

14 250 - 14 350 kHz **AMATEUR** 5.152	AMATEUR	– Amateur applications	Amateur applications within the band 14 000-14 350 kHz
14 350 - 14 990 kHz **FIXED** **Mobile except aeronautical mobile (R)**	FIXED Mobile except aeronautical mobile (R)		
14 990 - 15 005 kHz **STANDARD FREQUENCY AND TIME SIGNAL (15 000 kHz)** 5.111	STANDARD FREQUENCY AND TIME SIGNAL (15 000 kHz)		
15 005 - 15 010 kHz **STANDARD FREQUENCY AND TIME SIGNAL** **Space research**	STANDARD FREQUENCY AND TIME SIGNAL Space research		
15 010 - 15 100 kHz **AERONAUTICAL MOBILE (OR)**	AERONAUTICAL MOBILE (OR)	– Aeronautical Mobile (OR) applications	Appendix 26 Allotment Plan
15 100 - 15 600 kHz **BROADCASTING**	BROADCASTING	– Broadcasting	Article 12 planning procedure
15 600 - 15 800 kHz **BROADCASTING** 5.134 5.146	BROADCASTING	– Broadcasting	
15 800 - 16 100 kHz **FIXED** 5.153	FIXED		
16 100 – 16 200 kHz **FIXED** **Radiolocation** 5.145A	FIXED		

5.145B			
16 200 – 16 360 kHz **FIXED**	FIXED		
16 360 - 17 410 kHz **MARITIME MOBILE** 5.109 5.110 5.132 5.145	MARITIME MOBILE	– DSC Calling (16805, 16805.5, 16806,16903, 16903.5, 16904 kHz) – DSC distress traffic 16804.5 kHz – Maritime Safety Information (MSI) 16806.5 kHz – Telephony distress traffic and calling by rescue centers 16420 kHz – Telex distress traffic 16695 kHz	Appendix 17 channeling plan. Appendix 25 allotment plan The conditions for the use of the carrier frequencies 8 291 kHz, 12 290 kHz and 16 420 kHz are prescribed in Articles 31 and 52 (No. 5.145)
17 410 - 17 480 kHz **FIXED**	FIXED		
17 480 - 17 550 kHz **BROADCASTING** 5.134 5.146	BROADCASTING 5.134 5.146	– Broadcasting	
17 550 - 17 900 kHz **BROADCASTING**	BROADCASTING	– Broadcasting	Article 12 planning procedure
17 900 - 17 970 kHz **AERONAUTICAL MOBILE (R)**	AERONAUTICAL MOBILE (R)	– Aeronautical Mobile (R) applications	Appendix 27 Allotment Plan including HF Data Links
17 970 - 18 030 kHz **AERONAUTICAL MOBILE (OR)**	AERONAUTICAL MOBILE (OR)	– Aeronautical Mobile (OR) applications	Appendix 26 Allotment Plan
18 030 - 18 052 kHz **FIXED**	FIXED		
18 052 - 18 068 kHz **FIXED** **Space research**	FIXED Space research		
18 068 - 18 168 kHz **AMATEUR**	AMATEUR AMATEUR - SATELLITE	– Amateur applications	

AMATEUR - SATELLITE 5.154			
18 168 - 18 780 kHz **FIXED** **Mobile except aeronautical mobile**	FIXED Mobile except aeronautical mobile	–	
18 780 - 18 900 kHz **MARITIME MOBILE**	MARITIME MOBILE	– Maritime applications – DSC Calling (18898.5, 18899, 18899.5 kHz)	Appendix 17 channeling plan
18 900 - 19 020 kHz **BROADCASTING** 5.134 5.146	BROADCASTING	– Broadcasting	
19 020 - 19 680 kHz **FIXED**	FIXED		
19 680 - 19 800 kHz **MARITIME MOBILE** 5.132	MARITIME MOBILE	– DSC Calling (19703.5, 19704, 19704.5 kHz) – Maritime applications Maritime Safety Information (MSI) 19680.5 kHz	Appendix 17 channeling plan. Appendix 25 allotment plan
19 800 - 19 990 kHz **FIXED**	FIXED		
19 990 - 19 995 kHz **STANDARD FREQUENCY AND TIME SIGNAL** **Space research** 5.111	STANDARD FREQUENCY AND TIME SIGNAL Space research		
19 995 - 20 010 kHz **STANDARD FREQUENCY AND TIME SIGNAL (20 000 kHz)** 5.111	STANDARD FREQUENCY AND TIME SIGNAL (20 000 kHz)		
20 010 - 21 000 kHz **FIXED** **Mobile**	FIXED Mobile		

21 000 - 21 450 kHz **AMATEUR** **AMATEUR - SATELLITE**	AMATEUR AMATEUR - SATELLITE	– Amateur applications	
21 450 - 21 850 kHz **BROADCASTING**	BROADCASTING	– Broadcasting	
21 850 - 21 870 kHz **FIXED** 5.155A 5.155	FIXED		
21 870 - 21 924 kHz **FIXED** 5.155B	FIXED		The use by the fixed service is limited for provision of services related to aircraft flight safety (5.155B)
21 924 - 22 000 kHz **AERONAUTICAL MOBILE (R)**	AERONAUTICAL MOBILE (R)	– Aeronautical Mobile (R) applications	Appendix 27 Allotment Plan. Including HF Data Links
22 000 - 22 855 kHz **MARITIME MOBILE** 5.132 5.156	MARITIME MOBILE	– DSC Calling (22374.5, 22375, 22375.5, 22444, 22444.5, 22445 kHz) – Maritime applications Maritime Safety Information (MSI) 22376 kHz	Appendix 17 channeling plan. Appendix 25 allotment plan
22 855 - 23 000 kHz **FIXED** 5.156	FIXED		
23 000 - 23 200 kHz **FIXED** **Mobile except aeronautical mobile (R)** 5.156	FIXED Mobile except aeronautical mobile (R)		
23 200 - 23 350 kHz **FIXED** 5.156A **AERONAUTICAL MOBILE (OR)**	FIXED AERONAUTICAL MOBILE (OR)	– Aeronautical Mobile (OR) applications	The use by the fixed service is limited for provision of services related to aircraft flight safety (5.156A)
23 350 - 24 000 kHz	FIXED MOBILE except aeronautical mobile		The use by the maritime mobile service is limited to inter-ship radiotelegraphy (5.157)

FIXED **MOBILE except aeronautical mobile** 5.157			
24 000 - 24 450 kHz **FIXED** **LAND MOBILE**	FIXED LAND MOBILE		
24 450 – 24 600 kHz **FIXED** **LAND MOBILE** **Radiolocation** 5.132A 5.158	FIXED LAND MOBILE		
24 600 – 24 890 kHz **FIXED** **LAND MOBILE**	FIXED LAND MOBILE		
24 890 - 24 990 kHz **AMATEUR** **AMATEUR - SATELLITE**	AMATEUR AMATEUR - SATELLITE	– Amateur applications	
24 990 - 25 005 kHz **STANDARD FREQUENCY AND TIME SIGNAL (25 000 kHz)**	STANDARD FREQUENCY AND TIME SIGNAL (25 000 kHz)		
25 005 - 25 010 kHz **STANDARD FREQUENCY AND TIME SIGNAL** **Space Research**	STANDARD FREQUENCY AND TIME SIGNAL Space research		
25 010 - 25 070 kHz **FIXED** **MOBILE except aeronautical mobile**	FIXED MOBILE except aeronautical mobile		
25 070 - 25 210 kHz **MARITIME MOBILE**	MARITIME MOBILE	– DSC Calling (25208.5, 25209, 25209.5 kHz)	Appendix 17 channeling plan
25 210 - 25 550 kHz **FIXED**	FIXED MOBILE except aeronautical mobile		

MOBILE except aeronautical mobile			
25 550 - 25 670 kHz **RADIO ASTRONOMY** 5.149	RADIO ASTRONOMY		
25 670 - 26 100 kHz **BROADCASTING**	BROADCASTING	– Broadcasting	Article 12 Planning procedure
26 100 - 26 175 kHz **MARITIME MOBILE** 5.132	MARITIME MOBILE	- DSC Calling (26121, 26121.5, 16122 kHz) - Maritime applications Maritime Safety Information (MSI) 26100.5 kHz	Appendix 17 channeling plan. Appendix 25 allotment plan
26 175 - 26 200 kHz **FIXED** **MOBILE except aeronautical mobile**	FIXED MOBILE except aeronautical mobile	- Citizen Band - Non-Specific SRD applications - Inductive SRD Applications/ Remote Control - Wireless Audio Applications - Model Control	CB : ETSI EN 300 135 within the band 26.960 - 27.410 MHz EN 300 433 SRD within the band 26.957-27.283 MHz : ETSI EN 300 330 EN 300 220
26 200 - 26 350 kHz **FIXED** **MOBILE except aeronautical mobile** **Radiolocation** 5.132A 5.133A	FIXED MOBILE except aeronautical mobile		
26 350 - 27 500 kHz **FIXED** **MOBILE except aeronautical mobile** 5.150	FIXED MOBILE except aeronautical mobile	- Citizens Band (CB Radio) within the band 26.965 – 27.405 MHz - ISM within 26.975 – 27.283 MHz - Model Control (26.995, 27.045, 27.095 MHz)	
27.5 - 28 MHz **METEOROLOGICAL AIDS** **FIXED** **MOBILE**	METEOROLOGICAL AIDS FIXED MOBILE	-	
28 - 29.7 MHz **AMATEUR** **AMATEUR - SATELLITE**	AMATEUR AMATEUR - SATELLITE	– Amateur applications	

29.7 - 30.005 MHz **FIXED** **MOBILE**	FIXED MOBILE	– Wireless Application in Healthcare & Listening Devices	Active medical implants within the band 30.0-37.5 MHz (EN 302 510)
30.005 - 30.01 MHz **SPACE OPERATION (satellite identification)** **FIXED** **MOBILE** **SPACE RESEARCH**	SPACE OPERATION (satellite identification) FIXED MOBILE SPACE RESEARCH	– Wireless Application in Healthcare & Listening Devices	Active medical implants within the band 30.0-37.5 MHz (EN 302 510)
30.01 - 37.5 MHz **FIXED** **MOBILE**	FIXED MOBILE	– PMR – Model control – Wireless Application in Healthcare & Listening Devices	Model control within the band 34.995-35.225 MHz (Only for flying models) Active medical implants within the band 30.0-37.5 MHz (EN 302 510)
37.5 - 38.25 MHz **FIXED** **MOBILE** **Radio astronomy** 5.149	FIXED MOBILE Radio astronomy	– PMR	
38.25 - 39MHz **FIXED** **MOBILE**	FIXED MOBILE	– PMR	
39 - 39.5 MHz **FIXED** **MOBILE** **Radiolocation 5.132A** 5.159	FIXED MOBILE		
39.5 - 39.986 MHz **FIXED** **MOBILE**	FIXED MOBILE		
39.986 - 40.02 MHz **FIXED**	FIXED MOBILE	– PMR	

MOBILE **Space research**	Space research		
40.02 - 40.98 MHz **FIXED** **MOBILE** 5.150	FIXED MOBILE	– ISM – PMR – Model Control (40.66, 40.675, 40.685 and 40.695 MHz) – Non-Specific SRD applications	ISM within the band 40.66-40.70 MHz
40.98 - 41.015 MHz **FIXED** **MOBILE** **Space research** 5.160 5.161	FIXED MOBILE Space research	– PMR	
41.015 - 42 MHz **FIXED** **MOBILE** 5.160 5.161 5.161A	FIXED MOBILE	– PMR	
42 – 42.5 MHz **FIXED** **MOBILE** **Radiolocation** 5.132A 5.161B	FIXED MOBILE		
42.5 – 44 MHz **FIXED** **MOBILE** 5.160 5.161 5.161 A	FIXED MOBILE		
44 - 47MHz **FIXED** **MOBILE**	FIXED MOBILE	– PMR	

5.162 5.162A			
47 - 50 MHz **BROADCASTING** 5.162A 5.163 5.164 5.165	BROADCASTING		
50 - 52 MHz **BROADCASTING** **Amateur** 5.166A 5.166B 5.166C 5.166D 5.166E 5.169 5.169A 5.169B 5.162A 5.164 5.165	BROADCASTING AMATEUR	– Amateur Applications	The frequency band 50 – 54 MHz is allocated to the amateur service on a primary basis.
52 - 68 MHz **BROADCASTING** 5.162A 5.163 5.164 5.165 5.169 5.169A 5.169B 5.171	BROADCASTING AMATEUR	– Amateur Applications	The frequency band 50 – 54 MHz is allocated to the amateur service on a primary basis.
68 - 74.8 MHz **FIXED** **MOBILE except aeronautical mobile** 5.149 5.175 5.177 5.179	FIXED MOBILE except aeronautical mobile	– PMR (Single Freq. operation) – Radio Astronomy	
74.8 - 75.2 MHz **AERONAUTICAL RADIONAVIGATION** 5.180 5.181	AERONAUTICAL RADIONAVIGATION	– ILS/Marker beacons	
75.2 - 87.5 MHz **FIXED** **MOBILE except aeronautical mobile** 5.175 5.179 5.187	FIXED MOBILE except aeronautical mobile	– PMR (Single Frequency) – PMR (Duplex Systems)	
87.5 - 100 MHz	BROADCASTING	– FM sound Broadcasting – Wireless Audio Applications SRD (EN 301	FM broadcasting assignments in accordance with GE - 84 Agreement

BROADCASTING 5.190		357)	
100 - 108 MHz **BROADCASTING** 5.192 5.194	BROADCASTING	– FM sound Broadcasting – Wireless Audio Applications SRD (EN 301 357)	FM broadcasting assignments in accordance with GE - 84 Agreement
108 - 117.975 MHz **AERONAUTICAL RADIONAVIGATION** 5.197 5.197A	AERONAUTICAL RADIONAVIGATION	– ILS/Localizer (Within 108 - 112 MHz) – VOR (Within 108 - 117.975 MHz)	Also allocated on a primary basis to the aeronautical mobile (R) service, limited to systems operating in accordance with recognized international aeronautical standards (No. 5.197A)
117.975 - 137 MHz **AERONAUTICAL MOBILE (R)** 5.111 5.200 5.201 5.202	AERONAUTICAL MOBILE (R)	– Aeronautical mobile communications for safety and regularity of flights (117.975 – 121.45 MHz) – EPIRB (121.45 – 121.55 MHz) – Aeronautical mobile communications for safety and regularity of flights, airline business and airport mobile communications (121.55 – 137 MHz)	121.5 MHz is the aeronautical emergency frequency Auxiliary frequency to emergency frequency 123.1 MHz (where required) (No. 5.200)
137 - 137.025 MHz **SPACE OPERATION (space -to- Earth)** 5.203C **METEOROLOGICAL - SATELLITE (space -to- Earth)** **MOBILE - SATELLITE (space -to- Earth)** 5.208A 5.208B 5.209 **SPACE RESEARCH (space - to - Earth)** **Fixed** **Mobile except aeronautical mobile (R)** 5.204 5.205 5.206 5.207 5.208	FIXED MOBILE except aeronautical mobile (R)	– Mobile applications (Restricted to aeronautical Mobile (OR), including air sport)	Allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis (No. 5.204)
137.025 - 137.175 MHz **SPACE OPERATION (space -to- Earth)** 5.203C **METEOROLOGICAL - SATELLITE (space -to- Earth)** **SPACE RESEARCH (space -to- Earth)** **Fixed** **Mobile except aeronautical mobile (R)**	FIXED MOBILE except aeronautical mobile (R)	– Mobile applications (Restricted to aeronautical Mobile (OR), including air sport)	Allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis (No. 5.204)

Mobile - satellite (space -to- Earth) 5.208A 5.208B 5.209 5.204 5.205 5.206 5.207 5.208			
137.175 - 137.825 MHz **SPACE OPERATION (space - to - Earth)** 5.203C 5.209A **METEOROLOGICAL - SATELLITE (space -to- Earth)** **MOBILE - SATELLITE (space -to- Earth)** 5.208A 5.208B 5.209 **SPACE RESEARCH (space -to- Earth)** **Fixed** **Mobile except aeronautical mobile (R)** 5.204 5.205 5.206 5.207 5.208	FIXED MOBILE except aeronautical mobile (R)	– Mobile applications (Restricted to aeronautical Mobile (OR), including air sport)	Allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis (No. 5.204)
137.825 - 138 MHz **SPACE OPERATION (space -to- Earth)** 5.203C **METEOROLOGICAL - SATELLITE (space -to- Earth)** **SPACE RESEARCH (space -to- Earth)** **Fixed** **Mobile except aeronautical mobile (R)** **Mobile - satellite (space -to- Earth)** 5.208A 5.208B 5.209 5.204 5.205 5.206 5.207 5.208	FIXED MOBILE except aeronautical mobile (R)	– Mobile applications (Restricted to aeronautical Mobile (OR), including air sport)	Allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis (No. 5.204)
138 - 143.6 MHz **AERONAUTICAL MOBILE (OR)** 5.210 5.211 5.212 5.214	AERONAUTICAL MOBILE (OR) MARITIME MOBILE LAND MOBILE	– Air operation control	Also allocated to the maritime mobile and land mobile services on a primary basis (No. 5.211)
143.6 - 143.65 MHz **AERONAUTICAL MOBILE (OR)** **SPACE RESEARCH (space -to- Earth)**	AERONAUTICAL MOBILE (OR) SPACE RESEARCH (space - to – Earth) MARITIME MOBILE LAND MOBILE	– Air operation	Also allocated to the maritime mobile and land mobile services on a primary basis (No. 5.211)

5.211 5.212 5.214			
143.65 - 144 MHz **AERONAUTICAL MOBILE (OR)** 5.210 5.211 5.212 5.214	AERONAUTICAL MOBILE (OR) MARITIME MOBILE LAND MOBILE	– Air operation	Also allocated to the maritime mobile and land mobile services on a primary basis (No. 5.211)
144 - 146 MHz **AMATEUR** **AMATEUR - SATELLITE** 5.216	AMATEUR AMATEUR - SATELLITE	– Amateur – Amateur Satellite	
146 - 148 MHz **FIXED** **MOBILE except aeronautical mobile (R)**	FIXED MOBILE except aeronautical mobile (R)	– PMR (Both Single frequency and Duplex operations)	
148 - 149.9 MHz **FIXED** **MOBILE except aeronautical mobile (R)** **MOBILE – SATELLITE (Earth -to- space)** 5.209 5.218 5.218A 5.219 5.221	FIXED MOBILE except aeronautical mobile (R) MOBILE – SATELLITE (Earth - to - space)	– LEO Satellite – PMR (Duplex operations)	Stations of the mobile-satellite service shall not cause harmful interference to, or claim protection from, stations of the fixed or mobile services (No. 5.221)
149.9 - 150.05 MHz **MOBILE - SATELLITE (Earth -to- space)** 5.209 5.220	MOBILE - SATELLITE (Earth - to - space)	– LEO Satellite – PMR (Single frequency operations)	
150.05 - 153 MHz **FIXED** **MOBILE except aeronautical mobile** **RADIO ASTRONOMY** 5.149	FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY	– PMR (Both Single frequency and Duplex operations) – Radio Astronomy	
153 - 154 MHz **FIXED** **MOBILE except aeronautical mobile (R)**	FIXED MOBILE except aeronautical mobile (R) Meteorological Aids	– PMR (Duplex Operations)	

Meteorological Aids			
154 - 156.4875 MHz **FIXED** **MOBILE except aeronautical mobile (R)** 5.225A 5.226	FIXED MOBILE except aeronautical mobile (R)	– PMR (Duplex Operations)	Maritime communications as per Appendix 18
156.4875 - 156.5625 MHz **MARITIME MOBILE (distress and calling via DSC)** 5.111 5.226 5.227	MARITIME MOBILE (distress and calling via DSC)	- DSC distress, safety and calling 156.525 MHz	Maritime communications as per Appendix 18
156.5625 - 156.7625 MHz **FIXED** **MOBILE except aeronautical mobile (R)** 5.226	FIXED MOBILE except aeronautical mobile (R)		Maritime communications as per Appendix 18
156.7625 - 156.7875 MHz **MARITIME MOBILE Mobile-satellite (Earth-to-space)** 5.111 5.226 5.228	MARITIME MOBILE		Maritime communications as per Appendix 18
156.7875 – 156.8125 MHz **MARITIME MOBILE (distress and calling)** 5.111 5.226	MARITIME MOBILE	– International distress, safety and calling frequency (156.8 MHz single Frequency)	Maritime communications as per Appendix 18
156.8125 – 156.8375 MHz **MARITIME MOBILE** **Mobile-satellite (Earth– to-space)** 5.111 5.226 5.228	MARITIME MOBILE		Maritime communications as per Appendix 18
156.8375 - 157.1875 MHz **FIXED** **MOBILE except aeronautical mobile** 5.226	FIXED MOBILE except aeronautical mobile	– Satellite component of VDES	Maritime communications as per Appendix 18

157.1875 - 157.3375 MHz **FIXED** **MOBILE except aeronautical mobile** **Maritime mobile-satellite** 5.208A 5.208B 5.228AB 5.228AC 5.226	FIXED MOBILE except aeronautical mobile Maritime mobile-satellite		Maritime communications as per Appendix 18 VHF Data Exchange System (VDES) within frequency bands 157.1875 - 157.3375 MHz and 161.7875 - 161.9375 MHz (corresponding to channels: 24, 84, 25, 85, 26, 86, 1024, 1084, 1025, 1085, 1026, 1086, 2024, 2084, 2025, 2085, 2026 and 2086)
157.3375-161.7875 **FIXED** **MOBILE except aeronautical mobile** 5.226	FIXED MOBILE except aeronautical mobile		Maritime communications as per Appendix 18
161.7875-161.9375 **FIXED** **MOBILE except aeronautical mobile** **Maritime mobile-satellite** 5.208A 5.208B 5.228AB5.228AC 5.226	FIXED MOBILE except aeronautical mobile Maritime mobile-satellite	- Satellite component of VDES	Maritime communications as per Appendix 18 VDES within frequency bands 157.1875 - 157.3375 MHz and 161.7875 - 161.9375 MHz (corresponding to channels: 24, 84, 25, 85, 26, 86, 1024, 1084, 1025, 1085, 1026, 1086, 2024, 2084, 2025, 2085, 2026 and 2086)
161.9375- 161.9625 MHz **FIXED** **MOBILE except aeronautical mobile** **Maritime mobile-satellite (Earth-to-space)** 5.228AA 5.226	FIXED MOBILE except aeronautical mobile Maritime mobile-satellite (Earth-to-space)	- AIS (161.975 MHz) - ASM1 (161.95 MHz)	Maritime communications as per Appendix 18 The use of maritime mobile-satellite (Earth-to-space) service is limited to the systems which operate in accordance with Appendix 18 (No. 5.228AA) Channels ASM 1 and ASM 2 are used for application specific messages (ASM) as described in the most recent version of Recommendation ITU-R M.2092.
161.9625-161.9875 MHz **FIXED**	FIXED MOBILE except aeronautical mobile	-	Maritime communications as per Appendix 18

MOBILE except aeronautical mobile **Mobile-satellite (Earth-to-space)** 5.228F 5.226 5.228A 5.228B			
161.9875- 162.0125 MHz **FIXED** **MOBILE except aeronautical mobile** **Maritime mobile-satellite (Earth-to-space)** 5.228AA 5.226 5.229	FIXED MOBILE except aeronautical mobile Maritime mobile-satellite (Earth-to-space)	-	Maritime communications as per Appendix 18 The use of maritime mobile-satellite (Earth-to-space) service is limited to the systems which operate in accordance with Appendix 18 (5.228AA)
162.0125 - 162.0375 MHz **FIXED** **MOBILE except aeronautical mobile** **Mobile-satellite (Earth-to-space) 5.228F** 5.226 5.228A 5.228B 5.229	FIXED MOBILE except aeronautical mobile	– PMR – Coastal Stations – Wireless Application in Healthcare & Listening Devices (Within 173.965 - 174.015 MHz) – ETSI EN 300 422 – AIS (162.025 MHz) – ASMI 2 (162.00 MHz)	Maritime communications as per Appendix 18 Channels ASM 1 and ASM 2 are used for application specific messages (ASM) as described in the most recent version of Recommendation ITU-R M.2092.
162.0375 – 174 MHz **FIXED** **MOBILE except aeronautical mobile** 5.226 5.229	FIXED MOBILE except aeronautical mobile		
174 - 223 MHz **BROADCASTING** 5.235 5.237 5.243	BROADCASTING	– Broadcasting (terrestrial) – Wireless Application in Healthcare & Listening Devices	DAB, DVB and Analog TV assignments in accordance with GE-06 Agreement
223 - 230 MHz **BROADCASTING** **Fixed** **Mobile** 5.243 5.246 5.247	BROADCASTING Fixed Mobile	– Broadcasting	The band 223-235 MHz is also allocated to the aeronautical radionavigation service on a primary basis (No. 5.247)
230 - 235 MHz **FIXED**	FIXED MOBILE		The band 223-235 MHz is also allocated to the aeronautical radionavigation service on a primary basis (No. 5.247)

MOBILE 5.247 5.251 5.252			
235 - 267 MHz **FIXED** **MOBILE** 5.111 5.254 5.256 5.256A	FIXED MOBILE	– EPIRB (242.95 – 243.055 MHz)	243 MHz for use by survival craft stations and equipment used for survival purposes (No. 5.256)
267 - 272 MHz **FIXED** **MOBILE** **Space operation (space -to- Earth)** 5.254 5.257	FIXED MOBILE Space operation (space - to - Earth)		
272 - 273 MHz **SPACE OPERATION (space -to- Earth)** **FIXED** **MOBILE** 5.254	SPACE OPERATION (space - to - Earth) FIXED MOBILE		
273 - 312 MHz **FIXED** **MOBILE** 5.254	FIXED MOBILE		
312 - 315 MHz **FIXED** **MOBILE** **Mobile - satellite (Earth -to- space)** 5.254 5.255	FIXED MOBILE Mobile - satellite (Earth - to - space)		
315 - 322 MHz **FIXED** **MOBILE** 5.254	FIXED MOBILE	- Inductive SRD Applications/ Vehicle Fitted Radio Equipment (315 MHz)	

322 - 328.6 MHz **FIXED** **MOBILE** **RADIO ASTRONOMY** 5.149	FIXED MOBILE RADIO ASTRONOMY		
328.6 - 335.4 MHz **AERONAUTICAL RADIONAVIGATION** 5.258 5.259	AERONAUTICAL RADIONAVIGATION	– ILS/Glide path	
335.4 - 387 MHz **FIXED** **MOBILE** 5.254	FIXED MOBILE	– Digital Land Mobile PMR/PAMR – Camel Race Equipment (within 361.0 – 361.49375 MHz)- as per the 'Class License for the Camel Racing Radio Equipment' – Emergency Services (380 - 387 MHz)	
387 - 390 MHz **FIXED** **MOBILE** **Mobile - satellite (space -to- Earth)** 5.208A 5.208B 5.254 5.255	FIXED MOBILE Mobile - satellite (space - to - Earth)	– TETRA – PPDR/ Emergency Services	
390 - 399.9 MHz **FIXED** **MOBILE** 5.254	FIXED MOBILE	– TETRA – PPDR/ Emergency Services	
399.9 - 400.05 MHz **MOBILE - SATELLITE (Earth -to- space)** 5.209 5.220 5.260A 5.260B	MOBILE - SATELLITE (Earth - to - space)		
400.05 - 400.15 MHz **STANDARD FREQUENCY AND TIME SIGNAL - SATELLITE (400.1 MHz)**	STANDARD FREQUENCY AND TIME SIGNAL - SATELLITE (400.1 MHz) FIXED MOBILE		Also allocated to the fixed and mobile services on a primary basis (No. 5.262)

5.261 5.262			
400.15 - 401 MHz **METEOROLOGICAL AIDS** **METEOROLOGICAL - SATELLITE (space -to- Earth)** **MOBILE - SATELLITE (space -to- Earth)** 5.208A 5.208B 5.209 **SPACE RESEARCH (space -to- Earth)** 5.263 **Space operation (space -to- Earth)** 5.262 5.264	METEOROLOGICAL AIDS METEOROLOGICAL - SATELLITE (space - to - Earth) MOBILE - SATELLITE (space - to - Earth) SPACE RESEARCH (space - to - Earth) FIXED MOBILE Space operation (space - to - Earth)	– LEO Satellites	Also allocated to the fixed and mobile services on a primary basis (No. 5.262)
401 - 402 MHz **METEOROLOGICAL AIDS** **SPACE OPERATION (space -to- Earth)** **EARTH EXPLORATION - SATELLITE (Earth -to- space)** **METEOROLOGICAL - SATELLITE (Earth -to- space)** **Fixed** **Mobile except aeronautical mobile** 5.264A 5.264B	METEOROLOGICAL AIDS SPACE OPERATION (space - to - Earth) EARTH EXPLORATION - SATELLITE (Earth - to - space) METEOROLOGICAL - SATELLITE (Earth - to - space) Fixed Mobile except aeronautical mobile	– Meteorological radiosondes – Medical implants within 401 - 406 MHz	
402 - 403 MHz **METEOROLOGICAL AIDS** **EARTH EXPLORATION - SATELLITE (Earth -to- space)** **METEOROLOGICAL - SATELLITE (Earth -to- space)** **Fixed** **Mobile except aeronautical mobile** 5.264A 5.264B	METEOROLOGICAL AIDS EARTH EXPLORATION - SATELLITE (Earth - to - space) METEOROLOGICAL - SATELLITE (Earth - to - space) Fixed Mobile except aeronautical mobile	– Meteorological radiosondes – Medical implants within 401 - 406 MHz (EN 302 537)	
403 - 406 MHz **METEOROLOGICAL AIDS** **Fixed**	METEOROLOGICAL AIDS Fixed Mobile except aeronautical mobile	– Meteorological radiosondes – Medical implants within 401 - 406 MHz (EN 302 537)	Resolution 205 (Rev.WRC-19) applies (No. 5.265)

Mobile except aeronautical mobile 5.265			
406 - 406.1 MHz **MOBILE - SATELLITE (Earth -to- space)** 5.265 5.266 5.267	MOBILE - SATELLITE (Earth - to - space)	– EPIRB	- Low power EPIRBs - Resolution 205 (Rev.WRC-19) applies (No. 5.265) - No fixed or mobile frequency assignments in this band
406.1 - 410 MHz **FIXED** **MOBILE except aeronautical mobile** **RADIO ASTRONOMY** 5.149 5.265	FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY	– Analogue and digital land mobile PMR/PAMR (Single frequency applications)	Resolution 205 (Rev.WRC-19) applies (No. 5.265)
410 - 420 MHz **FIXED** **MOBILE except aeronautical mobile** **SPACE RESEARCH (space -to- space)** 5.268	FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space - to - space)	– TETRA (Duplex applications)	
420 - 430 MHz **FIXED** **MOBILE except aeronautical mobile** **Radiolocation** 5.269 5.270 5.271	FIXED MOBILE except aeronautical mobile Radiolocation	– TETRA (Duplex applications)	
430 - 432 MHz **AMATEUR** **RADIOLOCATION** 5.271 5.274 5.275 5.276 5.277	AMATEUR RADIOLOCATION	– Amateur Applications	Also allocated to the fixed service on a primary basis (No. 5.276)
432 - 438 MHz **AMATEUR** **RADIOLOCATION** **Earth exploration - satellite (active)** 5.279A	AMATEUR RADIOLOCATION Earth exploration - satellite (active)	– Non-Specific SRD applications – Inductive SRD Applications/ Vehicle Fitted Radio Equipment – Non-Specific SRDs for Falcon or Bird Tracking – Amateur Applications	Also allocated to the fixed service on a primary basis (No. 5.276)

5.138 5.271 5.272 5.276 5.277 5.280 5.281 5.282			
438 - 440 MHz **AMATEUR** **RADIOLOCATION** 5.271 5.274 5.275 5.276 5.277 5.283	AMATEUR RADIOLOCATION	– Amateur Applications	Also allocated to the fixed service on a primary basis (No. 5.276)
440 - 450 MHz **FIXED** **MOBILE except aeronautical mobile** **Radiolocation** 5.269 5.270 5.271 5.284 5.285 5.286	FIXED MOBILE except aeronautical mobile Radiolocation		
450 - 455 MHz **FIXED** **MOBILE** 5.286AA 5.209 5.271 5.286 5.286A 5.286B 5.286C 5.286D 5.286E	FIXED MOBILE	– PMR/PAMR – Digital Land Mobile DMO – Onsite paging	
455 - 456 MHz **FIXED** **MOBILE** 5.286AA 5.209 5.271 5.286A 5.286B 5.286C 5.286E	FIXED MOBILE	– PMR/PAMR – Onsite paging	
456 - 459 MHz **FIXED** **MOBILE** 5.286AA 5.271 5.287 5.288	FIXED MOBILE	– PMR/ PAMR – Fixed Telemetry Applications (Simplex/Duplex) – Onsite paging – Maritime onboard Vessel Communications within 457.525 - 457.575 MHz – Inductive SRD Applications/ Vehicle Fitted Radio Equipment (458.95 MHz)	
459 - 460 MHz **FIXED** **MOBILE** 5.286AA	FIXED MOBILE	– PMR/ PAMR – Onsite paging	

5.209 5.271 5.286A 5.286B 5.286C 5.286E			
460 - 470 MHz **FIXED** **MOBILE** 5.286AA **Meteorological - satellite (space -to- Earth)** 5.287 5.288 5.289 5.290	FIXED MOBILE Meteorological - satellite (space - to - Earth)	– PMR/ PAMR – Onsite paging – Maritime on-board Vessel Communications within 467.525 - 467.575 MHz	
470 - 694 MHz **BROADCASTING** 5.149 5.291A 5.294 5.296 5.300 5.304 5.306 5.312	BROADCASTING Fixed Land Mobile Mobile except aeronautical mobile	– Broadcasting – Wireless Audio Applications/Wireless microphone systems (On tuning range basis) – Wireless audio PMSE equipment	DVB and Analog TV assignments in accordance with GE - 06 Agreement Also allocated on a secondary basis to the land mobile service, intended for applications ancillary to broadcasting and programme-making. Also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis (No. 5.300)
694 - 790 MHz **MOBILE except aeronautical mobile** 5.312A 5.317A **BROADCASTING** 5.300 5.312	MOBILE except aeronautical mobile	- IMT	Also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis (No. 5.300) The use by the mobile, except aeronautical mobile, service is subject to the provisions of Resolution 760 (WRC-19). See also Resolution 224 (Rev.WRC-19) (No. 5.312A).
790 - 862 MHz **FIXED** **MOBILE except aeronautical mobile** 5.316B 5.317A **BROADCASTING** 5.312 5.319	MOBILE except aeronautical mobile	– IMT – Broad Band PPDR – Wireless Audio Applications/Wireless microphone systems (823-826 MHz/ 826-832 MHz)	
862 - 890 MHz **FIXED**	FIXED MOBILE except aeronautical mobile	– Non-Specific SRD applications (868 – 870 MHz) – Wireless Audio Applications (863 – 865 MHz)	

MOBILE except aeronautical mobile 5.317A **BROADCASTING** 5.322 5.319 5.323		– Radio Frequency Identification Equipment (RFID) – M2M Applications – GSM-R Railway Systems (876 – 880 MHz paired with 921 - 925 MHz) – EGSM (880-890 MHz paired with 925–935 MHz)	
890 - 942 MHz **FIXED** **MOBILE except aeronautical mobile** 5.317A **BROADCASTING** 5.322 **Radiolocation** 5.323	FIXED MOBILE except aeronautical mobile	– GSM – EGSM (880 – 890 MHz paired with 925 – 935 MHz) – GSM-R Railway Systems (876 – 880 MHz paired with 921 - 925 MHz) – M2M Applications (915 – 921 MHz)	
942 - 960 MHz **FIXED** **MOBILE except aeronautical mobile** 5.317A **BROADCASTING** 5.322 5.323	FIXED MOBILE except aeronautical mobile	– GSM	
960 - 1 164 MHz **AERONAUTICAL RADIONAVIGATION** 5.328 **AERONAUTICAL MOBILE (R)** 5.327A 5.328AA	AERONAUTICAL RADIONAVIGATION AERONAUTICAL MOBILE (R)	– Flight Safety, Navigation and Information Distribution systems (DME,TACAN,SSR,MIDS) – Ultra-Wide Band Technology Applications	Automatic Dependent Surveillance (ADS-B) within the range 1 087.7-1 092.3 MHz to support global flight tracking of civilian aircraft (No. 5.328AA) The use by 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 (No. 5.328)
1 164 - 1 215 MHz **AERONAUTICAL RADIONAVIGATION** 5.328 **RADIONAVIGATION - SATELLITE (space -to- Earth) (space -to- space)** 5.328B 5.328A	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION - SATELLITE (space - to - Earth) (space - to - space)	– Flight Safety, Navigation and Information Distribution systems (DME,TACAN,SSR,MIDS) – Satellite navigation – Ultra-Wide Band Technology Applications	The use by 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 (No. 5.328)

1 215 - 1 240 MHz **EARTH EXPLORATION - SATELLITE (active)** **RADIOLOCATION** **RADIONAVIGATION - SATELLITE (space - to - Earth) (space -to- space)** 5.328B 5.329 5.329A **SPACE RESEARCH (active)** 5.330 5.331 5.332	EARTH EXPLORATION - SATELLITE (active) RADIOLOCATION RADIONAVIGATION - SATELLITE (space - to - Earth) (space - to - space) SPACE RESEARCH (active)	– Radar and Navigation systems – Active Sensors – Satellite Navigation – Ultra-Wide Band Technology Applications	Also allocated to the fixed and mobile services on a primary basis (No. 5.330) Also allocated to the radionavigation service on a primary basis (No. 5.331)
1 240 - 1 300 MHz **EARTH EXPLORATION - SATELLITE (active)** **RADIOLOCATION** **RADIONAVIGATION - SATELLITE (space -to- Earth) (space -to- space)** 5.328B 5.329 5.329A **SPACE RESEARCH (active)** **Amateur** 5.282 5.330 5.331 5.332 5.335 5.335A	EARTH EXPLORATION - SATELLITE (active) RADIOLOCATION RADIONAVIGATION - SATELLITE (space - to - Earth) (space - to - space) SPACE RESEARCH (active) Amateur	– Radar and Navigation systems – Active Sensors – Satellite Navigation – Ultra-Wide Band Technology Applications	Also allocated to the fixed and mobile services on a primary basis (No. 5.330) Also allocated to the radionavigation service on a primary basis (No. 5.331)
1 300 - 1 350 MHz **RADIOLOCATION** **AERONAUTICAL RADIONAVIGATION** 5.337 **RADIONAVIGATION - SATELLITE (Earth -to- space)** 5.149 5.337A	RADIOLOCATION AERONAUTICAL RADIONAVIGATION RADIONAVIGATION - SATELLITE (Earth - to - space)	– Radar and Navigation systems – Satellite Navigation – Ultra-Wide Band Technology Applications	
1 350 - 1 400 MHz **FIXED** **MOBILE** **RADIOLOCATION** 5.149 5.338 5.338A 5.339	FIXED MOBILE RADIOLOCATION	– Low capacity fixed links – Ultra-Wide Band Technology Applications	
1 400 - 1 427 MHz **EARTH EXPLORATION - SATELLITE (passive)** **RADIO ASTRONOMY** **SPACE RESEARCH (passive)**	EARTH EXPLORATION - SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	– Passive applications – Radio Astronomy Applications – Ultra-Wide Band Technology Applications	All emissions prohibited

5.340 5.341			
1 427 - 1 429 MHz **SPACE OPERATION (Earth -to- space)** **FIXED** **MOBILE except aeronautical mobile** 5.341A 5.341B 5.341C 5.338A 5.341	SPACE OPERATION (Earth - to - space) FIXED MOBILE except aeronautical mobile	– IMT – Low capacity fixed links – Ultra-Wide Band Technology Applications	
1 429 - 1 452 MHz **FIXED** **MOBILE except aeronautical mobile** 5.341A 5.338A 5.341 5.342	FIXED MOBILE except aeronautical mobile	– IMT – Low capacity fixed links – Ultra-Wide Band Technology Applications	
1 452 - 1 492 MHz **FIXED** **MOBILE except aeronautical mobile** 5.346 **BROADCASTING** **BROADCASTING - SATELLITE** 5.208B 5.341 5.342 5.345	FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING - SATELLITE	– IMT – Ultra-Wide Band Technology Applications	
1 492 - 1 518 MHz **FIXED** **MOBILE except aeronautical mobile** 5.341A 5.341 5.342	FIXED MOBILE except aeronautical mobile	– IMT – Low capacity fixed links – Ultra-Wide Band Technology Applications	
1 518 - 1 525 MHz **FIXED** **MOBILE except aeronautical mobile** **MOBILE - SATELLITE (space -to- Earth)** 5.348 5.348A 5.348B 5.351A 5.341 5.342	FIXED MOBILE except aeronautical mobile MOBILE - SATELLITE (space - to - Earth)	– Unidirectional fixed links – Mobile satellite applications – Ultra-Wide Band Technology Applications	

1 525 - 1 530 MHz **SPACE OPERATION (space -to- Earth)** **FIXED** **MOBILE - SATELLITE** **(space -to- Earth)** 5.208B 5.351A **Earth Exploration Satellite** **Mobile except aeronautical mobile** 5.349 5.341 5.342 5.350 5.351 5.352A 5.354	SPACE OPERATION (space - to - Earth) FIXED MOBILE - SATELLITE (space - to - Earth) MOBILE except aeronautical mobile Earth Exploration Satellite	– Mobile satellite applications – Unidirectional fixed links – Ultra-Wide Band Technology Applications	The allocation of the band 1 525- 1 530 MHz to the mobile, except aeronautical mobile, service is on a primary basis (No. 5.349)
1 530 - 1 535 MHz **SPACE OPERATION (space -to- Earth)** **MOBILE - SATELLITE** **(space -to- Earth)** 5.208B 5.351A 5.353A **Earth exploration - satellite** **Fixed** **Mobile except aeronautical mobile** 5.341 5.342 5.351 5.354	SPACE OPERATION (space - to - Earth) MOBILE - SATELLITE (space - to - Earth) Earth exploration - satellite Fixed Mobile except aeronautical mobile	– Mobile satellite applications – Priority for GMDSS Distress, urgency and safety communications – Ultra-Wide Band Technology Applications	
1 535 - 1 559 MHz **MOBILE - SATELLITE (space -to- Earth)** 5.208B 5.351A 5.341 5.351 5.353A 5.354 5.355 5.356 5.357 5.357A 5.359 5.362A	MOBILE - SATELLITE (space - to - Earth)	– Mobile satellite applications – 1544 - 1545MHz for Safety, search and Rescue only in band including GMDSS – Priority for GMDSS Distress, urgency and safety communications – Ultra-Wide Band Technology Applications	Band 1 540 – 1 559 MHz also allocated to the fixed service on a secondary basis (No. 5.355)
1 559 - 1 610MHz **AERONAUTICAL RADIONAVIGATION** **RADIONAVIGATION - SATELLITE (space -to- Earth)** **(space -to- space)** 5.208B 5.328B 5.329A 5.341	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION - SATELLITE (space - to - Earth) (space - to - space)	– Satellite Navigation – Vehicle Fitted Radio Equipment /GPS Receiver – Ultra-Wide Band Technology Applications	
1 610 - 1 610.6 MHz **MOBILE - SATELLITE (Earth -to- space)** 5.351A **AERONAUTICAL RADIONAVIGATION**	MOBILE - SATELLITE (Earth - to - space) AERONAUTICAL RADIONAVIGATION	– Mobile satellite applications – Ultra-Wide Band Technology Applications	Band 1 610-1 645.5 MHz also allocated to the fixed service on a secondary basis (No. 5.355) Band 1 610-1 645.5 MHz also allocated

5.341 5.355 5.359 5.364 5.366 5.367 5.368 5.369 5.371 5.372			to the aeronautical mobile-satellite (R) service on a primary basis, subject to agreement obtained under No. 9.21 (No. 5.367)
1 610.6 - 1 613.8 MHz **MOBILE - SATELLITE (Earth -to- space)** 5.351A **RADIO ASTRONOMY** **AERONAUTICAL RADIONAVIGATION** 5.149 5.341 5.355 5.359 5.364 5.366 5.367 5.368 5.369 5.371 5.372	MOBILE - SATELLITE (Earth - to - space) RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION	– Mobile satellite applications – Ultra-Wide Band Technology Applications	Band 1 610-1 645.5 MHz also allocated to the fixed service on a secondary basis (No. 5.355) Band 1 610-1 645.5 MHz also allocated to the aeronautical mobile-satellite (R) service on a primary basis, subject to agreement obtained under No. 9.21 (No. 5.367) (Earth-to-space) is also allocated to the radiodetermination-satellite service on a secondary basis, subject to agreement obtained under No. 9.21 (No. 5.371)
1 613.8 - 1 621.35 MHz **MOBILE - SATELLITE (Earth -to- space)** 5.351A **AERONAUTICAL RADIONAVIGATION** **Mobile - satellite (space -to- Earth)** 5.208B 5.341 5.355 5.359 5.364 5.365 5.366 5.367 5.368 5.369 5.371 5.372	MOBILE - SATELLITE (Earth - to - space) AERONAUTICAL RADIONAVIGATION Mobile - satellite (space - to - Earth)	– Mobile satellite applications – Ultra-Wide Band Technology Applications	Band 1 610-1 645.5 MHz also allocated to the fixed service on a secondary basis (No. 5.355) Band 1 610-1 645.5 MHz also allocated to the aeronautical mobile-satellite (R) service on a primary basis, subject to agreement obtained under No. 9.21 (No. 5.367) (Earth-to-space) is also allocated to the radiodetermination-satellite service on a secondary basis, subject to agreement obtained under No. 9.21 (No. 5.371)
1 621.35 - 1 626. 5 MHz **MARITIME MOBILE-SATELLITE (space-to-Earth)** 5.373 5.373A **MOBILE-SATELLITE (Earth-to-space)** 5.351A **AERONAUTICAL RADIONAVIGATION** **Mobile - satellite (space-to-Earth)** **except maritime mobile satellite (space-to-Earth)** 5.208B 5.341 5.355 5.359 5.364 5.365 5.366 5.367	MARITIME MOBILE-SATELLITE (space-to-Earth) MOBILE-SATELLITE (Earth-to-space) AERONAUTICAL RADIONAVIGATION Mobile - satellite (space-to-Earth) except maritime mobile satellite (space-to-Earth)	– MMSS GMDSS	Band 1 610-1 645.5 MHz also allocated to the fixed service on a secondary basis (No. 5.355) Band 1 610-1 645.5 MHz also allocated to the aeronautical mobile-satellite (R) service on a primary basis, subject to agreement obtained under No. 9.21 (No. 5.367)

5.368 5.369 5.371 5.372			
1 626.5 - 1 660 MHz **MOBILE - SATELLITE (Earth -to- space)** 5.351A 5.341 5.351 5.353A 5.354 5.355 5.357A 5.359 5.362A 5.374 5.375 5.376	MOBILE - SATELLITE (Earth - to - space)	– Mobile satellite applications – 1 645.5-1 646.5 MHz band is limited to distress and safety communications – Priority for GMDSS Distress and safety communications in the band 1 626.5-1 645.5 MHz – Ultra-Wide Band Technology Applications	Bands 1 610-1 645.5 MHz and 1 646.5-1 660 MHz are also allocated to the fixed service on a secondary basis (No. 5.355)
1 660 - 1 660.5 MHz **MOBILE - SATELLITE (Earth -to- space)** 5.351A **RADIO ASTRONOMY** 5.149 5.341 5.351 5.354 5.362A 5.376A	MOBILE - SATELLITE (Earth - to - space) RADIO ASTRONOMY	– Mobile satellite applications – Radio Astronomy Applications – Ultra-Wide Band Technology Applications	
1 660.5 - 1 668 MHz **RADIO ASTRONOMY** **SPACE RESEARCH (passive)** **Fixed** **Mobile except aeronautical mobile** 5.149 5.341 5.379 5.379A	RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile	– Radio astronomy applications – Ultra-Wide Band Technology Applications	
1 668 - 1 668.4 MHz **MOBILE - SATELLITE (Earth -to- space)** 5.351A 5.379B 5.379C **RADIO ASTRONOMY** **SPACE RESEARCH (passive)** **Fixed** **Mobile except aeronautical mobile** 5.149 5.341 5.379 5.379A	MOBILE - SATELLITE (Earth - to - space) RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile	– Radio astronomy applications – Ultra-Wide Band Technology Applications	
1 668.4 - 1 670 MHz **METEOROLOGICAL AIDS** **FIXED** **MOBILE except aeronautical mobile** **MOBILE - SATELLITE (Earth -to- space)** 5.351A	METEOROLOGICAL AIDS FIXED MOBILE except aeronautical mobile MOBILE - SATELLITE (Earth - to - space) RADIO ASTRONOMY	– Meteorological applications – Radio astronomy applications – Ultra-Wide Band Technology Applications	

5.379B 5.379C **RADIO ASTRONOMY** 5.149 5.341 5.379D 5.379E			
1 670 - 1 675 MHz **METEOROLOGICAL AIDS** **FIXED** **METEOROLOGICAL - SATELLITE (space -to- Earth)** **MOBILE** **MOBILE - SATELLITE (Earth -to- space)** 5.351A 5.379B 5.341 5.379D 5.379E 5.380A	METEOROLOGICAL AIDS FIXED METEOROLOGICAL - SATELLITE (space - to - Earth) MOBILE MOBILE - SATELLITE (Earth - to - space)	– Meteorological applications – Ultra-Wide Band Technology Applications	
1 675 - 1 690 MHz **METEOROLOGICAL AIDS** **FIXED** **METEOROLOGICAL - SATELLITE (space -to- Earth)** **MOBILE except aeronautical mobile** 5.341	METEOROLOGICAL AIDS FIXED METEOROLOGICAL - SATELLITE (space - to - Earth) MOBILE except aeronautical mobile	– Meteorological applications – Ultra-Wide Band Technology Applications	
1 690 - 1 700 MHz **METEOROLOGICAL AIDS** **METEOROLOGICAL - SATELLITE (space -to- Earth)** **Fixed** **Mobile except aeronautical mobile** 5.289 5.341 5.382	METEOROLOGICAL AIDS METEOROLOGICAL - SATELLITE (space - to - Earth) FIXED MOBILE except aeronautical mobile	– Meteorological applications – Ultra-Wide Band Technology Applications	The allocation of the frequency band 1 690-1 700 MHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (No. 5.382)
1 700 - 1 710 MHz **FIXED** **METEOROLOGICAL - SATELLITE (space -to- Earth)** **MOBILE except aeronautical mobile** 5.289 5.341	FIXED METEOROLOGICAL - SATELLITE (space - to - Earth) MOBILE except aeronautical mobile	– Meteorological applications – Ultra-Wide Band Technology Applications	

1 710 - 1 930 MHz **FIXED** **MOBILE** 5.384A 5.388A 5.388B 5.149 5.341 5.385 5.386 5.387 5.388	FIXED MOBILE	– DCS 1800 (1710-1785 MHz paired with 1805-1880 MHz) – Terrestrial UMTS/IMT – 2000 – DECT (1880 – 1900 MHz) – Wireless Audio Applications (1795 – 1800 MHz) – Ultra-Wide Band Technology Applications	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 (No. 5.385)
1 930 - 1 970 MHz **FIXED** **MOBILE** 5.388A 5.388B 5.388	FIXED MOBILE	– Terrestrial UMTS/IMT – 2000 (1920-1980 MHz paired with 2110-2170 MHz)	
1 970 - 1 980 MHz **FIXED** **MOBILE** 5.388A 5.388B 5.388	FIXED MOBILE	– Terrestrial UMTS/IMT – 2000 (1920-1980 MHz paired with 2110-2170 MHz) – Ultra-Wide Band Technology Applications	
1 980 - 2 010 MHz **FIXED** **MOBILE** **MOBILE - SATELLITE (Earth -to- space)** 5.351A 5.388 5.389A 5.389B 5.389F	FIXED MOBILE MOBILE - SATELLITE (Earth - to - space)	– Mobile satellite applications – UMTS/IMT - 2000 satellite component – Ultra-Wide Band Technology Applications	
2 010 - 2 025 MHz **FIXED** **MOBILE 5.388A** 5.388B 5.388	FIXED MOBILE	– Terrestrial UMTS/IMT – 2000 – Ultra-Wide Band Technology Applications	
2 025 - 2 110 MHz **SPACE OPERATION (Earth -to- space) (space -to- space)** **EARTH EXPLORATION - SATELLITE (Earth -to- space) (space -to- space)** **FIXED** **MOBILE** 5.391	SPACE OPERATION (Earth - to - space) (space - to - space) EARTH EXPLORATION - SATELLITE (Earth - to - space) (space - to - space) FIXED MOBILE SPACE RESEARCH (Earth - to - space) (space - to - space)	– Fixed links/ Wireless Camera – Tactical Radio Relay – Ultra-Wide Band Technology Applications	PMSE Applications

SPACE RESEARCH (Earth -to- space) (space -to-space) 5.392			
2 110 - 2 120 MHz **FIXED** **MOBILE** 5.388A 5.388B **SPACE RESEARCH (deep space) (Earth -to- space)** 5.388	FIXED MOBILE SPACE RESEARCH (deep space) (Earth - to - space)	– Terrestrial UMTS/IMT – 2000 (1920-1980 MHz paired with 2110-2170 MHz) – Ultra-Wide Band Technology Applications	
2 120 - 2 160 MHz **FIXED** **MOBILE** 5.388A 5.388B 5.388	FIXED MOBILE	– Terrestrial UMTS/IMT – 2000 (1920-1980 MHz paired with 2110-2170 MHz) – Ultra-Wide Band Technology Applications	
2 160 - 2 170 MHz **FIXED** **MOBILE** 5.388A 5.388B 5.388	FIXED MOBILE	– Terrestrial UMTS/IMT – 2000 (1920-1980 MHz paired with 2110-2170 MHz) – Ultra-Wide Band Technology Applications	
2 170 - 2 200 MHz **FIXED** **MOBILE** **MOBILE - SATELLITE (space -to- Earth)** 5.351A 5.388 5.389A 5.389F	FIXED MOBILE MOBILE - SATELLITE (space - to - Earth)	– Fixed Links – Mobile satellite applications – UMTS/IMT - 2000 satellite component – Ultra-Wide Band Technology Applications	
2 200 - 2 290 MHz **SPACE OPERATION (space -to- Earth) (space -to-space)** **EARTH EXPLORATION - SATELLITE (space -to-Earth) (space -to- space)** **FIXED** **MOBILE** 5.391	SPACE OPERATION (space - to - Earth) (space - to - space) EARTH EXPLORATION - SATELLITE (space - to - Earth) (space - to - space) FIXED MOBILE SPACE RESEARCH (space - to - Earth) (space - to - space)	– Fixed links – Ultra-Wide Band Technology Applications	PMSE Applications

SPACE RESEARCH (space -to- Earth) (space -to - space) 5.392			
2 290 - 2 300 MHz **FIXED** **MOBILE except aeronautical mobile** **SPACE RESEARCH (deep space) (space - to - Earth)**	FIXED MOBILE except aeronautical mobile SPACE RESEARCH (deep space) (space - to - Earth)	– Mobile applications – Ultra-Wide Band Technology Applications	
2 300 - 2 450 MHz **FIXED** **MOBILE** 5.384A **Amateur** **Radiolocation** 5.150 5.282 5.395	FIXED MOBILE Amateur Radiolocation	– IMT (2300 - 2400 MHz) – Aeronautical Telemetry – Amateur applications – Amateur Satellite applications – Automatic Vehicle Identification (2446 - 2454 MHz) – ISM – RFID within the band 2446-2454 MHz – Non-Specific SRD applications /WLAN – Ultra-Wide Band Technology Applications	
2 450 - 2 483.5 MHz **FIXED** **MOBILE** **Radiolocation** 5.150	FIXED MOBILE Radiolocation	– Automatic Vehicle Identification (2446 - 2454 MHz) – ISM – Motion sensors – RFID within the band 2446-2454 MHz – RLAN – Cordless Phones – Non-Specific SRD applications/WLAN – Ultra-Wide Band Technology Applications	
2 483.5 - 2 500 MHz **FIXED** **MOBILE** **MOBILE – SATELLITE (space -to- Earth)** 5.351A **RADIODETERMINATIONSATELLITE (space-to-Earth)** 5.398 **Radiolocation** 5.398A 5.150 5.399 5.401 5.402	FIXED MOBILE MOBILE – SATELLITE (space - to - Earth) RADIODETERMINATIONSATELLITE (space-to-Earth) Radiolocation	– Fixed links – ISM – Mobile satellite applications – Ultra-Wide Band Technology Applications	

2 500 - 2 520 MHz **FIXED** 5.410 **MOBILE except aeronautical mobile** 5.384A 5.405 5.412	FIXED MOBILE except aeronautical mobile	– Terrestrial UMTS/ IMT – Ultra-Wide Band Technology Applications	
2 520 - 2 655 MHz **FIXED** 5.410 **MOBILE except aeronautical mobile** 5.384A **BROADCASTING - SATELLITE** 5.413 5.416 5.339 5.412 5.418B 5.418C	FIXED MOBILE except aeronautical mobile BROADCASTING - SATELLITE	– Terrestrial UMTS/ IMT – Ultra-Wide Band Technology Applications	
2 655 - 2 670 MHz **FIXED** 5.410 **MOBILE except aeronautical mobile** 5.384A **BROADCASTING - SATELLITE** 5.208B 5.413 5.416 **Earth exploration - satellite (passive)** **Radio astronomy** **Space research (passive)** 5.149 5.412	FIXED MOBILE except aeronautical mobile BROADCASTING - SATELLITE Earth exploration - satellite (passive) Radio astronomy Space research (passive)	– Terrestrial UMTS/ IMT – Ultra-Wide Band Technology Applications	
2 670 - 2 690 MHz **FIXED** 5.410 **MOBILE except aeronautical mobile** 5.384A **Earth exploration - satellite (passive)** **Radio astronomy** **Space research (passive)** 5.149 5.412	FIXED MOBILE except aeronautical mobile Earth exploration - satellite (passive) Radio astronomy Space research (passive)	– Radio astronomy applications – Terrestrial UMTS/ IMT – Mobile Satellite Applications – Ultra-Wide Band Technology Applications	
2 690 - 2 700 MHz **EARTH EXPLORATION - SATELLITE (passive)** **RADIO ASTRONOMY** **SPACE RESEARCH (passive)** 5.340 5.422	EARTH EXPLORATION - SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	– Passive applications	All emissions are prohibited 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 (No. 5.422)

2 700 - 2 900 MHz **AERONAUTICAL RADIONAVIGATION** 5.337 **Radiolocation** 5.423 5.424	AERONAUTICAL RADIONAVIGATION Radiolocation	– Meteorological radars – Radar and Navigation systems (Aeronautical) – Ultra-Wide Band Technology Applications	
2 900 - 3 100 MHz **RADIOLOCATION** 5.424A **RADIONAVIGATION** 5.426 5.425 5.427	RADIOLOCATION RADIONAVIGATION	– Radar and Navigation systems – Ultra-Wide Band Technology Applications	The use of the band 2 900-3 100 MHz by the aeronautical radionavigation service is limited to ground-based radars (No. 5.426)
3 100 - 3 300 MHz **RADIOLOCATION** **Earth exploration - satellite (active)** **Space research (active)** 5.149 5.428	RADIOLOCATION Earth exploration - satellite (active) Space research (active)	– Radars and active sensors – Ultra-Wide Band Technology Applications	
3 300 - 3 400 MHz **RADIOLOCATION** 5.149 5.429 5.429A 5.429B 5.430	RADIOLOCATION FIXED MOBILE	– Radars – Fixed / mobile applications – Ultra-Wide Band Technology Applications	Also allocated to the fixed and mobile services on a primary basis (No. 5.429)
3 400 - 3 600 MHz **FIXED** **FIXED - SATELLITE (space -to- Earth)** **MOBILE except aeronautical mobile** 5.430A **Radiolocation** 5.431	FIXED FIXED - SATELLITE (space - to - Earth) MOBILE (except Aeronautical Mobile) Radiolocation	– Fixed wireless access – Radars Upper limit for airborne radars is 3410 MHz – Mobile applications – IMT – Ultra-Wide Band Technology Applications	The allocation of the frequency band 3 400-3 600 MHz to the mobile, except aeronautical mobile, service is subject to agreement obtained under No. **9.21** (No. 5.430A)
3 600 - 4 200 MHz **FIXED** **FIXED - SATELLITE (space -to- Earth)** **Mobile**	FIXED FIXED - SATELLITE (space - to - Earth) MOBILE	– IMT (3600 – 3800 MHz) – Coordinated earth stations in FSS – Medium/high capacity fixed links (3800 – 4200 MHz) – Ultra-Wide Band Technology Applications	
4 200 - 4 400 MHz	AERONAUTICAL MOBILE (R) AERONAUTICAL RADIONAVIGATION	– Wireless Avionics Intra-communication Systems	

AERONAUTICAL MOBILE (R) 5.436 **AERONAUTICAL RADIONAVIGATION** 5.438 5.437 5.439 5.440		– Earth Exploration Satellite systems for sea surface temperature measurements – Radio altimeters – Ultra-Wide Band Technology Applications	
4 400 - 4 500 MHz **FIXED** **MOBILE** 5.440A	FIXED MOBILE	– Mobile applications – Transhorizon links – Ultra-Wide Band Technology Applications	
4 500 - 4 800 **FIXED** **FIXED - SATELLITE (space -to- Earth)** 5.441 **MOBILE** 5.440A	FIXED FIXED - SATELLITE (space - to - Earth) MOBILE	– Coordinated earth stations in FSS Fixed - Satellite service – Fixed - Satellite frequency plan in 4500 - 4800 MHz – Transhorizon links – Ultra-Wide Band Technology Applications	FSS applications within the band 4500 – 4800 MHz in accordance with ITU - R Appendix - 30B
4 800 - 4 990 MHz **FIXED** **MOBILE** 5.440A 4.441A 5.441B 5.442 **Radio astronomy** 5.149 5.339 5.443	FIXED MOBILE Radio astronomy	– Passive applications – Space Research and EES (passive) – Radio astronomy applications – Ultra-Wide Band Technology Applications	
4 990 - 5 000 MHz **FIXED** **MOBILE except aeronautical mobile** **RADIO ASTRONOMY** **Space research (passive)** 5.149	FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY Space research (passive)	– Radio astronomy applications – Ultra-Wide Band Technology Applications	
5 000 - 5 010 MHz **AERONAUTICAL MOBILE-SATELLITE (R)** 5.443AA **AERONAUTICAL RADIONAVIGATION** **RADIONAVIGATION - SATELLITE (Earth -to- space)**	AERONAUTICAL MOBILE-SATELLITE (R) AERONAUTICAL RADIONAVIGATION RADIONAVIGATION - SATELLITE (Earth - to - space)	– Radio astronomy applications – Satellite Navigation – Ultra-Wide Band Technology Applications	
5 010 - 5 030 MHz **AERONAUTICAL MOBILE-SATELLITE (R)** 5.443AA **AERONAUTICAL RADIONAVIGATION**	AERONAUTICAL MOBILE-SATELLITE (R) AERONAUTICAL RADIONAVIGATION RADIONAVIGATION - SATELLITE	– Radio astronomy applications – Satellite Navigation – Ultra-Wide Band Technology Applications	

RADIONAVIGATION - SATELLITE (space -to- Earth) (space -to- space) 5.328B 5.443B	(space - to - Earth) (space - to - space)		
5 030 - 5 091 MHz **AERONAUTICAL MOBILE (R)** 5.443C **AERONAUTICAL MOBILE-SATELLITE (R)** 5.443D **AERONAUTICAL RADIONAVIGATION** 5.444	AERONAUTICAL MOBILE (R) AERONAUTICAL MOBILE-SATELLITE (R) AERONAUTICAL RADIONAVIGATION	– Aeronautical Radionavigation – Ultra-Wide Band Technology Applications	
5 091 - 5 150 MHz **FIXED-SATELLITE (Earth-to-space)** 5.444A **AERONAUTICAL MOBILE** 5.444B **AERONAUTICAL MOBILE-SATELLITE (R)** 5.443AA **AERONAUTICAL RADIONAVIGATION** 5.444	FIXED-SATELLITE (Earth-to-space) AERONAUTICAL MOBILE AERONAUTICAL MOBILE-SATELLITE (R) AERONAUTICAL RADIONAVIGATION	– Aeronautical Radionavigation – FSS – Ultra-Wide Band Technology Applications	FSS with limitations as per 5.444A
5 150 - 5 250 MHz **FIXED - SATELLITE (Earth - to - space)** 5.447A **MOBILE except aeronautical mobile** 5.446A 5.446B **AERONAUTICAL RADIONAVIGATION** 5.446 5.446C 5.446D 5.447 5.447B 5.447C	FIXED - SATELLITE (Earth - to - space) MOBILE AERONAUTICAL RADIONAVIGATION	– Feeder links for MSS – Wireless Access Systems (WAS/ RLANs) – Aeronautical telemetry – Ultra-Wide Band Technology Applications	The use of the frequency bands 5 150-5 350 MHz and 5 470-5 725 MHz by the stations in the mobile, except aeronautical mobile, service shall be in accordance with Resolution 229 (Rev.WRC-19). (No. 446A)
5 250 - 5 255 MHz **EARTH EXPLORATION - SATELLITE (active)** **MOBILE except aeronautical mobile** 5.446A 5.447F **RADIOLOCATION** **SPACE RESEARCH** 5.447D 5.447E 5.448 5.448A	EARTH EXPLORATION - SATELLITE (active) MOBILE except aeronautical mobile RADIOLOCATION SPACE RESEARCH	– Active Sensors – Position fixing – Shipborne and VTS radar – Weather radars (Ground based and airborne) – Wireless Access Systems (WAS/ RLANs) – Ultra-Wide Band Technology Applications	The use of the frequency bands 5 150-5 350 MHz and 5 470-5 725 MHz by the stations in the mobile, except aeronautical mobile, service shall be in accordance with Resolution 229 (Rev.WRC-19). (No. 446A)
5 255 - 5 350 MHz **EARTH EXPLORATION - SATELLITE (active)** **MOBILE except aeronautical mobile** 5.446A 5.447F **RADIOLOCATION**	EARTH EXPLORATION - SATELLITE (active) MOBILE except aeronautical mobile RADIOLOCATION SPACE RESEARCH	– Active Sensors – Position fixing – Shipborne and VTS radar – Weather radars (Ground based and airborne) – Wireless Access Systems (WAS/ RLANs)	The use of the frequency bands 5 150-5 350 MHz and 5 470-5 725 MHz by the stations in the mobile, except aeronautical mobile, service shall be in accordance with Resolution 229 (Rev.WRC-19). (No. 446A)

SPACE RESEARCH (active) 5.447E 5.448 5.448A		– Ultra-Wide Band Technology Applications	
5 350 - 5 460 MHz **EARTH EXPLORATION - SATELLITE (active)** 5.448B **RADIOLOCATION** 5.448D **AERONAUTICAL RADIONAVIGATION** 5.449 **SPACE RESEARCH (active)** 5.448C	EARTH EXPLORATION - SATELLITE (active) RADIOLOCATION AERONAUTICAL RADIONAVIGATION SPACE RESEARCH (active)	– Active Sensors – Position fixing – Shipborne and VTS radar – Weather radars (Ground based and airborne) – Ultra-Wide Band Technology Applications	The use by aeronautical radionavigation service is limited to airborne radars and associated airborne beacons (No. 5.449)
5 460 - 5 470 MHz **EARTH EXPLORATION-SATELLITE (active)** **RADIOLOCATION** 5.448D **RADIONAVIGATION** 5.449 **SPACE RESEARCH (active)** 5.448B	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION SPACE RESEARCH (active)	– Active Sensors – Position fixing – Shipborne and VTS radar – Weather radars (Ground based and airborne) – Ultra-Wide Band Technology Applications	The use by aeronautical radionavigation service is limited to airborne radars and associated airborne beacons (No. 5.449)
5 470 - 5 570 MHz **EARTH EXPLORATION-SATELLITE (active)** **MOBILE except aeronautical mobile** 5.446A 5.450A **RADIOLOCATION** 5.450B **MARITIME RADIONAVIGATION** **SPACE RESEARCH (active)** 5.448B 5.450 5.451	EARTH EXPLORATION-SATELLITE (active) MOBILE except aeronautical mobile RADIOLOCATION MARITIME RADIONAVIGATION SPACE RESEARCH (active)	– Active Sensors – Position fixing – Shipborne and VTS radar – Weather radars (Ground based and airborne) – Wireless Access Systems (WAS/ RLANs) – Ultra-Wide Band Technology Applications	The use of the frequency bands 5 150-5 350 MHz and 5 470-5 725 MHz by the stations in the mobile, except aeronautical mobile, service shall be in accordance with Resolution 229 (Rev.WRC-19). (No. 446A)
5 570 - 5 650 MHz **MOBILE except aeronautical mobile** 5.446A 5.450A **RADIOLOCATION** 5.450B **MARITIME RADIONAVIGATION** 5.450 5.451 5.452	MOBILE except aeronautical mobile RADIOLOCATION MARITIME RADIONAVIGATION	– Shipborne and VTS radar – Wireless Access Systems (WAS/ RLANs) – Ultra-Wide Band Technology Applications	The use of the frequency bands 5 150-5 350 MHz and 5 470-5 725 MHz by the stations in the mobile, except aeronautical mobile, service shall be in accordance with Resolution 229 (Rev.WRC-19). (No. 446A)
5 650 - 5 725 MHz **MOBILE except aeronautical mobile** 5.446A 5.450A **RADIOLOCATION** **Amateur**	FIXED MOBILE RADIOLOCATION Amateur Space research (deep space)	– Amateur applications (5660 - 5670 MHz) – Amateur Satellite applications (5660-5670MHz) – Position fixing – Shipborne and VTS radar	Also allocated to the fixed and mobile services on a primary basis (No. 5.453) The use of the frequency bands 5 150-5 350 MHz and 5 470-5 725 MHz by the stations in the mobile, except aeronautical mobile, service shall be in

Space research (deep space) 5.282 5.451 5.453 5.454 5.455		– Weather radars (Ground based and airborne) – Wireless Access Systems (WAS/ RLANs) – Ultra-Wide Band Technology Applications	accordance with Resolution 229 (Rev.WRC-19). (No. 446A)
5 725 - 5 830 MHz **FIXED – SATELLITE (Earth -to- space)** **RADIOLOCATION** **Amateur** 5.150 5.451 5.453 5.455	FIXED MOBILE FIXED – SATELLITE (Earth - to - space) RADIOLOCATION Amateur	– Amateur applications – ISM Within (5725 - 5875 MHz) – Radiolocation Applications – Nonspecific SRD applications/WLAN (5725 - 5875 MHz) – Weather radars – Ultra-Wide Band Technology Applications	Also allocated to the fixed and mobile services on a primary basis (No. 5.453)
5 830 - 5 850 MHz **FIXED - SATELLITE (Earth -to- space)** **RADIOLOCATION** **Amateur** **Amateur - satellite (space -to- Earth)** 5.150 5.451 5.453 5.455	FIXED MOBILE FIXED - SATELLITE (Earth - to - space) RADIOLOCATION Amateur Amateur - satellite (space - to - Earth)	– Amateur Satellite applications (5830 - 5850 MHz) – ISM (5725 - 5875 MHz) – Radiolocation Applications – Nonspecific SRD applications/ WLAN (5725 - 5875 MHz) – Weather radars – Ultra-Wide Band Technology Applications	Also allocated to the fixed and mobile services on a primary basis (No. 5.453)
5 850 - 5 925 MHz **FIXED** **FIXED - SATELLITE (Earth -to- space)** **MOBILE** 5.150	FIXED FIXED - SATELLITE (Earth - to - space) MOBILE	– Coordinated earth stations in FSS – ISM (5725 - 5875 MHz) – Nonspecific SRD (5725 - 5875 MHz) – ITS Applications – Ultra-Wide Band Technology Applications	
5 925 - 6 700 MHz **FIXED** 5.457 **FIXED - SATELLITE (Earth -to- space)** 5.457A 5.457B **MOBILE** 5.457C 5.149 5.440 5.458	FIXED FIXED - SATELLITE (Earth - to - space) MOBILE	– Coordinated earth stations in FSS – Medium/high capacity fixed links – Earth Exploration Satellite systems – Earth station on vessels Within the band 5925-6425 MHz – Ultra-Wide Band Technology Applications	
6 700 - 7 075 MHz **FIXED** **FIXED - SATELLITE (Earth -to- space) (space -to - Earth)** 5.441	FIXED FIXED - SATELLITE (Earth - to - space) (space - to - Earth) MOBILE	– Earth Exploration Satellite systems (for sea surface temperature measurements) – Feeder - links for MSS (within the band 6925 - 7075 MHz) – Fixed Satellite applications (within the band 6725 - 7025 MHz), priority for civil networks	FSS applications within the band 6725 – 7025 MHz in accordance with ITU - R Appendix - 30B PMSE Applications

MOBILE 5.458 5.458A 5.458B		– Medium/high capacity fixed links – Ultra-Wide Band Technology Applications	
7 075 - 7 145 MHz **FIXED** **MOBILE** 5.458 5.459	FIXED MOBILE	– Earth Exploration Satellite systems (For sea surface temperature measurements) – Medium/high capacity fixed links – Ultra-Wide Band Technology Applications	PMSE Applications
7 145 - 7 190 MHz **FIXED** **MOBILE** **SPACE RESEARCH (deep space) (Earth-to-space)** 5.458 5.459	FIXED MOBILE SPACE RESEARCH (deep space) (Earth-to-space)	– Earth Exploration Satellite systems (For sea surface temperature measurements) – Medium/high capacity fixed links – Ultra-Wide Band Technology Applications	PMSE Applications
7 190 - 7 235 MHz **EARTH EXPLORATION-SATELLITE (Earth-to-space)** 5.460A 5.460B **FIXED** **MOBILE** **SPACE RESEARCH (Earth -to- space)** 5.460 5.458 5.459	EARTH EXPLORATION-SATELLITE (Earth-to-space) FIXED MOBILE SPACE RESEARCH (Earth - to - space)	– Earth Exploration Satellite systems for sea surface temperature measurements – Fixed links – Ultra-Wide Band Technology Applications	PMSE Applications
7 235 - 7 250 MHz **EARTH EXPLORATION-SATELLITE (Earth-to-space)** 5.460A **FIXED** **MOBILE** 5.458	EARTH EXPLORATION-SATELLITE (Earth-to-space) FIXED MOBILE	– Earth Exploration Satellite Systems for sea surface temperature measurements – Fixed links – Ultra-Wide Band Technology Applications	PMSE Applications
7 250 - 7 300 MHz **FIXED** **FIXED - SATELLITE (space -to- Earth)** **MOBILE**	FIXED FIXED - SATELLITE (space - to - Earth) MOBILE	– Fixed links – Mobile satellite applications within the band 7250 - 7375 MHz – Ultra-Wide Band Technology Applications	PMSE Applications

5.461			
7 300 - 7 375 MHz **FIXED** **FIXED - SATELLITE (space -to- Earth)** **MOBILE except aeronautical mobile** 5.461	FIXED FIXED - SATELLITE (space - to - Earth) MOBILE except aeronautical mobile	– Fixed links – Mobile satellite applications within the band 7250 - 7375 MHz – Ultra-Wide Band Technology Applications	PMSE Applications
7 375 - 7 450 MHz **FIXED** **FIXED - SATELLITE (space -to- Earth)** **MOBILE except aeronautical mobile** **MARITIME MOBILE-SATELLITE (space-to-Earth)** 5.461AA 5.461AB	FIXED FIXED - SATELLITE (space - to - Earth) MOBILE except aeronautical mobile MARITIME MOBILE-SATELLITE (space-to-Earth)	– Fixed links – Ultra-Wide Band Technology Applications	PMSE Applications
7 450 - 7 550 MHz **FIXED** **FIXED - SATELLITE (space -to- Earth)** **METEOROLOGICAL - SATELLITE (space -to- Earth)** **MOBILE except aeronautical mobile** **MARITIME MOBILE-SATELLITE (space-to-Earth)** 5.461AA 5.461AB 5.461A	FIXED FIXED - SATELLITE (space - to - Earth) METEOROLOGICAL - SATELLITE (space - to - Earth) MOBILE except aeronautical mobile MARITIME MOBILE-SATELLITE (space-to-Earth)	– Fixed links – Meteorological Satellite – Ultra-Wide Band Technology Applications	
7 550 - 7 750 MHz **FIXED** **FIXED - SATELLITE (space -to- Earth)** **MOBILE except aeronautical mobile** **MARITIME MOBILE-SATELLITE (space-to-Earth)** 5.461AA 5.461 AB	FIXED FIXED - SATELLITE (space - to - Earth) MOBILE except aeronautical mobile MARITIME MOBILE-SATELLITE (space-to-Earth)	– Fixed links – Ultra-Wide Band Technology Applications	
7 750 - 7900 MHz **FIXED** **METEOROLOGICAL - SATELLITE (space -to- Earth)** 5.461B	FIXED METEOROLOGICAL - SATELLITE (space - to - Earth) MOBILE except aeronautical mobile	– Fixed links – Meteorological Satellite – Ultra-Wide Band Technology Applications	

MOBILE except aeronautical mobile			
7 900 - 8 025 MHz **FIXED** **FIXED - SATELLITE (Earth -to- space)** **MOBILE** 5.461	FIXED FIXED - SATELLITE (Earth - to - space) MOBILE	– Fixed links – Mobile satellite applications – Ultra-Wide Band Technology Applications	
8 025 - 8 175 MHz **EARTH EXPLORATION - SATELLITE (space -to- Earth)** **FIXED** **FIXED - SATELLITE (Earth -to- space)** **MOBILE** 5.463 5.462A	EARTH EXPLORATION - SATELLITE (space - to - Earth) FIXED FIXED - SATELLITE (Earth - to - space) MOBILE	– Fixed links – Earth Exploration satellite – Ultra-Wide Band Technology Applications	
8 175 - 8 215 MHz **EARTH EXPLORATION - SATELLITE (space -to- Earth)** **FIXED** **FIXED - SATELLITE (Earth -to- space)** **METEOROLOGICAL - SATELLITE (Earth -to- space)** **MOBILE** 5.463 5.462A	EARTH EXPLORATION - SATELLITE (space - to - Earth) FIXED FIXED - SATELLITE (Earth - to - space) METEOROLOGICAL - SATELLITE (Earth - to - space) MOBILE	– Fixed links – Earth Exploration satellite – Ultra-Wide Band Technology Applications	
8 215 - 8 400 MHz **EARTH EXPLORATION - SATELLITE (space -to- Earth)** **FIXED** **FIXED - SATELLITE (Earth -to- space)** **MOBILE** 5.463 5.462A	EARTH EXPLORATION - SATELLITE (space - to - Earth) FIXED FIXED - SATELLITE (Earth - to - space) MOBILE	– Fixed links – Earth Exploration satellite – Radio Astronomy applications (VLBI observations) – Ultra-Wide Band Technology Applications	
8 400 - 8 500 MHz	FIXED MOBILE except aeronautical mobile	– Fixed links – Ultra-Wide Band Technology Applications	

FIXED **MOBILE except aeronautical mobile** **SPACE RESEARCH (space -to- Earth)** 5.465 5.466	SPACE RESEARCH (space - to - Earth)		
8 500 - 8 550 MHz **RADIOLOCATION** 5.468 5.469	RADIOLOCATION FIXED MOBILE	– Aeronautical Radionavigation e.g. airfield approach – Shipborne, land and airborne surveillance radars – Ultra-Wide Band Technology Applications	Also allocated to the fixed and mobile services on a primary basis (No. 5.468)
8 550 - 8 650 MHz **EARTH EXPLORATION - SATELLITE (active)** **RADIOLOCATION** **SPACE RESEARCH (active)** 5.468 5.469 5.469A	EARTH EXPLORATION - SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) FIXED MOBILE	– Aeronautical Radionavigation e.g. airfield approach – Shipborne, land and airborne surveillance radars – Spaceborne active sensors – Ultra-Wide Band Technology Applications	Also allocated to the fixed and mobile services on a primary basis (No. 5.468)
8 650 - 8 750 MHz **RADIOLOCATION** 5.468 5.469	RADIOLOCATION FIXED MOBILE	– Aeronautical Radionavigation e.g. airfield approach – Shipborne, land and airborne surveillance radars – Ultra-Wide Band Technology Applications	Also allocated to the fixed and mobile services on a primary basis (No. 5.468)
8 750 - 8 850 MHz **RADIOLOCATION** **AERONAUTICAL RADIONAVIGATION** 5.470 5.471	RADIOLOCATION AERONAUTICAL RADIONAVIGATION	– Airborne Doppler Radar – Shore-based radars (8825 – 8850 MHz) – Ultra-Wide Band Technology Applications	The use by the aeronautical radionavigation service is limited to airborne Doppler navigation aids on a center frequency of 8 800 MHz (No. 5.470) The frequency bands 8 825-8 850 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 (No. 5.471)
8 850 - 9 000 MHz **RADIOLOCATION** **MARITIME RADIONAVIGATION** 5.472 5.473	RADIOLOCATION MARITIME RADIONAVIGATION	– Aeronautical Radionavigation e.g. airfield approach – Shore-based radars – Ultra-Wide Band Technology Applications	The maritime radionavigation service is limited to shore-based radars (No. 5.472)
9 000 - 9 200 MHz **AERONAUTICAL RADIONAVIGATION** 5.337	AERONAUTICAL RADIONAVIGATION RADIOLOCATION	– Aeronautical Radionavigation e.g. airfield approach, precision approach radar ASDE – Shore-based radars	The frequency bands 8 825-8 850 MHz and 9 000-9 200 MHz are also allocated to the maritime radionavigation service,

RADIOLOCATION 5.471 5.473A		– Ultra-Wide Band Technology Applications	on a primary basis, for use by shore-based radars only (No. 5.471)
9 200 - 9 300 MHz **EARTH EXPLORATION-SATELLITE (active)** 5.474A 5.474B 5.474C **RADIOLOCATION** **MARITIME RADIONAVIGATION** 5.472 5.473 5.474 5.474D	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION MARITIME RADIONAVIGATION	– Aeronautical Radionavigation e.g. airfield approach, precision approach radar ASDE – Motion sensors – Shipborne, land and airborne surveillance radars – Ultra-Wide Band Technology Applications	The maritime radionavigation service in the band 9 200 – 9 225 MHz is limited to shore-based radars (No. 5.472)
9 300 - 9 500 MHz **EARTH EXPLORATION-SATELLITE (active)** **RADIOLOCATION** **RADIONAVIGATION** 5.475 **SPACE RESEARCH (active)** 5.427 5.474 5.475A 5.475B 5.476A	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION SPACE RESEARCH (active)	– Aeronautical Radionavigation e.g. airfield approach – Motion sensors – Shipborne, land and airborne surveillance radars – Weather radars – Search and Rescue Transponders (SART) – Ultra-Wide Band Technology Applications	
9 500 - 9 800 MHz **EARTH EXPLORATION - SATELLITE (active)** **RADIOLOCATION** **RADIONAVIGATION** **SPACE RESEARCH (active)** 5.476A	EARTH EXPLORATION - SATELLITE (active) RADIOLOCATION RADIONAVIGATION SPACE RESEARCH (active)	– Aeronautical Radionavigation e.g. airfield approach – Motion sensors – Shipborne, land and airborne surveillance radars – Spaceborne active sensors – Ultra-Wide Band Technology Applications	
9 800 - 9 900 MHz **RADIOLOCATION** **Earth exploration - satellite (active)** **Fixed** **Space research (active)** 5.477 5.478 5.478A 5.478B	RADIOLOCATION Earth exploration - satellite (active) FIXED Space research (active)	– Fixed Links – Aeronautical Radionavigation e.g. airfield approach – Motion sensors – Shipborne, land and airborne surveillance radars – Ultra-Wide Band Technology Applications	The allocation of the frequency band 9 800 - 10 000 MHz to the fixed services on a primary basis (No. 5.477)
9 900 - 10 000 MHz **EARTH EXPLORATION-SATELLITE (active) 5.474A**	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION	– Aeronautical Radionavigation e.g. airfield approach – Motion sensors – Shipborne, land and airborne surveillance	The allocation of the frequency band 9 800 - 10 000 MHz to the fixed services on a primary basis (No. 5.477)

5.474B 5.474C **RADIOLOCATION** **Fixed** 5.474D 5.477 5.478 5.479	FIXED	radars – Ultra-Wide Band Technology Applications	
10 - 10.4 GHz **EARTH EXPLORATION SATELLITE (active) 5.474A 5.474B 5.474C** **FIXED** **MOBILE** **RADIOLOCATION** **Amateur** 5.474D 5.479	EARTH EXPLORATION SATELLITE (active) FIXED MOBILE RADIOLOCATION Amateur	– Amateur applications – Fixed wireless access systems Including point - to - multipoint – Civil radars (Low power radars in certain sub-bands) – Ultra-Wide Band Technology Applications	
10.4 - 10.45 GHz **FIXED** **MOBILE** **RADIOLOCATION** **Amateur**	FIXED MOBILE RADIOLOCATION Amateur	– Fixed Links – Amateur applications – Fixed wireless access systems Including point - to - multipoint – Civil radars (Low power radars in certain sub-bands) – Ultra-Wide Band Technology Applications	
10.45 - 10.5 GHz **RADIOLOCATION** **Amateur** **Amateur - satellite** 5.481	RADIOLOCATION Amateur Amateur – satellite	– Amateur applications – Civil radars (Low power radars in certain sub-bands) – Ultra-Wide Band Technology Applications	
10.5 - 10.55 GHz **FIXED** **MOBILE** **Radiolocation**	FIXED MOBILE Radiolocation	– Fixed links – Fixed wireless access systems (including point - to - multipoint) – SRDs- Radiodetermination applications – Ultra-Wide Band Technology Applications	
10.55 - 10.6 GHz **FIXED** **MOBILE except aeronautical mobile**	FIXED MOBILE except aeronautical mobile Radiolocation	– Fixed links – Fixed wireless access systems (including point - to - multipoint) – SRDs- Radiodetermination applications	

Radiolocation		– Ultra-Wide Band Technology Applications	
10.6 - 10.68 GHz **EARTH EXPLORATION - SATELLITE (passive)** **FIXED** **MOBILE except aeronautical mobile** **RADIO ASTRONOMY** **SPACE RESEARCH (passive)** **Radiolocation** 5.149 5.482 5.482A	EARTH EXPLORATION - SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive) Radiolocation	– Fixed links – Fixed wireless access systems (including point - to - multipoint) – Ultra-Wide Band Technology Applications	
10.68 - 10.7 GHz **EARTH EXPLORATION - SATELLITE (passive)** **RADIO ASTRONOMY** **SPACE RESEARCH (passive)** 5.340 5.483	EARTH EXPLORATION - SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) FIXED MOBILE except aeronautical mobile	– Fixed links – Passive applications	Also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis (No. 5.483)
10.7 - 10.95 GHz **FIXED** **FIXED-SATELLITE** **(space-to-Earth)** 5.441 **(Earth-to-space)** 5.484 **MOBILE except aeronautical mobile**	FIXED FIXED - SATELLITE (space - to - Earth) (Earth - to - space) MOBILE except aeronautical mobile	– Fixed links (high capacity) – Fixed Satellite Service applications	FSS applications within the band 10.7 - 10.95 GHz in accordance with ITU - R Appendix - 30B
10.95 - 11.2 GHz **FIXED** **FIXED-SATELLITE** **(space-to-Earth)** 5.484A 5.484B **(Earth-to-space)** 5.484 **MOBILE except aeronautical mobile**	FIXED FIXED - SATELLITE (space - to - Earth) (Earth - to - space) MOBILE except aeronautical mobile	– Fixed links (high capacity) – Fixed Satellite Service applications	
11.2 - 11.45 GHz **FIXED** **FIXED-SATELLITE** **(space-to-Earth)** 5.441	FIXED FIXED - SATELLITE (space - to - Earth) (Earth - to - space) MOBILE except aeronautical mobile	– Fixed links (high capacity) – Fixed Satellite Service applications	FSS applications within the band 11.2 - 11.45 GHz in accordance with ITU - R Appendix - 30B

(Earth-to-space) 5.484 **MOBILE except aeronautical mobile**			
11.45 - 11.7 GHz **FIXED** **FIXED-SATELLITE** **(space-to-Earth)** 5.484A 5.484B **(Earth-to-space)** 5.484 **MOBILE except aeronautical mobile**	FIXED FIXED - SATELLITE (space - to - Earth) (Earth - to - space) MOBILE except aeronautical mobile	– Fixed links (high capacity) – Fixed Satellite Service applications	
11.7 - 12.5 GHz **FIXED** **MOBILE except aeronautical mobile** **BROADCASTING** **BROADCASTING - SATELLITE** 5.492 5.487 5.487A	FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING - SATELLITE	– Satellite Broadcasting	BSS applications within the band 11.7 – 12.5 GHz in accordance with ITU - R Appendix - 30
12.5 - 12.75 GHz **FIXED - SATELLITE** **(space -to- Earth)** 5.484A 5.484B **(Earth -to- space)** 5.494 5.495 5.496	FIXED - SATELLITE (space - to - Earth) (Earth - to - space) FIXED MOBILE except aeronautical mobile	– Fixed satellite applications	Also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis (No. 5.494)
12.75 - 13.25 GHz **FIXED** **FIXED - SATELLITE (Earth -to- space)** 5.441 **MOBILE** **Space research (deep space) (space -to- Earth)**	FIXED FIXED - SATELLITE (Earth - to - space) MOBILE Space research (deep space) (space - to - Earth)	– Fixed links (high capacity) – Fixed Satellite Service applications	FSS application in accordance with ITU - R Appendix - 30B
13.25 - 13.4 GHz **EARTH EXPLORATION - SATELLITE (active)** **AERONAUTICAL RADIONAVIGATION** 5.497 **SPACE RESEARCH (active)** 5.498A 5.499	EARTH EXPLORATION - SATELLITE (active) AERONAUTICAL RADIONAVIGATION SPACE RESEARCH (active)	– Doppler Navigation aids – Earth exploration observations – Ship berthing radars	

13.4 - 13.65 GHz **EARTH EXPLORATION SATELLITE (active)** **FIXED-SATELLITE (space-to-Earth)** 5.499A 5.499B **RADIOLOCATION** **SPACE RESEARCH** 5.499C 5.499D **Standard frequency and time signal-satellite (Earth-to-space)** 5.499E 5.500 5.501 5.501B	EARTH EXPLORATIONSATELLITE (active) FIXED-SATELLITE (space-to-Earth) RADIOLOCATION SPACE RESEARCH FIXED MOBILE Standard frequency and time signal-satellite (Earth-to-space)	– Doppler Navigation aids – Earth exploration observations – Ship berthing radars – Motion Sensors	Also allocated to the fixed and mobile services on a primary basis (No. 5.500)
13.65 - 13.75 GHz **EARTH EXPLORATION - SATELLITE (active)** **RADIOLOCATION** **SPACE RESEARCH** 5.501A **Standard frequency and time signal - satellite (Earth -to- space)** 5.499 5.500 5.501 5.501B	EARTH EXPLORATION - SATELLITE (active) RADIOLOCATION SPACE RESEARCH FIXED MOBILE Standard frequency and time signal - satellite (Earth - to - space)	– Doppler Navigation aids – Earth exploration observations – Ship berthing radars – Motion Sensors	Also allocated to the fixed and mobile services on a primary basis (No. 5.500)
13.75 - 14 GHz **FIXED - SATELLITE (Earth -to- space)** 5.484A **RADIOLOCATION** **Earth exploration - satellite** **Standard frequency and time signal - satellite (Earth -to- space)** **Space research** 5.499 5.500 5.501 5.502 5.503	FIXED - SATELLITE (Earth - to - space) RADIOLOCATION FIXED MOBILE Earth exploration - satellite Standard frequency and time signal - satellite (Earth - to - space) Space research	– Doppler Navigation aids – Navigation radars – Ship berthing radars – Motion Sensors – Passive applications – Fixed Satellite Service applications	Also allocated to the fixed and mobile services on a primary basis (No. 5.500)
14 - 14.25 GHz **FIXED - SATELLITE (Earth -to- space)** 5.457A 5.457B 5.484A 5.484B 5.506 5.506B **RADIONAVIGATION** 5.504 **Mobile - satellite (Earth -to- space)** 5.504B 5.504C 5.506A **Space research**	FIXED - SATELLITE (Earth - to - space) RADIONAVIGATION FIXED Mobile - satellite (Earth - to - space) Space research	– Mobile satellite systems – Earth Station on-board vessel (ESoV) – VSAT/SNG applications (Low density carriers, including VSATs and digital SNG, are encouraged to use this band)	Also allocated to the fixed service on a primary basis (No. 5.505)

5.504A 5.505			
14.25 - 14.3 GHz **FIXED - SATELLITE (Earth -to- space)** 5.457A 5.457B 5.484A 5.484B 5.506 5.506B **RADIONAVIGATION** 5.504 **Mobile - satellite (Earth -to- space)** 5.504B 5.506A 5.508A **Space research** 5.504A 5.505 5.508	FIXED - SATELLITE (Earth - to - space RADIONAVIGATION FIXED Mobile - satellite (Earth - to - space) Space research	– Mobile satellite systems – Earth Station on-board vessel (ESoV) – VSAT/SNG applications (Low density carriers, including VSATs and digital SNG, are encouraged to use this band)	Also allocated to the fixed service on a primary basis (No. 5.505)
14.3 - 14.4 GHz **FIXED** **FIXED - SATELLITE (Earth - to - space)** 5.457A 5.457B 5.484A 5.484B 5.506 5.506B **MOBILE except aeronautical mobile** **Mobile - satellite (Earth -to- space)** 5.504B 5.506A 5.509A **Radionavigation - satellite** 5.504A	FIXED FIXED - SATELLITE (Earth - to - space) MOBILE except aeronautical mobile Mobile - satellite (Earth - to - space Radionavigation - satellite	– Mobile satellite systems – Earth Station on-board vessel (ESoV) – VSAT/SNG applications (Low density carriers, including VSATs and digital SNG, are encouraged to use this band)	
14.4 - 14.47 GHz **FIXED** **FIXED - SATELLITE (Earth -to- space)** 5.457A 5.457B 5.484A 5.484B 5.506 5.506B **MOBILE except aeronautical mobile** **Mobile - satellite (Earth -to- space)** 5.504B 5.506A 5.509A **Space research (space -to- Earth)** 5.504A	FIXED FIXED - SATELLITE (Earth - to - space) MOBILE except aeronautical mobile Mobile - satellite (Earth - to - space Space research (space - to - Earth)	– Fixed Links – Mobile satellite systems – Earth Station on-board vessel (ESoV) – VSAT/SNG applications (Low density carriers, including VSATs and digital SNG, are encouraged to use this band)	
14.47 - 14.5 GHz **FIXED**	FIXED FIXED - SATELLITE (Earth - to - space) MOBILE except aeronautical mobile	– Fixed Links – Mobile satellite systems – Earth Station on-board vessel (ESoV) – VSAT/SNG applications (Low density	

FIXED - SATELLITE (Earth -to- space) 5.457A 5.457B 5.484A 5.506 5.506B **MOBILE except aeronautical mobile** **Mobile - satellite (Earth -to- space)** 5.504B 5.506A 5.509A **Radio astronomy** 5.149 5.504A	Mobile - satellite (Earth - to - space) Radio astronomy	carriers, including VSATs and digital SNG, are encouraged to use this band) – Radio Astronomy applications	
14.5 - 14.75 GHz **FIXED** **FIXED-SATELLITE (Earth-to-space)** 5.509B 5.509C 5.509D 5.509E 5.509F 5.510 **MOBILE** **Space research** 5.509G	FIXED FIXED - SATELLITE (Earth - to - space) MOBILE Space research	– Fixed links – Radio astronomy applications	
14.75 - 14.8 GHz **FIXED** **FIXED - SATELLITE (Earth -to- space)** 5.510 **MOBILE** **Space research** 5.509G	FIXED FIXED - SATELLITE (Earth - to - space) MOBILE Space research	– Fixed links – Radio astronomy applications	FSS application in accordance with ITU - R Appendix - 30A
14.8 - 15.35 GHz **FIXED** **MOBILE** **Space research** 5.339	FIXED MOBILE Space research	– Fixed links – Radio astronomy applications	
15.35 - 15.4 GHz **EARTH EXPLORATION - SATELLITE (passive)** **RADIO ASTRONOMY** **SPACE RESEARCH (passive)** 5.340 5.511	EARTH EXPLORATION - SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile	– Passive applications	Also allocated to the fixed and mobile services on a secondary basis (No. 5.511)
15.4 - 15.43 GHz	RADIOLOCATION AERONAUTICAL RADIONAVIGATION	– Doppler radar for low power sensing – Ground movement radar	

RADIOLOCATION 5.511E 5.511F **AERONAUTICAL RADIONAVIGATION**			
15.43 - 15.63 GHz **FIXED - SATELLITE (Earth -to- space)** 5.511A **RADIOLOCATION** 5.511E 5.511F **AERONAUTICAL RADIONAVIGATION** 5.511C	FIXED - SATELLITE (Earth - to - space) RADIOLOCATION AERONAUTICAL RADIONAVIGATION	– Doppler radar for low power sensing – Ground movement radar – MSS feeder links	
15.63 - 15.7 GHz **RADIOLOCATION** 5.511E 5.511F **AERONAUTICAL RADIONAVIGATION**	RADIOLOCATION AERONAUTICAL RADIONAVIGATION	– Doppler radar for low power sensing – Ground movement radar	
15.7 - 16.6 GHz **RADIOLOCATION** 5.512 5.513	RADIOLOCATION FIXED MOBILE		The band 15.7-17.3 GHz is also allocated to the fixed and mobile services on a primary basis (No. 5.512)
16.6 - 17.1 GHz **RADIOLOCATION** **Space research (deep space) (Earth -to- space)** 5.512 5.513	RADIOLOCATION FIXED MOBILE Space research (deep space) (Earth - to - space)		The band 15.7-17.3 GHz is also allocated to the fixed and mobile services on a primary basis (No. 5.512)
17.1 - 17.2 GHz **RADIOLOCATION** 5.512 5.513	RADIOLOCATION FIXED MOBILE		The band 15.7-17.3 GHz is also allocated to the fixed and mobile services on a primary basis (No. 5.512)
17.2 - 17.3 GHz **EARTH EXPLORATION - SATELLITE (active)** **RADIOLOCATION** **SPACE RESEARCH (active)** 5.512 5.513 5.513A	EARTH EXPLORATION - SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) FIXED MOBILE	– Wireless Access Systems including Radio Local Area Networks	(Mobile application for HIPERLANs which have priority over space services. HIPERLANs cannot claim protection from radiolocation service) The band 15.7-17.3 GHz is also allocated to the fixed and mobile services on a primary basis (No. 5.512)
17.3 - 17.7 GHz	FIXED - SATELLITE (Earth - to - space)	– Feeder link plan (Earth - to - space) – High Density FSS	ITU - R RR Appendix30A feeder link plans

FIXED - SATELLITE **(Earth -to- space)** 5.516 **(space -to- Earth)** 5.516A 5.516B **Radiolocation** 5.514	(space - to - Earth) Radiolocation Fixed Mobile		Also allocated to the fixed and mobile services on a secondary basis (No. 5.514)
17.7 - 18.1 GHz **FIXED** **FIXED - SATELLITE** **(space -to- Earth)** 5.484A 5.517A **(Earth -to- space)** 5.516 **MOBILE**	FIXED FIXED - SATELLITE (space - to - Earth) (Earth - to - space) MOBILE	– Feeder link plan (Earth - to - space) – Fixed links – Fixed Satellite Service applications – Earth stations in motion (ESIMs)	ITU - R RR Appendix30A feeder link plans The operation of ESIMs shall be subject to the application of Resolution 169 (WRC-19)
18.1 - 18.4 GHz **FIXED** **FIXED - SATELLITE** **(space -to- Earth)** 5.484A 5.516B 5.517A **(Earth -to- space)** 5.520 **MOBILE** 5.519 5.521	FIXED FIXED - SATELLITE (space - to - Earth) (Earth - to - space) MOBILE	– Feeder link band – Fixed links – Fixed Satellite Service applications – Earth stations in motion (ESIMs)	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 The operation of ESIMs shall be subject to the application of Resolution 169 (WRC-19)
18.4 - 18.6 GHz **FIXED** **FIXED - SATELLITE (space -to- Earth)** 5.484A 5.516B 5.517A **MOBILE**	FIXED FIXED - SATELLITE (space - to - Earth) MOBILE	– Fixed links – Fixed Satellite Service applications – Earth stations in motion (ESIMs)	The operation of ESIMs shall be subject to the application of Resolution 169 (WRC-19)
18.6 - 18.8 GHz **EARTH EXPLORATION - SATELLITE (passive)** **FIXED** **FIXED - SATELLITE** **(space -to- Earth)** 5.517A 5.522B **MOBILE except aeronautical mobile** **Space research (passive)**	EARTH EXPLORATION - SATELLITE (passive) FIXED FIXED - SATELLITE (space - to - Earth) MOBILE except aeronautical mobile Space research (passive)	– Fixed links – Fixed Satellite Service applications – Passive Applications – Earth stations in motion (ESIMs)	The operation of ESIMs shall be subject to the application of Resolution 169 (WRC-19)

5.522A 5.522C			
18.8 - 19.3 GHz **FIXED** **FIXED - SATELLITE (space -to- Earth)** 5.516.B 5.517A 5.523A **MOBILE**	FIXED FIXED - SATELLITE (space - to - Earth) MOBILE	– Fixed links – Fixed Satellite Service applications – Earth stations in motion (ESIMs)	The operation of ESIMs shall be subject to the application of Resolution 169 (WRC-19)
19.3 - 19.7 GHz **FIXED** **FIXED - SATELLITE (space -to- Earth) (Earth -to- space)** 5.517A 5.523B 5.523C 5.523D 5.523E **MOBILE**	FIXED FIXED - SATELLITE (space - to - Earth) (Earth - to - space) MOBILE	– Fixed links – Fixed Satellite Service applications – Earth stations in motion (ESIMs)	The operation of ESIMs shall be subject to the application of Resolution 169 (WRC-19)
19.7 - 20.1 GHz **FIXED - SATELLITE (space -to- Earth)** 5.484A 5.484B 5.516B 5.527A **Mobile - satellite (space -to- Earth)** 5.524	FIXED - SATELLITE (space - to - Earth) FIXED MOBILE Mobile - satellite (space - to - Earth)	– Fixed and Mobile Satellite Service applications – High Density FSS – Earth stations in motion (ESIMs)	The band 19.7-21.2 GHz is also allocated to the fixed and mobile services on a primary basis (No. 5.524) The operation of earth stations in motion communicating with the FSS is subject to Resolution 156 (WRC-15) (No. 5.527A)
20.1 - 20.2 GHz **FIXED - SATELLITE (space -to- Earth)** 5.484A 5.484B 5.516B 5.527A **MOBILE - SATELLITE (space -to- Earth)** 5.524 5.525 5.526 5.527 5.528	FIXED - SATELLITE (space - to - Earth) MOBILE - SATELLITE (space - to - Earth) FIXED MOBILE	– Fixed and Mobile Satellite Service applications – High Density FSS – Earth stations in motion (ESIMs)	The band 19.7-21.2 GHz is also allocated to the fixed and mobile services on a primary basis (No. 5.524) The operation of earth stations in motion communicating with the FSS is subject to Resolution 156 (WRC-15) (No. 5.527A)
20.2 - 21.2 GHz **FIXED - SATELLITE (space -to- Earth)** **MOBILE - SATELLITE (space -to- Earth)** **Standard frequency and time signal - satellite (space -to- Earth)** 5.524	FIXED - SATELLITE (space - to - Earth) MOBILE - SATELLITE (space - to - Earth) FIXED MOBILE Standard frequency and time signal - satellite (space - to - Earth)	– Fixed and Mobile Satellite Service applications	The band 19.7-21.2 GHz is also allocated to the fixed and mobile services on a primary basis (No. 5.524)

21.2 - 21.4 GHz **EARTH EXPLORATION - SATELLITE (passive)** **FIXED** **MOBILE** **SPACE RESEARCH (passive)**	EARTH EXPLORATION - SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive)	– Fixed Links – Passive applications – Unidirectional temporary fixed or mobile links	
21.4 - 22 GHz **FIXED** **MOBILE** **BROADCASTING - SATELLITE** 5.208B 5.530A 5.530B	FIXED MOBILE BROADCASTING - SATELLITE	– Fixed Links – BSS Applications/ Wide band high definition television	
22 - 22.21 GHz **FIXED** **MOBILE except aeronautical mobile** 5.149	FIXED MOBILE except aeronautical mobile	– Fixed links – Passive applications	
22.21 - 22.5 GHz **EARTH EXPLORATION - SATELLITE (passive)** **FIXED** **MOBILE except aeronautical mobile** **RADIO ASTRONOMY** **SPACE RESEARCH (passive)** 5.149 5.532	EARTH EXPLORATION - SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive)	– Fixed links – Radio astronomy applications	
22.5 - 22.55 GHz **FIXED** **MOBILE**	FIXED MOBILE	– Fixed links – Radio astronomy applications	
22.55 - 23.15GHz **FIXED** **INTER - SATELLITE** 5.338A **MOBILE** **SPACE RESEARCH (Earth - to -space)** 5.532A	FIXED INTER - SATELLITE MOBILE SPACE RESEARCH (Earth-to-space)	– Fixed links – Radio astronomy applications	

5.149			
23.15 – 23.55 GHz **FIXED** **INTER – SATELLITE** 5.338A **MOBILE**	FIXED MOBILE	– Fixed Links	
23.55 - 23.6 GHz **FIXED** **MOBILE**	FIXED MOBILE	– Fixed links	
23.6 - 24 GHz **EARTH EXPLORATION - SATELLITE (passive)** **RADIO ASTRONOMY** **SPACE RESEARCH (passive)** 5.340	EARTH EXPLORATION - SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	– Passive applications	All emissions prohibited
24 - 24.05 GHz **AMATEUR** **AMATEUR - SATELLITE** 5.150	AMATEUR AMATEUR – SATELLITE	– Amateur applications – Amateur Satellite applications – ISM	
24.05 - 24.25 GHz **RADIOLOCATION** **Amateur** **Earth exploration - satellite (active)** 5.150	RADIOLOCATION Amateur Earth exploration - satellite (active)	– Amateur applications – Rain radars from satellites – Motion sensors – ISM Within the band 24.05-24.25 GHz – Non - specific SRD Within the band 24.05-24.25 GHz – Road transport and traffic telematics within the band 24.150-24.250 GHz – Automotive Short Range Radar – Radio-determination & Detection Applications	
24.25 - 24.45 GHz **FIXED** **MOBILE except aeronautical mobile** 5.338A 5.532AB	FIXED MOBILE except aeronautical mobile	– Terrestrial IMT – Unidirectional temporary fixed links	

24.45 - 24.65 GHz **FIXED** **INTER – SATELLITE** **MOBILE except aeronautical mobile** 5.338A 5.532AB	FIXED INTER – SATELLITE MOBILE except aeronautical mobile	– Terrestrial IMT – Fixed links	
24.65 - 24.75 GHz **FIXED** **FIXED - SATELLITE (Earth -to- Space)** 5.532B **INTER-SATELLITE** **MOBILE except aeronautical mobile** 5.338A 5.532AB	FIXED FIXED - SATELLITE (Earth - to - Space) INTER – SATELLITE MOBILE except aeronautical mobile	– Terrestrial IMT – Fixed links – Fixed wireless access systems	The use of the band 24.65-25.25 GHz by the fixed-satellite service (Earth-to-space) is limited to earth stations using a minimum antenna diameter of 4.5 m (No. 5.532B)
24.75 - 25.25 GHz **FIXED** **FIXED - SATELLITE (Earth -to- Space)** 5.532B **MOBILE except aeronautical mobile** 5.338A 5.532AB	FIXED FIXED - SATELLITE (Earth - to - Space) MOBILE except aeronautical mobile	– Terrestrial IMT – Fixed links – Fixed wireless access systems	The use of the band 24.65-25.25 GHz by the fixed-satellite service (Earth-to-space) is limited to earth stations using a minimum antenna diameter of 4.5 m (No. 5.532B)
25.25 - 25.5 GHz **FIXED** 5.534A **INTER - SATELLITE** 5.536 **MOBILE** 5.338A 5.532AB **Standard frequency and time signal - satellite (Earth -to- space)**	FIXED INTER - SATELLITE MOBILE MOBILE except aeronautical mobile Standard frequency and time signal - satellite (Earth - to - space)	– Terrestrial IMT – Fixed links – Fixed wireless access systems	
25.5 - 27 GHz **EARTH EXPLORATION - SATELLITE (space –to- Earth)** 5.536B **FIXED** 5.534A **INTER - SATELLITE** 5.536 **MOBILE** 5.338A 5.532AB **SPACE RESEARCH (space -to- Earth)** 5.536C **Standard frequency and time signal - satellite (Earth -to- space)** 5.536A	EARTH EXPLORATION - SATELLITE (space - to FIXED INTER - SATELLITE MOBILE SPACE RESEARCH (space - to - Earth) Standard frequency and time signal - satellite (Earth - to - space)	– Terrestrial IMT – Fixed links – Fixed wireless access systems	Earth stations operating in the space research service shall not claim protection from, or constrain the use and deployment of, stations of the fixed and mobile services (No. 5.536C)
27 - 27.5 GHz	FIXED INTER - SATELLITE	– Terrestrial IMT	

FIXED **INTER - SATELLITE** 5.536 **MOBILE** 5.338A 5.532AB	MOBILE		
27.5 - 28.5 GHz **FIXED** 5.537A **FIXED - SATELLITE (Earth -to- space)** 5.484A 5.516B 5.517A 5.539 **MOBILE** 5.538 5.540	FIXED FIXED - SATELLITE (Earth - to - space) MOBILE	– Fixed links – Fixed wireless access systems – Feeder Links – Fixed satellite services – Earth stations in motion (ESIMs)	Satellite equipment onboard aircraft within the band 27.5-29.5 GHz (please refer to the Guidelines for Aeronautical Radio Spectrum Licenses) The operation of ESIMs shall be subject to the application of Resolution 169 (WRC-19)
28.5 - 29.1 GHz **FIXED** **FIXED - SATELLITE (Earth -to- space)** 5.484A 5.516B 5.517A 5.523A 5.539 **MOBILE** **Earth exploration - satellite (Earth -to- space)** 5.541 5.540	FIXED FIXED - SATELLITE (Earth - to - space) MOBILE Earth exploration - satellite (Earth - to - space)	– Fixed links – Fixed wireless access systems – Feeder Links – Fixed satellite services – Earth stations in motion (ESIMs)	Satellite equipment onboard aircraft within the band 27.5-29.5 GHz (please refer to the Guidelines for Aeronautical Radio Spectrum Licenses) The operation of ESIMs shall be subject to the application of Resolution 169 (WRC-19)
29.1 - 29.5 GHz **FIXED** **FIXED - SATELLITE (Earth -to- space)** 5.516B 5.517A 5.523C 5.523E 5.535A 5.539 5.541A **MOBILE** **Earth exploration - satellite (Earth -to- space)** 5.541 5.540	FIXED FIXED - SATELLITE (Earth - to - space) MOBILE Earth exploration - satellite (Earth - to - space)	– Fixed links – Fixed wireless access systems – Feeder Links – Fixed satellite services – Earth stations in motion (ESIMs)	Satellite equipment onboard aircraft within the band 27.5-29.5 GHz (please refer to the Guidelines for Aeronautical Radio Spectrum Licenses) The operation of ESIMs shall be subject to the application of Resolution 169 (WRC-19)
29.5 - 29.9 GHz **FIXED – SATELLITE (Earth -to- space)** 5.484A 5.484B 5.516B 5.527A 5.539 **Earth exploration – satellite (Earth -to- space)** 5.541 **Mobile - satellite (Earth -to- space)** 5.540 5.542	FIXED - SATELLITE (Earth - to - space) Earth exploration - satellite (Earth - to - space) Mobile - satellite (Earth - to - space) Fixed Mobile	– Fixed and Mobile satellite services – Earth Station on-board vessel (ESoV)	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 (No. 5.542) The operation of earth stations in motion communicating with the FSS is subject to Resolution 156 (WRC-15) (No. 5.527A)
29.9 - 30 GHz	FIXED - SATELLITE (Earth - to - space)	– Fixed and Mobile satellite services	The band 29.5-31 GHz is also allocated

FIXED - SATELLITE (Earth -to- space) 5.484A 5.484B 5.516B 5.527A 5.539 **MOBILE - SATELLITE (Earth -to- space)** **Earth exploration - satellite (Earth -to- space)** 5.541 5.543 5.525 5.526 5.527 5.538 5.540 5.542	MOBILE - SATELLITE (Earth - to - space) Earth exploration - satellite (Earth - to - space) Fixed Mobile	– Earth Station on-board vessel (ESoV)	to the fixed and mobile services on a secondary basis. The power limits specified in Nos. 21.3 and 21.5 shall apply (No. 5.542) The operation of earth stations in motion communicating with the FSS is subject to Resolution 156 (WRC-15) (No. 5.527A)
30 - 31 GHz **FIXED - SATELLITE (Earth -to- space)** 5.338A **MOBILE - SATELLITE (Earth -to- space)** **Standard frequency and time signal - satellite (space -to- Earth)** 5.542	FIXED - SATELLITE (Earth - to - space) MOBILE - SATELLITE (Earth - to - space) Standard frequency and time signal - satellite (space - to - Earth) Fixed Mobile	– Fixed and Mobile satellite services	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 (No. 5.542)
31 - 31.3 GHz **FIXED** 5.338A 5.543B **MOBILE** **Standard frequency and time signal - satellite (space -to- Earth)** **Space research** 5.544 5.545 5.149	FIXED MOBILE Standard frequency and time signal - satellite (space - to - Earth) Space research	– Fixed links – High-altitude platform station (HAPS) – Radio astronomy applications	The use of the fixed-service allocation by HAPS shall be in accordance with the provisions of Resolution 167 (WRC-19).
31.3 - 31.5 GHz **EARTH EXPLORATION - SATELLITE (passive)** **RADIO ASTRONOMY** **SPACE RESEARCH (passive)** 5.340	EARTH EXPLORATION - SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	– Passive applications – Surface temperature and emissivity, atmospheric attenuation	All emissions are prohibited
31.5 - 31.8 GHz **EARTH EXPLORATION - SATELLITE (passive)** **RADIO ASTRONOMY** **SPACE RESEARCH (passive)** **Fixed** **Mobile except aeronautical mobile**	EARTH EXPLORATION - SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile	– Passive applications – Surface temperature and emissivity, atmospheric attenuation	

5.149 5.546			
31.8 - 32 GHz **FIXED** 5.547A **RADIONAVIGATION** **SPACE RESEARCH (deep space) (space -to- Earth)** 5.547 5.547B 5.548	FIXED RADIONAVIGATION SPACE RESEARCH (deep space) (space - to - Earth)	– High density fixed links (Both Point - to - Point and Point - to - Multipoint) – Airport Surface Detection Equipment	
32 - 32.3 GHz **FIXED** 5.547A **RADIONAVIGATION** **SPACE RESEARCH (deep space) (space -to- Earth)** 5.547 5.547C 5.548	FIXED RADIONAVIGATION SPACE RESEARCH (deep space) (space - to - Earth)	– High density fixed links (Both Point - to - Point and Point - to - Multipoint) – Airport Surface Detection Equipment	
32.3 - 33 GHz **FIXED** 5.547A **INTER - SATELLITE** **RADIONAVIGATION** 5.547 5.547D 5.548	FIXED INTER - SATELLITE RADIONAVIGATION	– High density fixed links (Both Point - to - Point and Point - to - Multipoint) – Airport Surface Detection Equipment	
33 - 33.4 GHz **FIXED** 5.547A **RADIONAVIGATION** 5.547 5.547E	FIXED RADIONAVIGATION	– High density fixed links (Both Point - to - Point and Point - to - Multipoint) – Airport Surface Detection Equipment	
33.4 - 34.2 GHz **RADIOLOCATION** 5.549	RADIOLOCATION FIXED MOBILE	– Motion sensors – Short range radar – Surveying and measurement	Also allocated to the fixed and mobile services on a primary basis (No. 5.549)
34.2 - 34.7 GHz **RADIOLOCATION** **SPACE RESEARCH (deep space) (Earth -to- space)** 5.549	RADIOLOCATION SPACE RESEARCH (deep space) (Earth - to - space) FIXED MOBILE	– Motion sensors – Short range radar – Surveying and measurement	Also allocated to the fixed and mobile services on a primary basis (No. 5.549)

34.7 - 35.2 GHz **RADIOLOCATION** **Space research** 5.550 5.549	RADIOLOCATION FIXED MOBILE Space research	– Motion sensors – Short range radar – Surveying and measurement	Also allocated to the fixed and mobile services on a primary basis (No. 5.549)
35.2 - 35.5 GHz **METEOROLOGICAL AIDS** **RADIOLOCATION** 5.549	METEOROLOGICAL AIDS RADIOLOCATION FIXED MOBILE	– Rain radar from satellites	Also allocated to the fixed and mobile services on a primary basis (No. 5.549)
35.5 - 36 GHz **METEOROLOGICAL AIDS** **EARTH EXPLORATION - SATELLITE (active)** **RADIOLOCATION** **SPACE RESEARCH (active)** 5.549 5.549A	METEOROLOGICAL AIDS EARTH EXPLORATION - SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) FIXED MOBILE	– Rain radar from satellites	Also allocated to the fixed and mobile services on a primary basis (No. 5.549)
36 - 37 GHz **EARTH EXPLORATION - SATELLITE (passive)** **FIXED** **MOBILE** **SPACE RESEARCH (passive)** 5.149 5.550A	EARTH EXPLORATION - SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive)	– Passive applications – Radio astronomy applications	For sharing of the band 36-37 GHz between the Earth exploration-satellite (passive) service and the fixed and mobile services, Resolution 752 (WRC-07) shall apply (No. 5.550A)
37 - 37.5 GHz **FIXED** **MOBILE except aeronautical mobile** 5.550B **SPACE RESEARCH (space -to- Earth)** 5.547	FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space - to - Earth)	– Terrestrial IMT – High density fixed links – Low and medium capacity fixed links	For IMT implementation, Resolution 243 (WRC-19) applies.
37.5 - 38 GHz **FIXED** **FIXED - SATELLITE (space -to- Earth)** 5.550C	FIXED FIXED - SATELLITE (space - to - Earth) MOBILE except aeronautical mobile SPACE RESEARCH (space - to - Earth)	– Terrestrial IMT – Fixed Satellite Service applications – High density fixed links – Low capacity fixed links	For IMT implementation, Resolution 243 (WRC-19) applies.

MOBILE except aeronautical mobile 5.550B **SPACE RESEARCH (space -to- Earth)** **Earth exploration - satellite (space -to- Earth)** 5.547	Earth exploration - satellite (space - to - Earth)		
38 - 39.5 GHz **FIXED** 5.550D **FIXED - SATELLITE (space -to- Earth)** 5.550C **MOBILE** 5.550B **Earth exploration - satellite (space -to- Earth)** 5.547	FIXED FIXED - SATELLITE (space - to - Earth) MOBILE Earth exploration - satellite (space - to - Earth)	– Terrestrial IMT – High-altitude platform station (HAPS) – Fixed Satellite Service applications – High density fixed links – Low capacity fixed links	For IMT implementation, Resolution 243 (WRC-19) applies. The use of the fixed-service allocation by HAPS shall be in accordance with the provisions of Resolution 168 (WRC-19).
39.5 - 40 GHz **FIXED** **FIXED - SATELLITE (space -to- Earth)** 5.516B 5.550C **MOBILE** 5.550B **MOBILE - SATELLITE (space -to- Earth)** **Earth exploration - satellite (space -to- Earth)** 5.547 5.550E	FIXED FIXED - SATELLITE (space - to - Earth) MOBILE MOBILE - SATELLITE (space - to - Earth) Earth exploration - satellite (space - to - Earth)	– Terrestrial IMT – Fixed Satellite Service applications	For IMT implementation, Resolution 243 (WRC-19) applies.
40 - 40.5 GHz **EARTH EXPLORATION - SATELLITE (Earth -to- space)** **FIXED** **FIXED - SATELLITE (space -to- Earth)** 5.516B 5.550C **MOBILE** 5.550B **MOBILE - SATELLITE (space -to- Earth)** **SPACE RESEARCH (Earth -to- space)** **Earth exploration - satellite (space -to- Earth)** 5.550E	EARTH EXPLORATION - SATELLITE (Earth - to - space) FIXED FIXED - SATELLITE (space - to - Earth) MOBILE MOBILE - SATELLITE (space - to - Earth) SPACE RESEARCH (Earth - to - space) Earth exploration - satellite (space - to - Earth)	– Terrestrial IMT – Broadband mobile systems – Fixed Satellite Service applications	For IMT implementation, Resolution 243 (WRC-19) applies.
40.5 - 41 GHz	FIXED LAND MOBILE	– Terrestrial IMT – Fixed Satellite Service applications	For IMT implementation, Resolution 243 (WRC-19) applies.

FIXED **FIXED-SATELLITE (space -to- Earth)** 5.550C **LAND MOBILE** 5.550B **BROADCASTING** **BROADCASTING - SATELLITE** **Aeronautical mobile** **Maritime mobile** 5.547	FIXED - SATELLITE (space - to - Earth) BROADCASTING BROADCASTING - SATELLITE Aeronautical mobile Maritime mobile	– Multimedia Wireless Systems MWS	
41 - 42.5 GHz **FIXED** **FIXED - SATELLITE (space -to- Earth)** 5.516B 5.550C **LAND MOBILE** 5.550B **BROADCASTING** **BROADCASTING – SATELLITE** **Aeronautical mobile** **Maritime mobile** 5.547 5.551F 5.551H 5.551I	FIXED LAND MOBILE FIXED - SATELLITE (space - to - Earth) BROADCASTING BROADCASTING - SATELLITE Aeronautical mobile Maritime mobile	– Terrestrial IMT – Fixed Satellite Service applications – Multimedia Wireless Systems MWS	For IMT implementation, Resolution 243 (WRC-19) applies.
42.5 - 43.5 GHz **FIXED** **FIXED - SATELLITE (Earth -to- space)** 5.552 **MOBILE except aeronautical mobile** 5.550B **RADIO ASTRONOMY** 5.149 5.547	FIXED FIXED - SATELLITE (Earth - to - space) MOBILE except aeronautical mobile RADIO ASTRONOMY	– Terrestrial IMT – Broadband mobile systems – Fixed Satellite Service applications – Multimedia Wireless Systems MWS – Radio astronomy applications	For IMT implementation, Resolution 243 (WRC-19) applies.
43.5 - 47 GHz **MOBILE** 5.553 5.553A **MOBILE - SATELLITE** **RADIONAVIGATION** **RADIONAVIGATION - SATELLITE** 5.554	MOBILE MOBILE - SATELLITE RADIONAVIGATION RADIONAVIGATION – SATELLITE		

47 - 47.2 GHz **AMATEUR** **AMATEUR - SATELLITE**	AMATEUR AMATEUR - SATELLITE	– Amateur applications – Amateur Satellite applications	
47.2 - 47.5 GHz **FIXED** **FIXED - SATELLITE (Earth -to- space)** 5.550C 5.552 **MOBILE** 5.553B 5.552A	FIXED FIXED - SATELLITE (Earth - to - space) MOBILE	– Feeder link band – Fixed Satellite Service applications – High-altitude platform station (HAPS)	The use of the fixed-service allocation by HAPS shall be in accordance with the provisions of Resolution 122 (Rev. WRC-19).
47.5 - 47.9 GHz **FIXED** **FIXED - SATELLITE** **(Earth -to- space)** 5.550C 5.552 **(space -to- Earth)** 5.516B 5.554A **MOBILE** 5.553B	FIXED FIXED - SATELLITE (Earth - to - Space) (Space - to - Earth) MOBILE	– Feeder link band – Fixed Satellite Service applications – IMT	For IMT implementation, Resolution 243 (WRC-19) applies.
47.9 - 48.2 GHz **FIXED** **FIXED - SATELLITE (Earth -to- space)** 5.550C 5.552 **MOBILE** 5.553B 5.552A	FIXED FIXED - SATELLITE (Earth - to - space) MOBILE	– Feeder link band – Fixed Satellite Service applications – IMT – High-altitude platform station (HAPS)	For IMT implementation, Resolution 243 (WRC-19) applies. The use of the fixed-service allocation by HAPS shall be in accordance with the provisions of Resolution 122 (Rev. WRC-19).
48.2 - 48.54 GHz **FIXED** **FIXED - SATELLITE** **(Earth -to- space)** 5.550C 5.552 **(space -to- Earth)** 5.516B 5.554A 5.555B **MOBILE**	FIXED FIXED - SATELLITE (Earth - to - space) (space - to - Earth) MOBILE	– Feeder link band – Fixed Satellite Service applications	
48.54 - 49.44 GHz **FIXED** **FIXED - SATELLITE** **(Earth -to - space)** 5.550C 5.552	FIXED FIXED - SATELLITE (Earth - to - space) MOBILE	– Feeder link band – Fixed Satellite Service applications – Low and Medium capacity fixed links – Radio Astronomy applications	All emissions prohibited from airborne stations in the band 48.94-49.04.

MOBILE 5.149 5.340 5.555			
49.44 - 50.2 GHz **FIXED** **FIXED - SATELLITE** **(Earth - to - space)** 5.338A 5.550C 5.552 **(space -to- Earth)** 5.516B 5.554A 5.555B **MOBILE**	FIXED FIXED - SATELLITE (Earth - to - space) (space - to - Earth) MOBILE	– Fixed Satellite Service applications – Low and Medium capacity fixed links	
50.2 – 50.4 GHz **EARTH EXPLORATION - SATELLITE (passive)** **SPACE RESEARCH (passive)** 5.340	EARTH EXPLORATION - SATELLITE (passive) SPACE RESEARCH (passive)	– Passive applications	All emissions prohibited
50.4 - 51.4 GHz **FIXED** **FIXED - SATELLITE (Earth -to- space)** 5.338A 5.550C **MOBILE** **Mobile - satellite (Earth -to- space)**	FIXED FIXED - SATELLITE (Earth - to - space) MOBILE Mobile - satellite (Earth - to - space)	- Fixed Satellite Service Applications	
51.4 - 52.4 GHz **FIXED** **FIXED-SATELLITE (Earth-to-space)** 5.555C **MOBILE** 5.338A 5.547 5.556	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE	– High density fixed links – Fixed Satellite Service applications	The use by the fixed-satellite service (Earth-to-space) is limited to geostationary-satellite networks (No. 5.555C)
52.4 - 52.6 GHz **FIXED** 5.338A **MOBILE** 5.547 5.556	FIXED MOBILE	- High density fixed links	
52.6 - 54.25 GHz	EARTH EXPLORATION - SATELLITE (passive)	– Passive applications	All emissions prohibited.

EARTH EXPLORATION - SATELLITE (passive) **SPACE RESEARCH (passive)** 5.340 5.556	SPACE RESEARCH (passive)		
54.25 - 55.78 GHz **EARTH EXPLORATION - SATELLITE (passive)** **INTER - SATELLITE** 5.556A **SPACE RESEARCH (passive)** 5.556B	EARTH EXPLORATION - SATELLITE (passive) INTER - SATELLITE SPACE RESEARCH (passive)	– Passive applications	
55.78 - 56.9 GHz **EARTH EXPLORATION - SATELLITE (passive)** **FIXED** 5.557A **INTER - SATELLITE** 5.556A **MOBILE** 5.558 **SPACE RESEARCH (passive)** 5.547 5.557	EARTH EXPLORATION - SATELLITE (passive) FIXED INTER - SATELLITE MOBILE SPACE RESEARCH (passive)	– Passive applications – High density fixed links	
56.9 - 57 GHz **EARTH EXPLORATION - SATELLITE (passive)** **FIXED** **INTER - SATELLITE** 5.558A **MOBILE** 5.558 **SPACE RESEARCH (passive)** 5.547 5.557	EARTH EXPLORATION - SATELLITE (passive) FIXED INTER - SATELLITE MOBILE SPACE RESEARCH (passive)	– Passive applications – High density fixed links	
57 - 58.2 GHz **EARTH EXPLORATION - SATELLITE (passive)** **FIXED** **INTER - SATELLITE** 5.556A **MOBILE** 5.558 **SPACE RESEARCH (passive)** 5.547 5.557	EARTH EXPLORATION - SATELLITE (passive) FIXED INTER - SATELLITE MOBILE SPACE RESEARCH (passive)	– Passive applications – High density fixed links – SRDs within the band 57-64 GHz (Radio-determination Applications) – Multiple-Gigabit WAS/RLAN (57-66 GHz)	

58.2 - 59 GHz **EARTH EXPLORATION - SATELLITE (passive)** **FIXED** **MOBILE** **SPACE RESEARCH (passive)** 5.547 5.556	EARTH EXPLORATION - SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive)	– Passive applications – High density fixed links – SRDs within the band 57-64 GHz (Radio-determination Applications) – Multiple-Gigabit WAS/RLAN (57-66 GHz)	
59 - 59.3 GHz **EARTH EXPLORATION - SATELLITE (passive)** **FIXED** **INTER - SATELLITE** 5.556A **MOBILE** 5.558 **RADIOLOCATION** 5.559 **SPACE RESEARCH (passive)**	EARTH EXPLORATION - SATELLITE (passive) FIXED INTER - SATELLITE MOBILE RADIOLOCATION SPACE RESEARCH (passive)	– Passive applications – SRD within the band 57-64 GHz (Radio-determination Applications) – Multiple-Gigabit WAS/RLAN (57-66 GHz)	
59.3 - 64 GHz **FIXED** **INTER - SATELLITE** **MOBILE** 5.558 **RADIOLOCATION** 5.559 5.138	FIXED INTER - SATELLITE MOBILE RADIOLOCATION	– High density fixed links – ISM – SRDs within the band 57-64 GHz (Radio-determination Applications) – Multiple-Gigabit WAS/RLAN (57-66 GHz) – Non-specific SRDs within the band 61-61.5 GHz – Broadband mobile systems – Radiolocation Systems – RTTT (Road Transport and Traffic Telematics Vehicle to road/vehicle to vehicle)	
64 - 65 GHz **FIXED** **INTER - SATELLITE** **MOBILE except aeronautical mobile** 5.547 5.556	FIXED INTER - SATELLITE MOBILE except aeronautical mobile	– High density fixed links – Fixed point-to-point Light License (64 – 66 GHz) – Multiple-Gigabit WAS/RLAN (57-66 GHz)	
65 - 66 GHz **EARTH EXPLORATION - SATELLITE** **FIXED**	EARTH EXPLORATION - SATELLITE FIXED INTER - SATELLITE MOBILE except aeronautical mobile	– Broadband Mobile systems – High density fixed links – Fixed point-to-point Light License (64 – 66 GHz) – Multiple-Gigabit WAS/RLAN (57-66 GHz)	

INTER - SATELLITE **MOBILE except aeronautical mobile** **SPACE RESEARCH** 5.547	SPACE RESEARCH		
66 - 71 GHz **INTER - SATELLITE** **MOBILE** 5.553 5.558 5.559AA **MOBILE - SATELLITE** **RADIONAVIGATION** **RADIONAVIGATION - SATELLITE** 5.554	INTER – SATELLITE MOBILE MOBILE - SATELLITE RADIONAVIGATION RADIONAVIGATION – SATELLITE	- Terrestrial IMT	For IMT implementation, Resolution 241 (WRC-19) applies.
71 - 74 GHz **FIXED** **FIXED - SATELLITE (space -to-Earth)** **MOBILE** **MOBILE - SATELLITE (space -to- Earth)**	FIXED FIXED - SATELLITE (space - to - Earth) MOBILE MOBILE - SATELLITE (space - to - Earth)	– Fixed point-to-point Light License (71.125 – 75.825 GHz)	
74 - 76 GHz **FIXED** **FIXED - SATELLITE (space -to- Earth)** **MOBILE** **BROADCASTING** **BROADCASTING - SATELLITE** **Space research (space -to- Earth)** 5.561	FIXED FIXED - SATELLITE (space - to - Earth) MOBILE BROADCASTING BROADCASTING - SATELLITE Space research (space - to - Earth)	– Future civil systems – Space science services – Fixed point-to-point Light License (71.125 – 75.825 GHz) – SRDs- Radio-determination Applications (75-85 GHz)	
76 - 77.5 GHz **RADIO ASTRONOMY** **RADIOLOCATION** **Amateur** **Amateur - satellite** **Space research (space -to- Earth)**	RADIO ASTRONOMY RADIOLOCATION Amateur Amateur - satellite Space research (space - to - Earth)	– Amateur applications – Amateur Satellite applications – Civil radiolocation – Radio astronomy applications – RTTT – Automotive Short Range Radars (77-81 GHz) – SRDs- Radio-determination Applications (75-85 GHz)	

5.149			
77.5 - 78 GHz **AMATEUR** **AMATEUR – SATELLITE** **RADIOLOCATION** 5.559B **Radio astronomy** **Space research (space -to- Earth)** 5.149	AMATEUR AMATEUR – SATELLITE RADIOLOCATION Radio astronomy Space research (space - to - Earth)	– Amateur applications – Radio astronomy applications – Automotive Short Range Radars (77-81 GHz) – SRDs- Radio-determination Applications (75-85 GHz)	The use by the radiolocation service shall be limited to short-range radar for ground-based applications, including automotive radars. (No. 5.559B)
78 - 79 GHz **RADIOLOCATION** **Amateur** **Amateur - satellite** **Radio astronomy** **Space research (space -to- Earth)** 5.149 5.560	RADIOLOCATION Amateur Amateur - satellite Radio astronomy Space research (space - to - Earth)	– Radio astronomy applications – Radiolocation services – Automotive Short Range Radars (77-81 GHz) – SRDs- Radio-determination Applications (75-85 GHz)	Amateur and Amateur-satellite services on a secondary basis
79 - 81 GHz **RADIO ASTRONOMY** **RADIOLOCATION** **Amateur** **Amateur - satellite** **Space research (space -to- Earth)** 5.149	RADIO ASTRONOMY RADIOLOCATION Amateur Amateur - satellite Space research (space - to - Earth)	– Radio astronomy applications – Radiolocation services – Automotive Short Range Radars (77-81 GHz) – SRDs- Radio-determination Applications (75-85 GHz)	
81 - 84 GHz **FIXED** 5.338A **FIXED - SATELLITE (Earth -to- space)** **MOBILE** **MOBILE - SATELLITE (Earth -to- space)** **RADIO ASTRONOMY** **Space research (space -to- Earth)**	FIXED FIXED - SATELLITE (Earth - to - space) MOBILE MOBILE - SATELLITE (Earth - to - space) RADIO ASTRONOMY Space research (space - to - Earth)	– Radio astronomy applications – Fixed point-to-point Light License (81.125 – 85.825 GHz) – SRDs- Radio-determination Applications (75-85 GHz)	

5.149 5.561A			
84 - 86 GHz **FIXED** 5.338A **FIXED - SATELLITE (Earth -to- space)** 5.561B **MOBILE** **RADIO ASTRONOMY** 5.149	FIXED FIXED - SATELLITE (Earth - to - space) MOBILE RADIO ASTRONOMY	– Radio astronomy applications – Fixed point-to-point Light License (81.125 – 85.825 GHz) – SRDs- Radio-determination Applications (75-85 GHz)	
86 - 92 GHz **EARTH EXPLORATION - SATELLITE (passive)** **RADIO ASTRONOMY** **SPACE RESEARCH (passive)** 5.340	EARTH EXPLORATION - SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	– Passive applications	All emissions prohibited.
92 - 94 GHz **FIXED** 5.338A **MOBILE** **RADIO ASTRONOMY** **RADIOLOCATION** 5.149	FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION	– Radio astronomy applications – Short Range radars	
94 - 94.1 GHz **EARTH EXPLORATION - SATELLITE (active)** **RADIOLOCATION** **SPACE RESEARCH (active)** **Radio astronomy** 5.562 5.562A	EARTH EXPLORATION - SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) Radio astronomy	– Cloud profiling Radar – Short Range radars	
94.1 - 95 GHz **FIXED** **MOBILE** **RADIO ASTRONOMY**	FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION	– Radio astronomy applications – Short Range radars	

RADIOLOCATION 5.149			
95 - 100 GHz **FIXED** **MOBILE** **RADIO ASTRONOMY** **RADIOLOCATION** **RADIONAVIGATION** **RADIONAVIGATION - SATELLITE** 5.149 5.554	FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION RADIONAVIGATION RADIONAVIGATION – SATELLITE	– Radio astronomy applications	
100 - 102 GHz **EARTH EXPLORATION - SATELLITE (passive)** **RADIO ASTRONOMY** **SPACE RESEARCH (passive)** 5.340 5.341	EARTH EXPLORATION - SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	– Earth Exploration satellite systems	
102 - 105 GHz **FIXED** **MOBILE** **RADIO ASTRONOMY** 5.149 5.341	FIXED MOBILE RADIO ASTRONOMY	– Radio astronomy applications	
105 - 109.5 GHz **FIXED** **MOBILE** **RADIO ASTRONOMY** **SPACE RESEARCH (passive)** 5.562B 5.149 5.341	FIXED MOBILE RADIO ASTRONOMY SPACE RESEARCH (passive)	- Radio astronomy applications	
109.5 - 111.8 GHz **EARTH EXPLORATION - SATELLITE (passive)**	EARTH EXPLORATION - SATELLITE (passive) RADIO ASTRONOMY	– Radio astronomy applications	

RADIO ASTRONOMY **SPACE RESEARCH (passive)** 5.340 5.341	SPACE RESEARCH (passive)		
111.8 - 114.25 GHz **FIXED** **MOBILE** **RADIO ASTRONOMY** **SPACE RESEARCH (passive)** 5.562B 5.149 5.341	FIXED MOBILE RADIO ASTRONOMY SPACE RESEARCH (passive)	- Radio astronomy applications	
114.25 - 116 GHz **EARTH EXPLORATION - SATELLITE (passive)** **RADIO ASTRONOMY** **SPACE RESEARCH (passive)** 5.340 5.341	EARTH EXPLORATION - SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	– Radio astronomy applications	
116 - 119.98 GHz **EARTH EXPLORATION - SATELLITE (passive)** **INTER - SATELLITE** 5.562C **SPACE RESEARCH (passive)** 5.341	EARTH EXPLORATION - SATELLITE (passive) INTER - SATELLITE SPACE RESEARCH (passive)	– Passive applications	
119.98 - 122.25 GHz **EARTH EXPLORATION - SATELLITE (passive)** **INTER - SATELLITE** 5.562C **SPACE RESEARCH (passive)** 5.138 5.341	EARTH EXPLORATION - SATELLITE (passive) INTER - SATELLITE SPACE RESEARCH (passive)	– Passive applications – Non-specific SRDs within 122-123 GHz	
122.25 - 123 GHz **FIXED** **INTER - SATELLITE** **MOBILE** 5.558	FIXED INTER - SATELLITE MOBILE Amateur	– Amateur applications – Amateur Satellite applications – Non-specific SRDs within 122-123 GHz	

Amateur 5.138			
123 - 130 GHz **FIXED - SATELLITE (space -to- Earth)** **MOBILE - SATELLITE (space -to- Earth)** **RADIONAVIGATION** **RADIONAVIGATION - SATELLITE** **Radio astronomy** 5.562D 5.149 5.554	FIXED - SATELLITE (space - to - Earth) MOBILE - SATELLITE (space - to - Earth) RADIONAVIGATION RADIONAVIGATION - SATELLITE Radio astronomy		
130 - 134 GHz **EARTH EXPLORATION - SATELLITE (active)** 5.562E **FIXED** **INTER - SATELLITE** **MOBILE** 5.558 **RADIO ASTRONOMY** 5.149 5.562A	EARTH EXPLORATION - SATELLITE (active) FIXED INTER - SATELLITE MOBILE RADIO ASTRONOMY	– Radio astronomy applications	
134 - 136 GHz **AMATEUR** **AMATEUR - SATELLITE** **Radio astronomy**	AMATEUR AMATEUR - SATELLITE Radio astronomy	– Amateur applications – Amateur Satellite applications	
136 - 141 GHz **RADIO ASTRONOMY** **RADIOLOCATION** **Amateur** **Amateur - satellite** 5.149	RADIO ASTRONOMY RADIOLOCATION Amateur Amateur - satellite	– Amateur applications – Amateur Satellite applications – Radio Astronomy applications	
141 - 148.5 GHz **FIXED** **MOBILE**	FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION	– Radio astronomy applications	

RADIO ASTRONOMY **RADIOLOCATION** 5.149			
148.5 - 151.5 GHz **EARTH EXPLORATION - SATELLITE (passive)** **RADIO ASTRONOMY** **SPACE RESEARCH (passive)** 5.340	EARTH EXPLORATION - SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	– Passive applications	
151.5 - 155.5 GHz **FIXED** **MOBILE** **RADIO ASTRONOMY** **RADIOLOCATION** 5.149	FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION	– Radio astronomy applications	
155.5 - 158.5 GHz **FIXED** **MOBILE** **RADIO ASTRONOMY** 5.149	FIXED MOBILE RADIO ASTRONOMY	– Radio astronomy applications	
158.5 - 164 GHz **FIXED** **FIXED - SATELLITE (space -to- Earth)** **MOBILE** **MOBILE - SATELLITE (space -to- Earth)**	FIXED FIXED - SATELLITE (space - to - Earth) MOBILE MOBILE - SATELLITE (space - to - Earth)		
164 - 167 GHz **EARTH EXPLORATION - SATELLITE (passive)** **RADIO ASTRONOMY** **SPACE RESEARCH (passive)**	EARTH EXPLORATION - SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	– Passive applications	

5.340			
167 - 174.5 GHz **FIXED** **FIXED - SATELLITE (space -to- Earth)** **INTER - SATELLITE** **MOBILE** 5.558 5.149 5.562D	FIXED FIXED - SATELLITE (space - to - Earth) INTER - SATELLITE MOBILE		
174.5 - 174.8 GHz **FIXED** **INTER - SATELLITE** **MOBILE** 5.558	FIXED INTER - SATELLITE MOBILE		
174.8 - 182 GHz **EARTH EXPLORATION - SATELLITE (passive)** **INTER - SATELLITE** 5.562H **SPACE RESEARCH (passive)**	EARTH EXPLORATION - SATELLITE (passive) INTER - SATELLITE SPACE RESEARCH (passive)	– Passive applications	
182 - 185 GHz **EARTH EXPLORATION - SATELLITE (passive)** **RADIO ASTRONOMY** **SPACE RESEARCH (passive)** 5.340	EARTH EXPLORATION - SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	– Passive applications – Radio astronomy applications	
185 - 190 GHz **EARTH EXPLORATION - SATELLITE (passive)** **INTER - SATELLITE** 5.562H **SPACE RESEARCH (passive)**	EARTH EXPLORATION - SATELLITE (passive) INTER - SATELLITE SPACE RESEARCH (passive)	– Passive applications	
190 - 191.8 GHz **EARTH EXPLORATION - SATELLITE (passive)** **SPACE RESEARCH (passive)** 5.340	EARTH EXPLORATION - SATELLITE (passive) SPACE RESEARCH (passive)	– Passive applications	

191.8 - 200 GHz **FIXED** **INTER - SATELLITE** **MOBILE** 5.558 **MOBILE - SATELLITE** **RADIONAVIGATION** **RADIONAVIGATION - SATELLITE** 5.149 5.341 5.554	FIXED INTER - SATELLITE MOBILE 5.558 MOBILE - SATELLITE RADIONAVIGATION RADIONAVIGATION - SATELLITE		
200 - 209 GHz **EARTH EXPLORATION - SATELLITE (passive)** **RADIO ASTRONOMY** **SPACE RESEARCH (passive)** 5.340 5.341 5.563A	EARTH EXPLORATION - SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	– Radio astronomy applications – Earth Exploration observations	
209 - 217 GHz **FIXED** **FIXED - SATELLITE (Earth -to- space)** **MOBILE** **RADIO ASTRONOMY** 5.149 5.341	FIXED FIXED - SATELLITE (Earth - to - space) MOBILE RADIO ASTRONOMY	– Radio astronomy applications	
217 - 226 GHz **FIXED** **FIXED - SATELLITE (Earth -to- space)** **MOBILE** **RADIO ASTRONOMY** **SPACE RESEARCH (passive)** 5.562B 5.149 5.341	FIXED FIXED - SATELLITE (Earth - to - space) MOBILE RADIO ASTRONOMY SPACE RESEARCH (passive)		
226 - 231.5 GHz **EARTH EXPLORATION - SATELLITE (passive)** **RADIO ASTRONOMY**	EARTH EXPLORATION - SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	– Radio astronomy applications – Passive applications	

SPACE RESEARCH (passive) 5.340			
231.5 - 232 GHz **FIXED** **MOBILE** **Radiolocation**	FIXED MOBILE Radiolocation		
232 - 235 GHz **FIXED** **FIXED - SATELLITE (space -to- Earth)** **MOBILE** **Radiolocation**	FIXED FIXED - SATELLITE (space - to - Earth) MOBILE Radiolocation		
235 - 238 GHz **EARTH EXPLORATION - SATELLITE (passive)** **FIXED - SATELLITE (space -to- Earth)** **SPACE RESEARCH (passive)** 5.563A 5.563B	EARTH EXPLORATION - SATELLITE (passive) FIXED - SATELLITE (space - to - Earth) SPACE RESEARCH (passive)	– Radio astronomy applications – Passive applications	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 (No. 5.563B)
238 - 240 GHz **FIXED** **FIXED - SATELLITE (space -to- Earth)** **MOBILE** **RADIOLOCATION** **RADIONAVIGATION** **RADIONAVIGATION - SATELLITE**	FIXED FIXED - SATELLITE (space - to - Earth) MOBILE RADIOLOCATION RADIONAVIGATION RADIONAVIGATION - SATELLITE		
240 - 241 GHz **FIXED** **MOBILE** **RADIOLOCATION**	FIXED MOBILE RADIOLOCATION		
241 - 248 GHz **RADIO ASTRONOMY**	RADIO ASTRONOMY RADIOLOCATION Amateur	– Amateur applications – Amateur Satellite applications – Non-specific SRDs within 244-246 GHz	

RADIOLOCATION **Amateur** **Amateur - satellite** 5.138 5.149	Amateur - satellite	– Radio astronomy applications	
248 - 250 GHz **AMATEUR** **AMATEUR - SATELLITE** **Radio astronomy** 5.149	AMATEUR AMATEUR - SATELLITE Radio astronomy	– Amateur applications – Amateur Satellite applications	
250 - 252 GHz **EARTH EXPLORATION - SATELLITE (passive)** **RADIO ASTRONOMY** **SPACE RESEARCH (passive)** 5.340 5.563A	EARTH EXPLORATION - SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	– Earth Exploration observations	
252 - 265 GHz **FIXED** **MOBILE** **MOBILE - SATELLITE (Earth -to- space)** **RADIO ASTRONOMY** **RADIONAVIGATION** **RADIONAVIGATION - SATELLITE** 5.149 5.554	FIXED MOBILE MOBILE - SATELLITE (Earth - to - space) RADIO ASTRONOMY RADIONAVIGATION RADIONAVIGATION - SATELLITE	– Radio Astronomy applications	
265 - 275 GHz **FIXED** **FIXED - SATELLITE (Earth -to- space)** **MOBILE** **RADIO ASTRONOMY** 5.149 5.563A	FIXED FIXED - SATELLITE (Earth - to - space) MOBILE RADIO ASTRONOMY		
275 - 3000GHz **(Not allocated)** 5.564A 5.565	(Not allocated)		Fixed and land mobile service applications in frequency bands in the range 275-450 GHz (see 5.564A)

QNFAP - PART 3
QATAR'S FOOTNOTES

Footnotes Relevant to Qatar

5.54B Additional allocation: in Algeria, Saudi Arabia, Bahrain, Egypt, the United Arab Emirates, the Russian Federation, Iran (Islamic Republic of), Iraq, Kuwait, Lebanon, Morocco, Qatar, the Syrian Arab Republic, Sudan and Tunisia, the frequency band 8.3-9 kHz is also allocated to the radionavigation, fixed and mobile services on a primary basis.

5.56 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.

5.57 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.

5.60 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.

5.64 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.

5.73 The band 285-325 kHz (283.5-325 kHz in Region 1) in the maritime radionavigation service may be used to transmit supplementary navigational information using narrow-band techniques, on condition that no harmful interference is caused to radiobeacon stations operating in the radionavigation service.

5.74 Additional Allocation: in Region 1, the frequency band 285.3-285.7 kHz is also allocated to the maritime radionavigation service (other than radiobeacon) on a primary basis.

5.76 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

5.79 In the maritime mobile service, the frequency bands 415-495 kHz and 505-526.5 kHz are limited to radiotelegraphy and may also be used for the NAVDAT system in accordance with the most recent version of Recommendation ITU-R M.2010, subject to agreement between interested and affected administrations. NAVDAT transmitting stations are limited to coast stations.

5.80A The maximum equivalent isotropically radiated power (e.i.r.p.) of stations in the amateur service using frequencies in the band 472-479 kHz shall not exceed 1 W. Administrations may increase this limit of e.i.r.p. to 5 W in portions of their territory which are at a distance of over 800 km from the borders of Algeria, Saudi Arabia, Azerbaijan, Bahrain, Belarus, China, Comoros, Djibouti, Egypt, United Arab Emirates, the Russian Federation, Iran (Islamic Republic of), Iraq, Jordan, Kazakhstan, Kuwait, Lebanon, Libya, Morocco,

Mauritania, Oman, Uzbekistan, Qatar, Syrian Arab Republic, Kyrgyzstan, Somalia, Sudan, Tunisia, Ukraine and Yemen. In this frequency band, stations in the amateur service shall not cause harmful interference to, or claim protection from, stations of the aeronautical radionavigation service.

5.80B The use of the frequency band 472-479 kHz in Algeria, Saudi Arabia, Azerbaijan, Bahrain, Belarus, China, Comoros, Djibouti, Egypt, United Arab Emirates, the Russian Federation, Iraq, Jordan, Kazakhstan, Kuwait, Lebanon, Libya, Mauritania, Oman, Uzbekistan, Qatar, Syrian Arab Republic, Kyrgyzstan, Somalia, Sudan, Tunisia and Yemen is limited to the maritime mobile and aeronautical radionavigation services. The amateur service shall not be used in the above-mentioned countries in this frequency band, and this should be taken into account by the countries authorizing such use.

5.82C The frequency band 495-505 kHz is used for the international NAVDAT system as described in the most recent version of Recommendation ITU-R M.2010. NAVDAT transmitting stations are limited to coast stations.

5.84 The conditions for the use of the frequency 518 kHz by the maritime mobile service are prescribed in Articles 31 and 52.

5.90 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.

5.92 Some countries of Region 1 use radiodetermination systems in the bands 1 606.5-1 625 kHz, 1 635-1 800 kHz, 1 850-2 160 kHz, 2 194-2 300 kHz, 2 502-2 850 kHz and 3 500-3 800 kHz, subject to agreement obtained under No. **9.21**. The radiated mean power of these stations shall not exceed 50 W.

5.100 In Region 1, the authorization to use the band 1 810-1 830 kHz by the amateur service in countries situated totally or partially north of 40° N shall be given only after consultation with the countries mentioned in Nos. **5.98** and **5.99** to define the necessary steps to be taken to prevent harmful interference between amateur stations and stations of other services operating in accordance with Nos. **5.98** and **5.99**.

5.103 In Region 1, in making assignments to stations in the fixed and mobile services in the bands 1 850-2 045 kHz, 2 194-2 498 kHz, 2 502-2 625 kHz and 2 650-2 850 kHz, administrations should bear in mind the special requirements of the maritime mobile service.

5.104 In Region 1, the use of the band 2 025-2 045 kHz by the meteorological aids service is limited to oceanographic buoy stations.

5.108 The carrier frequency 2 182 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.

5.109 The frequencies 2 187.5 kHz, 4 207.5 kHz, 6 312 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.

5.113 For the conditions for the use of the bands 2 300-2 495 kHz (2 498 kHz in Region 1), 3 200-3 400 kHz, 4 750-4 995 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**.

5.127 The use of the band 4 000-4 063 kHz by the maritime mobile service is limited to ship stations using radiotelephony (see No. 52.220 and Appendix 17).

5.130 The conditions for the use of the carrier frequencies 4 125 kHz and 6 215 kHz are prescribed in Articles 31 and 52.

5.131 The frequency 4 209.5 kHz is used exclusively for the transmission by coast stations of meteorological and navigational warnings and urgent information to ships by means of narrow-band direct-printing techniques.

5.132 The frequencies 4 210 kHz, 6 314 kHz, 8 416.5 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).

5.133B Stations in the amateur service using the frequency band 5 351.5-5 366.5 kHz shall not exceed a maximum radiated power of 15 W (e.i.r.p.). However, in Region 2 in Mexico, stations in the amateur service using the frequency band 5 351.5-5 366.5 kHz shall not exceed a maximum radiated power of 20 W (e.i.r.p.). In the following Region 2 countries: Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Dominica, El Salvador, Ecuador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, Saint Lucia, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, Venezuela, as well as the overseas countries and territories within the Kingdom of the Netherlands in Region 2, stations in the amateur service using the frequency band 5 351.5-5 366.5 kHz shall not exceed a maximum radiated power of 25 W (e.i.r.p.).

5.134 The use of the frequency bands 5 900-5 950 kHz, 7 300-7 350 kHz, 9 400-9 500 kHz, 11 600-11 650 kHz, 12 050-12 100 kHz, 13 570-13 600 kHz, 13 800-13 870 kHz, 15 600-15 800 kHz, 17 480-17 550 kHz and 18 900-19 020 kHz by the broadcasting service is subject to the application of the procedure of Article 12. Administrations are encouraged to use these frequency bands to facilitate the introduction of digitally modulated emissions in accordance with the provisions of Resolution 517 (Rev.WRC-19).

5.136 **Additional allocation,** frequencies in the band 5 900-5 950 kHz may be used by stations in the following services, communicating only within the boundary of the country in which they are located: fixed service (in all three Regions), land mobile service (in Region 1), mobile except aeronautical mobile (R) service (in Regions 2 and 3), 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

5.138 The following bands:

6 765-6 795 kHz (centre frequency 6 780 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.

5.141B Additional allocation: in Algeria, Saudi Arabia, Australia, Bahrain, Botswana, Brunei Darussalam, China, Comoros, Korea (Rep. of), Diego Garcia, Djibouti, Egypt, United Arab Emirates, Eritrea, Guinea, Indonesia, Iran (Islamic Republic of), Japan, Jordan, Kuwait, Libya, Mali, Morocco, Mauritania, Niger, New Zealand, Oman, Papua New Guinea, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Sudan, South Sudan, Tunisia, Viet Nam and Yemen, the frequency band 7 100-7 200 kHz is also allocated to the fixed and the mobile, except aeronautical mobile (R), services on a primary basis.

5.142 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.

5.143B In Region 1, frequencies in the band 7 350-7 450 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 on condition that harmful interference is not caused to the broadcasting service. The total radiated power of each station shall not exceed 24 dBW.

5.143C Additional allocation: in Algeria, Saudi Arabia, Bahrain, Comoros, Djibouti, Egypt, United Arab Emirates, Iran (Islamic Republic of), Jordan, Kuwait, Libya, Morocco, Mauritania, Niger, Oman, Qatar, the Syrian Arab Republic, Sudan, South Sudan, Tunisia and Yemen, the bands 7 350-7 400 kHz and 7 400-7 450 kHz are also allocated to the fixed service on a primary basis.

5.145 The conditions for the use of the carrier frequencies 8 291 kHz, 12 290 kHz and 16 420 kHz are prescribed in Articles 31 and 52.

5.147 On condition that harmful interference is not caused to the broadcasting service, frequencies in the bands 9 775-9 900 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.

5.149 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,

1 330-1 400 MHz,

1 610.6-1 613.8 MHz,

1 660-1 670 MHz,

1 718.8-1 722.2 MHz,

2 655-2 690 MHz,

3 260-3 267 MHz,

3 332-3 339 MHz,

3 345.8-3 352.5 MHz,

4 825-4 835 MHz,

4 950-4 990 MHz,

4 990-5 000 MHz,

6 650-6 675.2 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,	130-134 GHz,	173.52-173.85 GHz,
94.1-100 GHz,	136-148.5 GHz,	195.75-196.15 GHz,
102-109.5 GHz,	151.5-158.5 GHz,	209-226 GHz,
111.8-114.25 GHz,	168.59-168.93 GHz,	241-250 GHz
128.33-128.59 GHz,	171.11-171.45 GHz,	252-275 GHz
129.23-129.49 GHz,	172.31-172.65 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**).

5.155B The band 21 870-21 924 kHz is used by the fixed service for provision of services related to aircraft flight safety.

5.156A The use of the band 23 200-23 350 kHz by the fixed service is limited to provision of services related to aircraft flight safety.

5.166A Different category of service: in Austria, Cyprus, the Vatican, Croatia, Denmark, Spain, Finland, Hungary, Latvia, the Netherlands, the Czech Republic, the United Kingdom, Slovakia and Slovenia, the frequency band 50.0- 50.5 MHz is allocated to the amateur service on a primary basis. Stations in the amateur service in these countries shall not cause harmful interference to, or claim protection from, stations of the broadcasting, fixed and mobile services operating in accordance with the Radio Regulations in the frequency band 50.0-50.5 MHz in the countries not listed in this provision. For a station of these services, the protection criteria in No. 5.169B shall also apply. In Region 1, with the exception of those countries listed in No. 5.169, wind profiler radars operating in the radiolocation service under No. 5.162A are authorized to operate on the basis of equality with stations in the amateur service in the frequency band 50.0-50.5 MHz.

5.166B In Region 1, stations in the amateur service operating on a secondary basis shall not cause harmful interference to, or claim protection from, stations of the broadcasting service. The field strength generated by an amateur station in Region 1 in the frequency band 50-52 MHz shall not exceed a calculated value of +6 dB(μV/m) at a height of 10 m above ground for more than 10% of time along the border of a country with operational analogue broadcasting stations in Region 1 and of neighbouring countries with broadcasting stations in Region 3 listed in Nos. 5.167 and 5.168.

5.166C In Region 1, stations in the amateur service in the frequency band 50-52 MHz, with the exception of those countries listed in No. 5.169, shall not cause harmful interference to, or claim protection from, wind profiler radars operating in the radiolocation service under No. 5.162A.

5.169A Alternative allocation: in the following countries in Region 1: Angola, Saudi Arabia, Bahrain, Burkina Faso, Burundi, the United Arab Emirates, Gambia, Jordan, Kenya, Kuwait, Mauritius, Mozambique, Oman, Uganda, Qatar, South Sudan and Tanzania, the frequency band 50-54 MHz is allocated to the amateur service on a primary basis. In Guinea-Bissau, the frequency band 50.0-50.5 MHz is allocated to the amateur service on a primary basis. In Djibouti, the frequency band 50-52 MHz is allocated to the amateur service on a primary basis. With the exception of those countries listed in No. 5.169, stations in the amateur service operating in Region 1 under this footnote, in all or part of the frequency band 50-54 MHz, shall not cause harmful interference to, or claim protection from, stations of other services operating in accordance with the Radio Regulations in Algeria, Egypt, Iran (Islamic Republic of), Iraq, Israel, Libya, Palestine*, the Syrian Arab Republic, the Dem. People's Republic of Korea, Sudan and Tunisia. The field strength generated by an amateur station in the frequency band 50-54 MHz shall not exceed a value of +6 dB(μV/m) at a height of 10 m above ground for more than 10% of time along the borders of listed countries requiring protection.

5.180 The frequency 75 MHz is assigned to marker beacons. Administrations shall refrain from assigning frequencies close to the limits of the guardband to stations of other services which, because of their power or geographical position, might cause harmful interference or otherwise place a constraint on marker beacons. Every effort should be made to improve further the characteristics of airborne receivers and to limit the power of transmitting stations close to the limits 74.8 MHz and 75.2 MHz.

5.200 In the band 117.975-137 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 for distress and safety purposes with stations of the aeronautical mobile service.

5.203C The use of the space operation service (space-to-Earth) with non-geostationary satellite short-duration mission systems in the frequency band 137-138 MHz is subject to Resolution 660 (WRC-19). Resolution 32 (WRC-19) applies. These systems shall not cause harmful interference to, or claim protection from, the existing services to which the frequency band is allocated on a primary basis.

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

5.208A In making assignments to space stations in the mobile-satellite service in the frequency bands 137- 138 MHz, 387-390 MHz and 400.15-401 MHz and in the maritime mobile-satellite service (space-to-Earth) in the frequency bands 157.1875-157.3375 MHz and 161.7875-161.9375 MHz, administrations shall take all practicable steps to protect the radio astronomy service in the frequency bands 150.05-153 MHz, 322-328.6 MHz, 406.1-410 MHz and 608-614 MHz from harmful interference from unwanted emissions as shown in the most recent version of Recommendation ITU-R RA.769.

5.208B In the frequency bands:
137-138 MHz,
157.1875-157.3375 MHz,

161.7875-161.9375 MHz,
387-390 MHz,
400.15-401 MHz,
1 452-1 492 MHz,
1 525-1 610 MHz,
1 613.8-1 626.5 MHz,
2 655-2 690 MHz,
21.4-22 GHz,
Resolution 739 (Rev.WRC-19) applies.

5.209 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.

5.209A The use of the frequency band 137.175-137.825 MHz by non-geostationary-satellite systems in the space operation service identified as short-duration mission in accordance with Appendix 4 is not subject to No. 9.11A.

5.211 Additional allocation: in Germany, Saudi Arabia, Austria, Bahrain, Belgium, Denmark, the United Arab Emirates, Spain, Finland, Greece, Guinea, Ireland, Israel, Kenya, Kuwait, Lebanon, Liechtenstein, Luxembourg, North Macedonia, Mali, Malta, Montenegro, Norway, the Netherlands, Qatar, Slovakia, the United Kingdom, Serbia, Slovenia, Somalia, Sweden, Switzerland, Tanzania, Tunisia and Turkey, the frequency band 138-144 MHz is also allocated to the maritime mobile and land mobile services on a primary basis.

5.218A The frequency band 148-149.9 MHz in the space operation service (Earth-to-space) may be used by nongeostationary-satellite systems with short-duration missions. Non-geostationary-satellite systems in the space operation service used for a short-duration mission in accordance with Resolution 32 (WRC-19) of the Radio Regulations are not subject to agreement under No. 9.21. At the stage of coordination, the provisions of Nos. 9.17 and 9.18 also apply. In the frequency band 148-149.9 MHz, non-geostationary-satellite systems with short-duration missions shall not cause unacceptable interference to, or claim protection from, existing primary services within this frequency band, or impose additional constraints on the space operation and mobile-satellite services. In addition, earth stations in non-geostationary-satellite systems in the space operation service with short-duration missions in the frequency band 148-149.9 MHz shall ensure that the power flux-density does not exceed −149 dB(W/(m2 ▯ 4 kHz)) for more than 1% of time at the border of the territory of the following countries: Armenia, Azerbaijan, Belarus, China, Korea (Rep. of), Cuba, Russian Federation, India, Iran (Islamic Republic of), Japan, Kazakhstan, Malaysia, Uzbekistan, Kyrgyzstan, Thailand and Viet Nam. In case this power flux-density limit is exceeded, agreement under No. 9.21 is required to be obtained from countries mentioned in this footnote.

5.219 The use of the frequency 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 frequency band 148-149.9 MHz. The use of the frequency band 148-149.9 MHz by non-geostationary-satellite systems in the space operation service identified as short-duration mission is not subject to No. 9.11A

5.221 Stations of the mobile-satellite service in the frequency 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, Djibouti, Egypt, the United Arab Emirates, Eritrea, Spain, Estonia, Eswatini, Ethiopia, the Russian Federation, Finland, France, Gabon, Georgia, Ghana, Greece, Guinea, Guinea Bissau, Hungary, India, Iran (Islamic Republic of), Ireland, Iceland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kuwait, Lesotho, Latvia, Lebanon, Libya, Liechtenstein, Lithuania, Luxembourg, North Macedonia, Malaysia, Mali, Malta, Mauritania, Moldova, Mongolia, Montenegro, 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, Dem. People's Rep. of Korea, Slovakia, Romania, the United Kingdom, Senegal, Serbia, Sierra Leone, Singapore, Slovenia, Sudan, Sri Lanka, South Africa, Sweden, Switzerland, Tanzania, Chad, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Ukraine, Viet Nam, Yemen, Zambia and Zimbabwe. (WRC-19)

5.228AA The use of the frequency bands 161.9375-161.9625 MHz and 161.9875-162.0125 MHz by the maritime mobile satellite (Earth-to-space) service is limited to the systems which operate in accordance with Appendix 18.

5.228AB The use of the frequency bands 157.1875-157.3375 MHz and 161.7875-161.9375 MHz by the maritime mobile-satellite service (Earth-to-space) is limited to non-geostationary-satellite systems operating in accordance with Appendix 18.

5.247 Additional allocation: in Saudi Arabia, Bahrain, the United Arab Emirates, Jordan, Oman, Qatar and Syrian Arab Republic, the band 223-235 MHz is also allocated to the aeronautical radionavigation service on a primary basis.

5.256 The frequency 243 MHz is the frequency in this band for use by survival craft stations and equipment used for survival purposes.

5.260A In the frequency band 399.9-400.05 MHz, the maximum e.i.r.p. of any emission of earth stations in the mobile-satellite service shall not exceed 5 dBW in any 4 kHz band and the maximum e.i.r.p. of each earth station in the mobile-satellite service shall not exceed 5 dBW in the whole 399.9-400.05 MHz frequency band. Until 22 November 2022, this limit shall not apply to satellite systems for which complete notification information has been received by the Radiocommunication Bureau by 22 November 2019 and that have been brought into use by that date. After 22 November 2022, these limits shall apply to all systems within the mobile-satellite service operating in this frequency band.

In the frequency band 399.99-400.02 MHz, the e.i.r.p. limits as specified above shall apply after 22 November 2022 to all systems within the mobile-satellite service. Administrations are requested that their mobile-satellite service satellite links in the 399.99-400.02 MHz frequency band comply with the e.i.r.p. limits as specified above, after 22 November 2019.

5.260B In the frequency band 400.02-400.05 MHz, the provisions of No. 5.260A are not applicable for telecommand uplinks within the mobile-satellite service.

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

5.264A In the frequency band 401-403 MHz, the maximum e.i.r.p. of any emission of each earth station in the meteorological-satellite service and the Earth exploration-satellite service shall not exceed 22 dBW in any 4 kHz band for geostationary-satellite systems and non-geostationary-satellite systems with an orbit of apogee equal or greater than 35 786 km.

The maximum e.i.r.p. of any emission of each earth station in the meteorological-satellite service and the Earth exploration-satellite service shall not exceed 7 dBW in any 4 kHz band for non-geostationary-satellite systems with an orbit of apogee lower than 35 786 km.

The maximum e.i.r.p. of each earth station in the meteorological-satellite service and the Earth exploration satellite service shall not exceed 22 dBW for geostationary-satellite systems and non-geostationary-satellite systems with an orbit of apogee equal or greater than 35 786 km in the whole 401-403 MHz frequency band. The maximum e.i.r.p. of each earth station in the meteorological-satellite service and the Earth exploration-satellite service shall not exceed 7 dBW for non-geostationary-satellite systems with an orbit of apogee lower than 35 786 km in the whole 401-403 MHz frequency band.

Until 22 November 2029, these limits shall not apply to satellite systems for which complete notification information has been received by the Radiocommunication Bureau by 22 November 2019 and that have been brought into use by that date. After 22 November 2029, these limits shall apply to all systems within the meteorological-satellite service and the Earth exploration-satellite service operating in this frequency band.

5.264B Non-geostationary-satellite systems in the meteorological-satellite service and the Earth exploration satellite service for which complete notification information has been received by the Radiocommunication Bureau before 28 April 2007 are exempt from provisions of No. 5.264A and may continue to operate in the frequency band 401.898- 402.522 MHz on a primary basis without exceeding a maximum e.i.r.p. level of 12 dBW.

5.265 In the frequency band 403-410 MHz, Resolution 205 (Rev.WRC-19) applies.

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

5.268 Use of the frequency band 410-420 MHz by the space research service is limited to space-to-space communication links with an orbiting, manned space vehicle. The power flux-density at the surface of the Earth produced by emissions from transmitting stations of the space research service (space-to-space) in the

frequency band 410-420 MHz shall not exceed −153 dB(W/m2) for 0° ≤ σ ≤ 5°, −153 + 0.077 (δ − 5) dB(W/m2) for 5° ≤ δ ≤ 70° and −148 dB(W/m2) for 70° ≤ δ ≤ 90°, where δ is the angle of arrival of the radio-frequency wave and the reference bandwidth is 4 kHz. In this frequency band, stations of the space research service (space-to-space) shall not claim protection from, nor constrain the use and development of, stations of the fixed and mobile services. No. 4.10 does not apply.

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

5.286AA The frequency band 450-470 MHz is identified for use by administrations wishing to implement International Mobile Telecommunications (IMT) - see Resolution 224 (Rev.WRC-19). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations.

5.287 Use of the frequency bands 457.5125-457.5875 MHz and 467.5125-467.5875 MHz by the maritime mobile service is limited to on-board communication stations. The characteristics of the equipment and the channeling arrangement shall be in accordance with Recommendation ITU-R M.1174-4. The use of these frequency bands in territorial waters is subject to the national regulations of the administration concerned.

5.296 Additional allocation: in Albania, Germany, Angola, Saudi Arabia, Austria, Bahrain, Belgium, Benin, Bosnia and Herzegovina, Botswana, Bulgaria, Burkina Faso, Burundi, Cameroon, Vatican, Congo (Rep. of the), Côte d'Ivoire, Croatia, Denmark, Djibouti, Egypt, United Arab Emirates, Spain, Estonia, Eswatini. Finland, France, Gabon, Georgia, Ghana, Hungary, Iraq, Ireland, Iceland, Israel, Italy, Jordan, Kenya, Kuwait, Lesotho, Latvia, Lebanon, Libya, Liechtenstein, Lithuania, Luxembourg, North Macedonia, Malawi, Mali, Malta, Morocco, Mauritius, Mauritania, Moldova, Monaco, Mozambique, Namibia, Niger, Nigeria, Norway, Oman, Uganda, the Netherlands, Poland, Portugal, Qatar, the Syrian Arab Republic, Slovakia, the Czech Republic, Romania, the United Kingdom, Rwanda, San Marino, Serbia, Sudan, South Africa, Sweden, Switzerland, Tanzania, Chad, Togo, Tunisia, Turkey, Ukraine, Zambia and Zimbabwe, the frequency band 470-694 MHz is also allocated on a secondary basis to the land mobile service, intended for applications ancillary to broadcasting and programme-making. Stations of the land mobile service in the countries listed in this footnote shall not cause harmful interference to existing or planned stations operating in accordance with the Table in countries other than those listed in this footnote.

5.300 Additional allocation: in Saudi Arabia, Cameroon, Egypt, United Arab Emirates, Israel, Jordan, Libya, Oman, Qatar, the Syrian Arab Republic and Sudan, the frequency band 582- 790 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis.

5.306 Additional allocation: in Region 1, except in the African Broadcasting Area (see Nos. **5.10** to **5.13**), and in Region 3, the band 608-614 MHz is also allocated to the radio astronomy service on a secondary basis.

5.312A In Region 1, the use of the frequency band 694-790 MHz by the mobile, except aeronautical mobile, service is subject to the provisions of Resolution 760 (Rev.WRC-19). See also Resolution 224 (Rev.WRC-19).

5.316B In Region 1, the allocation to the mobile, except aeronautical mobile, service in the frequency band 790-862 MHz is subject to agreement obtained under No. 9.21 with respect to the aeronautical radionavigation service in countries mentioned in No. 5.312. For countries party to the GE06 Agreement, the use of stations of the mobile service is also subject to the successful application of the procedures of that Agreement. Resolutions 224 (Rev.WRC-19) and 749 (Rev.WRC-19) shall apply, as appropriate.

5.317A The parts of the frequency band 698-960 MHz in Region 2 and the frequency bands 694-790 MHz in Region 1 and 790-960 MHz in Regions 1 and 3 which are allocated to the mobile service on a primary basis are identified for use by administrations wishing to implement International Mobile Telecommunications (IMT) – see Resolutions 224 (Rev.WRC-19), 760 (Rev.WRC-19) and 749 (Rev.WRC-19), where applicable. This identification does not preclude the use of these frequency bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations.

5.327A The use of the frequency band 960-1 164 MHz by the aeronautical mobile (R) service is limited to systems that operate in accordance with recognized international aeronautical standards. Such use shall be in accordance with Resolution 417 (Rev.WRC-15).

5.328AA The frequency band 1 087.7-1 092.3 MHz is also allocated to the aeronautical mobile-satellite (R) service (Earth-to-space) on a primary basis, limited to the space station reception of Automatic Dependent Surveillance-Broadcast (ADS-B) emissions from aircraft transmitters that operate in accordance with recognized international aeronautical standards. Stations operating in the aeronautical mobile-satellite (R) service shall not claim protection from stations operating in the aeronautical radionavigation service. Resolution 425 (Rev.WRC-19) shall apply.

5.329 Use of the radionavigation-satellite service in the frequency 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. 5.331. Furthermore, the use of the radionavigation-satellite service in the frequency 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 (Rev.WRC-19) shall apply.

5.330 Additional allocation: in Angola, Saudi Arabia, Bahrain, Bangladesh, Cameroon, China, Djibouti, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Guyana, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Nepal, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, Somalia, Sudan, South Sudan, Chad, Togo and Yemen, the band 1 215-1 300 MHz is also allocated to the fixed and mobile services on a primary basis.

5.331 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, Lesotho, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, North Macedonia, Madagascar, Mali, Mauritania, Montenegro, Nigeria, Norway, Oman, Pakistan, the Kingdom of the Netherlands, Poland, Portugal, Qatar, the Syrian Arab Republic, Dem. People's Rep. of Korea, Slovakia, the United Kingdom, Serbia, Slovenia, Somalia, Sudan, South Sudan, Sri Lanka, South Africa, Sweden, Switzerland, Thailand, Togo, Turkey, Venezuela and Viet Nam, the frequency band 1 215-1 300 MHz is also allocated to the radionavigation service on a primary basis. In Canada and the United States, the frequency 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.

5.337 The use of the bands 1 300-1 350 MHz, 2 700-2 900 MHz and 9 000-9 200 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.

5.337A 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.

5.338A In the frequency bands 1 350-1 400 MHz, 1 427-1 452 MHz, 22.55-23.55 GHz, 24.25-27.5 GHz, 30- 31.3 GHz, 49.7-50.2 GHz, 50.4-50.9 GHz, 51.4-52.4 GHz, 52.4-52.6 GHz, 81-86 GHz and 92-94 GHz, Resolution 750 (Rev.WRC-19) applies.

5.341A In Region 1, the frequency bands 1 427-1 452 MHz and 1 492-1 518 MHz are identified for use by administrations wishing to implement International Mobile Telecommunications (IMT) in accordance with Resolution 223 (Rev.WRC-15). This identification does not preclude the use of these frequency bands by any other application of the services to which it is allocated and does not establish priority in the Radio Regulations. The use of IMT stations is subject to agreement obtained under No. 9.21 with respect to the aeronautical mobile service used for aeronautical telemetry in accordance with No. 5.342.

5.346 In Algeria, Angola, Saudi Arabia, Bahrain, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Congo (Rep. of the), Côte d'Ivoire, Djibouti, Egypt, United Arab Emirates, Eswatini, Gabon, Gambia, Ghana, Guinea, Iraq, Jordan, Kenya, Kuwait, Lesotho, Lebanon, Liberia, Madagascar, Malawi, Mali, Morocco, Mauritius, Mauritania, Mozambique, Namibia, Niger, Nigeria, Oman, Uganda, Palestine**, Qatar, Dem. Rep. of the Congo, Rwanda, Senegal, Seychelles, Sudan, South Sudan, South Africa, Tanzania, Chad, Togo, Tunisia, Zambia, and Zimbabwe, the frequency band 1 452-1 492 MHz is identified for use by administrations listed above wishing to implement International Mobile Telecommunications (IMT) in accordance with Resolution 223 (Rev.WRC-15). This identification does not preclude the use of this frequency band by any other application of the services to which it is allocated and does not establish priority in the Radio Regulations. The use of this frequency band for the implementation of IMT is subject to

agreement obtained under No. 9.21 with respect to the aeronautical mobile service used for aeronautical telemetry in accordance with No. 5.342. See also Resolution 761 (WRC-19).

5.349 Different category of service: in Saudi Arabia, Azerbaijan, Bahrain, Cameroon, Egypt, Iran (Islamic Republic of), Iraq, Israel, Kazakhstan, Kuwait, Lebanon, North Macedonia, Morocco, Qatar, Syrian Arab Republic, Kyrgyzstan, Turkmenistan and Yemen, the allocation of the frequency band 1 525-1 530 MHz to the mobile, except aeronautical mobile, service is on a primary basis (see No. 5.33).

5.352A In the frequency band 1 525-1 530 MHz, stations in the mobile-satellite service, except stations in the maritime mobile-satellite service, shall not cause harmful interference to, or claim protection from, stations of the fixed service in Algeria, Saudi Arabia, Egypt, Guinea, India, Israel, Italy, Jordan, Kuwait, Mali, Morocco, Mauritania, Nigeria, Oman, Pakistan, the Philippines, Qatar, Syrian Arab Republic, Viet Nam and Yemen notified prior to 1 April 1998.

5.353A 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.)

5.355 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.

5.356 The use of the band 1 544-1 545 MHz by the mobile-satellite service (space-to-Earth) is limited to distress and safety communications (see Article 31).

5.365 The use of the band 1 613.8-1 626.5 MHz by the mobile-satellite service (space-to-Earth) is subject to coordination under No. 9.11A.

5.368 The provisions of No. 4.10 do not apply with respect to the radiodetermination-satellite and mobile-satellite services in the frequency band 1 610-1 626.5 MHz. However, No. 4.10 applies in the frequency band 1 610-1 626.5 MHz with respect to the aeronautical radionavigation-satellite service when operating in accordance with No. 5.366, the aeronautical mobile satellite (R) service when operating in accordance with No. 5.367, and in the frequency band 1 621.35-1 626.5 MHz with respect to the maritime mobile-satellite service when used for GMDSS.

5.371 Additional allocation: in Region 1, the bands 1 610-1 626.5 MHz (Earth-to-space) (space-to-Earth) is also allocated to the radiodetermination-satellite service on a secondary basis, subject to agreement obtained under No. **9.21**.

5.372 Harmful interference shall not be caused to stations of the radio astronomy service using the frequency band 1 610.6-1 613.8 MHz by stations of the radiodetermination-satellite and mobile-satellite services (No. **29.13** applies). The equivalent power flux-density (epfd) produced in the frequency band 1 610.6-1 613.8 MHz by all space stations of a non-geostationary-satellite system in the mobile-satellite service (space-to-Earth) operating in frequency band 1 613.8-1 626.5 MHz shall be in compliance with the protection criteria provided in Recommendations ITU-R RA.769-2 and ITU-R RA.1513-2, using the methodology given in Recommendation ITU-R M.1583-1, and the radio astronomy antenna pattern described in Recommendation ITU-R RA.1631-0.

5.373 Maritime mobile earth stations receiving in the frequency band 1 621.35-1 626.5 MHz shall not impose additional constraints on earth stations operating in the maritime mobile-satellite service or maritime earth stations of the radiodetermination-satellite service operating in accordance with the Radio Regulations in the frequency band 1 610- 1 621.35 MHz or on earth stations operating in the maritime mobile-satellite service operating in accordance with the Radio Regulations in the frequency band 1 626.5-1 660.5 MHz, unless otherwise agreed between the notifying administrations.

5.373A Maritime mobile earth stations receiving in the frequency band 1 621.35-1 626.5 MHz shall not impose constraints on the assignments of earth stations of the mobile-satellite service (Earth-to-space) and the radiodetermination-satellite service (Earth-to-space) in the frequency band 1 621.35-1 626.5 MHz in networks for which complete coordination information has been received by the Radiocommunication Bureau before 28 October 2019.

5.382 Different category of service: in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Congo (Rep. of the), Egypt, the United Arab Emirates, Eritrea, Ethiopia, the Russian Federation, Guinea, Iraq, Israel, Jordan, Kazakhstan, Kuwait, Lebanon, North Macedonia, Mauritania, Moldova, Mongolia, Oman, Uzbekistan, Poland, Qatar, the Syrian Arab Republic, Kyrgyzstan, Somalia, Tajikistan, Turkmenistan, Ukraine and Yemen, the allocation of the frequency band 1 690- 1 700 MHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (see No. 5.33), and in the Dem. People's Rep. of Korea, the allocation of the frequency band 1 690-1 700 MHz to the fixed service is on a primary basis (see No. 5.33) and to the mobile, except aeronautical mobile, service on a secondary basis.

5.388B 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, Jordan, Kenya, Kuwait, Lebanon, Libya, Mali, Morocco, Mauritania, Nigeria, Oman, Uganda, Pakistan, Qatar, the Syrian Arab Republic, Senegal, Singapore, Sudan, South Sudan, Tanzania, Chad, Togo, Tunisia, Yemen, Zambia and Zimbabwe, for the purpose of protecting fixed and mobile services, including IMT mobile stations, in their territories from co-channel interference, a high altitude platform station (HAPS) operating as an IMT base station in neighboring countries, in the frequency bands referred to in No. 5.388A, shall not exceed a co-channel power flux-density of −127 dB(W/(m2 · 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.

5.391 In making assignments to the mobile service in the frequency bands 2 025-2 110 MHz and 2 200-2 290 MHz, administrations shall not introduce high-density mobile systems, as described in Recommendation ITU-R SA.1154-0, and shall take that Recommendation into account for the introduction of any other type of mobile system.

5.410 The band 2 500-2 690 MHz may be used for tropospheric scatter systems in Region 1, subject to agreement obtained under No. 9.21. No. 9.21 does not apply to tropospheric scatter links situated entirely outside Region 1. Administrations shall make all practicable efforts to avoid developing new tropospheric scatter systems in this band. When planning new tropospheric scatter radio-relay links in this band, all possible measures shall be taken to avoid directing the antennas of these links towards the geostationary-satellite orbit.

5.422 Additional allocation: in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Brunei Darussalam, Congo (Rep. of the), Côte d'Ivoire, Cuba, Djibouti, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Gabon, Georgia, Guinea, Guinea-Bissau, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kuwait, Lebanon, Mauritania, Mongolia, Montenegro, Nigeria, Oman, Pakistan, the Philippines, Qatar, Syrian Arab Republic, Kyrgyzstan, the Dem. Rep. of the Congo, Romania, Somalia, Tajikistan, Tunisia, Turkmenistan, Ukraine and Yemen, the band 2 690-2 700 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.

5.423 In the band 2 700-2 900 MHz, ground-based radars used for meteorological purposes are authorized to operate on a basis of equality with stations of the aeronautical radionavigation service.

5.424A In the band 2 900-3 100 MHz, stations in the radiolocation service shall not cause harmful interference to, nor claim protection from, radar systems in the radionavigation service.

5.425 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.

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

5.429 Additional allocation: in Saudi Arabia, Bahrain, Bangladesh, Benin, Brunei Darussalam, Cambodia, Cameroon, China, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Egypt, the United Arab Emirates, India, Indonesia, Iran (Islamic Republic of), Iraq, Japan, Jordan, Kenya, Kuwait, Lebanon, Libya, Malaysia, New Zealand, Oman, Uganda, Pakistan, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, the Dem. People's Rep. of Korea, Sudan and Yemen, the frequency band 3 300-3 400 MHz is also allocated to the fixed and mobile services on a primary basis. New Zealand and the countries bordering the Mediterranean shall not claim protection for their fixed and mobile services from the radiolocation service.

5.430A The allocation of the frequency band 3 400-3 600 MHz to the mobile, except aeronautical mobile, service is subject to agreement obtained under No. 9.21. This frequency band is identified for International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. The provisions of Nos. 9.17 and 9.18 shall also apply in the coordination phase. Before an administration brings into use a (base or mobile) station of the mobile service in this frequency band, it shall ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed −154.5 dB(W/(m² . 4 kHz)) for more than 20% of time at the border of the territory of any other administration. This limit may be exceeded on the territory of any country whose administration has so agreed. In order to ensure that the pfd limit at the border of the territory of any other administration is met, the calculations and verification shall be made, taking into account all relevant information, with the mutual agreement of both administrations (the administration responsible for the terrestrial station and the administration responsible for the earth station) and with the assistance of the Bureau if so requested. In case of disagreement, calculation and verification of the pfd shall be made by the Bureau, taking into account the information referred to above. Stations of the mobile service in the frequency band 3 400-3 600 MHz shall not claim more protection from space stations than that provided in Table 21-4 of the Radio Regulations (Edition of 2004).

5.436 Use of the frequency band 4 200-4 400 MHz by stations in the aeronautical mobile (R) service is reserved exclusively for wireless avionics intra-communication systems that operate in accordance with recognized international aeronautical standards. Such use shall be in accordance with Resolution 424 (WRC-15).

5.438 Use of the frequency band 4 200-4 400 MHz by the aeronautical radionavigation service is reserved exclusively for radio altimeters installed on board aircraft and for the associated transponders on the ground.

5.444 The frequency band 5 030-5 150 MHz is to be used for the operation of the international standard system (microwave landing system) for precision approach and landing. In the frequency band 5 030-5 091 MHz, the requirements of this system shall have priority over other uses of this frequency band. For the use of the frequency band 5 091-5 150 MHz, No. 5.444A and Resolution 114 (Rev.WRC-15) apply.

5.444A The use of the allocation to the fixed-satellite service (Earth-to-space) in the frequency band 5 091-5 150 MHz is limited to feeder links of non-geostationary satellite systems in the mobile-satellite service and is subject to coordination under No. 9.11A. The use of the frequency band 5 091-5 150 MHz by feeder links of non-geostationary satellite systems in the mobile-satellite service shall be subject to application of Resolution 114 (Rev.WRC-15). Moreover, to ensure that the aeronautical radionavigation service is protected from harmful interference, coordination is required for feeder-link earth stations of the non-geostationary satellite systems in the mobile-satellite service which are separated by less than 450 km from the territory of an administration operating ground stations in the aeronautical radionavigation service.

5.444B The use of the frequency band 5 091-5 150 MHz by the aeronautical mobile service is limited to:

– systems operating in the aeronautical mobile (R) service and in accordance with international aeronautical standards, limited to surface applications at airports. Such use shall be in accordance with Resolution 748 (Rev.WRC-19);

– aeronautical telemetry transmissions from aircraft stations (see No. 1.83) in accordance with Resolution 418 (Rev.WRC-19).

5.446 Additional allocation: in the countries listed in Nos. **5.369** and **5.400**, the band 5 150-5 216 MHz is also allocated to the radiodetermination-satellite service (space-to-Earth) on a primary basis, subject to agreement obtained under No. **9.21**. In Region 2, the band is also allocated to the radiodetermination-satellite service (space-to-Earth) on a primary basis. In Regions 1 and 3, except those countries listed in Nos. **5.369** and **5.400**, the band is also allocated to the radiodetermination-satellite service (space-to-Earth) on a secondary basis. The use by the radiodetermination-satellite service is limited to feeder links in conjunction with the radiodetermination-satellite service operating in the bands 1 610-1 626.5 MHz and/or 2 483.5-2 500 MHz. The total power flux-density at the Earth's surface shall in no case exceed –159 dB (W/m^2) in any 4 kHz band for all angles of arrival.

5.446A The use of the frequency bands 5 150-5 350 MHz and 5 470-5 725 MHz by the stations in the mobile, except aeronautical mobile, service shall be in accordance with Resolution 229 (Rev.WRC-19).

5.446C Additional allocation: in Region 1 (except in Algeria, Saudi Arabia, Bahrain, Egypt, United Arab Emirates, Iraq, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Syrian Arab Republic, Sudan, South Sudan and Tunisia), the frequency band 5 150-5 250 MHz is also allocated to the aeronautical mobile service on a primary basis, limited to aeronautical telemetry transmissions from aircraft stations (see No. 1.83), in accordance with Resolution 418 (Rev.WRC-19). These stations shall not claim protection from other stations operating in accordance with Article 5. No. 5.43A does not apply.

5.447F In the frequency 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). The radiolocation service, the Earth exploration-satellite service (active) and the space research service (active) shall not impose more stringent conditions upon the mobile service than those stipulated in Resolution 229 (Rev.WRC-19).

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

5.450A In the frequency band 5 470-5 725 MHz, stations in the mobile service shall not claim protection from radiodetermination services. The radiodetermination services shall not impose more stringent conditions upon the mobile service than those stipulated in Resolution 229 (Rev.WRC-19).

5.452 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.

5.453 Additional allocation: in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Djibouti, Egypt, the United Arab Emirates, Eswatini, Gabon, Guinea, Equatorial Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Japan, Jordan, Kenya, Kuwait, Lebanon, Libya, Madagascar, Malaysia, Niger, Nigeria, Oman, Uganda, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Sri Lanka, Tanzania, Chad, Thailand,

Togo, Viet Nam and Yemen, the band 5 650-5 850 MHz is also allocated to the fixed and mobile services on a primary basis. In this case, the provisions of Resolution 229 (Rev.WRC-12) do not apply. In addition, in Afghanistan, Angola, Benin, Bhutan, Botswana, Burkina Faso, Burundi, Dem. Rep. of the Congo, Fiji, Ghana, Kiribati, Lesotho, Malawi, Maldives, Mauritius, Micronesia, Mongolia, Mozambique, Myanmar, Namibia, Nauru, New Zealand, Papua New Guinea, Rwanda, Solomon Islands, South Sudan, South Africa, Tonga, Vanuatu, Zambia and Zimbabwe, the band 5 725-5 850 MHz is allocated to the fixed service on a primary basis, and stations operating in the fixed service shall not cause harmful interference to and shall not claim protection from other primary services in the frequency band.

5.457B In the frequency bands 5 925-6 425 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, Jordan, Kuwait, Libya, 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).

5.461AA The use of the frequency band 7 375-7 750 MHz by the maritime mobile-satellite service is limited to geostationary-satellite networks.

5.461AB In the frequency band 7 375-7 750 MHz, earth stations in the maritime mobile-satellite service shall not claim protection from, nor constrain the use and development of, stations in the fixed and mobile, except aeronautical mobile, services. No. 5.43A does not apply.

5.461B The use of the band 7 750-7 900 MHz by the meteorological-satellite service (space-to-Earth) is limited to non-geostationary satellite systems.

5.462A 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 values for angles of arrival (θ), without the consent of the affected administration:

-135 dB (W/m^2) in a 1 MHz band	for	$0^\circ \leq \theta < 5^\circ$
$-135 + 0.5\,(\theta - 5)$ dB (W/m^2) in a 1 MHz band	for	$5^\circ \leq \theta < 25^\circ$
-125 dB (W/m^2) in a 1 MHz band	for	$25^\circ \leq \theta \leq 90^\circ$

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

5.470 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.

5.471 Additional allocation: in Algeria, Germany, Bahrain, Belgium, China, Egypt, the United Arab Emirates, France, Greece, Indonesia, Iran (Islamic Republic of), Libya, the Netherlands, Qatar and Sudan, the frequency bands 8 825-8 850 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.

5.472 In the bands 8 850-9 000 MHz and 9 200-9 225 MHz, the maritime radionavigation service is limited to shore-based radars.

5.474 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).

5.474B Stations operating in the Earth exploration-satellite (active) service shall comply with Recommendation ITU-R RS.2066-0.

5.474C Stations operating in the Earth exploration-satellite (active) service shall comply with Recommendation ITU-R RS.2065-0.

5.474D Stations in the Earth exploration-satellite service (active) shall not cause harmful interference to, or claim protection from, stations of the maritime radionavigation and radiolocation services in the frequency band 9 200-9 300 MHz, the radionavigation and radiolocation services in the frequency band 9 900-10 000 MHz and the radiolocation service in the frequency band 10.0-10.4 GHz.

5.475 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.

5.477 Different category of service: in Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, Djibouti, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Guyana, India, Indonesia, Iran (Islamic Republic of), Iraq, Jamaica, Japan, Jordan, Kuwait, Lebanon, Liberia, Malaysia, Nigeria, Oman, Uganda, Pakistan, Qatar, Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, South Sudan, Trinidad and Tobago, and Yemen, the allocation of the frequency band 9 800-10 000 MHz to the fixed service is on a primary basis (see No. 5.33).

5.479 The band 9 975-10 025 MHz is also allocated to the meteorological-satellite service on a secondary basis for use by weather radars.

5.482 In the band 10.6-10.68 GHz, the power delivered to the antenna of stations of the fixed and mobile, except aeronautical mobile, services shall not exceed -3 dBW. This limit may be exceeded, subject to agreement obtained under No. 9.21. However, in Algeria, Saudi Arabia, Armenia, Azerbaijan, Bahrain, Bangladesh, Belarus, Egypt, United Arab Emirates, Georgia, India, Indonesia, Iran (Islamic Republic of), Iraq, Jordan, Kazakhstan, Kuwait, Lebanon, Libya, Morocco, Mauritania, Moldova, Nigeria, Oman, Uzbekistan, Pakistan,

Philippines, Qatar, Syrian Arab Republic, Kyrgyzstan, Singapore, Tajikistan, Tunisia, Turkmenistan and Viet Nam, this restriction on the fixed and mobile, except aeronautical mobile, services is not applicable.

5.483 Additional allocation: in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, China, Colombia, Korea (Rep. of), Egypt, the United Arab Emirates, Georgia, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kazakhstan, Kuwait, Lebanon, Mongolia, Qatar, Kyrgyzstan, the Dem. People's Rep. of Korea, Tajikistan, Turkmenistan and Yemen, the frequency band 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.

5.484 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.

5.484A The use of the bands 10.95-11.2 GHz (space-to-Earth), 11.45-11.7 GHz (space-to-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-to-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-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. 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.

5.484B Resolution 155 (WRC-15) shall apply.

5.487 In the band 11.7-12.5 GHz in Regions 1 and 3, the fixed, fixed-satellite, mobile, except aeronautical mobile, and broadcasting services, in accordance with their respective allocations, shall not cause harmful interference to, or claim protection from, broadcasting-satellite stations operating in accordance with the Regions 1 and 3 Plan in Appendix 30.

5.487A Additional allocation: in Region 1, the band 11.7-12.5 GHz, in Region 2, the band 12.2-12.7 GHz and, in Region 3, the band 11.7-12.2 GHz, are also allocated to the fixed-satellite service (space-to-Earth) on a primary basis, limited to non-geostationary systems and 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 broadcasting-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.

5.492 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.

5.494 Additional allocation: in Algeria, Saudi Arabia, Bahrain, Cameroon, the Central African Rep., Congo (Rep. of the), Côte d'Ivoire, Djibouti, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Gabon, Ghana, Guinea, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Madagascar, Mali, Morocco, Mongolia, Nigeria, Oman, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, Somalia, Sudan, South Sudan, Chad, Togo and Yemen, the frequency band 12.5-12.75 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. .

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

5.499A The use of the frequency band 13.4-13.65 GHz by the fixed-satellite service (space-to-Earth) is limited to geostationary-satellite systems and is subject to agreement obtained under No. 9.21 with respect to satellite systems operating in the space research service (space-to-space) to relay data from space stations in the geostationary-satellite orbit to associated space stations in non-geostationary satellite orbits for which advance publication information has been received by the Bureau by 27 November 2015.

5.499B Administrations shall not preclude the deployment and operation of transmitting earth stations in the standard frequency and time signal-satellite service (Earth-to-space) allocated on a secondary basis in the frequency band 13.4-13.65 GHz due to the primary allocation to FSS (space-to-Earth).

5.499C The allocation of the frequency band 13.4-13.65 GHz to the space research service on a primary basis is limited to:

– satellite systems operating in the space research service (space-to-space) to relay data from space stations in the geostationary-satellite orbit to associated space stations in non-geostationary satellite orbits for which advance publication information has been received by the Bureau by 27 November 2015,

– active spaceborne sensors,

– satellite systems operating in the space research service (space-to-Earth) to relay data from space stations in the geostationary-satellite orbit to associated earth stations.

Other uses of the frequency band by the space research service are on a secondary basis.

5.499D In the frequency band 13.4-13.65 GHz, satellite systems in the space research service (space-to-Earth) and/or the space research service (space-to-space) shall not cause harmful interference to, nor claim protection from, stations in the fixed, mobile, radiolocation and Earth exploration-satellite (active) services.

5.499E In the frequency band 13.4-13.65 GHz, geostationary-satellite networks in the fixed-satellite service (space-to- Earth) shall not claim protection from space stations in the Earth exploration-satellite service (active) operating in accordance with these Regulations, and No. 5.43A does not apply. The provisions of No. 22.2 do not apply to the Earth exploration-satellite service (active) with respect to the fixed-satellite service (space-to-Earth) in this frequency band.

5.500 Additional allocation: in Algeria, 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, Morocco, Mauritania, Niger, Nigeria, Oman, Qatar, the Syrian Arab Republic, Singapore, Sudan, South Sudan, Chad and Tunisia, the frequency band 13.4-14 GHz is also allocated to the fixed and mobile services on a primary basis. In Pakistan, the frequency band 13.4-13.75 GHz is also allocated to the fixed and mobile services on a primary basis.

5.501A The allocation of the frequency band 13.65-13.75 GHz to the space research service on a primary basis is limited to active spaceborne sensors. Other uses of the frequency band by the space research service are on a secondary basis.

5.505 Additional allocation: in Algeria, Saudi Arabia, Bahrain, Botswana, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Korea (Rep. of), Djibouti, Egypt, the United Arab Emirates, Eswatini, Gabon, Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Oman, the Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, South Sudan, Chad, Viet Nam and Yemen, the frequency band 14-14.3 GHz is also allocated to the fixed service on a primary basis.

5.509B The use of the frequency bands 14.5-14.75 GHz in countries listed in Resolution 163 (WRC-15) and 14.5-14.8 GHz in countries listed in Resolution 164 (WRC-15) by the fixed-satellite service (Earth-to-space) not for feeder links for the broadcasting-satellite service is limited to geostationary-satellites.

5.509C For the use of the frequency bands 14.5-14.75 GHz in countries listed in Resolution 163 (WRC-15) and 14.5-14.8 GHz in countries listed in Resolution 164 (WRC-15) by the fixed-satellite service (Earth-to-space) not for feeder links for the broadcasting-satellite service, the fixed-satellite service earth stations shall have a minimum antenna diameter of 6 m and a maximum power spectral density of −44.5 dBW/Hz at the input of the antenna. The earth stations shall be notified at known locations on land.

5.509D Before an administration brings into use an earth station in the fixed-satellite service (Earth-to-space) not for feeder links for the broadcasting-satellite service in the frequency bands 14.5-14.75 GHz (in countries listed in Resolution 163 (WRC-15)) and 14.5-14.8 GHz (in countries listed in Resolution 164 (WRC-15)), it shall ensure that the power flux-density produced by this earth station does not exceed −151.5dB(W/(m2·4 kHz)) produced at all altitudes from 0 m to 19 000 m above sea level at 22 km seaward from all coasts, defined as the low-water mark, as officially recognized by each coastal State.

5.509F In the frequency bands 14.50-14.75 GHz in countries listed in Resolution 163 (WRC-15) and 14.50-14.8 GHz in countries listed in Resolution 164 (WRC-15), earth stations in the fixed-satellite service (Earth-to-space) not for feeder links for the broadcasting-satellite service shall not constrain the future deployment of the fixed and mobile services.

5.509G The frequency band 14.5-14.8 GHz is also allocated to the space research service on a primary basis. However, such use is limited to the satellite systems operating in the space research service (Earth-to-space) to relay data to space stations in the geostationary-satellite orbit from associated earth stations. Stations in the space research service shall not cause harmful interference to, or claim protection from, stations in the fixed and mobile services and in the fixed satellite service limited to feeder links for the broadcasting-satellite service and associated space operations functions using the guard bands under Appendix 30A and feeder links for the broadcasting-satellite service in Region 2. Other uses of this frequency band by the space research service are on a secondary basis.

5.510 Except for use in accordance with Resolution 163 (WRC-15) and Resolution 164 (WRC-15), the use of the frequency 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. Uses other than feeder links for the broadcasting-satellite service are not authorized in Regions 1 and 2 in the frequency band 14.75-14.8 GHz.

5.511 Additional allocation: in Saudi Arabia, Bahrain, Cameroon, Egypt, the United Arab Emirates, Guinea, Iran (Islamic Republic of), Iraq, Israel, Kuwait, Lebanon, Oman, Pakistan, Qatar, the Syrian Arab Republic and Somalia, the band 15.35-15.4 GHz is also allocated to the fixed and mobile services on a secondary basis.

5.512 Additional allocation: in Algeria, Saudi Arabia, Austria, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, Congo (Rep. of the), Egypt, El Salvador, the United Arab Emirates, Eritrea, Finland, Guatemala, India, Indonesia, Iran (Islamic Republic of), Jordan, Kenya, Kuwait, Lebanon, Libya, Malaysia, Mali, Morocco, Mauritania, Montenegro, Nepal, Nicaragua, Niger, Oman, Pakistan, Qatar, Syrian Arab Republic, the Dem. Rep. of the Congo, Singapore, Somalia, Sudan, South Sudan, Chad, Togo and Yemen, the frequency band 15.7-17.3 GHz is also allocated to the fixed and mobile services on a primary basis.

5.514 Additional allocation: in Algeria, Saudi Arabia, Bahrain, Bangladesh, Cameroon, El Salvador, the United Arab Emirates, Guatemala, India, Iran (Islamic Republic of), Iraq, Israel, Italy, Japan, Jordan, Kuwait, Libya, Lithuania, Nepal, Nicaragua, Nigeria, Oman, Uzbekistan, 52 Pakistan, Qatar, Kyrgyzstan, Sudan and South Sudan, the frequency 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.

5.516 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 17.3-18.1 GHz (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.

5.516A 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.

5.516B 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 frequency bands by other fixed-satellite service applications or by other services to which these frequency bands are allocated on a co-primary basis and does not establish priority in these Radio Regulations among users of the frequency bands. Administrations should take this into account when considering regulatory provisions in relation to these frequency bands. See Resolution 143 (Rev.WRC-19).

5.517A The operation of earth stations in motion communicating with geostationary fixed-satellite service space stations within the frequency bands 17.7-19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space) shall be subject to the application of Resolution 169 (WRC-19).

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.

5.524 Additional allocation: in Afghanistan, Algeria, Saudi Arabia, Bahrain, 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, South Sudan, Chad, Togo and Tunisia, the frequency 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 frequency band 19.7-21.2 GHz and of space stations in the mobile-satellite service in the frequency band 19.7-20.2 GHz where the allocation to the mobile-satellite service is on a primary basis in the latter frequency band.

5.527A The operation of earth stations in motion communicating with the FSS is subject to Resolution156 (WRC-15).

5.532AB The frequency band 24.25-27.5 GHz is identified for use by administrations wishing to implement the terrestrial component of International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. Resolution 242 (WRC-19) applies.

5.536A 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 the most recent version of Recommendation ITU-R SA.1862. Resolution 242 (WRC-19) applies.

5.536B In Algeria, Saudi Arabia, Austria, Bahrain, Belgium, Brazil, China, Korea (Rep. of), Denmark, Egypt, United Arab Emirates, Estonia, Finland, Hungary, India, Iran (Islamic Republic of), Iraq, Ireland, Israel, Italy, Jordan, Kenya, Kuwait, Lebanon, Libya, Lithuania, Moldova, Norway, Oman, Uganda, Pakistan, the Philippines, Poland, Portugal, Qatar, the Syrian Arab Republic, Dem. People's Rep. of Korea, Slovakia, the Czech Rep., Romania, the United Kingdom, Singapore, Slovenia, Sudan, Sweden, Tanzania, Turkey, Viet Nam and Zimbabwe, earth stations operating in the Earth exploration-satellite service in the frequency band 25.5-27 GHz shall not claim protection from, or constrain the use and deployment of, stations of the fixed and mobile services. Resolution 242 (WRC-19) applies.

5.536C 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, South 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.

5.542 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.

5.543B The allocation to the fixed service in the frequency band 31-31.3 GHz is identified for worldwide use by high-altitude platform stations (HAPS). This identification does not preclude the use of this frequency band by other fixed-service applications or by other services to which this frequency band is allocated on a co-primary basis, and does not establish priority in the Radio Regulations. Such use of the fixed-service allocation by HAPS shall be in accordance with the provisions of Resolution 167 (WRC-19).

5.549 Additional allocation: in Saudi Arabia, Bahrain, Bangladesh, Egypt, the United Arab Emirates, Gabon, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Malaysia, Mali, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, Singapore, Somalia, Sudan, South 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.

5.550B The frequency band 37-43.5 GHz, or portions thereof, is identified for use by administrations wishing to implement the terrestrial component of International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. Because of the potential deployment of FSS earth stations within the frequency range 37.5-42.5 GHz and high-density applications in the fixed-satellite service in the bands 39.5-40 GHz in Region 1, 40-40.5 GHz in all Regions and 40.5-42 GHz in Region 2 (see No. 5.516B), administrations should further take into account potential constraints to IMT in these bands, as appropriate. Resolution 243 (WRC-19) applies.

5.550C The use of the frequency bands 37.5-39.5 GHz (space-to-Earth), 39.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space) by a non-geostationary-satellite system in the fixed satellite service is subject to the application of the provisions of No. 9.12 for coordination with other non-geostationary-satellite systems in the fixed-satellite service but not with non-geostationary-satellite systems in other services. Resolution 770 (WRC-19) shall also apply, and No. 22.2 shall continue to apply.

5.550D The allocation to the fixed service in the frequency band 38-39.5 GHz is identified for worldwide use by administrations wishing to implement high-altitude platform stations (HAPS). In the HAPS-to-ground direction, the HAPS ground station shall not claim protection from stations in the fixed, mobile and fixed-satellite services; and No. 5.43A does not apply. This identification does not preclude the use of this frequency band by other fixed-service applications or by other services to which this frequency band is

allocated on a co-primary basis and does not establish priority in the Radio Regulations. Furthermore, the development of the fixed-satellite, fixed and mobile services shall not be unduly constrained by HAPS. Such use of the fixed-service allocation by HAPS shall be in accordance with the provisions of Resolution 168 (WRC-19).

5.550E The use of the frequency bands 39.5-40 GHz and 40-40.5 GHz by non-geostationary-satellite systems in the mobile-satellite service (space-to-Earth) and by non-geostationary-satellite systems in the fixed-satellite service (space-to-Earth) is subject to the application of the provisions of No. 9.12 for coordination with other non-geostationary-satellite systems in the fixed-satellite and mobile-satellite services but not with non-geostationary-satellite systems in other services. No. 22.2 shall continue to apply for non-geostationary-satellite-systems.

5.552A The allocation to the fixed service in the frequency bands 47.2-47.5 GHz and 47.9-48.2 GHz is identified for use by high-altitude platform stations (HAPS). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated on a co-primary basis, and does not establish priority in the Radio Regulations. Such use of the fixed-service allocation in the frequency bands 47.2-47.5 GHz and 47.9-48.2 GHz by HAPS shall be in accordance with the provisions of Resolution 122 (Rev.WRC-19).

5.553 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).

5.553A In Algeria, Angola, Bahrain, Belarus, Benin, Botswana, Brazil, Burkina Faso, Cabo Verde, Korea (Rep. of), Côte d'Ivoire, Croatia, United Arab Emirates, Estonia, Eswatini, Gabon, Gambia, Ghana, Greece, Guinea, Guinea-Bissau, Hungary, Iran (Islamic Republic of), Iraq, Jordan, Kuwait, Lesotho, Latvia, Liberia, Lithuania, Madagascar, Malawi, Mali, Morocco, Mauritius, Mauritania, Mozambique, Namibia, Niger, Nigeria, Oman, Qatar, Senegal, Seychelles, Sierra Leone, Slovenia, Sudan, South Africa, Sweden, Togo, Tunisia, Zambia and Zimbabwe, the frequency band 45.5-47 GHz is identified for use by administrations wishing to implement the terrestrial component of International Mobile Telecommunications (IMT), taking into account No. 5.553. With respect to the aeronautical mobile service and radionavigation service, the use of this frequency band for the implementation of IMT is subject to agreement obtained under No. 9.21 with concerned administrations and shall not cause harmful interference to, or claim protection from these services. This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. Resolution 244 (WRC-19) applies.

5.553B In Region 2 and Algeria, Angola, Saudi Arabia, Australia, Bahrain, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Rep., Comoros, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Djibouti, Egypt, United Arab Emirates, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Equatorial Guinea, India, Iran (Islamic Republic of), Iraq, Japan, Jordan, Kenya, Kuwait, Lesotho, Liberia, Libya, Lithuania, Madagascar, Malaysia, Malawi, Mali, Morocco, Mauritius, Mauritania, Mozambique, Namibia, Niger, Nigeria, Oman, Uganda, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo,

Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Singapore, Slovenia, Somalia, Sudan, South Africa, Sweden, Tanzania, Chad, Togo, Tunisia, Zambia and Zimbabwe, the frequency band 47.2-48.2 GHz is identified for use by administrations wishing to implement International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated, and does not establish any priority in the Radio Regulations. Resolution 243 (WRC-19) applies.

5.555C The use of the frequency band 51.4-52.4 GHz by the fixed-satellite service (Earth-to-space) is limited to geostationary-satellite networks. The earth stations shall be limited to gateway earth stations with a minimum antenna diameter of 2.4 metres.

5.559AA The frequency band 66-71 GHz is identified for use by administrations wishing to implement the terrestrial component of International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which this frequency band is allocated and does not establish priority in the Radio Regulations. Resolution 241 (WRC-19) applies.

5.559B The use of the frequency band 77.5-78 GHz by the radiolocation service shall be limited to short-range radar for ground-based applications, including automotive radars. The technical characteristics of these radars are provided in the most recent version of Recommendation ITU-R M.2057. The provisions of No. 4.10 do not apply.

5.562 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.

5.562B In the frequency bands 105-109.5 GHz, 111.8-114.25 GHz and 217-226 GHz, the use of this allocation is limited to space-based radio astronomy only.

5.563A 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.

5.564A For the operation of fixed and land mobile service applications in frequency bands in the range 275- 450 GHz:

The frequency bands 275-296 GHz, 306-313 GHz, 318-333 GHz and 356-450 GHz are identified for use by administrations for the implementation of land mobile and fixed service applications, where no specific conditions are necessary to protect Earth exploration-satellite service (passive) applications.

The frequency bands 296-306 GHz, 313-318 GHz and 333-356 GHz may only be used by fixed and land mobile service applications when specific conditions to ensure the protection of Earth exploration-satellite service (passive) applications are determined in accordance with Resolution 731 (Rev.WRC-19).

In those portions of the frequency range 275-450 GHz where radio astronomy applications are used, specific conditions (e.g. minimum separation distances and/or avoidance angles) may be necessary to ensure protection of radio astronomy sites from land mobile and/or fixed service applications, on a case-by-case basis in accordance with Resolution 731 (Rev.WRC-19).

The use of the above-mentioned frequency bands by land mobile and fixed service applications does not preclude use by, and does not establish priority over, any other applications of radio services in the range of 275-450 GHz.

QNFAP - PART 4
Appendices and Annexes

Appendix 1: List of Specific Assignments

Frequency Range (MHz)	Uplink (Terminal-Bas) (MHz)	Downlink (Bas-Terminal) (MHz)	Applications
26.965 – 27.405			CB Radio
87.5 – 108			Broadcast / FM
108 – 118			Aeronautical
118 – 136			Aeronautical
156 – 163			Maritime
174 – 230			DVB-T
330 – 350	330 – 340	340 – 350	TMR / PMR
350 – 370	350 – 360	360 – 370	PMR / TETRA
380 – 400	380 – 390	390 – 400	PMR / TETRA
410 – 430	410 – 420	420 – 430	PMR / DMR / TETRA
450 – 470	450 – 460	460 – 470	PMR / Telemetry
457.5375 & 467.5375			UHF on-board vessel communications
470 – 694			DVB
694 – 790	698 – 733	753 – 788	IMT
790 – 862	832 – 862	790 – 821	Mobile / LTE
876 – 925	876 – 880	921 – 925	GSM-R
880 – 960	880 – 915	925 – 960	Mobile / E-GSM
960 – 1215			DME
1350 – 1530	1375 – 1400	1427 – 1452	Fixed Links
1710 – 1880	1710 – 1785	1805 – 1880	Mobile / DCS

2025 – 2110			Wireless Cameras
1920 – 2170	1920 – 1980	2110 – 2170	Mobile / UMTS
2200 – 2290			Wireless Cameras
2400 – 2483.5			Fixed links (Light Licensed)
2500 – 2690	2500 – 2570	2620 – 2690	Mobile / LTE
3400 – 3600			IMT
3600 – 3800			IMT
5725 – 5875			Fixed Links (Light Licensed)
5875 - 5925			Intelligent Transport Systems (ITS)
5925 – 6425	5925 – 6175	6175 – 6425	Fixed Applications
6425 – 7125	6425 – 6770	6770 – 7125	Fixed Links
7110 – 7750	7110 – 7275 & 7597 – 7750	7275 – 7597	Fixed Links
7125 – 7425	7125 – 7268	7282 – 7425	Fixed Links
7425 - 7725	7425 – 7568	7582 – 7725	Fixed Links
7725 – 8275	7725 – 8000	8000 – 8275	Fixed Links
7900 – 8400	7900 – 8157	8157 – 8400	Fixed Links
8275 – 8500	8275 – 8387.5	8387.5 – 8500	Fixed Links
10150 – 10300 / 10500 – 10650	10150 – 10300	10500 – 10650	Fixed Links
10700 – 11700	10700 – 11200	11200 – 11700	Fixed Links
11700 – 12500	11700 – 12100	12100 – 12500	Fixed Links
12750 – 13250	12750 – 12996	12996 – 13250	Fixed Links
14400 – 15350	14400 – 14875	14875 – 15350	Fixed Links

17700 – 19700	17700 – 18700	18700 – 19700	Fixed Links
21200 – 23600	22000 – 22600	23000 – 23600	Fixed Links
24500 – 26500	24500 – 25445	25557 – 26500	Fixed Links
31000 – 31300	31000 – 31150	31150 – 31300	Fixed Links
37000 – 39500	37000 – 38248	38248 – 39500	Fixed Links
71000 – 86500	71000 – 76000	81000 – 86000	Fixed Links

Appendix 2: List of frequency bands for SRD applications

Frequency Range	Applications	Standard Reference
9 – 148.5 kHz	Inductive SRD Applications	EN 303 417 EN 303 447 EN 303 454 EN 300 330
9 – 315 kHz	Healthcare and Listening Devices	EN 302 195
133 kHz	Inductive SRD Vehicle Immobilizer, anti-theft system, navigation device	EN 300 330
134 kHz	Inductive SRD Vehicle Immobilizer, anti-theft system, navigation device	EN 300 330
3155 kHz – 3400 kHz	Inductive Applications Security Device	EN 300 330
6765 kHz – 6795 kHz	Non-Specific Short Range Devices	EN 300 330
6765 kHz – 6795 kHz	Inductive SRD Applications	EN 300 330 EN 303 417
7400 kHz – 8800 kHz	Inductive SRD Applications	EN 300 330
13 533 kHz – 13 567 kHz	Non-Specific Short Range Devices	EN 300 330
13 533 kHz – 13 567 kHz	Inductive SRD Vehicle Fitted Radio Equipment	EN 300 330
13 533 kHz – 13 567 kHz	Radio Frequency Identification Equipment (RFID)	EN 300 330

26 957 kHz – 27 283 kHz	Non-Specific Short Range Devices	EN 300 220 EN 300 330
26990 - 27000 kHz 27040 - 27050 kHz 27090 - 27100 kHz 27140 - 27150 kHz 27190 - 27200 kHz	Model Control	EN 300 220
30 MHz – 37.5 MHz	Healthcare and Listening Devices	EN 302 510
34.995 MHz – 35.225 MHz	Model Control	EN 300 220
40.66 - 40.70 MHz	Non-Specific Short Range Devices Model Control	EN 300 220
87.5 MHz – 108 MHz	Wireless Audio Applications	EN 301 357
173.965 MHz – 174.015 MHz	Healthcare and Listening Devices	EN 300 422
315 MHz	Inductive SRD Applications Vehicle Fitted Radio Equipment	EN 300 220
401 MHz – 406 MHz	Healthcare and Listening Devices	EN 301 839 EN 302 537
433.05 MHz – 434.79 MHz	Non-Specific Short Range Devices	EN 300 220
433.05 MHz – 434.79 MHz	Inductive SRD Applications Vehicle Fitted Radio Equipment	EN 300 220
433.05 MHz – 434.79 MHz	Inductive Applications Falcon or Bird Tracking	EN 300 220
470 MHz – 694 MHz	Wireless Microphone Systems Wireless Audio Applications	EN 300 422
823 MHz – 826 MHz	Wireless Microphone Systems Wireless Audio Applications	EN 300 422
826 MHz – 832 MHz	Wireless Microphone Systems	EN 300 422

	Wireless Audio Applications	
863 MHz – 865 MHz	Wireless Audio Applications Wireless Audio & Multimedia Streaming	EN 300 422 EN 301 357
865.6 MHz – 867.6 MHz	Radio Frequency Identification Equipment (RFID)	EN 302 208
868 MHz – 868.6 MHz	Non-Specific Short Range Devices	EN 300 220
868.7 MHz – 869.2 MHz	Non-Specific Short Range Devices	EN 300 220
869.4 MHz – 869.65 MHz	Non-Specific Short Range Devices	EN 300 220
869.7 MHz – 870 MHz	Non-Specific Short Range Devices	EN 300 220
863 MHz – 870 MHz	M2M Applications	EN 300 220
870 MHz – 875.8 MHz	M2M Applications	EN 300 220
870 MHz – 876 MHz	M2M Applications	EN 300 220
915 MHz – 921 MHz	M2M Applications	EN 300 220
1575.42 MHz	Vehicle Fitted Radio Equipment GPS Receiver	EN 301 489-1
Below 1600 MHz	Ultra-Wide Band Technology Applications	EN 302 065
1600 MHz – 2700 MHz	Ultra-Wide Band Technology Applications	EN 302 065
1795 MHz – 1800 MHz	Wireless Audio Applications Cordless Loudspeakers, Headphones	EN 301 357
1880 MHz – 1900 MHz	Digital Enhanced Cordless Telecommunications (DECT)	EN 300 175
2400 MHz – 2483.5 MH	Non-Specific Short Range Devices ISM & Bluetooth	EN 300 228
2400 MHz – 2483.5 MHz	ISM Cordless Phones	EN 300 440
2400 MHz – 2483.5 MHz	Wireless Access Systems Including Radio Local Area Networks	EN 300 328

	WAS/RLAN	
2446 MHz – 2454 MHz	Radio Frequency Identification Equipment (RFID) Application Asset Tracking Systems	EN 300 440
2700 MHz – 3400 MHz	Ultra-Wide Band Technology Wide Band Data Transmission Systems	EN 302 065
3100 MHz – 4800 MHz	Ultra-Wide Band Technology Wide Band Data Transmission Systems	EN 302 065
4800 MHz – 6000 MHz	Ultra-Wide Band Technology Wide Band Data Transmission Systems	EN 302 065
5150 MHz – 5250 MHz	Wireless Access Systems Including Radio Local Area Networks WAS/RLAN	EN 301 893
5250 MHz – 5350 MHz	Wireless Access Systems Including Radio Local Area Networks WAS/RLAN	EN 301 893
5470 MHz – 5725 MHz	Wireless Access Systems Including Radio Local Area Networks WAS/RLAN	EN 301 893
5725 MHz – 5875 MHz	Non-Specific Short Range Devices	EN 300 440
5725 MHz – 5875 MHz	Wireless Access Systems Including Radio Local Area Networks WAS/RLAN	EN 302 502
6000 MHz – 8500 MHz	Ultra-Wide Band Technology Applications	EN 302 065
8500 MHz – 10600 MHz	Ultra-Wide Band Technology Applications	EN 302 065
Above 10600 MHz	Ultra-Wide Band Technology Applications	EN 302 065
24.05 GHz – 24.25 GHz	Radio-determination Applications Movement Detection & Alert Systems	EN 300 440 EN 302 288 EN 302 372

24.05 GHz – 24.25 GHz	Inductive Applications Vehicle Immobilizer, Antitheft system, navigation device	EN 300 440 EN 302 288
24.150 GHz – 24.250 GHz	Transport and Traffic Telematics Vehicle Radar Systems	EN 302 858 EN 302 288
57 GHz – 64 GHz	Radio-determination Applications Movement Detection & Alert Systems	EN 302 372
61 GHz – 61.5 GHz	Non-Specific Short Range Devices	EN 305 550
75 GHz – 85 GHz	Radio-determination Applications Movement Detection & Alert Systems	EN 302 372
76 GHz – 77 GHz	Transport and Traffic Telematics Vehicles Radar Systems	EN 301 091
122 GHz – 123 GHz	Non-Specific Short Range Devices	EN 305 550
244 GHz – 246 GHz	Non-Specific Short Range Devices	EN 305 550

Appendix 3: Harmonized frequency ranges / frequency spots

Maritime Service

Frequency	Applications	Notes
415 kHz –27.5 MHz	MF and HF Maritime mobile communications (including DSC)	Ship Radio Station (SOLAS)
156 – 163 MHz	VHF maritime mobile communications (including DSC)	Ship Radio Station (SOLAS) Ship Radio Station (non-SOLAS)
2900-3100 MHz 5460-5650 MHz 9200-9500 MHz	Radar for Radionavigation	Ship Radio Station (SOLAS) Ship Radio Station (non-SOLAS) (Only in sea Area A1)
156 – 163 MHz	VHF Portable mobile communications (including optional associated equipment for class D DSC)	Ship Radio Station (SOLAS) Ship Radio Station (non-SOLAS)
156 – 163 MHz	AIS in VHF band	Ship Radio Station (SOLAS) Ship Radio Station (non-SOLAS)
457.5375 –467.5375 MHz	UHF on-board mobile communications	Ship Radio Station (SOLAS) Ship Radio Station (non-SOLAS)
14.00-14.5 GHz (Uplink) 29.5-30 GHz (Uplink)	Earth Station on board vessels (ESoV)	Ship Radio Station (SOLAS)
1626.5 -1645.5 MHz (Uplink)	Mobile Satellite Terminals (used for GMDSS)	Ship Radio Station (SOLAS)
1 644.3-1 644.5 MHz & 1 645.5-1 646.5 MHz	Satellite EPIRB	Ship Radio Station (SOLAS)
157.200-157.325 MHz 161.800-161.925 MHz	VHF Data Exchange System (VDES)	Ship Radio Station (SOLAS) Ship Radio Station (non-SOLAS)

Aeronautical Service

Frequency	Applications	Notes
255 – 283.5, 283.5 – 315, 315 – 325, 325 – 405, 415 – 435, 435 – 495, 505 – 526.5, 53.5, 579.5, 850, 897, 949 kHz.	Non-directional beacons	Beacons for radionavigation
75 MHz	VHF marker beacons	Beacons for radionavigation
328.6 – 335.4 MHz	ILS glide path transmitter	Instrument landing systems for radionavigation
108 – 111.975 MHz	ILS localiser radio equipment	Instrument landing systems for radionavigation
5000 – 5150 MHz	Microwave landing system (MLS)	Instrument landing systems for radionavigation
108 – 117.975 MHz	VHF Omni directional radio range equipment and Doppler VHF Omni directional radio range equipment (VOR/DVOR)	Instrument landing systems for radionavigation
960 – 1215 MHz	Ground based distance measuring equipment (DME)	Instrument landing systems for radionavigation
2850 – 3025 kHz 3400 – 3500 kHz 4650 – 4700 kHz 5480 – 5680 kHz 6525 – 6685 kHz 8815 – 8965 kHz 8965 – 10100 kHz 11175 – 11400 kHz 13200 – 13360 kHz 17900 – 17970 kHz 21924 – 22000 kHz	Fixed HF Stations	Ground based HF SSB for voice and data link communications for AGA civil and SAR (Search and Rescue) applications

118 – 137 MHz	Air-ground / Ground-air communications	AGA civil communications for Mode 2 and / or Mode 4 data links
1215 – 1350 MHz 2700 – 3100 MHz	Primary Radars	Air traffic control primary radar
960 – 1215 MHz	Secondary Surveillance Radar	Air traffic control secondary surveillance radar monitoring

Appendix 4: Frequency Allotment Plan

Exclusive Frequency Allotment Plan for the Aeronautical Mobile (OR) Service

APPENDIX 26 (REV.WRC-19)

Following carrier frequencies would be exclusively used in Qatar for Aeronautical mobile (OR) service:

S. No.	Frequencies (kHz)
1	3083
2	3933
3	4727
4	5705
5	6703
6	9028
7	11232
8	13227
9	15040
10	18027
The carrier (reference) frequencies 3 023 kHz and 5 680 kHz are intended for worldwide common use	

Note:

i. A bandwidth of up to a maximum of 2.8 kHz, situated wholly within the frequency channel concerned should be utilizable.

ii. Power limits, class of emission and limits to unwanted emission shall be in accordance with the Appendix 26 and Appendix 27 of the Radio Regulations 2020.

iii. The frequencies should only be used for Telephony {J3E (SSB, suppressed carrier) } and Telegraphy (including Automatic Data transmission) {A1A, A1B, F1B; (A,H)2(A,B); (R,J)2(A,B,D); J(7,9)(B,D,X)}.

Frequency Allotment Plan for the Aeronautical Mobile (R) Service

National Plan is in strict accordance with the **Appendix 27** of the RR-2020. The Maps, region marking, class of emission, Frequencies, spurious emission limits, and Bandwidth limitations remain the same.

Frequencies for distress and safety communications for the Global Maritime Distress and Safety System (GMDSS)

APPENDIX 15 (REV.WRC-19)

The frequencies to be used exclusively for Global Maritime Distress and Safety System (GMDSS) communications are given below:

A. Frequencies below 30 MHz

Frequency (kHz)	Description of Usage	Notes
490	MSI	The frequency 490 kHz is used exclusively for maritime safety information (MSI). (WRC-03)
518	MSI	The frequency 518 kHz is used exclusively by the international NAVTEX system.
***2 174.5**	NBDP-COM	
***2 182**	RTP-COM	The frequency 2 182 kHz uses class of emission J3E. See also No. 52.190.
***2 187.5**	DSC	
3 023	AERO-SAR	The aeronautical carrier (reference) frequencies 3 023 kHz and 5 680 kHz may be used for intercommunication between mobile stations engaged in coordinated search and rescue operations, and for communication between these stations and participating land stations, in accordance with the provisions of Appendix **27** (see Nos. 5.111 and 5.115).
***4 125**	RTP-COM	See also No. 52.221. The carrier frequency 4 125 kHz may be used by aircraft stations to communicate with stations of the maritime mobile service for distress and safety purposes, including search and rescue (see No. 30.11).
***4 177.5**	NBDP-COM	
***4 207.5**	DSC	
4 209.5	MSI	The frequency 4 209.5 kHz is exclusively used for NAVTEX-type transmissions (see Resolution **339 (Rev.WRC-07)**).
4 210	MSI-HF	
5 680	AERO-SAR	See note under 3 023 kHz above.
***6 215**	RTP-COM	See also No. 52.221.

***6 268**	NBDP-COM	
***6 312**	DSC	
6 314	MSI-HF	
***8 291**	RTP-COM	
***8 376.5**	NBDP-COM	
***8 414.5**	DSC	
8 416.5	MSI-HF	
***12 290**	RTP-COM	
***12 520**	NBDP-COM	
***12 577**	DSC	
12 579	MSI-HF	
***16 420**	RTP-COM	
***16 695**	NBDP-COM	
***16 804.5**	DSC	
16 806.5	MSI-HF	
19 680.5	MSI-HF	
22 376	MSI-HF	
26 100.5	MSI-HF	

B. Frequencies above 30 MHz (VHF/UHF)

Frequency (MHz)	Description of usage	Notes
***121.5**	AERO-SAR	The aeronautical emergency frequency 121.5 MHz is used for the purposes of distress and urgency for radiotelephony by stations of the aeronautical mobile service using frequencies in the frequency band between 117.975 MHz and 137 MHz. This frequency may also be used for these purposes by survival craft stations. Use of the frequency 121.5 MHz by emergency position-indicatingradio beacons shall be in accordance with Recommendation ITU-R M.690-3. Mobile stations of the maritime mobile service may communicate with stations of the aeronautical mobile service on the aeronautical emergency frequency 121.5 MHz for the purposes of distress and urgency only, and

		on the aeronautical auxiliary frequency 123.1 MHz for coordinated search and rescue operations, using class A3E emissions for both frequencies (see also Nos. **5.111** and **5.200**). They shall then comply with any special arrangement between governments concerned by which the aeronautical mobile service is regulated.
123.1	AERO-SAR	The aeronautical auxiliary frequency 123.1 MHz, which is auxiliary to the aeronautical emergency frequency 121.5 MHz, is for use by stations of the aeronautical mobile service and by other mobile and land stations engaged in coordinated search and rescue operations (see also No. 5.200). Mobile stations of the maritime mobile service may communicate with stations of the aeronautical mobile service on the aeronautical emergency frequency 121.5 MHz for the purposes of distress and urgency only, and on the aeronautical auxiliary frequency 123.1 MHz for coordinated search and rescue operations, using class A3E emissions for both frequencies (see also Nos. 5.111 and 5.200). They shall then comply with any special arrangement between governments concerned by which the aeronautical mobile service is regulated.
156.3	VHF-CH06	The frequency 156.3 MHz may be used for communication between ship stations and aircraft stations engaged in coordinated search and rescue operations. It may also be used by aircraft stations to communicate with ship stations for other safety purposes (see also Note *f*) in Appendix **18**).
***156.525**	VHF-CH70	The frequency 156.525 MHz is used in the maritime mobile service for distress and safety calls using digital selective calling (see also Nos. 4.9, 5.227, 30.2 and 30.3).
156.650	VHF-CH13	The frequency 156.650 MHz is used for ship-to-ship communications relating to the safety of navigation in accordance with Note *k*) in Appendix **18**.
***156.8**	VHF-CH16	The frequency 156.8 MHz is used for distress and safety communications by radiotelephony. Additionally, the frequency 156.8 MHz may be used by aircraft stations for safety purposes only.
***161.975**	AIS-SART VHF CH AIS 1	AIS 1 is used for AIS search and rescue transmitters (AIS-SART) for use in search and rescue operations.
***162.025**	AIS-SART VHF CH AIS 2	AIS 2 is used for AIS search and rescue transmitters (AIS-SART) for use in search and rescue operations.
***406-406.1**	406-EPIRB	This frequency band is used exclusively by satellite emergency position-indicating radio beacons in the Earth-to-space direction (see No. 5.266).
1 530-1 544	SAT-COM	In addition to its availability for routine non-safety purposes, the band 1 530-1 544 MHz is used for distress and safety purposes in the space-to-Earth direction in the maritime mobile-satellite service. GMDSS

		distress, urgency and safety communications have priority in this band (see No. 5.353A).
***1 544-1 545**	D&S-OPS	Use of the band 1 544-1 545 MHz (space-to-Earth) is limited to distress and safety operations (see No. 5.356), including feeder links of satellites needed to relay the emissions of satellite emergency position-indicating radio beacons to earth stations and narrow-band (space-to-Earth) links from space stations to mobile stations.
1 621.35-1 626.5	SAT-COM	In addition to its availability for routine non-safety purposes, the frequency band 1 621.35-1 626.5 MHz is used for distress and safety purposes in the Earth-to-space and space-to-Earth directions in the maritime mobile-satellite service. GMDSS distress, urgency and safety communications have priority in this band over non-safety communications within the same satellite system.
1 626.5-1 645.5	SAT-COM	In addition to its availability for routine non-safety purposes, the band 1 626.5-1 645.5 MHz is used for distress and safety purposes in the Earth-to-space direction in the maritime mobile-satellite service. GMDSS distress, urgency and safety communications have priority in this band (see No. 5.353A).
***1 645.5-1 646.5**	D&S-OPS	Use of the band 1 645.5-1 646.5 MHz (Earth-to-space) is limited to distress and safety operations (see No. 5.375).
9 200-9 500	SARTS	This frequency band is used by radar transponders to facilitate search and rescue.

* Except as provided in these Regulations, any emission capable of causing harmful interference to distress, alarm, urgency or safety communications on the frequencies denoted by an asterisk (*) is prohibited. Any emission causing harmful interference to distress and safety communications on any of the discrete frequencies identified in this Appendix is prohibited. (WRC-07)

Legend:

- **AERO-SAR** These aeronautical carrier (reference) frequencies may be used for distress and safety purposes by mobile stations engaged in coordinated search and rescue operations.
- **D&S-OPS** The use of these bands is limited to distress and safety operations of satellite emergency position-indicating radio beacons (EPIRBs).
- **SAT-COM** These frequency bands are available for distress and safety purposes in the maritime mobile-satellite service (see Notes).
- **VHF-CH#** These VHF frequencies are used for distress and safety purposes. The channel number (CH#) refers to the VHF channel as listed in Appendix 18 of RR-2008, which should also be consulted.
- **AIS** These frequencies are used by automatic identification systems (AIS), which should operate in accordance with the most recent version of Recommendation ITU-R M.1371. (WRC-07)

- **DSC** These frequencies are used exclusively for distress and safety calls using digital selective calling.
- **MSI** In the maritime mobile service, these frequencies are used exclusively for the transmission of maritime safety information (MSI) (including meteorological and navigational warnings and urgent information) by coast stations to ships, by means of narrow-band direct-printing telegraphy.
- **MSI-HF** In the maritime mobile service, these frequencies are used exclusively for the transmission of high seas MSI by coast stations to ships, by means of narrow-band direct-printing telegraphy.
- **NBDP-COM** These frequencies are used exclusively for distress and safety communications (traffic) using narrow-band direct-printing telegraphy.
- **RTP-COM** These carrier frequencies are used for distress and safety communications (traffic) by radiotelephony.

Frequency allotment Plan for coast radiotelephone Stations operating in the maritime mobile bands between 4 000 kHz and 27 500 kHz

(Appendix 25 (Rev.WRC-03))

S. No.	Channel number	Assigned Frequency (in kHz)	Carrier Frequency (in kHz)
1	409	4 382.4	4381
2	432	4 424.4	4423
3	804	8 729.4	8728
4	826	8 795.4	8794
5	832	8 813.4	8812
6	1201	13 078.4	13077
7	1229	13 162.4	13161
8	1239	13 192.4	13191
9	1626	17 318.4	17317
10	1643	17 369.4	17368
11	2228	22 778.4	22777
12	2235	22 799.4	22798

BSS Plans/List allotment in Downlink

(Appendix 30 (Rev.WRC-19))

General Details

Allotment Name: **QAT24700**	
Nominal Orbital Position	20.00°E
Longitude of Boresight	51.38°

Latitude of Boresight	25.26°
Major axis (Space Station)	0.60°
Minor axis (Space Station)	0.60°
Orientation	90.00
Space station: antenna gain / code	48.88 (co-polar) / R13TSS
Earth station: antenna gain / code	35.50 / MODRES
E.I.R.P	54.5
Designation of Emission	27M0G7W
Polarization	CL

Note:

Minimum Equivalent Protection Margin (EPM)

- Channels 2, 4, 6, 8, 10, 12 and 14 5.9
- Channels 16 and 18 5.8
- Channel 20 6.2 (in accordance with note 1of §11.2 of AP30-RR-2012)

BSS Uplink Feeder Allotment

(Appendix 30A (Rev.WRC-19) Plans/List)

Allotment Name: QAT24700	
Nominal Orbital Position	20.00°E
Longitude of Boresight	51.59°
Latitude of Boresight	25.35°
Major axis (Space Station)	0.60°
Minor axis (Space Station)	0.60°
Orientation	90.00
Space station: antenna gain / code	48.88 (co-polar) / MODRSS
Earth station: antenna gain / code	57.00 / MODTES
E.I.R.P	84.0
Designation of Emission	27M0G7W
Polarization	CL

Note:

Minimum Equivalent Protection Margin (EPM)

- Channels 2, 4, 6, 8, 10, 12, 14, 16 and 18 13.7
- Channel 20 15.5

FSS Allotment Plan/List

(Appendix 30B (Rev.WRC-19))
Allotment Name: QAT00000

Frequency Bands:	**4500 – 4800 MHz (Space to Earth)** **6725 – 7025 MHz (Earth to Space)**
Nominal Orbital Position	0.90°E
Longitude of Boresight	51.60°
Latitude of Boresight	25.40°
Major axis of the elliptical cross-section half-power beam	1.60°
Minor axis of the elliptical cross-section half-power beam	1.60°
Orientation of the ellipse	90.00
Earth station E.I.R.P. density	-9.6 dB (W/Hz)
Satellite E.I.R.P. density	-41.6 dB (W/Hz)

Frequency Bands:	**10.70 – 10.95 GHz (Space to Earth)** **11.20 – 11.45 GHz (Space to Earth)** **12.75 – 13.25 GHz (Earth to Space)**
Nominal Orbital Position	0.90°E
Longitude of Boresight	51.60°
Latitude of Boresight	25.40°
Major axis of the elliptical cross-section half-power beam	0.80°
Minor axis of the elliptical cross-section half-power beam	0.80°
Orientation of the ellipse	90.00
Earth station E.I.R.P. density	-10.2 dB (W/Hz)
Satellite E.I.R.P. density	-31.5 dB (W/Hz)

Annex 1: List of Spectrum Regulations

Service	Applicable regulations	Link
Fixed	Point to point	http://www.cra.gov.qa/en/document/guidelines-fixed-radio-spectrum-licenses
	Point –to-multipoint	
	Point –to-multipoint / multipoint –to-multipoint	
	Point –to-multipoint / multipoint –to-multipoint	
	Point–to–point / Point-to-multipoint/ multipoint –to-multipoint	
Aeronautical	Aircraft radio station	http://www.cra.gov.qa/en/document/guidelines-aeronautical-radio-spectrum-licenses
	Aircraft portable radio Equipment	
	Aeronautical ground stations	
	Aeronautical navigational aids	
	Aeronautical ground based radar	
Broadcasting	Commercial Radio broadcasting Station	http://www.cra.gov.qa/en/document/guidelines-broadcasting-radio-spectrum-licenses
	Community Radio Broadcasting Station	
	Digital Terrestrial TV Multiplexer Network	
	Digital Terrestrial Audio Multiplexer Network	
	Digital Video Broadcasting – Handheld Multiplexer Network	
Maritime	Ship Radio station (SOLAS)	http://www.cra.gov.qa/en/document/guidelines-maritime-radio-spectrum-licenses
	Ship Radio station (non-SOLAS)	
	Maritime portable radio equipment	
	Maritime navigational aids and radar	
	Coastal station	
Private Mobile	Frequency Assigned Network	http://www.cra.gov.qa/en/document/

Radio (PMR)	Frequency Assigned Area	guidelines-private-mobile-radio-spectrum-licenses
	Band Assigned	
Amateur	Basic	http://www.cra.gov.qa/en/document/guidelines-amateur-radio-station-licenses
	General	
	Advanced	
	Extra	
	Visitor / Resident	
	Club	
	Repeater	
	Beacon	
Citizen's Band	Citizen's Band Radio Station	http://www.cra.gov.qa/en/document/guidelines-citizen%E2%80%99s-band-radio-station-license
Satellite	Fixed Earth Station	http://www.cra.gov.qa/en/document/guidelines-satellite-radio-spectrum-licenses
	Satellite Earth Station Network Link	
	Transportable Earth Station	
Test & Development	Research	http://www.cra.gov.qa/en/document/guidelines-test-development-radio-spectrum-licenses
	Trial or demonstration	
Temporary	Temporary Radio Spectrum	http://www.cra.gov.qa/en/document/guidelines-temporary-radio-spectrum-licenses
Other	Short Range Devices	https://cra.gov.qa/en/document/class-license-for-short-range-devices_v3
	Camel Racing Equipment	https://cra.gov.qa/document/class-license-for-camel-racing-equipment----12-april-2016

	Wireless Home Area Networks (WHANs)	https://cra.gov.qa/document/cra-class-license-for-whans

Annex 2: International Agreement

Terrestrial Broadcasting Plans

Qatar is signatory of number of ITU-R regional agreements and assigns the frequencies according to associated plans. Current recorded/coordinated Broadcasting plan/frequencies with respect to their associated agreements are given below.

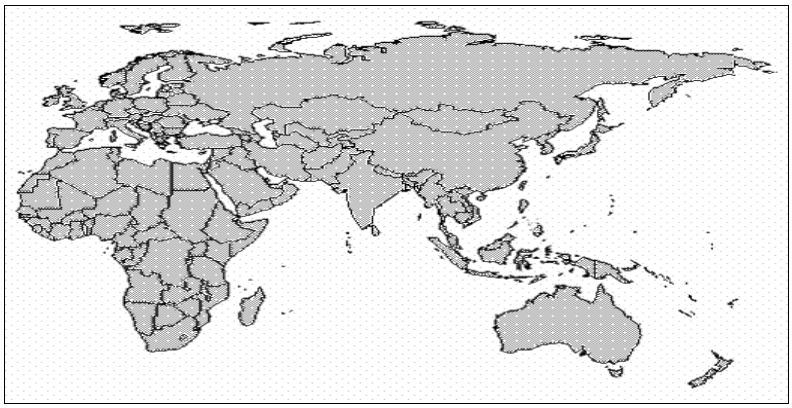
GE-75 Agreement

Regional Agreement concerning the Use by the Broadcasting Service of Frequencies in the **Medium Frequency** Bands in ITU-R Regions 1 and 3 and in the **Low Frequency Bands** in ITU-R Region 1.

LF: 150-285 kHz

MF: 525-1605 kHz

GE-75 planning area is shown in the below map.

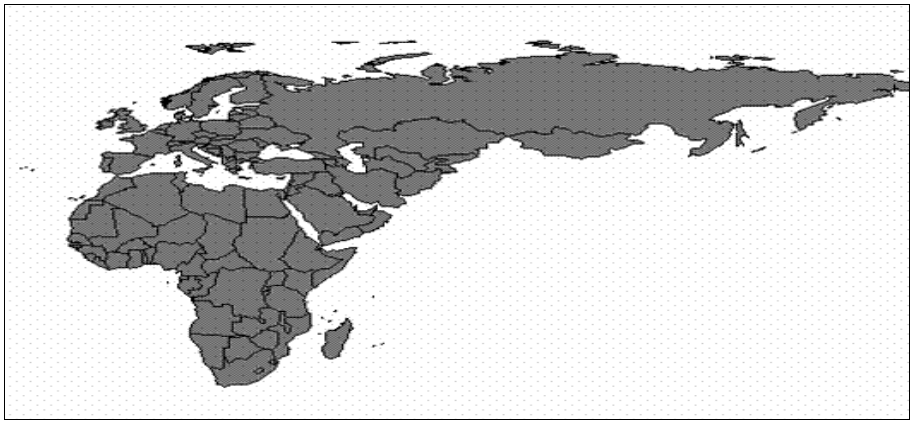


GE-75 Recorded Assignments

Site Name	Freq. Assignment (kHz)
DOHA	675
AL KHAISAH	936
AL ARISH	954
AL KHAISAH	999
AL KHAISAH	1233
ALKHAISAH	1485
DOHA	1602

GE-84 Agreement

It is relating to the Use of the Band 87.5 - 108 MHz for FM Sound Broadcasting and include the countries of Region 1 as defined in No. 393 of the Radio Regulations together with the Democratic Republic of Afghanistan and the Islamic Republic of Iran. The plan includes assignment in VHF-FM band i.e. Band II: 87.5-108 MHz



GE-84 Recorded FM Assignments

Site Name	Freq. Assignment (MHz)	ERP Horizontal (dBW)	ERP Vertical (dBW)
AL KHOR	88	24	
JUMALIYAH (DUKHAN)	90.8	50	
DOHA (MARKHIYAH)	92	50	
ABU SAMRAH	92.6	50	
UMM SAID (UDAYD)	93.4	27	
AL KHOR	97.6	24	
JUMALIYAH (DUKHAN)	100.8	50	
DOHA (MARKHIYAH)	102	50	
ABU SAMRAH	102.6	50	
UMM SAID (UDAYD)	103.4	27	
AL RUWAIS	104	20	
AL RUWAIS	107.4	20	
HALUL	107.5	20	
HALUL	107.7	20	

GE-06 Agreement

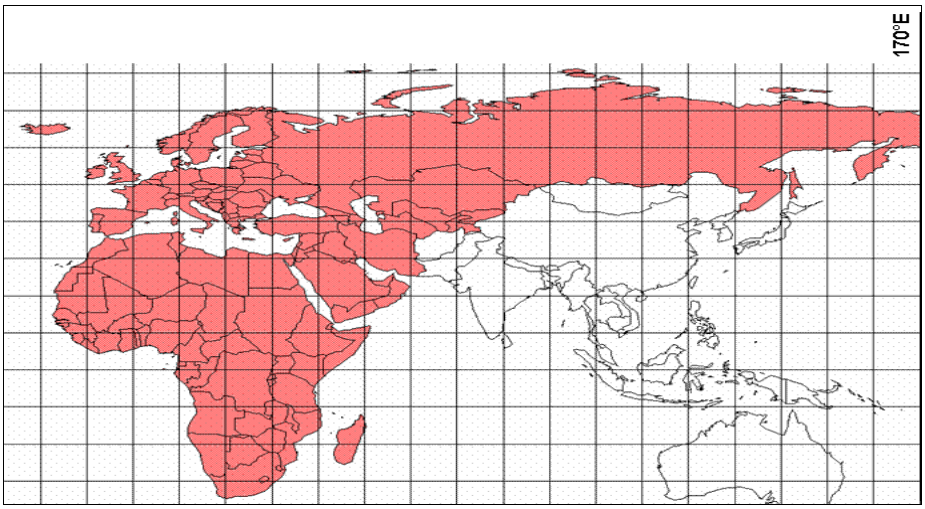
Covers

Band III: 174-230 MHz

Band IV: 470-582 MHz

Band V: 582-862 MHz

in ITU-R Region 1 (those parts of Region 1, as defined in No. **5.3** of the *Radio Regulations*, situated to the west of meridian 170° E and to the north of parallel 40° S, except the territories of Mongolia) and the Islamic Republic of Iran.



GE-06 Recorded Digital Assignments

Site Name	Frequency MHz	Frequency Block	TV Channel	Service	ERP Horizontal (dBW)	ERP Vertical (dBW)
AL RUWAIS	216.928	11A		DAB	20	
AL UDAID	216.928	11A		DAB	20	
MARKHIYAH	216.928	11A		DAB	20	
MARKHIYAH	218.64	11B		DAB	17	
AL ARISH	218.64	11B		DAB	17	
JUMAILIYAH	218.64	11B		DAB	17	
DUKHAN	220.352	11C		DAB	17	
MARKHIYAH	220.352	11C		DAB	17	
ABU SAMRA	220.352	11C		DAB	17	

SHAHANIYAH	222.064	11D		DAB	17	
ABU SAMRA	222.064	11D		DAB		17
AL KHOR	222.064	11D		DAB	17	
AL WAKRA	223.936	12A		DAB	17	
AL ARISH	223.936	12A		DAB	17	
JUMAILIYAH	223.936	12A		DAB	17	
AL HUWAILAH	225.684	12B		DAB		17
AL WAKRA	225.684	12B		DAB	17	
MARKHIYAH	225.684	12B		DAB		17
AL RUWAIS	227.360	12C		DAB	17	
AL KHOR	227.360	12C		DAB		17
HALUL	227.360	12C		DAB	17	
JELIHA	229.072	12D		DAB	17	
MUKAINISS	229.072	12D		DAB		17
SUDANTHEEL	229.072	12D		DAB	17	
SHAHANIYAH	205.5		9	DVB	17	
ABU SAMRA	666		45	DVB	24	
MARKHIYAH	474		21	DVB	24	
ABU SAMRA	642		42	DVB	24	
AL RUWAIS	474		21	DVB	24	
MARKHIYAH	642		42	DVB	24	
MARKHIYAH	602		37	DVB	24	
AL UDAID	490		23	DVB	24	
DUKHAN	506		25	DVB	24	
MUFAIDH	522		27	DVB	24	
AL WAKRA	538		29	DVB	24	
MUKAINISS	554		31	DVB	24	
AL ARISH	618		39	DVB		24
AL KHOR	666		45	DVB	24	
AL WAKRA	522		27	DVB	24	
AL AMIRIYAH	618		39	DVB	24	
SHAHANIYAH	177.5		5	DVB	17	

SHAHANIYAH	191.5		7	DVB	17	
AL ARISH	498		24	DVB	24	
JULAIHA	498		24	DVB	24	

Annex 3: Useful Abbreviations

ACLR	Adjacent Channel Leakage Ratio
ACP	Adjacent Channel Power
ACRR	Adjacent Channel Rejection Ratio
ADS	Automatic Dependant Surveillance (Aeronautical)
Aer Mob (OR)	Aeronautical Radiocommunication
Aer Mob (R)	Aeronautical Mobile (off route)
Aer Nav	Aeronautical Radionavigation
AES	Aircraft Earth Stations
AF	Air Forces
AFA	Adaptive Frequency Agility
AGA	Air-Ground-Air
AIS	"Automatic Identification and Surveillance System" or "Universal shipborne Automatic Identification System"
ALD	Assistive Listening Devices
AM	Amplitude Modulation
AMS(R)S	Aeronautical Mobile-Satellite (Route) Service
ASDE	Airport Surface Detection Equipment
ATIS	Automatic Transmitter Identification System
ATPC	Automatic Transmit Power Control
BBDR	Broad Band Disaster Relief
BC	Broadcasting
BEM	Block Edge Mask
BFWA	Broadband Fixed Wireless Access

BMA	Building Material Analysis
BSS	Broadcasting Satellite Service
BTS	Base Transceiver Station
BWA	Broadband Wireless Access
CB	Citizen's Band
CDMA	Code Division Multiple Access
CEPT	European Conference of Postal and Telecommunications Administrations
CGC	Complementary Ground Component
COM	Communication
CT	Cordless Telephone
DA2GC	Direct Air-to-Ground Communications
CW	Continuous Waves
DAA	Detect and Avoid
DAB	Digital Audio Broadcasting
dB	decibel
dBd	antenna gain in decibels relative to a dipole antenna
dBi	antenna gain in decibels relative to an isotropic antenna
dBm	dB relative to the power of 1 mW
dBW	dB relative to the power of 1 W
DC	Duty Cycle
DECT	Digital Enhanced Cordless Telecommunications
DF	Direction Finding
D-GPS	Differential Global Positioning System

DL	Down Link (Base station to Mobile station)
DME	Distance Measuring Equipment
DMO	Direct Mode Operation (PMR)
DMR	Digital Mobile Radio
DRM	Digital Radio Mondiale
DRS	Digital Radio System
DSC	Digital Selective Calling
DSRR	Digital Short- Range Radio
DSSS	Direct Sequence Spread Spectrum
DTTB	Digital Terrestrial Television Broadcasting
DVB	Digital Video Broadcasting
DVB-T	Digital Video Broadcasting - Terrestrial
DVB-H	Digital Video Broadcasting - Handheld
EAS	Electronic Article Surveillance
EESS	Earth Exploration-Satellite Service
EGSM	Extended Global System for Mobile Communications
EIRP or e.i.r.p.	Equivalent Isotropically Radiated Power
ELT	Emergency Locator Transmitter
EMC	Electromagnetic Compatibility
EN	European Standard (Telecommunications series)
ENG/OB	Electronic News Gathering / Outside Broadcasting
EPIRBs	Emergency Position Indicating Radio Beacon
ERC	European Radiocommunications Committee

ERC/DEC	Decision from the ERC
ERC/REC	Recommendation from the ERC
ERMES	Enhanced Radio Messaging System
ERO	European Radiocommunications Office
ERP or e.r.p.	Effective Radiated Power
ERPEP	Effective Radiated Peak Envelope Power
ESV	Earth Stations on-board Vessels
ETSI	European Telecommunications Standards Institute
FB	Base station (in a mobile radio system)
FDD	Frequency Division Duplex
FHSS	Frequency Hopping Spread Spectrum
FM	Frequency Modulation
FMCW	Frequency Modulated Continuous Wave
FOCA	Federal Office of Civil Aviation
FS	Fixed Service
FSS	Fixed-Satellite Service
FWA	Fixed Wireless Access
GALILEO	European Global Navigation Satellite System
GBAS	Ground Based Augmentation System
GBSAR	Ground Based Synthetic Aperture Radar
GBR	Ground Based Radar
GLONASS	Global Navigation Satellite System
GMDSS	Global Maritime Distress and Safety System

GNSS	Global Navigation Satellite System
GPR	Ground Probing Radar
GPS	Global Positioning System
GSM	Global System for Mobile Communications
GSM 1800	Global System for Mobile Communications at 1800 MHz
GSM 900	Global System for Mobile Communications at 900 MHz
GSMOBA	Global System for Mobile Communications On Board Aircraft
GSMOBV	Global System for Mobile Communications On Board Vessels
GSM-R	Global System for Mobile Communications on Railways
GSO	Geostationary Satellite Orbit
GSO ESOMPs	Earth Stations On Mobile Platforms (geostationary FSS systems)
HAPS	High Altitude Platform Station
HDFS	High Density applications in the Fixed Service
HDFSS	High Density Fixed-Satellite Service
HDTV	High Definition Television
HEST	High EIRP Satellite Terminal
HIPERLAN	High Performance Radio Local Area Network
HRPD	High Rate Packet Data
IALA	International Association Of Lighthouse Authorities
ICAO	International Civil Aviation Organisation
IEEE	Institute of Electrical and Electronics Engineers
ILS	Instrument Landing Systems
IMO	International Maritime Organization

IMT	International Mobile Telecommunications
IMT-2000	International Mobile Telecommunications-2000
IMT-Advanced	Systems beyond IMT-2000
IoT	Internet of Things
ISM	Industrial, Scientific and Medical Applications
ITS	Intelligent Transport Systems
ITU	International Telecommunication Union
JTIDS	Joint Tactical Information and Distribution System
LAN	Local Area Network
LBT	Listen Before Talk, Listen Before Transmit
LEO	Low Earth Orbit
Links	Radio Connections
LORAN	Long Range Aid to Navigation
LPD	Low Power Device
LP GSM	Low Power Global System for Mobile Communications
LPR	Level Probing Radar
LRR	Long Range Radar
LTE	Long Term Evolution
Mar Mob	Maritime Mobile
M2M	Machine-to-Machine
MAC	Medium Access Control
MFCN	Mobile/Fixed Communications Networks
MEDS	Medical Data Service Systems

MIDS	Multifunctional Information Distribution System
Misc. applic.	Miscellaneous applications
ML	Mobile station (in a mobile radio system)
MLS	Microwave Landing System
MMSI	Maritime Mobile Service Identity
MMSS	Maritime Mobile Satellite Service
mmwFS	millimetre wave applications in the Fixed Service
MP-MP	Multipoint to Multipoint
MSI	Maritime Safety Information
MSS	Mobile-Satellite Service
MVDS	Multichannel Video Distribution System
MWS	Multimedia Wireless System
NAVTEX	Narrow-band direct-printing telegraphy system for transmission of navigational and meteorological warnings and urgent information to ships
NBDP	Narrow-Band Direct-Printing
NCU	Network Control Unit
NDB	Non Directional Radio Beacon
NGSO	Non Geostationary Satellite Orbit
NGSO ESOMPs	Land and Maritime Earth Stations on Mobile Platforms (ESOMPs) operating with Non-Geostationary FSS systems.
NIB	Non Interference Basis (in connection with frequency assignment)
NINPB	Non Interference Non Protected Basis (in connection with frequency assignment)
NMT	Nordic Mobile Telephone
NPB	Non Protected Basis (in connection with frequency assignment)

NP2M	Narrowband Point to Multipoint system
OB	Outside Broadcasting
OBTS	On Board Transceiver Station
OFDM	Orthogonal Frequency Division Multiplexing
PAMR	Public Access Mobile Radio
PLB	Personal Locator Beacon
PLC	Powerline Communications
P-MP	Point to Multipoint
PMR	Private (Professional) Mobile Radio
PMSE	Program Making and Special Events
PPDR	Public Protection and Disaster Relief
Primary	Where a band is indicated as allocated to more than one service and the name of the service is printed in “capitals“ (example: FIXED) these are called “primary“ services. Within a band, primary services shall have prior choice of frequencies. Where a band is indicated in a footnote of the Table as allocated to a service “on a primary basis“ in an area smaller than a Region, or in a particular country, this is a primary service only in that area or country.
P-P	Point to Point
ppm	parts per million
PRF	Pulse Repetition Frequency
PSD	Power Spectral Density
R&TTE	Radio and Telecommunications Terminal Equipment
RA	Radio Astronomy
RACON	Radar Beacon
RAS	Radio Astronomy Service
RBW	Resolution Bandwidth

RF	Radio frequency
RFID	Radio Frequency Identification
RLAN	Radio Local Area Networks
RNSS	Radionavigation Satellite Service
RR	Radio Regulations
RSBN	Radiolocation Systems for Short Range Navigation
RSU	Road Site Units
RTE	Radar Target Enhancer
RTPC	Remote Transmit Power Control
RTTT	Road Transport and Traffic Telematics
RX	Receiver (Receiving frequency)
SAB	Service Ancillary to Broadcasting
SAP	Service Ancillary to Program Making
SAR	Search and Rescue
SARSAT	Search and Rescue Satellite
SDL	Supplementary Down Link
S-DAB	Satellite Digital Audio Broadcasting
Secondary	"Where a band is indicated as allocated to more than one service and the name of the service is printed in "normal characters" (example: Fixed) these are called "secondary services". Stations of a secondary service: - shall not cause harmful interference to stations of primary services to which the-frequencies are already assigned or to which stations may be assigned at a later date. - cannot claim protection from harmful interference from stations of a primary service to which frequencies are already assigned or may be assigned at a later date.

- can claim protection, however from harmful interference from stations of the same or other secondary service(s) to which frequencies may be assigned at a later date.

Where a band is indicated in a footnote of the table as allocated to a service “on a secondary basis “in an area smaller than a Region, or in a particular country, this is a secondary service."

SF-CW Radar Stepped Frequency CW Radar

SIT/SUT Satellite Interactive Terminal / Satellite User Terminal

SNG Satellite News Gathering

SOLAS Safety of Life at Sea

SOS Space Operation Service

SPA Self Provided Applications

S-PCS Satellite Personal Communication System

SRD(s) Short Range Device(s)

SRR Short Range Radars

SS Spread Spectrum

SSR Secondary Surveillance Radar

TACAN Tactical Air Navigation

TACS Total Access Communications System

TAPS TETRA Advanced Packet Service

T-DAB Terrestrial Digital Audio Broadcasting

TDD Time Division Duplex

TETRA Trans European Trunked Radio System, Terrestrial Trunked Radio

TETRAPOL Digital PMR technology

TLPR Tank Level Probing Radar

TMR Trunked Mobile Radio

TRA-ECS	Terrestrial radio applications capable of providing electronic communications services
TTT	Transport and Traffic Telematics
TV	Television
TX	Transmitter (Transmitting frequency)
UAV	Unmanned Aerial Vehicle
UL	Up Link (Mobile station to Base station)
UMTS	Universal Mobile Telecommunication System
UNO	United Nations Organisation
UWB	Ultra Wide Band
VBW	Video BandWidth
VLBI	Very Long Baseline Interferometry
VOR	VHF Omnidirectional Radio Range
v-BS	Vessel Base Station
v-MS	Vessel Mobile Station
VSAT	Very Small Aperture Terminal
VSWR	Voltage Standing Wave Ratio
VTS	Vessel Traffic System (radar)
WAIC	Wireless Avionics Intra-Communication Systems
WAS	Wireless Access Systems
WAS/RLAN	Wireless Access Systems including Radio Local Area Networks
WB	Wide Band
WIA	Wireless Industrial Applications
WiMAX	Worldwide Interoperability for Microwave Access

WLAM	Wideband Low Activity Mode
WLAN	Wireless Local Area Networks
WPR	Wall Probing Radar
WRC	World Radiocommunication Conference
WTO	World Trade Organization

Communications Regulatory Authority (CRA)
Spectrum Management Department
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