National Information and Communications Technology Authority

PAPUA NEW GUINEA TABLE OF RADIOFREQUENCY ALLOCATIONS

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PREFACE

Radio frequency spectrum is a scarce natural resource of any country for use by radiocommunications transceivers as well as by devices employing energy of radio wave for influencing materials. Radio waves are the fastest carrier of information through space. Each radio channel can be used almost only once at a given position for provision of few numbers of services, therefore, efficient and eligible utilization of radio frequency spectrum is mandatory. Surprisingly, aircrafts, ships, radars, handsets, vehicles, satellites, microwave links, wireless sensors, cell phone base stations, models, broadcasting stations and many other equipments and devices are using parts of spectrum without interfering each other. In fact, the constructive international coordination and mutual understanding of countries has enabled more harmonized and honorable use of spectrum by all countries. The International Telecommunications Union (ITU) was established by UN to plan for more standardized and economic utilization of telecommunications resources by all countries and to facilitate implementation of higher telecommunications technology. In particular, the Radiocommunications sector of ITU (ITU-R) is responsible for regulation of radio frequency spectrum and satellite orbits worldwide to the maximum extent possible. Almost all UN members are also member of ITU.

The Article 5 of ITU Radio Regulations (ITU RR) provides an extensive frequency band plan for the International Frequency Allocations Table (I-FAT), in three Radio Regions, from 8.3 kHz to 3000 GHz. Under the Article 5, each member administration develops its own National Frequency Allocations Table (N-FAT) to reflect national usage of radio frequency spectrum for different radiocommunications services. Every four or three years, I-FAT is subject to change through a competent World Radiocommunications Conferences (WRC). Consequently, N-FAT is also subject to change time to time. This book provides the N-FAT of Papua New Guinea, which is in Region 3 and far from border of Radio Regions. However, the utilization of any specific frequency from the N-FAT by radiocommunications services needs a license issued by National Information and Communications Technology Authority (NICTA) or Minister by law. Any change to the N-FAT rests with NICTA.

The contents of N-FAT are created by customization of the latest ITU RR Article 5, based on procedures and requirements of national spectrum management. Existing frequency assignments, unique geographical characteristics of Papua New Guinea and potential demands in future were considered for development of new N-FAT. Table is the informative and legal framework, showing how certain frequency bands are subdivided into more applicable sub-bands and what technical or operational limitations is applicable for implementation of radiocommunication services in Papua New Guinea. This frequency band plan is a basic text of national radio regulations and in another scope, provides ground to make additional provisions for domestic frequency requirements in accordance to its national jurisdictions which have no place in the International Table.

The review contained in this N-FAT is consistent with the Final Act of World Radiocommunications Conference in 2019. While every effort is being made to ensure the accuracy of the information contained in this edition, radio frequency allocations and plans are subject to later amendments. That is, if a need for more spectrum arises or, if amendments on radio regulations in any future world administrative conferences requires of it.

Potential spectrum users are advised to consult with NICTA, regarding the policies applying to the use of the frequency bands of their interest and requirements to ensure that the band is, or will be available. It is also advised that consultation should occur prior to any firm decision being reached on the frequency band of interest and before any expenditure commitment is made.

It is reasonably presumed that all necessary related information that needs to be included for the intended purpose is captured in its entirty during this revision.

For any further information regarding the N-FAT contents and its application should be forwarded to;

National Information and Communications Technology Authority (NICTA)
Engineering and Resource Planning Department
P. O. Box 8444
Boroko, NCD
Papua New Guinea

PART 1: TERMS AND DEFINITIONS

1.1 For the purposes of these Regulations, the following terms shall have the meanings defined below. These terms and definitions do not, however, necessarily apply for other purposes. Definitions identical to those contained in the Annex to the Constitution or the Annex to the Convention of the ITU (Geneva, 1992) are marked "(CS)" or "(CV)" respectively. In particular, if the text of a definition below, a term is printed in italics, this means that the term itself is defined in this Part.

Section I – General terms

1.2 *administration:* Any governmental department or service responsible for discharging the obligations undertaken in the Constitution of the ITU, in the Convention of the ITU and in the Administrative Regulations (CS 1002).

1.3 *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 (CS).

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

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

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

1.7 *terrestrial radiocommunication:* Any *radiocommunication* other than *space radiocommunication* or *radio astronomy*.

1.8 *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.

1.9 *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*.

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

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

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

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

1.14 *Coordinated Universal Time (UTC):* Time scale, based on the second (SI), as described in Resolution 655. (WRC-15)

For most practical purposes associated with the Radio Regulations, UTC is equivalent to mean solar time at the prime meridian (0° longitude), formerly expressed in GMT.

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

Section II – Specific terms related to frequency management

1.16 *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.

1.17 *allotment* (of a radio frequency or radio frequency channel)*:* Entry of a designated frequency channel in an agreed plan, adopted by a competent conference, for use by one or more administrations for a

terrestrial or space *radiocommunication service* in one or more identified countries or geographical areas and under specified conditions.

1.18 *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.

Section III – Radio services

1.19 *radiocommunication service:* A service as defined in this Section involving the transmission, *emission* and/or reception of *radio waves* for specific *telecommunication* purposes.

In these Regulations, unless otherwise stated, any radiocommunication service relates to *terrestrial radiocommunication*.

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

1.21 *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*.

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

1.23 *space operation service:* A *radiocommunication service* concerned exclusively with the operation of *spacecraft*, in particular *space tracking, space telemetry* and *space telecommand*.

These functions will normally be provided within the service in which the *space station* is operating.

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

1.25 *mobile-satellite service:* A *radiocommunication service:*

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

– between *mobile earth stations* by means of one or more *space stations*.

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

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

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

1.28 *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.

1.29 *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.

1.30 *port operations service:* A *maritime mobile service* in or near a port, between *coast stations* and *ship stations*, or between *ship stations*, in which messages are restricted to those relating to the operational handling, the movement and the safety of ships and, in emergency, to the safety of persons.

Messages which are of a *public correspondence* nature shall be excluded from this service.

1.31 *ship movement service:* A *safety service* in the *maritime mobile service* other than a *port operations service*, between *coast stations* and *ship stations*, or between *ship stations*, in which messages are restricted to those relating to the movement of ships.

Messages which are of a *public correspondence* nature shall be excluded from this service.

1.32 *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.

1.33 *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.

1.34 *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.

1.35 *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.

1.36 *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.

1.37 *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.

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

1.39 *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*.

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

1.41 *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.

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

1.43 *radionavigation-satellite service:* A *radiodetermination-satellite service* used for the purpose of *radionavigation*.

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

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

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

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

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

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

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* (R): route.

** (OR): off-route.

1.49 *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.

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

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

– information relating to the characteristics of the Earth and its natural phenomena, including data relating to the state of the environment, is obtained from *active sensors* or *passive sensors* on Earth *satellites*;

– similar information is collected from airborne or Earth-based platforms;

– such information may be distributed to earth stations within the system concerned;

– platform interrogation may be included.

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

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

1.53 *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.

1.54 *standard frequency and time signal-satellite service:* A *radiocommunication service* using *space stations* on earth *satellites* for the same purposes as those of the *standard frequency and time signal service*.

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

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

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

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

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

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

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

Section IV – Radio stations and systems

1.61 *station:* One or more transmitters or receivers or a combination of transmitters and receivers, including the accessory equipment, necessary at one location for carrying on a *radiocommunication service*, or the *radio astronomy service*.

Each station shall be classified by the service in which it operates permanently or temporarily.

1.62 *terrestrial station:* A *station* effecting *terrestrial radiocommunication*.

In these Regulations, unless otherwise stated, any *station* is a terrestrial station.

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

– with one or more *space stations*; or

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

1.64 *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.

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

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

1.66A *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.

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

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

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

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

1.71 *base station:* A *land station* in the *land mobile service*.

1.72 *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*.

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

1.74 *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.

1.75 *coast station:* A *land station* in the *maritime mobile service*.

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

1.77 *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*.

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

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

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

1.81 *aeronautical station:* A *land station* in the *aeronautical mobile service*.

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

1.82 *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*.

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

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

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

1.86 *radiodetermination Station:* A *station* in the *radiodetermination service*.

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

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

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

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

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

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

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

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

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

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

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

1.98 *experimental station:* A *station* utilizing *radio waves* in experiments with a view to the development of science or technique.

This definition does not include *amateur stations.*

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

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

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

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

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

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

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

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

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

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

1.108A meteorological aids land station: A station in the meteorological aids service not intended to be used while in motion. (WRC-19)

1.108B meteorological aids mobile station: A station in the meteorological aids service intended to be used while in motion or during halts at unspecified points. (WRC-15)

1.109 *radiosonde:* An automatic radio transmitter in the *meteorological aids service* usually carried on an aircraft, free balloon, kite or parachute, and which transmits meteorological data.

1.109A *adaptive system:* A radiocommunication system which varies its radio characteristics according to channel quality.

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

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

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

1.113 *satellite link:* A radio link between a transmitting *earth station* and a receiving *earth station* through one *satellite*.

A satellite link comprises one up-link and one down-link.

1.114 *multi-satellite link:* A radio link between a transmitting *earth station* and a receiving *earth station* through two or more *satellites*, without any intermediate *earth station*.

A multi-satellite link comprises one up-link, one or more satellite-to-satellite links and one down-link.

1.115 *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.

Section V – Operational terms

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

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

1.118 *telegram:* Written matter intended to be transmitted by *telegraphy* for delivery to the addressee. This term also includes *radiotelegrams* unless otherwise specified (CS).

In this definition the term *telegraphy* has the same general meaning as defined in the Convention.

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

[1] **1.117.1** A graphic document records information in a permanent form and is capable of being filed and consulted; it may take the form of written or printed matter or of a fixed image.

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

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

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

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

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

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

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

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

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

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

1.130 *community reception* (in the broadcasting-satellite service)*:* The reception of *emissions* from a *space station* in the *broadcasting-satellite service* by receiving equipment, which in some cases may be complex and have antennas larger than those used for *individual reception*, and intended for use:

– by a group of the general public at one location; or

– through a distribution system covering a limited area.

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

1.132 *radiotelemetry: Telemetry* by means of *radio waves*.

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

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

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

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

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[2] **1.125.1**, **1.126.1** and **1.127.1** In general, *duplex operation* and *semi-duplex operation* require two frequencies in *radiocommunication*; *simplex operation* may use either one or two.

Section VI – Characteristics of emissions and radio equipment

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

1.138 *emission: Radiation* produced, or the production of *radiation*, by a radio transmitting *station*.

For example, the energy radiated by the local oscillator of a radio receiver would not be an emission but a *radiation*.

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

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

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

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

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

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

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

1.146 *unwanted emissions*[*]*:* Consist of *spurious emissions* and *out-of-band emissions*.

1.146A *out-of-band domain* (of an emission)*:* The frequency range, immediately outside the necessary bandwidth but excluding the *spurious domain*, in which *out-of-band emissions* generally predominate. *Out-of-band emissions*, defined based on their source, occur in the out-of-band domain and, to a lesser extent, in the *spurious domain*. *Spurious emissions* likewise may occur in the out-of-band domain as well as in the *spurious domain*. (WRC-03)

1.146B *spurious domain* (of an emission): The frequency range beyond the *out-of-band domain* in which *spurious emissions* generally predominate. (WRC-03)

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

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

1.149 *characteristic frequency:* A frequency which can be easily identified and measured in a given *emission*.

A carrier frequency may, for example, be designated as the characteristic frequency.

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[*] The terms associated with the definitions given by Nos. **1.144**, **1.145** and **1.146** shall be expressed in the working languages as follows:

Numbers	In French	In English	In Spanish
1.144	Emission hors bande	Out-of-band emission	Emisión fuera de banda
1.145	Rayonnement non essentiel	Spurious emission	Emisión no esencial
1.146	Rayonnements non désirés	Unwanted emissions	Emisiones no deseadas

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

1.151 *frequency tolerance:* The maximum permissible departure by the centre frequency of the frequency band occupied by an *emission* from the *assigned frequency* or, by the *characteristic frequency* of an *emission* from the *reference frequency*.

The frequency tolerance is expressed in parts in 10^6 or in hertz.

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

1.153 *occupied bandwidth:* The width of a frequency band such that, below the lower and above the upper frequency limits, the *mean powers* emitted are each equal to a specified percentage β/2 of the total *mean power* of a given *emission*.

Unless otherwise specified in an ITU-R Recommendation for the appropriate *class of emission*, the value of β/2 should be taken as 0.5%.

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

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

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

– *peak envelope power* (*P*X or *p*X);

– *mean power* (*P*Y or *p*Y);

– *carrier power* (*P*Z or *p*Z).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

1.165 *ionospheric scatter:* The propagation of *radio waves* by scattering as a result of irregularities or discontinuities in the ionization of the ionosphere.

Section VII – Frequency sharing

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

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

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

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

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

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

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

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

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

[3] **1.167.1** and **1.168.1** The terms "permissible interference" and "accepted interference" are used in the coordination of frequency assignments between administrations.

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

1.175 *effective boresight area* (of a steerable satellite beam)*:* An area on the surface of the Earth within which the boresight of a *steerable satellite beam* is intended to be pointed.

There may be more than one unconnected effective boresight area to which a single *steerable satellite beam* is intended to be pointed.

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

Section VIII – Technical terms relating to space

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

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

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

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

1.181 *reflecting satellite:* A *satellite* intended to reflect radiocommunication signals.

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

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

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

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

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

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

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

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

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

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

PART 2 : PAPUA NEW GUINEA TABLE OF RADIOFREQUENCY ALLOCATIONS

Introduction

The table provides plan of frequency bands allocated to certain number of radiocommunications services in columns 1, 2, 3 and 4 for three ITU-R Regions and Papua New Guinea respectively together with column 5 labeled "usage" for presentation of common usage of each frequency band in Papua New Guinea. The columns 4 and 5 of Table provide an agreed framework of rights, obligations and procedures applicable to manage and regulate the operation of radiocommunication stations within Papua New Guinea with a degree of conformity with the ITU Table. Moreover:

a) Columns 1, 2 and 3 reproduced from latest ITU Radio Reglations Article 5 (as adopted by WRC-19) while column 4 customized to Papua New Guinea using column 3 (Region 3 frequency allocations);

b) Only relevant footnotes from column 3 of ITU Radio Regulations Article 5 (Region 3 frequency allocations) are selected for column 4. The footnote numbering notations used in ITU Radio Regulations Article 5 are retained for appropriate linkage between provisions of this text and the international counterpart. Therefore, footnotes with format "5.*nnn*L" are reproduced from ITU Radio Regulations Article 5. The modified limited number of footnotes separated by a PNG notation;

c) Footnote numbers that do not appear in this Part (such as **5.45**), are those numbers that are deleted or not used in ITU Radio Regulations Article 5;

d) Informative details and references included in column 5 are for clarification of frequency band usage;

e) Footnotes containing the name of Papua New Guinea are shown by underline in column 4, to reflect national concerns. The required modifications to the Region 3 frequency allocations (of ITU Radio Reulations Article 5) are therefore properly reflected in the concerned frequency bands of column 4;

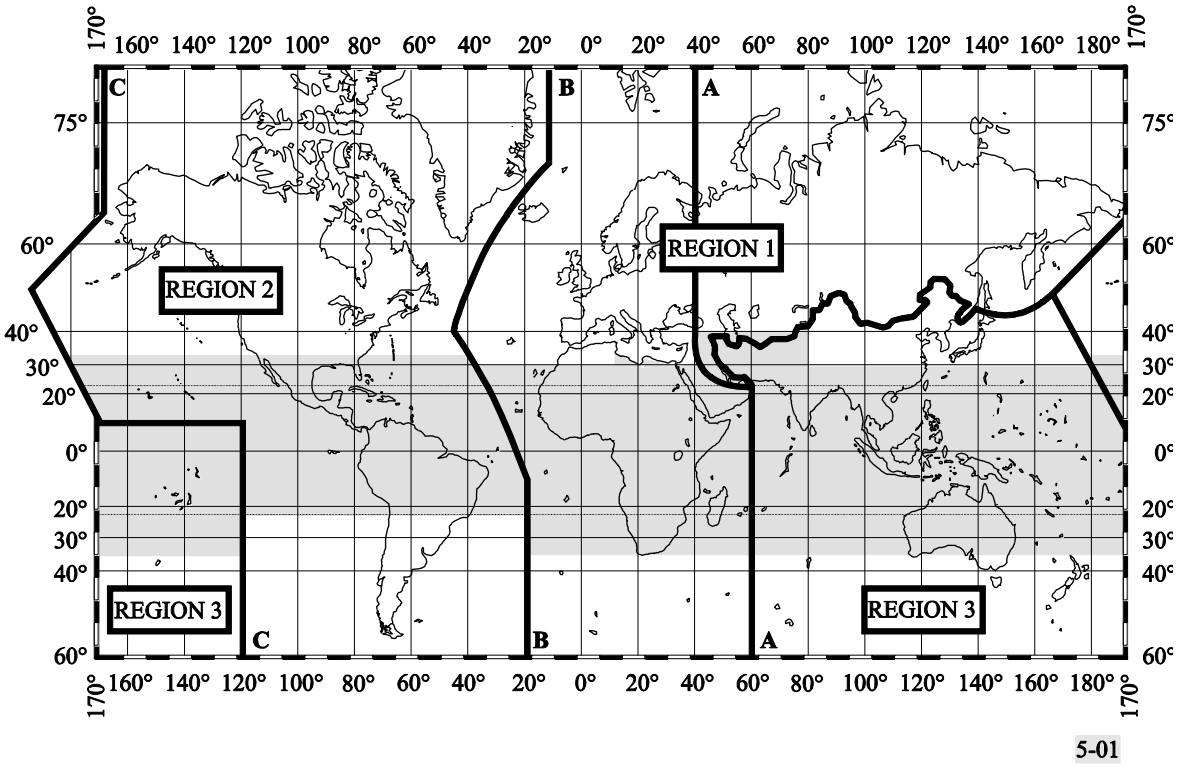
f) In addition to the relevant ITU footnotes, particular footnotes relevant to Papua New Guinea have been included, in PNG*nn* format, to cover special situations applying in Papua New Guinea.

5.1 In all documents of the Union where the terms *allocation*, *allotment* and *assignment* are to be used, they shall have the meaning given to them in Nos. **1.16** to **1.18**, the terms used in the three working languages being as follows:

Frequency distribution to	**French**	**English**	**Spanish**
Services	Attribution (attribuer)	Allocation (to allocate)	Atribución (atribuir)
Areas or countries	Allotissement (allotir)	Allotment (to allot)	Adjudicación (adjudicar)
Stations	Assignation (assigner)	Assignment (to assign)	Asignación (asignar)

Section I – Regions and areas

5.2 For the allocation of frequencies the world has been divided into three Regions[1] as shown on the following map and described in Nos. **5.3** to **5.9**:



The shaded part represents the Tropical Zones as defined in Nos. **5.16** to **5.20** and **5.21**.

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

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

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

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

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

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

5.9 *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

[1] **5.2.1** It should be noted that where the words “regions” or “regional” are without a capital “R” in these Regulations, they do not relate to the three Regions here defined for purposes of frequency allocation.

170° West and parallel 10° North; thence along parallel 10° North to its intersection with meridian 120° West; thence along meridian 120° West to the South Pole.

5.10 For the purposes of these Regulations, the term "African Broadcasting Area" means:

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

5.12 *b)* islands in the Indian Ocean west of meridian 60° East of Greenwich, situated between the parallel 40° South and the great circle arc joining the points 45° East, 11° 30′ North and 60° East, 15° North;

5.13 *c)* islands in the Atlantic Ocean east of line B defined in No. **5.8** of these Regulations, situated between the parallels 40° South and 30° North.

5.14 The "European Broadcasting Area" is bounded on the west by the western boundary of Region 1, on the east by the meridian 40° East of Greenwich and on the south by the parallel 30° North so as to include the northern part of Saudi Arabia and that part of those countries bordering the Mediterranean within these limits. In addition, Armenia, Azerbaijan, Georgia and those parts of the territories of Iraq, Jordan, Syrian Arab Republic, Turkey and Ukraine lying outside the above limits are included in the European Broadcasting Area. (WRC-07)

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

5.16 1) The "Tropical Zone" (see map in No. **5.2**) is defined as:

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

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

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

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

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

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

Section II – Categories of services and allocations

5.23 *Primary and secondary services*

5.24 1) Where, in a box of the Table in Section IV of this Article, 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:

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

5.26 *b)* services the names of which are printed in "normal characters" (example: Mobile); these are called "secondary" services (see Nos. **5.28** to **5.31**).

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

5.28 3) Stations of a secondary service:

5.29 *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;

5.30 *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;

5.31 *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.

5.32 4) 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 (see Nos. **5.28** to **5.31**).

5.33 5) 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.

5.34 *Additional allocations*

5.35 1) Where a band is indicated in a 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 (see No. **5.36**).

5.36 2) If the 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.

5.37 3) 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 the footnote of the Table.

5.38 *Alternative allocations*

5.39 1) Where a band is indicated in a 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 (see No. **5.40**).

5.40 2) 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.

5.41 3) 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 footnote.

5.42 *Miscellaneous provisions*

5.43 1) Where it is indicated in these Regulations 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. (WRC-2000)

5.43A 1*bis*) Where it is indicated in these Regulations 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. (WRC-2000)

5.44 2) Except if otherwise specified in a footnote, the term "fixed service", where appearing in Section IV of this Part, does not include systems using ionospheric scatter propagation.

Section III – Description of the Table of Frequency Allocations

5.46. 1) The heading of the Table in Section IV of this Article includes five columns, each of three left columns corresponds to one of the Regions (see No. **5.2**) and column 4 and 5 provides national frequency allocations. Where an allocation occupies the whole of the width of the three left columns of Table or only one or two of the three columns, this is a worldwide allocation or a Regional allocation, respectively.[1]

[1] The No. **5.46** is revised to explain two additional columns of national frequency allocations

5.47 2) The frequency band referred to in each allocation is indicated in the left-hand top corner of the part of the Table concerned.

5.48 3) Within each of the categories specified in Nos. **5.25** and **5.26**, services are listed in alphabetical order according to the French language. The order of listing does not indicate relative priority within each category.

5.49 4) In the case where there is a parenthetical addition to an allocation in the Table, that service allocation is restricted to the type of operation so indicated.

5.50 5) The footnote references which appear in the Table below the allocated service or services apply to more than one of the allocated services, or to the whole of the allocation concerned. (WRC-2000)

5.51 6) The footnote references which appear to the right of the name of a service are applicable only to that particular service.

5.52 7) In certain cases, the names of countries appearing in the footnotes have been simplified in order to shorten the text.

Section IV – Table of Frequency Allocations

9-110 kHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
Below 8.3	(Not allocated) 5.53 5.54		(Not allocated) 5.53 5.54	
8.3-9	METEOROLOGICAL AIDS 5.54A 5.54B 5.54C		**8.3-9** METEOROLOGICAL AIDS 5.54A 5.54C	
9-11.3	METEOROLOGICAL AIDS 5.54A RADIONAVIGATION		**9-11.3** METEOROLOGICAL AIDS 5.54A RADIONAVIGATION	
11.3-14	RADIONAVIGATION		**11.3-14** RADIONAVIGATION	
14-19.95	FIXED MARITIME MOBILE 5.57 5.55 5.56		**14-19.95** FIXED MARITIME MOBILE 5.57	
19.95-20.05	STANDARD FREQUENCY AND TIME SIGNAL (20 kHz)		**19.95-20.05** STANDARD FREQUENCY AND TIME SIGNAL (20 kHz)	In accordance with ITU RR Article **26.**
20.05-70	FIXED MARITIME MOBILE 5.57 5.56 5.58		**20.05-70** FIXED MARITIME MOBILE 5.57 5.56	Maritime radiotelegraph broadcasting and teleprinters for marine and submarine communication.
70-72 RADIONAVIGATION 5.60	**70-90** FIXED MARITIME MOBILE 5.57 MARITIME RADIO- NAVIGATION 5.60 Radiolocation	**70-72** RADIONAVIGATION 5.60 Fixed Maritime mobile 5.57 5.59	**70-72** RADIONAVIGATION 5.60 Fixed Maritime mobile 5.57	Long range radio navigation (LORAN) systems for determination of line of position (LOP) in the bands 70-86 kHz and 112-130 kHz.
72-84 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60 5.56		**72-84** FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60	**72-84** FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60	Maritime radiotelegraph broadcasting. Long range radio navigation (LORAN) systems for determination of line of position (LOP) in the bands 70-86 kHz and 112-130 kHz.
84-86 RADIONAVIGATION 5.60		**84-86** RADIONAVIGATION 5.60 Fixed Maritime mobile 5.57 5.59	**84-86** RADIONAVIGATION 5.60 Fixed Maritime mobile 5.57	Long range radio navigation (LORAN) systems for determination of line of position (LOP) in the bands 70-86 kHz and 112-130 kHz.
86-90 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.56	5.61	**86-90** FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60	**86-90** FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60	Maritime radiotelegraph broadcasting.
90-110	RADIONAVIGATION 5.62 Fixed 5.64		**90-110** RADIONAVIGATION 5.62 Fixed 5.64	Coordination is required for radionavigation in this band (5.62).

110-200 kHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
110-112 FIXED MARITIME MOBILE RADIONAVIGATION 5.64	**110-130** FIXED MARITIME MOBILE MARITIME RADIO-NAVIGATION 5.60 Radiolocation	**110-112** FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64	**110-112** FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64	LORAN-C en-route hyperbolic aeronautical radionavigation system.
112-115 RADIONAVIGATION 5.60		**112-117.6** RADIONAVIGATION 5.60	**112-117.6** RADIONAVIGATION 5.60	
115-117.6 RADIONAVIGATION 5.60 Fixed Maritime mobile 5.64 5.66		Fixed Maritime mobile 5.64 5.65	Fixed Maritime mobile 5.64	Long range radio navigation (LORAN) systems for determination of line of position (LOP) in the bands 70-86 kHz and 112-130 kHz.
117.6-126 FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64		**117.6-126** FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64	**117.6-126** FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64	Long range radio navigation (LORAN) systems for determination of line of position (LOP) in the bands 70-86 kHz and 112-130 kHz
126-129 RADIONAVIGATION 5.60		**126-129** RADIONAVIGATION 5.60 Fixed Maritime mobile 5.64 5.65	**126-129** RADIONAVIGATION 5.60 Fixed Maritime mobile 5.64	Long range radio navigation (LORAN) systems for determination of line of position (LOP) in the bands 70-86 kHz and 112-130 kHz.
129-130 FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64	5.61 5.64	**129-130** FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64	**129-130** FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64	Long range radio navigation (LORAN) systems for determination of line of position (LOP) in the bands 70-86 kHz and 112-130 kHz.
130-148.5 FIXED MARITIME MOBILE 5.64 5.67	**130-160** FIXED MARITIME MOBILE 5.64	**130-160** FIXED MARITIME MOBILE RADIONAVIGATION 5.64	**130-160** FIXED MARITIME MOBILE RADIONAVIGATION 5.64	Limitations on fixed and maritime mobile applications (see 5.64).
148.5-255 BROADCASTING	**160-190** FIXED	**160-190** FIXED Aeronautical radionavigation	**160-190** FIXED Aeronautical radionavigation	Mainly usable by aeronautical radionavigation.
5.68 5.69 5.70	**190-200** AERONAUTICAL RADIONAVIGATION		**190-200** AERONAUTICAL RADIONAVIGATION	Mainly usable by aeronautical radionavigation.

200-495 kHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
255-283.5 BROADCASTING AERONAUTICAL RADIONAVIGATION 5.70 **283.5-315** AERONAUTICAL RADIONAVIGATION MARITIME RADIONAVIGATION (radiobeacons) 5.73 5.74	**200-275** AERONAUTICAL RADIONAVIGATION Aeronautical mobile **275-285** AERONAUTICAL RADIONAVIGATION Aeronautical mobile Maritime radionavigation (radiobeacons)	**200-285** AERONAUTICAL RADIONAVIGATION Aeronautical mobile	**200-285** AERONAUTICAL RADIONAVIGATION Aeronautical mobile	L-type non-directional aeronautical radio beacon (NDB) within 255 – 495 kHz.
	285-315 AERONAUTICAL RADIONAVIGATION MARITIME RADIONAVIGATION (radiobeacons) 5.73		**285-315** AERONAUTICAL RADIONAVIGATION MARITIME RADIONAVIGATION (radiobeacons) 5.73	L-type non-directional aeronautical radio beacon (NDB) within 255 – 495 kHz.
315-325 AERONAUTICAL RADIONAVIGATION Maritime radionavigation (radiobeacons) 5.73 5.75	**315-325** MARITIME RADIONAVIGATION (radiobeacons) 5.73 Aeronautical radionavigation	**315-325** AERONAUTICAL RADIONAVIGATION MARITIME RADIONAVIGATION (radiobeacons) 5.73	**315-325** AERONAUTICAL RADIONAVIGATION MARITIME RADIONAVIGATION (radiobeacons) 5.73	L-type non-directional aeronautical radio beacon (NDB) within 255 – 495 kHz.
325-405 AERONAUTICAL RADIONAVIGATION	**325-335** AERONAUTICAL RADIONAVIGATION Aeronautical mobile Maritime radionavigation (radiobeacons) **335-405** AERONAUTICAL RADIONAVIGATION Aeronautical mobile	**325-405** AERONAUTICAL RADIONAVIGATION Aeronautical mobile	**325-405** AERONAUTICAL RADIONAVIGATION Aeronautical mobile	L-type non-directional aeronautical radio beacon (NDB) within 255 – 495 kHz.
405-415 RADIONAVIGATION 5.76	**405-415** RADIONAVIGATION 5.76 Aeronautical mobile		**405-415** RADIONAVIGATION 5.76 Aeronautical mobile	Direction finding in maritime radionavigation on 410 kHz (ITU-RR No. 28.12).
415-435 MARITIME MOBILE 5.79 AERONAUTICAL RADIONAVIGATION **435-472** MARITIME MOBILE 5.79 Aeronautical radionavigation 5.77 5.82	**415-472** MARITIME MOBILE 5.79 Aeronautical radionavigation 5.77 5.80 5.78 5.82		**415-472** MARITIME MOBILE 5.79 AERONAUTICAL RADIONAVIGATION 5.77 5.78 5.82	NBDP and DSC ITU-RR Articles 51 and 52. L-type non-directional aeronautical radio beacon (NDB) within 255 – 495 kHz.
472-479 MARITIME MOBILE 5.79 Amateur 5.80A Aeronautical radionavigation 5.77 5.80 5.82 5.80B			**472-479** MARITIME MOBILE 5.79 AERONAUTICAL RADIONAVIGATION 5.77 5.80 Amateur 5.80A 5.82	NBDP and DSC ITU-RR Articles 51 and 52. L-type non-directional aeronautical radio beacon (NDB) within 255 – 495 kHz. Use of this band by Amateur service is restricted to professional amateurs only (see **5.80A**).
479-495 MARITIME MOBILE 5.79 5.79A Aeronautical radionavigation 5.77 5.82	**479-495** MARITIME MOBILE 5.79 5.79A Aeronautical radionavigation 5.77 5.80 5.82		**479-495** MARITIME MOBILE 5.79 5.79A AERONAUTICAL RADIONAVIGATION 5.77 5.80 5.82	NBDP and DSC ITU-RR Articles 51 and 52. L-type non-directional aeronautical radio beacon (NDB) within 255 – 495 kHz. Maritime safety information (MSI-NAVTEX) on 490 kHz (**5.79A**).

495-1 800 kHz

<table>
<tr><th colspan="5">Allocation to services</th></tr>
<tr><th>Region 1</th><th>Region 2</th><th>Region 3</th><th>Papua New Guinea</th><th>Usage</th></tr>
<tr><td>495-505</td><td colspan="2">MARITIME MOBILE 5.82C</td><td>495-505
MARITIME MOBILE</td><td>The GMDSS carrier frequency 500 kHz, using type A2A or H2A emission, is an international distress and calling frequency for Morse radiotelegraphy (ITU-R M.1170 and ITU-RR No.28.12).</td></tr>
<tr><td rowspan="3">505-526.5
MARITIME MOBILE 5.79 5.79A 5.84
AERONAUTICAL RADIONAVIGATION</td><td>505-510
MARITIME MOBILE 5.79</td><td rowspan="3">505-526.5
MARITIME MOBILE 5.79 5.79A 5.84
AERONAUTICAL RADIONAVIGATION
Aeronautical mobile
Land mobile</td><td rowspan="3">505-526.5
MARITIME MOBILE 5.79 5.79A 5.84
AERONAUTICAL RADIONAVIGATION
Aeronautical mobile
Land mobile</td><td rowspan="3">MSI-NAVTEX on 518 kHz using NBDP.
The frequency 512 kHz is supplementary channel for ships in case 500 kHz is busy.
See ITU RR Articles 51 and 52 for maritime mobile
(In region 1 the Regional Agreement GE85-MM-R1 is applicable for aeronautical radionavigation).</td></tr>
<tr><td>510-525
MOBILE 5.79A 5.84
AERONAUTICAL RADIONAVIGATION</td></tr>
<tr><td>525-535
BROADCASTING 5.86
AERONAUTICAL RADIONAVIGATION</td></tr>
<tr><td rowspan="2">526.5-1 606.5
BROADCASTING

5.87 5.87A</td><td rowspan="2">526.5-535
BROADCASTING
Mobile
5.88</td><td rowspan="2">526.5-535
BROADCASTING</td><td rowspan="2">Traditional AM Sound Broadcasting with 9 kHz channel spacing.</td></tr>
<tr><td>535-1 605
BROADCASTING</td></tr>
<tr><td rowspan="2">1 606.5-1 625
FIXED
MARITIME MOBILE 5.90
LAND MOBILE

5.92</td><td>1 605-1 625
BROADCASTING 5.89

5.90</td><td rowspan="2">535-1 606.5
BROADCASTING</td><td rowspan="2">535-1 606.5
BROADCASTING</td><td rowspan="2">Traditional AM Sound Broadcasting with 9 kHz channel spacing.</td></tr>
<tr><td rowspan="3">1 625-1 705
FIXED
MOBILE
BROADCASTING 5.89
Radiolocation

5.90</td></tr>
<tr><td>1 606.5-1 800
FIXED
MOBILE
RADIOLOCATION
RADIONAVIGATION</td><td>1 606.5-1 800
FIXED
MOBILE
RADIOLOCATION
RADIONAVIGATION</td><td></td></tr>
<tr><td>1 625-1 635
RADIOLOCATION

5.93</td><td rowspan="2">Narrow Band Direct-Printing telegraphy (NBDP) and Digital Selective Calling (DSC) applications in maritime mobile service by coastal stations (ITU RR Articles 51 and 52).

Radio Beacons</td></tr>
<tr><td>1 635-1 800
FIXED
MARITIME MOBILE 5.90
LAND MOBILE

5.92 5.96</td><td>1 705-1 800
FIXED
MOBILE
RADIOLOCATION

AERONAUTICAL RADIONAVIGATION</td><td>5.91</td></tr>
</table>

1 800-2 194 kHz

<table>
<tr><th colspan="5">Allocation to services</th></tr>
<tr><th>Region 1</th><th>Region 2</th><th>Region 3</th><th>Papua New Guinea</th><th>Usage</th></tr>
<tr><td>1 800-1 810
RADIOLOCATION
5.93</td><td rowspan="2">1 800-1 850
AMATEUR</td><td rowspan="2">1 800-2 000
AMATEUR
FIXED
MOBILE except aeronautical mobile
RADIONAVIGATION
Radiolocation</td><td rowspan="2">1 800-2 000
AMATEUR
FIXED
MOBILE except aeronautical mobile
RADIONAVIGATION
Radiolocation</td><td rowspan="2">For DSC. NBDP and SSB Radiotelephony by ship and coast stations in Maritime Mobile service see ITU-RR Articles 51 and 52.</td></tr>
<tr><td>1 810-1 850
AMATEUR
5.98 5.99 5.100</td></tr>
<tr><td>1 850-2 000
FIXED
MOBILE except aeronautical mobile
5.92 5.96 5.103</td><td>1 850-2 000
AMATEUR
FIXED
MOBILE except aeronautical mobile
RADIOLOCATION
RADIONAVIGATION
5.102</td><td>5.97</td><td>5.97</td><td></td></tr>
<tr><td>2 000-2 025
FIXED
MOBILE except aeronautical mobile (R)
5.92 5.103</td><td colspan="2" rowspan="2">2 000-2 065
FIXED
MOBILE</td><td>2 000-2 065
FIXED
MOBILE</td><td rowspan="2">For DSC. NBDP and SSB Radiotelephony by ship and coast stations in Maritime Mobile service see ITU-RR Articles 51 and 52.</td></tr>
<tr><td>2 025-2 045
FIXED
MOBILE except aeronautical mobile (R)
Meteorological aids 5.104
5.92 5.103</td></tr>
<tr><td rowspan="2">2 045-2 160
FIXED
MARITIME MOBILE
LAND MOBILE
5.92</td><td colspan="2">2 065-2 107
MARITIME MOBILE 5.105
5.106</td><td>2 065-2 107
MARITIME MOBILE 5.105
5.106</td><td>Fixed service subject to mean power less than 50 W (5.106).
For DSC. NBDP and SSB Radiotelephony by ship and coast stations in Maritime Mobile service see ITU-RR Articles 51 and 52.</td></tr>
<tr><td>2 160-2 170
RADIOLOCATION
5.93 5.107</td><td colspan="2">2 107-2 170
FIXED
MOBILE</td><td>2 107-2 170
FIXED
MOBILE</td><td>For DSC. NBDP and SSB Radiotelephony by ship and coast stations in Maritime Mobile service see ITU-RR Articles 51 and 52.</td></tr>
<tr><td colspan="2">2 170-2 173.5</td><td>MARITIME MOBILE</td><td>2 170-2 173.5
MARITIME MOBILE</td><td>A channel for DSC, NBDP and SSB Radiotelephony, see also ITU RR 52.188.</td></tr>
<tr><td colspan="2">2 173.5-2 190.5</td><td>MOBILE (distress and calling)
5.108 5.109 5.110 5.111</td><td>2 173.5-2 190.5
MOBILE
(distress and calling)
5.108 5.109 5.110 5.111</td><td>SAR and Radiotelephony distress and calling on 2182 kHz.
DSC distress on 2187.5 kHz.
NBDP) telegraphy international distress on 2174.5 kHz.</td></tr>
<tr><td colspan="2">2 190.5-2 194</td><td>MARITIME MOBILE</td><td>2 190.5-2 194
MARITIME MOBILE</td><td>NBDP and SSB radiotelephony (ITU RR Articles 51 and 52).</td></tr>
</table>

2 194-3 230 kHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
2 194-2 300 FIXED MOBILE except aeronauticalmobile (R) 5.92 5.103 5.112	**2 194-2 300** FIXED MOBILE 5.112		**2 194-2 300** FIXED MOBILE except aeronautical mobile (R)	For DSC. NBDP and SSB Radiotelephony by ship and coast stations in Maritime Mobile service see ITU-RR Articles **51** and **52.**
2 300-2 498 FIXED MOBILE except aeronautical mobile (R) BROADCASTING 5.113 5.103	**2 300-2 495** FIXED MOBILE BROADCASTING 5.113		**2 300-2 495** FIXED MOBILE except aeronautical mobile (R) BROADCASTING 5.113	Tropical 120m AM sound Broadcasting with TX carrier power less than 50 kW (ITU RR Article **23**).
2 498-2 501 STANDARD FREQUENCY AND TIME SIGNAL (2 500 kHz)	**2 495-2 501** STANDARD FREQUENCY AND TIME SIGNAL (2 500 kHz)		**2 495-2 501** STANDARD FREQUENCY AND TIME SIGNAL (2 500 kHz)	In accordance with ITU RR Article **26.**
2 501-2 502 STANDARD FREQUENCY AND TIME SIGNAL Space Research			**2 501-2 502** STANDARD FREQUENCY AND TIME SIGNAL Space Research	In accordance with ITU RR Article **26.**
2 502-2 625 FIXED MOBILE except aeronautical mobile (R) 5.92 5.103 5.114	**2 502-2 505** STANDARD FREQUENCY AND TIME SIGNAL		**2 502-2 505** STANDARD FREQUENCY AND TIME SIGNAL	In accordance with ITU RR Article **26.**
2 625-2 650 MARITIME MOBILE MARITIME RADIONAVIGATION 5.92	**2 505-2 850** FIXED MOBILE		**2 505-2 850** FIXED MOBILE	SSB radio telephony on carrier frequency 2635 kHz and 2638 kHz in accordance with ITU RR No. **52.11.**
2 650-2 850 FIXED MOBILE except aeronautical mobile (R) 5.92 5.103				
2 850-3 025 AERONAUTICAL MOBILE (R) 5.111 5.115			**2 850-3 025** AERONAUTICAL MOBILE (R) 5.111 5.115	In accordance with allotment plan given in ITU RR App. **27.** SAR on 3023 kHz.
3 025-3 155 AERONAUTICAL MOBILE (OR)			**3 025-3 155** AERONAUTICAL MOBILE (OR)	In accordance with allotment plan given in ITU RR App. **26.**
3 155-3 200 FIXED MOBILE except aeronautical mobile (R) 5.116 5.117			**3 155-3 200** FIXED MOBILE except aeronautical mobile (R) 5.116	NBDP telegraphy by ship stations in Maritime Mobile service (ITU RR Article **52**).
3 200-3 230 FIXED MOBILE except aeronautical mobile (R) BROADCASTING 5.113 5.116			**3 200-3 230** FIXED MOBILE except aeronautical mobile (R) BROADCASTING 5.113 5.116	For DSC. NBDP and SSB Radiotelephony by ship and coast stations in Maritime Mobile service see ITU-RR Articles **51** and **52.** Tropical 90m AM sound Broadcasting with TX carrier power less than 50 kW (ITU RR Article **23**).

3 230-4 995 kHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
3 230-3 400 FIXED MOBILE except aeronautical mobile BROADCASTING 5.113 5.116 5.118			**3 230-3 400** FIXED MOBILE except aeronautical mobile BROADCASTING 5.113 5.116	For DSC. NBDP and SSB Radiotelephony by ship and coast stations in Maritime Mobile service see ITU-RR Articles **51** and **52.** Tropical 90m AM sound Broadcasting with TX carrier power less than 50 kW (ITU RR Article **23**).
3 400-3 500 AERONAUTICAL MOBILE (R)			**3 400 - 3 500** AERONAUTICAL MOBILE (R)	In accordance with allotment plan given in ITU RR App. **27.**
3 500-3 800 AMATEUR FIXED MOBILE except aeronautical mobile 5.92	**3 500-3 750** AMATEUR 5.119	**3 500-3 900** AMATEUR FIXED MOBILE	**3 500-3 900** AMATEUR FIXED MOBILE	For DSC. NBDP and SSB Radiotelephony by ship and coast stations in Maritime Mobile service see ITU-RR Articles **51** and **52.** Aeronautical mobile stations would use exclusive subband of the band 3800-3900 kHz.
3 800-3 900 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE	**3 750-4 000** AMATEUR FIXED MOBILE except aeronautical mobile (R)			
3 900-3 950 AERONAUTICAL MOBILE (OR) 5.123		**3 900-3 950** AERONAUTICAL MOBILE BROADCASTING	**3 900-3 950** AERONAUTICAL MOBILE BROADCASTING	Future Sound Broadcasting and aeronautical mobile systems.
3 950-4 000 FIXED BROADCASTING	5.122 5.125	**3 950-4 000** FIXED BROADCASTING 5.126	**3 950-4 000** FIXED BROADCASTING 5.126	Conventional Fixed service has higher priority in this band. 75m AM sound Broadcasting.
4 000-4 063 FIXED MARITIME MOBILE 5.127 5.126			**4 000-4 063** FIXED MARITIME MOBILE 5.127 5.126	TX power of fixed stations shall not exceed 50 W in this band. SSB Radiotelephony application in ship stations in (Sub-Section C-1, App. **17**, ITU-R RR).
4 063-4 438 MARITIME MOBILE 5.79A 5.109 5.110 5.130 5.131 5.132 5.128			**4 063-4 438** MARITIME MOBILE 5.79A 5.109 5.110 5.130 5.131 5.132 5.128	NAVTEX (4209.5 kHz), distress frequency for DSC (4207.5 kHz), NBDP (4177.5 kHz and 4209.5 kHz) and MSI (4210 kHz). For detailed in formation see ITU RR Article **31**, App. **13** and App. **17** (Sub-section **C-1**).
4 438-4 488 FIXED MOBILE except aeronautical mobile (R) Radiolocation 5.132A 5.132B	**4 438-4 488** FIXED MOBILE except aeronautical mobile (R) RADIOLOCATION 5.132A	**4 438-4 488** FIXED MOBILE except aeronautical mobile Radiolocation 5.132A	**4 438-4 488** FIXED MOBILE except aeronautical mobile Radiolocation 5.132A	Duplex operation of coastal station with ships transmitting in 4438-4650 kHz (Sub-Section C-1, App. **17**, ITU-R RR). Radiolocation service is limited to oceanographic radars (5.132A).
4 488-4 650 FIXED MOBILE except aeronautical mobile (R)		**4 488-4 650** FIXED MOBILE except aeronautical mobile	**4 488-4 650** FIXED MOBILE except aeronautical mobile	Duplex operation of coastal station with ships transmitting in 4438-4650 kHz (Sub-Section C-1, App. **17**, ITU-R RR)
4 650-4 700 AERONAUTICAL MOBILE (R)			**4 650-4 700** AERONAUTICAL MOBILE (R)	In accordance with allotment plan given in ITU RR App. **27.**
4 700-4 750 AERONAUTICAL MOBILE (OR)			**4 700-4 750** AERONAUTICAL MOBILE (OR)	In accordance with allotment plan given in ITU RR App. **26.**
4 750-4 850 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE BROADCASTING 5.113	**4 750-4 850** FIXED MOBILE except aeronautical mobile (R) BROADCASTING 5.113	**4 750-4 850** FIXED BROADCASTING 5.113 Land mobile	**4 750-4 850** FIXED BROADCASTING 5.113 Land mobile	Tropical 60m AM sound Broadcasting with carrier power less than 50 kW. Conventional Fixed service has higher priority in this band.
4 850-4 995 FIXED LAND MOBILE BROADCASTING 5.113			**4 850-4 995** FIXED LAND MOBILE BROADCASTING 5.113	Tropical 60m AM sound Broadcasting with carrier power less than 50 kW. Conventional Fixed and land mobile services has higher priority in this band.

4 995-7 100 kHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
4 995-5 003 STANDARD FREQUENCY AND TIME SIGNAL (5 000 kHz)			**4 995-5 003** STANDARD FREQUENCY AND TIME SIGNAL (5 000 kHz)	
5 003-5 005 STANDARD FREQUENCY AND TIME SIGNAL Space research			**5 003-5 005** STANDARD FREQUENCY AND TIME SIGNAL Space research	
5 005-5 060 FIXED BROADCASTING 5.113			**5 005-5 060** FIXED BROADCASTING 5.113	Tropical 60m AM sound Broadcasting with TX carrier power less than 50 kW. Conventional Fixed service has higher priority in this band.
5 060-5 250 FIXED Mobile except aeronautical mobile 5.133			**5 060-5 250** FIXED Mobile except aeronautical mobile	Conventional fixed stations and PMR.
5 250-5 275 FIXED MOBILE except aeronautical mobile Radiolocation 5.132A 5.133A	**5 250-5 275** FIXED MOBILE except aeronautical mobile RADIOLOCATION 5.132A	**5 250-5 275** FIXED MOBILE except aeronautical mobile Radiolocation 5.132A	**5 250-5 275** FIXED MOBILE except aeronautical mobile Radiolocation 5.132A	Conventional fixed stations and PMR. Radiolocation service is limited to oceanographic radars (5.132A).
5 275-5 351.5 FIXED MOBILE except aeronautical mobile			**5 275-5 450** FIXED MOBILE except aeronautical mobile	Conventional fixed stations and PMR.
5 351.5 – 5 366.5 FIXED MOBILE except aeronautical mobile Amateur 5.133B			FIXED MOBILE except aeronautical mobile Amateur 5.133B	Conventional fixed stations and PMR.
5 366.5 – 5 450 FIXED MOBILE except aeronautical mobile			FIXED MOBILE except aeronautical mobile	Conventional fixed stations and PMR.
5 450-5 480 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE	**5 450-5 480** AERONAUTICAL MOBILE (R)	**5 450-5 480** FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE	**5 450-5 480** FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE	Conventional Fixed and land mobile services has higher priority in this band.
5 480-5 680 AERONAUTICAL MOBILE (R) 5.111 5.115			**5 480-5 680** AERONAUTICAL MOBILE (R) 5.111 5.115	In accordance with allotment plan given in ITU RR App. **27.** Search and Rescue on 5680 kHz (5.111 and 5.115).
5 680-5 730 AERONAUTICAL MOBILE (OR) 5.111 5.115			**5 680-5 730** AERONAUTICAL MOBILE (OR) 5.111 5.115	In accordance with allotment plan given in ITU RR App. **26.** Search and Rescue on 5680 kHz (5.111 and 5.115).
5 730-5 900 FIXED LAND MOBILE	**5 730-5 900** FIXED MOBILE except aeronautical mobile (R)	**5 730-5 900** FIXED Mobile except aeronautical mobile (R)	**5 730-5 900** FIXED Mobile except aeronautical mobile (R)	Conventional Fixed and land mobile services has higher priority in this band.
5 900-5 950 BROADCASTING 5.134 5.136			**5 900-5 950** BROADCASTING 5.134 5.136	49 m Short Wave AM sound broadcasting subject to procedure of ITU RR Article **12.**
5 950-6 200 BROADCASTING			**5 950-6 200** BROADCASTING	49 m Short Wave AM sound broadcasting.
6 200-6 525 MARITIME MOBILE 5.109 5.110 5.130 5.132 5.137			**6 200-6 525** MARITIME MOBILE 5.109 5.110 5.130 5.132 5.137	MSI (6314 kHz), NBDP (6268 kHz) & DSC (6312 kHz, 6312.5 kHz/ 6331 kHz). For detail see ITU RR App. **17** and Article **31**.
6 525-6 685 AERONAUTICAL MOBILE (R)			**6 525-6 685** AERONAUTICAL MOBILE (R)	In according with allotment plan given in ITU RR App. **27.**
6 685-6 765 AERONAUTICAL MOBILE (OR)			**6 685-6 765** AERONAUTICAL MOBILE (OR)	In according with allotment plan given in ITU RR App. **26.**

6 765-7 000	FIXED MOBILE except aeronautical mobile (R) 5.138 5.138A 5.139	**6 765-7 000** FIXED MOBILE except aeronautical mobile (R) 5.138 5.138A	Conventional fixed stations and PMR. ISM application in the band 6 765-6 795 kHz (5.138).
7 000-7 100	AMATEUR AMATEUR-SATELLITE 5.140 5.141 5.141A	**7 000-7 100** AMATEUR AMATEUR-SATELLITE	

7 100-10 100 kHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
7 100-7 200 AMATEUR 5.141A 5.141B 5.141C 5.142			**7 100-7 200** AMATEUR FIXED 5.141B MOBILE 5.141B	Conventional Fixed and mobile services has higher priority in this band.
7 200-7 300 BROADCASTING	**7 200-7 300** AMATEUR 5.142	**7 200-7 300** BROADCASTING	**7 200-7 300** BROADCASTING	41m AM sound Broadcasting.
7 300-7 400 BROADCASTING 5.134 5.143 5.143A 5.143B 5.143C 5.143D			**7 300-7 400** BROADCASTING 5.134 5.143 5.143A	41m AM sound Broadcasting. 7 300-7 350 kHz is subject to procedure of ITU RR Article **12.**
7 400-7 450 BROADCASTING 5.143B 5.143C	**7 400-7 450** FIXED MOBILE except aeronautical mobile (R)	**7 400-7 450** BROADCASTING 5.143A 5.143C	**7 400-7 450** BROADCASTING 5.143A	41m short wave AM sound Broadcasting.
7 450-8 100 FIXED MOBILE except aeronautical mobile (R) 5.143E 5.144			**7 450-8 100** FIXED MOBILE except aeronautical mobile (R) 5.143E 5.144	Conventional fixed stations and PMR.
8 100-8 195 FIXED MARITIME MOBILE			**8 100-8 195** FIXED MARITIME MOBILE	For maritime mobile service see sub-Section C-2, App. **17**, ITU RR
8 195-8 815 MARITIME MOBILE 5.109 5.110 5.132 5.145 5.111			**8 195-8 815** MARITIME MOBILE 5.109 5.110 5.132 5.145 5.111	MSI (8416.5 kHz), distress frequency for DSC (8414.5 kHz) and for NBDP (8376.5 kHz). SAR (8364 kHz), RTP-COM (8291 kHz). For detail see ITU RR App.s **17** & **15**, Articles **31** and **52.**
8 815-8 965 AERONAUTICAL MOBILE (R)			**8 815-8 965** AERONAUTICAL MOBILE (R)	In accordance with allotment plan given in Appendix **27.**
8 965-9 040 AERONAUTICAL MOBILE (OR)			**8 965-9 040** AERONAUTICAL MOBILE (OR)	In according with allotment plan given in ITU RR App. **26.**
9 040-9 305 FIXED	**9 040-9 400** FIXED	**9 040-9 305** FIXED	**9 040-9 305** FIXED	Conventional fixed stations.
9 305-9 355 FIXED Radiolocation 5.145A 5.145B		**9 305-9 355** FIXED Radiolocation 5.145A	**9 305-9 355** FIXED Radiolocation 5.145A	Radiolocation service is limited to oceanographic radars (5.145A).
9 355-9 400 FIXED		**9 355-9 400** FIXED	**9 355-9 400** FIXED	Conventional fixed stations.
9 400-9 500 BROADCASTING 5.134 5.146			**9 400-9 500** BROADCASTING 5.134 5.146	31m AM sound Broadcasting subject to the procedure of ITU RR Article **12.**
9 500-9 900 BROADCASTING 5.147			**9 500-9 900** BROADCASTING 5.147	31m AM sound Broadcasting May be used by fixed stations (5.147).
9 900-9 995 FIXED			**9 900-9 995** FIXED	Conventional fixed stations.
9 995-10 003 STANDARD FREQUENCY AND TIME SIGNAL (10 000 kHz) 5.111			**9 995-10 003** STANDARD FREQUENCY AND TIME SIGNAL (10 000 kHz) 5.111	In accordance with ITU RR Article **26.**
10 003-10 005 STANDARD FREQUENCY AND TIME SIGNAL Space research 5.111			**10 003-10 005** STANDARD FREQUENCY AND TIME SIGNAL Space research 5.111	In accordance with ITU RR Article **26.**
10 005-10 100 AERONAUTICAL MOBILE (R) 5.111			**10 005-10 100** AERONAUTICAL MOBILE (R) 5.111	In accordance with allotment plan given in ITU RR App. **27.**

10 100-13 800 kHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
10 100-10 150 FIXED Amateur			**10 100-10 150** FIXED Amateur	Conventional fixed stations.
10 150-11 175 FIXED Mobile except aeronautical mobile (R)			**10 150-11 175** FIXED Mobile except aeronautical mobile (R)	Conventional fixed stations and PMR.
11 175-11 275 AERONAUTICAL MOBILE (OR)			**11 175-11 275** AERONAUTICAL MOBILE (OR)	In accordance with allotment plan given in ITU RR App. **26.**
11 275-11 400 AERONAUTICAL MOBILE (R)			**11 275-11 400** AERONAUTICAL MOBILE (R)	In accordance with allotment plan given in ITU RR App. **27.**
11 400-11 600 FIXED			**11 400-11 600** FIXED	Conventional fixed stations.
11 600-11 650 BROADCASTING 5.134 5.146			**11 600-11 650** BROADCASTING 5.134 5.146	25m AM sound Broadcasting subject to the procedure of ITU RR Article **12.**
11 650-12 050 BROADCASTING 5.147			**11 650-12 050** BROADCASTING 5.147	25m AM sound Broadcasting May be used by fixed stations (5.147).
12 050-12 100 BROADCASTING 5.134 5.146			**12 050-12 100** BROADCASTING 5.134 5.146	25m AM sound Broadcasting subject to the procedure of ITU RR Article **12.**
12 100-12 230 FIXED			**12 100-12 230** FIXED	Conventional fixed stations.
12 230-13 200 MARITIME MOBILE 5.109 5.110 5.132 5.145			**12 230-13 200** MARITIME MOBILE 5.109 5.110 5.132 5.145	MSI (12579 kHz), distress frequency for DSC (12577 kHz) and for NBDP (12520 kHz). RTP-COM (12290 kHz). For detail see ITU RR App.s **17** & **15**, Articles **31** and **52**.
13 200-13 260 AERONAUTICAL MOBILE (OR)			**13 200-13 260** AERONAUTICAL MOBILE (OR)	In accordance with allotment plan given in ITU RR App. **26**
13 260-13 360 AERONAUTICAL MOBILE (R)			**13 260-13 360** AERONAUTICAL MOBILE (R)	In accordance with allotment plan given in ITU RR App. **27.**
13 360-13 410 FIXED RADIO ASTRONOMY 5.149			**13 360-13 410** FIXED RADIO ASTRONOMY 5.149	Conventional fixed stations.
13 410-13 450 FIXED Mobile except aeronautical mobile (R)			**13 410-13 450** FIXED Mobile except aeronautical mobile (R)	Conventional fixed stations and PMR.
13 450-13 550 FIXED Mobile except aeronautical mobile (R) Radiolocation 5.132A 5.149A	**13 450-13 550** FIXED Mobile except aeronautical mobile (R) Radiolocation 5.132A		**13 450-13 550** FIXED Mobile except aeronautical mobile (R) Radiolocation 5.132A	Conventional fixed stations and PMR Radiolocation service is limited to oceanographic radars (5.132A).
13 550-13 570 FIXED Mobile except aeronautical mobile (R) 5.150			**13 550-13 570** FIXED Mobile except aeronautical mobile (R) 5.150	Conventional fixed stations and PMR. ISM applications in the band 13 553-13 567 kHz
13 570-13 600 BROADCASTING 5.134 5.151			**13 570-13 600** BROADCASTING 5.134 5.151	22m AM sound Broadcasting subject to the procedure of ITU RR Article **12.**
13 600-13 800 BROADCASTING			**13 600-13 800** BROADCASTING	22m AM sound Broadcasting.

13 800-18 030 kHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
13 800-13 870 BROADCASTING 5.134 5.151			**13 800-13 870** BROADCASTING 5.134 5.151	Subject to the procedure of ITU RR Article **12.**
13 870-14 000 FIXED Mobile except aeronautical mobile (R)			**13 870-14 000** FIXED Mobile except aeronautical mobile (R)	Conventional fixed stations and PMR.
14 000-14 250 AMATEUR AMATEUR-SATELLITE			**14 000-14 250** AMATEUR AMATEUR-SATELLITE	
14 250-14 350 AMATEUR 5.152			**14 250-14 350** AMATEUR	
14 350-14 990 FIXED Mobile except aeronautical mobile (R)			**14 350-14 990** FIXED Mobile except aeronautical mobile (R)	Conventional fixed stations and PMR.
14 990-15 005 STANDARD FREQUENCY AND TIME SIGNAL (15 000 kHz) 5.111			**14 990-15 005** STANDARD FREQUENCY AND TIME SIGNAL (15 000 kHz) 5.111	In accordance with ITU RR Article **26.**
15 005-15 010 STANDARD FREQUENCY AND TIME SIGNAL Space research			**15 005-15 010** STANDARD FREQUENCY AND TIME SIGNAL Space research	In accordance with ITU RR Article **26.**
15 010-15 100 AERONAUTICAL MOBILE (OR)			**15 010-15 100** AERONAUTICAL MOBILE (OR)	In accordance with allotment plan given in ITU RR App. **26.**
15 100-15 600 BROADCASTING			**15 100-15 600** BROADCASTING	19m AM sound Broadcasting.
15 600-15 800 BROADCASTING 5.134 5.146			**15 600-15 800** BROADCASTING 5.134 5.146	19m AM sound Broadcasting subject to the procedure of ITU RR Article **12.**
15 800-16 100 FIXED 5.153			**15 800-16 100** FIXED 5.153	Conventional fixed stations.
16 100-16 200 FIXED Radiolocation 5.145A 5.145B	**16 100-16 200** FIXED RADIOLOCATION 5.145A	**16 100-16 200** FIXED Radiolocation 5.145A	**16 100-16 200** FIXED Radiolocation 5.145A	Conventional fixed stations. Radiolocation service is limited to oceanographic radars (5.145A).
16 200-16 360 FIXED			**16 200-16 360** FIXED	Conventional fixed stations.
16 360-17 410 MARITIME MOBILE 5.109 5.110 5.132 5.145			**16 360-17 410** MARITIME MOBILE 5.109 5.110 5.132 5.145	MSI (16806.5 kHz), distress frequency for DSC (16804.5 kHz) and for NBDP (16695 kHz). RTP-COM (16420 kHz). For detail see ITU RR App.s **17** & **15**, Articles **31** and **52.**
17 410-17 480 FIXED			**17 410-17 480** FIXED	Conventional fixed stations.
17 480-17 550 BROADCASTING 5.134 5.146			**17 480-17 550** BROADCASTING 5.134 5.146	16m AM sound Broadcasting subject to the procedure of ITU RR Article 12.
17 550-17 900 BROADCASTING			**17 550-17 900** BROADCASTING	16m AM sound Broadcasting.
17 900-17 970 AERONAUTICAL MOBILE (R)			**17 900-17 970** AERONAUTICAL MOBILE (R)	In accordance with allotment plan given in ITU RR App. **27.**
17 970-18 030 AERONAUTICAL MOBILE (OR)			**17 970-18 030** AERONAUTICAL MOBILE (OR)	In accordance with allotment plan given in ITU RR App. **26.**

18 030-23 350 kHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
18 030-18 052 FIXED			**18 030-18 052** FIXED	Conventional fixed stations.
18 052-18 068 FIXED Space research			**18 052-18 068** FIXED Space research	Conventional fixed stations.
18 068-18 168 AMATEUR AMATEUR-SATELLITE 5.154			**18 068-18 168** AMATEUR AMATEUR-SATELLITE 5.154	
18 168-18 780 FIXED Mobile except aeronautical mobile			**18 168-18 780** FIXED Mobile except aeronautical mobile	
18 780-18 900 MARITIME MOBILE			**18 780-18 900** MARITIME MOBILE	
18 900-19 020 BROADCASTING 5.134 5.146			**18 900-19 020** BROADCASTING 5.134 5.146	May be used by fixed stations (5.146).
19 020-19 680 FIXED			**19 020-19 680** FIXED	Conventional fixed stations.
19 680-19 800 MARITIME MOBILE 5.132			**19 680-19 800** MARITIME MOBILE 5.132	The channel assignment plan is given in ITU RR App. **17.** MSI (19680.5 kHz) and NBDP.
19 800-19 990 FIXED			**19 800-19 990** FIXED	Conventional fixed stations
19 990-19 995 STANDARD FREQUENCY AND TIME SIGNAL Space research 5.111			**19 990-19 995** STANDARD FREQUENCY AND TIME SIGNAL Space research 5.111	In accordance with ITU RR Article **26**. Search and rescue (SAR) operations on 19993 kHz ± 3 kHz kHz (ITU RR Article **31**).
19 995-20 010 STANDARD FREQUENCY AND TIME SIGNAL (20 000 kHz) 5.111			**19 995-20 010** STANDARD FREQUENCY AND TIME SIGNAL (20 000 kHz) 5.111	In accordance with ITU RR Article **26**. Search and rescue (SAR) operations on 19993 kHz ± 3 kHz kHz (ITU RR Article **31**).
20 010-21 000 FIXED Mobile			**20 010-21 000** FIXED Mobile	Conventional fixed stations and PMR.
21 000-21 450 AMATEUR AMATEUR-SATELLITE			**21 000-21 450** AMATEUR AMATEUR-SATELLITE	
21 450-21 850 BROADCASTING			**21 450-21 850** BROADCASTING	13m AM sound Broadcasting.
21 850-21 870 FIXED 5.155A 5.155			**21 850-21 870** FIXED	Conventional fixed stations.
21 870-21 924 FIXED 5.155B			**21 870-21 924** FIXED 5.155B	
21 924-22 000 AERONAUTICAL MOBILE (R)			**21 924-22 000** AERONAUTICAL MOBILE (R)	In accordance with allotment plan given in ITU RR App. **27.**
22 000-22 855 MARITIME MOBILE 5.132 5.156			**22 000-22 855** MARITIME MOBILE 5.132 5.156	The channel assignment plan is given in ITU RR App. **17.** MSI (22376 kHz) and NBDP.
22 855-23 000 FIXED 5.156			**22 855-23 000** FIXED	Conventional fixed stations.
23 000-23 200 FIXED Mobile except aeronautical mobile (R) 5.156			**23 000-23 200** FIXED Mobile except aeronautical mobile (R)	Conventional fixed stations and PMR.
23 200-23 350 FIXED 5.156A AERONAUTICAL MOBILE (OR)			**23 200-23 350** FIXED 5.156A AERONAUTICAL MOBILE (OR)	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.

23 350-27 500 kHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
23 350-24 000 FIXED MOBILE except aeronautical mobile 5.157			**23 350-24 000** FIXED MOBILE except aeronautical mobile 5.157	Conventional fixed stations and PMR. Maritime mobile service is limited to inter-ship radiotelegraphy (5.157).
24 000-24 450 FIXED LAND MOBILE			**24 000-24 450** FIXED LAND MOBILE	Conventional fixed stations and PMR.
24 450-24 600 FIXED LAND MOBILE Radiolocation 5.132A 5.158	**24 450-24 650** FIXED LAND MOBILE RADIOLOCATION 5.132A	**24 450-24 600** FIXED LAND MOBILE Radiolocation 5.132A	**24 450-24 600** FIXED LAND MOBILE Radiolocation 5.132A	Conventional fixed stations and PMR . Radiolocation service is limited to oceanographic radars (5.132A).
24 600-24 890 FIXED LAND MOBILE	**24 650-24 890** FIXED LAND MOBILE	**24 600-24 890** FIXED LAND MOBILE	**24 600-24 890** FIXED LAND MOBILE	Conventional fixed stations and PMR.
24 890-24 990 AMATEUR AMATEUR-SATELLITE			**24 890-24 990** AMATEUR AMATEUR-SATELLITE	
24 990-25 005 STANDARD FREQUENCY AND TIME SIGNAL (25 000 kHz)			**24 990-25 005** STANDARD FREQUENCY AND TIME SIGNAL (25 000 kHz)	In accordance with ITU RR Article **26.**
25 005-25 010 STANDARD FREQUENCY AND TIME SIGNAL Space research			**25 005-25 010** STANDARD FREQUENCY AND TIME SIGNAL Space research	In accordance with ITU RR Article **26.**
25 010-25 070 FIXED MOBILE except aeronautical mobile			**25 010-25 070** FIXED MOBILE except aeronautical mobile	Conventional fixed stations and PMR.
25 070-25 210 MARITIME MOBILE			**25 070-25 210** MARITIME MOBILE	The channel assignment plan is given in ITU RR App. **17.**
25 210-25 550 FIXED MOBILE except aeronautical mobile			**25 210-25 5** FIXED MOBILE except aeronautical mobile	Conventional fixed stations and PMR.
25 550-25 670 RADIO ASTRONOMY 5.149			**25 550-25 670** RADIO ASTRONOMY 5.149	
25 670-26 100 BROADCASTING			**25 670-26 100** BROADCASTING	11m AM sound Broadcasting.
26 100-26 175 MARITIME MOBILE 5.132			**26 100-26 175** MARITIME MOBILE 5.132	The channel assignment plan is given in ITU RR App. **17.** MSI (26100.5 kHz)
26 175-26 200 FIXED MOBILE except aeronautical mobile			**26 175-26 200** FIXED MOBILE except aeronautical mobile	Conventional fixed stations and PMR.
26 200-26 350 FIXED MOBILE except aeronautical mobile Radiolocation 5.132A 5.133A	**26 200-26 420** FIXED MOBILE except aeronautical mobile RADIOLOCATION 5.132A	**26 200-26 350** FIXED MOBILE except aeronautical mobile Radiolocation 5.132A	**26 200-26 350** FIXED MOBILE except aeronautical mobile Radiolocation 5.132A	Conventional fixed stations and PMR. Radiolocation service is limited to oceanographic radars (5.132A).
26 350-27 500 FIXED MOBILE except aeronautical mobile 5.150	**26 420-27 500** FIXED MOBILE except aeronautical mobile 5.150	**26 350-27 500** FIXED MOBILE except aeronautical mobile 5.150	**26 350-27 500** FIXED MOBILE except aeronautical mobile 5.150	Conventional fixed stations and PMR. 27 MHz CB in accordance with document No. TR603. LPDs & Radio Tx Toys in accordance with TR619. ISM in the 26957-27283 kHz.

27.5-41.015 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
27.5-28 METEOROLOGICAL AIDS FIXED MOBILE			**27.5-28** METEOROLOGICAL AIDS FIXED MOBILE	Conventional fixed stations and PMR.
28-29.7 AMATEUR AMATEUR-SATELLITE			**28-29.7** AMATEUR AMATEUR-SATELLITE	
29.7-30.005 FIXED MOBILE			**29.7-30.005** FIXED MOBILE	Conventional fixed stations and PMR.
30.005-30.01 SPACE OPERATION (satellite identification) FIXED MOBILE SPACE RESEARCH			**30.005-30.01** SPACE OPERATION (satellite identification) FIXED MOBILE SPACE RESEARCH	Conventional fixed stations and PMR.
30.01-37.5 FIXED MOBILE			**30.01-37.5** FIXED MOBILE	Conventional fixed stations and PMR. 30 MHz Cordless Telephone in accordance with the TR421. Radio Control Models in accordance with TR619.
37.5-38.25 FIXED MOBILE Radio astronomy 5.149			**37.5-38.25** FIXED MOBILE Radio astronomy 5.149	Conventional fixed stations and PMR.
38.25-39 FIXED MOBILE	**38.25-39.986** FIXED MOBILE	**38.25-39.5** FIXED MOBILE	**38.25-39.5** FIXED MOBILE	Conventional fixed stations and PMR. 30 MHz Cordless Telephone in accordance with the TR421.
38.9-39.5 FIXED MOBILE Radiolocation 5.132A 5.159				
39.5-39.986 FIXED MOBILE		**39.5-39.986** FIXED MOBILE RADIOLOCATION 5.132A	**39.5-39.986** FIXED MOBILE RADIOLOCATION 5.132A	Conventional fixed stations and PMR Radiolocation service is limited to oceanographic radars (5.132A). 30 MHz Cordless Telephone in accordance with the TR421.
39.986-40.02 FIXED MOBILE Space research		**39.986-40** FIXED MOBILE RADIOLOCATION 5.132A Space research	**39.986-40** FIXED MOBILE RADIOLOCATION 5.132A Space research	Conventional fixed stations and PMR. Radiolocation service is limited to oceanographic radars (5.132A).
		40-40.02 FIXED MOBILE Space research	**40-40.02** FIXED MOBILE Space research	Conventional fixed stations and PMR.
40.02-40.98 FIXED MOBILE 5.150			**40.02-40.98** FIXED MOBILE 5.150	Conventional fixed stations and PMR ISM in the 40.66-40.70 MHz. LPDs& Radio Tx Toys in accordance with the TR619.
40.98-41.015 FIXED MOBILE Space research 5.160 5.161			**40.98-41.015** FIXED MOBILE Space research	Conventional fixed stations and PMR.

41.015-75.2 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
41.015-42 FIXED MOBILE 5.160 5.161 5.161A			**41.015-44** FIXED MOBILE	Conventional fixed stations and PMR.
42-42.5 FIXED MOBILE Radiolocation 5.161A 5.160 5.161B	**42-42.5** FIXED MOBILE 5.161		**42-42.5** FIXED MOBILE	Conventional fixed stations and PMR.
42. 5-44 FIXED MOBILE 5.160 5.161 5.161A			**42.5-44** FIXED MOBILE	Conventional fixed stations and PMR.
44-47 FIXED MOBILE 5.162 5.162A			**44-47** FIXED MOBILE 5.162	Conventional fixed stations and PMR. 46 MHz Cordless Telephone in accordance with the TR421.
47-50 BROADCASTING 5.162A 5.163 5.164 5.165	**47-50** FIXED MOBILE	**47-50** FIXED MOBILE BROADCASTING 5.162A	**47-50** FIXED MOBILE BROADCASTING	Conventional fixed stations and PMR. 46 MHz Cordless Telephone in accordance with the TR421.
50-52 BROADCASTING Amateur 5.166A 5.166B 5.166C 5.166D 5.166E 5.169 5.169A 5.169B 5.162A 5.164 5.165	**50-54** AMATEUR 5.162A 5.167 5.167A 5.168 5.170			Primary allocation to Amateur Service.
52-68 BROADCASTING 5.162A 5.163 5.164 5.165 5.169 5.169A 5.169B 5.171	**54-68** BROADCASTING Fixed Mobile 5.172	**54-68** FIXED MOBILE BROADCASTING 5.162A	**54-68** FIXED MOBILE	Conventional fixed stations and PMR.
68-74.8 FIXED MOBILE except aeronautical mobile	**68-72** BROADCASTING Fixed Mobile 5.173	**68-74.8** FIXED MOBILE	**68-74.8** FIXED MOBILE	TLMRS (Single Frequency Systems) in accordance with the "VHF Mid Band Plan in the band 68-88 MHz".
	72-73 FIXED MOBILE			
	73-74.6 RADIO ASTRONOMY 5.178			
	74.6-74.8 FIXED MOBILE			

5.149 5.174 5.175 5.177 5.179		5.149 5.176 5.179	5.149 5.176	
74.8-75.2	AERONAUTICAL RADIONAVIGATION 5.180 5.181		**74.8-75.2** AERONAUTICAL RADIONAVIGATION 5.180	ILS on 75 MHz ± 0.005%. (ICAO Annex 10, volume1, chapter 3, sections 3.1.7 and 3.6) using horizontal polarization with vertical radiation pattern.

75.2-137.175 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
75.2-87.5 FIXED MOBILE except aeronautical mobile 5.175 5.179 5.184 5.187	**75.2-75.4** FIXED MOBILE 5.179		**75.2-75.4** FIXED MOBILE 5.179	Single Frequency Systems in accordance with the "VHF Mid Band Plan in the band 68-88 MHz".
	75.4-76 FIXED MOBILE	**75.4-87** FIXED MOBILE 5.182 5.183 5.188	**75.4-87** FIXED MOBILE 5.188	Single Frequency Systems (Conventional) in accordance with the "VHF Mid Band Plan in the band 68-88 MHz".
	76-88 BROADCASTING Fixed Mobile 5.185	**87-100** FIXED MOBILE BROADCASTING	**87-88** FIXED MOBILE	Fixed and Mobile systems in accordance with the "VHF Mid Band Plan in the band 68-88 MHz".
87.5-100 BROADCASTING 5.190	**88-100** BROADCASTING		**88-100** BROADCASTING	VHF FM Broadcasting in accordance with the plan No. **1212.1.**
100-108 BROADCASTING 5.192 5.194			**100-108** BROADCASTING	VHF FM Broadcasting in accordance with the plan No. **1212.1.**
108-117.975 AERONAUTICAL RADIONAVIGATION 5.197 5.197A			**108-117.975** AERONAUTICAL RADIONAVIGATION	ILS localizer in the band 108–111.975 MHz, Short range VOR (TVOR) and en-route VOR, see also ITU RR Resolution **413.**
117.975-137 AERONAUTICAL MOBILE (R) 5.111 5.200 5.201 5.202			**117.975-137** AERONAUTICAL MOBILE 5.111 5.200 5.201	Aeronautical air – ground and air – air voice and data communications in the bands 117.975 – 121.45 MHz and 121.55 – 137.0 MHz. SAR radiotelephony in the 121.5 MHz and Auxiliary frequency 123.1 MHz to the 121.5 MHz.
137-137.025 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			**137-137.025** SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.209 SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) 5.207 5.208	Weather observation by GSO and Non-GSO satellites in the band 137 – 138 MHz.
137.025-137.175 SPACE OPERATION (space-to-Earth) 5.203C METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Fixed Mobile-satellite (space-to-Earth) 5.208A 5.208B 5.209 Mobile except aeronautical mobile (R) 5.204 5.205 5.206 5.207 5.208			**137.025-137.175** SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Fixed Mobile-satellite (space-to-Earth) 5.208A 5.209 Mobile except aeronautical mobile (R) 5.207 5.208	Weather observation by GSO and Non-GSO satellites in the band 137 – 138 MHz.

137.175-148 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
137.175-137.825 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			**137.175-137.825** SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.209 SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) 5.207 5.208	Weather observation by GSO and Non-GSO satellites in the band 137 – 138 MHz.
137.825-138 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			**137.825-138** SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Fixed Mobile-satellite (space-to-Earth) 5.208A 5.209 Mobile except aeronautical mobile (R) 5.207 5.208	Weather observation by GSO and Non-GSO satellites in the band 137 – 138 MHz.
138-143.6 AERONAUTICAL MOBILE (OR) 5.210 5.211 5.212 5.214	**138-143.6** FIXED MOBILE RADIOLOCATION Space research (space-to-Earth)	**138-143.6** FIXED MOBILE Space research (space-to-Earth) 5.207 5.213	**138-143.6** FIXED MOBILE Space research (space-to-Earth) 5.207	Conventional Fixed service has higher priority in this band.
143.6-143.65 AERONAUTICAL MOBILE (OR) SPACE RESEARCH (space-to-Earth) 5.211 5.212 5.214	**143.6-143.65** FIXED MOBILE RADIOLOCATION SPACE RESEARCH (space-to-Earth)	**143.6-143.65** FIXED MOBILE SPACE RESEARCH (space-to-Earth) 5.207 5.213	**143.6-143.65** FIXED MOBILE SPACE RESEARCH (space-to-Earth) 5.207	Conventional Fixed service has higher priority in this band.
143.65-144 AERONAUTICAL MOBILE (OR) 5.210 5.211 5.212 5.214	**143.65-144** FIXED MOBILE RADIOLOCATION Space research (space-to-Earth)	**143.65-144** FIXED MOBILE Space research (space-to-Earth) 5.207 5.213	**143.65-144** FIXED MOBILE Space research (space-to-Earth) 5.207	Conventional Fixed service has higher priority in this band.
144-146 AMATEUR AMATEUR-SATELLITE 5.216			**144-146** AMATEUR AMATEUR-SATELLITE	The 2 meters amateur band.
146-148 FIXED MOBILE except aeronautical mobile (R)	**146-148** AMATEUR 5.217	**146-148** AMATEUR FIXED MOBILE 5.217	**146-148** AMATEUR FIXED MOBILE	Conventional Fixed and land mobile services has higher priority over amateur service in this band.

148-156.8375 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
148-149.9 FIXED MOBILE except aeronautical mobile (R) MOBILE-SATELLITE (Earth-to-space) 5.209 5.218 5.218A 5.219 5.221	**148-149.9** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.209 5.218 5.218A 5.219 5.221		**148-149.9** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.209 5.218 5.219 5.221	Land mobile service in accordance with Band plan "148-174 MHz".
149.9-150.05 MOBILE-SATELLITE (Earth-to-space) 5.209 5.220			**149.9-150.05** MOBILE-SATELLITE (Earth-to-space) 5.209 5.220	EPIRB and low rate data throughput satellite.
150.05-153 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY 5.149	**150.05-154** FIXED MOBILE 5.225		**150.05-154** FIXED MOBILE	Land mobile service in accordance with Band plan "148-174 MHz".
153-154 FIXED MOBILE except aeronautical mobile (R) Meteorological Aids				
154-156.4875 FIXED MOBILE except aeronautical mobile (R) 5.225A 5.226	**154-156.4875** FIXED MOBILE 5.226	**154-156.4875** FIXED MOBILE 5.225A 5.226	**154-156.4875** FIXED MOBILE 5.226	Land mobile service in accordance with Band plan "148-174 MHz".
156.4875-156.5625 MARITIME MOBILE (distress and calling) 5.111 5.225A 5.226 5.227			**156.4875-156.5625** MARITIME MOBILE (distress and calling) 5.111 5.226 5.227	SAR and safety DSC in 156.525 MHz (ITU RR Article **31** and App.**18**).
156.5625-156.7625 FIXED MOBILE except aeronautical mobile (R) 5.226	**156.5625-156.7625** FIXED MOBILE 5.225..5.226		**156.5625-156.7625** FIXED MOBILE 5.225..5.226	Land mobile service in accordance with Band plan "148-174 MHz". Safety of navigation communication for ship to ship on 156.650 MHz (ITU RR No. 33.52).
156.7625-156.7875 MARITIME MOBILE Mobile-satellite (Earth-to-space) 5.225A 5.226 5.228	**156.7625-156.7875** MARITIME MOBILE MOBILE SATELLITE (Earth-to-space) 5.225A 5.226 5.228	**156.7625-156.7875** MARITIME MOBILE Mobile-satellite (Earth-to-space) 5.225A 5.226 5.228	**156.7625-156.7875** MARITIME MOBILE Mobile-satellite (Earth-to-space) 5.226 5.228	Maritime mobile service in accordance with ITU RR Article **31** and App.**18.**
156.7875-156.8125 MARITIME MOBILE (distress and calling) 5.111 5.226			**156.7875-156.8125** MARITIME MOBILE (distress and calling) 5.111 5.226	SAR and safety DSC in 156.8 MHz (ITU RR Article **31** and Appendix **15**).
156.8125-156.8375 MARITIME MOBILE Mobile-satellite (Earth-to-space) 5.111 5.226 5.228	**156.8125-156.8375** MARITIME MOBILE MOBILE SATELLITE (Earth-to-space) 5.111..5.226 5.228	**156.8125-156.8375** MARITIME MOBILE Mobile-satellite (Earth-to-space) 5.111 5.226 5.228	**156.8125-156.8375** MARITIME MOBILE Mobile-satellite (Earth-to-space) 5.111 5.226 5.228	Maritime mobile service in accordance with ITU RR Article **31** and App.**18.**

156.8375-235 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
156.8375-157.1875 FIXED MOBILE except aeronautical Mobile 5.226	**156.8375-157.1875** FIXED MOBILE 5.226		**156.8375-157.1875** FIXED MOBILE 5.226	Maritime mobile service in accordance with ITU RR Articles **31** and 52, and App.18.
157.1875-157.3375 FIXED MOBILE except aeronautical mobile Maritime mobile-satellite 5.208A 5.208B 5.228AB 5.228AC 5.226	**157.1875-157.3375** FIXED MOBILE Maritime mobile-satellite 5.208A 5.208B 5.228AB 5.228AC 5.226		**157.1875-157.3375** FIXED MOBILE Maritime mobile-satellite 5.208A 5.208B 5.228AB 5.226	Maritime mobile service in accordance with ITU RR Articles **31** and 52, and App.18.
157.3375-161.7875 FIXED MOBILE except aeronautical Mobile 5.226	**157.3375-161.7875** FIXED MOBILE 5.226		**157.3375-161.7875** FIXED MOBILE 5.226	Land mobile service in accordance with Band plan "148-174 MHz".
161.7875-161.9375 FIXED MOBILE except aeronautical mobile Maritime mobile-satellite 5.208A 5.208B 5.228AB 5.228AC 5.226	**161.7875-161.9375** FIXED MOBILE Maritime mobile-satellite 5.208A 5.208B 5.228AB 5.228AC 5.226		**161.7875-161.9375** FIXED MOBILE Maritime mobile-satellite 5.208A 5.208B 5.228AB 5.226	Land mobile service in accordance with Band plan "148-174 MHz". Channel No. 28 public correspondence from coast stations to ship stations (ITU RR App.**18**).
161.9375 – 161.9625 FIXED MOBILE except aeronautical mobile Maritime mobile-satellite (Earth-to-space) 5.228AA 5.226	**161.9375 – 161.9625** FIXED MOBILE Maritime mobile-satellite (Earth-to-space) 5.228AA 5.226		**161.9375 – 161.9625** FIXED MOBILE Maritime mobile-satellite (Earth-to-space) 5.228AA 5.226	Land mobile service in accordance with Band plan "148-174 MHz".
161.9625-161.9875 FIXED MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.228F 5.226 5.228A 5.228B	**161.9625-161.9875** AERONAUTICAL MOBILE (OR) MARITIME MOBILE MOBILE SATELLITE (Earth-to-space) 5.228C 5.228D	**161.9625-161.9875** MARITIME MOBILE Aeronautical mobile (OR) 5.228E Mobile-satellite (Earth-to-space) 5.228F 5.226	**161.9625-161.9875** MARITIME MOBILE Aeronautical mobile (OR) 5.228E Mobile-satellite (Earth-to-space) 5.228F 5.226	The use of the automatic identification (AID) system by AM(OR)S is limited to aircraft stations for the purpose of SAR, also MSS (↑) is limited to the reception of AID.
161.9875-162.0125 FIXED MOBILE except aeronautical mobile Maritime mobile-satellite (Earth-to-space) 5.228AA 5.226 5.229	**161.9875-162.0125** FIXED MOBILE Maritime mobile – satellite (Earth-to-space) 5.228AA 5.226		**161.9875-162.0125** FIXED MOBILE 5.226	Land mobile service in accordance with Band plan "148-174 MHz". Channel No. 28 public correspondence from coast stations to ship stations (ITU RR App.**18**).
162.0125-162.0375 FIXED MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.228F 5.226 5.229 5.228A 5.228B	**162.0125-162.0375** AERONAUTICAL MOBILE (OR) MARITIME MOBILE MOBILE SATELLITE (Earth-to-space) 5.228C 5.228D	**162.0125-162.0375** MARITIME MOBILE Aeronautical mobile (OR) 5.228E Mobile-satellite (Earth-to-space) 5.228F 5.226	**162.0125-162.0375** MARITIME MOBILE Aeronautical mobile (OR) 5.228E Mobile-satellite (Earth-to-space) 5.228F 5.226	The use of the automatic identification (AID) system by AM(OR)S is limited to aircraft stations for the purpose of SAR, also MSS (↑) is limited to the reception of AID.
162.0375-174 FIXED MOBILE except aeronautical mobile 5.226 5.229	**162.0375-174** FIXED MOBILE 5.226 5.230 5.231		**162.0375-174** FIXED MOBILE 5.226	Land mobile service in accordance with Band plan "148-174 MHz".

174-223 BROADCASTING 5.235 5.237 5.243	**174-216** BROADCASTING Fixed Mobile **216-220** FIXED MARITIME MOBILE Radiolocation 5.241 5.242 **220-225** AMATEUR` FIXED MOBILE Radiolocation 5.241	**174-223** FIXED MOBILE BROADCASTING 5.233 5.238 5.240 5.245	**174-223** BROADCASTING Fixed Mobile	VHF TV Band III based on 7 MHz channel spacing.
223-230 BROADCASTING Fixed Mobile 5.243 5.246 5.247	**225-235** FIXED MOBILE	**223-230** FIXED MOBILE BROADCASTING AERONAUTICAL RADIONAVIGATION Radiolocation 5.250	**223-230** BROADCASTING Fixed Mobile Radiolocation	VHF TV channel No. 8 (in the VHF TV Band III).
230-235 FIXED MOBILE 5.247 5.251 5.252		**230-235** FIXED MOBILE AERONAUTICAL RADIONAVIGATION 5.250	**230-235** FIXED MOBILE AERONAUTICAL RADIONAVIGATION	Conventional Fixed and land mobile services for defense purposes.

235-399.9 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
235-267 FIXED MOBILE 5.111 5.252 5.254 5.256 5.256A			**235-267** FIXED MOBILE 5.111 5.254 5.256	Conventional Fixed and land mobile services for defense purposes. SAR on 243 MHz (RR App. 13). AERO-SAR radiotelephony in the 243 MHz for communication with maritime and aeronautical stations. This frequency is being watched by mobile satellite service on-board. EPIRB in interaction with SAR.
267-272 FIXED MOBILE Space operation (space-to-Earth) 5.254 5.257			**267-272** FIXED MOBILE Space operation (space-to-Earth) 5.254 5.257	Conventional Fixed and land mobile services for defense purposes.
272-273 SPACE OPERATION (space-to-Earth) FIXED MOBILE 5.254			**272-273** SPACE OPERATION (space-to-Earth) FIXED MOBILE 5.254	Conventional Fixed and land mobile services for defense purposes.
273-312 FIXED MOBILE 5.254			**273-312** FIXED MOBILE 5.254	Conventional Fixed and land mobile services for defense purposes.
312-315 FIXED MOBILE Mobile-satellite (Earth-to-space) 5.254 5.255			**312-315** FIXED MOBILE Mobile-satellite (Earth-to-space) 5.254 5.255	Conventional Fixed and land mobile services for defense purposes.
315-322 FIXED MOBILE 5.254			**315-322** FIXED MOBILE 5.254	Conventional Fixed and land mobile services for defense purposes.
322-328.6 FIXED MOBILE RADIO ASTRONOMY 5.149			**322-328.6** FIXED MOBILE RADIO ASTRONOMY 5.149	Conventional Fixed and land mobile services for defense purposes.
328.6-335.4 AERONAUTICAL RADIONAVIGATION 5.258 5.259			**328.6-335.4** AERONAUTICAL RADIONAVIGATION 5.258	Limited to instrument landing (ILS) system in glide path (ICAO, Annex **10**, Vol. **1**, Chapter 3).
335.4-387 FIXED MOBILE 5.254			**335.4-387** FIXED MOBILE 5.254 PNG3	Defense fixed and mobile purposes.
387-390 FIXED MOBILE Mobile-satellite (space-to-Earth) 5.208A 5.254 5.255			**387-390** FIXED MOBILE Mobile-satellite (space-to-Earth) 5.208A 5.254 5.255 PNG3	Defense fixed and mobile purposes.
390-399.9 FIXED MOBILE 5.254			**390-399.9** FIXED MOBILE 5.254 PNG3	Defense fixed and mobile purposes.

399.9-410 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
399.9-400.05 MOBILE-SATELLITE (Earth-to-space) 5.209 5.220 5.260A 5.260B			**399.9-400.05** MOBILE-SATELLITE (Earth-to-space) 5.209 5.220	The mobile-satellite service is limited to non-GSO systems. Both services are effective until 1 January 2015.
400.05-400.15 STANDARD FREQUENCY AND TIME SIGNAL-SATELLITE (400.1 MHz) 5.261 5.262			**400.05-400.15** STANDARD FREQUENCY AND TIME SIGNAL-SATELLITE (400.1 MHz) 5.261	
400.15-401 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.209 SPACE RESEARCH (space-to-Earth) 5.263 Space operation (space-to-Earth) 5.262 5.264			**400.15-401** METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.209 SPACE RESEARCH (space-to-Earth) 5.263 Space operation (space-to-Earth) 5.264	Radiosondee NAVID, readout from balloon-borne radiosonde and readout from descending dropsonde.
401-402 METEOROLOGICAL AIDS SPACE OPERATION (space-to-Earth) EARTH EXPLORATION-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) Fixed Mobile except aeronautical mobile 5.264A 5.264B			**401-402** METEOROLOGICAL AIDS SPACE OPERATION (space-to-Earth) EARTH EXPLORATION-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space)	Radiosondee NAVID, readout from balloon-borne radiosonde and readout from descending dropsonde.
402-403 METEOROLOGICAL AIDS EARTH EXPLORATION-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) Fixed Mobile except aeronautical mobile 5.264A 5.264B			**402-403** METEOROLOGICAL AIDS EARTH EXPLORATION-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) FIXED MOBILE except aeronautical mobile PNG4	Fixed and land mobile service in accordance with "the 400 MHz band plan". Radiosonde, NAVID, readout from balloon-borne radiosonde and readout from descending dropsonde. Medical Implant in 402-405 MHz.
403-406 METEOROLOGICAL AIDS Fixed Mobile except aeronautical mobile 5.265			**403-406** METEOROLOGICAL AIDS FIXED MOBILE except aeronautical mobile 5.265 PNG4	Fixed and land mobile service in accordance with "the 400 MHz band plan". Radiosonde NAVID, readout from balloon-borne radiosonde and readout from descending dropsonde. Medical Implant in 402-405 MHz.
406-406.1 MOBILE-SATELLITE (Earth-to-space) 5.265 5.266 5.267			**406-406.1** MOBILE-SATELLITE (Earth-to-space) 5.265 5.266 5.267	COSPAS – SARSAT global satellite-based search and rescue system (ITU-R M.1478). EPIRB's service (ITU RR Article **31** and, App.s **13** and **15**).
406.1-410 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY 5.149 5.265			**406.1-410** FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY 5.149 5.265	Fixed and land mobile service in accordance with "the 400 MHz band plan".

410-460 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
410-420 FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-space) 5.268			**410-420** FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-space) 5.268	Fixed and land mobile service in accordance with "the 400 MHz band plan".
420-430 FIXED MOBILE except aeronautical mobile Radiolocation 5.269 5.270 5.271			**420-430** FIXED MOBILE except aeronautical mobile Radiolocation	Fixed and land mobile service in accordance with "the 400 MHz band plan".
430-432 AMATEUR RADIOLOCATION 5.271 5.274 5.275 5.276 5.277	**430-432** RADIOLOCATION Amateur 5.271 5.276 5.277 5.278 5.279		**430-432** RADIOLOCATION Amateur	Use of thisband by Amateur service is restricted to professional amateurs only.
432-438 AMATEUR RADIOLOCATION Earth exploration-satellite (active) 5.279A 5.138 5.271 5.276 5.277 5.280 5.281 5.282	**432-438** RADIOLOCATION Amateur Earth exploration-satellite (active) 5.279A 5.271 5.276 5.277 5.278 5.279 5.281 5.282		**432-438** RADIOLOCATION Amateur Earth exploration-satellite (active) 5.279A 5.282	Use of thisband by Amateur service is restricted to professional amateurs only.
438-440 AMATEUR RADIOLOCATION 5.271 5.274 5.275 5.276 5.277 5.283	**438-440** RADIOLOCATION Amateur 5.271 5.276 5.277 5.278 5.279		**438-440** RADIOLOCATION Amateur	Use of thisband by Amateur service is restricted to professional amateurs only.
440-450 FIXED MOBILE except aeronautical mobile Radiolocation 5.269 5.270 5.271 5.284 5.285 5.286			**440-450** FIXED MOBILE except aeronautical mobile Radiolocation 5.286	Fixed and land mobile service in accordance with "the 400 MHz band plan".
450-455 FIXED MOBILE 5.286AA 5.209 5.271 5.286 5.286A 5.286B 5.286C 5.286D 5.286E			**450-455** FIXED MOBILE 5.286AA 5.209 5.286 5.286A 5.286B 5.286C	Fixed and land mobile service in accordance with the "Public Cellular Band Plan".
455-456 FIXED MOBILE 5.286AA 5.209 5.271 5.286A 5.286B 5.286C 5.286E	**455-456** FIXED MOBILE 5.286AA MOBILE-SATELLITE (Earth-to-space) 5.286A 5.286B 5.286C 5.209	**455-456** FIXED MOBILE 5.286AA 5.209 5.271 5.286A 5.286B 5.286C 5.286E	**455-456** FIXED MOBILE 5.286AA 5.209 5.286A5.286B 5.286C	Fixed and land mobile service in accordance with the "Public Cellular Band Plan"
456-459 FIXED MOBILE 5.286AA 5.271 5.287 5.288			**456-459** FIXED MOBILE 5.286AA 5.287	Fixed and land mobile service in accordance with the "Public Cellular Band Plan".
459-460 FIXED MOBILE 5.286AA 5.209 5.271 5.286A 5.286B 5.286C 5.286E	**459-460** FIXED MOBILE 5.286AA MOBILE-SATELLITE (Earth-to-space) 5.286A 5.286B 5.286C 5.209	**459-460** FIXED MOBILE 5.286AA 5.209 5.271 5.286A 5.286B 5.286C 5.286E	**459-460** FIXED MOBILE 5.286AA 5.209 5.286A 5.286B 5.286C	Fixed and land mobile service in accordance with the "Public Cellular Band Plan".

460-890 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
460-470 FIXED MOBILE 5.286AA Meteorological-Satellite (space-to-Earth) 5.287 5.288 5.289 5.290			**460-470** FIXED MOBILE 5.286AA Meteorological-Satellite (space-to-Earth) 5.287 5.289	Fixed and land mobile service in accordance with the "Public Cellular Band Plan".
470- 694 BROADCASTING 5.149 5.291A 5.294 5.296 5.300 5.304 5.306 5.312	**470-512** BROADCASTING Fixed Mobile 5.292 5.293 5.295	**470-585** FIXED MOBILE 5.296A BROADCASTING 5.291 5.298	**470-526** FIXED MOBILE	UHF CBRS in the band 476.400 – 477.425MHz in accordance with document No. TR603.
	512-608 BROADCASTING 5.295 5.297		**526-585** BROADCASTING PNG5	UHF Television channels 28 to 34 in the band IV (526-606 MHz) using 8 MHz channel spacing.
	608-614 RADIO ASTRONOMY Mobile-satellite except aeronautical mobile-satellite (Earth-to-space)	**585-610** FIXED MOBILE 5.296A BROADCASTING RADIONAVIGATION 5.149 5.305 5.306 5.307	**585-610** BROADCASTING 5.149 5.306 5.307 PNG5	UHF Television channels 35 to 37 in the band IV (526-606 MHz) using 8 MHz channel spacing.
	614-698 BROADCASTING Fixed Mobile 5.293 5.308 5.308A 5.309	**610-890** FIXED MOBILE 5.296A 5.313A 5.317A BROADCASTING	**610-694** BROADCASTING PNG5	UHF Television channels 38 to 48 in the band V (606-694 MHz) using 8 MHz channel spacing.
694 – 790 MOBILE except aeronautical mobile 5.312A 5.317A BROADCASTING 5.300 5.311A 5.312	**698-806** MOBILE 5.317A BROADCASTING Fixed 5.293 5.309		**694-890** FIXED MOBILE 5.313A 5.317A	700 MHz Band for IMT according to APT FDD Plan (698 -806 MHz)
790-862 FIXED MOBILE except aeronautical mobile 5.316B 5.317A BROADCASTING 5.312 5.319	**806-890** FIXED MOBILE 5.317A BROADCASTING			Allocation for PPDR subject to the plan and assignment " in the 800 MHz band . .
862-890 FIXED MOBILE except aeronautical mobile 5.317A BROADCASTING 5.322 5.319 5.323	5.317 5.318	5.149 5.305 5.306 5.307 5.320	5.149 5.311A 5.320	

890-1 300 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
890-942 FIXED MOBILE except aeronautical mobile 5.317A BROADCASTING 5.322 Radiolocation 5.323	**890-902** FIXED MOBILE except aeronautical mobile 5.317A Radiolocation 5.318 5.325 **902-928** FIXED Amateur Mobile except aeronautical mobile 5.325A Radiolocation 5.150 5.325 5.326 **928-942** FIXED MOBILE except aeronautical mobile 5.317A Radiolocation 5.325	**890-942** FIXED MOBILE 5.317A BROADCASTING Radiolocation 5.327	**890-942** MOBILE 5.317A	Cellular mobile service subject to "the 900 MHz band plan" and the "Public Cellular Band Plan". ISM devices in the 915-925 MHz in accordance with "the 900 MHz band plan"
942-960 FIXED MOBILE except aeronautical mobile 5.317A BROADCASTING 5.322 5.323	**942-960** FIXED MOBILE 5.317A	**942-960** FIXED MOBILE 5.317A BROADCASTING 5.320	**942-960** MOBILE 5.317A 5.320	Cellular mobile service subject to "the 900 MHz band plan"
960-1 164 AERONAUTICAL RADIONAVIGATION 5.328 5.328AA AERONAUTICAL MOBILE (R) 5.327A			**960-1 164** AERONAUTICAL RADIONAVIGATION 5.328 5.328AA AERONAUTICAL MOBILE (R) 5.327A	DME (960 – 1215 MHz) and SSR in the paired bands 1025-1035 MHz/ 1085 – 1095 MHz. Airborne collision avoidance system (ACAS) supplementing SSR on the frequencies 1030 and 1090 MHz. Global Fight Tracking for Civil Aviation in the segment 1087.7 MHz – 1092.3 MHz
1 164-1 215 AERONAUTICAL RADIONAVIGATION 5.328 RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.328A			**1 164-1 215** AERONAUTICAL RADIONAVIGATION 5.328 RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.328A	DME (960 – 1215 MHz), SSR. GPS L5 link (ITU-R Rec. M.1088). GALILO E5a and E5b radionavigation satellite systems.
1 215-1 240 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			**1 215-1 240** EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to space) 5.328B 5.329 5.329A SPACE RESEARCH (active) 5.332	Primary radar stations on the ground in the band 1215 – 1400 MHz. GPS L2-signal on 1227.6 MHz (ITU-R Rec. M.1088).
1 240-1 300 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			**1 240-1 300** 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 5.332 5.335A	Primary radar stations on the ground in the band 1215 – 1400 MHz. GLONASS and GALILO radionavigation satellite systems. Use of thisband by Amateur service is restricted to professional amateurs only.

1 300-1 525 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
1 300-1 350 AERONAUTICAL RADIONAVIGATION 5.337 RADIOLOCATION RADIONAVIGATION SATELLITE (Earth-to-space) 5.149 5.337A			**1 300-1 350** AERONAUTICAL RADIONAVIGATION 5.337 RADIOLOCATION RADIONAVIGATION SATELLITE (Earth-to-space) 5.149 5.337A	Primary radar stations on the ground in the band 1215 – 1400 MHz. Ground-based radars and to associated airborne transponders (5.337).
1 350-1 400 FIXED MOBILE RADIOLOCATION 5.149 5.338 5.339	**1 350-1 400** RADIOLOCATION 5.149 5.334 5.339		**1 350-1 400** RADIOLOCATION 5.149 5.339	Primary radar stations on the ground in the band 1215 – 1400 MHz. GPS L3 link on 1379.913 MHz.
1 400-1 427 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341			**1 400-1 427** EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341	All emissions are prohibited in this band.
1 427-1 429 SPACE OPERATION (Earth-to-space) FIXED MOBILE except aeronautical mobile 5.341A 5.341B 5.341C 5.338A 5.341			**1 427-1 429** SPACE OPERATION (Earth-to-space) FIXED MOBILE except aeronautical mobile 5.341	Low capacity microwavepoint to point in 1427.9-1447.9/1475.9-1495.9 MHz. Also ITU-R Rec.s F1242 and F.701 applies.
1 429-1 452 FIXED MOBILE except aeronautical mobile 5.341A 5.338A 5.341 5.342	**1 429-1 452** FIXED MOBILE 5.341B 5.341C 5.343 5.338A 5.341		**1 429-1 452** FIXED MOBILE 5.341	Low capacity microwavepoint to point in 1427.9-1447.9/ 1475.9-1495.9MHz and 1447.9-1462.9/1495.9-1510.9 MHz. Also ITU-R Rec.s F1242 and F.701 applies.
1 452-1 492 FIXED MOBILE except aeronautical mobile 5.346 BROADCASTING BROADCASTING-SATELLITE 5.208B 5.341 5.342 5.345	**1 452-1 492** FIXED MOBILE 5.341B 5.343 5.346A BROADCASTING BROADCASTING-SATELLITE 5.208B 5.341 5.344 5.345		**1 452-1 492** FIXED MOBILE BROADCASTING 5.345 BROADCASTING-SATELLITE 5.345 5.347A 5.341	Low capacity microwavepoint to point in 1427.9-1447.9/1475.9-1495.9 MHz and in 1447.9-1462.9/1495.9-1510.9 MHz. Also ITU-R Rec.s F1242 and F.701 applies.
1 492-1 518 FIXED MOBILE except aeronautical mobile 5.341A 5.341 5.342	**1 492-1 518** FIXED MOBILE 5.341B 5.343 5.341 5.344	**1 492-1 518** FIXED MOBILE 5.341C 5.341	**1 492-1 518** FIXED MOBILE 5.341	Low capacity microwavepoint to point in 1427.9-1447.9/ 1475.9-1495.9 MHz and 1447.9-1462.9/1495.9-1510.9 MHz. Also ITU-R Rec.s F1242 and F.701 applies.
1 518-1 525 FIXED MOBILE except aeronautical mobile MOBILE-SATELLITE (space-to-Earth) 5.348 5.348A 5.348B 5.341 5.342	**1 518-1 525** FIXED MOBILE 5.343 MOBILE-SATELLITE (space-to-Earth) 5.348 5.348A 5.348B 5.341 5.344	**1 518-1 525** FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.348 5.348A 5.348B 5.341	**1 518-1 525** FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.348 5.341	Fixed service in accordance with ITU-R Rec. F.701.

1 525-1 610.6 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
1 525-1 530 SPACE OPERATION (space-to-Earth) FIXED MOBILE-SATELLITE (space-to-Earth) 5.351A Earth exploration-satellite Mobile except aeronautical mobile 5.349 5.341 5.342 5.350 5.351 5.352A 5.354	**1 525-1 530** SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.351A Earth exploration-satellite Fixed Mobile 5.343 5.341 5.351 5.354	**1 525-1 530** SPACE OPERATION (space-to-Earth) FIXED MOBILE-SATELLITE (space-to-Earth) 5.351A Earth exploration-satellite Mobile 5.349 5.341 5.351 5.352A 5.354	**1 525-1 530** SPACE OPERATION (space-to-Earth) FIXED MOBILE-SATELLITE (space-to-Earth) 5.351A Earth exploration-satellite Mobile 5.349 5.341 5.351 5.354	For fixed service, ITU-R Rec. F.701 applies. INMARSAT B, C, D, M, M4, mini M terminals
1 530-1 535 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.351A 5.353A Earth exploration-satellite Fixed Mobile except aeronautical mobile 5.341 5.342 5.351 5.354	**1 530-1 535** SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.351A 5.353A Earth exploration-satellite Fixed Mobile 5.343 5.341 5.351 5.354		**1 530-1 535** SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.351A 5.353A Earth exploration-satellite Fixed Mobile 5.341 5.351 5.354	INMARSAT B, C, D, M, M4, mini M terminals GMDSS distress, urgency and safety communications (in addition to routine non-safety communications) in the band 1530 – 1544 MHz (ITU RR App. **15**).
1 535-1 559 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			**1 535-1 559** MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A 5.341 5.351 5.353A 5.354 5.356 5.357 5.357A	INMARSAT B, C, D, M, M4, mini M terminals GMDSS distress, urgency and safety communications (in addition to routine non-safety communications) in the band 1530–1544 MHz (ITU RR App. **15**). Distress/safety operations and feeder links to relay EPIRB and narrow-band space-to-earth links from satellite to mobile station in maritime mobile-satellite service. GMDSS in the band 1544–1545 MHz (ITU RR Article **31** and App. **15**).
1 559-1 610 A ERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.208B 5.328B 5.329A 5.341			**1 559-1 610** AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.329A 5.341	GPS L1 link on 1575.42 MHz (ITU-R Rec. M.1088). GLONASS L1 link in the band 1602.5625 – 1615.5 MHz. GALILO L1 link in the band 1559 – 1591 MHz.
1 610-1 610.6 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION 5.341 5.355 5.359 5.363 5.364 5.366 5.367 5.368 5.369 5.371 5.372	**1 610-1 610.6** MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) 5.341 5.364 5.366 5.367 5.368 5.370 5.372	**1 610-1 610.6** MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Radiodetermination-satellite (Earth-to-space) 5.341 5.355 5.359 5.364 5.366 5.367 5.368 5.369 5.372	**1 610-1 610.6** MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION RADIODETERMINATION SATELLITE (Earth-to-space) 5.369 5.341 5.364 5.366 5.367 5.368 5.372	Airborne electronic aids to air navigation and any directly associated ground-based or satellite-borne facilities. Satellite personal communication systems (S-PCS).

1 610.6-1 668 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
1 610.6-1 613.8 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION 5.149 5.341 5.355 5.359 5.363 5.364 5.366 5.367 5.368 5.369 5.371 5.372	**1 610.6-1 613.8** MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) 5.149 5.341 5.364 5.366 5.367 5.368 5.370 5.372	**1 610.6-1 613.8** MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION Radiodetermination-satellite (Earth-to-space) 5.149 5.341 5.355 5.359 5.364 5.366 5.367 5.368 5.369 5.372	**1 610.6-1 613.8** MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) 5.369 5.149 5.341 5.364 5.366 5.367 5.368 5.372	Airborne electronic aids to air navigation and any directly associated ground-based or satellite-borne facilities. Satellite personal communication systems (S-PCS).
1 613.8-1 621.35 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to-Earth) 5.208B 5.341 5.355 5.359 5.363 5.364 5.365 5.366 5.367 5.368 5.369 5.371 5.372	**1 613.8-1 621.35** MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) Mobile-satellite (space-to-Earth) 5.208B 5.341 5.364 5.365 5.366 5.367 5.368 5.370 5.372	**1 613.8-1 621.35** MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to-Earth) 5.208B Radiodetermination-satellite (Earth-to-space) 5.341 5.355 5.359 5.364 5.365 5.366 5.367 5.368 5.369 5.372	**1 613.8-1 621.35** MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) 5.369 Mobile-satellite (space-to-Earth) 5.208B 5.341 5.364 5.365 5.366 5.367 5.368 5.372	Airborne electronic aids to air navigation and any directly associated ground-based or satellite-borne facilities. Satellite personal communication systems (S-PCS).
1 621.35-1 626.5 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 5.368 5.369 5.371 5.372	**1 621.35-1 626.5** 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 5.364 5.365 5.366 5.367 5.368 5.370 5.372	**1 621.35-1 626.5** 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) Radiodetermination-satellite (Earth-to-space) 5.208B 5.341 5.355 5.359 5.364 5.365 5.366 5.367 5.368 5.369 5.371 5.372	**1 621.35-1 626.5** MARITIME MOBILE-SATELLITE (space-to-Earth) 5.373 5.373A MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) 5.369 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 5.368 5.369 5.371 5.372	Airborne electronic aids to air navigation and any directly associated ground-based or satellite-borne facilities. Satellite personal communication systems (S-PCS).
1 626.5-1 660 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) 5.351A		**1 626.5-1 660** MOBILE-SATELLITE (Earth-to-space) 5.351A 5.341 5.351 5.353A 5.354 5.357A 5.375 5.376	Terminals of space radiocom systems providing either data communications or both voice and data communications. GMDSS distress, urgency and safety communications (in addition to routine non-safety communications) in the band 1626.5 – 1645.5 MHz (ITU RR App. **15**). Distress and safety operations and feeder links to relay EPIRB and narrow-band space-to-earth links from satellite to mobile station in maritime mobile-satellite service (GMDSS) in the band 1645.5 – 1646.5 MHz (ITU RR Article **31** and App.**15**). INMARSAT B, C, D, M, M4, mini M terminals.
1 660-1 660.5 5.149 5.341 5.351 5.354 5.362A 5.376[a]	MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY		**1 660-1 660.5** MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY 5.149 5.341 5.351 5.354 5.376A	End-user stations (terminals) of space radiocommunication systems providing either data communications or both voice and data communications. INMARSAT B, C, D, M, M4, mini M terminals.

1 660.5-1 668	RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149 5.341 5.379 5.379A	**1 660.5-1 668** RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149 5.341 5.379A	

1 668-1 710 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
1 668-1 668.4 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			**1 668-1 668.4** 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 5.379A	
1 668.4-1 670 METEOROLOGICAL AIDS FIXED MOBILE except aeronautical mobile MOBILE-SATELLITE (Earth-to-space) 5.379B 5.379C RADIO ASTRONOMY 5.149 5.341 5.379D 5.379E			**1 668.4-1 670** METEOROLOGICAL AIDS FIXED MOBILE except aeronautical mobile MOBILE-SATELLITE (Earth-to-space) 5.379B 5.379C RADIO ASTRONOMY 5.149 5.341 5.379D	Direct data readout from balloon-borne radiosonde in the band 1668.4 – 1700 MHz. Radiosonde radio direction finding (RDF) (ITU-R Rec. SA.1262).
1 670-1 675 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE 5.380 MOBILE-SATELLITE (Earth-to-space) 5.379B 5.341 5.379D 5.379E 5.380A			**1 670-1 675** METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE 5.380 MOBILE-SATELLITE (Earth-to-space) 5.379B 5.341 5.379D 5.380A	Direct data readout from balloon-borne radiosonde in the band 1668.4 – 1700 MHz. Radiosonde radio direction finding (RDF) (ITU-R Rec. SA.1262) Worldwide aeronautical public correspondence.
1 675-1 690 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.341			**1 675-1 690** METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.341	Direct data readout from balloon-borne radiosonde in the band 1668.4 – 1700 MHz. Radiosonde radio direction finding (RDF) (ITU-R Rec. SA.1262). Fixed earth stations for reception of raw image data, data collection data and spacecraft telemetry from GSO meteorological satellites (ITU-R Rec. SA.1158).
1 690-1 700 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) Fixed Mobile except aeronautical mobile 5.289 5.341 5.382	**1 690-1 700** METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) 5.289 5.341 5.381		**1 690-1 700** METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) 5.289 5.341	Direct data readout from balloon-borne radiosonde in the band 1668.4 – 1700 MHz. User stations for direct readout services from GSO MetSat in thee band 1690–1698 MHz and from Non-GSO MetSat in the band 1698 – 1710 MHz (ITU-R SA.1158).
1 700-1 710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.289 5.341	**1 700-1 710** FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.289 5.341 5.384		**1 700-1 710** FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.289 5.341	User stations for direct readout services and prerecorded image data from Non-GSO MetSat in the band 1698 – 1710 MHz (ITU-R Rec. SA.1158). Fixed service in the bands 1.8 GHz and 1.9 GHz bands (ITU-R Rec. F.701, F.382 and F.283).

1 710-2 170 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
1 710-1 930 FIXED MOBILE 5.384A 5.388A 5.388B 5.149 5.341 5.385 5.386 5.387 5.388			**1 710-1 930** FIXED MOBILE 5.384A 5.388A 5.149 5.341 5.385 5.388	GSM systems in the band 1710-1785 MHz/1805-1880 MHz. Designated for IMT in the bands mentioned in No. 5.388 Fixed service are available outside the "IMT Plan".
1 930-1 970 FIXED MOBILE 5.388A 5.388B 5.388	**1 930-1 970** FIXED MOBILE 5.388A 5.388B Mobile-satellite (Earth-to-space) 5.388	**1 930-1 970** FIXED MOBILE 5.388A 5.388B 5.388	**1 930-1 970** MOBILE 5.388A 5.388	Designated for IMT in the bands mentioned in No. 5. 388 in accordance with "IMT plan". Fixed service are available outside the IMT usage
1 970-1 980 FIXED MOBILE 5.388A 5.388B 5.388			**1 970-1 980** MOBILE 5.388A 5.388	Designated for IMT in the bands mentioned in No. 5. 388 .
1 980-2 010 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.351A 5.388 5.389A 5.389B 5.389F			**1 980-2 010** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.351A 5.388 5.389A	Satellite component of IMT-2000 subject to coordination under No. 9.11A.
2 010-2 025 FIXED MOBILE 5.388A 5.388B 5.388	**2 010-2 025** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.388 5.389C 5.389E	**2 010-2 025** FIXED MOBILE 5.388A 5.388B 5.388	**2 010-2 025** MOBILE 5.388A 5.388	Designated for IMT in the bands mentioned in No. 5. 388
2 025-2 110 SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (Earth-to-space) (space-to-space) 5.392			**2 025-2 110** SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (Earth-to-space) (space-to-space) 5.392	High density mobile systems are not permitted. Low capacity microwave links in the 1.8 GHz, 1.9 GHz bands in accordance with ITU-R Rec. F.701, F.382, F.283 and F.1098.
2 110-2 120 FIXED MOBILE 5.388A 5.388B SPACE RESEARCH (deep space) (Earth-to-space) 5.388			**2 110-2 120** MOBILE 5.388A 5.388	Designated for IMT in the bands mentioned in No. 5. 388
2 120-2 160 FIXED MOBILE 5.388A 5.388B 5.388	**2 120-2 160** FIXED MOBILE 5.388A 5.388B Mobile-satellite (space-to-Earth) 5.388	**2 120-2 160** FIXED MOBILE 5.388A 5.388B 5.388	**2 120-2 160** MOBILE 5.388A 5.388	Designated for IMT in the bands mentioned in No. 5. 388 in accordance with the Relevant Band Plans
2 160-2 170 FIXED MOBILE 5.388A 5.388B 5.388	**2 160-2 170** FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.388 5.389C 5.389E	**2 160-2 170** FIXED MOBILE 5.388A 5.388B 5.388	**2 160-2 170** MOBILE 5.388A 5.388	Designated for IMT in the bands mentioned in No. 5. 388

2 170-2 520 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
2 170-2 200 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A 5.388 5.389A 5.389F			**2 170-2 200** FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A 5.388 5.389A	Satellite component of IMT-2000 subject to coordination under No. 9.11A. Low capacity microwave links in the 2.1 GHz, 2.2 GHz bands in accordance with ITU-R Rec. F.701, F.382, F.283 and F.1098.
2 200-2 290 SPACE OPERATION (space-to-Earth) (space-to-space) EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (space-to-Earth) (space-to-space) 5.392			**2 200-2 290** SPACE OPERATION (space-to-Earth) (space-to-space) EARTH EXPLORATION- SATELLITE (space-to-Earth) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (space-to-Earth) (space-to-space) 5.392	Low capacity microwave links in the 2.1 GHz, 2.2 GHz bands in accordance with ITU-R Rec. F.701, F.382, F.283 and F.1098. High density mobile systems are not permitted.
2 290-2 300 FIXED MOBILE except aeronautical mobile SPACE RESEARCH (deep space) (space-to-Earth)			**2 290-2 300** FIXED MOBILE except aeronautical mobile SPACE RESEARCH (deep space) (space-to-Earth)	Low capacity microwave links in the 2.1 GHz, 2.2 GHz bands in accordance with ITU-R Rec. F.701, F.382, F.283, F.1098 and F.1243.
2 300-2 450 FIXED MOBILE Amateur Radiolocation 5.150 5.282 5.395	**2 300-2 450** FIXED MOBILE RADIOLOCATION Amateur 5.150 5.282 5.393 5.394 5.396		**2 300-2 450** FIXED MOBILE RADIOLOCATION Amateur 5.150 5.282 5.396	The band 2300-2400 MHz designated for IMT advanced in accordance with "IMT Plan" for high-density applications. Amateur service is restricted to professional amateurs only. 2.4 GHz (2400 – 2483.5 MHz) ISM band. LPD devices are permited to use this band subject to comply with given standards.
2 450-2 483.5 FIXED MOBILE Radiolocation 5.150	**2 450-2 483.5** FIXED MOBILE RADIOLOCATION 5.150		**2 450-2 483.5** FIXED MOBILE RADIOLOCATION 5.150	2.4 GHz (2400 – 2483.5 MHz) ISM band. LPD devices are permited to use this band subject to comply with given standards.
2 483.5-2 500 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A RADIODETERMINATION- SATELLITE (space-to-Earth) 5.398 Radiolocation 5.398A 5.150 5.399 5.401 5.402	**2 483.5-2 500** FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A RADIOLOCATION RADIODETERMINATION- SATELLITE (space-to-Earth) 5.398 5.150 5.402	**2 483.5-2 500** FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A RADIOLOCATION RADIODETERMINATION- SATELLITE (space-to-Earth) 5.398 5.150 5.401 5.402	**2 483.5-2 500** FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A RADIOLOCATION RADIODETERMINATION- SATELLITE (space-to-Earth) 5.398 5.150 5.401 5.402	Low capacity microwave links in the 2.4 GHz, 2.48 GHz bands in accordance with ITU-R Rec. F.701, F.1243 and F.746. ISM band, up to 2.5 GHz SAP/SAB and ENG/OB (temporary application).
2 500-2 520 FIXED 5.410 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (space-to-Earth) 5.351A 5.403 5.407 5.412 5.414	**2 500-2 520** FIXED FIXED-SATELLITE (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (space-to-Earth) 5.351A 5.403 5.404 5.407 5.414 5.415A		**2 500-2 520** FIXED MOBILE except aeronautical mobile 5.384A 5.414 5.415	The band 2.5-2.69 GHz designted for implementation of LTE systems, in accordance with the "Public Cellular Band Plan".

2 520-2 700 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
2 520-2 655 FIXED 5.410 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416	**2 520-2 655** FIXED 5.410 FIXED-SATELLITE (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416	**2 520-2 535** FIXED 5.410 FIXED-SATELLITE (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.403 5.414A 5.415A	**2 520-2 535** FIXED MOBILE except aeronautical mobile 5.384A 5.403 5.415 5.416	The band 2.5-2.69 GHz designted for implementation of IMT systems. SAP/SAB and ENG/OB in the band 2520 – 2670 MHz (temporary application).
5.339 5.412 5.418B 5.418C	5.339 5.418B 5.418C	**2 535-2 655** FIXED 5.410 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.339 5.418 5.418A 5.418B 5.418C	**2 535-2 655** FIXED MOBILE except aeronautical mobile 5.384A 5.339 5.416 5.418C	The band 2.5-2.69 GHz designted for implementation of IMT systems. SAP/SAB and ENG/OB in the band 2520 – 2670 MHz (temporary application).
2 655-2 670 FIXED 5.410 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.347A 5.413 5.416 Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.412 5.420	**2 655-2 670** FIXED FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.347A 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.347A 5.413 5.416 Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.420	**2 655-2 670** FIXED FIXED-SATELLITE (Earth-to-space) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.347A 5.413 5.416 Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.420	**2 655-2 670** FIXED MOBILE except aeronautical mobile 5.384A 5.149 5.415 5.416 5.420	The band 2.5-2.69 GHz designted for implementation of IMT systems. SAP/SAB and ENG/OBTS in the band 2520 – 2670 MHz (temporary application).
2 670-2 690 FIXED 5.410 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (Earth-to-space) 5.351A Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.412 5.419 5.420	**2 670-2 690** FIXED FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.347A 5.415 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (Earth-to-space) 5.351A Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.419 5.420	**2 670-2 690** FIXED FIXED-SATELLITE (Earth-to-space) 5.415 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (Earth-to-space) 5.351A Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.419 5.420	**2 670-2 690** FIXED MOBILE except aeronautical mobile 5.384A 5.149 5.415 5.419 5.420	The band 2.5-2.69 GHz designted for implementation of IMT systems.
2 690-2 700 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.422			**2 690-2 700** EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	All emissions are prohibited in this band.

2 700-4 400 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
2 700-2 900 AERONAUTICAL RADIONAVIGATION 5.337 Radiolocation 5.423 5.424			**2 700-2 900** AERONAUTICAL RADIONAVIGATION 5.337 Radiolocation 5.423	Ground-based 10 cm (S-band) long-range surveillance primary radar and associated airborne transponders in accordance to ICAO Annex 10, Vol.1, chapter 3.
2 900-3 100 RADIOLOCATION 5.424A RADIONAVIGATION 5.426 5.425 5.427			**2 900-3 100** RADIOLOCATION 5.424A RADIONAVIGATION 5.426 5.425 5.427	Ground-based 10 cm (S-band) long-range surveillance primary radar and associated airborne transponders in accordance to ICAO Annex 10, Vol.1, chapter 3. Maritime SIT and RACON S-band radars.
3 100-3 300 RADIOLOCATION Earth exploration-satellite (active) Space research (active) 5.149 5.428			**3 100-3 300** RADIOLOCATION Earth exploration-satellite (active) Space research (active) 5.149	Ground-based 10 cm (S-band) long-range surveillance primary radar and associated airborne transponders in accordance to ICAO Annex 10, Vol.1, chapter 3. High power shipboard and airborne radars for searching, tracking and surveillance in the band 3100 – 3600 MHz.
3 300-3 400 RADIOLOCATION 5.149 5.429 5.429A 5.429B 5.430	**3 300-3 400** RADIOLOCATION Amateur Fixed Mobile 5.149 5.429C 5.429D	**3 300-3 400** RADIOLOCATION Amateur 5.149 5.429 5.429E 5.429F	**3 300-3 400** RADIOLOCATION Amateur 5.149	High power shipboard and airborne radars for searching, tracking and surveillance in the band 3100 – 3600 MHz. Amateur service is restricted to professional amateurs only.
3 400-3 600 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.430A Radiolocation 5.431	**3 400-3 500** FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.431A 5.431B Amateur Radiolocation 5.433 5.282	**3 400-3 500** FIXED FIXED-SATELLITE (space-to-Earth) Amateur Mobile 5.432 5.432B Radiolocation 5.433 5.282 5.432A	**3 400-3 500** FIXED Amateur Mobile 5.282 5.433	The band 3400-3600 MHz designated for high-density fixed and mobile systems. Amateur service is restricted to professional amateurs only.
	3 500-3 600 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.431B Radiolocation 5.433	**3 500-3 600** FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.433A Radiolocation 5.433	**3 500-3 600** FIXED MOBILE except aeronautical mobile	The band 3400-3600 MHz designated for high-density fixed and mobile systems".
3 600-4 200 FIXED FIXED-SATELLITE (space-to-Earth) Mobile	**3 600 – 3 700** FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.434 Radiolocation 5.433	**3 600-3 700** FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile Radiolocation 5.435	**3 600-3 700** FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile Radiolocation	Microwave links in the 4 GHz band in accordance with ITU-R Rec. F.635 and F.382. Point-to-multipoint access network (MDS) (Annex 4 in ITU-R Rec. F.755). Frequency block arrangement in accordance with ITU-R Rec. F.1488.
	3 700-4 200 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile		**3 700-4 200** FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile	Microwave links in the 4 GHz band in accordance with ITU-R Rec. F.635 and F.382. point-to-multipoint access network (MDS) (Annex 4 in ITU-R Rec. F.755). Frequency block arrangement in accordance with ITU-R Rec. F.1488.
4 200-4 400 AERONAUTICAL MOBILE (R) 5.436 AERONAUTICAL RADIONAVIGATION 5.438 5.437 5.439 5.440			**4 200-4 400** AERONAUTICAL RADIONAVIGATION 5.438 5.440 AERONAUTICAL MOBILE (R) 5.436	Reserved for radio altimeters installed on board aircraft and for the associated transponders on the ground (5.438). This band is also allocated for exclusive use by wireless avionics-intracommunication (5.436)

2 700-5 150 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
4 400-4 500 FIXED MOBILE 5.440A			**4 400-4 500** FIXED MOBILE	Microwave links in the 4.7 GHz band in accordance with ITU-R Rec. F.746 and F.1099.SAP/SAB and ENG/OB in the band 4400 – 5000 MHz (temporary application).
4 500-4 800 FIXED FIXED-SATELLITE (space-to-Earth) 5.441 MOBILE 5.440A			**4 500-4 800** FIXED FIXED-SATELLITE (space-to-Earth) 5.441 MOBILE 5.440A	Microwave links in the 4.7 GHz band in accordance with ITU-R Rec. F.746 and F.1099. SAP/SAB and ENG/OB in the band 4400 – 5000 MHz (temporary application). National PNG00000 planned beam at 154.1° degree in GSO orbit with the boresight at 148.40° E Longitude and -6.60° N latitude in the band 4500 – 4800 MHz (ITU RR App. **30B**).
4 800-4 990 FIXED MOBILE 5.440A 5.441A 5.441B 5.442 Radio astronomy 5.149 5.339 5.443			**4 800-4 990** FIXED MOBILE 5.442 Radio astronomy 5.149 5.339	Microwave links in the 4.7 GHz band in accordance with ITU-R Rec. F.746 and F.1099. SAP/SAB and ENG/OB in the band 4400 – 5000 MHz (temporary application).
4 990-5 000 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY Space research (passive) 5.149			**4 990-5 000** FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY Space research (passive) 5.149	Microwave links in the 4.7 GHz band in accordance with ITU-R Rec. F.746 and F.1099.
5 000-5 010 AERONAUTICAL MOBILE SATELLITE (R) 5.443AA AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (Earth-to-space)			**5 000-5 010** AERONAUTICAL MOBILE SATELLITE (R) 5.443AA AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (Earth-to-space)	Internationally standardized aeronautical mobile satellite systems.
5 010-5 030 AERONAUTICAL MOBILE SATELLITE (R) 5.443AA AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-space) 5.328B 5.443B			**5 010-5 030** AERONAUTICAL MOBILE SATELLITE (R) 5.443AA AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-space) 5.328B 5.443B	Internationally standardized aeronautical mobile satellite systems.
5 030-5 091 AERONAUTICAL MOBILE (R) 5.443C AERONAUTICAL MOBILE SATELLITE (R) 5.443D AERONAUTICAL RADIONAVIGATION 5.444			**5 030-5 091** AERONAUTICAL MOBILE (R) 5.443C AERONAUTICAL MOBILE SATELLITE (R) 5.443D AERONAUTICAL RADIONAVIGATION 5.444	MLS for precision approach and landing has prority over other uses of this band (5.444). Internationally standardized aeronautical mobile and aeronautical mobile satellite systems. DME system.
5 091-5 150 FIXED-SATELLITE (Earth- to- space) 5.444A AERONAUTICAL MOBILE 5.444B AERONAUTICAL MOBILE SATELLITE (R) 5.443AA AERONAUTICAL RADIONAVIGATION 5.444			**5 091-5 150** AERONAUTICAL MOBILE 5.444B AERONAUTICAL MOBILE SATELLITE (R) 5.443AA AERONAUTICAL RADIONAVIGATION 5.444 5.444A	Microwave landing system (MLS) for precision approach and landing (see ITU-R Rec. M.1582 and Res. **114**).

5 150-5 470 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
5 150-5 250 FIXED-SATELLITE (Earth-to-space) 5.447A MOBILE except aeronautical mobile 5.446A 5.446B AERONAUTICAL NAVIGATION 5.446 5.446C 5.446D 5.447 5.447B 5.447C			**5 150-5 250** AERONAUTICAL RADIONAVIGATION FIXED-SATELLITE (Earth-to-space) 5.447A MOBILE except aeronautical mobile 5.446A 5.446B 5.446 5.447B 5.447C	HIPERLAN indoor applications (under LPD category) in the band 5150 – 5250 MHz with a maximum mean e.i.r.p. of 200 mW (see ITU-R Res.**229**).
5 250-5 255 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH 5.447D MOBILE except aeronautical mobile 5.446A 5.447F 5.447E 5.448 5.448A			**5 250-5 255** EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH 5.447D FIXED 5.447E MOBILE except aeronautical mobile 5.446A 5.447F 5.448A	FWA systems in fixed service and stations in mobile service shall not claim protection from the other services in the band 5 250-5 350 MHz (see 5.447E and 5.447F for details) HIPERLAN in the band 5250 – 5350 MHz with a max. mean e.i.r.p. of 200 mW for indoor and 1 W for outdoor applications (ITU-R Res.**229**).
5 255- 5 350 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) MOBILE except aeronautical mobile 5.446A 5.447F 5.447E 5.448 5.448A			**5 255- 5 350** EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) FIXED 5.447E MOBILE except aeronautical mobile 5.446A 5.447F 5.448A	HIPERLAN in the band 5250 – 5350 MHz with a max. mean e.i.r.p. of 200 mW for indoor and 1 W for outdoor applications (ITU-R Res.**229**). FWA systems in fixed service and stations in mobile service shall not claim protection from the other serices in the band 5 250-5 350 MHz (see 5.447E and 5.447F for details).
5 350-5 460 EARTH EXPLORATION-SATELLITE (active) 5.448B SPACE RESEARCH (active) 5.448C AERONAUTICAL RADIONAVIGATION 5.449 RADIOLOCATION 5.448D			**5 350-5 460** EARTH EXPLORATION-SATELLITE (active) 5.448B SPACE RESEARCH (active) 5.448C AERONAUTICAL RADIONAVIGATION 5.449 RADIOLOCATION 5.448D	Aeronautical navigation service limited to airborne radars and associated airborne beacons in the band 5350 – 5470 MHz.
5 460-5 470 RADIONAVIGATION 5.449 EARTH EXPLORATION-SATELLITE (active) 5.448B SPACE RESEARCH (active) 5.448C RADIOLOCATION 5.448D 5.448B			**5 460-5 470** RADIONAVIGATION 5.449 EARTH EXPLORATION-SATELLITE (active) 5.448B SPACE RESEARCH (active) 5.448C RADIOLOCATION 5.448D 5.448B	Aeronautical navigation service limited to airborne radars and associated airborne beacons in the band 5350 – 5470 MHz.
5 470-5 570 MARITIME RADIONAVIGATION MOBILE except aeronautical mobile 5.446A 5.450A EARTH EXPLORATION-SATELLITE (active) SPACE RESEARCH (active) RADIOLOCATION 5.450B 5.448B 5.450 5.451			**5 470-5 570** MARITIME RADIONAVIGATION MOBILE except aeronautical mobile 5.446A 5.450A EARTH EXPLORATION-SATELLITE (active) SPACE RESEARCH (active) RADIOLOCATION 5.450B 5.448B	For the conditions of sharing between WAS, including RLANs, and the EESS (active) in this band see ITU-R Rec. M.1653. In the band 5470-5725 MHz, mobile service shall be restricted to a maximum TX power of 250 mW with a maximum mean e.i.r.p. of 1W and a maximum mean e.i.r.p. density of 50 mW/MHz in any 1 MHz band (ITU RR Res. **229**).
5 460-5 470 RADIONAVIGATION 5.449 EARTH EXPLORATION-SATELLITE (active) SPACE RESEARCH (active) RADIOLOCATION 5.448D 5.448B			**5 460-5 470** RADIONAVIGATION 5.449 EARTH EXPLORATION-SATELLITE (active) SPACE RESEARCH (active) RADIOLOCATION 5.448D 5.448B	Aeronautical navigation service limited to airborne radars and associated airborne beacons in the band 5350 – 5470 MHz. In the band 5470-5725 MHz, mobile service shall be restricted to a maximum TX power of 250 mW with a maximum mean e.i.r.p. of 1W and a maximum mean e.i.r.p. density of 50 mW/MHz in any 1 MHz band (ITU RR Res. **229**).

5 470-6 700 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
5 470-5 570 MARITIME RADIONAVIGATION MOBILE except aeronautical mobile 5.446A 5.450A EARTH EXPLORATION-SATELLITE (active) SPACE RESEARCH (active) RADIOLOCATION 5.450B 5.448B 5.450 5.451			**5 470-5 570** MARITIME RADIONAVIGATION MOBILE except aeronautical mobile 5.446A 5.450A EARTH EXPLORATION- SATELLITE (active) SPACE RESEARCH (active) RADIOLOCATION 5.450B 5.448B	In the band 5470-5725 MHz, mobile service shall be restricted to a maximum TX power of 250 mW with a maximum mean e.i.r.p. of 1W and a maximum mean e.i.r.p. density of 50 mW/MHz in any 1 MHz band (ITU RR Res. **229**).
5 570-5 650 MARITIME RADIONAVIGATION MOBILE except aeronautical mobile 5.446A 5.450A RADIOLOCATION 5.450B 5.450 5.451 5.452			**5 570-5 650** MARITIME RADIONAVIGATION MOBILE except aeronautical mobile 5.446A 5.450A RADIOLOCATION 5.450B 5.452	In the band 5470-5725 MHz, mobile service shall be restricted to a maximum TX power of 250 mW with a maximum mean e.i.r.p. of 1W and a maximum mean e.i.r.p. density of 50 mW/MHz in any 1 MHz band (ITU RR Res. **229**). Ground-based meterologicl radar in the band 5600-5650 MHz for weather services (5.452).
5 650-5 725 RADIOLOCATION MOBILE except aeronautical mobile 5.446A 5.450A Amateur Space research (deep space) 5.282 5.451 5.453 5.454 5.455			**5 650-5 725** RADIOLOCATION MOBILE except aeronautical mobile 5.446A 5.450A Amateur Space research (deep space) 5.282	In the band 5470-5725 MHz, mobile service shall be restricted to a maximum TX power of 250 mW with a maximum mean e.i.r.p. of 1W and a maximum mean e.i.r.p. density of 50 mW/MHz in any 1 MHz band (ITU-R Res. **229**). Use of thisband by Amateur service is restricted to professional amateurs only.
5 725-5 830 FIXED-SATELLITE (Earth-to-space) RADIOLOCATION Amateur 5.150 5.451 5.453 5.455	**5 725-5 830** RADIOLOCATION Amateur 5.150 5.453 5.455		**5 725-5 830** RADIOLOCATION Amateur 5.150	5.8 GHz ISM band (5725-5 875 MHz).
5 830-5 850 FIXED-SATELLITE (Earth-to-space) RADIOLOCATION Amateur Amateur-satellite (space-to-Earth) 5.150 5.451 5.453 5.455	**5 830-5 850** RADIOLOCATION Amateur Amateur-satellite (space-to-Earth) 5.150 5.453 5.455		**5 830-5 850** RADIOLOCATION Amateur Amateur-satellite (space-to-Earth) 5.150	Use of this band by Amateur service is restricted to professional amateurs only. 5.8 GHz ISM band (5725-5 875 MHz).
5 850-5 925 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.150	**5 850-5 925** FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Amateur Radiolocation 5.150	**5 850-5 925** FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Radiolocation 5.150	**5 850-5 925** FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Radiolocation 5.150	Microwave links in the 6 GHz band in accordance with ITU-R Rec. F.3835.8 GHz ISM band (up to 5875 MHz).
5 925-6 700 FIXED 5.457 FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B MOBILE 5.149 5.440 5.458			**5 925-6 700** FIXED 5.457 FIXED-SATELLITE (Earth-to-space) 5.457A MOBILE 5.149 5.440 5.458	Microwave links in the 6 GHz and 6.5 GHz bands in accordance with ITU-R Rec. F.383 and F.384 (see *noting a)*, ITU- R Res. **902**). VSAT uplink in the band 5925 – 6725 MHz. See ITU-R Res. **902** for licensing Earth stations on board vessels (ESV) in the band 5925–6425 MHz.

6 700-7 900 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
6 700-7 075 FIXED FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.441 MOBILE 5.458 5.458A 5.458B			**6 700-7 075** FIXED FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.441 MOBILE 5.458 5.458A 5.458B	Microwave links in the 6.5 GHz and 7 GHz bands in accordance with ITU-R Rec. F.384 and F.385. National PNG00000 planned beam at 154.10° degree in GSO orbit with the boresight at 148.40° Longitude and -6.6° latitude in the band 6725 – 7025 MHz (ITU-R App. **30B**).
7 075-7 145 FIXED MOBILE 5.458 5.459			**7 075-7 145** FIXED MOBILE 5.458	Microwave links in the 6.5 GHz and 7 GHz bands in accordance with ITU-R Rec. F.384 and F.385.
7 145 – 7 190 FIXED MOBILE SPACE RESEARCH (deep space) (Earth–to–space) 5.458 5.459			**7 145 – 7 190** FIXED MOBILE SPACE RESEARCH (deep space) (Earth–to–space) 5.458 5.459	Microwave links in the 7.4 GHz band in accordance with ITU-R Rec. F.385
7 190-7 235 EARTH EXPLORATION SATELLITE (Earth-to-Space) 5.460A 5.460B FIXED MOBILE SPACE RESEARCH (Earth-to-space) 5.460 5.458 5.459			**7 190-7 235** EARTH EXPLORATION SATELLITE (Earth-to-space) 5.460A FIXED MOBILE SPACE RESEARCH (Earth-to-space) 5.460 5.458	Microwave links in the 7.4 GHz band in accordance with ITU-R Rec. F.385
7 235-7 250 EARTH EXPLORATION SATELLITE (Earth-to-Space) 5.460A FIXED MOBILE 5.458			**7 235-7 250** FIXED MOBILE 5.458	Microwave links in the 7.4 GHz band in accordance with ITU-R Rec. F.385.
7 250-7 300 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE 5.461			**7 250-7 300** FIXED FIXED-SATELLITE (space-to-Earth) MOBILE 5.461	Microwave links in the 7.2 GHz and 7.4 GHz band in accordance with ITU-R Rec. F.385.
7 300-7 375 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except Aeronautical mobile 5.461			**7 300-7 375** FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except Aeronautical mobile 5.461	Microwave links in the 7.2 GHz and 7.4 GHz band in accordance with ITU-R Rec. F.385.
7 375-7 450 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile MARITIME MOBILE-SATELLITE (space-to-Earth) 5.461AA 5.461AB			**7 375-7 450** FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.461	Microwave links in the 7.2 GHz and 7.4 GHz band in accordance with ITU-R Rec. F.385.
7 450-7 550 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			**7 450-7 550** FIXED FIXED-SATELLITE (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.461A	Microwave links in the 7.2 GHz and 7.4 GHz band in accordance with ITU-R Rec. F.385.
7 550-7 750 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile MARITIME MOBILE- SATELLITE (space-to-Earth) 5.461AA 5.461AB			**7 550-7 750** FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile	Microwave links in the 7 GHz and 8 GHz band in accordance with ITU-R Rec. F.385 and F.386.

7 750-7 850	FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) 5.461B MOBILE except aeronautical mobile	**7 750-7 850** FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) 5.461B MOBILE except aeronautical mobile	Microwave links in the 7 GHz and 8 GHz band in accordance with ITU-R Rec. F.385 and F.386.
7 850-7 900	FIXED MOBILE except aeronautical mobile	**7 850-7 900** FIXED MOBILE except aeronautical mobile	Microwave links in the 7 GHz and 8 GHz band in accordance with ITU-R Rec. F.385 and F.386.

7 900-9 000 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
7 900-8 025 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.461			**7 900-8 025** FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.461	Microwave links in the 8 GHz and 8.15 GHz bands in accordance with ITU-R Rec. F.386.
8 025-8 175 EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A			**8 025-8 175** EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A	Microwave links in the 8 GHz and 8.15 GHz bands in accordance with ITU-R Rec. F.386. Aircraft stations shall not start any course of transmission in the band 8025 – 8400 MHz in the aeronautical mobile service (5.463).
8 175-8 215 EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A			**8 175-8 215** EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A	Microwave links in the 8 GHz, 8.15 GHz and 8.3 GHz bands in accordance with ITU-R Rec. F.386. Aircraft stations shall not start any course of transmission in the band 8025 – 8400 MHz in the aeronautical mobile service (5.463).
8 215-8 400 EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A			**8 215-8 400** EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A	Microwave links in the 8 GHz, 8.15 GHz and 8.3 GHz bands in accordance with ITU-R Rec. F.386. Aircraft stations shall not start any course of transmission in the band 8025 – 8400 MHz in the aeronautical mobile service (5.463).
8 400-8 500 FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-Earth) 5.465 5.466			**8 400-8 500** FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-Earth) 5.465	Microwave links in the 8 GHz, 8.3 GHz and 8.4 GHz bands in accordance with ITU-R Rec. F.386.
8 500-8 550 RADIOLOCATION 5.468 5.469			**8 500-8 550** RADIOLOCATION	Maritime and aeronautical ground based radars to measure speed and distance in the band 8500 – 10000 MHz.
8 550-8 650 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) 5.468 5.469 5.469A			**8 550-8 650** EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) 5.469A	Maritime and aeronautical ground based radars to measure speed and distance in the band 8500 – 10000 MHz.
8 650-8 750 RADIOLOCATION 5.468 5.469			**8 650-8 750** RADIOLOCATION	Maritime and aeronautical ground based radars to measure speed and distance in the band 8500 – 10000 MHz.
8 750-8 850 RADIOLOCATION AERONAUTICAL RADIONAVIGATION 5.470 5.471			**8 750-8 850** RADIOLOCATION AERONAUTICAL RADIONAVIGATION 5.470	Maritime and aeronautical ground based radars to measure speed and distance in the band 8500 – 10000 MHz Airborne Doppler navigation aid in aeronautical navigation service.
8 850-9 000 RADIOLOCATION MARITIME RADIONAVIGATION 5.472 5.473			**8 850-9 000** RADIOLOCATION MARITIME RADIONAVIGATION 5.472	Maritime shore-based surveillance radars. Aeronautical ground based radars to measure speed and distance in the band 8500 – 10000 MHz.

9 000-10 600 MHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
9 000-9 200 AERONAUTICAL RADIONAVIGATION 5.337 Radiolocation 5.471 5.473A			**9 000-9 200** AERONAUTICAL RADIONAVIGATION 5.337 Radiolocation 5.473A	Ground-based radar and associated airborne transponders in aeronautical radio navigation service in accordance with ICAO Annex 10, Vol.1, chapter 3 and depending to the requirements different assigned bandwidths are achievable. Maritime radars to measure speed and distance in the band 8500 – 10000 MHz.
9 200-9 300 EARTH EXPLORATION-SATELLITE (active) 5.474A 5.474B 5.474C RADIOLOCATION MARITIME RADIONAVIGATION 5.472 5.473 5.474 5.474D			**9 200-9 300** RADIOLOCATION MARITIME RADIONAVIGATION 5.472 5.474	Maritime shore-based surveillance radars in the band 9200-9255 MHz. Search and rescue transponders (SART) in the band 9 200-9 500 MHz (see ITU RR Article **31**).
9 300-9 500 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION 5.475 SPACE RESEARCH (active) 5.427 5.474 5.475A 5.475B 5.476A			**9 300-9 500** EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION 5.475 SPACE RESEARCH (active) 5.427 5.474 5.475A 5.475B 5.476A	Search and rescue transponders (SART) in the band 9 200-9 500 MHz (see ITU RR Article **31**). Aeronautical radionavigation service is limited to airborne weather radars and ground-based radars in the band 9 300-9 500 MHz. Ground-based radar beacons (see 5.475).
9 500-9 800 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION SPACE RESEARCH (active) 5.476A			**9 500-9 800** EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION SPACE RESEARCH (active) 5.476A	Maritime and aeronautical ground based radars to measure speed and distance in the band 8500 – 10000 MHz.
9 800-9 900 RADIOLOCATION Earth exploration-satellite (active) Space research (active) Fixed 5.477 5.478 5.478A 5.478B			**9 800-9 900** RADIOLOCATION Earth exploration-satellite (active) Space research (active) Fixed 5.478A 5.478B	Maritime and aeronautical ground based radars to measure speed and distance in the band 8500 – 10000 MHz.
9 900-10 000 EARTH EXPLORATION-SATELLITE (active) 5.474A 5.474B 5.474C RADIOLOCATION Fixed 5.474D 5.477 5.478 5.479			**9 900-10 000** RADIOLOCATION Fixed 5.479	Weather Radar in the band 9975 – 10025 MHz on a secondary services (see **5.479**).
10-10.4 EARTH EXPLORATION SATELLITE (active) 5.474A 5.474B 5.474C FIXED MOBILE RADIOLOCATION Amateur 5.474D 5.479	**10-10.4** EARTH EXPLORATION SATELLITE (active) 5.474A 5.474B 5.474C RADIOLOCATION Amateur 5.474D 5.479 5.480	**10-10.4** EARTH EXPLORATION SATELLITE (active) 5.474A 5.474B 5.474C FIXED MOBILE RADIOLOCATION Amateur 5.474D 5.479	**10-10.4** EARTH EXPLORATION SATELLITE (active) 5.474A 5.474B 5.474C FIXED MOBILE RADIOLOCATION Amateur 5.474D 5.479	Microwave links in the 10 GHz, 10.4 GHz and 10.5 GHz bands in accordance with ITU-R Rec. F.747, F.1568 and F.746. Weather Radar in the band 9975 – 10025 MHz on a secondary services (see **5.479**). Amateur service is restricted to professional amateurs only.
10.4–10.45 FIXED MOBILE RADIOLOCATION Amateur	**10.4–10.45** RADIOLOCATION Amateur 5.480	**10.4–10.45** FIXED MOBILE RADIOLOCATION Amateur	**10.4–10.45** FIXED MOBILE RADIOLOCATION Amateur	Microwave links in the 10 GHz, 10.4 GHz and 10.5 GHz bands in accordance with ITU-R Rec. F.747, F.1568 and F.746. Weather Radar in the band 9975 – 10025 MHz on a secondary services (see 5.479). Amateur service is restricted to professional amateurs only.
10.45-10.5 RADIOLOCATION Amateur Amateur-satellite 5.481			**10.45-10.5** RADIOLOCATION Amateur Amateur-satellite	Amateur service is restricted to professional amateurs only.

10.5-10.55 FIXED MOBILE Radiolocation	**10.5-10.55** FIXED MOBILE RADIOLOCATION	**10.5-10.55** FIXED MOBILE RADIOLOCATION	Microwave links in the 10 GHz, 10.4 GHz and 10.5 GHz bands in accordance with ITU-R Rec. F.747, F.1568 and F.746.
10.55-10.6 FIXED MOBILE except aeronautical mobile Radiolocation		**10.55-10.6** FIXED MOBILE except aeronautical mobile Radiolocation	Microwave links in the 10 GHz, 10.4 GHz and 10.5 GHz bands in accordance with ITU-R Rec. F.747, F.1568 and F.746. FDMA point-to-multipoint systems in accordance to ITU-R F.755, Annex 4.

10.6-12.75 GHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
10.6-10.68 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive) Radiolocation 5.149 5.482 5.482A			**10.6-10.68** EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive) Radiolocation 5.149 5.482 5.482A	Microwave links in the 10 GHz, 10.4 GHz and 10.5 GHz bands in accordance with ITU-R Rec. F.747, F.1568 and F.746.FDMA point-to-multipoint systems in accordance to ITU-R F.755, Annex 4.
10.68-10.7 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.483			**10.68-10.7** EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	All emissions are prohibited in this band.
10.7-10.95 FIXED FIXED-SATELLITE (space-to-Earth) 5.441 (Earth-to-space) 5.484 MOBILE except aeronautical mobile	**10.7-10.95** FIXED FIXED-SATELLITE (space-to-Earth) 5.441 MOBILE except aeronautical mobile		**10.7-10.95** FIXED FIXED-SATELLITE (space-to-Earth) 5.441 MOBILE except aeronautical mobile	Microwave links in the 11 GHz band in accordance with ITU-R Rec. F.387. National PNG00000 planned beam at 154.10° degree in GSO orbit with the boresight at 148.40° Longitude and -6.60° latitude in the bands 10.7 – 10.95 GHz and 11.2–11.45 GHz (ITU RR App. **30B**). For use of non-planned bands by non-GSO FSS see 5.484A. Receive-only earth stations, Satellite news gathering (SNG) equipments and Satellite interactive terminals (SIT).
10.95-11.2 FIXED FIXED SATELLITE (space-to-Earth) 5.484A 5.484B (Earth-to-space) 5.484 MOBILE except aeronautical mobile	**10.95 – 11.2** FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B MOBILE except aeronautical mobile		**10.95 – 11.2** FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B MOBILE except aeronautical mobile	Microwave links in the 11 GHz band in accordance with ITU-R Rec. F.387. National PNG00000 planned beam at 154.10° degree in GSO orbit with the boresight at 148.40° Longitude and -6.60° latitude in the bands 10.7 – 10.95 GHz and 11.2–11.45 GHz (ITU RR App. **30B**). For use of non-planned bands by non-GSO FSS see 5.484A. Receive-only earth stations, Satellite news gathering (SNG) equipments and Satellite interactive terminals (SIT).
11.2 – 11.45 FIXED FIXED-SATELLITE (space-to-Earth) 5.441 (Earth-to-space) 5.484 MOBILE except aeronautical mobile	**11.2 -11.45** FIXED FIXED SATELLITE (space-to-Earth) 5.441 MOBILE except aeronautical mobile		**11.2 -11.45** FIXED FIXED SATELLITE (space-to-Earth) 5.441 MOBILE except aeronautical mobile	Microwave links in the 11 GHz band in accordance with ITU-R Rec. F.387. National PNG00000 planned beam at 154.10° degree in GSO orbit with the boresight at 148.40° Longitude and -6.60° latitude in the bands 10.7 – 10.95 GHz and 11.2–11.45 GHz (ITU RR App. **30B**). For use of non-planned bands by non-GSO FSS see 5.484A. Receive-only earth stations, Satellite news gathering (SNG) equipments and Satellite interactive terminals (SIT).
11.45 – 11.7 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B (Earth-to-space) 5.484 MOBILE except aeronautical mobile	**11.45 -11.7** FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B MOBILE except aeronautical mobile		**11.45 -11.7** FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B MOBILE except aeronautical mobile	Microwave links in the 11 GHz band in accordance with ITU-R Rec. F.387. National PNG00000 planned beam at 154.10° degree in GSO orbit with the boresight at 148.40° Longitude and -6.60° latitude in the bands 10.7 – 10.95 GHz and 11.2–11.45 GHz (ITU RR App. **30B**). For use of non-planned bands by non-GSO FSS see 5.484A. Receive-only earth stations, Satellite news gathering (SNG) equipments and Satellite interactive terminals (SIT).

11.7-12.5 FIXED BROADCASTING BROADCASTING-SATELLITE 5.492 MOBILE except aeronautical mobile 5.487 5.487A	**11.7-12.1** FIXED 5.486 FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B 5.488 Mobile except aeronautical mobile 5.485 **12.1-12.2** FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B 5.488 5.485 5.489	**11.7-12.2** FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE 5.492 5.487 5.487A	**11.7-12.2** FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE 5.492 5.487 5.487A	Microwave links in the 12.1 GHz band in accordance with ITU-R Rec. F.746. Home-receivers of numerous broadcasting-satellite networks National beam PNG13100 planned at 134° orbital position in broadcasting satellite service in the band 11.7–12.2 GHz with boresight at long. 148.07° and lat. -6.65°. For detail refer to ITU RR App. **30.**
	12.2-12.7 FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE 5.492 5.487A 5.488 5.490	**12.2-12.5** FIXED FIXED-SATELLITE (space-to-Earth) 5.484B MOBILE except aeronautical mobile BROADCASTING 5.484A 5.487	**12.2-12.5** FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile BROADCASTING 5.484A 5.487	Microwave links in the 12.1 GHz band in accordance with ITU-R Rec. F.746.
12.5-12.75 FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B (Earth-to-space) 5.494 5.495 5.496	**12.7-12.75** FIXED FIXED-SATELLITE (Earth-to-space) MOBILE except aeronautical mobile	**12.5-12.75** FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B MOBILE except aeronautical mobile BROADCASTING-SATELLITE 5.493	**12.5-12.75** FIXED FIXED-SATELLITE (space-to-Earth) 5.484A MOBILE except aeronautical mobile BROADCASTING-SATELLITE 5.493	SAP/SAB and ENG/OB (temporary application).

12.75-14.4 GHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
12.75-13.25 FIXED FIXED-SATELLITE (Earth-to-space) 5.441 MOBILE Space research (deep space) (space-to-Earth)			**12.75-13.25** FIXED FIXED-SATELLITE (Earth-to-space) 5.441 MOBILE Space research (deep space) (space-to-Earth)	Microwave links in the 13 GHz band in accordance with ITU-R rec. F.497. National PNG00000 planned beam at 154.10° degree in GSO orbit with the boresight at 148.40° Longitude and -6.60° latitude in the band 12.75 – 13.25 GHz (ITU RR App. **30B**).
13.25-13.4 EARTH EXPLORATION-SATELLITE (active) AERONAUTICAL RADIONAVIGATION 5.497 SPACE RESEARCH (active) 5.498A 5.499			**13.25-13.4** EARTH EXPLORATION-SATELLITE (active) AERONAUTICAL RADIONAVIGATION 5.497 SPACE RESEARCH (active) 5.498A	Aeronautical radionavigation service is limited to Doppler navigation aids in the band 13.25 13.4 GHz (5.497).
13.4-13.65 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	**13.4 – 13.65** EARTH EXPLORATION- SATELLITE (active) RADIOLOCATION SPACE RESEARCH 5.499C 5.499D Standard frequency and time signal-satellite (Earth-to-space) 5.499 5.500 5.501 5.501B		**13.4-13.65** EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH 5.499C 5.499D Standard frequency and time signal-satellite (Earth-to-space) 5.501B	Shipboard and airborne military radars for tracking targets and commanding and controlling in the band 13.25 – 14 GHz.
13.65 – 13.75 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			**13.65 – 13.75** 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	Shipboard and airborne military radars for tracking targets and commanding and controlling in the band 13.25 – 14 GHz.
13.75-14 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			**13.75-14** FIXED-SATELLITE (Earth-to-space) 5.484A RADIOLOCATION Earth exploration-satellite Standard frequency and time signal-satellite (Earth-to-space) Space research 5.502 5.503	Shipboard and airborne military radars for tracking targets and commanding and controlling in the band 13.25 – 14 GHzIn this band GSO and non-GSO FSS earth stations and radiolocation or radionavigation shall comply with technical requirements given in ITU RR No.5.502.
14-14.25 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 5.504A 5.505			**14-14.25** FIXED-SATELLITE (Earth-to-space) 5.457A 5.484A 5.506 5.506B RADIONAVIGATION 5.504 Mobile-satellite (Earth-to-space) 5.506A Space research 5.504A	For ship earth station see ITU RR Res.**902.** Feeder link of broadcasting satellite service in fixed satellite service. For aircraft earth stations in the aeronautical mobile service see Annex 1, part B of ITU Rec. M.1643. Satellite news gathering (SNG) equipments.
14.25-14.3 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			**14.25-14.3** FIXED-SATELLITE (Earth-to-space) 5.457A 5.484A 5.506 5.506B RADIONAVIGATION 5.504 Mobile-satellite (Earth-to-space) 5.506A Space research 5.504A	Microwave radio relay links in the 14.3 GHz band in accordance with ITU-R Rec. F.746. For ship earth station see ITU RR Res.**902.** Feeder link of broadcasting satellite service in fixed satellite service. Satellite news gathering (SNG) equipments.

14.3-14.4 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	**14.3-14.4** FIXED-SATELLITE (Earth-to-space) 5.457A 5.484A 5.484B 5.506 5.506B Mobile-satellite (Earth-to-space) 5.506A Radionavigation-satellite 5.504A	**14.3-14.4** FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.484A 5.484B 5.506 .506B MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.504B 5.506A 5.509A Radionavigation-satellite 5.504A	**14.3-14.4** FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.484A 5.506 506B MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.506A Radionavigation-satellite 5.504A	Microwave radio relay links in the 14.3 GHz band in accordance with ITU-R Rec. F.746. For ship earth station see ITU RR Res.902.

14.4-17.1 GHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
14.4-14.47 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			**14.4-14.47** FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.484A 5.506 5.506B MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.506A Space research (space-to-Earth) 5.504A	Microwave radio relay links in the 14.3 GHz band in accordance with ITU-R Rec. F.746. For ship earth station see ITU RR Res.**902.**
14.47-14.5 FIXED 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			**14.47-14.5** FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.484A 5.506 5.506B MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.506A Radio astronomy 5.149 5.504A	Microwave radio relay links in the 14.3 GHz band in accordance with ITU-R Rec. F.746. For ship earth station see ITU RR Res.**902.**
14.5-14.75 FIXED FIXED-SATELLITE (Earth-to-space) 5.509B 5.509C 5.509D 5.509E 5.509F 5.510 MOBILE Space research 5.509G			**14.5-14.75** FIXED FIXED-SATELLITE (Earth-to-space) 5.510 MOBILE Space research	Microwave links in the 15 GHz band in accordance to ITU-R Rec. F.636. National beam PNG13101 and PNG13102 at 134° with antenna boresight at 148.07 longitude and -6.65 latitude in the plan of broadcasting-satellite feeder-link in this band (ITU RR App. **30A**).
14.75 – 14.8 FIXED FIXED SATELLITE (Earth-to-space) 5.510 MOBILE Space research 5.509G		**14.75 – 14.8** FIXED FIXED-SATELLITE (Earth-to-space) 5.509B 5.509C 5.509D 5.509E 5.509F 5.510 MOBILE Space research 5.509G	**14.75 – 14.8** FIXED FIXED-SATELLITE (Earth-to-space) 5.509B 5.509C 5.509D 5.509E 5.509F 5.510 MOBILE Space research 5.509G	Microwave links in the 15 GHz band in accordance to ITU-R Rec. F.636. National beam PNG13101 and PNG13102 at 134° with antenna boresight at 148.07 longitude and -6.65 latitude in the plan of broadcasting-satellite feeder-link in this band (ITU RR App. 30A).
14.8-15.35 FIXED MOBILE Space research 5.339			**14.8-15.35** FIXED MOBILE Space research 5.339	Microwave links in the 15 GHz band in accordance to ITU-R Rec. F.636.
15.35-15.4 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.511			**15.35-15.4** EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.511	All emissions prohibited in this band (except for countries listed in No.5.511).
15.4-15.43 RADIOLOCATION 5.511E 5.511F AERONAUTICAL RADIONAVIGATION			**15.4-15.43** RADIOLOCATION 5.511E 5.511F AERONAUTICAL RADIONAVIGATION	Aeronautical radionavigation stations average radiated power is limited to 42 dBW e.i.r.p. (ITU-R Rec. S.1340).
15.43-15.63 FIXED-SATELLITE (Earth-to-space) 5.511A RADIOLOCATION 5.511E 5.511F AERONAUTICAL RADIONAVIGATION 5.511C			**15.43-15.63** FIXED-SATELLITE (Earth-to-space) 5.511A RADIOLOCATION 5.511E 5.511F AERONAUTICAL RADIONAVIGATION 5.511C	Aeronautical radionavigation stations average radiated power is limited to 42 dBW e.i.r.p. (ITU-R Rec. S.1340). Primary radar particularly airport surface detection equipment (ASDE).
15.63-15.7 RADIOLOCATION 5.511E 5.511F AERONAUTICAL RADIONAVIGATION			**15.63-15.7** RADIOLOCATION 5.511E 5.511F AERONAUTICAL RADIONAVIGATION 5.511D	Aeronautical radionavigation stations average radiated power is limited to 42 dBW e.i.r.p. (ITU-R Rec. S.1340). Primary radar particularly airport surface detection equipment (ASDE).
15.7-16.6 RADIOLOCATION 5.512 5.513			**15.7-16.6** RADIOLOCATION	Primary radar particularly airport surface detection equipment (ASDE).
16.6-17.1 RADIOLOCATION Space research (deep space) (Earth-to-space) 5.512 5.513			**16.6-17.1** RADIOLOCATION Space research (deep space) (Earth-to-space)	Airport surface detection equipment (ASDE).

17.1-19.3 GHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
17.1-17.2 RADIOLOCATION 5.512 5.513			**17.1-17.2** RADIOLOCATION	Airport surface detection equipment (ASDE).
17.2-17.3 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) 5.512 5.513 5.513A			**17.2-17.3** EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) 5.513A	Experimental testing and calibration of radiolocations and navigation systems.
17.3-17.7 FIXED-SATELLITE (Earth-to-space) 5.516 (space-to-Earth) 5.516A 5.516B Radiolocation 5.514	**17.3-17.7** FIXED-SATELLITE (Earth-to-space) 5.516 BROADCASTING-SATELLITE Radiolocation 5.514 5.515	**17.3-17.7** FIXED-SATELLITE (Earth-to-space) 5.516 Radiolocation 5.514	**17.3-17.7** FIXED-SATELLITE (Earth-to-space) 5.516 Radiolocation	Use of GSO FSS in the band 17.3 – 18.1 GHz is limited to feeder links of broadcasting-satellite service (for using non-GSO FSS in band 17.3–18.1 GHz see 5.516). The feeder link plan of ITU RR App. **30A** in the band 17.3-181 GHz (Papua New Ginuea has no beam in this plan). Experimental testing and calibration of radiolocations and navigation systems.
17.7-18.1 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.517A (Earth-to-space) 5.516 MOBILE	**17.7-17.8** FIXED FIXED-SATELLITE (space-to-Earth) 5.517 5.517A (Earth-to-space) 5.516 BROADCASTING-SATELLITE Mobile 5.515 **17.8-18.1** FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.517A (Earth-to-space) 5.516 MOBILE 5.519	**17.7-18.1** FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.517A (Earth-to-space) 5.516 MOBILE	**17.7-18.1** FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.517A (Earth-to-space) 5.516 MOBILE	Use of GSO FSS in the band 17.3 – 18.1 GHz is limited to feeder links of broadcasting-satellite service (for using non-GSO FSS in band 17.3– 18.1 GHz see 5.516). Microwave links in the 18 GHz band in accordance with ITU-R Rec. F.595. The feeder link plan of ITU RR App. **30A** in the band 17.3-181 GHz (Papua New Ginuea has no beam in this plan). Operation of ESIM with GSO FSS shall be subject to Res.**169** see 5.517A .
18.1-18.4 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B 5.517A (Earth-to-space) 5.520 MOBILE 5.519 5.521			**18.1-18.4** FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.517A (Earth-to-space) 5.520 MOBILE 5.519	Microwave links in the 18 GHz band in accordance with ITU-R Rec. F.595. Use of FSS is limited to feeder links of GSO systems in the broadcasting-satellite service. Operation of ESIM with GSO FSS shall be subject to Res.**169** see 5.517A .
18.4-18.6 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B 5.517A MOBILE			**18.4-18.6** FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.517A MOBILE	Microwave links in the 18 GHz band in accordance with ITU-R Rec. F.595. Operation of ESIM with GSO FSS shall be subject to Res.**169** see 5.517A.
18.6-18.8 EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) 5.517A 5.522B MOBILE except aeronautical mobile Space research (passive) 5.522A 5.522C	**18.6-18.8** EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) 5.516B 5.517A 5.522B MOBILE except aeronautical mobile SPACE RESEARCH (passive) 5.522A	**18.6-18.8** EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) 5.517A 5.522B MOBILE except aeronautical mobile Space research (passive) 5.522A	**18.6-18.8** EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) 5.517A 5.522B MOBILE except aeronautical mobile Space research (passive) 5.522A	Microwave links in the 18 GHz band in accordance with ITU-R Rec. F.595. Emission of fixed service and FSS service shall be in accordance with ITU RR article 21 (5.522A). Use of FSS in limited to GSO systems with an orbit of apogee greater than 20 000 km (5.522B). Operation of ESIM with GSO FSS shall be subject to Res.**169** see 5.517A.
18.8-19.3 FIXED FIXED-SATELLITE (space-to-Earth) 5.516.B 5.517A 5.523A MOBILE			**18.8-19.3** FIXED FIXED-SATELLITE (space-to-Earth) 5.517A 5.523A MOBILE	Microwave links in the 18 GHz band in accordance with ITU-R Rec. F.595. GSO and non-GSO FSS are subject to **9.11A** (see 5.523A). Operation of ESIM with GSO FSS shall be subject to Res.**169** see 5.517A.

19.3-23.15 GHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
19.3-19.7 FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 5.517A 5.523B 5.523C 5.523D 5.523E MOBILE			**19.3-19.7** FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 5.517A 5.523B 5.523C 5.523D 5.523E MOBILE	Microwave links in the 18 GHz band in accordance with ITU-R Rec. F.595. FSS is limited to feeder links for non-GSO systems in MSS (5.523B). Operation of ESIM with GSO FSS shall be subject to Res.**169** see 5.517A.
19.7-20.1 FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B 5.516B 5.527A Mobile-satellite (space-to-Earth) 5.524	**19.7-20.1** 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 5.529	**19.7-20.1** FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B 5.516B 5.527A Mobile-satellite (space-to-Earth) 5.524	**19.7-20.1** FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B Mobile-satellite (space-to-Earth)	High-density applications in the fixed-satellite service in the band 19.7-20.2 GHz. New non-GSO systems are subject to application of RR No.9.12 respect to existing non-GSO systems.
20.1-20.2 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			**20.1-20.2** FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B MOBILE-SATELLITE (space-to-Earth) 5.525 5.526 5.527 5.528	High-density applications in the fixed-satellite service in the band 19.7-20.2 GHz. New non-GSO systems are subject to application of RR No.9.12 respect to existing non-GSO systems. Spot-beam MSS in this band.
20.2-21.2 FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) Standard frequency and time signal-satellite (space-to-Earth) 5.524			**20.2-21.2** FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) Standard frequency and time signal-satellite (space-to-Earth)	Reserved for future use.
21.2-21.4 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive)			**21.2-21.4** EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive)	Microwave links in the 23 GHz band in accordance with ITU-R Rec. F.637. Temporary service ancillary to broadcasting and program making (SAB/SAP).
21.4-22 FIXED MOBILE BROADCASTING-SATELLITE 5.208B 5.530A 5.530B	**21.4-22** FIXED 5.530E MOBILE 5.530A	**21.4-22** FIXED MOBILE BROADCASTING-SATELLITE 5.208B 5.530A 5.530B 5.531	**21.4-22** FIXED MOBILE BROADCASTING-SATELLITE 5.208B 5.530A 5.530B 5.531	Microwave links in the 23 GHz band in accordance with ITU-R Rec. F.637 (see 5.530B and ITU R Res. 755 also). HDTV systems of the broadcasting-satellite service in the band 21.4 – 22 GHz.
22-22.21 FIXED MOBILE except aeronautical mobile 5.149			**22-22.21** FIXED MOBILE except aeronautical mobile 5.149	Microwave links in the 23 GHz band in accordance with ITU-R Rec. F.637.
22.21-22.5 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive) 5.149 5.532			**22.21-22.5** EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive) 5.149 5.532	Microwave links in the 23 GHz band in accordance with ITU-R Rec. F.637.
22.5-22.55 FIXED MOBILE			**22.5-22.55** FIXED MOBILE	Microwave links in the 23 GHz band in accordance with ITU-R Rec. F.637.
22.55-23.15 FIXED INTER-SATELLITE 5.338A MOBILE SPACE RESEARCH (Earth-to-space) 5.532A 5.149			**22.55-23.15** FIXED INTER-SATELLITE 5.338A MOBILE SPACE RESEARCH (Earth-to-space) 5.532A 5.149	Microwave links in the 23 GHz band in accordance with ITU-R Rec. F.637.

23.15-27 GHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
23.15-23.55 FIXED INTER-SATELLITE 5.338A MOBILE			**23.15-23.55** FIXED INTER-SATELLITE 5.338A MOBILE	Microwave links in the 23 GHz band in accordance with ITU-R Rec. F.637.
23.55-23.6 FIXED MOBILE			**23.55-23.6** FIXED MOBILE	Microwave links in the 23 GHz band in accordance with ITU-R Rec. F.637. Point-to-multipoint systems in TDMA technology (ITU-R F.755).
23.6-24 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340			**23.6-24** EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	All emissions are prohibited in this band.
24-24.05 AMATEUR AMATEUR-SATELLITE 5.150			**24-24.05** AMATEUR AMATEUR-SATELLITE 5.150	
24.05-24.25 RADIOLOCATION Amateur Earth exploration-satellite (active) 5.150			**24.05-24.25** RADIOLOCATION Amateur Earth exploration-satellite (active) 5.150	Different types of short range radars (less than 200 m) for distance and speed measurement such as police radar-gun.
24.25-24.45 FIXED MOBILE except aeronautical mobile 5.338A 5.532AB	**24.25-24.45** FIXED 5.532AA MOBILE except aeronautical mobile 5.338A 5.532AB RADIONAVIGATION	**24.25-24.45** FIXED MOBILE 5.338A 5.532AB RADIONAVIGATION	**24.25-24.45** FIXED MOBILE 5.338A 5.532AB RADIONAVIGATION	Microwave links in the 25 GHz band in accordance with ITU-R Rec. F.748. Implementation of terrestrial component of IMT is permissible subject to Res. **242** see 5.532AB.
24.45-24.65 FIXED INTER-SATELLITE MOBILE except aeronautical mobile 5.338A 5.532AB	**24.45-24.65** FIXED 5.532AA INTER-SATELLITE MOBILE except aeronautical mobile 5.338A 5.532AB RADIONAVIGATION 5.533	**24.45-24.65** FIXED INTER-SATELLITE MOBILE 5.338A 5.532AB RADIONAVIGATION 5.533	**24.45-24.65** FIXED INTER-SATELLITE MOBILE 5.338A 5.532AB RADIONAVIGATION 5.533	Microwave links in the 25 GHz and 25.5 GHz bands in accordance with ITU-R Rec. F.748. FDMA and TDMA high-density point-to-multipoint systems in accordance with ITU-R Rec. F.755, Annexes 3 and 4. Implementation of terrestrial component of IMT is permissible subject to Res. **242** see 5.532AB.
24.65-24.75 FIXED FIXED-SATELLITE (Earth-to-space) 5.532B INTER-SATELLITE MOBILE except aeronautical mobile 5.338A 5.532AB	**24.65-24.75** FIXED 5.532AA INTER-SATELLITE MOBILE except aeronautical mobile 5.338A 5.532AB RADIOLOCATION-SATELLITE (Earth-to-space)	**24.65-24.75** FIXED FIXED-SATELLITE (Earth-to-space) 5.532B INTER-SATELLITE MOBILE 5.338A 5.532AB	**24.65-24.75** FIXED FIXED-SATELLITE (Earth-to-space) 5.532B INTER-SATELLITE MOBILE 5.338A 5.532AB	Microwave links in the 25 GHz and 25.5 GHz bands in accordance with ITU-R Rec. F.748. FDMA and TDMA high-density point-to-multipoint systems in accordance with ITU-R Rec. F.755, Annexes 3 and 4. Implementation of terrestrial component of IMT is permissible subject to Res. **242** see 5.532AB.
24.75-25.25 FIXED FIXED-SATELLITE (Earth-to-space) 5.532B MOBILE except aeronautical mobile 5.338A 5.532AB	**24.75-25.25** FIXED 5.532AA FIXED-SATELLITE (Earth-to-space) 5.535 MOBILE except aeronautical mobile 5.338A 5.532AB	**24.75-25.25** FIXED FIXED-SATELLITE (Earth-to-space) 5.535 MOBILE 5.338A 5.532AB	**24.75-25.25** FIXED FIXED-SATELLITE (Earth-to-space) 5.535 MOBILE 5.338A 5.532AB	Microwave links in the 25 GHz and 25.5 GHz bands in accordance with ITU-R Rec. F.748. FDMA and TDMA high-density point-to-multipoint systems in accordance with ITU-R Rec. F.755, Annexes 3 and 4. Implementation of terrestrial component of IMT is permissible subject to Res. **242** see 5.532AB.
25.25-25.5 FIXED 5.534A INTER-SATELLITE 5.536 MOBILE 5.338A 5.532AB Standard frequency and time signal-satellite (Earth-to-space)			**25.25-25.5** FIXED 5.534A INTER-SATELLITE 5.536 MOBILE 5.338A 5.532AB Standard frequency and time signal-satellite (Earth-to-space)	Microwave links in the 25.5 GHz, 26 GHz, and 26.1 GHz and 27.1 GHz bands in accordance with ITU-R Rec. F.748. FDMA and TDMA high-density point-to-multipoint systems in accordance with ITU-R F.755, Annexes 3 and 4. Implementation of terrestrial component of IMT is permissible subject to Res. **242** see 5.532AB.

25.5-27	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)-to-space) 5.536A	**25.5-27** 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	Microwave links in the 25.5 GHz, 26 GHz, and 26.1 GHz and 27.1 GHz bands in accordance with ITU-R Rec. F.748. FDMA and TDMA high-density point-to-multipoint systems in accordance with ITU-R F.755, Annexes 3 and 4. Implementation of terrestrial component of IMT is permissible subject to Res. **242** see 5.532AB.

27-31.3 GHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
27-27.5 FIXED INTER-SATELLITE 5.536 MOBILE 5.338A 5.532AB	**27-27.5** FIXED 5.534A FIXED-SATELLITE (Earth-to-space) INTER-SATELLITE 5.536 5.537 MOBILE 5.338A 5.532AB		**27-27.5** FIXED 5.534A FIXED-SATELLITE (Earth-to-space) INTER-SATELLITE 5.536 5.537 MOBILE 5.338A 5.532AB	Microwave links in the 25.5, 26, 26.1 and 27.1 GHz bands in accordance with ITU-R Rec. F.748. FDMA and TDMA high-density point-to-multipoint systems in accordance with ITU-R F.755, Annexes 3 and 4. Implementation of terrestrial component of IMT is permissible subject to Res. **242** see 5.532AB
27.5-28.5 FIXED 5.537A FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.517A 5.539 MOBILE 5.538 5.540			**27.5-28.5** FIXED 5.537A FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.517A 5.539 MOBILE 5.538 5.540	Microwave links in the 28 GHz and 28.5 GHz bands in accordance with ITU-R Rec. F.748. FDMA and TDMA high-density point-to-multipoint systems in accordance with ITU-R Rec. F.755, Annexes 3 and 4.
28.5-29.1 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			**28.5-29.1** 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	Microwave links in the 28 GHz 28.5 GHz bands in accordance with ITU-R Rec. F.748. GSO and non-GSO FSS are subject to 9.11A (see 5.523A). FDMA and TDMA high-density point-to-multipoint systems in accordance with ITU-R Rec. F.755, Annexes 3 and 4.
29.1-29.5 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			**29.1-29.5** 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	Microwave links in the 28 GHz 28.5 GHz bands in accordance with ITU-R Rec. F.748. FDMA and TDMA high-density point-to-multipoint systems in accordance with ITU-R Rec. F.755, Annexes 3 and 4.
29.5-29.9 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	**29.5-29.9** 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 5.525 5.526 5.527 5.529 5.540	**29.5-29.9** 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	**29.5-29.9** FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.539 Earth exploration-satellite (Earth-to-space) 5.541 Mobile-satellite (Earth-to-space) 5.540	Use of the band 29.5-30 GHz by non-GSO FSS is subject to application of ITU RR No.9.12 respect to existing non-GSO FSS system (see 5.484A). Worldwide high-density applications in the fixed-satellite service (HDFSS) via satellite receives in the band 29.46–30 GHz (Earth-to-space) (ITU RR Res. 143).
29.9-30 FIXED-SATELLITE (Earth-to-space) 5.484A 5.484B 5.516B 5.539 5.527A 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			**29.9-30** FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 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	Use of the band 29.5-30 GHz by non-GSO FSS is subject to application of ITU RR No.9.12 respect to existing non-GSO FSS system (see 5.484A). Worldwide high-density applications in the fixed-satellite service (HDFSS) via satellite receives in the band 29.46–30 GHz (Earth-to-space) (ITU RR Res. 143).
30-31 FIXED-SATELLITE (Earth-to-space) 5.338A MOBILE-SATELLITE (Earth-to-space) Standard frequency and time signal-satellite (space-to-Earth) 5.542			**30-31** FIXED-SATELLITE (Earth-to-space) 5.338A MOBILE-SATELLITE (Earth-to-space) Standard frequency and time signal-satellite (space-to-Earth)	For the unwanted emission of fixed-satellite service See ITU RR Res. 750.
31-31.3 FIXED 5.338A 5.543B MOBILE Standard frequency and time signal-satellite (space-to-Earth) Space research 5.544 5.545 5.149			**31-31.3** FIXED 5.338A 5.543B MOBILE Standard frequency and time signal-satellite (space-to-Earth) Space research 5.544 5.545 5.149	Use of fixed-service allocation for HAPS shall be in accordance with provisions of Res. **167** see 5.543B. Point-to-point and point-to-multipoint operation in the band 31 – 31.3 GHz.

31.3-35.5 GHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
31.3-31.5 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340			**31.3-31.5** EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	All emissions are prohibited in this band.
31.5-31.8 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149 5.546	**31.5-31.8** EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	**31.5-31.8** EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149	**31.5-31.8** EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149	Reserved for future use.
31.8-32 FIXED 5.547A RADIONAVIGATION SPACE RESEARCH (deep space) (space-to-Earth) 5.547 5.547B 5.548			**31.8-32** FIXED 5.547A RADIONAVIGATION SPACE RESEARCH (deep space) (space-to-Earth) 5.547 5.548	FDD or TDD point-to-point (extendable to point-to-multipoint) in the band 37.6 GHz according with ITU-R Rec. F.1520. For block arrangement see the guidelines in ITU-R Rec. F.1519. For protection of airborne radars from the interference of HDFS see ITU-R Rec. F.1571.
32-32.3 FIXED 5.547A RADIONAVIGATION SPACE RESEARCH (deep space) (space-to-Earth) 5.547 5.547C 5.548			**32-32.3** FIXED 5.547A RADIONAVIGATION SPACE RESEARCH (deep space) (space-to-Earth) 5.547 5.548	FDD or TDD point-to-point (extendable to point-to-multipoint) in the band 37.6 GHz according with ITU-R Rec. F.1520. For block arrangement see the guidelines in ITU-R Rec. F.1519. For protection of airborne radars from the interference of HDFS see ITU-R Rec. F.1571.
32.3-33 FIXED 5.547A INTER-SATELLITE RADIONAVIGATION 5.547 5.547D 5.548			**32.3-33** FIXED 5.547A INTER-SATELLITE RADIONAVIGATION 5.547 5.548	FDD or TDD point-to-point (extendable to point-to-multipoint) in 37.6 GHz band in accordance with ITU-R Rec.F.1520. For block arrangement see the guidelines in ITU-R Rec. F.1519. For protection of airborne radars from the interference of HDFS see ITU-R Rec. F.1571.
33-33.4 FIXED 5.547A RADIONAVIGATION 5.547 5.547E			**33-33.4** FIXED 5.547A RADIONAVIGATION 5.547	FDD or TDD point-to-point (extendable to point-to-multipoint) in 37.6 GHz band in accordance with ITU-R Rec.F.1520. For block arrangement see the guidelines in ITU-R Rec. F.1519. For protection of airborne radars from the interference of HDFS see ITU-R Rec. F.1571.
33.4-34.2 RADIOLOCATION 5.549			**33.4-34.2** RADIOLOCATION	Short range radars.
34.2-34.7 RADIOLOCATION SPACE RESEARCH (deep space) (Earth-to-space) 5.549			**34.2-34.7** RADIOLOCATION SPACE RESEARCH (deep space) (Earth-to-space)	Short range radars.
34.7-35.2 RADIOLOCATION Space research 5.550 5.549			**34.7-35.2** RADIOLOCATION Space research	Short range radars.
35.2-35.5 METEOROLOGICAL AIDS RADIOLOCATION 5.549			**35.2-35.5** METEOROLOGICAL AIDS RADIOLOCATION	Short range radars. Weather observatory satellites.

35.5-40.5 GHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
35.5-36 METEOROLOGICAL AIDS EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) 5.549 5.549A			**35.5-36** METEOROLOGICAL AIDS EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) 5.549A	Short range radars. Weather observatory satellites.
36-37 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 5.149 5.550A			**36-37** EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 5.149 5.550A	Microwave systems in the bands 36.5 GHz and 38 GHz in accordance with ITU-R F.794 and ITU-RR Res. **752** (transmitter power at the antenna port less than -10dBW for point to point). For use of this band by different serices see ITU-RR Res. **752.**
37-37.5 FIXED MOBILE except aeronautical mobile 5.550B SPACE RESEARCH (space-to-Earth) 5.547			**37-37.5** FIXED MOBILE except aeronautical mobile 5.550B SPACE RESEARCH (space-to-Earth) 5.547	Microwave systems in 36.5 and 38 GHz bands in accordance with the ITU-R Rec. F.794. Implementation of terrestrial component of IMT is permissible subject to Res. **243** see 5.550B. Worldwide high-density applications in the fixed service (HDFS) (ITU RR Res. 75) in the band 37 – 40 GHz.
37.5-38 FIXED FIXED-SATELLITE (space-to-Earth) 5.550C MOBILE except aeronautical mobile 5.550B SPACE RESEARCH (space-to-Earth) Earth exploration-satellite (space-to-Earth) 5.547			**37.5-38** FIXED FIXED-SATELLITE (space-to-Earth) 5.550C MOBILE except aeronautical mobile 5.550B SPACE RESEARCH (space-to-Earth) Earth exploration-satellite (space-to-Earth) 5.547	Microwave systems, supporting HDFS (see ITU RR Res. 75), in the bands 38 GHz, 38.25 GHz and 38.28 GHz in accordance with the ITU-R Rec. F.794. Implementation of terrestrial component of IMT is permissible subject to Res. **243** see 5.550B. VSAT terminals providing video, voice, internet, broadcasting service via 36 MHz – width channels (ITU-R Rec. S.1557).
38-39.5 FIXED 5.550D FIXED-SATELLITE (space-to-Earth) 5.550C MOBILE 5.550B Earth exploration-satellite (space-to-Earth) 5.547			**38-39.5** FIXED 5.550D FIXED-SATELLITE 5.550C (space-to-Earth) MOBILE 5.550B Earth exploration-satellite (space-to-Earth) 5.547	Microwave systems, supporting HDFS (see ITU RR Res. 75), in the bands 38, 38.25, 38.28, 38.77 and 39.3 GHz in accordance with the ITU-R Rec. F.794. VSAT terminals providing video, voice, internet, broadcasting service via 36 MHz – width channels (ITU-R Rec. S.1557). Implementation of HAPS in the HAPS-to-ground direction is permissible and shall be in accordance with the provisions of Res. **168** see 5.550D.
39.5-40 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			**39.5-40** 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	Microwave systems, supporting HDFS (see ITU RR Res. 75), in the bands 38, 39.3 and 40.5 GHz in accordance with ITU-R Rec. F.794. For this band see also ITU RR Res. 143, ITU-R Rec. S.524 and Rec. S.1594. Implementation of terrestrial component of IMT is permissible subject to Res. **243** see 5.550B. VSAT terminals providing video, voice, internet, broadcasting service via 36 MHz – width channels (ITU-R Rec. S.1557).
40-40.5 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			**40-40.5** 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) 5.550 E	Microwave systems, supporting HDFS, in the bands 38 GHz and 40 GHz in accordance with the ITU-R Rec. F.794. High-density applications in FSS. Implementation of terrestrial component of IMT is permissible subject to Res. **243** see 5.550B. VSAT terminals providing video, voice, internet, broadcasting service via 36 MHz – width channels (ITU-R Rec. S.1557). For this band see also ITU RR Res. 143, ITU-R Rec.s S.524 and S.1594.

40.5-50.2 GHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
40.5-41 FIXED FIXED-SATELLITE (space-to-Earth) 5.550C LAND MOBILE 5.550B BROADCASTING BROADCASTING-SATELLITE Aeronautical mobile Maritime mobile 5.547	**40.5-41** FIXED FIXED-SATELLITE (space-to-Earth)5.516B 5.550C LAND MOBILE 5.550B BROADCASTING BROADCASTING-SATELLITE Aeronautical mobile Maritime mobile Mobile-satellite (space-to-Earth) 5.547	**40.5-41** FIXED FIXED-SATELLITE (space-to-Earth) 5.550C LAND MOBILE 5.550B BROADCASTING BROADCASTING-SATELLITE Aeronautical mobile Maritime mobile 5.547	**40.5-41** FIXED FIXED-SATELLITE (space-to-Earth) 5.550C LAND MOBILE 5.550B BROADCASTING BROADCASTING-SATELLITE Aeronautical mobile Maritime mobile 5.547	Worldwide high-density applications in the fixed service (HDFS) (ITU RR Res. 75) in the band 40.5 – 43.5 GHz. VSAT terminals providing video, voice, internet, broadcasting service via 36 MHz – width channels (ITU-R Rec. S.1557). Implementation of terrestrial component of IMT is permissible subject to Res. **243** see 5.550B.
41-42.5 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			**41-42.5** 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	Worldwide high-density applications in the fixed service (HDFS) (ITU RR Res. 75) in the band 40.5 – 43.5 GHz VSAT terminals providing video, voice, internet, broadcasting service via 36 MHz – width channels (ITU-R Rec. S.1557). Implementation of terrestrial component of IMT is permissible subject to Res. **243** see 5.550B.
42.5-43.5 FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE except aeronautical mobile 5.550B RADIO ASTRONOMY 5.149 5.547			**42.5-43.5** FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE except aeronautical mobile 5.550B RADIO ASTRONOMY 5.149 5.547	Worldwide high-density applications in the fixed service (HDFS) (ITU RR Res. 75) in the band 40.5 – 43.5 GHz. Implementation of terrestrial component of IMT is permissible subject to Res. **243** see 5.550B.
43.5-47 MOBILE 5.553 5.553A MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.554			**43.5-47** MOBILE 5.553 5.553A MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.554	Spectral line observation in the band 45.33 – 45.44 GHz (ITU-R Rec. RA.314).
47-47.2 AMATEUR AMATEUR-SATELLITE			**47-47.2** AMATEUR AMATEUR-SATELLITE	6 mm amateur band.
47.2-47.5 FIXED FIXED-SATELLITE (Earth-to-space) 5.550C 5.552 MOBILE 5.553B 5.552A			**47.2-47.5** FIXED FIXED-SATELLITE (Earth-to-space) 5.550C 5.552 MOBILE 5.553B 5.552A	For HAPS fixed system in the band 47.2-47.5 GHz and 47.9-48.2 GHz, an example of technical specification has been given in Table 28, ITU-R Rec. F.758.
47.5-47.9 FIXED FIXED-SATELLITE (Earth-to-space) 5.550C 5.552 (space-to-Earth) 5.516B 5.554A MOBILE 5.553B	**47.5-47.9** FIXED FIXED-SATELLITE (Earth-to-space) 5.550C 5.552 MOBILE 5.553B		**47.5-47.9** FIXED FIXED-SATELLITE (Earth-to-space) 5.550C 5.552 MOBILE 5.553B	Microwave systems in the band 47.2 – 50.2 GHz. Technical specification has been given in Table 28, ITU-R Rec. F.758.
47.9-48.2 FIXED FIXED-SATELLITE (Earth-to-space) 5.550C 5.552 MOBILE 5.553B 5.552A			**47.9-48.2** FIXED FIXED-SATELLITE (Earth-to-space) 5.550C 5.552 MOBILE 5.553B 5.552A	For HAPS fixed system in the band 47.2-47.5 GHz and 47.9-48.2 GHz, an example of technical specification has been given in Table 27, ITU-R Rec. F.758.

48.2-48.54 FIXED FIXED-SATELLITE (Earth-to-space) 5.550C 5.552 (space-to-Earth) 5.516B 5.554A 5.555B MOBILE	**48.2-50.2** FIXED FIXED-SATELLITE (Earth-to-space) 5.338A 5.516B 5.550C 5.552 MOBILE	**48.2-50.2** FIXED FIXED-SATELLITE (Earth-to-space) 5.338A 5.550C 5.552 MOBILE	
48.54-49.44 FIXED FIXED-SATELLITE (Earth-to-space) 5.550C 5.552 MOBILE 5.149 5.340 5.555			Low and medium capacity short range digital microwave systems in the band 47.2 – 50.2 GHz, an example of technical specification has been given in Table 27, ITU-R Rec. F.758.
49.44-50.2 FIXED FIXED-SATELLITE (Earth-to-space) 5.338A 5.550C 5.552 (space-to-Earth) 5.516B 5.554A 5.555B MOBILE			
	5.149 5.340 5.555	5.149 5.340 5.555	

50.2-57 GHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
50.2-50.4 EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 5.340			**50.2-50.4** EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 5.340	All emissions are prohibited in this band.
50.4-51.4 FIXED FIXED-SATELLITE (Earth-to-space) 5.338A 5.550C MOBILE Mobile-satellite (Earth-to-space)			**50.4-51.4** FIXED FIXED-SATELLITE (Earth-to-space) 5.338A 5.550C MOBILE Mobile-satellite (Earth-to-space)	Weather prediction for disaster management under ITU RR No. 5.338A.
51.4-52.4 FIXED FIXED-SATELLITE (Earth-to-space) 5.555C MOBILE 5.338A 5.547 5.556			**51.4-52.6** FIXED FIXED-SATELLITE (Earth-to-space) 5.555C MOBILE 5.338A 5.547 5.556	FDD short range FWSs for high density fixed service in accordance with ITU-R Rec. F.1496. Low and medium capacity short range digital microwave systems in the band 51.4 – 52.6 GHz, an example of technical specification has been given in Tables 28 and 35, ITU-R Rec. F.758.
52.4-52.6 FIXED 5.338A MOBILE 5.547 5.556			**51.4-52.6** FIXED 5.338A MOBILE	FDD short range FWSs for high density fixed service in accordance with ITU-R Rec. F.1496. Low and medium capacity short range digital microwave systems in the band 51.4 – 52.6 GHz, an example of technical specification has been given in Tables 28 and 35, ITU-R Rec. F.758.
52.6-54.25 EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 5.340 5.556			**52.6-54.25** EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 5.340 5.556	All emissions are prohibited in this band.
54.25-55.78 EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.556A SPACE RESEARCH (passive) 5.556B			**54.25-55.78** EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.556A SPACE RESEARCH (passive)	Inter-satellite service is limited to satellites in the GSO orbit in the bands 54.25-56.9 GHz.
55.78-56.9 EARTH EXPLORATION-SATELLITE (passive) FIXED 5.557A INTER-SATELLITE 5.556A MOBILE 5.558 SPACE RESEARCH (passive) 5.547 5.557			**55.78-56.9** EARTH EXPLORATION-SATELLITE (passive) FIXED 5.557A INTER-SATELLITE 5.556A MOBILE 5.558 SPACE RESEARCH (passive) 5.547	TDD or FDD FWSs in supporting HDFS in accordance with ITU-R Rec. F. 1497, Annex 1. Low and medium capacity short range digital microwave systems in 55.78 –57 GHz band, an example of technical specification is available in Tables 27 & 29, ITU-R Rec. F.758. Inter-satellite service is limited to satellites in the GSO orbit in the bands 54.25-56.9 GHz.
56.9-57 EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.558A MOBILE 5.558 SPACE RESEARCH (passive) 5.547 5.557			**56.9-57** EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.558A MOBILE 5.558 SPACE RESEARCH (passive) 5.547	TDD or FDD FWSs in supporting HDFS in accordance with ITU-R Rec. F. 1497, Annex 1. Low and medium capacity short range digital microwave systems in the band 55.78 – 57 GHz, an example of technical specification has been given in Tables 27 and 29, ITU-R Rec. F.758.

57-74 GHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
57-58.2 EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.556A MOBILE 5.558 SPACE RESEARCH (passive) 5.547 5.557			**57-58.2** EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.556A MOBILE 5.558 SPACE RESEARCH (passive) 5.547	TDD or FDD FWS in supporting HDFS in accordance with ITU-R Rec. F.1497, Annex 2. An example of technical specification is available in Table 29, ITU-R Rec. F.758. Inter-satellite service is limited to satellites in the GSO orbit in the bands 57-58.2 GHz.
58.2-59 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 5.547 5.556			**58.2-59** EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 5.547 5.556	TDD or FDD FWSs in supporting HDFS in accordance with ITU-R Rec. F. 1497, Annex 2. An example of technical specification has been given in Table 29, ITU-R Rec. F.758.
59-59.3 EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.556A MOBILE 5.558 RADIOLOCATION 5.559 SPACE RESEARCH (passive)			**59-59.3** EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.556A MOBILE 5.558 RADIOLOCATION 5.559 SPACE RESEARCH (passive)	Airborne radar in the band 59 – 64 GHz in radiolocation service (5.559).
59.3-64 FIXED INTER-SATELLITE MOBILE 5.558 RADIOLOCATION 5.559 5.138			**59.3-64** FIXED INTER-SATELLITE MOBILE 5.558 RADIOLOCATION 5.559 5.138	Short range high capacity digital links for fixed and mobile application. Short range vehicle radar equipment, standardized by ASTAP, with power delivered to the antenna less than 10 mW and 1 GHz bandwidth (ITU-R Rec. M.1452).
64-65 FIXED INTER-SATELLITE MOBILE except aeronautical mobile 5.547 5.556			**64-65** FIXED INTER-SATELLITE MOBILE except aeronautical mobile 5.547 5.556	Worldwide high-density applications in the fixed service (HDFS) (ITU RR Res. 75) in the band 64 – 66 GHz. An example of technical specification has been given in Table 33, ITU-R Rec. F.758
65-66 EARTH EXPLORATION-SATELLITE FIXED INTER-SATELLITE MOBILE except aeronautical mobile SPACE RESEARCH 5.547			**65-66** EARTH EXPLORATION-SATELLITE FIXED INTER-SATELLITE MOBILE except aeronautical mobile SPACE RESEARCH 5.547	Worldwide high-density applications in the fixed service (HDFS) (ITU RR Res. **75**) in the band 64 – 66 GHz. An example of technical specification has been given in Table 33, ITU-R Rec. F.758.
66-71 INTER-SATELLITE MOBILE 5.553 5.558 5.559AA MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.554			**66-71** INTER-SATELLITE MOBILE 5.553 5.558 5.559AA MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.554	Implementation of terrestrial component of IMT is permissible subject to Res. **241** see 5.559AA.
71-74 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth)			**71-74** FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth)	Short range high capacity microwave systems in the bands 71-76 GHz/81-86 GHz.

74-94 GHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
74-76 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE BROADCASTING BROADCASTING-SATELLITE Space research (space-to-Earth) 5.559A 5.561			**74-76** FIXED FIXED-SATELLITE (space-to-Earth) MOBILE ROADCASTING BROADCASTING-SATELLITE Space research (space-to-Earth) 5.561	Short range high capacity microwave systems in the bands 71-76 GHz/81-86 GHz.
76-77.5 RADIO ASTRONOMY RADIOLOCATION Amateur Amateur-satellite Space research (space-to-Earth) 5.149			**76-77.5** RADIO ASTRONOMY RADIOLOCATION Amateur Amateur-satellite Space research (space-to-Earth) 5.149	Use of thisband by Amateur service is restricted to professional amateurs only. Road transport and traffic telematics (RTTT) in the band 76 – 77 GHz (ITU-R Rec. SM.1538 and ITU-R Rec. M.1452).
77.5-78 AMATEUR AMATEUR-SATELLITE RADIOLOCATION 5.559B Radio astronomy Space research (space-to-Earth) 5.149			**77.5-78** AMATEUR AMATEUR-SATELLITE RADIOLOCATION 5.559B Radio astronomy Space research (space-to-Earth) 5.149	Use of thisband by Amateur service is restricted to professional amateurs only. Short Range Radar for ground based applications including auotomotive radar
78-79 RADIOLOCATION Amateur Amateur-satellite Radio astronomy Space research (space-to-Earth) 5.149 5.560			**78-79** RADIOLOCATION Amateur Amateur-satellite Radio astronomy Space research (space-to-Earth) 5.149 5.560	Use of thisband by Amateur service is restricted to professional amateurs only. Short Range Radar for ground based applications including auotomotive radar
79-81 RADIO ASTRONOMY RADIOLOCATION Amateur Amateur-satellite Space research (space-to-Earth) 5.149			**79-81** RADIO ASTRONOMY RADIOLOCATION Amateur Amateur-satellite Space research (space-to-Earth) 5.149	Use of thisband by Amateur service is restricted to professional amateurs only. Short Range Radar for ground based applications including auotomotive radar
81-84 FIXED 5.338A FIXED-SATELLITE (Earth-to-space) MOBILE MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY Space research (space-to-Earth) 5.149 5.561A			**81-84** FIXED 5.338A FIXED-SATELLITE (Earth-to-space) MOBILE MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY Space research (space-to-Earth) 5.149 5.561A	Short range high capacity microwave systems in the bands 71-76 GHz/81-86 GHz.
84-86 FIXED 5.338A FIXED-SATELLITE (Earth-tospace) 5.561B MOBILE RADIO ASTRONOMY 5.149			**84-86** FIXED 5.338A FIXED-SATELLITE (Earth-tospace) MOBILE RADIO ASTRONOMY 5.149	Short range high capacity microwave systems in the bands 71-76 GHz/81-86 GHz.
86-92 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340			**86-92** EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	All emissions prohibited in this band.
92-94 FIXED 5.338A MOBILE RADIO ASTRONOMY RADIOLOCATION 5.149			**92-94** FIXED 5.338A MOBILE RADIO ASTRONOMY RADIOLOCATION 5.149	Very high capacity short range microwave links in the band 92-95 GHz.

94-119.98 GHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
94-94.1 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) Radio astronomy 5.562 5.562A			**94-94.1** EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) Radio astronomy 5.562 5.562A	Very high capacity short range microwave links in the band 92-95 GHz.
94.1-95 FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION 5.149			**94.1-95** FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION 5.149	Very high capacity short range microwave links in the band 92-95 GHz.
95-100 FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.149 5.554			**95-100** FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.149 5.554	
100-102 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341			**100-102** EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341	All emissions prohibited in this band.
102-105 FIXED MOBILE RADIO ASTRONOMY 5.149 5.341			**102-105** FIXED MOBILE RADIO ASTRONOMY 5.149 5.341	
105-109.5 FIXED MOBILE RADIO ASTRONOMY SPACE RESEARCH (passive) 5.562B 5.149 5.341			**105-109.5** FIXED MOBILE RADIO ASTRONOMY SPACE RESEARCH (passive) 5.562B 5.149 5.341	Use of this allocation is limited to space-based radio astronomy only (WRC-19)
109.5-111.8 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341			**109.5-111.8** EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341	All emissions prohibited in this band.
111.8-114.25 FIXED MOBILE RADIO ASTRONOMY SPACE RESEARCH (passive) 5.562B 5.149 5.341			**111.8-114.25** FIXED MOBILE RADIO ASTRONOMY SPACE RESEARCH (passive) 5.562B 5.149 5.341	Use of this allocation is limited to space-based radio astronomy only (WRC-19)
114.25-116 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341			**114.25-116** EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341	All emissions prohibited in this band.
116-119.98 EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.562C SPACE RESEARCH (passive) 5.341			**116-119.98** EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.562C SPACE RESEARCH (passive) 5.341	

119.98-158.5 GHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
119.98-122.25 EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.562C SPACE RESEARCH (passive) 5.138 5.341			**119.98-122.25** EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.562C SPACE RESEARCH (passive) 5.138 5.341	ISM band.
122.25-123 FIXED INTER-SATELLITE MOBILE 5.558 Amateur 5.138			**122.25-123** FIXED INTER-SATELLITE MOBILE 5.558 Amateur 5.138	ISM band.
123-130 FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) RADIONAVIGATION RADIONAVIGATION-SATELLITE Radio astronomy 5.562D 5.149 5.554			**123-130** FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) RADIONAVIGATION RADIONAVIGATION-SATELLITE Radio astronomy 5.149 5.554	
130-134 EARTH EXPLORATION-SATELLITE (active) 5.562E FIXED INTER-SATELLITE MOBILE 5.558 RADIO ASTRONOMY 5.149 5.562A			**130-134** EARTH EXPLORATION-SATELLITE (active) 5.562E FIXED INTER-SATELLITE MOBILE 5.558 RADIO ASTRONOMY 5.149 5.562A	
134-136 AMATEUR AMATEUR-SATELLITE Radio astronomy			**134-136** AMATEUR AMATEUR-SATELLITE Radio astronomy	
136-141 RADIO ASTRONOMY RADIOLOCATION Amateur Amateur-satellite 5.149			**136-141** RADIO ASTRONOMY RADIOLOCATION Amateur Amateur-satellite 5.149	
141-148.5 FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION 5.149			**141-148.5** FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION 5.149	
148.5-151.5 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340			**148.5-151.5** EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	All emissions prohibited in this band.
151.5-155.5 FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION 5.149			**151.5-155.5** FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION 5.149	
155.5-158.5 FIXED MOBILE RADIO ASTRONOMY 5.149			**155.5-158.5** FIXED MOBILE RADIO ASTRONOMY 5.149	

158.5-202 GHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
158.5-164 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth)			**158.5-164** FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth)	
164-167 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340			**164-167** EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	All emissions prohibited in this band.
167-174.5 FIXED FIXED-SATELLITE (space-to-Earth) INTER-SATELLITE MOBILE 5.558 5.149 5.562D			**167-174.5** FIXED FIXED-SATELLITE (space-to-Earth) INTER-SATELLITE MOBILE 5.558 5.149	
174.5-174.8 FIXED INTER-SATELLITE MOBILE 5.558			**174.5-174.8** FIXED INTER-SATELLITE MOBILE 5.558	
174.8-182 EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.562H SPACE RESEARCH (passive)			**174.8-182** EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.562H SPACE RESEARCH (passive)	
182-185 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340			**182-185** EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	All emissions prohibited in this band.
185-190 EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.562H SPACE RESEARCH (passive)			**185-190** EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.562H SPACE RESEARCH (passive)	
190-191.8 EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 5.340			**190-191.8** EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 5.340	All emissions prohibited in this band.
191.8-200 FIXED INTER-SATELLITE MOBILE 5.558 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.149 5.341 5.554			**191.8-200** FIXED INTER-SATELLITE MOBILE 5.558 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.149 5.341 5.554	
200-202 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341 5.563A			**200-202** EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341 5.563A	All emissions prohibited in this band.

202-248 GHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
202-209 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341 5.563A			**202-209** EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341 5.563A	All emissions prohibited in this band.
209-217 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY 5.149 5.341			**209-217** FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY 5.149 5.341	
217-226 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY SPACE RESEARCH (passive) 5.562B 5.149 5.341			**217-226** FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY SPACE RESEARCH (passive) 5.562B 5.149 5.341	Use of this allocation is limited to space-based radio astronomy only (WRC-19)
226-231.5 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340			**226-231.5** EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	All emissions prohibited in this band.
231.5-232 FIXED MOBILE Radiolocation			**231.5-232** FIXED MOBILE Radiolocation	
232-235 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Radiolocation			**232-235** FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Radiolocation	
235-238 EARTH EXPLORATION-SATELLITE (passive) FIXED-SATELLITE (space-to-Earth) SPACE RESEARCH (passive) 5.563A 5.563B			**235-238** EARTH EXPLORATION-SATELLITE (passive) FIXED-SATELLITE (space-to-Earth) SPACE RESEARCH (passive) 5.563A 5.563B	
238-240 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE RADIOLOCATION RADIONAVIGATION RADIONAVIGATION-SATELLITE			**238-240** FIXED FIXED-SATELLITE (space-to-Earth) MOBILE RADIOLOCATION RADIONAVIGATION RADIONAVIGATION-SATELLITE	
240-241 FIXED MOBILE RADIOLOCATION			**240-241** FIXED MOBILE RADIOLOCATION	
241-248 RADIO ASTRONOMY RADIOLOCATION Amateur Amateur-satellite 5.138 5.149			**241-248** RADIO ASTRONOMY RADIOLOCATION Amateur Amateur-satellite 5.138 5.149	ISM band.

248-3 000 GHz

Allocation to services				
Region 1	**Region 2**	**Region 3**	**Papua New Guinea**	**Usage**
248-250 AMATEUR AMATEUR-SATELLITE Radio astronomy 5.149			**248-250** AMATEUR AMATEUR-SATELLITE Radio astronomy 5.149	
250-252 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.563A			**250-252** EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.563A	All emissions prohibited in this band.
252-265 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.149 5.554			**252-265** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.149 5.554	
265-275 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY 5.149 5.563A			**265-275** FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY 5.149 5.563A	
275-3 000 (Not allocated) 5.564A 5.565			**275-3 000** (Not allocated) 5.564A 5.565	

Section V – Footnotes to the Frequency Allocations in Papua New Guinea

PNG1 The bands 26.965 – 27.405 MHz (10 kHz spacing) and 476.4 – 477.425 MHz (25 kHz spacing) are allocated to the Citizens' Band Radio Service (CBRS), (see document **TR603** "**CONDITION FOR OPERATION AND LICENSING OF CBRS**").

PNG2 The 86-88 MHz segment should be avoided in areas where any of the first three VHF FM broadcasting channels (88.1, 88.3, and 88.5 MHz) are used. In those areas assignments can be made if EMC checks have confirmed an acceptable likelihood of mutual interference. (see document "**VHF MID BAND PLAN**")

PNG3 All non-defense usage of the band 359 – 399.9 MHz under the fixed and mobile services shall be seized and the validity period of issued licenses would not be extended anymore. Existing frequency assignments within this band shall be coordinated with NICTA for obtaining necessary frequency assignments in other frequency bands before first of August 2013.

PNG4 The category of the secondary fixed and mobile (except aeronautical mobile) services in the band 402 – 406 MHz coverted into primary because of national demand considering the provision ITU- Radio Regulation No. **4.4**.

PNG5 These following bands (channels 28 to 48) are allocated to the UHF Television usage using 8 MHz channel spacing;

UHF Band 4	**526 – 606 MHz**
UHF Band 5	**606 – 694 MHz**

Notes: i) NICTA may temporarily allocate additional TV channel(s) to enable smooth transition from Analog broadcasting to digital broadcasting, if demanded by the licensees;
ii) Segment 526 – 534 MHz (Band IV Channel 28) maybe allocated to the PNG Amateur TV service

(see document "**TECHNICAL STANDARDS FOR CABLE TV SYSTEMS IN PNG**")

Section VI – Footnotes to the ITU Radio Regulations Article 5

5.53 Administrations authorizing the use of frequencies below 8.3 kHz shall ensure that no harmful interference is caused to services to which the bands above 8.3 kHz are allocated. (WRC-12)

5.54 Administrations conducting scientific research using frequencies below 8.3 kHz are urged to advise other administrations that may be concerned in order that such research may be afforded all practicable protection from harmful interference. (WRC-12)

5.54A Use of the 8.3-11.3 kHz frequency band by stations in the meteorological aids service is limited to passive use only. In the band 9-11.3 kHz, meteorological aids stations shall not claim protection from stations of the radionavigation service submitted for notification to the Bureau prior to 1 January 2013. For sharing between stations of the meteorological aids service and stations in the radionavigation service submitted for notification after this date, the most recent version of Recommendation ITU-R RS.1881 should be applied. (WRC-12)

5.54B *Additional allocation:* in Algeria, Saudi Arabia, Egypt, the United Arab Emirates, the Russian Federation, Iran (Isamic 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. (WRC-15)

5.54C *Additional allocation:* in China, the frequency band 8.3-9 kHz is also allocated to the maritime radionavigation and maritime mobile services on a primary basis. (WRC-12)

5.55 *Additional allocation:* in Armenia, the Russian Federation, Georgia, Kyrgyzstan, Tajikistan and Turkmenistan, the frequency band 14-17 kHz is also allocated to the radionavigation service on a primary basis. (WRC-15)

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, the Russian Federation, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan, the frequencies 25 kHz and 50 kHz will be used for this purpose under the same conditions. (WRC-12)

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.

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

5.59 *Different category of service:* in Bangladesh and Pakistan, the allocation of the bands 70-72 kHz and 84-86 kHz to the fixed and maritime mobile services is on a primary basis (see Part **3**, Subsection **35.6**).

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.

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

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

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.

5.65 *Different category of service:* in Bangladesh, the allocation of the bands 112-117.6 kHz and 126-129 kHz to the fixed and maritime mobile services is on a primary basis (see Part **3**, Subsection **35.6**).

5.66 *Different category of service:* in Germany, the allocation of the band 115-117.6 kHz to the fixed and maritime mobile services is on a primary basis (see Part **3**, Subsection **35.6**) and to the radionavigation service on a secondary basis (see Part **3**, Subsection **35.5**).

5.67 *Additional allocation:* in Mongolia, Kyrgyzstan and Turkmenistan, the band 130-148.5 kHz is also allocated to the radionavigation service on a secondary basis. Within and between these countries this service shall have an equal right to operate. (WRC-19)

5.67A 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.) and shall not cause harmful interference to stations of the radionavigation service operating in countries listed in No. **5.67**. (WRC-07)

5.67B The use of the band 135.7-137.8 kHz in Algeria, Egypt, Iran (Islamic Republic of), Iraq, Lebanon, Syrian Arab Republic, Sudan, South Sudan and Tunisia is limited to the fixed and maritime mobile services. The amateur service shall not be used in the above-mentioned countries in the band 135.7-137.8 kHz, and this should be taken into account by the countries authorizing such use. (WRC-19)

5.68 *Alternative allocation:* in, Congo (Rep. of the), the Dem. Rep. of the Congo and South Africa, the frequency band 160-200 kHz is allocated to the fixed service on a primary basis. (WRC-15)

5.69 *Additional allocation:* in Somalia, the band 200-255 kHz is also allocated to the aeronautical radionavigation service on a primary basis.

5.70 *Alternative allocation:* in Angola, Botswana, Burundi, the Central African Rep., Congo (Rep. of the), Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Nigeria, Oman, the Dem. Rep. of the Congo, South Africa, Swaziland, Tanzania, Chad, Zambia and Zimbabwe, the band 200-283.5 kHz is allocated to the aeronautical radionavigation service on a primary basis. (WRC-19)

5.71 Supressed

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 radiobeacons) on a primary basis.

5.75 *Different category of service:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Moldova, Kyrgyzstan, Tajikistan, Turkmenistan, Ukraine and the Black Sea areas of Romania, the allocation of the band 315-325 kHz to the maritime radionavigation service is on a primary basis under the condition that in the Baltic Sea area, the assignment of frequencies in this band to new stations in the maritime or aeronautical radionavigation services shall be subject to prior consultation between the administrations concerned. (WRC-07)

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.

5.77 *Different category of service:* in Australia, China, the French overseas communities of Region 3, Korea (Rep. of), India, Iran (Islamic Republic of), Japan, Pakistan, Papua New Guinea, the Dem. People's Rep. of Korea and Sri Lanka, the allocation of the frequency band 415-495 kHz to the aeronautical radionavigation service is on a primary basis. In Armenia, Azerbaijan, Belarus, the Russian Federation, Kazakhstan, Latvia, Uzbekistan and Kyrgyzstan, the allocation of the frequency band 435-495 kHz to the aeronautical radionavigation service is on a primary basis.

Administrations in all the aforementioned countries shall take all practical steps necessary to ensure that aeronautical radionavigation stations in the frequency band 435-495 kHz do not cause interference to reception by coast stations of transmissions from ship stations on frequencies designated for ship stations on a worldwide basis. (WRC-19)

5.78 *Different category of service:* in Cuba, the United States of America and Mexico, the allocation of the band 415-435 kHz to the aeronautical radionavigation service is on a primary basis.

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. (WRC-19)

5.79A When establishing coast stations in the NAVTEX service on the frequencies 490 kHz, 518 kHz and 4 209.5 kHz, administrations are strongly recommended to coordinate the operating characteristics in accordance with the procedures of the International Maritime Organization (IMO) (see Resolution **339 (Rev.WRC-07)**). (WRC-07)

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

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. (WRC-12)

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. (WRC-12)

5.82 In the maritime mobile service, the frequency 490 kHz is to be used exclusively for the transmission by coast stations of navigational and meteorological warnings and urgent information to ships, by means of narrow-band direct-printing telegraphy. The conditions for use of the frequency 490 kHz are prescribed in Articles **31** and **52**. In using the frequency band 415-495 kHz for the aeronautical radionavigation service, administrations are requested to ensure that no harmful interference is caused to the frequency 490 kHz. In using the frequency band 472-479 kHz for the amateur service, administrations shall ensure that no harmful interference is caused to the frequency 490 kHz. (WRC-12)

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. (WRC-19)

5.84 The conditions for the use of the frequency 518 kHz by the maritime mobile service are prescribed in Articles **31** and **52**. (WRC-07)

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

5.87 *Additional allocation:* in Angola, Botswana, Eswatini, Lesotho, Malawi, Mozambique, Namibia and Niger, the frequency band 526.5-535 kHz is also allocated to the mobile service on a secondary basis. (WRC-19)

5.87A *Additional allocation:* in Uzbekistan, the band 526.5-1 606.5 kHz is also allocated to the radionavigation service on a primary basis. Such use is subject to agreement obtained under No. **9.21** with administrations concerned and limited to ground-based radiobeacons in operation on 27 October 1997 until the end of their lifetime.

5.88 *Additional allocation:* in China, the band 526.5-535 kHz is also allocated to the aeronautical radionavigation service on a secondary basis.

5.89 In Region 2, the use of the band 1 605-1 705 kHz by stations of the broadcasting service is subject to the Plan established by the Regional Administrative Radio Conference (Rio de Janeiro, 1988).

The examination of frequency assignments to stations of the fixed and mobile services in the band 1 625-1 705 kHz shall take account of the allotments appearing in the Plan established by the Regional Administrative Radio Conference (Rio de Janeiro, 1988).

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.

5.91 *Additional allocation:* in the Philippines and Sri Lanka, the band 1 606.5-1 705 kHz is also allocated to the broadcasting service on a secondary basis.

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.

5.93 *Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Hungary, Kazakhstan, Latvia, Lithuania, Mongolia, Nigeria, Uzbekistan, Poland, Kyrgyzstan, Slovakia, Tajikistan, Chad, Turkmenistan and Ukraine, the frequency bands 1 625-1 635 kHz, 1 800-1 810 kHz and 2 160-2 170 kHz are also allocated to the fixed and land mobile services on a primary basis, subject to agreement obtained under No. **9.21**. (WRC-15)

5.96 In Germany, Armenia, Austria, Azerbaijan, Belarus, Croatia, Denmark, Estonia, the Russian Federation, Finland, Georgia, Hungary, Ireland, Iceland, Israel, Kazakhstan, Latvia, Liechtenstein, Lithuania, Malta, Moldova, Norway, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., the United Kingdom, Sweden, Switzerland, Tajikistan, Turkmenistan and Ukraine, administrations may allocate up to 200 kHz to their amateur service in the bands 1 715-1 800 kHz and 1 850-2 000 kHz. However, when allocating the frequency bands within this range to their amateur service, administrations shall, after prior consultation with administrations of neighbouring countries, take such steps as may be necessary to prevent harmful interference from their amateur service to the fixed and mobile services of other countries. The mean power of any amateur station shall not exceed 10 W. (WRC-15)

5.97 In Region 3, the Loran system operates either on 1 850 kHz or 1 950 kHz, the bands occupied being 1 825-1 875 kHz and 1 925-1 975 kHz respectively. Other services to which the band 1 800-2 000 kHz is allocated may use any frequency therein on condition that no harmful interference is caused to the Loran system operating on 1 850 kHz or 1 950 kHz.

5.98 *Alternative allocation*: in Armenia, Azerbaijan, Belarus, Belgium, Cameroon, Congo (Rep. of the), Denmark, Egypt, Eritrea, Spain, Ethiopia, the Russian Federation, Georgia, Greece, Italy, Kazakhstan, Lebanon,

Lithuania, the Syrian Arab Republic, Kyrgyzstan, Somalia, Tajikistan, Tunisia, Turkmenistan and Turkey , the band 1 810-1 830 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-15)

5.99 *Additional allocation:* in Saudi Arabia, Austria, Iraq, Libya, Uzbekistan, Slovakia, Romania, Slovenia, Chad, and Togo, the band 1 810-1 830 kHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

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**.

5.102 *Alternative allocation:* in Bolivia, Chile, Paraguay and Peru, the band 1 850-2 000 kHz is allocated to the fixed, mobile except aeronautical mobile, radiolocation and radionavigation services on a primary basis. (WRC-15)

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.

5.105 In Region 2, except in Greenland, coast stations and ship stations using radiotelephony in the band 2 065-2 107 kHz shall be limited to class J3E emissions and to a peak envelope power not exceeding 1 kW. Preferably, the following carrier frequencies should be used: 2 065.0 kHz, 2 079.0 kHz, 2 082.5 kHz, 2 086.0 kHz, 2 093.0 kHz, 2 096.5 kHz, 2 100.0 kHz and 2 103.5 kHz. In Argentina and Uruguay, the carrier frequencies 2 068.5 kHz and 2 075.5 kHz are also used for this purpose, while the frequencies within the band 2 072-2 075.5 kHz are used as provided in No. **52.165**.

5.106 In Regions 2 and 3, provided no harmful interference is caused to the maritime mobile service, the frequencies between 2 065 kHz and 2 107 kHz may be used by stations of the fixed service communicating only within national borders and whose mean power does not exceed 50 W. In notifying the frequencies, the attention of the Bureau should be drawn to these provisions.

5.107 *Additional allocation:* in Saudi Arabia, Eritrea, Eswatini, Ethiopia, Iraq, Libya and Somalia, the frequency band 2 160-2 170 kHz is also allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis. The mean power of stations in these services shall not exceed 50 W. (WRC-19)

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**. (WRC-07)

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**.

5.110 The frequencies 2 174.5 kHz, 4 177.5 kHz, 6 268 kHz, 8 376.5 kHz, 12 520 kHz and 16 695 kHz are international distress frequencies for narrow-band direct-printing telegraphy. The conditions for the use of these frequencies are prescribed in Article **31**.

5.111 The carrier frequencies 2 182 kHz, 3 023 kHz, 5 680 kHz, 8 364 kHz and the frequencies 121.5 MHz, 156.525 MHz, 156.8 MHz and 243 MHz may also be used, in accordance with the procedures in force for terrestrial radiocommunication services, for search and rescue operations concerning manned space vehicles. The conditions for the use of the frequencies are prescribed in Article **31**.

The same applies to the frequencies 10 003 kHz, 14 993 kHz and 19 993 kHz, but in each of these cases emissions must be confined in a band of ?3 kHz about the frequency. (WRC-07)

5.112 *Alternative allocation:* in Sri Lanka, the frequency band 2 194-2 300 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-19)

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 Part **2**, Sections **32** to **34** and Nos. **23.3** to **23.10**.

5.114 *Alternative allocation*: in Iraq, the frequency band 2 502-2 625 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-19)

5.115 The carrier (reference) frequencies 3 023 kHz and 5 680 kHz may also be used, in accordance with Article **31**, by stations of the maritime mobile service engaged in coordinated search and rescue operations. (WRC-07)

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

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

5.117 *Alternative allocation*: in Côte d'Ivoire, Egypt, Liberia, Sri Lanka and Togo, the frequency band 3 155-3 200 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-19)

5.118 *Additional allocation:* in the United States, Mexico and Peru, the frequency band 3 230-3 400 kHz is also allocated to the radiolocation service on a secondary basis. (WRC-19)

5.119 *Additional allocation:* in Peru, the band 3 500-3 750 kHz is also allocated to the fixed and mobile services on a primary basis. (WRC-15)

5.122 *Alternative allocation:* in Bolivia, Chile, Ecuador, Paraguay and Peru, the band 3 750-4 000 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-15)

5.123 *Additional allocation:* in Botswana, Eswatini, Lesotho, Malawi, Mozambique, Namibia, South Africa, Zambia and Zimbabwe, the frequency band 3 900-3 950 kHz is also allocated to the broadcasting service on a primary basis, subject to agreement obtained under No. **9.21**. (WRC-19)

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

5.126 In Region 3, the stations of those services to which the band 3 995-4 005 kHz is allocated may transmit standard frequency and time signals.

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**).

5.128 Frequencies in the frequency bands 4 063-4 123 kHz and 4 130-4 438 kHz may be used exceptionally by stations in the fixed service, communicating only within the boundary of the country in which they are located, with a mean power not exceeding 50 W, on condition that harmful interference is not caused to the maritime mobile

service. In addition, in Afghanistan, Argentina, Armenia, Belarus, Botswana, Burkina Faso, the Central African Rep., China, the Russian Federation, Georgia, India, Kazakhstan, Mali, Niger, Pakistan, Kyrgyzstan, Tajikistan, Chad, Turkmenistan and Ukraine, in the frequency bands 4 063-4 123 kHz, 4 130-4 133 kHz and 4 408-4 438 kHz, stations in the fixed service, with a mean power not exceeding 1 kW, can be operated on condition that they are situated at least 600 km from the coast and that harmful interference is not caused to the maritime mobile service. (WRC-19)

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**. (WRC-07)

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**).

5.132A Stations in the radiolocation service shall not cause harmful interference to, or claim protection from, stations operating in the fixed or mobile services. Applications of the radiolocation service are limited to oceanographic radars operating in accordance with Resolution **612 (Rev.WRC-12)**. (WRC-12)

5.132B *Alternative allocation:* in Armenia, Belarus, Moldova and Kyrgyzstan, the frequency band 4 438- 4 488 kHz is allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis. (WRC-19)

5.133 *Different category of service:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Latvia, Lithuania, Niger, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 5 130-5 250 kHz to the mobile, except aeronautical mobile, service is on a primary basis (see No. **5.33**). (WRC-12)

5.133A *Alternative allocation:* in Armenia, Belarus, Moldova and Kyrgyzstan, the frequency bands 5 250- 5 275 kHz and 26 200-26 350 kHz are allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-19)

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.). (WRC-19)

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). (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. (WRC-07)

5.137 On condition that harmful interference is not caused to the maritime mobile service, the bands 6 200-6 213.5 kHz and 6 220.5-6 525 kHz may be used exceptionally by stations in the fixed service, communicating only within the boundary of the country in which they are located, with a mean power not exceeding 50 W. At the time of notification of these frequencies, the attention of the Bureau will be drawn to the above conditions.

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.

5.138A Until 29 March 2009, the band 6 765-7 000 kHz is allocated to the fixed service on a primary basis and to the land mobile service on a secondary basis. After this date, this band is allocated to the fixed and the mobile except aeronautical mobile (R) services on a primary basis.

5.139 *Different category of service:* until 29 March 2009, in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Latvia, Lithuania, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 6 765-7 000 kHz to the land mobile service is on a primary basis (see No. **5.33**). (WRC-07)

5.140 *Additional allocation:* in Angola, Iraq, Somalia and Togo, the band 7 000-7 050 kHz is also allocated to the fixed service on a primary basis. (WRC-15)

5.141 *Alternative allocation:* in Egypt, Eritrea, Ethiopia, Guinea, Libya, Madagascar and Niger, the band 7 000-7 050 kHz is allocated to the fixed service on a primary basis. (WRC-12)

5.141A *Additional allocation:* in Uzbekistan and Kyrgyzstan, the bands 7 000-7 100 kHz and 7 100-7 200 kHz are also allocated to the fixed and land mobile services on a secondary basis.

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. (WRC-19)

5.141C In Regions 1 and 3, the band 7 100-7 200 kHz is allocated to the broadcasting service until 29 March 2009 on a primary basis.

5.142 Until 29 March 2009, the use of the band 7 100-7 300 kHz in Region 2 by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3. After 29 March 2009 the use of the band 7 200-7 300 kHz in Region 2 by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3.

5.143 *Additional allocation:* frequencies in the band 7 300-7 350 kHz may be used by stations in the fixed service and in the land mobile service, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies for these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations. (WRC-07)

5.143A In Region 3, the band 7 350-7 450 kHz is allocated, until 29 March 2009, to the fixed service on a primary basis and to the land mobile service on a secondary basis. After 29 March 2009, frequencies in this band may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies for these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

5.143B In Region 1, the band 7 350-7 450 kHz is allocated, until 29 March 2009, to the fixed service on a primary basis and to the land mobile service on a secondary basis. After 29 March 2009, on condition that harmful interference is not caused to the broadcasting service, frequencies in the band 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, each station using a total radiated power that shall not exceed 24 dBW.

5.143C *Additional allocation:* after 29 March 2009 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. (WRC-12)

5.143D In Region 2, the band 7 350-7 400 kHz is allocated, until 29 March 2009, to the fixed service on a primary basis and to the land mobile service on a secondary basis. After 29 March 2009, frequencies in this band may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies for these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

5.143E Until 29 March 2009, the band 7 450-8 100 kHz is allocated to the fixed service on a primary basis and to the land mobile service on a secondary basis.

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

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**. (WRC-07)

5.145A Stations in the radiolocation service shall not cause harmful interference to, or claim protection from, stations operating in the fixed service. Applications of the radiolocation service are limited to oceanographic radars operating in accordance with Resolution **612 (Rev.WRC-12)**. (WRC-12)

5.145B *Alternative allocation:* in Armenia, Belarus, Moldova and Kyrgyzstan, the frequency bands 9 305- 9 355 kHz and 16 100-16 200 kHz are allocated to the fixed service on a primary basis. (WRC-19)

5.146 *Additional allocation:* frequencies in the bands 9 400-9 500 kHz, 11 600-11 650 kHz, 12 050-12 100 kHz, 15 600-15 800 kHz, 17 480-17 550 kHz and 18 900-19 020 kHz may be used by stations in the fixed service,

communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies in the fixed service, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations. (WRC-07)

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,	4 950-4 990 MHz,	102-109.5 GHz,
25 550-25 670 kHz,	4 990-5 000 MHz,	111.8-114.25 GHz,
37.5-38.25 MHz,	6 650-6 675.2 MHz,	128.33-128.59 GHz,
73-74.6 MHz in Regions 1 and 3,	10.6-10.68 GHz,	129.23-129.49 GHz,
150.05-153 MHz in Region 1,	14.47-14.5 GHz,	130-134 GHz,
322-328.6 MHz,	22.01-22.21 GHz,	136-148.5 GHz,
406.1-410 MHz,	22.21-22.5 GHz,	151.5-158.5 GHz,
608-614 MHz in Regions 1 and 3,	22.81-22.86 GHz,	168.59-168.93 GHz,
1 330-1 400 MHz,	23.07-23.12 GHz,	171.11-171.45 GHz,
1 610.6-1 613.8 MHz,	31.2-31.3 GHz,	172.31-172.65 GHz,
1 660-1 670 MHz,	31.5-31.8 GHz in Regions 1 and 3,	173.52-173.85 GHz,
1 718.8-1 722.2 MHz,	36.43-36.5 GHz,	195.75-196.15 GHz,
2 655-2 690 MHz,	42.5-43.5 GHz,	209-226 GHz,
3 260-3 267 MHz,	48.94-49.04 GHz,	241-250 GHz,
3 332-3 339 MHz,	76-86 GHz,	252-275 GHz
3 345.8-3 352.5 MHz,	92-94 GHz,	
4 825-4 835 MHz,	94.1-100 GHz,	

are allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from spaceborne or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. **4.5** and **4.6** and Article **29**). (WRC-07)

5.149A *Alternative allocation:* in Armenia, Belarus, Moldova and Kyrgyzstan, the frequency band 13 450- 13 550 kHz is allocated to the fixed service on a primary basis and to the mobile, except aeronautical mobile (R), service on a secondary basis. (WRC-19)

5.150 The following bands:

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

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

5.151 *Additional allocation:* frequencies in the bands 13 570-13 600 kHz and 13 800-13 870 kHz may be used by stations in the fixed service and in the mobile except aeronautical mobile (R) service, communicating only within the boundary of the country in which they are located, on the condition that harmful interference is not caused to the broadcasting service. When using frequencies in these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations. (WRC-07)

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

5.153 In Region 3, the stations of those services to which the band 15 995-16 005 kHz is allocated may transmit standard frequency and time signals.

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

5.155 *Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Slovakia, Tajikistan, Turkmenistan and Ukraine, the band 21 850-21 870 kHz is also allocated to the aeronautical mobile (R) service on a primary basis. (WRC-07)

5.155A In Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Slovakia, Tajikistan, Turkmenistan and Ukraine, the use of the band 21 850-21 870 kHz by the fixed service is limited to provision of services related to aircraft flight safety. (WRC-07)

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

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

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.

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

5.158 *Alternative allocation:* in Armenia, Belarus, Moldova and Kyrgyzstan, the frequency band 24 450- 24 600 kHz is allocated to the fixed and land mobile services on a primary basis. (WRC-19)

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5.159 *Alternative allocation:* in Armenia, Belarus, Moldova and Kyrgyzstan, the frequency band 39-39.5 MHz is allocated to the fixed and mobile services on a primary basis. (WRC-19)

5.160 *Additional allocation:* in Botswana, Burundi, Dem. Rep. of the Congo and Rwanda, the band 41-44 MHz is also allocated to the aeronautical radionavigation service on a primary basis. (WRC-12)

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

5.161A *Additional allocation:* in Korea (Rep. of), the United States and Mexico, the frequency bands 41.015-41.665 MHz and 43.35-44 MHz are also allocated to the radiolocation service on a primary basis. Stations in the radiolocation service shall not cause harmful interference to, or claim protection from, stations operating in the fixed or mobile services. Applications of the radiolocation service are limited to oceanographic radars operating in accordance with Resolution **612 (Rev.WRC-12)**. (WRC-19)

5.161B *Alternative allocation:* in Albania, Germany, Armenia, Austria, Belarus, Belgium, Bosnia and Herzegovina, Cyprus, Vatican, Croatia, Denmark, Spain, Estonia, Finland, France, Greece, Hungary, Ireland, Iceland, Italy, Latvia, The Former Yugoslav Rep. of Macedonia, Liechtenstein, Lithuania, Luxembourg, Malta, Moldova, Monaco, Montenegro, Norway, Uzbekistan, Netherlands, Portugal, Kyrgyzstan, Slovakia, Czech Rep., Romania, United Kingdom, San Marino, Slovenia, Sweden, Switzerland, Turkey and Ukraine, the frequency band 42-42.5 MHz is allocated to the fixed and mobile services on a primary basis. (WRC-15)

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

5.162A *Alternative allocation:* in Albania, Germany, Armenia, Austria, Belarus, Belgium, Bosnia and Herzegovina, Cyprus, Vatican, Croatia, Denmark, Spain, Estonia, Finland, France, Greece, Hungary, Ireland, Iceland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, North Macedonia, Malta, Moldova, Monaco, Montenegro, Norway, Uzbekistan, Netherlands, Portugal, Kyrgyzstan, Slovakia, Czech Rep., Romania, United Kingdom, San Marino, Slovenia, Sweden, Switzerland, Turkey and Ukraine, the frequency band 42-42.5 MHz is allocated to the fixed and mobile services on a primary basis. (WRC-19)

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5.163 *Additional allocation:* in Armenia, Belarus, the Russian Federation, Georgia, Kazakhstan, Latvia, Moldova, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the frequency bands 47-48.5 MHz and 56.5-58 MHz are also allocated to the fixed and land mobile services on a secondary basis. (WRC-19)

5.164 *Additional allocation:* in Albania, Algeria, Germany, Austria, Belgium, Bosnia and Herzegovina, Botswana, Bulgaria, Côte d'Ivoire, Croatia, Denmark, Spain, Estonia, Eswatini, Finland, France, Gabon, Greece, Hungary, Ireland, Israel, Italy, Jordan, Lebanon, Libya, Liechtenstein, Lithuania, Luxembourg, Madagascar, Mali, Malta, Morocco, Mauritania, Monaco, Montenegro, Nigeria, Norway, the Netherlands, Poland, Syrian Arab Republic, Slovakia, Czech Rep., Romania, the United Kingdom, Serbia, Slovenia, Sweden, Switzerland, Chad, Togo, Tunisia and Turkey, the band 47-68 MHz, in South Africa the frequency band 47-50 MHz, and in Latvia the frequency band 48.5-56.5 MHz and 58-68 MHz, are also allocated to the land mobile service on a primary basis. However, stations of the land mobile service in the countries mentioned in connection with each frequency band referred to in this footnote shall not cause harmful interference to, or claim protection from, existing or planned broadcasting stations of countries other than those mentioned in connection with the frequency band. (WRC-19)

5.165 *Additional allocation:* in Angola, Cameroon, Congo (Rep. of the), Egypt, Madagascar, Mozambique, Niger, Somalia, Sudan, South Sudan, Tanzania and Chad, the frequency band 47-68 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-19)

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. (WRC-19)

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**. (WRC-19)

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**. (WRC-19)

5.166D *Different category of service:* in Lebanon, the frequency band 50-52 MHz is allocated to the amateur service on a primary basis. Stations in the amateur service in Lebanon 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 50-52 MHz in the countries not listed in this provision. (WRC-19)

5.166E In the Russian Federation, only the frequency band 50.080-50.280 MHz is allocated to the amateur service on a secondary basis. The protection criteria for the other services in the countries not listed in this provision are specified in Nos. **5.166B** and **5.169B**. (WRC-19)

5.167 *Alternative allocation:* in Bangladesh, Brunei Darussalam, India, Iran (Islamic Republic of), Pakistan and Singapore, the band 50-54 MHz is allocated to the fixed, mobile and broadcasting services on a primary basis. (WRC-15)

5.167A *Additional allocation:* in Indonesia and Thailand, the band 50-54 MHz is also allocated to the fixed, mobile and broadcasting services on a primary basis. (WRC-15)

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

5.169 *Alternative allocation:* in Botswana, Eswatini, Lesotho, Malawi, Namibia,Rwanda, South Africa, Zambia and Zimbabwe, the frquency band 50-54 MHz is allocated to the amateur service on a primary basis. In Senegal, the frequency band 50-51 MHz is allocated to the amateur service on a primary basis. (WRC-19)

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. (WRC-19)

5.169B Except countries listed under No. **5.169**, stations in the amateur service used in Region 1, in all or part of the 50-54 MHz frequency band, shall not cause harmful interference to, or claim protection from, stations of other services used in accordance with the Radio Regulations in Algeria, Armenia, Azerbaijan, Belarus, Egypt, Russian Federation, Iran (Islamic Republic of), Iraq, Kazakhstan, Kyrgyzstan, Libya, Uzbekistan, Palestine*, the Syrian Arab Republic, Sudan, Tunisia and Ukraine. 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 the countries listed in this provision. (WRC-19)

5.170 *Additional allocation:* in New Zealand, the band 51-54 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-15)

5.171 *Additional allocation:* in Botswana, Eswatini, Lesotho, Malawi, Mali, Namibia, Dem. Rep. of the Congo, Rwanda, South Africa,Zambia and Zimbabwe, the frequency band 54-68 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-19)

5.172 *Different category of service:* in the French Overseas Departments and communities in Region 2 and Guyana, the allocation of the band 54-68 MHz to the fixed and mobile services is on a primary basis (see No 5.33).). (WRC-15)

5.173 *Different category of service:* in the French Overseas Departments and communities in Region 2 and Guyana, the allocation of the band 68-72 MHz to the fixed and mobile services is on a primary basis (see **No. 5.33).** (WRC-15)

5.175 *Alternative allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Moldova, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the bands 68-73 MHz and 76-87.5 MHz are allocated to the broadcasting service on a primary basis. In Latvia and Lithuania, the bands 68-73 MHz and 76-87.5 MHz are allocated to the broadcasting and mobile, except aeronautical mobile, services on a primary basis. The services to which these bands are allocated in other countries and the broadcasting service in the countries listed above are subject to agreements with the neighbouring countries concerned. (WRC-07)

5.176 *Additional allocation:* in Australia, China, Korea (Rep. of), the Philippines, the Dem. People's Rep. of Korea and Samoa, the band 68-74 MHz is also allocated to the broadcasting service on a primary basis. (WRC-07)

5.177 *Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 73-74 MHz is also allocated to the broadcasting service on a primary basis, subject to agreement obtained under No. **9.21**. (WRC-07)

5.178 *Additional allocation:* in Colombia, Cuba, El Salvador, Guatemala, Guyana, Honduras and Nicaragua, the band 73-74.6 MHz is also allocated to the fixed and mobile services on a secondary basis. (WRC-12)

5.179 *Additional allocation:* in Armenia, Azerbaijan, Belarus, China, the Russian Federation, Georgia, Kazakhstan, Lithuania, Mongolia, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the bands 74.6-74.8 MHz and 75.2-75.4 MHz are also allocated to the aeronautical radionavigation service, on a primary basis, for ground-based transmitters only. (WRC-12)

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.

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

5.182 *Additional allocation:* in Western Samoa, the band 75.4-87 MHz is also allocated to the broadcasting service on a primary basis.

5.183 *Additional allocation:* in China, Korea (Rep. of), Japan, the Philippines and the Dem. People's Rep. of Korea, the band 76-87 MHz is also allocated to the broadcasting service on a primary basis.

5.185 *Different category of service:* in the United States, the French Overseas Departments and communities in Region 2, Guyana and Paraguay, the allocation of the band 76-88 MHz to the fixed and mobile services is on a primary basis (see **No 5.33)**. (WRC-15)

5.187 *Alternative allocation:* in Albania, the band 81-87.5 MHz is allocated to the broadcasting service on a primary basis and used in accordance with the decisions contained in the Final Acts of the Special Regional Conference (Geneva, 1960).

5.188 *Additional allocation:* in Australia, the band 85-87 MHz is also allocated to the broadcasting service on a primary basis. The introduction of the broadcasting service in Australia is subject to special agreements between the administrations concerned.

5.190 *Additional allocation:* in Monaco, the band 87.5-88 MHz is also allocated to the land mobile service on a primary basis, subject to agreement obtained under No. **9.21**.

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

5.194 *Additional allocation:* in Kyrgyzstan, Somalia and Turkmenistan, the frequency band 104-108 MHz is also allocated to the mobile, except aeronautical mobile (R), service on a secondary basis. (WRC-19)

5.197 *Additional allocation:* in Pakistan and the Syrian Arab Republic, the band 108-111.975 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. **9.21**. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedures invoked under No. **9.21**. (WRC-07)

5.197A *Additional allocation:* the band 108-117.975 MHz is also allocated on a primary basis to the aeronautical mobile (R) service, limited to systems operating in accordance with recognized international aeronautical standards. Such use shall be in accordance with Resolution **413 (Rev.WRC-07)**. The use of the band 108-112 MHz by the aeronautical mobile (R) service shall be limited to systems composed of ground-based transmitters and associated receivers that provide navigational information in support of air navigation functions in accordance with recognized international aeronautical standards. (WRC-07)

5.197 *Additional allocation:* in Pakistan and the Syrian Arab Republic, the band 108-111.975 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. **9.21**. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedures invoked under No. **9.21**. (WRC-07)

5.197A *Additional allocation:* the band 108-117.975 MHz is also allocated on a primary basis to the aeronautical mobile (R) service, limited to systems operating in accordance with recognized international aeronautical standards. Such use shall be in accordance with Resolution **413 (Rev.WRC-07)**. The use of the band 108-112 MHz by the aeronautical mobile (R) service shall be limited to systems composed of ground-based transmitters and associated receivers that provide navigational information in support of air navigation functions in accordance with recognized international aeronautical standards. (WRC-07)

5.201 *Additional allocation:* in Armenia, Azerbaijan, Belarus, Bulgaria, Estonia, the Russian Federation, Georgia, Hungary, Iran (Islamic Republic of), Iraq (Republic of), Japan, Kazakhstan, Mali, Mongolia, Mozambique, Uzbekistan, Papua New Guinea, Poland, Kyrgyzstan, Romania, Senegal, Tajikistan, Turkmenistan and Ukraine, the frequency band 132-136 MHz is also allocated to the aeronautical mobile (OR) service on a primary basis. In assigning frequencies to stations of the aeronautical mobile (OR) service, the administration shall take account of the frequencies assigned to stations in the aeronautical mobile (R) service. (WRC-19)

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

stations of the aeronautical mobile (OR) service, the administration shall take account of the frequencies assigned to stations in the aeronautical mobile (R) service. (WRC-19)

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. (WRC-19)

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**). (WRC-19)

5.205 *Different category of service:* in Israel and Jordan, the allocation of the band 137-138 MHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (see Part **3**, Subsection **35.6**).

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

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

5.208 The use of the band 137-138 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**.

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 161.9375 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. (WRC-19)

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. (WRC-19)

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.

[*] This provision was previously numbered as No. **5.347A**. It was renumbered to preserve the sequential order.

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**. (WRC-19)**5.210** *Additional allocation:* in Italy, the Czech Rep. and the United Kingdom, the bands 138-143.6 MHz and 143.65-144 MHz are also allocated to the space research service (space-to-Earth) on a secondary basis. (WRC-07)

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. (WRC-19)

5.212 *Alternative allocation:* in Angola, Botswana, Cameroon, the Central African Rep., Congo (Rep. of the), Eswatini, Gabon, Gambia, Ghana, Guinea, Iraq, Jordan, Lesotho, Liberia, Libya, Malawi, Mozambique, Namibia, Niger, Oman, Uganda, Syrian Arab Republic, the Dem. Rep. of the Congo, Rwanda, Sierra Leone, South Africa, Chad, Togo, Zambia and Zimbabwe, the frequency band 138-144 MHz is allocated to the fixed and mobile services on a primary basis. (WRC-19)

5.213 *Additional allocation:* in China, the band 138-144 MHz is also allocated to the radiolocation service on a primary basis.

5.214 *Additional allocation:* in Eritrea, Ethiopia, Kenya, North Macedonia, Montenegro, Serbia, Somalia, Sudan, South Sudan and Tanzania, the frequency band 138-144 MHz is also allocated to the fixed service on a primary basis. (WRC-19)

5.216 *Additional allocation:* in China, the band 144-146 MHz is also allocated to the aeronautical mobile (OR) service on a secondary basis.

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

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

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. (WRC-19)

5.219 **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.** (WRC-19)

5.220 The use of the bands 149.9-150.05 MHz and 399.9-400.05 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**.. (WRC-15)

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. (Rev.WRC-19)

5.225 *Additional allocation:* in Australia and India, the band 150.05-153 MHz is also allocated to the radio astronomy service on a primary basis.

5.225A *Additional allocation:* in Algeria, Armenia, Azerbaijan, Belarus, China, the Russian Federation, France, Iran (Islamic Republic of), Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan, Ukraine and Viet Nam, the frequency band 154-156 MHz is also allocated to the radiolocation service on a primary basis. The usage of the frequency band 154-156 MHz by the radiolocation service shall be limited to space-object detection systems operating from terrestrial locations. The operation of stations in the radiolocation service in the frequency band 154-156 MHz shall be subject to agreement obtained under No. **9.21**. For the identification of potentially affected administrations in Region 1, the instantaneous field-strength value of 12 dB(μV/m) for 10% of the time produced at 10 m above ground level in the 25 kHz reference frequency band at the border of the territory of any other administration shall be used. For the identification of potentially affected administrations in Region 3, the interference-to-noise ratio (*I*/*N*) value of −6 dB (*N* = −161 dBW/4 kHz), or −10 dB for applications with greater protection requirements, such as public protection and disaster relief (PPDR (*N* = −161 dBW/4 kHz)), for 1% of the time produced at 60 m above ground level at the border of the territory of any other administration shall be used. In the frequency bands 156.7625-156.8375 MHz, 156.5125-156.5375 MHz, 161.9625-161.9875 MHz, 162.0125-162.0375 MHz, out-of-band e.i.r.p. of space surveillance radars shall not exceed −16 dBW. Frequency assignments to the radiolocation service under this allocation in Ukraine shall not be used without the agreement of Moldova. (WRC-12)

5.226 The frequency 156.525 MHz is the international distress, safety and calling frequency for the maritime mobile VHF radiotelephone service using digital selective calling (DSC). The conditions for the use of this frequency and the band 156.4875-156.5625 MHz are contained in Articles **31** and **52**, and in Appendix **18**.

The frequency 156.8 MHz is the international distress, safety and calling frequency for the maritime mobile VHF radiotelephone service. The conditions for the use of this frequency and the band 156.7625-156.8375 MHz are contained in Article **31** and Appendix **18**.

In the bands 156-156.4875 MHz, 156.5625-156.7625 MHz, 156.8375-157.45 MHz, 160.6-160.975 MHz and 161.475-162.05 MHz, each administration shall give priority to the maritime mobile service on only such frequencies as are assigned to stations of the maritime mobile service by the administration (see Articles **31** and **52**, and Appendix **18**).

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

However, the frequencies 156.8 MHz and 156.525 MHz and the frequency bands in which priority is given to the maritime mobile service may be used for radiocommunications on inland waterways subject to

agreement between interested and affected administrations and taking into account current frequency usage and existing agreements. (WRC-07)

5.227 *Additional allocation:* the bands 156.4875-156.5125 MHz and 156.5375-156.5625 MHz are also allocated to the fixed and land mobile services on a primary basis. The use of these bands by the fixed and land mobile services shall not cause harmful interference to nor claim protection from the maritime mobile VHF radio-communication service. (WRC-07)

5.228 The use of the frequency bands 156.7625-156.7875 MHz and 156.8125-156.8375 MHz by the mobile-satellite service (Earth-to-space) is limited to the reception of automatic identification system (AIS) emissions of long-range AIS broadcast messages (Message 27, see the most recent version of Recommendation ITU-R M.1371). With the exception of AIS emissions, emissions in these frequency bands by systems operating in the maritime mobile service for communications shall not exceed 1 W. (WRC-12)

5.228A The frequency bands 161.9625-161.9875 MHz and 162.0125-162.0375 MHz may be used by aircraft stations for the purpose of search and rescue operations and other safety-related communications. (WRC-12)

5.228AA The use of 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. (WRC-15)

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**. (WRC-19)

5.228AC The use of the frequency bands 157.1875-157.3375 MHz and 161.7875-161.9375 MHz by the maritime mobile-satellite service (space-to-Earth) is limited to non-geostationary-satellite systems operating in accordance with Appendix **18**. Such use is subject to agreement obtained under No. **9.21** with respect to the terrestrial services in Azerbaijan, Belarus, China, Korea (Rep. of), Cuba, the Russian Federation, the Syrian Arab Republic, the Dem. People's Rep. of Korea, South Africa and Viet Nam. (WRC-19)

5.228B The use of the frequency bands 161.9625-161.9875 MHz and 162.0125-162.0375 MHz by the fixed and land mobile services shall not cause harmful interference to, or claim protection from, the maritime mobile service. (WRC-12)

5.228C The use of the frequency bands 161.9625-161.9875 MHz and 162.0125-162.0375 MHz by the maritime mobile service and the mobile-satellite (Earth-to-space) service is limited to the automatic identification system (AIS). The use of these frequency bands by the aeronautical mobile (OR) service is limited to AIS emissions from search and rescue aircraft operations. The AIS operations in these frequency bands shall not constrain the development and use of the fixed and mobile services operating in the adjacent frequency bands. (WRC-12)

5.228D The frequency bands 161.9625-161.9875 MHz (AIS 1) and 162.0125-162.0375 MHz (AIS 2) may continue to be used by the fixed and mobile services on a primary basis until 1 January 2025, at which time this allocation shall no longer be valid. Administrations are encouraged to make all practicable efforts to discontinue the use of these bands by the fixed and mobile services prior to the transition date. During this transition period, the maritime mobile service in these frequency bands has priority over the fixed, land mobile and aeronautical mobile services. (WRC-12)

5.228E The use of the automatic identification system in the frequency bands 161.9625-161.9875 MHz and 162.0125-162.0375 MHz by the aeronautical mobile (OR) service is limited to aircraft stations for the purpose of search and rescue operations and other safety-related communications. (WRC-12)

5.228F The use of the frequency bands 161.9625-161.9875 MHz and 162.0125-162.0375 MHz by the mobile-satellite service (Earth-to-space) is limited to the reception of automatic identification system emissions from stations operating in the maritime mobile service. (WRC-12)

5.229 *Alternative allocation:* in Morocco, the band 162-174 MHz is allocated to the broadcasting service on a primary basis. The use of this band shall be subject to agreement with administrations having services, operating or planned, in accordance with the Table which are likely to be affected. Stations in existence on 1 January 1981, with their technical characteristics as of that date, are not affected by such agreement.

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

5.231 *Additional allocation:* in Afghanistan and China, the band 167-174 MHz is also allocated to the broadcasting service on a primary basis. The introduction of the broadcasting service into this band shall be subject to agreement with the neighbouring countries in Region 3 whose services are likely to be affected. (WRC-12)

5.233 *Additional allocation:* in China, the band 174-184 MHz is also allocated to the space research (space-to-Earth) and the space operation (space-to-Earth) services on a primary basis, subject to agreement obtained under No. **9.21**. These services shall not cause harmful interference to, or claim protection from, existing or planned broadcasting stations.

5.235 *Additional allocation:* in Germany, Austria, Belgium, Denmark, Spain, Finland, France, Israel, Italy, Liechtenstein, Malta, Monaco, Norway, the Netherlands, the United Kingdom, Sweden and Switzerland, the band 174-223 MHz is also allocated to the land mobile service on a primary basis. However, the stations of the land mobile service shall not cause harmful interference to, or claim protection from, broadcasting stations, existing or planned, in countries other than those listed in this footnote.

5.237 *Additional allocation:* in Congo (Rep. of the), Egypt, Eritrea, Ethiopia, Gambia, Guinea, Libya, Mali, Sierra Leone, Somalia and Chad, the band 174-223 MHz is also allocated to the fixed and mobile services on a secondary basis. (WRC-12)

5.238 *Additional allocation:* in Bangladesh, India, Pakistan and the Philippines, the band 200-216 MHz is also allocated to the aeronautical radionavigation service on a primary basis.

5.240 *Additional allocation:* in China and India, the band 216-223 MHz is also allocated to the aeronautical radionavigation service on a primary basis and to the radiolocation service on a secondary basis.

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

5.242 *Additional allocation:* in Canada and Mexico, the frequency band 216-220 MHz is also allocated to the land mobile service on a primary basis. (WRC-19)

5.243 *Additional allocation:* in Somalia, the band 216-225 MHz is also allocated to the aeronautical radionavigation service on a primary basis, subject to not causing harmful interference to existing or planned broadcasting services in other countries.

5.245 *Additional allocation:* in Japan, the band 222-223 MHz is also allocated to the aeronautical radionavigation service on a primary basis and to the radiolocation service on a secondary basis.

5.246 *Alternative allocation:* in Spain, France, Israel and Monaco, the band 223-230 MHz is allocated to the broadcasting and land mobile services on a primary basis (see Part **3**, Subsection **35.6**) on the basis that, in the preparation of frequency plans, the broadcasting service shall have prior choice of frequencies; and allocated to the fixed and mobile, except land mobile, services on a secondary basis. However, the stations of the land mobile service shall not cause harmful interference to, or claim protection from, existing or planned broadcasting stations in Morocco and Algeria.

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.

5.250 *Additional allocation*: in China, the band 225-235 MHz is also allocated to the radio astronomy service on a secondary basis.

5.251 *Additional allocation:* in Nigeria, the band 230-235 MHz is also allocated to the aeronautical radionavigation service on a primary basis, subject to agreement obtained under No. **9.21**.

5.252 *Alternative allocation:* in Botswana, Eswatini, Lesotho, Malawi, Mozambique, Namibia, South Africa, Zambia and Zimbabwe, the frequency bands 230-238 MHz and 246-254 MHz are allocated to the broadcasting service on a primary basis, subject to agreement obtained under No. **9.21**. (WRC-19)

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

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

5.256 The frequency 243 MHz is the frequency in this band for use by survival craft stations and equipment used for survival purposes. (WRC-07)

5.256A *Additional allocation:* in China, the Russian Federation and Kazakhstan, the band 258-261 MHz is also allocated to the space research service (Earth-to-space) and space operation service (Earth-to-space) on a primary basis. Stations in the space research service (Earth-to-space) and space operation service (Earth-to-space) shall not cause harmful interference to, or claim protection from, or constrain the use and development of the mobile service systems and mobile-satellite service systems operating in the band. Stations in space research service (Earth-to-space) and space operation service (Earth-to-space) shall not constrain the future development of fixed service systems of other countries. (WRC-15)

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

5.258 The use of the band 328.6-335.4 MHz by the aeronautical radionavigation service is limited to Instrument Landing Systems (glide path).

5.259 *Additional allocation:* in Egypt and the Syrian Arab Republic, the band 328.6-335.4 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. **9.21**. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedure invoked under No. **9.21**. (WRC-12)

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 mobilesatellite 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. (WRC-19)

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. (WRC-19)

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

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. (WRC-12)

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

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

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 explorationsatellite 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. (WRC-19)

5.264B Non-geostationary-satellite systems in the meteorological-satellite service and the Earth explorationsatellite 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. (WRC-19)

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

5.266 The use of the band 406-406.1 MHz by the mobile-satellite service is limited to low power satellite emergency position-indicating radiobeacons (see also Article **31**). (WRC-07)

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 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/m^2) for $0° \le \delta \le 5°$, -153 + 0.077 (δ – 5) dB(W/m^2) for $5° \le \delta \le 70°$ and –148 dB(W/m^2) for $70° \le \delta \le 90°$, where δ is the angle of arrival of the radio-frequency wave and the reference bandwidth is 4 kHz. No. **4.10** does not apply to extra-vehicular activities. In this frequency band 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. (WRC-15)

5.269 *Different category of service:* in Australia, the United States, India, Japan and the United Kingdom, the allocation of the bands 420-430 MHz and 440-450 MHz to the radiolocation service is on a primary basis (see Part **3**, Subsection **35.6**).

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

5.271 *Additional allocation:* in Belarus, China, India, Kyrgyzstan and Turkmenistan, the band 420-460 MHz is also allocated to the aeronautical radionavigation service (radio altimeters) on a secondary basis. (WRC-07)

5.274 *Alternative allocation:* in Denmark, Norway, Sweden and Chad, the bands 430-432 MHz and 438-440 MHz are allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

5.275 *Additional allocation:* in Croatia, Estonia Finland, Libya, NorthMacedonia, Montenegro and Serbia, the frequency bands 430-432 MHz and 438-440 MHz are also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-19)

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 band 430-440 MHz is also allocated to the fixed service on a primary basis and the bands 430-435 MHz and 438-440 MHz are also allocated, except in Ecuador, to the mobile, except aeronautical mobile, service on a primary basis. (WRC-15)

5.277 *Additional allocation:* in Angola, Armenia, Azerbaijan, Belarus, Cameroon, Congo (Rep. of the), Djibouti, the Russian Federation, Georgia, Hungary, Israel, Kazakhstan, Mali, Uzbekistan, Poland, the Dem. Rep. of the Congo, Kyrgyzstan, Slovakia, Romania, Rwanda, Tajikistan, Chad, Turkmenistan and Ukraine, the frequency band 430-440 MHz is also allocated to the fixed service on a primary basis. (WRC-19)

5.278 *Different category of service:* in Argentina, Brazil, Colombia, Costa Rica, Cuba, Guyana, Honduras, Panama, Paraguay, Uruguay and Venezuela, the allocation of the frequency band 430-440 MHz to the amateur service is on a primary basis (see No**. 5.33).**, (WRC-19)

5.279 *Additional allocation:* in Mexico, the frequency bands 430-435 MHz and 438-440 MHz are also allocated on a primary basis to the land mobile service, subject to agreement obtained under No. **9.21**. (WRC-19)

5.279A The use of the frequency band 432-438 MHz by sensors in the Earth exploration-satellite service (active) shall be in accordance with Recommendation ITU-R RS.1260-2. Additionally, the Earth exploration-satellite service (active) in the frequency band 432-438 MHz shall not cause harmful interference to the aeronautical radionavigation service in China. The provisions of this footnote in no way diminish the obligation of the Earth exploration-satellite service (active) to operate as a secondary service in accordance with Nos. **5.29** and **5.30. (WRC-19)**.

5.280 In Germany, Austria, Bosnia and Herzegovina, Croatia, Liechtenstein, North Macedonia, Montenegro, Portugal, Serbia, Slovenia and Switzerland, the frequency band 433.05-434.79 MHz (centre frequency 433.92 MHz) is designated for industrial, scientific and medical (ISM) applications. Radiocommunication services of these

countries operating within this frequency band must accept harmful interference which may be caused by these applications. ISM equipment operating in this frequency band is subject to the provisions of No. **15.13**. (WRC-19)

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

5.282 In the bands 435-438 MHz, 1 260-1 270 MHz, 2 400-2 450 MHz, 3 400-3 410 MHz (in Regions 2 and 3 only) and 5 650-5 670 MHz, the amateur-satellite service may operate subject to not causing harmful interference to other services operating in accordance with the Table (see No. **5.43**). Administrations authorizing such use shall ensure that any harmful interference caused by emissions from a station in the amateur-satellite service is immediately eliminated in accordance with the provisions of No. **25.11**. The use of the bands 1 260-1 270 MHz and 5 650-5 670 MHz by the amateur-satellite service is limited to the Earth-to-space direction.

5.283 *Additional allocation:* in Austria, the band 438-440 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

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

5.285 *Different category of service:* in Canada, the allocation of the band 440-450 MHz to the radiolocation service is on a primary basis (see Part **3**, Subsection **35.6**).

5.286 The band 449.75-450.25 MHz may be used for the space operation service (Earth-to-space) and the space research service (Earth-to-space), subject to agreement obtained under No. **9.21**.

5.286A The use of the bands 454-456 MHz and 459-460 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**.

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

5.286B The use of the band 454-455 MHz in the countries listed in No. **5.286D**, 455-456 MHz and 459-460 MHz in Region 2, and 454-456 MHz and 459-460 MHz in the countries listed in No. **5.286E**, by stations in the mobile-satellite service, shall not cause harmful interference to, or claim protection from, stations of the fixed or mobile services operating in accordance with the Table of Frequency Allocations.

5.286C The use of the band 454-455 MHz in the countries listed in No. **5.286D**, 455-456 MHz and 459-460 MHz in Region 2, and 454-456 MHz and 459-460 MHz in the countries listed in No. **5.286E**, by stations in the mobile-satellite service, shall not constrain the development and use of the fixed and mobile services operating in accordance with the Table of Frequency Allocations.

5.286D *Additional allocation:* in Canada, the United States and Panama, the band 454-455 MHz is also allocated to the mobile-satellite service (Earth-to-space) on a primary basis. (WRC-07)

5.286E *Additional allocation:* in Cape Verde, Nepal and Nigeria, the bands 454-456 MHz and 459-460 MHz are also allocated to the mobile-satellite (Earth-to-space) service on a primary basis. (WRC-07)

5.287 Use of the frequency bands 457.5125-457.5875 MHz and 467.5125-467.5875 by the maritime mobile service is limited to on-board communication stations. The characteristics of the equipment and the channelling 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. (WRC-19)

5.288 In the territorial waters of the United States and the Philippines, the preferred frequencies for use by on-board communication stations shall be 457.525 MHz, 457.550 MHz, 457.575 MHz and 457.600 MHz paired, respectively, with 467.750 MHz, 467.775 MHz, 467.800 MHz and 467.825 MHz. The characteristics of the equipment used shall conform to those specified in Recommendation ITU-R M.1174-4. (WRC-19)

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

5.290 *Different category of service:* in Afghanistan, Azerbaijan, Belarus, China, the Russian Federation, Japan, Kyrgyzstan, Tajikistan and Turkmenistan, the allocation of the band 460-470 MHz to the meteorological-satellite service (space-to-Earth) is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**. (WRC-12)

5.291 *Additional allocation:* in China, the band 470-485 MHz is also allocated to the space research (space-to-Earth) and the space operation (space-to-Earth) services on a primary basis subject to agreement obtained under No. **9.21** and subject to not causing harmful interference to existing and planned broadcasting stations.

5.291A *Additional allocation:* in Germany, Austria, Denmark, Estonia, Liechtenstein,the Czech Rep. Serbia and Switzerland, the band 470-494 MHz is also allocated to the radiolocation service on a secondary basis. This use is limited to the operation of wind profiler radars in accordance with Resolution **217 (WRC-97)**. (WRC-15)

5.292 *Different category of service:* in Argentina, Uruguay and Venezuela the allocation of the band 470-512 MHz to the fixed and mobile services, and in Argentina, Uruguay and Venezuela to the mobile service, is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**. (WRC-15)

5.293 *Different category of service:* in Canada, Chile, Cuba, the United States, Guyana, Jamaicaand Panama, the allocation of the bands 470-512 MHz and 614-806 MHz to the fixed service is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**. In Bahamas, Barbados,Canada, Chile, Cuba, the United States, Guyana, Jamaica, Mexicoand Panama the allocation of the bands 470-512 MHz and 614-698 MHz to the mobile service is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**. In Argentina and Ecuador, the allocation of the band 470-512 MHz to the fixed and mobile services is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**. (WRC-15)

5.294 *Additional allocation:* in Saudi Arabia, Cameroon, Côte d'Ivoire, Egypt, Ethiopia, Israel, Libya, the Syrian Arab Republic, Chad and Yemen, the band 470-582 MHz is also allocated to the fixed service on a secondary basis. (WRC-15)

5.295 In the Bahamas, Barbados, Canada, the United States and Mexico, the frequency band 470-608 MHz, or portions thereof, is identified for International Mobile Telecommunications (IMT) – see Resolution **224 (Rev.WRC-19)**. 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. Mobile service stations of the IMT system within the frequency band are subject to agreement obtained under No. **9.21** and shall not cause harmful interference to, or claim protection from, the broadcasting service of neighbouring countries.Nos. **5.43** and **5.43A** apply. (WRC-19)

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,Ukrain, 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. (WRC-19)

5.296A In Micronesia, the Solomon Islands, Tuvalu and Vanuatu, the frequency band 470-698 MHz, or portions thereof, and in Bangladesh, Maldives and New Zealand, the frequency band 610-698 MHz, or portions thereof, are

identified for use by these administrations wishing to implement International Mobile Telecommunications (IMT) – see Resolution **224 (Rev.WRC-19)**. 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. The mobile allocation in this frequency band shall not be used for IMT systems unless subject to agreement obtained under No. **9.21** and shall not cause harmful interference to, or claim protection from, the broadcasting service of neighbouring countries. Nos. **5.43** and **5.43A** apply. (WRC-19)

5.297 *Additional allocation:* in Canada, Costa Rica, Cuba, El Salvador, the United States, Guatemala, Guyana and Jamaica, the frequency band 512-608 MHz is also allocated to the fixed and mobile services on a primary basis, subject to agreement obtained under No. **9.21**. In the Bahamas, Barbados and Mexico, the frequency band 512-608 MHz is also allocated to the mobile service on a primary basis, subject to agreement obtained under No. **9.21**. In Mexico, the frequency band 512-608 MHz is also allocated on a secondary basis to the fixed service (see No. **5.32**). (WRC-19)

5.298 *Additional allocation:* in India, the band 549.75-550.25 MHz is also allocated to the space operation service (space-to-Earth) on a secondary basis.

5.300 *Additional allocation:* in Saudi Arabia, Cameroon, Egypt, United Arab Emirates, Israel, Jordan, Libya, Oman, Qatar, the Syrian Arab Republicand Sudan, the band 582-790 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis. (WRC-15)

5.304 *Additional allocation:* in the African Broadcasting Area (see Part **2**, Section **29**), the band 606-614 MHz is also allocated to the radio astronomy service on a primary basis.

5.305 *Additional allocation:* in China, the band 606-614 MHz is also allocated to the radio astronomy service on a primary basis.

5.306 *Additional allocation:* in Region 1, except in the African Broadcasting Area (see Part **2**, Section **29**), and in Region 3, the band 608-614 MHz is also allocated to the radio astronomy service on a secondary basis.

5.307 *Additional allocation:* in India, the band 608-614 MHz is also allocated to the radio astronomy service on a primary basis.

5.308 *Additional allocation:* in Belize, Colombia and Guatemala, the frequency band 614-698 MHz is also allocated to the mobile service on a primary basis. Stations of the mobile service within the frequency band are subject to agreement obtained under No. **9.21**. (WRC-19)

5.308A **5.308A** In the Bahamas, Barbados, Belize, Canada, Colombia, the United States, Guatemala and Mexico, the frequency band 614-698 MHz, or portions thereof, is identified for International Mobile Telecommunications (IMT) – see Resolution **224 (Rev.WRC-19).** 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. Mobile service stations of the IMT system within the frequency band are subject to agreement obtained under No. **9.21** and shall not cause harmful interference to, or claim protection from, the broadcasting service of neighbouring countries. Nos. **5.43** and **5.43A** apply.(WRC-19)

5.309 *Different category of service*: in El Salvador, the allocation of the band 614-806 MHz to the fixed service is on a primary basis (see No **5.33**)), subject to agreement obtained under No. **9.21**. (WRC-15)

5.312 *Additional allocation*: in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the frequency band 645-862 MHz, and in Bulgaria the bands 646-686 MHz, 726-753 MHz, 778-811 MHz and 822-852 MHz, are also allocated to the aeronautical radionavigation service on a primary basis. (WRC-19)

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)**. (WRC-19)

5.313A The frequency band, or portions of the frequency band 698-790 MHz, in Australia, Bangladesh, Brunei Darussalam, Cambodia, China, Korea (Rep. of), Fiji, India, Indonesia, Japan, Kiribati, Lao P.D.R., Malaysia, Myanmar (Union of), New Zealand, Pakistan, Papua New Guinea, the Philippines, the Dem. People's Rep. Of Korea, Solomon Islands, Samoa, Singapore, Thailand, Tonga, Tuvalu, Vanuatu and Viet Nam, are identified for use by these administrations wishing to implement International Mobile Telecommunications (IMT). 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. (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. (WRC-19)

5.317 *Additional allocation*: in Region 2 (except Brazil, the United States and Mexico), the band 806-890 MHz is also allocated to the mobile-satellite service on a primary basis, subject to agreement obtained under No. **9.21**. The use of this service is intended for operation within national boundaries. (WRC-15)

5.317A The parts of the frequency band 698-960 MHz in Region 2 and the frequency bands 694-790 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 (WRC-19)** and **749 (Rev.WRC-19)**, where applicable. This identification does not preclude the use of these bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. (WRC-19)

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

5.319 *Additional allocation*: in Belarus, the Russian Federation and Ukraine, the bands 806-840 MHz (Earth-to-space) and 856-890 MHz (space-to-Earth) are also allocated to the mobile-satellite, except aeronautical mobile-satellite (R), service. The use of these bands by this service shall not cause harmful interference to, or claim protection from, services in other countries operating in accordance with the Table of Frequency Allocations and is subject to special agreements between the administrations concerned.

5.320 *Additional allocation*: in Region 3, the bands 806-890 MHz and 942-960 MHz are also allocated to the mobile-satellite, except aeronautical mobile-satellite (R), service on a primary basis, subject to agreement obtained under No. **9.21**. The use of this service is limited to operation within national boundaries. In seeking such agreement, appropriate protection shall be afforded to services operating in accordance with the Table, to ensure that no harmful interference is caused to such services.

5.322 In Region 1, in the band 862-960 MHz, stations of the broadcasting service shall be operated only in the African Broadcasting Area (see Nos. **5.10** to **5.13**) excluding Algeria, Burundi, Egypt, Spain, Lesotho, Libya, Morocco, Malawi, Namibia, Nigeria, South Africa, Tanzania, Zimbabwe and Zambia, subject to agreement obtained under No. **9.21**. (WRC-12)

5.323 *Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the frequency band 862-960 MHz, in Bulgaria the frequency bands 862-880MHz and 915-925MHz, and in Romania the frequency bands 862-880 MHz and 915-925 MHz, are also allocated to the aeronautical radionavigation service on a primary basis. Such use is subject to agreement obtained under No. **9.21** with administrations concerned and limited to ground-based radiobeacons in operation on 27 October 1997 until the end of their lifetime. (WRC-19)

5.325 *Different category of service*: in the United States, the allocation of the band 890-942 MHz to the radiolocation service is on a primary basis (see Part **3**, Subsection **35.6**), subject to agreement obtained under No. **9.21**.

5.325A *Different category of service:* in Argentina, Brazil, Costa Rica, Cuba, Dominican Republic, El Salvador, Ecuador, the French overseas departments and communities in Region 2, Guatemala, Paraguay, Uruguay and Venezuela, the frequency band 902-928 MHz is allocated to the land mobile service on a primary basis. In Mexico, the frequency band 902-905 MHz is allocated to the land mobile service on a primary basis. (WRC-19)

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

5.327 *Different category of service*: in Australia, the allocation of the band 915-928 MHz to the radiolocation service is on a primary basis (see Part **3**, Subsection **35.6**).

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)**. (WRC-15)

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

5.328A Stations in the radionavigation-satellite service in the band 1 164-1 215 MHz shall operate in accordance with the provisions of Resolution **609 (Rev.WRC-07)** and shall not claim protection from stations in the aeronautical radionavigation service in the band 960-1 215 MHz. No. **5.43A** does not apply. The provisions of No. **21.18** shall apply. (WRC-07)

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 (WRC-19)** shall apply. (WRC-19)

5.328B The use of the bands 1 164-1 300 MHz, 1 559-1 610 MHz and 5 010-5 030 MHz by systems and networks in the radionavigation-satellite service for which complete coordination or notification information, as appropriate, is received by the Radiocommunication Bureau after 1 January 2005 is subject to the application of the provisions of Nos. **9.12**, **9.12A** and **9.13**. Resolution **610 (WRC-03)** shall also apply; however, in the case of radionavigation-satellite service (space-to-space) networks and systems, Resolution **610 (WRC-03)** shall only apply to transmitting space stations. In accordance with No. **5.329A**, for systems and networks in the radionavigation-satellite service (space-to-space) in the bands 1 215-1 300 MHz and 1 559-1 610 MHz, the provisions of Nos. **9.7**, **9.12**, **9.12A** and **9.13** shall only apply with respect to other systems and networks in the radionavigation-satellite service (space-to-space). (WRC-07)

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 band 1 215-1 300 MHz shall be subject to the condition that no harmful interference is caused to the radiolocation service. No. **5.43** shall not apply in respect of the radiolocation service. Resolution **608 (WRC-19)** shall apply. (WRC-19)

5.329A Use of systems in the radionavigation-satellite service (space-to-space) operating in the bands 1 215-1 300 MHz and 1 559-1 610 MHz is not intended to provide safety service applications, and shall not impose any additional constraints on radionavigation-satellite service (space-to-Earth) systems or on other services operating in accordance with the Table of Frequency Allocations. (WRC-07)

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. (WRC-12)

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 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. (WRC-19)

5.332 In the band 1 215-1 260 MHz, active spaceborne sensors in the Earth exploration-satellite and space research services shall not cause harmful interference to, claim protection from, or otherwise impose constraints on operation or development of the radiolocation service, the radionavigation-satellite service and other services allocated on a primary basis.

5.334 *Additional allocation:* in Canada and the United States, the band 1 350-1 370 MHz is also allocated to the aeronautical radionavigation service on a primary basis.

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

5.335A In the band 1 260-1 300 MHz, active spaceborne sensors in the Earth exploration-satellite and space research services shall not cause harmful interference to, claim protection from, or otherwise impose constraints on operation or development of the radiolocation service and other services allocated by footnotes on a primary basis.

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.

5.338 In Kyrgyzstan, Slovakia and Turkmenistan, existing installations of the radionavigation service may continue to operate in the band 1 350-1 400 MHz. (WRC-12)

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. (WRC-19)

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

5.340 All emissions are prohibited in the following bands:

1 400-1 427 MHz,	
2 690-2 700 MHz,	except those provided for by No. **5.422**,
10.68-10.7 GHz,	except those provided for by No. **5.483**,
15.35-15.4 GHz,	except those provided for by No. **5.511**,
23.6-24 GHz,	
31.3-31.5 GHz,	
31.5-31.8 GHz,	in Region 2,
48.94-49.04 GHz,	from airborne stations

50.2-50.4 GHz[2],
52.6-54.25 GHz,
86-92 GHz,
100-102 GHz,
109.5-111.8 GHz,
114.25-116 GHz,
148.5-151.5 GHz,
164-167 GHz,
182-185 GHz,
190-191.8 GHz,
200-209 GHz,
226-231.5 GHz,
250-252 GHz.

5.341 In the bands 1 400-1 727 MHz, 101-120 GHz and 197-220 GHz, passive research is being conducted by some countries in a programme for the search for intentional emissions of extraterrestrial origin.

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**. (WRC-15)

5.341B In Region 2, the frequency band 1 427-1 518 MHz is 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 this frequency band by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. (WRC-15)

5.341C The frequency bands 1 427-1 452 MHz and 1 492-1 518 MHz are identified for use by administrations in Region 3 wishing to implement International Mobile Telecommunications (IMT) in accordance with Resolution **223 (Rev.WRC-15**). The use of these frequency bands by the above administrations for the implementation of IMT in the frequency bands 1 429-1 452 MHz and 1 492-1 518 MHz is subject to agreement obtained under No. 9.21 from countries using stations of the aeronautical mobile service. This identification does not preclude the use of these frequency bands by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. (WRC-15)

5.342 *Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Uzbekistan, Kyrgyzstan and Ukraine, the frequency band 1 429-1 535 MHz is also allocated to the aeronautical mobile service on a primary basis, exclusively for the purposes of aeronautical telemetry within the national territory. As of 1 April 2007, the use of the frequency band 1 452-1 492 MHz is subject to agreement between the administrations concerned. (WRC-15)

5.343 In Region 2, the use of the band 1 435-1 535 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile service.

5.344 *Alternative allocation:* in the United States, the band 1 452-1 525 MHz is allocated to the fixed and mobile services on a primary basis (see also No. **5.343**).

[2] **5.340.1** The allocation to the Earth exploration-satellite service (passive) and the space research service (passive) in the band 50.2-50.4 GHz should not impose undue constraints on the use of the adjacent bands by the primary allocated services in those bands.

5.345 **5.345** Use of the frequency band 1 452-1 492 MHz by the broadcasting-satellite service, and by the broadcasting service, is limited to digital audio broadcasting and is subject to the provisions of Resolution **528 (Rev.WRC-19)**. (WRC-19)

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-19)**. 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).** (WRC-19)

5.346A The frequency band 1 452-1 492 MHz is identified for use by administrations in Region 3 wishing to implement International Mobile Telecommunications (IMT) in accordance with Resolution **223 (Rev.WRC-19)** and Resolution **761 (Rev.WRC-19)**. The use of this frequency band by the above administrations for the implementation of IMT is subject to agreement obtained under No. **9.21** from countries using stations of the aeronautical mobile service. 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. (WRC-19)

5.348 The use of the band 1 518-1 525 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**. In the band 1 518-1 525 MHz stations in the mobile-satellite service shall not claim protection from the stations in the fixed service. No. **5.43A** does not apply.

5.348A In the band 1 518-1 525 MHz, the coordination threshold in terms of the power flux-density levels at the surface of the Earth in application of No. **9.11A** for space stations in the mobile-satellite (space-to-Earth) service, with respect to the land mobile service use for specialized mobile radios or used in conjunction with public switched telecommunication networks (PSTN) operating within the territory of Japan, shall be –150 dB(W/m^2) in any 4 kHz band for all angles of arrival, instead of those given in Table 5-2 of Appendix **5**. In the band 1 518-1 525 MHz stations in the mobile-satellite service shall not claim protection from stations in the mobile service in the territory of Japan. No. **5.43A** does not apply.

5.348B In the band 1 518-1 525 MHz, stations in the mobile-satellite service shall not claim protection from aeronautical mobile telemetry stations in the mobile service in the territory of the United States (see Nos. **5.343** and **5.344**) and in the countries listed in No. **5.342**. No. **5.43A** does not apply.

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**). (WRC-19)

5.350 *Additional allocation:* in Kyrgyzstan and Turkmenistan, the frequency band 1 525-1 530 MHz is also allocated to the aeronautical mobile service on a primary basis. (WRC-19)

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

5.351A For the use of the bands 1 518-1 544 MHz, 1 545-1 559 MHz, 1 610-1 645.5 MHz, 1 646.5-1 660.5 MHz, 1 668-1 675 MHz, 1 980-2 010 MHz, 2 170-2 200 MHz, 2 483.5-2 520 MHz and 2 670-2 690 MHz by the mobile-satellite service, see Resolutions **212 (Rev.WRC-07)** and **225 (Rev.WRC-07)**. (WRC-07)

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. (WRC-19)

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.)

5.354 The use of the bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz by the mobile-satellite services is subject to coordination under No. **9.11A**.

5.355 *Additional allocation:* in Bahrain, Bangladesh, Congo (Rep. of the), Djibouti, Egypt, Eritrea, Iraq, Israel, Kuwait, Qatar, Syrian Arab Republic, Somalia, Sudan, South Sudan, Chad, Togo and Yemen, the bands 1 540-1 559 MHz, 1 610-1 645.5 MHz and 1 646.5-1 660 MHz are also allocated to the fixed service on a secondary basis. (WRC-12)

** The use by Palestine of the allocation to the mobile service in the frequency band 1 452 -1 492 MHz identified for IMT is noted, pursuent to Resolution 99 (Rev.Dubai,2018) and taking into account the Isreali-Palestinian Interim Agreement of 28 September 1995.

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**).

5.357 Transmissions in the band 1 545-1 555 MHz from terrestrial aeronautical stations directly to aircraft stations, or between aircraft stations, in the aeronautical mobile (R) service are also authorized when such transmissions are used to extend or supplement the satellite-to-aircraft links.

5.357A In applying the procedures of Section II of Article **9** to the mobile-satellite service in the frequency bands 1 545-1 555 MHz and 1 646.5-1 656.5 MHz, priority shall be given to accommodating the spectrum requirements of the aeronautical mobile-satellite (R) service providing transmission of messages with priority 1 to 6 in Article **44**. Aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article **44** shall have priority access and immediate availability, by pre-emption if necessary, over all other mobile-satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to, or claim protection from, aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article **44**. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services. (The provisions of Resolution **222 (WRC-12)** shall apply.) (WRC-12)

5.359 *Additional allocation:* in Germany, Saudi Arabia, Armenia, Azerbaijan, Belarus,Cameroon, the Russian Federation,Georgia, Guinea, Guinea-Bissau, Jordan, Kazakhstan, Kuwait, Lithuania, Mauritania, Uganda, Uzbekistan, Pakistan, Poland, the Syrian Arab Republic, Kyrgyzstan, the Dem. People's Rep. of Korea, Romania, Tajikistan, Tunisia, Turkmenistan and Ukraine, the frequency bands 1 550-1 559 MHz, 1 610-1 645.5 MHz and 1 646.5-1 660 MHz are also allocated to the fixed service on a primary basis. Administrations are urged to make all practicable efforts to avoid the implementation of new fixed-service stations in these frequency bands. (WRC-19)

5.362A In the United States, in the bands 1 555-1 559 MHz and 1 656.5-1 660.5 MHz, the aeronautical mobile-satellite (R) service shall have priority access and immediate availability, by pre-emption if necessary, over all other mobile-satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to, or claim protection from, aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article **44**. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services.

5.364 The use of the band 1 610-1 626.5 MHz by the mobile-satellite service (Earth-to-space) and by the radiodetermination-satellite service (Earth-to-space) is subject to coordination under No. **9.11A**. A mobile earth station operating in either of the services in this band shall not produce a peak e.i.r.p. density in excess of -15 dB(W/4 kHz)in the part of the band used by systems operating in accordance with the provisions of No. **5.366** (to which No. **4.10** applies), unless otherwise agreed by the affected administrations. In the part of the band where such systems are not operating, the mean e.i.r.p. density of a mobile earth station shall not exceed –3 dB(W/4 kHz). Stations of the mobile-satellite service shall not claim protection from stations in the aeronautical radionavigation service, stations operating in accordance with the provisions of No. **5.366** and stations in the fixed service operating in accordance with the provisions of No. **5.359**. Administrations responsible for the coordination of mobile-satellite networks shall make all practicable efforts to ensure protection of stations operating in accordance with the provisions of No. **5.366**.

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**.

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

5.367 *Additional allocation*: The frequency band 1 610-1 626.5 MHz is also allocated to the aeronautical mobile-satellite (R) service on a primary basis, subject to agreement obtained under No. **9.21**. (WRC-12)

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 services 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. (WRC-19)

5.369 *Different category of service:* in Angola, Australia, China, Eritrea, Ethiopia, India, Iran (Islamic Republic of), Israel, Lebanon, Liberia, Madagascar, Mali, Pakistan, Papua New Guinea, Syrian Arab Republic, the Dem. Rep. of the Congo, Sudan, South Sudan, Togo and Zambia, the allocation of the band 1 610-1 626.5 MHz to the radiodetermination-satellite service (Earth-to-space) is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21** from countries not listed in this provision. (WRC-12)

5.370 *Different category of service:* in Venezuela, the allocation to the radiodetermination-satellite service in the band 1 610-1 626.5 MHz (Earth-to-space) is on a secondary basis.

5.371 *Additional allocation:* in Region 1, the band 1 610-1 626.5 MHz (Earth-to-space) is also allocated to the radiodetermination-satellite service on a secondary basis, subject to agreement obtained under No. **9.21**. (WRC-12)

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. (WRC-19

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. (WRC-19)

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 radiodeterminationsatellite 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. (WRC-19)

5.374 Mobile earth stations in the mobile-satellite service operating in the bands 1 631.5-1 634.5 MHz and 1 656.5-1 660 MHz shall not cause harmful interference to stations in the fixed service operating in the countries listed in No. **5.359**.

5.375 The use of the band 1 645.5-1 646.5 MHz by the mobile-satellite service (Earth-to-space) and for inter-satellite links is limited to distress and safety communications (see Article **31**).

5.376 Transmissions in the band 1 646.5-1 656.5 MHz from aircraft stations in the aeronautical mobile (R) service directly to terrestrial aeronautical stations, or between aircraft stations, are also authorized when such transmissions are used to extend or supplement the aircraft-to-satellite links.

5.376A Mobile earth stations operating in the band 1 660-1 660.5 MHz shall not cause harmful interference to stations in the radio astronomy service.

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

5.379A Administrations are urged to give all practicable protection in the band 1 660.5-1 668.4 MHz for future research in radio astronomy, particularly by eliminating air-to-ground transmissions in the meteorological aids service in the band 1 664.4-1 668.4 MHz as soon as practicable.

5.379B The use of the band 1 668-1 675 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**. In the band 1 668-1 668.4 MHz, Resolution **904 (WRC-07)** shall apply. (WRC-07)

5.379C In order to protect the radio astronomy service in the band 1 668-1 670 MHz, the aggregate power flux-density values produced by mobile earth stations in a network of the mobile-satellite service operating in this band shall not exceed –181 dB(W/m^2) in 10 MHz and −194 dB(W/m^2) in any 20 kHz at any radio astronomy station recorded in the Master International Frequency Register, for more than 2% of integration periods of 2 000 s.

5.379D For sharing of the band 1 668.4-1 675 MHz between the mobile-satellite service and the fixed and mobile services, Resolution **744 (Rev.WRC-07)** shall apply. (WRC-07)

5.379E In the band 1 668.4-1 675 MHz, stations in the mobile-satellite service shall not cause harmful interference to stations in the meteorological aids service in China, Iran (Islamic Republic of), Japan and Uzbekistan. In the band 1 668.4-1 675 MHz, administrations are urged not to implement new systems in the meteorological aids service and are encouraged to migrate existing meteorological aids service operations to other bands as soon as practicable.

5.380A In the band 1 670-1 675 MHz, stations in the mobile-satellite service shall not cause harmful interference to, nor constrain the development of, existing earth stations in the meteorological-satellite service notified before 1 January 2004. Any new assignment to these earth stations in this band shall also be protected from harmful interference from stations in the mobile-satellite service. (WRC-07)

5.381 *Additional allocation:* in Afghanistan, Cuba, India, Iran (Islamic Republic of) and Pakistan, the band 1 690-1 700 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

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, N, 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. (WRC-19)

5.384 *Additional allocation:* in India, Indonesia and Japan, the band 1 700-1 710 MHz is also allocated to the space research service (space-to-Earth) on a primary basis.

5.384A The frequency bands 1 710-1 885 MHz, 2 300-2 400 MHz and 2 500-2 690 MHz, or portions thereof, 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 bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. (WRC-15)

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

5.386 *Additional allocation:* the frequency band 1 750-1 850 MHz is also allocated to the space operation (Earth-to-space) and space research (Earth-to-space) services in Region 2 (except in Mexico), in Australia, Guam, India, Indonesia and Japan on a primary basis, subject to agreement obtained under No. **9.21**, having particular regard to troposcatter systems. (WRC-15)

5.387 *Additional allocation:* in Belarus, Georgia, Kazakhstan, Kyrgyzstan, Romania, Tajikistan and Turkmenistan, the band 1 770-1 790 MHz is also allocated to the meteorological-satellite service on a primary basis, subject to agreement obtained under No. **9.21**. (WRC-12)

5.388 The bands 1 885-2 025 MHz and 2 110-2 200 MHz are intended for use, on a worldwide basis, by administrations wishing to implement International Mobile Telecommunications (IMT). Such use does not preclude the use of these bands by other services to which they are allocated. The bands should be made available for IMT in accordance with Resolution **212 (Rev.WRC-15)**. (See also Resolution **223 (Rev.WRC-15)**.) (WRC-15)

5.388A In Regions 1 and 3, the bands 1 885-1 980 MHz, 2 010-2 025 MHz and 2 110-2 170 MHz and, in Region 2, the bands 1 885-1 980 MHz and 2 110-2 160 MHz may be used by high altitude platform stations as base stations to provide International Mobile Telecommunications-2000 (IMT-2000), in accordance with Resolution **221 (Rev.WRC-03)**. Their use by IMT-2000 applications using high altitude platform stations as base stations does not preclude the use of these bands by any station in the services to which they are allocated and does not establish priority in the Radio Regulations.

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 neighbouring 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. (WRC-19)

5.389A The use of the bands 1 980-2 010 MHz and 2 170-2 200 MHz by the mobile-satellite service is subject to coordination under No. **9.11A** and to the provisions of Resolution **716 (Rev.WRC-2000)**. (WRC-07)

5.389B The use of the frequency band 1 980-1 990 MHz by the mobile-satellite service shall not cause harmful interference to or constrain the development of the fixed and mobile services in Argentina, Brazil, Canada, Chile, Ecuador, the United States, Honduras, Jamaica, Mexico, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay and Venezuela. (WRC-19)

5.389A The use of the bands 1 980-2 010 MHz and 2 170-2 200 MHz by the mobile-satellite service is subject to coordination under No. **9.11A** and to the provisions of Resolution **716 (Rev.WRC-2000)**. (WRC-07)

5.389E The use of the bands 2 010-2 025 MHz and 2 160-2 170 MHz by the mobile-satellite service in Region 2 shall not cause harmful interference to or constrain the development of the fixed and mobile services in Regions 1 and 3.

5.389F In Algeria, Cape Verde, Egypt, Iran (Islamic Republic of), Mali, Syrian Arab Republic and Tunisia, the use of the frequency bands 1 980-2 010 MHz and 2 170-2 200 MHz by the mobile-satellite service shall neither cause harmful interference to the fixed and mobile services, nor hamper the development of those services prior to 1 January 2005, nor shall the former service request protection from the latter services. (WRC-19)

5.391 In making assignments to the mobile service in the 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. (WRC-15)

5.392 Administrations are urged to take all practicable measures to ensure that space-to-space transmissions between two or more non-geostationary satellites, in the space research, space operations and Earth exploration-satellite services in the bands 2 025-2 110 MHz and 2 200-2 290 MHz, shall not impose any constraints on Earth-to-space, space-to-Earth and other space-to-space transmissions of those services and in those bands between geostationary and non-geostationary satellites.

5.393 *Additional allocation:* in Canada, the United States and India, the frequency band 2 310-2 360 MHz is also allocated to the broadcasting-satellite service (sound) and complementary terrestrial sound broadcasting service on a primary basis. Such use is limited to digital audio broadcasting and is subject to the provisions of Resolution **528 (Rev.WRC-19)**, with the exception of *resolves* 3 in regard to the limitation on broadcasting-satellite systems in the upper 25 MHz. Complementary terrestrial sound broadcasting stations shall be subject to bilateral coordination with neighbouring countries prior to their bringing into use. (WRC-19)

5.394 In the United States, the use of the band 2 300-2 390 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile services. In Canada, the use of the band 2 360-2 400 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile services. (WRC-07)

5.395 In France and Turkey, the use of the band 2 310-2 360 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile service.

5.398 In respect of the radiodetermination-satellite service in the band 2 483.5-2 500 MHz, the provisions of No. **4.10** do not apply.

5.398A *Different category of service:* In Armenia, Azerbaijan, Belarus, the Russian Federation, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan and Ukraine, the band 2 483.5-2 500 MHz is allocated on a primary basis to the radiolocation service. The radiolocation stations in these countries shall not cause harmful interference to, or claim protection from, stations of the fixed, mobile and mobile-satellite services operating in accordance with the Radio Regulations in the frequency band 2 483.5-2 500 MHz. (WRC-12)

5.399 Except for cases referred to in No. **5.401**, stations of the radiodetermination-satellite service operating in the frequency band 2 483.5-2 500 MHz for which notification information is received by the Bureau after 17 February 2012, and the service area of which includes Armenia, Azerbaijan, Belarus, the Russian Federation, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan and Ukraine, shall not cause harmful interference to, and shall not claim protection from stations of the radiolocation service operating in these countries in accordance with No. **5.398A**. (WRC-12)

5.401 In Angola, Australia, Bangladesh, China, Eritrea, Eswatini, Ethiopia, India, Lebanon, Liberia, Libya, Madagascar, Mali, Pakistan, Papua New Guinea, Syrian Arab Republic, Dem. Rep. of the Congo, Sudan, Togo and Zambia, the frequency band 2 483.5-2 500 MHz was already allocated on a primary basis to the

radiodeterminationsatellite service before WRC-12, subject to agreement obtained under No. **9.21** from countries not listed in this provision. Systems in the radiodetermination-satellite service for which complete coordination information has been received by the Radiocommunication Bureau before 18 February 2012 will retain their regulatory status, as of the date of receipt of the coordination request information. (WRC-19)

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

5.403 Subject to agreement obtained under No. **9.21**, the band 2 520-2 535 MHz may also be used for the mobile-satellite (space-to-Earth), except aeronautical mobile-satellite, service for operation limited to within national boundaries. The provisions of No. **9.11A** apply. (WRC-07)

5.404 *Additional allocation:* in India and Iran (Islamic Republic of), the band 2 500-2 516.5 MHz may also be used for the radiodetermination-satellite service (space-to-Earth) for operation limited to within national boundaries, subject to agreement obtained under No. **9.21**.

5.407 In the band 2 500-2 520 MHz, the power flux-density at the surface of the Earth from space stations operating in the mobile-satellite (space-to-Earth) service shall not exceed –152 dB(W/(m^2 · 4 kHz)) in Argentina, unless otherwise agreed by the administrations concerned.

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. (WRC-12)

5.412 *Alternative allocation:* in Kyrgyzstan and Turkmenistan, the band 2 500-2 690 MHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

5.413 In the design of systems in the broadcasting-satellite service in the bands between 2 500 MHz and 2 690 MHz, administrations are urged to take all necessary steps to protect the radio astronomy service in the band 2 690-2 700 MHz.

5.414 The allocation of the frequency band 2 500-2 520 MHz to the mobile-satellite service (space-to-Earth) is subject to coordination under No. **9.11A**. (WRC-07)

5.414A In Japan and India, the use of the bands 2 500-2 520 MHz and 2 520-2 535 MHz, under No. **5.403**, by a satellite network in the mobile-satellite service (space-to-Earth) is limited to operation within national boundaries and subject to the application of No. **9.11A**. The following pfd values shall be used as a threshold for coordination under No. **9.11A**, for all conditions and for all methods of modulation, in an area of 1 000 km around the territory of the administration notifying the mobile-satellite service network:

−136 dB(W/(m^2 · MHz))	for $0° \le \theta \le 5°$
−136 + 0.55 (θ − 5) dB(W/(m^2 · MHz))	for $5° < \theta \le 25°$
−125 dB(W/(m^2 · MHz))	for $25° < \theta \le 90°$

where θ is the angle of arrival of the incident wave above the horizontal plane, in degrees. Outside this area Table **21-4** of Article **21** shall apply. Furthermore, the coordination thresholds in Table 5-2 of Annex 1 to Appendix **5** of the Radio Regulations (Edition of 2004), in conjunction with the applicable provisions of Articles **9** and **11** associated with No. **9.11A**, shall apply to systems for which complete notification information has been received by the Radicommunication Bureau by 14 November 2007 and that have been brought into use by that date. (WRC-07)

5.415 The use of the bands 2 500-2 690 MHz in Region 2 and 2 500-2 535 MHz and 2 655-2 690 MHz in Region 3 by the fixed-satellite service is limited to national and regional systems, subject to agreement obtained under No. **9.21**, giving particular attention to the broadcasting-satellite service in Region 1. (WRC-07)

5.415A *Additional allocation*: in India and Japan, subject to agreement obtained under No. **9.21**, the band 2 515-2 535 MHz may also be used for the aeronautical mobile-satellite service (space-to-Earth) for operation limited to within their national boundaries.

5.416 The use of the band 2 520-2 670 MHz by the broadcasting-satellite service is limited to national and regional systems for community reception, subject to agreement obtained under No. **9.21**. The provisions of No. **9.19** shall be applied by administrations in this band in their bilateral and multilateral negotiations. (WRC-07)

5.418 *Additional allocation:* in India, the frequency band 2 535-2 655 MHz is also allocated to the broadcasting-satellite service (sound) and complementary terrestrial broadcasting service on a primary basis. Such use is limited to digital audio broadcasting and is subject to the provisions of Resolution **528 (Rev.WRC-19)**. The provisions of No. **5.416** and Table **21-4** of Article **21**do not apply to this additional allocation. Use of non-geostationary-satellite systems in the broadcasting-satellite service (sound) is subject to Resolution **539 (Rev.WRC-19)**. Geostationary broadcasting-satellite service (sound) systems for which complete Appendix **4** coordination information has been received after 1 June 2005 are limited to systems intended for national coverage. The power flux-density at the Earth's surface produced by emissions from a geostationary broadcasting-satellite service (sound) space station operating in the band 2 630-2 655 MHz, and for which complete Appendix **4** coordination information has been received after 1 June 2005, shall not exceed the following limits, for all conditions and for all methods of modulation:

−130 dB(W/(m^2 · MHz))	for	$0° \le \theta \le 5°$
−130 + 0.4 (θ − 5) dB(W/(m^2 · MHz))	for	$5° < \theta \le 25°$
−122 dB(W/(m^2 · MHz))	for	$25° < \theta \le 90°$

where θ is the angle of arrival of the incident wave above the horizontal plane, in degrees. These limits may be exceeded on the territory of any country whose administration has so agreed. As an exception to the limits above, the pfd value of −122 dB(W/(m^2 · MHz)) shall be used as a threshold for coordination under No. **9.11** in an area of 1 500 km around the territory of the administration notifying the broadcasting-satellite service (sound) system.

In addition, an administration listed in this provision shall not have simultaneously two overlapping frequency assignments, one under this provision and the other under No. **5.416** for systems for which complete Appendix **4** coordination information has been received after 1 June 2005. (WRC-19)

5.418A In certain Region 3 countries listed in No. **5.418**, use of the band 2 630-2 655 MHz by non-geostationary-satellite systems in the broadcasting-satellite service (sound) for which complete Appendix **4** coordination information, or notification information, has been received after 2 June 2000, is subject to the application of the provisions of No. **9.12A**, in respect of geostationary-satellite networks for which complete Appendix **4** coordination information, or notification information, is considered to have been received after 2 June 2000, and No. **22.2** does not apply. No. **22.2** shall continue to apply with respect to geostationary-satellite networks for which complete Appendix **4** coordination information, or notification information, is considered to have been received before 3 June 2000.

5.418B Use of the band 2 630-2 655 MHz by non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. **5.418**, for which complete Appendix **4** coordination information, or notification information, has been received after 2 June 2000, is subject to the application of the provisions of No. **9.12**.

5.418C Use of the band 2 630-2 655 MHz by geostationary-satellite networks for which complete Appendix **4** coordination information, or notification information, has been received after 2 June 2000 is subject to the application of the provisions of No. **9.13** with respect to non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. **5.418** and No. **22.2** does not apply.

5.419 When introducing systems of the mobile-satellite service in the band 2 670-2 690 MHz, administrations shall take all necessary steps to protect the satellite systems operating in this band prior to 3 March 1992. The coordination of mobile-satellite systems in the band shall be in accordance with No. **9.11A**. (WRC-07)

5.420 The band 2 655-2 670 MHz may also be used for the mobile-satellite (Earth-to-space), except aeronautical mobile-satellite, service for operation limited to within national boundaries, subject to agreement obtained under No. **9.21**. The coordination under No. **9.11A** applies. (WRC-07)

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. (WRC-12)

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.

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

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.

5.427 In the bands 2 900-3 100 MHz and 9 300-9 500 MHz, the response from radar transponders shall not be capable of being confused with the response from radar beacons (racons) and shall not cause interference to ship or aeronautical radars in the radionavigation service, having regard, however, to No. **4.9**.

5.428 *Additional allocation:* in Kyrgyzstan and Turkmenistan, the frequency band 3 100-3 300 MHz is also allocated to the radionavigation service on a primary basis. (WRC-19)

5.429 *Additional allocation*: in Angola, Benin, Botswana, Burkina Faso, Burundi, Djibouti, Eswatini, Ghana, Guinea, Guinea-Bissau, Lesotho, Liberia, Malawi, Mauritania, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sudan, South Sudan, South Africa, Tanzania, Chad, Togo, Zambia and Zimbabwe, the frequency band 3 300-3 400 MHz is allocated to the mobile, except aeronautical mobile, service on a primary basis. Stations in the mobile service operating in the frequency band 3 300-3 400 MHz shall not cause harmful interference to, or claim protection from, stations operating in the radiolocation service. (WRC-19)

5.429A *Additional allocation*: in Angola, Benin, Botswana, Burkina Faso, Burundi, Djibouti, Eswatini, Ghana, Guinea, Guinea-Bissau, Lesotho, Liberia, Malawi, Mauritania, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sudan, South Sudan, South Africa, Tanzania, Chad, Togo, Zambia and Zimbabwe, the frequency band 3 300-3 400 MHz is allocated to the mobile, except aeronautical mobile, service on a primary basis. Stations in the mobile service operating in the frequency band 3 300-3 400 MHz shall not cause harmful interference to, or claim protection from, stations operating in the radiolocation service. (WRC-19)

5.429B In the following countries of Region 1 south of 30° parallel north: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Congo (Rep. of the), Côte d'Ivoire, Egypt, Eswatini, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Malawi, Mauritania, Mozambique, Namibia, Niger, Nigeria, Uganda, the Dem. Rep. of the Congo, Rwanda, Sudan, South Sudan, South Africa, Tanzania, Chad, Togo, Zambia and Zimbabwe, the frequency band 3 300-3 400 MHz is identified for the implementation of International Mobile Telecommunications (IMT). The use of this frequency band shall be in accordance with Resolution **223 (Rev.WRC-19)**. The use of the frequency band 3 300-3 400 MHz by IMT stations in the mobile service shall not cause harmful interference to, or claim protection from, systems in the radiolocation service, and administrations wishing to implement IMT shall obtain the agreement of neighbouring countries to protect operations within the radiolocation service. 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. (WRC-19)

5.429C *Different category of service*: in Argentina, Belize, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, El Salvador, Ecuador, Guatemala, Mexico, Paraguay and Uruguay, the frequency band 3 300-3 400 MHz is allocated to the mobile, except aeronautical mobile, service on a primary basis. In Argentina, Brazil, the Dominican Republic, Guatemala, Mexico, Paraguay and Uruguay, the frequency band 3 300-3 400 MHz is also allocated to the fixed service on a primary basis. Stations in the fixed and mobile services operating in the frequency band 3 300-3 400 MHz shall not cause harmful interference to, or claim protection from, stations operating in the radiolocation service. (WRC-19)

5.429D In the following countries in Region 2: Argentina, Belize, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, El Salvador, Ecuador, Guatemala, Mexico, Paraguay and Uruguay, the use of the frequency band 3 300-3 400 MHz is identified for the implementation of International Mobile Telecommunications (IMT). Such use shall be in accordance with Resolution **223 (Rev.WRC-19)**. This use in Argentina, Paraguay and Uruguay is subject to the application of No. **9.21**. The use of the frequency band 3 300-3 400 MHz by IMT stations in the mobile service shall not cause harmful interference to, or claim protection from, systems in the radiolocation service, and administrations wishing to implement IMT shall obtain the agreement of neighbouring countries to protect operations within the radiolocation service. 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. (WRC-19)

5.429E Additional allocation: in Papua New Guinea, the frequency band 3 300-3 400 MHz is allocated to the mobile, except aeronautical mobile, service on a primary basis. Stations in the mobile service operating in the frequency band 3 300-3 400 MHz shall not cause harmful interference to, or claim protection from, stations operating in the radiolocation service. (WRC-15)

5.429F In the following countries in Region 3: Cambodia, India, Indonesia, Lao P.D.R., Pakistan, the Philippines and Viet Nam, the use of the frequency band 3 300-3 400 MHz is identified for the implementation of International Mobile Telecommunications (IMT). Such use shall be in accordance with Resolution **223 (Rev.WRC-19)**. The use of the frequency band 3 300-3 400 MHz by IMT stations in the mobile service shall not cause harmful interference to, or claim protection from, systems in the radiolocation service. Before an administration brings into use a base or mobile station of an IMT system in this frequency band, it shall seek agreement under No. **9.21** with neighbouring countries to protect the radiolocation service. 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. (WRC-19)

5.430 *Additional allocation:* inKyrgyzstan and Turkmenistan, the frequency band 3 300-3 400 MHz is also allocated to the radionavigation service on a primary basis. (WRC-19)

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 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 band, it shall ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed −154.5 dB(W/(m^2 · 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, the 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 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). (WRC-15)

5.431 *Additional allocation:* in Germany, the frequency band 3 400-3 475 MHz is also allocated to the amateur service on a secondary basis. (WRC-19)

5.431A in Region 2, the allocation of the band 3 400-3 500 MHz to the mobile, except aeronautical mobile, service on a primary basis is subject to agreement obtained under No. **9.21**. (WRC-15)

5.431B In Region 2, the frequency band 3 400-3 600 MHz 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 priority in the Radio Regulations. At the stage of coordination the provisions of Nos. **9.17** and **9.18** also apply. Before an administration brings into use a base or mobile station of an IMT system, it shall seek agreement under No. **9.21** with other administrations and 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), with the assistance of the Bureau if so requested. In case of disagreement, the 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, including IMT systems, 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). (WRC-15)

5.432 *Different category of service:* in Korea (Rep. of), Japan, Pakistan and the Dem. People's Rep. of Korea, the allocation of the frequency band 3 400-3 500 MHz to the mobile, except aeronautical mobile, service is on a primary basis (see **No.5.33**). (WRC-19)

5.432A In Korea (Rep. of), Japan, Pakistan and the Dem. People's Rep. of Korea, the frequency band 3 400-3 500 MHz 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. At the stage of coordination the provisions of Nos. **9.17** and **9.18** also apply. 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 fluxdensity (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), with the assistance of the Bureau if so requested. In case of disagreement, the 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 3 400-3 500 MHz shall not claim more protection from space stations than that provided in Table **21-4** of the Radio Regulations (Edition of 2004). (WRC-19)

5.432B *Different category of service:* in Australia, Bangladesh, Brunei Darussalam, China, French overseas communities of Region 3, India, Indonesia, Iran (Islamic Republic of), Malaysia, New Zealand, the Philippines, Singapore and Thailand, the frequency band 3 400-3 500 MHz is allocated to the mobile, except aeronautical mobile, service on a primary basis, subject to agreement obtained under No. **9.21** with other administrations and 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. At the stage of coordination the provisions of Nos. **9.17** and **9.18** also apply. 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), with the assistance of the Bureau if so requested. In case of disagreement, the 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 3 400-3 500 MHz shall not claim more protection from space stations than that provided in Table **21-4** of the Radio Regulations (Edition of 2004). (WRC-19)

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

5.433A In Australia, Bangladesh, Brunei Darussalam, China, French overseas communities of Region 3, Korea (Rep. of), India, Indonesia, Iran (Islamic Republic of), Japan, New Zealand, Pakistan, the Philippines and the Dem. People's Rep. of Korea, the frequency band 3 500-3 600 MHz 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. At the stage of coordination the provisions of Nos. **9.17** and **9.18** also apply. 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), with the assistance of the Bureau if so requested. In case of disagreement, the 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 3 500-3 600 MHz shall not claim more protection from space stations than that provided in Table **21-4** of the Radio Regulations (Edition of 2004). (WRC-19)

5.434 In Canada, Chile, Colombia, Costa Rica, El Salvador, the United States and Paraguay, the frequency band 3 600-3 700 MHz, or portions thereof, is identified for use by these 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 priority in the Radio Regulations. At the stage of coordination the provisions of Nos. **9.17** and **9.18** also apply. Before an administration brings into use a base or mobile station of an IMT system, it shall seek agreement under No. **9.21** with other administrations and 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), with the assistance of the Bureau if so requested. In case of disagreement, the 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, including IMT systems, in the frequency band 3 600-3 700 MHz shall not claim more protection from space stations than that provided in Table **21-4** of the Radio Regulations (Edition of 2004). (WRC-19)

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

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).** (WRC-15)

5.437 Passive sensing in the Earth exploration-satellite and space research services may be authorized in the frequency band 4 200-4 400 MHz on a secondary basis. (WRC-15)

5.438 Use of the 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. . (WRC-15)

5.439 *Additional allocation:* in Iran (Islamic Republic of), the band 4 200-4 400 MHz is also allocated to the fixed service on a secondary basis. (WRC-12)

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

5.440A In Region 2 (except Brazil, Cuba, French overseas departments and communities, Guatemala, Paraguay, Uruguay and Venezuela), and in Australia, the band 4 400-4 940 MHz may be used for aeronautical mobile telemetry for flight testing by aircraft stations (see No. **1.83**). Such use shall be in accordance with Resolution **416 (WRC-07)** and shall not cause harmful interference to, nor claim protection from, the fixed-satellite and fixed services. Any such use does not preclude the use of these bands by other mobile service applications or by other services to which these bands are allocated on a co-primary basis and does not establish priority in the Radio Regulations. (WRC-07)

5.441 The use of the bands 4 500-4 800 MHz (space-to-Earth), 6 725-7 025 MHz (Earth-to-space) by the fixed-satellite service shall be in accordance with the provisions of Appendix **30B**. The use of the bands 10.7-10.95 GHz (space-to-Earth), 11.2-11.45 GHz (space-to-Earth) and 12.75-13.25 GHz (Earth-to-space) by geostationary-satellite systems in the fixed-satellite service shall be in accordance with the provisions of Appendix **30B**. The use of the bands 10.7-10.95 GHz (space-to-Earth), 11.2-11.45 GHz (space-to-Earth) and 12.75-13.25 GHz (Earth-to-space) by a non-geostationary-satellite system in the fixed-satellite service is subject to application of the provisions of No. **9.12** for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the fixed-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and No. **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.

5.441A In Brazil, Paraguay and Uruguay, the frequency band 4 800-4 900 MHz, or portions thereof, is identified for the implementation 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. The use of this frequency band for the implementation of IMT is subject to agreement obtained with neighbouring countries, and IMT stations shall not claim protection from stations of other applications of the mobile service. Such use shall be in accordance with Resolution **223 (Rev.WRC-19)**. (WRC-19)

5.441B In Angola, Armenia, Azerbaijan, Benin, Botswana, Brazil, Burkina Faso, Burundi, Cambodia, Cameroon, China, Côte d'Ivoire, Djibouti, Eswatini, Russian Federation, Gambia, Guinea, Iran (Islamic Republic of), Kazakhstan, Kenya, Lao P.D.R., Lesotho, Liberia, Malawi, Mauritius, Mongolia, Mozambique, Nigeria, Uganda, Uzbekistan, the Dem. Rep. of the Congo, Kyrgyzstan, the Dem. People's Rep. of Korea, Sudan, South Africa, Tanzania, Togo, Viet Nam, Zambia and Zimbabwe, the frequency band 4 800-4 990 MHz, or portions thereof, 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 priority in the Radio Regulations. The use of IMT stations is subject to agreement obtained under No. **9.21** with concerned administrations, and IMT stations shall not claim protection from stations of other applications of the mobile service. In addition, before an administration brings into use an IMT station in the mobile service, it shall ensure that the power flux-density (pfd) produced by this station does not exceed −155 dB(W/(m2 · 1 MHz)) produced up to 19 km above sea level at 20 km from the coast, defined as the low-water mark, as officially recognized by the coastal State. This pfd criterion is subject to review at WRC-23. Resolution **223 (Rev.WRC-19)** applies. This identification shall be effective after WRC-19. (WRC-19)

5.442 In the bands 4 825-4 835 MHz and 4 950-4 990 MHz, the allocation to the mobile service is restricted to the mobile, except aeronautical mobile, service. In Region 2 (except Brazil, Cuba, Guatemala, Mexico, Paraguay, Uruguay and Venezuela), and in Australia, the band 4 825-4 835 MHz is also allocated to the aeronautical mobile service, limited to aeronautical mobile telemetry for flight testing by aircraft stations. Such use shall be in accordance with Resolution **416 (WRC-07)** and shall not cause harmful interference to the fixed service. (WRC-15)

5.443 *Different category of service:* in Argentina, Australia and Canada, the allocation of the bands 4 825-4 835 MHz and 4 950-4 990 MHz to the radio astronomy service is on a primary basis (see Part **3**, Subsection **35.6**).

5.443AA In the frequency bands 5 000-5 030 MHz and 5 091-5 150 MHz, the aeronautical mobile-satellite (R) service is subject to agreement obtained under No. **9.21**. The use of these bands by the aeronautical mobile-satellite (R) service is limited to internationally standardized aeronautical systems. (WRC-12)

5.443B In order not to cause harmful interference to the microwave landing system operating above 5 030 MHz, the aggregate power flux-density produced at the Earth's surface in the band 5 030-5 150 MHz by all the space stations within any radionavigation-satellite service system (space-to-Earth) operating in the band 5 010-5 030 MHz shall not exceed −124.5 dB(W/m^2) in a 150 kHz band. In order not to cause harmful interference to the radio astronomy service in the band 4 990-5 000 MHz, radionavigation-satellite service systems operating in the band 5 010-5 030 MHz shall comply with the limits in the band 4 990-5 000 MHz defined in Resolution **741 (Rev.WRC-15)**. (WRC-15)

5.443C The use of the frequency band 5 030-5 091 MHz by the aeronautical mobile (R) service is limited to internationally standardized aeronautical systems. Unwanted emissions from the aeronautical mobile (R) service in the frequency band 5 030-5 091 MHz shall be limited to protect RNSS system downlinks in the adjacent 5 010-5 030 MHz band. Until such time that an appropriate value is established in a relevant ITU-R Recommendation, the e.i.r.p. density limit of −75 dBW/MHz in the frequency band 5 010-5 030 MHz for any AM(R)S station unwanted emission should be used. (WRC-12)

5.443D In the frequency band 5 030-5 091 MHz, the aeronautical mobile-satellite (R) service is subject to coordination under No. **9.11A**. The use of this frequency band by the aeronautical mobile-satellite (R) service is limited to internationally standardized aeronautical systems. (WRC-12)

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 band. For the use of the frequency band 5 091-5 150 MHz, No. **5.444A** and Resolution **114 (Rev.WRC-15)** apply. (WRC-15)

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-geostationarysatellite systems in the mobile-satellite service shall be subject to coordination under No. **9.11A**. The use of the frequency band 5 091-5 150 MHz by feeder inks 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. (WRC-15)

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)**. (WRC-19)

5.446 *Additional allocation:* in the countries listed in No. **5.369**, 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 (except in Mexico), 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 No. **5.369** and Bangladesh, 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. (WRC-15)

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)**. (WRC-19)

5.446B In the band 5 150-5 250 MHz, stations in the mobile service shall not claim protection from earth stations in the fixed-satellite service. No. **5.43A** does not apply to the mobile service with respect to fixed-satellite service earth stations.

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. (WRC-19)

5.446D *Additional allocation:* in Brazil, the 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**). (WRC-19)

5.447 *Additional allocation:* in Côte d'Ivoire, Egypt, Lebanon, the Syrian Arab Republic and Tunisia, the frequency band 5 150-5 250 MHz is also allocated to the mobile service, on a primary basis, subject to agreement obtained under No. **9.21**. In this case, the provisions of Resolution **229 (Rev.WRC-19)** do not apply. (WRC-19)

5.447A The allocation to the fixed-satellite service (Earth-to-space) is limited to feeder links of non-geostationary-satellite systems in the mobile-satellite service and is subject to coordination under No. **9.11A**.

5.447B *Additional allocation*: the band 5 150-5 216 MHz is also allocated to the fixed-satellite service (space-to-Earth) on a primary basis. This allocation is limited to feeder links of non-geostationary-satellite systems in the mobile-satellite service and is subject to provisions of No. **9.11A**. The power flux-density at the Earth's surface produced by space stations of the fixed-satellite service operating in the space-to-Earth direction in the band 5 150-5 216 MHz shall in no case exceed –164 dB(W/m^2) in any 4 kHz band for all angles of arrival.

5.447C Administrations responsible for fixed-satellite service networks in the band 5 150-5 250 MHz operated under Nos. **5.447A** and **5.447B** shall coordinate on an equal basis in accordance with No. **9.11A** with administrations responsible for non-geostationary-satellite networks operated under No. **5.446** and brought into use prior to 17 November 1995. Satellite networks operated under No. **5.446** brought into use after 17 November 1995 shall not claim protection from, and shall not cause harmful interference to, stations of the fixed-satellite service operated under Nos. **5.447A** and **5.447B**.

5.447D The allocation of the band 5 250-5 255 MHz to the space research service on a primary basis is limited to active spaceborne sensors. Other uses of the band by the space research service are on a secondary basis. (WRC-97)

5.447E *Additional allocation:* The band 5 250-5 350 MHz is also allocated to the fixed service on a primary basis in the following countries in Region 3: Australia, Korea (Rep. of), India, Indonesia, Iran (Islamic Republic of), Japan, Malaysia, Papua New Guinea, the Philippines, Dem. People's Rep. of Korea, Sri Lanka, Thailand and Viet Nam. The use of this band by the fixed service is intended for the implementation of fixed wireless access systems and shall comply with Recommendation ITU-R F.1613-0. In addition, the fixed service shall not claim protection from the radiodetermination, Earth exploration-satellite (active) and space research (active) services, but the provisions of No. **5.43A** do not apply to the fixed service with respect to the Earth exploration-satellite (active) and space research

(active) services. After implementation of fixed wireless access systems in the fixed service with protection for the existing radiodetermination systems, no more stringent constraints should be imposed on the fixed wireless access systems by future radiodetermination implementations. (WRC-15)

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 services, the Earth exploration-satellite service (active) and the space research service (active) shall not impose more stringent conditons upon the mobile service than those stipulated in Resolution 229 (Rev.WRC-19). (WRC-19)

5.448 *Additional allocation:* in Kyrgyzstan, Romania and Turkmenistan, the frequency band 5 250-5 350 MHz is also allocated to the radionavigation service on a primary basis. (WRC-19)

5.448A The Earth exploration-satellite (active) and space research (active) services in the frequency band 5 250-5 350 MHz shall not claim protection from the radiolocation service. No. **5.43A** does not apply.

5.448B The Earth exploration-satellite service (active) operating in the band 5 350-5 570 MHz and space research service (active) operating in the band 5 460-5 570 MHz shall not cause harmful interference to the aeronautical radionavigation service in the band 5 350-5 460 MHz, the radionavigation service in the band 5 460-5 470 MHz and the maritime radionavigation service in the band 5 470-5 570 MHz.

5.448C The space research service (active) operating in the band 5 350-5 460 MHz shall not cause harmful interference to nor claim protection from other services to which this band is allocated.

5.448D In the frequency band 5 350-5 470 MHz, stations in the radiolocation service shall not cause harmful interference to, nor claim protection from, radar systems in the aeronautical radionavigation service operating in accordance with No. **5.449**.

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.

5.450 *Additional allocation:* in Austria, Azerbaijan, Iran (Islamic Republic of), Kyrgyzstan, Romania, Turkmenistan and Ukraine, the band 5 470-5 650 MHz is also allocated to the aeronautical radionavigation service on a primary basis. (WRC-12)

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 measures upon the mobile service than those stipulated in Resolution 229 (Rev.WRC-19). (WRC-19)

5.450B In the frequency band 5 470-5 650 MHz, stations in the radiolocation service, except ground-based radars used for meteorological purposes in the band 5 600-5 650 MHz, shall not cause harmful interference to, nor claim protection from, radar systems in the maritime radionavigation service.

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

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 frequency 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-19**) 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 frequency 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. (WRC-19)

5.454 *Different category of service:* in Azerbaijan, the Russian Federation, Georgia, Kyrgyzstan, Tajikistan and Turkmenistan, the allocation of the band 5 670-5 725 MHz to the space research service is on a primary basis (see No. **5.33**). (WRC-12)

5.455 *Additional allocation:* in Armenia, Azerbaijan, Belarus, Cuba, the Russian Federation, Georgia, Hungary, Kazakhstan, Moldova, Uzbekistan, Kyrgyzstan, Romania, Tajikistan, Turkmenistan and Ukraine, the frequency band 5 670-5 850 MHz is also allocated to the fixed service on a primary basis. (WRC-19)

5.457 In Australia, Burkina Faso, Cote d'Ivoire, Mali and Nigeria, the allocation to the fixed service in the bands 6 440-6 520 MHz (HAPS-to-ground direction) and 6 560-6 640 MHz (ground-to-HAPS direction) may also be used by gateway links for high-altitude platform stations (HAPS) within the territory of these countries. Such use is limited to operation in HAPS gateway links and shall not cause harmful interference to, and shall not claim protection from, existing services, and shall be in compliance with Resolution **150 (WRC-12)**. Existing services shall not be constrained in future development by HAPS gateway links. The use of HAPS gateway links in these bands requires explicit agreement with other administrations whose territories are located within 1 000 kilometres from the border of an administration intending to use the HAPS gateway links. (WRC-12)

5.457A In the bands 5 925-6 425 MHz and 14-14.5 GHz, earth stations located on board vessels may communicate with space stations of the fixed-satellite service. Such use shall be in accordance with Resolution **902 (WRC-03)**. In the frequency band 5 925-6 425 MHz, earth stations located on board vessels and communicating with space stations of the fixed-satellite service may employ transmit antennas with minimum diameter of 1.2 m and operate without prior agreement of any administration if located at least 330 km away from the low-water mark as officially recognized by the coastal state. All other provisions of Resolution 902 (WRC-03) shall apply. (WRC-15)

5.457B In the 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)**. (WRC-15)

5.457C In Region 2 (except Brazil, Cuba, French overseas departments and communities, Guatemala, Mexico, Paraguay, Uruguay and Venezuela), the band 5 925-6 700 MHz may be used for aeronautical mobile telemetry for flight testing by aircraft stations (see No. **1.83**). Such use shall be in accordance with Resolution **416 (WRC-07)** and shall not cause harmful interference to, nor claim protection from, the fixed-satellite and fixed services. Any such use does not preclude the use of this band by other mobile service applications or by other services to which this band is allocated on a co-primary basis and does not establish priority in the Radio Regulations. (WRC-15)

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

5.458A In making assignments in the band 6 700-7 075 MHz to space stations of the fixed-satellite service, administrations are urged to take all practicable steps to protect spectral line observations of the radio astronomy service in the band 6 650-6 675.2 MHz from harmful interference from unwanted emissions.

5.458B The space-to-Earth allocation to the fixed-satellite service in the band 6 700-7 075 MHz is limited to feeder links for non-geostationary satellite systems of the mobile-satellite service and is subject to coordination under No. **9.11A**. The use of the band 6 700-7 075 MHz (space-to-Earth) by feeder links for non-geostationary satellite systems in the mobile-satellite service is not subject to No. **22.2**.

5.459 *Additional allocation:* in the Russian Federation, the frequency bands 7 100-7 155 MHz and 7 190-7 235 MHz are also allocated to the space operation service (Earth-to-space) on a primary basis, subject to agreement obtained under No. **9.21**. In the frequency band 7 190-7 235 MHz, with respect to the Earth exploration-satellite service (Earth-to-space), No 9.21 does not apply. (WRC-15)

5.460 No emissions from space research service (Earth-to-space) systems intended for deep space shall be effected in the band 7 190-7 235 MHz. Geostationary satellites in the space research service operating in the band 7 190-7 235 MHz shall not claim protection from existing and future stations of the fixed and mobile services and No. **5.43A** does not apply. (WRC-15)

5.460A The use of the frequency band 7 190-7 250 MHz (Earth-to-space) by the Earth exploration-satellite service shall be limited to tracking, telemetry and command for the operation of spacecraft. Space stations operating in the Earth exploration-satellite service (Earth-to-space) in the frequency band 7 190-7 250 MHz shall not claim protection from existing and future stations in the fixed and mobile services, and No. **5.43A** does not apply. No. **9.17** applies. Additionally, to ensure protection of the existing and future deployment of fixed and mobile services, the location of earth stations supporting spacecraft in the Earth exploration-satellite service in non-geostationary orbits or geostationary orbit shall maintain a separation distance of at least 10 km and 50 km, respectively, from the respective border(s) of neighbouring countries, unless a shorter distance is otherwise agreed between the corresponding administrations. (WRC-15)

5.460B Space stations on the geostationary orbit operating in the Earth exploration-satellite service (Earth-to-space) in the frequency band 7 190-7 235 MHz shall not claim protection from existing and future stations of the space research service, and No. 5.43A does not apply. (WRC-15)

5.461 *Additional allocation:* the bands 7 250-7 375 MHz (space-to-Earth) and 7 900-8 025 MHz (Earth-to-space) are also allocated to the mobile-satellite service on a primary basis, subject to agreement obtained under No. **9.21**.

5.461A The use of the band 7 450-7 550 MHz by the meteorological-satellite service (space-to-Earth) is limited to geostationary-satellite systems. Non-geostationary meteorological-satellite systems in this band notified before 30 November 1997 may continue to operate on a primary basis until the end of their lifetime.

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. (WRC-15)

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. (WRC-15)

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. (WRC-12)

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	$0° \le \theta < 5°$	
$-135 + 0.5\,(\theta - 5)$ dB(W/m^2) in a 1 MHz band	for	$5° \le \theta < 25°$	
-125 dB(W/m^2) in a 1 MHz band	for	$25° \le \theta \le 90°$	(WRC-12)

5.463 Aircraft stations are not permitted to transmit in the band 8 025-8 400 MHz.

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

5.466 *Different category of service:* in Singapore and Sri Lanka, the allocation of the band 8 400-8 500 MHz to the space research service is on a secondary basis (see No. **5.32**). (WRC-12)

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. (WRC-19)

5.469 *Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Hungary, Lithuania, Mongolia, Uzbekistan, Poland, Kyrgyzstan, the Czech Rep., Romania, Tajikistan, Turkmenistan and Ukraine, the band 8 500-8 750 MHz is also allocated to the land mobile and radionavigation services on a primary basis. (WRC-12)

5.469A In the band 8 550-8 650 MHz, stations in the Earth exploration-satellite service (active) and space research service (active) shall not cause harmful interference to, or constrain the use and development of, stations of the radiolocation service.

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 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. (WRC-15)

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.

5.473 *Additional allocation:* in Armenia, Austria, Azerbaijan, Belarus, Cuba, the Russian Federation, Georgia, Hungary, Uzbekistan, Poland, Kyrgyzstan, Romania, Tajikistan, Turkmenistan and Ukraine, the frequency bands 8 850-9 000 MHz and 9 200-9 300 MHz are also allocated to the radionavigation service on a primary basis. (WRC-19)

5.473A In the band 9 000-9 200 MHz, stations operating in the radiolocation service shall not cause harmful interference to, nor claim protection from, systems identified in No. **5.337** operating in the aeronautical radionavigation service, or radar systems in the maritime radionavigation service operating in this band on a primary basis in the countries listed in No. **5.471**. (WRC-07)

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**).

5.474A The use of the frequency bands 9 200-9 300 MHz and 9 900-10 400 MHz by the Earth exploration-satellite service (active) is limited to systems requiring necessary bandwidth greater than 600 MHz that cannot be fully accommodated within the frequency band 9 300-9 900 MHz. Such use is subject to agreement to be obtained under No. 9.21 from Algeria, Saudi Arabia, Bahrain, Egypt, Indonesia, Iran (Islamic Republic of), Lebanon and Tunisia. An administration that has not replied under No. **9.52** is considered as not having agreed to the coordination request. In this case, the notifying administration of the satellite system operating in the Earth exploration-satellite service (active) may request the assistance of the Bureau under Sub-Section IID of Article **9**. (WRC-15)

5.474B Stations operating in the Earth exploration-satellite (active) service shall comply with Recommendation ITU-R RS.2066-0. (WRC-15)

5.474C Stations operating in the Earth exploration-satellite (active) service shall comply with Recommendation ITU-R RS.2065-0. (WRC-15)

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. (WRC-15)

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. (WRC-07)

5.475A The use of the band 9 300-9 500 MHz by the Earth exploration-satellite service (active) and the space research service (active) is limited to systems requiring necessary bandwidth greater than 300 MHz that cannot be fully accommodated within the 9 500-9 800 MHz band. (WRC-07)

5.475B In the band 9 300-9 500 MHz, stations operating in the radiolocation service shall not cause harmful interference to, nor claim protection from, radars operating in the radionavigation service in conformity with the Radio Regulations. Ground-based radars used for meteorological purposes have priority over other radiolocation uses. (WRC-07)

5.476A In the band 9 300-9 800 MHz, stations in the Earth exploration-satellite service (active) and space research service (active) shall not cause harmful interference to, nor claim protection from, stations of the radio-navigation and radiolocation services. (WRC-07)

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 band 9 800-10 000 MHz to the fixed service is on a primary basis (see No. **5.33**). (WRC-15)

5.478 *Additional allocation:* in Azerbaijan, Kyrgyzstan, Romania, Turkmenistan and Ukraine, the frequency band 9 800-10 000 MHz is also allocated to the radionavigation service on a primary basis. (WRC-19)

5.478A The use of the band 9 800-9 900 MHz by the Earth exploration-satellite service (active) and the space research service (active) is limited to systems requiring necessary bandwidth greater than 500 MHz that cannot be fully accommodated within the 9 300-9 800 MHz band. (WRC-07)

5.478B In the band 9 800-9 900 MHz, stations in the Earth exploration-satellite service (active) and space research service (active) shall not cause harmful interference to, nor claim protection from stations of the fixed service to which this band is allocated on a secondary basis. (WRC-07)

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.

5.480 *Additional allocation:* in Argentina, Brazil, Chile, Cuba, El Salvador, Ecuador, Guatemala, Honduras, Paraguay, the overseas countries and territories within the Kingdom of the Netherlands in Region 2, Peru and Uruguay, the band 10-10.45 GHz is also allocated to the fixed and mobile services on a primary basis. In Colombia, Costa Rica, Mexico and Venezuela, the frequency band 10-10.45 GHz is also allocated to the fixed service on a primary basis. (WRC-19)

5.481 *Additional allocation:* in Algeria, Germany, Angola, Brazil, China, Côte d'Ivoire, Egypt, El Salvador, Ecuador, Spain, Guatemala, Hungary, Japan, Kenya, Morocco, Nigeria, Oman, Uzbekistan, Pakistan, Paraguay, Peru, the Dem. People's Rep. of Korea, Romania, Tunisia and Uruguay, the frequency band 10.45-10.5 GHz is also allocated to the fixed and mobile services on a primary basis. In Costa Rica, the frequency band 10.45-10.5 GHz is also allocated to the fixed service on a primary basis (WRC-19)

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, Libyan Arab Jamahiriya, Kazakhstan, Kuwait, Lebanon, 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, service is not applicable. (WRC-07)

5.482A For sharing of the band 10.6-10.68 GHz between the Earth exploration-satellite (passive) service and the fixed and mobile, except aeronautical mobile, services, Resolution **751 (WRC-07)** applies. (WRC-07)

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. (WRC-19)

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. (WRC-15)

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

5.486 *Different category of service:* in the United States, the allocation of the frequency band 11.7-12.1 GHz to the fixed service is on a secondary basis (see **No. 5.32)**. (WRC-15)

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.

5.488 The use of the band 11.7-12.2 GHz by geostationary-satellite networks in the fixed-satellite service in Region 2 is subject to application of the provisions of No. **9.14** for coordination with stations of terrestrial services

in Regions 1, 2 and 3. For the use of the band 12.2-12.7 GHz by the broadcasting-satellite service in Region 2, see Appendix **30**.

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

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

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.

5.493 The broadcasting-satellite service in the band 12.5-12.75 GHz in Region 3 is limited to a power flux-density not exceeding –111 dB(W/(m^2 · 27 MHz)) for all conditions and for all methods of modulation at the edge of the service area.

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. (WRC-15)

5.495 *Additional allocation:* in Greece, Monaco, Montenegro, Uganda, and Tunisia, the frequency band 12.5-12.75 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis. (WRC-19)

5.496 *Additional allocation:* in Austria, Azerbaijan, Kyrgyzstan and Turkmenistan, the band 12.5-12.75 GHz is also allocated to the fixed service and the mobile, except aeronautical mobile, service on a primary basis. However, stations in these services shall not cause harmful interference to fixed-satellite service earth stations of countries in Region 1 other than those listed in this footnote. Coordination of these earth stations is not required with stations of the fixed and mobile services of the countries listed in this footnote. The power flux-density limit at the Earth's surface given in Table **21-4** of Article **21**, for the fixed-satellite service shall apply on the territory of the countries listed in this footnote.

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

5.498A The Earth exploration-satellite (active) and space research (active) services operating in the band 13.25-13.4 GHz shall not cause harmful interference to, or constrain the use and development of, the aeronautical radionavigation service.

5.499 *Additional allocation:* in Bangladesh and India, the band 13.25-14 GHz is also allocated to the fixed service on a primary basis. In Pakistan, the band 13.25-13.75 GHz is allocated to the fixed service on a primary basis. (WRC-12)

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. (WRC-15)

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). (WRC-15)

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. (WRC-15)

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. (WRC-15)

5.499E In the frequency band 13.4-13.65 GHz, geostationary-satellite networks in the fixed-satellite service (spaceto-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. (WRC-15)

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 band 13.4-13.75 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-15)

5.501 *Additional allocation:* in Azerbaijan, Hungary, Japan, Kyrgyzstan, Romania and Turkmenistan, the band 13.4-14 GHz is also allocated to the radionavigation service on a primary basis. (WRC-12)

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. (WRC-15)

5.501B In the band 13.4-13.75 GHz, the Earth exploration-satellite (active) and space research (active) services shall not cause harmful interference to, or constrain the use and development of, the radiolocation service.

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

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

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

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

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

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

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

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

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

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

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

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

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

5.504A In the band 14-14.5 GHz, aircraft earth stations in the secondary aeronautical mobile-satellite service may also communicate with space stations in the fixed-satellite service. The provisions of Part **3**, Subsection **35.4a**, **b** and **c** apply.

5.504B Aircraft earth stations operating in the aeronautical mobile-satellite service in the frequency band 14-14.5 GHz shall comply with the provisions of Annex 1, Part C of Recommendation ITU-R M.1643-0, with respect to any radio astronomy station performing observations in the 14.47-14.5 GHz band located on the territory of Spain, France, India, Italy, the United Kingdom and South Africa. (WRC-15)

5.504C In the frequency band 14-14.25 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, Bahrain, Botswana, Côte d'Ivoire, Egypt, Guinea, India, Iran (Islamic Republic of), Kuwait, Nigeria, Oman, the Syrian Arab Republic and Tunisia by any aircraft earth station in the aeronautical mobile-satellite service shall not exceed the limits given in Annex 1, Part B of Recommendation ITU-R M.1643-0, unless otherwise specifically agreed by the affected administration(s). The provisions of this footnote in no way derogate the obligations of the aeronautical mobile-satellite service to operate as a secondary service in accordance with No. **5.29**. (WRC-15)

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. (WRC-19)

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

5.506A In the band 14-14.5 GHz, ship earth stations with an e.i.r.p. greater than 21 dBW shall operate under the same conditions as earth stations located on board vessels, as provided in Resolution **902 (WRC-03)**. This footnote shall not apply to ship earth stations for which the complete Appendix **4** information has been received by the Bureau prior to 5 July 2003.

5.506B Earth stations located on board vessels communicating with space stations in the fixed-satellite service may operate in the frequency band 14-14.5 GHz without the need for prior agreement from Cyprus and Malta, within the minimum distance given in Resolution **902 (WRC-03)** from these countries. (WRC-15)

5.508 *Additional allocation:* in Germany, France, Italy, Libya, North Macedonia and the United Kingdom, the frequency band 14.25-14.3 GHz is also allocated to the fixed service on a primary basis. (WRC-19)

5.508A In the frequency band 14.25-14.3 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, Bahrain, Botswana, China, Côte d'Ivoire, Egypt, France, Guinea, India, Iran (Islamic Republic of), Italy, Kuwait, Nigeria, Oman, the Syrian Arab Republic, the United Kingdom and Tunisia by any aircraft earth station in the aeronautical mobile-satellite service shall not exceed the limits given in Annex 1, Part B of Recommendation ITU-R M.1643-0, unless otherwise specifically agreed by the affected administration(s). The provisions of this footnote in no way derogate the obligations of the aeronautical mobile-satellite service to operate as a secondary service in accordance with No. **5.29**. (WRC-15)

5.509A In the frequency band 14.3-14.5 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, Bahrain, Botswana, Cameroon, China, Côte d'Ivoire, Egypt, France, Gabon, Guinea, India, Iran (Islamic Republic of), Italy, Kuwait, Morocco, Nigeria, Oman, the Syrian Arab Republic, the United Kingdom, Sri Lanka, Tunisia and Viet Nam by any aircraft earth station in the aeronautical mobile-satellite service shall not exceed the limits given in Annex 1, Part B of Recommendation ITU-R M.1643-0, unless otherwise specifically agreed by the affected administration(s). The provisions of this footnote in no way derogate the obligations of the aeronautical mobile-satellite service to operate as a secondary service in accordance with No. **5.29**. (WRC-15)

5.509B The use of the frequency bands 14.5-14.75 GHz in countries listed in Resolution **163 (WRC-15)** and14.5-14.8 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. (WRC-15)**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. (WRC-15)

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 −151.5 dB(W/(m^2 · 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. (WRC-15)

5.509E 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)**, the location of earth stations in the fixed-satellite service (Earth-

to-space) not for feeder links for the broadcasting-satellite service shall maintain a separation distance of at least 500 km from the border(s) of other countries unless shorter distances are explicitly agreed by those administrations. No. **9.17** does not apply. When applying this provision, administrations should consider the relevant parts of these Regulations and the latest relevant ITU-R Recommendations. (WRC-15)

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-tospace) not for feeder links for the broadcasting-satellite service shall not constrain the future deployment of the fixed and mobile services. (WRC-15)

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 fixedsatellite service limited to feeder links for the broadcasting-satellite service and associated space operations functions using the guardbands 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. (WRC-15)

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 (WRC-15)

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. (WRC-12)

5.511A Use of the frequency band 15.43-15.63 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links of non-geostationary systems in the mobile-satellite service, subject to coordination under No. **9.11A**. (WRC-15)

5.511C Stations operating in the aeronautical radionavigation service shall limit the effective e.i.r.p. in accordance with Recommendation ITU-R S.1340-0. The minimum coordination distance required to protect the aeronautical radionavigation stations (No. **4.10** applies) from harmful interference from feeder-link earth stations and the maximum e.i.r.p. transmitted towards the local horizontal plane by a feeder-link earth station shall be in accordance with Recommendation ITU-R S.1340-0. (WRC-15)

5.511E In the frequency band 15.4-15.7 GHz, stations operating in the radiolocation service shall not cause harmful interference to, or claim protection from, stations operating in the aeronautical radionavigation service. (WRC-12)

5.511F In order to protect the radio astronomy service in the frequency band 15.35-15.4 GHz, radiolocation stations operating in the frequency band 15.4-15.7 GHz shall not exceed the power flux-density level of −156 dB(W/m^2) in a 50 MHz bandwidth in the frequency band 15.35-15.4 GHz, at any radio astronomy observatory site for more than 2 per cent of the time. (WRC-12)

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 band 15.7-17.3 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-15)

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

5.513A Spaceborne active sensors operating in the band 17.2-17.3 GHz shall not cause harmful interference to, or constrain the development of, the radiolocation and other services allocated on a primary basis.

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, 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. (WRC-15)

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

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 bands. Administrations should take this into account when considering regulatory provisions in relation to these bands. See Resolution **143 (Rev. WRC-19)**. (WRC-19)

5.517 In Region 2, use of the fixed-satellite (space-to-Earth) service in the band 17.7-17.8 GHz shall not cause harmful interference to nor claim protection from assignments in the broadcasting-satellite service operating in conformity with the Radio Regulations. (WRC-07)

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)**. (WRC-19)

5.519 *Additional allocation:* the bands 18-18.3 GHz in Region 2 and 18.1-18.4 GHz in Regions 1 and 3 are also allocated to the meteorological-satellite service (space-to-Earth) on a primary basis. Their use is limited to geostationary satellites. (WRC-07)

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

5.521 *Alternative allocation:* in the United Arab Emirates and Greece, the frequency band 18.1-18.4 GHz is allocated to the fixed, fixed-satellite (space-to-Earth) and mobile services on a primary basis (see No. **5.33**). The provisions of No. **5.519** also apply. (WRC-15)

5.522A The emissions of the fixed service and the fixed-satellite service in the band 18.6-18.8 GHz are limited to the values given in Nos. **21.5A** and **21.16.2**, respectively.

5.522B The use of the band 18.6-18.8 GHz by the fixed-satellite service is limited to geostationary systems and systems with an orbit of apogee greater than 20 000 km.

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**.

5.523A The use of the bands 18.8-19.3 GHz (space-to-Earth) and 28.6-29.1 GHz (Earth-to-space) by geostationary and non-geostationary fixed-satellite service networks is subject to the application of the provisions of No. **9.11A** and No. **22.2** does not apply. Administrations having geostationary-satellite networks under coordination prior to 18 November 1995 shall cooperate to the maximum extent possible to coordinate pursuant to No. **9.11A** with non-geostationary-satellite networks for which notification information has been received by the Bureau prior to that date, with a view to reaching results acceptable to all the parties concerned. Non-geostationary-satellite networks shall not cause unacceptable interference to geostationary fixed-satellite service networks for which complete Appendix **4** notification information is considered as having been received by the Bureau prior to 18 November 1995.

5.523B The use of the band 19.3-19.6 GHz (Earth-to-space) by the fixed-satellite service is limited to feeder links for non-geostationary-satellite systems in the mobile-satellite service. Such use is subject to the application of the provisions of No. **9.11A**, and No. **22.2** does not apply.

5.523C No. **22.2** shall continue to apply in the bands 19.3-19.6 GHz and 29.1-29.4 GHz, between feeder links of non-geostationary mobile-satellite service networks and those fixed-satellite service networks for which complete Appendix **4** coordination information, or notification information, is considered as having been received by the Bureau prior to 18 November 1995.

5.523D The use of the band 19.3-19.7 GHz (space-to-Earth) by geostationary fixed-satellite service systems and by feeder links for non-geostationary-satellite systems in the mobile-satellite service is subject to the application of the provisions of No. **9.11A**, but not subject to the provisions of No. **22.2**. The use of this band for other non-geostationary fixed-satellite service systems, or for the cases indicated in Nos. **5.523C** and **5.523E**, is not subject to

the provisions of No. **9.11A** and shall continue to be subject to Articles **9** (except No. **9.11A**) and **11** procedures, and to the provisions of No. **22.2**.

5.523E No. **22.2** shall continue to apply in the bands 19.6-19.7 GHz and 29.4-29.5 GHz, between feeder links of non-geostationary mobile-satellite service networks and those fixed-satellite service networks for which complete Appendix **4** coordination information, or notification information, is considered as having been received by the Bureau by 21 November 1997.

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 band 19.7-21.2 GHz is also allocated to the fixed and mobile services on a primary basis. This additional use shall not impose any limitation on the power flux-density of space stations in the fixed-satellite service in the band 19.7-21.2 GHz and of space stations in the mobile-satellite service in the band 19.7-20.2 GHz where the allocation to the mobile-satellite service is on a primary basis in the latter band. (WRC-15)

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

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

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

5.527A The operation of earth stations in motion communicating with the FSS is subject to Resolution 156 (WRC-15). (WRC-15)

5.528 The allocation to the mobile-satellite service is intended for use by networks which use narrow spot-beam antennas and other advanced technology at the space stations. Administrations operating systems in the mobile-satellite service in the band 19.7-20.1 GHz in Region 2 and in the band 20.1-20.2 GHz shall take all practicable steps to ensure the continued availability of these bands for administrations operating fixed and mobile systems in accordance with the provisions of No. **5.524**.

5.529 The use of the bands 19.7-20.1 GHz and 29.5-29.9 GHz by the mobile-satellite service in Region 2 is limited to satellite networks which are both in the fixed-satellite service and in the mobile-satellite service as described in No. **5.526**.

5.530A Unless otherwise agreed between the administrations concerned, any station in the fixed or mobile services of an administration shall not produce a power flux-density in excess of −120.4 dB(W/(m^2 · MHz)) at 3 m above the ground of any point of the territory of any other administration in Regions 1 and 3 for more than 20% of the time. In conducting the calculations, administrations should use the most recent version of Recommendation ITU-R P.452 (see also the most recent version of Recommendation ITU-R BO.1898). (WRC-15)

5.530B In the band 21.4-22 GHz, in order to facilitate the development of the broadcasting-satellite service, administrations in Regions 1 and 3 are encouraged not to deploy stations in the mobile service and are encouraged to limit the deployment of stations in the fixed service to point-to-point links. (WRC-12)

5.530E The allocation to the fixed service in the frequency band 21.4-22 GHz is identified for use in Region 2 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 it 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 is limited to the HAPS-to-ground direction, and shall be in accordance with the provisions of Resolution **165 (WRC-19)**. (WRC-19)

5.531 *Additional allocation:* in Japan, the band 21.4-22 GHz is also allocated to the broadcasting service on a primary basis.

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

5.532A The location of earth stations in the space research service shall maintain a separation distance of at least 54 km from the respective border(s) of neighbouring countries to protect the existing and future deployment of fixed and mobile services unless a shorter distance is otherwise agreed between the corresponding administrations. Nos. **9.17** and **9.18** do not apply. (WRC-12)

5.532AA The allocation to the fixed service in the frequency band 24.25-25.25 GHz is identified for use in Region 2 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 is limited to the HAPS-to-ground direction and shall be in accordance with the provisions of Resolution **166 (WRC-19)**. (WRC-19)

5.532AB The allocation 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. (WRC-19)

5.532B Use of the band 24.65-25.25 GHz in Region 1 and the band 24.65-24.75 GHz in Region 3 by the fixed-satellite service (Earth-to-space) is limited to earth stations using a minimum antenna diameter of 4.5 m. (WRC-12)

5.533 The inter-satellite service shall not claim protection from harmful interference from airport surface detection equipment stations of the radionavigation service.

5.534A The allocation to the fixed service in the frequency band 25.25-27.5 GHz is identified in Region 2 for useby high-altitude platform stations (HAPS) in accordance with the provisions of Resolution **166 (WRC-19)**. Such use of the fixed-service allocation by HAPS shall be limited to the ground-to-HAPS direction in the frequency band 25.25-27.0 GHz and to the HAPS-to-ground direction in the frequency band 27.0-27.5 GHz. Furthermore, the use of the frequency band 25.5-27.0 GHz by HAPS shall be limited to gateway links. This identification does not preclude the use of this frequency band by other fixed-service applications or by other services to which this band is allocated on a coprimary basis, and does not establish priority in the Radio Regulations. (WRC-19)

5.535 In the band 24.75-25.25 GHz, feeder links to stations of the broadcasting-satellite service shall have priority over other uses in the fixed-satellite service (Earth-to-space). Such other uses shall protect and shall not claim protection from existing and future operating feeder-link networks to such broadcasting satellite stations.

5.535A The use of the band 29.1-29.5 GHz (Earth-to-space) by the fixed-satellite service is limited to geostationary-satellite systems and feeder links to non-geostationary-satellite systems in the mobile-satellite service. Such use is subject to the application of the provisions of No. **9.11A**, but not subject to the provisions of No. **22.2**, except as indicated in Nos. **5.523C** and **5.523E** where such use is not subject to the provisions of No. **9.11A** and shall continue to be subject to Articles **9** (except No. **9.11A**) and **11** procedures, and to the provisions of No. **22.2**.

5.536 Use of the 25.25-27.5 GHz band by the inter-satellite service is limited to space research and Earth exploration-satellite applications, and also transmissions of data originating from industrial and medical activities in space.

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. (WRC-19)

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, 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. (WRC-19)

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. (WRC-12)

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

5.537A In Bhutan, Cameroon, China, Korea (Rep. of), the Russian Federation, India, Indonesia, Iran (Islamic Republic of), Iraq, Japan, Kazakhstan, Malaysia, Maldives, Mongolia, Myanmar, Uzbekistan, Pakistan, the Philippines, Kyrgyzstan, the Dem. People's Rep. of Korea, Sudan, Sri Lanka, Thailand and Viet Nam, the allocation to the fixed service in the frequency band 27.9-28.2 GHz may also be used by high altitude platform stations (HAPS) within the territory of these countries. Such use of 300 MHz of the fixed-service allocation by HAPS in the above countries is further limited to operation in the HAPS-to-ground direction and shall not cause harmful interference to, nor claim protection from, other types of fixed-service systems or other co-primary services. Furthermore, the development of these other services shall not be constrained by HAPS. See Resolution **145 (Rev.WRC-19)**. (WRC-19)

5.538 *Additional allocation:* the bands 27.500-27.501 GHz and 29.999-30.000 GHz are also allocated to the fixed-satellite service (space-to-Earth) on a primary basis for the beacon transmissions intended for up-link power control. Such space-to-Earth transmissions shall not exceed an equivalent isotropically radiated power (e.i.r.p.) of −10 dBW in the direction of adjacent satellites on the geostationary-satellite orbit. (WRC-07)

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

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

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

5.541A Feeder links of non-geostationary networks in the mobile-satellite service and geostationary networks in the fixed-satellite service operating in the band 29.1-29.5 GHz (Earth-to-space) shall employ uplink adaptive power control or other methods of fade compensation, such that the earth station transmissions shall be conducted at the power level required to meet the desired link performance while reducing the level of mutual interference between both networks. These methods shall apply to networks for which Appendix **4** coordination information is considered as having been received by the Bureau after 17 May 1996 and until they are changed by a future competent world radiocommunication conference. Administrations submitting Appendix **4** information for coordination before this date are encouraged to utilize these techniques to the extent practicable.

5.542 *Additional allocation:* in Algeria, Saudi Arabia, Bahrain, 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, Oman, Pakistan, Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Somalia, Sudan, South Sudan, Sri Lanka and Chad, the band 29.5-31 GHz is also allocated to the fixed and mobile services on a secondary basis. The power limits specified in Nos. **21.3** and **21.5** shall apply. (WRC-12)

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

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)**. (WRC-19)

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

5.545 *Different category of service:* in Armenia, Georgia, Kyrgyzstan, Tajikistan and Turkmenistan, the allocation of the band 31-31.3 GHz to the space research service is on a primary basis (see No. **5.33**). (WRC-12)

5.546 *Different category of service:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Egypt, the United Arab Emirates, Spain, Estonia, the Russian Federation, Georgia, Hungary, Iran (Islamic Republic of), Israel, Jordan, Lebanon, Moldova, Mongolia, Oman, Uzbekistan, Poland, the Syrian Arab Republic, Kyrgyzstan, Romania, the United Kingdom, South Africa, Tajikistan, Turkmenistan and Turkey, the allocation of the frequency band 31.5-31.8 GHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (see No. **5.33**). (WRC-19)

5.547 The bands 31.8-33.4 GHz, 37-40 GHz, 40.5-43.5 GHz, 51.4-52.6 GHz, 55.78-59 GHz and 64-66 GHz are available for high-density applications in the fixed service (see Resolution **75 (WRC-2000)**). Administrations should take this into account when considering regulatory provisions in relation to these bands. Because of the potential deployment of high-density applications in the fixed-satellite service in the bands 39.5-40 GHz and 40.5-42 GHz (see No. **5.516B**), administrations should further take into account potential constraints to high-density applications in the fixed service, as appropriate. (WRC-07)

5.547A Administrations should take practical measures to minimize the potential interference between stations in the fixed service and airborne stations in the radionavigation service in the 31.8-33.4 GHz band, taking into account the operational needs of the airborne radar systems.

5.547B *Alternative allocation*: in the United States, the band 31.8-32 GHz is allocated to the radionavigation and space research (deep space) (space-to-Earth) services on a primary basis.

5.547C *Alternative allocation*: in the United States, the band 32-32.3 GHz is allocated to the radionavigation and space research (deep space) (space-to-Earth) services on a primary basis.

5.547D *Alternative allocation*: in the United States, the band 32.3-33 GHz is allocated to the inter-satellite and radionavigation services on a primary basis.

5.547E *Alternative allocation*: in the United States, the band 33-33.4 GHz is allocated to the radionavigation service on a primary basis.

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

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. (WRC-12)

5.549A In the band 35.5-36.0 GHz, the mean power flux-density at the Earth's surface, generated by any spaceborne sensor in the Earth exploration-satellite service (active) or space research service (active), for any angle greater than 0.8° from the beam centre shall not exceed -73.3 dB(W/m^2) in this band.

5.550 *Different category of service:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kyrgyzstan, Tajikistan and Turkmenistan, the allocation of the band 34.7-35.2 GHz to the space research service is on a primary basis (see No. **5.33**). (WRC-12)

5.550A 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. (WRC-07)

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 frequency 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 frequency bands, as appropriate. Resolution **243 (WRC-19)** applies.. (WRC-19)

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. (WRC-19)

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)**. (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. (WRC-19)

5.551F *Different category of service*: in Japan, the allocation of the band 41.5-42.5 GHz to the mobile service is on a primary basis (see Part **3**, Subsection **35.6**).

5.551H The equivalent power flux-density (epfd) produced in the band 42.5-43.5 GHz by all space stations in any non-geostationary-satellite system in the fixed-satellite service (space-to-Earth), or in the broadcasting-satellite service operating in the 42-42.5 GHz band, shall not exceed the following values at the site of any radio astronomy station for more than 2% of the time:

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

−209 dB(W/m^2) in any 500 kHz of the frequency band 42.5-43.5 GHz at the site of any radio astronomy station registered as a very long baseline interferometry station.

These epfd values shall be evaluated using the methodology given in Recommendation ITU-R S.1586-1 and the reference antenna pattern and the maximum gain of an antenna in the radio astronomy service given in Recommendation ITU-R RA.1631-0 and shall apply over the whole sky and for elevation angles higher than the minimum operating angle θ_{min} of the radiotelescope (for which a default value of 5° should be adopted in the absence of notified information).

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

– was in operation prior to 5 July 2003 and has been notified to the Bureau before 4 January 2004; or

– was notified before the date of receipt of the complete Appendix **4** information for coordination or notification, as appropriate, for the space station to which the limits apply.

Other radio astronomy stations notified after these dates may seek an agreement with administrations that have authorized the space stations. In Region 2, Resolution **743 (WRC-03)** shall apply. The limits in this footnote may be exceeded at the site of a radio astronomy station of any country whose administration so agreed. (WRC-15)

5.551I The power flux-density in the band 42.5-43.5 GHz produced by any geostationary space station in the fixed-satellite service (space-to-Earth), or the broadcasting-satellite service (space-to-Earth) operating in the 42-42.5 GHz band, shall not exceed the following values at the site of any radio astronomy station:

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

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

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

– was in operation prior to 5 July 2003 and has been notified to the Bureau before 4 January 2004; or

– was notified before the date of receipt of the complete Appendix **4** information for coordination or notification, as appropriate, for the space station to which the limits apply.

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

5.552 The allocation of the spectrum for the fixed-satellite service in the bands 42.5-43.5 GHz and 47.2-50.2 GHz for Earth-to-space transmission is greater than that in the band 37.5-39.5 GHz for space-to-Earth transmission in order to accommodate feeder links to broadcasting satellites. Administrations are urged to take all practicable steps to reserve the band 47.2-49.2 GHz for feeder links for the broadcasting-satellite service operating in the band 40.5-42.5 GHz.

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)**. (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, Tanzania, 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. (WRC-19)

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, Seychelles, Sierra Leone, Singapore, Slovenia, Somalia, Sudan, South 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. (WRC-19)

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

5.554A The use of the bands 47.5-47.9 GHz, 48.2-48.54 GHz and 49.44-50.2 GHz by the fixed-satellite service (space-to-Earth) is limited to geostationary satellites.

5.555 *Additional allocation:* the band 48.94-49.04 GHz is also allocated to the radio astronomy service on a primary basis.

5.555B The power flux-density in the band 48.94-49.04 GHz produced by any geostationary space station in the fixed-satellite service (space-to-Earth) operating in the bands 48.2-48.54 GHz and 49.44-50.2 GHz shall not exceed –151.8 dB(W/m^2) in any 500 kHz band at the site of any radio astronomy station.

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. (WRC-19)

5.556 In the bands 51.4-54.25 GHz, 58.2-59 GHz and 64-65 GHz, radio astronomy observations may be carried out under national arrangements.

5.556A Use of the bands 54.25-56.9 GHz, 57-58.2 GHz and 59-59.3 GHz by the inter-satellite service is limited to satellites in the geostationary-satellite orbit. The single-entry power flux-density at all altitudes from 0 km to 1 000 km above the Earth's surface produced by a station in the inter-satellite service, for all conditions and for all methods of modulation, shall not exceed -147 dB(W/(m^2 · 100 MHz)) for all angles of arrival.

5.556B *Additional allocation:* in Japan, the band 54.25-55.78 GHz is also allocated to the mobile service on a primary basis for low-density use.

5.557 *Additional allocation:* in Japan, the band 55.78-58.2 GHz is also allocated to the radiolocation service on a primary basis.

5.557A In the band 55.78-56.26 GHz, in order to protect stations in the Earth exploration-satellite service (passive), the maximum power density delivered by a transmitter to the antenna of a fixed service station is limited to -26 dB(W/MHz).

5.558 In the bands 55.78-58.2 GHz, 59-64 GHz, 66-71 GHz, 122.25-123 GHz, 130-134 GHz, 167-174.8 GHz and 191.8-200 GHz, stations in the aeronautical mobile service may be operated subject to not causing harmful interference to the inter-satellite service (see No. **5.43**).

5.558A Use of the band 56.9-57 GHz by inter-satellite systems is limited to links between satellites in geostationary-satellite orbit and to transmissions from non-geostationary satellites in high-Earth orbit to those in low-Earth orbit. For links between satellites in the geostationary-satellite orbit, the single entry power flux-density

at all altitudes from 0 km to 1 000 km above the Earth's surface, for all conditions and for all methods of modulation, shall not exceed –147 dB(W/(m^2 · 100 MHz)) for all angles of arrival.

5.559 In the band 59-64 GHz, airborne radars in the radiolocation service may be operated subject to not causing harmful interference to the inter-satellite service (see No. **5.43**).

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.. (WRC-19)

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. (WRC-15)

5.560 In the band 78-79 GHz radars located on space stations may be operated on a primary basis in the Earth exploration-satellite service and in the space research service.

5.561 In the band 74-76 GHz, stations in the fixed, mobile and broadcasting services shall not cause harmful interference to stations of the fixed-satellite service or stations of the broadcasting-satellite service operating in accordance with the decisions of the appropriate frequency assignment planning conference for the broadcasting-satellite service.

5.561A The 81-81.5 GHz band is also allocated to the amateur and amateur-satellite services on a secondary basis.

5.561B In Japan, use of the band 84-86 GHz, by the fixed-satellite service (Earth-to-space) is limited to feeder links in the broadcasting-satellite service using the geostationary-satellite orbit.

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.

5.562A In the bands 94-94.1 GHz and 130-134 GHz, transmissions from space stations of the Earth exploration-satellite service (active) that are directed into the main beam of a radio astronomy antenna have the potential to damage some radio astronomy receivers. Space agencies operating the transmitters and the radio astronomy stations concerned should mutually plan their operations so as to avoid such occurrences to the maximum extent possible.

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. (WRC-19)

5.562C Use of the band 116-122.25 GHz by the inter-satellite service is limited to satellites in the geostationary-satellite orbit. The single-entry power flux-density produced by a station in the inter-satellite service, for all conditions and for all methods of modulation, at all altitudes from 0 km to 1 000 km above the Earth's surface and in the vicinity of all geostationary orbital positions occupied by passive sensors, shall not exceed –148 dB(W/(m^2 · MHz)) for all angles of arrival.

5.562D *Additional allocation*: In Korea (Rep. of), the frequency bands 128-130 GHz, 171-171.6 GHz, 172.2-172.8 GHz and 173.3-174 GHz are also allocated to the radio astronomy service on a primary basis. Radio astronomy stations in Korea (Rep. of) operating in the frequency bands referred to in this footnote shall not claim protection from, or constrain the use and development of, services in other countries operating in accordance with the Radio Regulations. (WRC-15)

5.562E The allocation to the Earth exploration-satellite service (active) is limited to the band 133.5-134 GHz.

5.562H Use of the bands 174.8-182 GHz and 185-190 GHz by the inter-satellite service is limited to satellites in the geostationary-satellite orbit. The single-entry power flux-density produced by a station in the inter-satellite service, for all conditions and for all methods of modulation, at all altitudes from 0 to 1 000 km above the Earth's surface and in the vicinity of all geostationary orbital positions occupied by passive sensors, shall not exceed -144 dB(W/(m^2 · MHz)) for all angles of arrival.

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.

5.563B The band 237.9-238 GHz is also allocated to the Earth exploration-satellite service (active) and the space research service (active) for spaceborne cloud radars only.

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. (WRC-19)

5.565 The following frequency bands in the range 275-1 000 GHz are identified for use by administrations for passive service applications:

- radio astronomy service: 275-323 GHz, 327-371 GHz, 388-424 GHz, 426-442 GHz, 453-510 GHz, 623-711 GHz, 795-909 GHz and 926-945 GHz;
- Earth exploration-satellite service (passive) and space research service (passive): 275-286 GHz, 296-306 GHz, 313-356 GHz, 361-365 GHz, 369-392 GHz, 397-399 GHz, 409-411 GHz, 416-434 GHz, 439-467 GHz, 477-502 GHz, 523-527 GHz, 538-581 GHz, 611-630 GHz, 634-654 GHz, 657-692 GHz, 713-718 GHz, 729-733 GHz, 750-754 GHz, 771-776 GHz, 823-846 GHz, 850-854 GHz, 857-862 GHz, 866-882 GHz, 905-928 GHz, 951-956 GHz, 968-973 GHz and 985-990 GHz.

The use of the range 275-1 000 GHz by the passive services does not preclude use of this range by active services. Administrations wishing to make frequencies in the 275-1 000 GHz range available for active service applications are urged to take all practicable steps to protect these passive services from harmful interference until the date when the Table of Frequency Allocations is established in the above-mentioned 275-1 000 GHz frequency range.

All frequencies in the range 1 000-3 000 GHz may be used by both active and passive services. (WRC-12)

Appendix 1 - Acronyms

ADSE	Airport Surface Detection Equipment
AID	Automatic Identification
AM	Amplitude Modulation
AM(OR)S	Aeronautical Mobile (OR) Service
BC	Broadcasting Station, Sound
BSS	Broadcast - Satellite Service
BT	Broadcasting Station, Television
CB	Citizens' Band
CBRS	Citizens' Band Radio Service
COSPAS	Space System for Search of Distress Vessels (Cosmicheskaya Poiska Avariynykh Sudor)
CTS	Cordless Telepoint Service
DME	Distance Measurement Equipment
DSC	Digital Selective Calling
EIRP	Effective Isotropic Radiated Power
ENG	Electronic News Gathering
EPIRB	Emergency Position Indicating Radio Beacons
EESS	Earth Exploration Satellite Service
FDD	Frequency Division Duples
FDMA	Frequency Division Multiple Access
FM	Frequency Modulation
FSS	Fixed - Satellite Service
FWA	Fixed Wireless Access
GLONASS	Global Navigation Satellite System
GPS	Global Positioning System
HAPS	High Altitude Platform Station
HDFS	High Density Fixed Service
HDFSS	High Density Fixed-Satellite Service
HDTV	High Definition TV
ICAO	International Civil Aviation Organization
MS	Ship Station
MSS	Mobile Satellite Service
GMDSS	Global Maritime Distress and Safety System
GSO	Geostationary Satellite Orbit
ILS	Instrument Landing System
IMT	International Mobile Telecommunication
ISM	Industrial Scientific and Medical
ITU	International Telecommunications Union
I-FAT	International Frequency Allocation Table
LEO	Low Earth Orbit
LORAN	Long range radio navigation (system)
LPD	Low Power Device
MDS	Multipoint Distribution System
MLS	Microwave Landing System
MMDS	Multi-channel Multi-point Distribution Service
MS	Ship Station
MSI	Maritime Safety Information
MSS	Mobile Satellite Service
NAVID	Navigational Identification
NAVTEX	Navigational Telex
NBDP	Narrow Band Direct Printing

NDB	Non-Directional radio Beacon
N-FAT	National Frequency Allocation Table
OBTS	Outside Broadcast Television Service
PMR	Private Mobile Radio
RACON	Radar Beacon
RR	Radio Regulations
RTP-COM	Radio Telephony Communication
RTSS	Rural Telephone Subscriber Service
RTTT	Road Transport and Traffic Telematics
SAB	Service Ancillary to Broadcasting
SAP	Service Ancillary to Program making
SAR	Search and Rescue
SARSAT	Search and Rescue Satellite-Aided Tracking
SART	Search and Rescue Transponder
SFSC	Single Frequency Single Channel
SIT	Satellite Interactive Terminal
SNG	Satellite News Gathering
SOBL	Sound Outside Broadcast Link
SSB	Single Sideband
SSR	Secondary Surveillance Radar
STL	Studio-to-Transmitter Link
TDD	Time Division Duplex
TDMA	Time Division Multiple Access
TFSC	Two Frequency Single Channel
TLMRS	Trunked Land Mobile Radiocommunication Service
TX	Transmitter
VOR	VHF Omni-Directional Range
WAS	Wireless Access System