## INDEPENDENT COMMUNICATIONS AUTHORITY OF SOUTH AFRICA

## NOTICE 911 OF 2022

**PURSUANT TO SECTION 34 (2) AND 34 (5) OF THE ELECTRONIC COMMUNICATIONS ACT 2005, (ACT NO. 36 OF 2005)**

**HEREBY ISSUES A NOTICE REGARDING THE NATIONAL RADIO FREQUENCY PLAN 2021.**

The Independent Communications Authority of South Africa ("the Authority"), is, in terms of section 34 (2) and 34 (5) of the Electronic Communications Act (Act No. 36 of 2005) (as amended) publishing the **"National Radio Frequency Plan 2021".**

**DR. KEABETSWE MODIMOENG**

**CHAIRPERSON**

**DATE: 15/03/2022**

**NATIONAL RADIO FREQUENCY PLAN 2021**
**(NRFP-21)**

**8.3 kHz – 3000 GHz**

**INDEPENDENT COMMUNICATIONS AUTHORITY OF SOUTH AFRICA**

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# 1 TERMS, DEFINITIONS AND ACRONYMS

## 1.1 Terms and definitions

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| *accepted interference*[1]*:* | *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*. |
| *active satellite:* | A *satellite* carrying a *station* intended to transmit or retransmit *radiocommunication* signals. |
| *active sensor:* | A measuring instrument in the *earth exploration-satellite service* or in the *space research service* by means of which information is obtained by transmission and reception of *radio waves*. |
| *adaptive system:* | A *radiocommunication* system which varies its radio characteristics according to channel quality. |
| *administration* | Any governmental department or service responsible for discharging the obligations undertaken in the Constitution of the International Telecommunication Union, in the Convention of the International Telecommunication Union and in the Administrative Regulations (CS 1002). |
| *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*. |
| [2]*aeronautical mobile (OR)** service:* | An *aeronautical mobile service* intended for communications, including those relating to flight coordination, primarily outside national or international civil air routes. |
| *aeronautical mobile (R)* service:* | An *aeronautical mobile service* reserved for communications relating to safety and regularity of flight, primarily along national or international civil air routes |
| *aeronautical mobile service:* | A *mobile service* between *aeronautical stations* and *aircraft stations*, or between *aircraft stations*, in which *survival craft stations* may participate; *emergency position-indicating radiobeacon stations* may also participate in this service on designated distress and emergency frequencies. |
| *aeronautical mobile-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. |
| *aeronautical mobile-satellite (R)* service:* | An *aeronautical mobile-satellite service* reserved for communications relating to safety and regularity of flights, primarily along national or international civil air routes. |
| *aeronautical mobile-satellite service:* | A *mobile-satellite service* in which *mobile earth stations* are located on board aircraft; *survival craft stations* and *emergency position-indicating radiobeacon stations* may also participate in this service. |
| *aeronautical radionavigation service:* | A *radionavigation service* intended for the benefit and for the safe operation of aircraft. |
| *aeronautical radionavigation-satellite service:* | A *radionavigation-satellite service* in which *earth stations* are located on board aircraft. |

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

*(R): route.
**(OR): off-route.



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| *aeronautical station:* | A *land station* in the *aeronautical mobile service*.<br>In certain instances, an aeronautical station may be located, for example, on board ship or on a platform at sea. |
| *aircraft earth station:* | A *mobile earth station* in the *aeronautical mobile-satellite service* located on board an aircraft. |
| *aircraft station:* | A *mobile station* in the *aeronautical mobile service*, other than a *survival craft station*, located on board an aircraft. |
| *allocation* (of a frequency band): | Entry in the Table of Frequency Allocations of a given frequency band for the purpose of its use by one or more terrestrial or space *radiocommunication services* or the *radio astronomy service* under specified conditions. This term shall also be applied to the frequency band concerned. |
| *allotment* (of a radio frequency or radio frequency channel): | Entry of a designated frequency channel in an agreed plan, adopted by a competent conference, for use by one or more *administrations* for a terrestrial or space *radiocommunication service* in one or more identified countries or geographical areas and under specified conditions. |
| *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. |
| *amateur service:* | A *radiocommunication service* for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest. |
| *amateur station:* | A *station* in the *amateur service*. |
| *amateur-satellite service:* | A *radiocommunication service* using *space stations* on earth *satellites* for the same purposes as those of the *amateur service*. |
| *assigned frequency band:* | The frequency band within which the *emission* of a *station* is authorized; the width of the band equals the *necessary bandwidth* plus twice the absolute value of the *frequency tolerance*. Where *space stations* are concerned, the assigned frequency band includes twice the maximum Doppler shift that may occur in relation to any point of the Earth's surface. |
| *assigned frequency:* | The centre of the frequency band assigned to a *station*. |
| *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. |
| *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*. |
| *base station:* | A *land station* in the *land mobile service*. |
| *broadcasting service:* | A *radiocommunication service* in which the transmissions are intended for direct reception by the general public. This service may include sound transmissions, *television* transmissions or other types of transmission (CS). |
| *broadcasting station:* | A *station* in the *broadcasting service*. |
| *broadcasting-satellite service:* | A *radiocommunication service* in which signals transmitted or retransmitted by *space stations* are intended for direct reception by the general public.<br>In the broadcasting-satellite service, the term "direct reception" shall encompass both *individual reception* and *community reception*. |
| *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. |
| *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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| *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. |
| *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*. |
| *coast station:* | A *land station* in the *maritime mobile service*. |
| *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:<br>– by a group of the general public at one location; or<br>– through a distribution system covering a limited area. |
| *coordinated universal time (UTC):* | Time scale, based on the second (SI), as described in Resolution **655 (WRC-15)**. (WRC-15) |
| *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 bi-directionally allocated frequency band with receiving *earth stations*, beyond which the level of *permissible interference* will not be exceeded and coordination is therefore not required. (WRC-2000) |
| *coordination contour:* | The line enclosing the *coordination area*. |
| *coordination distance:* | When determining the need for coordination, the distance on a given azimuth from an *earth station* sharing the same frequency band with *terrestrial stations*, or from a transmitting *earth station* sharing the same bi-directionally 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) |
| *deep space:* | Space at distances from the Earth equal to, or greater than, $2 \times 10^6$ km. |
| *duplex operation:* | Operating method in which transmission is possible simultaneously in both directions of a *telecommunication* channel[3]. |
| *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:<br>– 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*;<br>– similar information is collected from airborne or Earth-based platforms;<br>– such information may be distributed to *earth stations* within the system concerned;<br>– platform interrogation may be included.<br>This service may also include *feeder links* necessary for its operation. |
| *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:<br>– with one or more *space stations*; or<br>– with one or more *stations* of the same kind by means of one or more *reflecting satellites* or other objects in space. |

[3] In general, *duplex operation* require two frequencies in *radiocommunication*



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| *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*. |
| *effective boresight area* (of a steerable satellite beam): | An area on the surface of the Earth within which the boresight of a *steerable satellite beam* is intended to be pointed. There may be more than one unconnected effective boresight area to which a single *steerable satellite beam* is intended to be pointed. |
| *effective 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. |
| *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. |
| *emergency position-indicating radiobeacon station:* | A *station* in the *mobile service* the *emissions* of which are intended to facilitate search and rescue operations. |
| *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*. |
| *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)*. |
| *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 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. |
| *experimental station:* | A *station* utilizing *radio waves* in experiments with a view to the development of science or technique.<br>This definition does not include *amateur stations.* |
| *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. |
| *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. |
| *fixed service:* | *A radiocommunication service* between specified fixed points. |
| *fixed station:* | A *station* in the *fixed service*. |
| *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*. |
| *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*.<br>The frequency tolerance is expressed in parts in $10^6$ or in hertz. |
| *frequency-shift telegraphy:* | *Telegraphy* by frequency modulation in which the telegraph signal shifts the frequency of the carrier between predetermined values. |
| *full carrier single-sideband emission:* | A *single-sideband emission* without reduction of the carrier. |



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| *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:<br>a) absolute or isotropic gain ($G_i$), when the reference antenna is an isotropic antenna isolated in space;<br>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;<br>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. |
| *geostationary satellite:* | A *geosynchronous satellite* whose circular and direct *orbit* lies in the plane of the Earth's equator and which thus remains fixed relative to the Earth; by extension, a *geosynchronous satellite* which remains approximately fixed relative to the Earth. (WRC-03) |
| *geostationary-satellite orbit:* | The *orbit* of a *geosynchronous satellite* whose circular and direct *orbit* lies in the plane of the Earth's equator. |
| *geosynchronous satellite:* | An earth *satellite* whose period of revolution is equal to the period of rotation of the Earth about its axis. |
| *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). |
| *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. |
| *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) |
| *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. |
| *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*. |
| *instrument landing system (ILS):* | A *radionavigation* system which provides aircraft with horizontal and vertical guidance just before and during landing and, at certain fixed points, indicates the distance to the reference point of landing. |
| *instrument landing system 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. |
| *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. |



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| *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. |
| *inter-satellite service:* | A *radiocommunication service* providing links between artificial *satellites*. |
| *ionospheric scatter:* | The propagation of *radio waves* by scattering as a result of irregularities or discontinuities in the ionization of the ionosphere. |
| *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*. |
| *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. |
| *land mobile service:* | A *mobile service* between *base stations* and *land mobile stations*, or between *land mobile stations*. |
| *land mobile station:* | A *mobile station* in the *land mobile service* capable of surface movement within the geographical limits of a country or continent. |
| *land mobile-satellite service:* | A *mobile-satellite service* in which *mobile earth stations* are located on land. |
| *land station:* | A station in the mobile service not intended to be used while in motion. |
| *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. |
| *maritime mobile service:* | A *mobile service* between *coast stations* and *ship stations*, or between *ship stations*, or between associated *on-board communication stations*; *survival craft stations* and *emergency position-indicating radiobeacon stations* may also participate in this service. |
| *maritime mobile-satellite service:* | A *mobile-satellite service* in which *mobile earth stations* are located on board ships; *survival craft stations* and *emergency position-indicating radiobeacon stations* may also participate in this service. |
| *maritime radionavigation service:* | A *radionavigation service* intended for the benefit and for the safe operation of ships. |
| *maritime radionavigation-satellite service:* | A *radionavigation-satellite service* in which *earth stations* are located on board ships. |
| *marker beacon:* | A transmitter in the *aeronautical radionavigation service* which radiates vertically a distinctive pattern for providing position information to aircraft. |
| *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. |
| *meteorological aids land station:* | A *station* in the *meteorological aids service* not intended to be used while in motion. (WRC-15) |
| *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) |
| *meteorological aids service:* | A *radiocommunication service* used for meteorological, including hydrological, observations and exploration. |
| *meteorological-satellite service:* | An *earth exploration-satellite service* for meteorological purposes. |



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| *mobile earth station:* | An *earth station* in the *mobile-satellite service* intended to be used while in motion or during halts at unspecified points. |
| *mobile service:* | A *radiocommunication service* between *mobile* and *land stations*, or between *mobile stations* (CV). |
| *mobile station:* | A *station* in the *mobile service* intended to be used while in motion or during halts at unspecified points. |
| *mobile-satellite service:* | A *radiocommunication service:*<br>– between *mobile earth stations* and one or more *space stations*, or between *space stations* used by this service; or<br>– between *mobile earth stations* by means of one or more *space stations*.<br>This service may also include *feeder links* necessary for its operation. |
| *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*.<br>A multi-satellite link comprises one up-link, one or more satellite-to-satellite links and one down-link. |
| *necessary bandwidth:* | For a given *class of emission*, the width of the frequency band which is just sufficient to ensure the transmission of information at the rate and with the quality required under specified conditions. |
| *occupied bandwidth:* | The width of a frequency band such that, below the lower and above the upper frequency limits, the *mean powers* emitted are each equal to a specified percentage b/2 of the total *mean power* of a given *emission*.<br>Unless otherwise specified in an ITU-R Recommendation for the appropriate *class of emission*, the value of b/2 should be taken as 0.5%. |
| *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. |
| *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. |
| *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) |
| *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*. |
| *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. |
| *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. |
| *period* (of a satellite): | The time elapsing between two consecutive passages of a *satellite* through a characteristic point on its *orbit*. |
| *permissible interference*[4]*:* | Observed or predicted *interference* which complies with quantitative *interference* and sharing criteria contained in these Regulations or in ITU- |

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



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| | R Recommendations or in special agreements as provided for in these Regulations. |
| *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. |
| *port station:* | A *coast station* in the *port operations service*. |
| *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:<br>– *peak envelope power* (*P*X or *p*X);<br>– *mean power* (*P*Y or *p*Y);<br>– *carrier power* (*P*Z or *p*Z).<br>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. |
| *primary radar:* | A *radiodetermination* system based on the comparison of reference signals with radio signals reflected from the position to be determined. |
| *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. |
| *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). |
| *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. |
| *radar:* | A *radiodetermination* system based on the comparison of reference signals with radio signals reflected, or retransmitted, from the position to be determined. |
| *radiation:* | The outward flow of energy from any source in the form of *radio waves*. |
| *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. |
| *radio astronomy service:* | A service involving the use of *radio astronomy*. |
| *radio astronomy station:* | A *station* in the *radio astronomy service*. |
| *radio astronomy:* | Astronomy based on the reception of *radio waves* of cosmic origin. |
| *radio direction-finding station:* | A *radiodetermination station* using *radio direction-finding*. |
| *radio direction-finding:* | *Radiodetermination* using the reception of *radio waves* for the purpose of determining the direction of a *station* or object. |
| *radio waves* or *hertzian waves:* | Electromagnetic waves of frequencies arbitrarily lower than 3 000 GHz, propagated in space without artificial guide. |
| *radio:* | A general term applied to the use of *radio waves*. |



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| *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. |
| *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*. |
| *radiocommunication:* | *Telecommunication* by means of *radio waves* (CS) (CV). |
| *radiodetermination service:* | A *radiocommunication service* for the purpose of *radiodetermination*. |
| *radiodetermination station:* | A *station* in the *radiodetermination service*. |
| *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*. |
| *radiodetermination-satellite service:* | *A radiocommunication service* for the purpose of *radiodetermination* involving the use of one or more *space stations*.<br>This service may also include *feeder links* necessary for its own operation. |
| *radiolocation land station:* | A *station* in the *radiolocation service* not intended to be used while in motion. |
| *radiolocation mobile station:* | A *station* in the *radiolocation service* intended to be used while in motion or during halts at unspecified points. |
| *radiolocation service:* | A *radiodetermination service* for the purpose of *radiolocation*. |
| *radiolocation:* | *Radiodetermination* used for purposes other than those of *radionavigation*. |
| *radiolocation-satellite service:* | A *radiodetermination-satellite service* used for the purpose of *radiolocation*.<br>This service may also include the *feeder links* necessary for its operation. |
| *radionavigation land station:* | A *station* in the *radionavigation service* not intended to be used while in motion. |
| *radionavigation mobile station:* | A *station* in the *radionavigation service* intended to be used while in motion or during halts at unspecified points. |
| *radionavigation service:* | A *radiodetermination service* for the purpose of *radionavigation*. |
| *radionavigation:* | *Radiodetermination* used for the purposes of navigation, including obstruction warning. |
| *radionavigation-satellite service:* | A *radiodetermination-satellite service* used for the purpose of *radionavigation*. This service may also include *feeder links* necessary for its operation. |
| *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. |
| *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*. |
| *radiotelemetry:* | *Telemetry* by means of *radio waves*. |
| *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*. |
| *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*. |



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| | |
|---|---|
| *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. |
| *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*. |
| *reflecting satellite:* | A *satellite* intended to reflect *radiocommunication* signals. |
| *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. |
| *safety service:* | Any *radiocommunication service* used permanently or temporarily for the safeguarding of human life and property. |
| *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. |
| *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. |
| *satellite network:* | A *satellite system* or a part of a *satellite system*, consisting of only one *satellite* and the cooperating *earth stations*. |
| *satellite system:* | A *space system* using one or more artificial earth *satellites*. |
| *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. |
| *secondary radar:* | A *radiodetermination* system based on the comparison of reference signals with radio signals retransmitted from the position to be determined. |
| *semi-duplex operation:* | A method which is *simplex operation* at one end of the circuit and *duplex operation* at the other[5]. |
| *ship earth station:* | A *mobile earth station* in the *maritime mobile-satellite service* located on board ship. |
| *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. |
| *ship station:* | A *mobile station* in the *maritime mobile service* located on board a vessel which is not permanently moored, other than a *survival craft station*. |
| *ship's emergency transmitter:* | A ship's transmitter to be used exclusively on a distress frequency for distress, urgency or safety purposes. |
| *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. [6] |
| *single-sideband emission:* | An amplitude modulated *emission* with one sideband only. |
| *space operation service:* | A *radiocommunication service* concerned exclusively with the operation of *spacecraft*, in particular *space tracking, space telemetry* and *space telecommand*. |

[5] In general, *semi-duplex operation* require two frequencies in *radiocommunication*;

[6] In general, *simplex operation* may use either one or two frequencies in *radiocommunication*;



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| | |
|---|---|
| | These functions will normally be provided within the service in which the *space station* is operating. |
| *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. |
| *space research service:* | A *radiocommunication service* in which *spacecraft* or other objects in space are used for scientific or technological research purposes. |
| *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. |
| *space system:* | Any group of cooperating *earth stations* and/or *space stations* employing *space radiocommunication* for specific purposes. |
| *space telecommand:* | The use of *radiocommunication* for the transmission of signals to a *space station* to initiate, modify or terminate functions of equipment on an associated space object, including the *space station*. |
| *space 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*. |
| *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. |
| *spacecraft:* | A man-made vehicle which is intended to go beyond the major portion of the Earth's atmosphere. |
| *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*. |
| *spurious domain* (of an emission): | The frequency range beyond the *out-of-band domain* in which *spurious emissions* generally predominate. (WRC-03) |
| *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*. |
| *standard frequency and time signal service:* | A *radiocommunication service* for scientific, technical and other purposes, providing the transmission of specified frequencies, time signals, or both, of stated high precision, intended for general reception. |
| *standard frequency and time signal station:* | A *station* in the *standard frequency and time signal service*. |
| *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. |
| *steerable satellite beam:* | A *satellite* antenna beam that can be re-pointed. |
| *suppressed carrier single-sideband emission:* | A *single-sideband emission* in which the carrier is virtually suppressed and not intended to be used for demodulation. |
| *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. |
| *telecommand:* | The use of *telecommunication* for the transmission of signals to initiate, modify or terminate functions of equipment at a distance. |
| *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). |



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| | |
|---|---|
| *telegram:* | Written matter intended to be transmitted by *telegraphy* for delivery to the addressee. This term also includes *radiotelegrams* unless otherwise specified (CS).<br>In this definition the term *telegraphy* has the same general meaning as defined in the Convention. |
| *telegraphy*[7] | 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). |
| *telemetry:* | The use of *telecommunication* for automatically indicating or recording measurements at a distance from the measuring instrument. |
| *telephony:* | A form of *telecommunication* primarily intended for the exchange of information in the form of speech (CS 1017). |
| *television:* | A form of *telecommunication* for the transmission of transient images of fixed or moving objects. |
| *terrestrial radiocommunication:* | Any *radiocommunication* other than *space radiocommunication* or *radio astronomy.* |
| *terrestrial station:* | A *station* effecting *terrestrial radiocommunication*. In these Regulations, unless otherwise stated, any *station* is a terrestrial station. |
| *tropospheric scatter:* | The propagation of *radio waves* by scattering as a result of irregularities or discontinuities in the physical properties of the troposphere. |
| *unwanted emissions:* | Consist of *spurious emissions* and *out-of-band emissions*. |

[7] 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.



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## 1.2 Acronyms

| | |
|---|---|
| AAA | Astronomy Advantage Area |
| AGAA | Astronomy Geographic Advantage Act, 2007 (Act No. 21 of 2007) |
| ASDE | Airports Surface Detection Equipment |
| ATC/CGC | Auxiliary Terrestrial Component /Complimentary Ground Component |
| BFWA | Broadband Fixed Wireless Access |
| BSS | Broadcast Satellite Service |
| BTX | Base Transmit |
| C-band | Frequency range between about 4 and 6 GHz |
| CT2 | Second generation cordless telephones operating to specification MPT1334. |
| dBW | Decibels relative to one Watt of power. |
| DECT | Digital European Cordless Telecommunication system. ERC Decision ERC/DEC/ (94)03 refers. |
| DF | Duplex Frequency |
| DSC | Digital Selective Calling |
| DSSS | Direct Sequence Spread Spectrum |
| ECA | Electronic Communications Act No 36 of 2005 |
| ENG | Electronic News Gathering |
| ENG/OB | Electronic News Gathering / Outside Broadcasting |
| EPIRB | Emergency Position Indicating Radio Beacon |
| FDDA | Field Disturbance and Doppler Apparatus |
| FM | Frequency Modulation |
| FSS | Fixed Satellite Service |
| FWA | Fixed Wireless Access |



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| | |
|---|---|
| GLONASS | Global Navigation Satellite System |
| GMDSS | Global Maritime Distress and Safety System. |
| GPS | Global Positioning System - a satellite radio navigation system. |
| GSM | Global System for Mobile communications. Originally Groupe Spécial Mobile. See ERC Decision ERC/DEC/ (94)01. |
| GSM-R | GSM Railways |
| GSO | Geostationary Orbit |
| HAP | High Altitude Platform |
| HDFS | High Density Fixed Service |
| HDFSS | High Density Fixed Satellite Service |
| HF | High Frequency (3 to 30 MHz) |
| ICAO | International Civil Aviation Organisation |
| ILS | Instrument Landing System-aeronautical radio navigation system. |
| IMO | International Maritime Organisation |
| IMT | International Mobile Telecommunications |
| ISM | Industrial, Scientific and Medical. The use of radio for non-communication purposes such as microwave heating etc. |
| ITU | International Telecommunication Union. |
| Ku-band | Part of the frequency band between about 12 and 18 GHz |
| LEO | Low Earth Orbit satellite |
| LMDS | Local Multipoint Distribution Services |
| LPVS | Low Power Video Surveillance |
| LTE | Long Term Evolution |
| MF | Medium Frequency (300 to 3000 kHz) |
| MMS | Maritime Mobile Service |



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| | |
|---|---|
| MPT | Mobile Public Trunking |
| MSS | Mobile Satellite Service |
| NGSO | Non-geostationary Satellite Orbit |
| OB | Outside Broadcast. |
| PAMR | Public Access Mobile Radio. |
| PMR | Private Mobile Radio. |
| PPDR | Public Protection and Disaster Relief |
| PSTN | Public Switched Telephone Network |
| RFID | Radio Frequency Identification systems |
| RLAN | Radio Local Area Network |
| RNSS | Radio Navigation Satellite Service |
| RR | Radio Regulation of the International Telecommunication Union |
| RTT | Road Transport Telematics |
| SAB | Services Ancillary to Broadcasting |
| SABRE | South African Band Replanning Exercise |
| SADC | Southern African Development Community |
| SAP | Services Ancillary to Programme-making |
| S-DAB | Satellite Digital Audio Broadcasting |
| SHF | Super High Frequency (3 to 30 GHz) |
| SKA | Square Kilometre Array |
| SNG | Satellite News Gathering |
| SRDs | Short Range Devices, formerly referred to as Low Power Devices (LPDs). |
| T-DAB | Terrestrial Digital Audio Broadcasting. |
| TDD | Time Division Duplex |



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| | |
|---|---|
| UHF | Ultra-High Frequency (300 to 3000 MHz) |
| UAV | Unmanned Aerial Vehicle |
| VHF | Very High Frequency (30 to 300 MHz) |
| VLF | Very Low Frequency (3 to 30 kHz) |
| VOR | Very high frequency Omnidirectional Range (aeronautical radionavigation system). |
| VSAT | Very Small Aperture Terminal |
| WAS | Wireless Access Services |
| WARC | World Administrative Radio Conference. The last WARC was held in 1992. WARCs are now superseded by WRCs. |
| WLAN | Wireless Local Area Network |
| WRC | World Radiocommunication Conference. |



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# 2 PREAMBLE

## 2.1 Legislative Framework

Section 30 (1) of the Electronic Communications Act, 2005 (Act No. 36 of 2005), herein after refered to as the "Act", provides that "*In carrying out its functions under this Act and the related legislation, the Authority controls,plans, administers and manages the use and licensing of the radio frequency spectrum …*"

This National Radio Frequency Plan 2021 (NRFP-21) has been prepared in alignment to section 34 of the Act, read with section 231 (2) of the Constitution of the Republic of South Africa, 1996.

The NRFP-21 allocates the Radio Frequency Spectrum to Radio Services in the Frequency Bands between 8.3 kHz and 3000 GHz. All frequency assignments must be in accordance with the national radio frequency plan.

This NRFP-21 incorporates the decisions taken by 2019 World Radiocommunication Conferences (WRC-19). The revision reflects the 2020 version of the ITU Radio Regulations edition, including the frequency allocations relevant to Region 1 and its associated footnotes. It also includes updates on the Table of Frequency Allocations extending up to 3000 GHz and South African National Footnotes.

A document containing relevant ITU – R Resolutions and Recommendations referred in this document can be found on the Authority's website.

The pattern of radio use is not static as it is continuously evolving to reflect the changes that are taking place in the radio environment, particularly in the field of technology. Spectrum allocations must reflect these changes and the position set out in this plan is therefore subject to regular reviews.

In view of the above, it is the intention of the Authority to update the NRFP when necessary, in order to keep the plan current with due regard given to the current and future usage of the radio frequency spectrum.

**The following updates and amendments amongst others have been implemented in NRFP -21:**

- National footnotes have been revised.
- The resolutions and decisions taken by World Radiocommunication Conferences preceding WRC-19.
- The resolutions and decisions taken by the WRC-19, as ratified by South Africa (Republic of), have been reflected.
- Incorporated references to the SADC Frequency Allocation Plan (FAP) and SADC Harmonised Guidelines
- Incorporated the published RFSAP's where applicable.

## 2.2 ITU-R Radio Regions

For the purposes of allocating frequencies, the ITU has divided the world into three Regions as shown on the following map:



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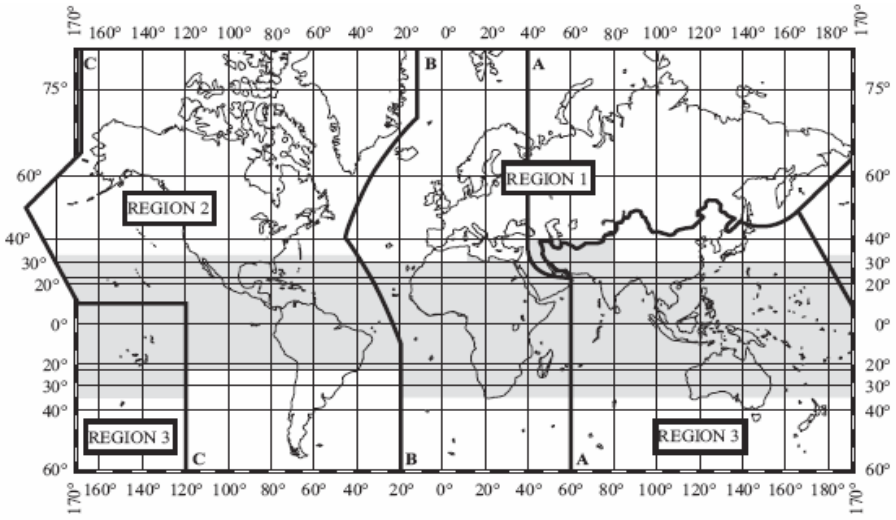


Region 1: Region 1 includes the area limited on the east by line A (lines A, B and C are defined below) and on the west by line B, excluding any of the territory of the Islamic Republic of Iran which lies between these limits. It also includes the whole of the territory of Armenia, Azerbaijan, the Russian 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.

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

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.

The Republic of South Africa falls under ITU Region 1 and thus aligns its frequency allocations with those specified for ITU Region 1 in the ITU Radio Regulations as required by the Act.

### 2.3 Structure of the Table of Frequency Allocations

The Table of Frequency Allocations (section 4) lists all the allocations in the radio-frequency spectrum in the Republic of South Africa. The structure of the Table, which is outlined below, is similar to that of the International Table of Frequency Allocations as it appears in Article **5** of the ITU Radio Regulations.

The Table of Frequency Allocations covers the frequency range 8.3 kilohertz (kHz) to 3 000 Gigahertz (GHz). The table of frequency allocations list for each frequency range the radiocommunication services that are permitted and which ones are currently in use in South Africa. Information is also given on possible future uses or changes in use of particular frequency bands.

#### 2.3.1 Column 1 - ITU Region 1 Allocations and footnotes

This column shows the type of radiocommunications service allocated to the frequency band by ITU. These allocations are defined in the ITU Radio Regulations. Entries in UPPER CASE denote primary services while entries in lower case denote secondary services as defined in the ITU Radio Regulations. Footnotes (e.g., **5.149**) are the footnotes to the Table of Frequency Allocations as detailed in Article **5** of the Radio Regulations.



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Values in this column denote the radio-frequency band. Magnitude of frequency units used in the column header are: kHz indicates kilohertz, MHz indicates Megahertz and GHz indicates Gigahertz.
Secondary services are on a non-interference and non-protection basis (NINP) to the primary services[8].
Spectrum assigned on a secondary basis means that the secondary station:

(i) cannot 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;
(ii) 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, however;
(iii) can claim protection from interference from stations of the secondary service(s) to which frequencies may be assigned at a later date.

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

The order of listing does not indicate relative priority within each category.
The footnote references are those that appear in Article 5 of the ITU Radio Regulations and are applicable to region 1.

- The footnote references which appear in the bottom of the table reflect the allocated service or services which apply to more than one of the allocated services, or to the whole of the allocation concerned.
- The footnote references which appear to the right of the name of a service are applicable only to that particular service.

### 2.3.2 Column 2 – South African allocations and footnotes

This column indicates the allocations of radiocommunication service(s) specified for South Africa, based on Article **5** of the ITU Radio Regulations. Names of services are based on the definitions in the ITU Radio Regulations and footnotes relevant to South Africa are included. The allocations highlighted with UPPER-CASE letters correspond to primary status allocations; the allocations with secondary status are written in lower-case.

Values in this column denote the radio-frequency band. The magnitude of the frequency units used in the column header are: kilohertz(kHz), Megahertz(MHz) and GHz indicates Gigahertz.
Whilst the South African allocations are broadly aligned with the ITU Region 1 requirements, a number of variations exist. In accordance with Radio Regulations No. **4.4**, such variations are subject to the condition that the associated radio installations do not cause harmful interference to the radio services or communications of other ITU Member States that operate in accordance with the provisions of the Radio Regulations, and that the possibility of harmful interference from such services and communications is accepted.

The column further makes reference to national footnotes (e.g., NF xx) that are indicated as 'NF' and appear in the table of allocation on the same basis as the ITU footnotes.

### 2.3.3 Column 3 – Typical Applications

This column indicates the current national usage of the frequency band in South Africa and contains allowed applications. Contains the main service, systems and application(s) of this frequency band or a part of it, authorized in South Africa. If the use covers more than one frequency band or concerns only one part of the band, the frequency range is generally indicated.

[8] Article **4.4** of the Radio Regulations: Administrations of the Member States shall not assign to a station any frequency in derogation of either the Table of Frequency Allocations in this Chapter or the other provisions of these Regulations, except on the express condition that such a station, when using such a frequency assignment, shall not cause harmful interference to, and shall not claim protection from harmful interference caused by, a station operating in accordance with the provisions of the Constitution, the Convention and these Regulations.



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### 2.3.4 Column 4 – Notes and comments

This column gives relevant document references as well as other additional information applicable to the frequency band. This column contains information about reference documents and relevant standards as well as other guidelines applicable to the frequency band, e.g., Government Gazette Notices pertinent to specific frequency bands, future requirements in specific bands, and ITU-R Recommendations or Resolutions which require implementation.

### 2.3.5 ITU-R Region 1 and National Footnotes

South African National Footnotes and ITU-R footnotes applicable to Region 1 are contained in sections 5 and 6 respectively.

### 2.3.6 List of frequency bands used for Maritime services

The List of frequency bands used for Maritime services is contained in section 8.

### 2.3.7 Frequency and wavelength bands

The radio spectrum shall be subdivided into nine frequency bands, which shall be designated by progressive whole numbers in accordance with the following table. As the unit of frequency is the hertz (Hz), frequencies shall be expressed:

– in kilohertz (kHz), up to and including 3 000 kHz;

– in megahertz (MHz), above 3 MHz, up to and including 3 000 MHz;

– in gigahertz (GHz), above 3 GHz, up to and including 3 000 GHz.

However, where adherence to these provisions would introduce serious difficulties, for example in connection with the notification and registration of frequencies, the lists of frequencies and related matters, reasonable departures may be made. (WRC-15).



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**Table 1: Frequency and wavelength bands**

| Band number | Symbols | Frequency Range (lower limit exclusive, upper limit inclusive) | Corresponding metric Subdivision= |
|---|---|---|---|
| 4 | VLF | 3 to 30 kHz | Myriametric waves |
| 5 | LF | 30 to300 kHz | Kilometric waves |
| 6 | MF | 300 to 3 000kHz | Hectometric waves |
| 7 | HF | 3 to 30 MHz | Decametric waves |
| 8 | VHF | 30 to300 MHz | Metric waves |
| 9 | UHF | 300 to 3000 MHz | Decimetric waves |
| 10 | SHF | 3 to 30 GHz | Centimetric waves |
| 11 | EHF | 30 to300 GHz | Millimetric waves |
| 12 | | 300 to 3000 GHz | Decimillimetric waves |

NOTE 1: "Band N" (N = band number) extends from $0.3 \times 10^N$ Hz to $3 \times 10^N$ Hz.
NOTE 2: Prefix: k = kilo ($10^3$), M = mega ($10^6$), G = giga ($10^9$).

**Table 2: Standard Frequency Band Nomenclature**

Table 2 below illustrates the standard letter-band designations.

| Band | Frequency Range (GHz) | Wavelength in Free Space (centimeters) |
|---|---|---|
| L band | 1 to 2 | 30.0 to 15.0 |
| S band | 2 to 4 | 15 to 7.5 |
| C band | 4 to 8 | 7.5 to 3.8 |
| X band | 8 to 12 | 3.8 to 2.5 |
| Ku band | 12 to 18 | 2.5 to 1.7 |
| K band | 18 to 27 | 1.7 to 1.1 |
| Ka band | 27 to 40 | 1.1 to 0.75 |
| V band | 40 to 75 | 0.75 to 0.40 |
| W band | 75 to 110 | 0.40 to 0.27 |
| Millimetre band | 110 to 300 | 0.27 to 0.10 |



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# 3 CONTACT DETAILS

Further information on the South African Table of Frequency Allocations and its interpretation can be obtained by contacting:

Independent Communications Authority of South Africa
350 Witch-Hazel Ave.
Eco-Park Estate
Centurion
0144
Phone: +27 12 568 3000
URL: http://www.icasa.org.za
E-mail: info@icasa.org.za



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# 4 TABLE OF FREQUENCY ALLOCATIONS

| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| **Below 8.3 kHz**<br><br>(Not allocated)<br>5.53 5.54 | **Below 8.3 kHz**<br><br>(Not allocated)<br>5.53 5.54 | | Frequency bands below 8.3 kHz are not allocated in South Africa |
| **8.3-9 kHz**<br><br>METEOROLOGICAL AIDS<br>5.54A 5.54B 5.54C | **8.3-9 kHz**<br><br>METEOROLOGICAL AIDS<br>5.54A | Thunderstorm detection stations | |
| **9-11.3 kHz**<br><br>METEOROLOGICAL AIDS<br>5.54A<br>RADIONAVIGATION | **9-11.3 kHz**<br><br>METEOROLOGICAL AIDS<br>5.54A<br>RADIONAVIGATION | Thunderstorm detection stations<br><br>Navigational Aids<br><br>Inductive Loop Systems (9 – 135 kHz) | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). |
| **11.3-14 kHz**<br><br>RADIONAVIGATION | **11.3-14 kHz**<br><br>RADIONAVIGATION | Navigational Aids<br><br>Inductive Loop Systems (9 – 135 kHz)<br><br>SRDs – inductive short-range radiocommunications (9 – 135 kHz) | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015).<br><br>SRDs - see ITU-R Rec.SM. 1896-1[9] latest version. |

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| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| **14-19.95 kHz**<br><br>FIXED<br>MARITIME MOBILE 5.57<br><br>5.55 5.56 | **14-19.95 kHz**<br><br>FIXED<br>MARITIME MOBILE 5.57<br>STANDARD FREQUENCY AND TIME SIGNAL<br><br>5.56 | Maritime mobile communications<br><br>Inductive Loop Systems (9 – 135 kHz)<br><br>SRDs – inductive short-range radiocommunications (9 – 135 kHz) | Radio Frequency Spectrum Régulations as amended (Annex B) (GG. No. 38641, 30 March 2015).<br><br>SRDs - see ITU-R Rec.SM. 2153-7 latest version. |
| **19.95-20.05 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL (20 kHz) | **19.95-20.05 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL (20 kHz) | Inductive Loop Systems (9 – 135 kHz)<br><br>SRDs – inductive short-range radiocommunications (9 – 135 kHz) | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015)<br>SRDs - see ITU-R Rec.SM. 1896-1 latest version. |
| **20.05-70 kHz**<br><br>FIXED<br>MARITIME MOBILE 5.57 | **20.05-70 kHz**<br><br>FIXED<br>MARITIME MOBILE 5.57<br>STANDARD FREQUENCY AND TIME SIGNAL | Maritime mobile communications<br><br>Inductive Loop Systems (9 – 135 kHz) RFID (59.75 – 60.25 kHz) | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No., 38641 March 2015) |

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| 5.56 5.58 | 5.56 | SRDs – inductive short-range radiocommunications (9 –135 kHz) | SRDs - see ITU-R Rec.SM. 1896-1 latest version. |
| **70-72 kHz**<br><br>RADIONAVIGATION 5.60 | **70-72 kHz**<br><br>RADIONAVIGATION 5.60 | Navigational Aids<br>Inductive Loop Systems (9 – 135 kHz) RFID (70 – 135 kHz)<br>SRDs – inductive short-range radiocommunications (9 – 135 kHz) | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 386410 March 2015)<br>SRDs - see ITU-R Rec.SM. 1896-1 latest version. |
| **72-84 kHz**<br><br>FIXED<br>MARITIME MOBILE 5.57<br>RADIONAVIGATION 5.60<br><br>5.56 | **72-84 kHz**<br><br>FIXED<br>MARITIME MOBILE 5.57<br>RADIONAVIGATION 5.60<br>STANDARD FREQUENCY AND TIME SIGNAL<br><br>5.56 | Maritime mobile communications<br>Navigational Aids<br><br>Inductive Loop Systems (9 – 135 kHz) RFID (70 – 135 kHz)<br><br>SRDs – inductive short-range radiocommunications (9 – 135 kHz) | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015).<br><br>SRDs - see ITU-R Rec.SM. 1896-1 latest version. |



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| **84-86 kHz**<br><br>RADIONAVIGATION 5.60 | **84-86 kHz**<br><br>RADIONAVIGATION 5.60 | Navigational Aids<br><br>Inductive Loop Systems (9 – 135 kHz) RFID (70 – 135 kHz)<br><br>SRDs – inductive short-range radiocommunications (9 – 135 kHz) | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). SRDs - see ITU-R Rec.SM. 1896-1 latest version. |
| **86-90 kHz**<br><br>FIXED<br>MARITIME MOBILE 5.57<br>RADIONAVIGATION<br><br>5.56 | **86-90 kHz**<br><br>FIXED<br>MARITIME MOBILE 5.57<br>RADIONAVIGATION<br>STANDARD FREQUENCY AND TIME SIGNAL<br><br>5.56 | Maritime mobile communications<br>Navigational Aids<br><br>Inductive Loop Systems (9 – 135 kHz) RFID (70 – 135 kHz)<br><br>SRDs – inductive short-range radiocommunications (9 – 135 kHz) | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015)<br><br>SRDs - see ITU-R Rec.SM. 1896-1 latest version. |
| **90-110 kHz**<br><br>RADIONAVIGATION 5.62<br>Fixed | **90-110 kHz**<br><br>RADIONAVIGATION 5.62<br>Fixed | Navigational Aids | Radio Frequency Spectrum Regulations (Annex B) (GG. No. 38641, 30 March 2015). |

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| 5.64 | 5.64 | Inductive Loop Systems (9 – 135 kHz) RFID (70 – 135 kHz)<br><br>SRDs – inductive short-range radiocommunications (9 – 135 kHz) | SRDs - see ITU-R Rec.SM. 1896-1 latest version. |
| **110-112 kHz**<br><br>FIXED<br>MARITIME MOBILE<br>RADIONAVIGATION<br><br>5.64 | **110-112 kHz**<br><br>FIXED<br>MARITIME MOBILE<br>RADIONAVIGATION<br><br>5.64 | Maritime mobile communications<br>Navigational Aids<br><br>Inductive Loop Systems (9 – 135 kHz) RFID (70 – 135 kHz)<br>SRDs – inductive short-range radiocommunications (9 – 135 kHz) | Radio Frequency Spectrum Regulations (Annex B) (GG. No. 38641, 30 March 2015).<br><br>SRDs - see ITU-R Rec.SM. 1896-1 latest version. |
| **112-115 kHz**<br><br>RADIONAVIGATION 5.60 | **112-115 kHz**<br><br>RADIONAVIGATION 5.60 | Navigational Aids<br><br>Inductive Loop Systems (9 – 135 kHz) RFID (70 – 135 kHz)<br><br>SRDs – inductive short-range radiocommunications (9 – 135 kHz) | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).<br><br>SRDs - see ITU-R Rec.SM. 1896-1 latest version. |
| **115-117.6 kHz**<br><br>RADIONAVIGATION 5.60 | **115-117.6 kHz**<br><br>RADIONAVIGATION 5.60 | Navigational Aids | |

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| Fixed<br>Maritime mobile<br><br><br><br><br><br>5.64 5.66 | Fixed<br>Maritime mobile<br><br><br><br><br><br>5.64 | Maritime mobile communications<br><br>Inductive Loop Systems (9 – 135 kHz) RFID (70 – 135 kHz)<br><br>SRDs – inductive short-range radiocommunications (9 – 135 kHz) | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).)<br><br><br><br><br>SRDs - see ITU-R Rec.SM. 1896-1 latest version. |
| **117.6-126 kHz**<br><br>FIXED<br>MARITIME MOBILE<br>RADIONAVIGATION 5.60<br><br><br><br><br><br>5.64 | **117.6-126 kHz**<br><br>FIXED<br>MARITIME MOBILE<br>RADIONAVIGATION 5.60<br><br><br><br><br><br>5.64 | Maritime mobile communications<br>Navigational Aids<br><br>Inductive Loop Systems (9 – 135 kHz) RFID (70 – 135 kHz)<br><br>SRDs – inductive short-range radiocommunications (9 – 135 kHz) | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).<br><br><br><br><br>SRDs - see ITU-R Rec.SM. 1896-1 latest version. |
| **126-129 kHz**<br><br>RADIONAVIGATION 5.60 | **126-129 kHz**<br><br>RADIONAVIGATION 5.60 | Navigational Aids<br><br>Inductive Loop Systems (9 – 135 kHz) RFID (70 – 135 kHz) | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |

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| | | SRDs – inductive short-range radiocommunications (9 – 135 kHz) | SRDs - see ITU-R Rec.SM. 1896-1 latest version. |
| **129-130 kHz**<br><br>FIXED<br>MARITIME MOBILE<br>RADIONAVIGATION 5.60<br><br>5.64 | **129-130 kHz**<br><br>FIXED<br>MARITIME MOBILE<br>RADIONAVIGATION 5.60<br><br>5.64 | Maritime mobile communications<br>Navigational Aids<br><br>Inductive Loop Systems (9 – 135 kHz) RFID (70 – 135 kHz)<br><br>SRDs – inductive short-range radiocommunications (9 – 135 kHz) | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).<br><br>SRDs - see ITU-R Rec.SM. 1896-1 latest version. |
| **130-135.7 kHz**<br><br>FIXED<br>MARITIME MOBILE<br><br>5.64 5.67 | **130-135.7 kHz**<br><br>FIXED<br>MARITIME MOBILE<br><br>5.64 | Maritime mobile communications<br><br>Inductive Loop Systems (9 – 135 kHz) RFID (70 – 135 kHz)<br><br>SRDs – inductive short-range radiocommunications (9 – 135 kHz) | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).<br><br>SRDs - see ITU-R Rec.SM. 1896-1 latest version. |
| **135.7-137.8 kHz**<br><br>FIXED | **135.7-137.8 kHz**<br><br>FIXED | | |

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| MARITIME MOBILE<br>Amateur 5.67A<br><br>5.64 5.67 5.67B | MARITIME MOBILE<br>Amateur 5.67A<br><br>5.64 | Maritime mobile communications<br>Amateur | Amateur (135.7-137.8 kHz) services are limited to maximum radiated power of 1 W (e.i.r.p).<br><br>Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |
| **137.8-148.5 kHz**<br><br>FIXED<br>MARITIME MOBILE<br><br>5.64 5.67 | **137.8-148.5 kHz**<br><br>FIXED<br>MARITIME MOBILE<br><br>5.64 | Maritime mobile communications | |
| **148.5-255 kHz**<br><br>BROADCASTING<br><br><br><br><br><br><br><br>5.68 5.69 5.70 | **148.5-160 kHz**<br><br>BROADCASTING | Broadcasting | Frequency Assignment Plan (GE75) applies. |
| | **160-200 kHz**<br>FIXED<br>5.68 | | |
| | **200-255 kHz**<br><br>AERONAUTICAL RADIONAVIGATION<br>5.70 | Navigational Aids | |

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| **255-283.5 kHz**<br><br>BROADCASTING<br>AERONAUTICAL<br>RADIONAVIGATION<br><br>5.70 | **255-283.5 kHz**<br><br>AERONAUTICAL<br>RADIONAVIGATION<br><br>5.70 | Navigational Aids | |
| **283.5-315 kHz**<br><br>AERONAUTICAL<br>RADIONAVIGATION<br>MARITIME<br>RADIONAVIGATION<br>(radiobeacons) 5.73 | **283.5- 285.3 kHz**<br><br>AERONAUTICAL<br>RADIONAVIGATION<br>MARITIME<br>RADIONAVIGATION<br>(radiobeacons) 5.73<br>MARITIME)<br>RADIONAVIGATION<br><br>5.74 | Navigational Aids<br><br>Supplementary navigational information using narrow-band | |
| | **285.3-285.7 kHz**<br><br>AERONAUTICAL<br>RADIONAVIGATION<br>MARITIME<br>RADIONAVIGATION<br>(radiobeacons) 5.73<br><br>5.74 | Navigational Aids<br><br>Supplementary navigational information using narrow-band | |
| | **285.7-315 kHz**<br><br>AERONAUTICAL<br>RADIONAVIGATION | Navigational Aids | |

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| 5.74 | MARITIME RADIONAVIGATION (radiobeacons) 5.73<br><br>5.74 | Supplementary navigational information using narrow-band | |
| **315-325 kHz**<br><br>AERONAUTICAL RADIONAVIGATION<br>Maritime radionavigation (radiobeacons) 5.73<br><br>5.75 | **315-325 kHz**<br><br>AERONAUTICAL RADIONAVIGATION<br>Maritime radionavigation (radiobeacons) 5.73 | Navigational Aids<br><br>Coast Radio Telegraph Stations Radionavigation | |
| **325-405 kHz**<br><br>AERONAUTICAL RADIONAVIGATION | **325-405 kHz**<br><br>AERONAUTICAL RADIONAVIGATION | Navigational Aids | |
| **405-415 kHz**<br><br>RADIONAVIGATION 5.76 | **405-415 kHz**<br><br>RADIONAVIGATION 5.76 | Navigational Aids | |
| **415-435 kHz**<br><br>MARITIME MOBILE 5.79<br><br>AERONAUTICAL RADIONAVIGATION | **415-435 kHz**<br><br>MARITIME MOBILE 5.79<br><br>AERONAUTICAL RADIONAVIGATION | Maritime mobile communications<br><br>Under the MMS the use of the band 415-495 kHz is limited to radiotelegraphy | NAVDAT System (TX for coast stations only) |
| **435-472 kHz** | **435-472 kHz** | | |

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| **MARITIME MOBILE** 5.79<br><br>Aeronautical radionavigation 5.77<br><br>5.82 | **MARITIME MOBILE** 5.79<br><br>Aeronautical radionavigation<br><br>5.82 | Maritime mobile communications Coast Stations in the NAVTEX service on 490 kHz; Res.339 applies.<br>Transmission of navigational and meteorological warnings and urgent info for ships (NBDP telegraphy). | NAVDAT System (TX for coast stations only)<br><br>Article 31 and Article 52 apply. |
| **472-479 kHz**<br><br>MARITIME MOBILE 5.79<br><br>Amateur 5.80A<br>Aeronautical radionavigation 5.77 5.80<br><br>5.80B 5.82 | **472-479 kHz**<br><br>MARITIME MOBILE 5.79<br><br>Amateur 5.80A Aeronautical radionavigation<br><br>5.82 | Navigational Aids | NAVDAT System (TX for coast stations only) |
| **479-495 kHz**<br><br>**MARITIME MOBILE** 5.79 5.79A<br><br>Aeronautical radionavigation 5.77<br><br>5.82 | **479-495 kHz**<br><br>**MARITIME MOBILE** 5.79 5.79A<br><br>Aeronautical radionavigation<br><br>5.82 | NAVTEX service on 490 kHz | NAVDAT System (TX for coast stations only)<br>Article 31 and Article 52 apply |
| **495-505 kHz**<br><br>MARITIME MOBILE 5.82C | **495-505 kHz**<br><br>MARITIME MOBILE 5.82C | Limited to radiotelegraphy; | NAVDAT System (TX for coast stations only)<br>Article 31 and Article 52 apply. |

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| **505-526.5 kHz**<br><br>MARITIME MOBILE 5.79 5.79A 5.84<br>AERONAUTICAL RADIONAVIGATION | **505-526.5 kHz**<br><br>MARITIME MOBILE 5.79 5.79A 5.84<br>AERONAUTICAL RADIONAVIGATION | Maritime mobile communications<br>Maritime Radio Telegraphy<br>NAVTEX service on 518 kHz<br>Coast Stations in the NAVTEX service on 518 kHz;<br>Navigational Aids | NAVDAT System (TX for coast stations only)<br>Articles 31 and 52 apply.<br>Resolution 339 Rev.WRC-07) applies.<br>The use of the band 505-526.5 kHz in the MMS is limited to radiotelegraphy. |
| **526.5-1 606.5 kHz**<br><br>BROADCASTING<br><br>5.87 5.87A | **526.5-1 606.5 kHz**<br><br>BROADCASTING | Medium Wave Sound Broadcasting (535.5 -1606.5 kHz)<br>Inductive Loop Systems (740 – 8800 kHz)<br><br>Digital Sound Broadcasting (DSB) services | The Terrestrial Broadcasting Frequency Plan as amended (GG No. 36321) 02 April 2013<br>Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).<br>Digital Sound Broadcasting (DSB) Regulations was published in GG44469 Notice 215 of 2021. |
| **1 606.5-1 625 kHz**<br><br>FIXED<br>MARITIME MOBILE 5.90<br>LAND MOBILE<br><br>5.92 | **1 606.5-1 625 kHz**<br><br>FIXED<br>MARITIME MOBILE 5.90<br>LAND MOBILE<br>RADIODETERMINATION<br><br>5.92 | Maritime mobile communications<br>Land mobile communications | |

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| **1 625-1 635 kHz**<br><br>RADIOLOCATION<br><br>5.93 | **1 625-1 635 kHz**<br><br>RADIOLOCATION | Navigational Aids | |
| **1 635-1 800 kHz**<br><br>FIXED<br>MARITIME MOBILE 5.90<br>LAND MOBILE<br><br>5.92 5.96 | **1 635-1 800 kHz**<br><br>FIXED<br>MARITIME MOBILE 5.90<br>LAND MOBILE<br>RADIODETERMINATION<br><br>5.92 | Maritime mobile communications<br>Land mobile communications | |
| **1 800-1 810 kHz**<br><br>RADIOLOCATION<br><br>5.93 | **1 800-1 810 kHz**<br><br>RADIOLOCATION | Navigational Aids | |
| **1 810-1 850 kHz**<br><br>AMATEUR<br><br>5.98 5.99 5.100 | **1 810-1 850 kHz**<br><br>AMATEUR | Amateur communications | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |
| **1 850-2 000 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile | **1 850-2 000 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile | Maritime mobile applications.<br>Maritime mobile communications | 1850-1950 kHz is used for Maritime Coast Stations; 1950-2045 kHz is |

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| 5.92 5.96 5.103 | RADIODETERMINATION<br>5.92 5.103 | Land mobile communications<br>Amateur communications | used by ship stations SSB Radio Telephony.<br>Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |
| **2 000-2 025 kHz**<br>FIXED<br>MOBILE except aeronautical mobile (R)<br>5.92 5.103 | **2 000-2 025 kHz**<br>FIXED<br>MOBILE except aeronautical mobile (R)<br>RADIODETERMINATION<br>5.92 5.103 | Maritime mobile communications<br>Land mobile communications | 1950-2045 kHz is used by ship stations SSB Radio Telephony |
| **2 025-2 045 kHz**<br>FIXED<br>MOBILE except aeronautical mobile (R)<br>Meteorological aids 5.104<br>5.92 5.103 | **2 025-2 045 kHz**<br>FIXED<br>MOBILE except aeronautical mobile (R)<br>Meteorological aids 5.104<br>RADIODETERMINATION<br>5.92 5.103 | Maritime mobile communications<br>Limited to Oceanographic buoy stations | 1950-2045 kHz is used by ship stations SSB Radio Telephony |
| **2 045-2 160 kHz**<br>FIXED<br>MARITIME MOBILE<br>LAND MOBILE<br>5.92 | **2 045-2 160 kHz**<br>FIXED<br>MARITIME MOBILE<br>LAND MOBILE<br>RADIODETERMINATION<br>5.92 | Maritime mobile communications<br>Land mobile communications | |

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| **2 160-2 170 kHz**<br><br>RADIOLOCATION<br><br>5.93 5.107 | **2 160-2 170 kHz**<br><br>RADIOLOCATION | Navigational Aids | |
| **2 170-2 173.5 kHz**<br><br>MARITIME MOBILE | **2 170-2 173.5 kHz**<br><br>MARITIME MOBILE | Maritime mobile communications | |
| **2 173.5-2 190.5 kHz**<br><br>MOBILE (distress and calling)<br><br>5.108 5.109 5.110 5.111 | **2 173.5-2 190.5 kHz**<br><br>MOBILE (distress and calling)<br><br>5.108 5.109 5.110 5.111 | Distress & Watch keeping (2182 kHz)<br>2 182 kHz is an international distress and calling frequency for radiotelephony.<br>2 187.5 kHz – DSC for distress and calling;<br>2 174.5 kHz – international distress frequency for NBDP telegraphy. | Article 31 and Article 52 applies |
| **2 190.5-2 194 kHz**<br><br>MARITIME MOBILE | **2 190.5-2 194 kHz**<br><br>MARITIME MOBILE | Maritime mobile communications | |
| **2 194-2 300 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R) | **2 194-2 300 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R) | Maritime mobile communications<br>Land mobile communications | |

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| 5.92 5.103 | RADIODETERMINATION<br><br>5.92 5.103 | | |
| **2 300-2 498 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R)<br>BROADCASTING 5.113<br><br>5.103 | **2 300-2 498 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R)<br>BROADCASTING 5.113<br><br>5.103 | Land Mobile and Maritime applications<br>Sound Broadcasting | Terrestrial Broadcasting Frequency Plan 2013 |
| **2 498-2 501 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL (2 500 kHz) | **2 498-2 501 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL (2 500 kHz) | | |
| **2 501-2 502 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL<br>Space Research | **2 501-2 502 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL<br>Space Research | | |
| **2 502-2 625 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R) | **2 502-2 625 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R)<br>RADIODETERMINATION | Land Mobile and Maritime applications | |

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| 5.92 5.103 | 5.92 5.103 | | |
| **2 625-2 650 kHz**<br><br>MARITIME MOBILE<br>MARITIME<br>RADIONAVIGATION<br><br>5.92 | **2 625-2 650 kHz**<br><br>MARITIME MOBILE<br>MARITIME<br>RADIONAVIGATION<br>RADIODETERMINATION<br><br>5.92 | Sonobuoys<br>Maritime mobile communications | |
| **2 650-2 850 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R)<br><br>5.92 5.103 | **2 650-2 850 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R)<br>RADIODETERMINATION<br><br>5.92 5.103 | Fixed Services links<br>Maritime mobile communications<br>Land mobile communications | |
| **2 850-3 025 kHz**<br><br>AERONAUTICAL MOBILE (R)<br><br>5.111 5.115 | **2 850-3 025 kHz**<br><br>AERONAUTICAL MOBILE (R)<br><br>5.111 5.115 | Aeronautical mobile (R)<br>3 023 kHz may be used under the MMS for search and rescue operations | Appendix 27 Allotment Plan applies<br>Article 31 applies |
| **3 025-3 155 kHz**<br><br>AERONAUTICAL MOBILE (OR) | **3 025-3 155 kHz**<br><br>AERONAUTICAL MOBILE (OR) | Aeronautical mobile (OR) | Appendix 26 Allotment Plan applies |



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| **3 155-3 200 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R)<br><br>5.116 5.117 | **3 155-3 200 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R)<br><br>5.116 | Maritime mobile communications<br>Land mobile communications<br>SRD[10]<br>Low power wireless hearing aids | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).<br>Worldwide channel for low power hearing aids (3155 to 3195 kHz).<br>Additional channels may be assigned in the band 3155 – 3400 kHz. |
| **3 200-3 230 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R)<br>BROADCASTING 5.113<br><br>5.116 | **3 200-3 230 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R)<br>BROADCASTING 5.113<br><br>5.116 | Maritime mobile communications<br>Land mobile communications<br>HF Sound Broadcasting<br>Low power wireless hearing aids | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).<br>The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013<br>Worldwide channel for low power hearing aids (3155 to 3195 kHz).<br>Additional channels may be assigned in the band 3155 – 3400 kHz. |

[10] http://www.crasa.org/common_up/crasa-setup/06-07-2015_SADC%20FREQUENCIES%20FOR%20SHORT%20RANGE%20DEVICE%20(SRDs)%20CRASA%20%202011%20-ANNEXURE%20B%20AND%20C.pdf

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| **3 230-3 400 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile<br>BROADCASTING 5.113<br><br><br><br><br><br><br><br>5.116 | **3 230-3 400 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile<br>BROADCASTING 5.113<br><br><br><br><br><br><br><br>5.116 | <br><br><br><br>HF Sound Broadcasting<br><br><br><br>Low power wireless hearing aids | <br><br><br><br>The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013<br><br><br>Worldwide channel for low power hearing aids (3155 to 3195 kHz). Additional channels may be assigned in the band 3155 – 3400 kHz. |
| **3 400-3 500 kHz**<br><br>AERONAUTICAL MOBILE (R) | **3 400-3 500 kHz**<br><br>AERONAUTICAL MOBILE (R) | <br><br>Aeronautical mobile (R) | <br><br>Appendix 27 Allotment Plan applies |
| **3 500-3 800 kHz**<br><br>AMATEUR<br>FIXED<br>MOBILE except aeronautical mobile<br><br><br><br>5.92 | **3 500-3 800 kHz**<br><br>AMATEUR<br>FIXED<br>MOBILE except aeronautical mobile<br>RADIODETERMINATION<br><br><br><br>5.92 | <br><br>Amateur communications<br><br>Maritime communications<br>Land mobile communications | <br><br>Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |

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| **3 800-3 900 kHz**<br><br>FIXED<br>AERONAUTICAL MOBILE (OR)<br>LAND MOBILE | **3 800-3 900 kHz**<br><br>FIXED<br>AERONAUTICAL MOBILE (OR)<br>LAND MOBILE | Aeronautical mobile (OR) | Appendix 26 Allotment Plan applies |
| **3 900-3 950 kHz**<br><br>AERONAUTICAL MOBILE (OR)<br><br>5.123 | **3 900-3 950 kHz**<br><br>AERONAUTICAL MOBILE (OR)<br>BROADCASTING 5.123 | Aeronautical mobile (OR) | Appendix 26 Allotment Plan applies |
| **3 950-4 000 kHz**<br><br>FIXED<br>BROADCASTING | **3 950-4 000 kHz**<br><br>FIXED<br>BROADCASTING | HF Sound Broadcasting | The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013 |
| **4 000-4 063 kHz**<br><br>FIXED<br>MARITIME MOBILE 5.127<br><br>5.126 | **4 000-4 063 kHz**<br><br>FIXED<br>MARITIME MOBILE 5.127 | Maritime mobile communications | Use of the band 4000-4063 kHz by the MMS is limited to ship stations using radiotelephony |
| **4 063-4 438 kHz**<br><br>MARITIME MOBILE 5.79A<br>5.109 5.110 5.130 5.131 5.132 | **4 063-4 4 438 kHz**<br><br>MARITIME MOBILE 5.79A 5.109<br>5.110 5.130 5.131 5.132 | Maritime mobile communications<br>4125 kHz – use of this frequency prescribed in Article 31. | See Section 7 for details<br>ITU RR Appendix 17 Channelling Plan applies |

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| | FIXED<br><br>5.128 | 4209.5 kHz - Coast Stations in the NAVTEX service; Res.339 applies.<br>4207.5 kHz – DSC for distress and calling;<br>4177.5 kHz – international distress frequency for NBDP telegraphy;.<br>4209.5 kHz – exclusive for transmission by coast stations of meteorological and navigational warnings and urgent information to ships (NBDP).<br>4210 kHz – maritime safety information (MSI) | ITU RR Appendix 25 Allotment Plan applies<br><br>Resolution 339 (Rev. WRC-07) applies<br><br>Articles 31 and Article 52 applies |
| **4 438-4 488 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R)<br><br>Radiolocation 5.132A | **4 438-4 488 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R)<br><br>Radiolocation 5.132A | Maritime communications<br>Land mobile communications<br><br>Oceanographic Radars | |
| **4 488-4 650 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R) | **4 488-4 650 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R) | | |

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| **4 650-4 700 kHz**<br><br>AERONAUTICAL MOBILE (R) | **4 650-4 700 kHz**<br><br>AERONAUTICAL MOBILE (R) | Aeronautical mobile (R) | Appendix 27 Allotment Plan applies |
| **4 700-4 750 kHz**<br><br>AERONAUTICAL MOBILE (OR) | **4 700-4 750 kHz**<br><br>AERONAUTICAL MOBILE (OR) | Aeronautical mobile (OR) | Appendix 26 Allotment Plan applies |
| **4 750-4 850 kHz**<br><br>FIXED<br>AERONAUTICAL MOBILE (OR)<br>LAND MOBILE<br>BROADCASTING 5.113 | **4 750-4 850 kHz**<br><br>FIXED<br>AERONAUTICAL MOBILE (OR)<br>LAND MOBILE<br>BROADCASTING 5.113 | Aeronautical mobile (OR)<br>Land mobile<br>HF Sound Broadcasting | Appendix 26 Allotment Plan applies<br><br>The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013 |
| **4 850-4 995 kHz**<br><br>FIXED<br>LAND MOBILE<br>BROADCASTING 5.113 | **4 850-4 995 kHz**<br><br>FIXED<br>LAND MOBILE<br>BROADCASTING 5.113 | Land mobile<br>HF Sound Broadcasting | The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013 |
| **4 995-5 003 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL (5 000 kHz) | **4 995-5 003 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL (5 000 kHz) | | |
| **5 003-5 005 kHz** | **5 003-5 005 kHz** | | |

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|---|---|---|---|
| STANDARD FREQUENCY AND TIME SIGNAL<br>Space research | STANDARD FREQUENCY AND TIME SIGNAL<br>Space research | | |
| **5 005-5 060 kHz**<br><br>FIXED<br>BROADCASTING 5.113 | **5 005-5 060 kHz**<br><br>FIXED<br>BROADCASTING 5.113 | HF Sound Broadcasting | The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013 |
| **5 060-5 250 kHz**<br><br>FIXED<br>Mobile except aeronautical mobile<br><br>5.133 | **5 060-5 250 kHz**<br><br>FIXED<br>Mobile except aeronautical mobile | SADC harmonised HF frequencies for cross-border mobile communications; | |
| **5 250-5 275 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile<br>Radiolocation 5.132A | **5 250-5 275 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile<br>Radiolocation 5.132A | SADC[11] harmonised HF frequencies for cross-border mobile communications;<br>Oceanographic Radar | Oceanographic Radars are used in accordance with ITU Resolution 612 (Rev WRC-12). |
| **5 275-5 351.5 kHz** | **5 275- 5 351.5 kHz** | | |

[11] http://www.crasa.org/common_up/crasa-setup/10-03-2015_SADC%20FREQUENCY%20BAND%20%202013.pdf

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| FIXED<br>MOBILE except aeronautical mobile | FIXED<br>MOBILE except aeronautical mobile<br>Amateur NF0 | Amateur communications | |
| **5 351.5-5 366.5 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile<br>Amateur 5.133B | **5 351.5-5 366.5 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile<br>Amateur NF0 | Amateur communications | |
| **5 366.5-5 450 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile | **5 366.5-5 450 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile | | |
| **5 450-5 480 kHz**<br><br>FIXED<br>AERONAUTICAL MOBILE (OR)<br>LAND MOBILE | **5 450-5 480 kHz**<br><br>FIXED<br>AERONAUTICAL MOBILE (OR)<br>LAND MOBILE | Aeronautical mobile (OR) | Appendix 27 Allotment plan applies |
| **5 480-5 680 kHz**<br><br>AERONAUTICAL MOBILE (R)<br><br>5.111 5.115 | **5 480-5 680 kHz**<br><br>AERONAUTICAL MOBILE (R)<br><br>5.111 5.115 | Aeronautical mobile (R) | Appendix 27 Allotment plan applies |

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| **5 680-5 730 kHz**<br><br>AERONAUTICAL MOBILE (OR)<br><br>5.111 5.115 | **5 680-5 730 kHz**<br><br>AERONAUTICAL MOBILE (OR)<br><br>5.111 5.115 | Aeronautical mobile (OR)<br>5 680 kHz may be used under the MMS for search and rescue operations<br>.<br>SRD[12] applications (5 725 – 5 875 kHz) | Appendix 26Allotment plan applies Article 31 applies on the use of 6215 kHz<br><br>Common international SRD band; see ITU-R Rec.SM 1896-1 latest version.<br><br>Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |
| **5 730-5 900 kHz**<br><br>FIXED<br>LAND MOBILE | **5 730-5 900 kHz**<br><br>FIXED<br>LAND MOBILE | Land mobile communications | |
| **5 900-5 950 kHz**<br><br>BROADCASTING 5.134<br><br>5.136 | **5 900-5 950 kHz**<br><br>BROADCASTING 5.134<br>Fixed 5.136<br>Land Mobile 5.136<br><br>5.136 | HF Sound Broadcasting | The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013<br>Article 12 Planning Procedures and Res.517 apply. |

[12] http://www.crasa.org/common_up/crasa-setup/06-07-2015_FRAME%20WORK%20FOR%20HARMONISATION%20FREQUENICES%20FOR%20SHORT%20RANGE%20DEVICES%20%20OF%20%20SHORT%20RANGE%20DEVICES%20%20(SRDs)%20-%20ANNEXURE%20A.pdf

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| **5 950-6 200 kHz**<br><br>BROADCASTING | **5 950-6 200 kHz**<br><br>BROADCASTING | HF Sound Broadcasting | The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013<br>Article 12 Planning Procedures and Res.517 apply. |
| **6 200-6 525 kHz**<br><br>MARITIME MOBILE 5.109 5.110 5.130 5.132 | **6 200-6 213.5 kHz**<br><br>FIXED<br>MARITIME MOBILE 5.109 5.110 5.130 5.132<br><br>5.137 | Maritime mobile communications | ITU RR Appendix 17 Channelling Plan applies<br>ITU RR Appendix 25 Allotment Plan applies<br>FS may be used on a secondary basis in the band 6 200 – 6 213.5 kHz and 6 220.5 – 6 525 kHz. |
| | **6 213.5-6 220.5 kHz**<br><br>MARITIME MOBILE 5.109 5.110 5.130 5.132<br><br>5.137 | Maritime mobile communications<br>6215 kHz DSC for distress and calling; | ITU RR Appendix 17 Channelling Plan applies<br>ITU RR Appendix 25 Allotment Plan applies<br>Article 31 applies<br>FS may be used on a secondary basis in the band 6 200 – 6 213.5 kHz and 6 220.5 – 6 525 kHz. |



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| 5.137 | **6 220.5-6 525 kHz**<br><br>FIXED<br>MARITIME MOBILE 5.109 5.110 5.130 5.132<br><br>5.137 | Maritime mobile communications<br>6312 kHz and 6215 kHz – DSC for distress and calling;<br>6268 kHz – international distress frequency for NBDP telegraphy;.<br>6314 kHz – maritime safety information (MSI); App.17 applies | ITU RR Appendix 17 Channelling Plan applies<br>ITU RR Appendix 25 Allotment Plan applies<br>Article 31 applies<br>FS may be used on a secondary basis in the band 6 200 – 6 213.5 kHz and 6 220.5 – 6 525 kHz. |
| **6 525-6 685 kHz**<br><br>AERONAUTICAL MOBILE (R) | **6 525-6 685 kHz**<br><br>AERONAUTICAL MOBILE (R) | Aeronautical mobile communications (R) | Appendix 27 Allotment Plan applies |
| **6 685-6 765 kHz**<br><br>AERONAUTICAL MOBILE (OR) | **6 685-6 765 kHz**<br><br>AERONAUTICAL MOBILE (OR) | Aeronautical mobile communications (OR) | Appendix 26 Allotment Plan applies |
| **6 765-7 000 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R)<br><br>5.138 | **6 765-7 000 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R)<br><br>5.138 | Inductive Loop Systems (6765 – 6795 kHz) | |

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| **7 000-7 100 kHz**<br><br>AMATEUR<br>AMATEUR-SATELLITE<br><br>5.140 5.141 5.141A | **7 000-7 100 kHz**<br><br>AMATEUR<br>AMATEUR-SATELLITE | Amateur communications<br>Amateur-satellite communications | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |
| **7 100-7 200 kHz**<br><br>AMATEUR<br><br>5.141A 5.141B | **7 100-7 200 kHz**<br><br>AMATEUR | Amateur communications | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |
| **7 200-7 300 kHz**<br><br>BROADCASTING | **7 200-7 300 kHz**<br><br>BROADCASTING | HF Sound Broadcasting | ITU RR Article 12 Planning Procedures applies |
| **7 300-7 400 kHz**<br><br>BROADCASTING 5.134 | **7 300-7 350 kHz**<br><br>BROADCASTING 5.134<br><br>5.143B 5.143 | HF Sound Broadcasting | The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013<br>Article 12 Planning Procedures and Res.517 apply.<br>NINP basis to broadcasting<br>FS and LMS may operate in the band 7 300 – 7 450 kHz on a secondary basis |
| | **7 350-7 400 kHz** | | |

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| 5.143 5.143A 5.143B 5.143C 5.143D | BROADCASTING 5.134<br>FIXED 5.143<br>LAND MOBILE 5.143 5.143A<br>5.143B 5.143D | HF Sound Broadcasting | The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013<br>Article 12 Planning Procedures and Res.517 apply.<br>NINP basis to broadcasting |
| **7 400-7 450 kHz**<br>BROADCASTING<br>5.143B 5.143C | **7 400-7 450 kHz**<br>BROADCASTING<br>5.143B | HF Sound Broadcasting<br>Inductive Loop Systems (7400 – 8800 kHz) | The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013<br>Article 12 Planning Procedures and Res.517 apply.<br>Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).<br>FS and LMS may operate in the band 7 350 – 7 450 kHz on a secondary basis |
| **7 450-8 100 kHz**<br>FIXED<br>MOBILE except aeronautical mobile (R)<br>5.144 | **7 450-8 100 kHz**<br>FIXED<br>MOBILE except aeronautical mobile (R) | Inductive Loop Systems (7400 – 8800 kHz) | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).<br>SADC harmonised HF frequencies for cross-border mobile communications; |

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| | | | |
| **8 100-8 195 kHz**<br><br>FIXED<br>MARITIME MOBILE | **8 100-8 195 kHz**<br><br>FIXED<br>MARITIME MOBILE | Maritime mobile communications<br>Inductive Loop Systems (7400 – 8800 kHz) | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |
| **8 195-8 815 kHz**<br><br>MARITIME MOBILE 5.109 5.110 5.132 5.145<br><br>5.111 | **8 195-8 815 kHz**<br><br>MARITIME MOBILE 5.109 5.110 5.132 5.145<br><br>5.111 | Digital Selective Calling (GMDSS)<br>Distress Watch keeping on 8414.5 kHz<br>Transmission of meteorological bulletins and notices to navigators<br>Inductive Loop Systems (7400 – 8800 kHz)<br>Maritime mobile communications<br>8414.5 kHz – DSC for distress and calling;<br>8 376.5 kHz – international distress frequency for NBDP telegraphy;<br>8416.5 kHz – maritime safety information (MSI); App.17 applies. | Appendix 15 of ITU RR<br>See Section 7 for details<br>Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).<br>ITU RR Appendix 17 Channelling Plan applies<br>ITU RR Appendix 25 Allotment Plan applies<br>Article 31 applies<br>Article 31 applies. |
| **8 815-8 965 kHz**<br><br>AERONAUTICAL MOBILE (R) | **8 815-8 965 kHz**<br><br>AERONAUTICAL MOBILE (R) | Aeronautical mobile communications | Appendix 27 Allotment Plan applies |
| **8 965-9 040 kHz** | **8 965-9 040 kHz** | | |

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| AERONAUTICAL MOBILE (OR) | AERONAUTICAL MOBILE (OR) | Aeronautical mobile communications | Appendix 26 Allotment Plan applies |
| **9 040-9 305 kHz**<br><br>FIXED | **9 040-9 305 kHz**<br><br>FIXED | Fixed Applications | |
| **9 305-9 355 kHz**<br><br>FIXED<br>Radiolocation 5.145A<br><br>5.145B | **9 305-9 355 kHz**<br><br>FIXED<br>Radiolocation 5.145A | Fixed Applications<br>Oceanographic radars | |
| **9 355-9 400 kHz**<br><br>FIXED | **9 355-9 400 kHz**<br><br>FIXED | | |
| **9 400-9 500 kHz**<br><br>BROADCASTING 5.134<br><br>5.146 | **9 400-9 500 kHz**<br><br>BROADCASTING 5.134<br><br>5.146 | HF Sound Broadcasting | The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013<br>Fixed services may be used on a secondary basis |
| **9 500-9 900 kHz**<br><br>BROADCASTING | **9 500-9 775 kHz**<br><br>BROADCASTING | HF Sound Broadcasting | |

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| | 5.147 | | The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013<br>ITU RR Article 12 Planning Procedures applies |
| 5.147 | **9 775-9 900 kHz**<br><br>BROADCASTING<br>FIXED<br><br>5.147 | HF Sound Broadcasting | The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013<br>ITU RR Article 12 Planning Procedures applies |
| **9 900-9 995 kHz**<br><br>FIXED | **9 900-9 995 kHz**<br><br>FIXED | Fixed Applications | |
| **9 995-10 003 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL (10 000 kHz)<br>5.111 | **9 995-10 003 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL (10 000 kHz)<br>5.111 | | |
| **10 003-10 005 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL<br>Space research<br><br>5.111 | **10 003-10 005 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL<br>Space research<br><br>5.111 | Passive sensing | |

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| **10 005-10 100 kHz**<br><br>AERONAUTICAL MOBILE (R)<br><br>5.111 | **10 005-10 100 kHz**<br><br>AERONAUTICAL MOBILE (R)<br><br>5.111 | Aeronautical mobile communications | Appendix 27 Allotment Plan applies |
| **10 100-10 150 kHz**<br><br>FIXED<br>Amateur | **10 100-10 150 kHz**<br><br>FIXED<br>Amateur | Fixed Applications<br>Amateur communications | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |
| **10 150-11 175 kHz**<br><br>FIXED<br>Mobile except aeronautical mobile (R) | **10 150-11 175 kHz**<br><br>FIXED<br>Mobile except aeronautical mobile (R) | SADC harmonised HF frequencies for cross-border mobile communications; | |
| **11 175-11 275 kHz**<br><br>AERONAUTICAL MOBILE (OR) | **11 175-11 275 kHz**<br><br>AERONAUTICAL MOBILE (OR) | Aeronautical mobile communications | Appendix 26 Allotment Plan applies |
| **11 275-11 400 kHz**<br><br>AERONAUTICAL MOBILE (R) | **11 275-11 400 kHz**<br><br>AERONAUTICAL MOBILE (R) | Aeronautical mobile communications | Appendix 27 Allotment Plan applies |
| **11 400-11 600 kHz** | **11 400-11 600 kHz** | | |

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| FIXED | FIXED | Fixed Applications | |
| **11 600-11 650 kHz**<br><br>BROADCASTING 5.134<br><br>5.146 | **11 600-11 650 kHz**<br><br>BROADCASTING 5.134<br>FIXED | HF Sound Broadcasting | Article 12 Planning Procedures and Res.517 apply. |
| **11 650-12 050 kHz**<br><br>BROADCASTING<br><br>5.147 | **11 650-11 700 kHz**<br><br>BROADCASTING<br>FIXED<br>` | HF Sound Broadcasting | ITU RR Article 12 Planning Procedures applies |
| | **11 700-11 975 kHz**<br><br>BROADCASTING<br><br>5.147 | HF Sound Broadcasting | ITU RR Article 12 Planning Procedures applies |
| | **11 975-12 050 kHz**<br><br>BROADCASTING<br>FIXED<br><br>5.147 | HF Sound Broadcasting | ITU RR Article 12 Planning Procedures applies |
| **12 050-12 100 kHz**<br><br>BROADCASTING 5.134<br><br>5.146 | **12 050-12 100 kHz**<br><br>BROADCASTING 5.134<br>FIXED<br><br>5.146 | HF Sound Broadcasting | Article 12 Planning Procedures and Res.517 apply. |

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| **12 100-12 230 kHz**<br><br>FIXED | **12 100-12 230 kHz**<br><br>FIXED | Fixed Applications | |
| **12 230-13 200 kHz**<br><br>MARITIME MOBILE 5.109<br><br>5.110 5.132 5.145 | **12 230-13 200 kHz**<br><br>MARITIME MOBILE 5.109<br><br>5.110 5.132 5.145 | Maritime mobile communications<br>Digital Selective Calling(GMDSS)<br>Distress Watch keeping (12 577 kHz)<br>12 577 kHz – DSC for distress and calling;<br>12 520 kHz – international distress frequency for NBDP telegraphy;<br>12 579 kHz – maritime safety information (MSI) | ITU RR Appendix 17 Channeling Plan applies<br>Appendix 15 of ITU RR<br>Transmission of meteorological bulletins and notices to navigators<br>See Section 7 for details<br>ITU RR Appendix 17 Channelling Plan applies<br>ITU RR Appendix 25 Allotment Plan applies<br>Article 31 applies. |
| **13 200-13 260 kHz**<br><br>AERONAUTICAL MOBILE (OR) | **13 200-13 260 kHz**<br><br>AERONAUTICAL MOBILE (OR) | Aeronautical mobile communications | Appendix 26 Allotment Plan applies |
| **13 260-13 360 kHz**<br><br>AERONAUTICAL MOBILE (R) | **13 260-13 360 kHz**<br><br>AERONAUTICAL MOBILE (R) | Aeronautical mobile communications | Appendix 27 Allotment Plan applies |
| **13 360-13 410 kHz** | **13 360-13 410 kHz** | | |

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| FIXED<br>RADIO ASTRONOMY<br><br>5.149 | FIXED<br>RADIO ASTRONOMY<br><br>5.149 | Radio astronomy<br>(Observations of decametric radiation) | See section 5 for coordination with radio astronomy |
| **13 410-13 450 kHz**<br><br>FIXED<br>Mobile except aeronautical mobile (R) | **13 410-13 450 kHz**<br><br>FIXED<br>Mobile except aeronautical mobile (R) | Maritime and/or land mobile communications | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |
| **13 450-13 550 kHz**<br><br>FIXED<br>Mobile except aeronautical mobile (R)<br>Radiolocation 5.132A<br><br>5.149A | **13 450-13 550 kHz**<br><br>FIXED<br>Mobile except aeronautical mobile (R)<br>Radiolocation 5.132A | Oceanographic radars | |
| **13 550-13 570 kHz**<br><br>FIXED<br>Mobile except aeronautical mobile (R)<br><br>5.150 | **13 550-13 570 kHz**<br><br>FIXED<br>Mobile except aeronautical mobile (R)<br><br>5.150 | Inductive Loop Systems (13 553 – 13 567 kHz)<br>RFID and EAS systems (13 553 – 13 567 kHz)<br>SRD[13] applications (13 553-13 567kHz) | Common international SRD band; see ITU-R Rec. SM. 1896-1 latest version<br>Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |

[13] http://www.crasa.org/common_up/crasa-setup/06-07-2015_SADC%20FREQUENCIES%20%20FOR%20SHORT%20RANGE%20%20DEVICES%20CRASA%202011.pdf

| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| | | | |
| **13 570-13 600 kHz**<br><br>BROADCASTING 5.134<br><br>5.151 | **13 570-13 600 kHz**<br><br>BROADCASTING 5.134<br>Fixed<br>Mobile except aeronautical mobile (R) | HF Sound Broadcasting | Article 12 Planning Procedures and Res.517 apply. |
| **13 600-13 800 kHz**<br><br>BROADCASTING | **13 600-13 800 kHz**<br><br>BROADCASTING | HF Sound Broadcasting | ITU RR Article 12 Planning Procedures applies |
| **13 800-13 870 kHz**<br><br>BROADCASTING 5.134<br><br>5.151 | **13 800-13 870 kHz**<br><br>BROADCASTING 5.134 | HF Sound Broadcasting | Article 12 Planning Procedures and Res.517 apply. |
| **13 870-14 000 kHz**<br><br>FIXED<br>Mobile except aeronautical mobile (R) | **13 870-14 000 kHz**<br><br>FIXED<br>Mobile except aeronautical mobile (R) | Fixed Applications<br>Land mobile communications<br>Maritime communications | |
| **14 000-14 250 kHz**<br><br>AMATEUR<br>AMATEUR-SATELLITE | **14 000-14 250 kHz**<br><br>AMATEUR<br>AMATEUR-SATELLITE | Amateur communications<br>Amateur-satellite communications | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |



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| **14 250-14 350 kHz**<br><br>AMATEUR<br><br>5.152 | **14 250-14 350 kHz**<br><br>AMATEUR | Amateur communications | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |
| **14 350-14 990 kHz**<br><br>FIXED<br>Mobile except aeronautical mobile (R) | **14 350-14 990 kHz**<br><br>FIXED<br>Mobile except aeronautical mobile (R) | SADC harmonised HF frequencies for cross-border mobile communications; | |
| **14 990-15 005 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL (15 000 kHz)<br><br>5.111 | **14 990-15 005 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL (15 000 kHz)<br><br>5.111 | | |
| **15 005-15 010 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL<br>Space research | **15 005-15 010 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL<br>Space research | | |
| **15 010-15 100 kHz**<br><br>AERONAUTICAL MOBILE (OR) | **15 010-15 100 kHz**<br><br>AERONAUTICAL MOBILE (OR) | Aeronautical mobile communications | Appendix 26 Allotment Plan applies |

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|---|---|---|---|
| **15 100-15 600 kHz**<br><br>BROADCASTING | **15 100-15 600 kHz**<br><br>BROADCASTING | HF Sound Broadcasting | The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013.<br>ITU RR Article 12 Planning Procedures applies |
| **15 600-15 800 kHz**<br><br>BROADCASTING 5.134<br><br>5.146 | **15 600-15 800 kHz**<br><br>BROADCASTING 5.134<br>FIXED<br><br>5.146 | HF Sound Broadcasting | The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013.<br>Article 12 Planning Procedures and Res.517 apply. |
| **15 800-16 100 kHz**<br><br>FIXED | **15 800-16 100 kHz**<br><br>FIXED | Fixed Applications | |
| **16 100-16 200 kHz**<br><br>FIXED<br>Radiolocation 5.145A<br><br>5.145B | **16 100-16 200 kHz**<br><br>FIXED<br>Radiolocation 5.145A | Oceanographic radars | |
| **16 200-16 360 kHz**<br><br>FIXED | **16 200-16 360 kHz**<br><br>FIXED | Fixed Applications | |

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|---|---|---|---|
| **16 360-17 410 kHz**<br><br>MARITIME MOBILE 5.109<br><br>5.110 5.132 5.145 | **16 360-17 410 kHz**<br><br>MARITIME MOBILE 5.109<br><br>5.110 5.132 5.145 | Maritime mobile communications Digital Selective Calling (GMDSS) Transmission of meteorological bulletins and notices to navigators.<br>16 804.5 kHz – DSC for distress and calling;<br>16 695 kHz – international distress frequency for NBDP telegraphy;<br>16 806.5 kHz – maritime | Appendix 15 of ITU RR<br>See Section 7 for details<br>ITU RR Appendix 17 Channelling Plan applies<br>ITU RR Appendix 25 Allotment Plan applies<br>Article 31 applies. |
| **17 410-17 480 kHz**<br><br>FIXED | **17 410-17 480 kHz**<br><br>FIXED | Fixed | |
| **17 480-17 550 kHz**<br><br>BROADCASTING 5.134<br><br>5.146 | **17 480-17 550 kHz**<br><br>BROADCASTING 5.134<br>FIXED<br><br>5.146 | HF Sound Broadcasting | The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013.<br>Article 12 Planning Procedures and Res.517 apply. |
| **17 550-17 900 kHz**<br><br>BROADCASTING | **17 550-17 900 kHz**<br><br>BROADCASTING | HF Sound Broadcasting | The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013.<br>ITU RR Article 12 Planning Procedures applies |



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|---|---|---|---|
| **17 900-17 970 kHz**<br><br>AERONAUTICAL MOBILE (R) | **17 900-17 970 kHz**<br><br>AERONAUTICAL MOBILE (R) | Aeronautical mobile communications | Appendix 27 Allotment Plan applies |
| **17 970-18 030 kHz**<br><br>AERONAUTICAL MOBILE (OR) | **17 970-18 030 kHz**<br><br>AERONAUTICAL MOBILE (OR) | Aeronautical mobile communications | Appendix 26 Allotment Plan applies |
| **18 030-18 052 kHz**<br><br>FIXED | **18 030-18 052 kHz**<br><br>FIXED | Fixed Applications | |
| **18 052-18 068 kHz**<br><br>FIXED<br>Space research | **18 052-18 068 kHz**<br><br>FIXED<br>Space research | Fixed Applications | |
| **18 068-18 168 kHz**<br><br>AMATEUR<br>AMATEUR-SATELLITE<br><br>5.154 | **18 068-18 168 kHz**<br><br>AMATEUR<br>AMATEUR-SATELLITE | Amateur communications<br>Amateur-satellite communications | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |
| **18 168-18 780 kHz**<br><br>FIXED<br>Mobile except aeronautical mobile | **18 168-18 780 kHz**<br><br>FIXED<br>Mobile except aeronautical mobile | Land mobile communications | |

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|---|---|---|---|
| **18 780-18 900 kHz**<br><br>MARITIME MOBILE | **18 780-18 900 kHz**<br><br>MARITIME MOBILE | Maritime communications | ITU RR Appendix 17 Channelling Plan applies |
| **18 900-19 020 kHz**<br><br>BROADCASTING 5.134<br><br>5.146 | **18 900-19 020 kHz**<br><br>BROADCASTING 5.134<br>FIXED<br><br>5.146 | HF Sound Broadcasting | The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013.<br><br>Article 12 Planning Procedures and Res.517 apply. |
| **19 020-19 680 kHz**<br><br>FIXED | **19 020-19 680 kHz**<br><br>FIXED | Fixed Applications | |
| **19 680-19 800 kHz**<br><br>MARITIME MOBILE 5.132 | **19 680-19 800 kHz**<br><br>MARITIME MOBILE 5.132 | 19 680.5 kHz – maritime safety information (MSI); App.17 applies | The frequency 19 680.5 kHz is the international frequency for transmission of MSI. |
| **19 800-19 990 kHz**<br><br>FIXED | **19 800-19 990 kHz**<br><br>FIXED | Fixed Applications | |

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|---|---|---|---|
| **19 990-19 995 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL<br>Space research<br><br>5.111 | **19 990-19 995 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL<br>Space research<br><br>5.111 | | |
| **19 995-20 010 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL (20 000 kHz)<br><br>5.111 | **19 995-20 010 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL (20 000 kHz)<br><br>5.111 | | |
| **20 010-21 000 kHz**<br><br>FIXED<br>Mobile | **20 010-21 000 kHz**<br><br>FIXED<br>Mobile | | |
| **21 000-21 450 kHz**<br><br>AMATEUR<br>AMATEUR-SATELLITE | **21 000-21 450 kHz**<br><br>AMATEUR<br>AMATEUR-SATELLITE | Amateur communications<br>Amateur-satellite communications | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |
| **21 450-21 850 kHz**<br><br>BROADCASTING | **21 450-21 850 kHz**<br><br>BROADCASTING | HF Sound Broadcasting | The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013.<br>ITU RR Article 12 Planning Procedures applies |

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|---|---|---|---|
| **21 850-21 870 kHz**<br><br>FIXED 5.155A<br><br>5.155 | **21 850-21 870 kHz**<br><br>FIXED | Fixed Applications[14] | |
| **21 870-21 924 kHz**<br><br>FIXED 5.155B | **21 870-21 924 kHz**<br><br>FIXED 5.155B | Fixed Applications | This band is used by the FS for services related to aircraft flight safety (5.155B) |
| **21 924-22 000 kHz**<br><br>AERONAUTICAL MOBILE (R) | **21 924-22 000 kHz**<br><br>AERONAUTICAL MOBILE (R) | Aeronautical mobile communications | Appendix 27 Allotment Plan applies |
| **22 000-22 855 kHz**<br><br>MARITIME MOBILE 5.132<br><br>5.156 | **22 000-22 855 kHz**<br><br>MARITIME MOBILE 5.132 | 22 376 kHz – maritime safety information (MSI); App.17 applies | ITU RR Appendix 17 Channelling Plan applies.<br>ITU RR Appendix 25 Allotment Plan applies.<br>The frequency 22 376 kHz is the international frequency for transmission of MSI.<br>See Section 7 for details |

[14] http://www.crasa.org/common_up/crasa-setup/10-03-2015_FREQUENCY%20CHANNELING%20ARRANGEMENTS%20FOR%20TERRESTRIAL%20FIXED%20AND%20MOBILE%202011.pdf

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| **22 855-23 000 kHz**<br><br>FIXED<br><br>5.156 | **22 855-23 000 kHz**<br><br>FIXED | Fixed Applications | |
| **23 000-23 200 kHz**<br><br>FIXED<br>Mobile except aeronautical mobile (R)<br><br>5.156 | **23 000-23 200 kHz**<br><br>FIXED<br>Mobile except aeronautical mobile (R) | | |
| **23 200-23 350 kHz**<br><br>FIXED 5.156A<br>AERONAUTICAL MOBILE (OR) | **23 200-23 350 kHz**<br><br>FIXED 5.156A<br>AERONAUTICAL MOBILE (OR) | Aeronautical mobile communications | The use of this band by the FS is limited to the provision of services related to aircraft flight safety (5.156A) |
| **23 350-24 000 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile 5.157 | **23 350-24 000 kHz**<br><br>FIXED<br><br>MARITIME MOBILE 5.157 | Inter-ship radiotelegraphy | The use of this band by the MMS is limited to inter-ship radiotelegraphy (5.157). |
| **24 000-24 450 kHz**<br><br>FIXED<br>LAND MOBILE | **24 000-24 450 kHz**<br><br>FIXED<br>LAND MOBILE | | |
| **24 450-24 600 kHz** | **24 450-24 600 kHz** | | |

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|---|---|---|---|
| FIXED<br>LAND MOBILE<br>Radiolocation 5.132A<br><br>5.158 | FIXED<br>LAND MOBILE<br>Radiolocation 5.132A | Oceanographic radars | |
| **24 600-24 890 kHz**<br><br>FIXED<br>LAND MOBILE | **24 600-24 890 kHz**<br><br>FIXED<br>LAND MOBILE | | |
| **24 890-24 990 kHz**<br><br>AMATEUR<br>AMATEUR-SATELLITE | **24 890-24 990 kHz**<br><br>AMATEUR<br>AMATEUR-SATELLITE | | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |
| **24 990-25 005 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL (25 000 kHz) | **24 990-25 005 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL (25 000 kHz) | | |
| **25 005-25 010 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL<br>Space research | **25 005-25 010 kHz**<br><br>STANDARD FREQUENCY AND TIME SIGNAL<br>Space research | | |
| **25 010-25 070 kHz** | **25 010-25 070 kHz** | | |

| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| FIXED<br>MOBILE except aeronautical mobile | FIXED<br>MOBILE except aeronautical mobile | | |
| **25 070-25 210 kHz**<br><br>MARITIME MOBILE | **25 070-25 210 kHz**<br><br>MARITIME MOBILE | Maritime mobile communications | ITU RR Appendix 17 Channelling Plan applies |
| **25 210-25 550 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile | **25 210-25 550 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile | | |
| **25 550-25 670 kHz**<br><br>RADIO ASTRONOMY<br><br>5.149 | **25 550-25 670 kHz**<br><br>RADIO ASTRONOMY<br><br>5.149 | Radio astronomy<br>(Observations of decametric radiation) | See section 5 for coordination with radio astronomy |
| **25 670-26 100 kHz**<br><br>BROADCASTING | **25 670-26 100 kHz**<br><br>BROADCASTING | HF Sound Broadcasting | The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013<br>ITU RR Article 12 Planning Procedures applies. |
| **26 100-26 175 kHz** | **26 100-26 175 kHz** | | |



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| MARITIME MOBILE 5.132 | MARITIME MOBILE 5.132 | 26 100.5 kHz – maritime safety information (MSI); App.17 applies | ITU RR Appendix 17 Channelling Plan applies.<br>ITU RR Appendix 25 Allotment Plan applies.<br>The frequency 26 100.5 kHz is the international frequency for transmission of MSI. |
| **26 175-26 200 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile | **26 175-26 200 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile | Single Frequency Mobile<br>Mobile systems (single frequency)<br>CB Radio (26.96-27.410 MHz)<br>ISM applications (26.975-27.283 MHz)<br>SRD applications (26 957-27 283 kHz) | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).<br>Common international SRD band; see ITU-R Rec. SM. 1896-1 latest version. |
| **26 200-26 350 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile<br><br>Radiolocation 5.132A<br><br>5.133A | **26 200-26 350 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile<br><br>Radiolocation 5.132A | Single Frequency Mobile<br>Oceanography radars | |

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| **26 350-27 500 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile<br><br>5.150 | **26 350-27 500 kHz**<br><br>FIXED<br>MOBILE except aeronautical mobile<br><br>5.150 | Single Frequency Mobile<br>Inductive Loop Systems, Non-specific SRD's (26.957 – 27.283 MHz)<br>Surface Model Control (26.995 MHz, 27.045 MHz, 27.095 MHz, 27.145 MHz and 27.195 MHz) | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |
| **27.5-28 MHz**<br><br>METEOROLOGICAL AIDS<br>FIXED<br>MOBILE | **27.5-28 MHz**<br><br>METEOROLOGICAL AIDS<br>FIXED<br>MOBILE | Radiosondes | |
| **28-29.7 MHz**<br><br>AMATEUR<br>AMATEUR-SATELLITE | **28-29.7 MHz**<br><br>AMATEUR<br>AMATEUR-SATELLITE | Amateur communications<br>Amateur-satellite communications | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |
| **29.7-30.005 MHz**<br><br>FIXED<br>MOBILE | **29.7-30.005 MHz**<br><br>FIXED<br>MOBILE<br><br>Amateur NF1 | Single frequency mobile (29.7-29.99 MHz)<br>Government Services | Amateur – disaster and emergencies |

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| | | | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |
| **30.005-30.01 MHz**<br><br>SPACE OPERATION (satellite identification)<br>FIXED<br>MOBILE<br>SPACE RESEARCH | **30.005-30.01 MHz**<br><br>SPACE OPERATION (satellite identification)<br>FIXED<br>MOBILE<br>SPACE RESEARCH | Government Services | |
| **30.01-37.5 MHz**<br><br>FIXED<br>MOBILE | **30.01-37.5 MHz**<br><br>FIXED<br>MOBILE | Single Frequency Mobile (32 – 32.325 MHz)<br>Government Services<br>Mobile 1 MTX (32.325 – 33.675 MHz)<br>Single Frequency Mobile (33.675 – 34.175 MHz)<br>Mobile 2 MTX (34.175 – 35 MHz)<br>Model Aircraft Control (35 – 35.5 MHz)<br>Wireless microphone (36.65 – 36.75 MHz)<br>Single Frequency Mobile (33.25 – 33.5 MHz)<br>Mobile 3 BTX 35.5 – 36.825 MHz<br>Single Frequency Mobile 36.825 – 38.5 MHz | Paired with 41.65 – 43 MHz<br><br>Paired with 40.625 – 41.25 MHz<br>Exclusive use by Model Aircraft Control<br><br>Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).<br>Paired with 38.5 – 39.825 MHz |

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| | | PMR[15] | |
| **37.5-38.25 MHz**<br><br>FIXED<br>MOBILE<br><br>Radio astronomy<br><br>5.149 | **37.5-38.25 MHz**<br><br>FIXED<br>MOBILE<br><br>Radio astronomy<br><br>5.149 | Single Frequency Mobile (36.825 – 38.5 MHz)<br>Government Services<br>Radio Astronomy (Observations of decametric radiation) | See Section 5 for coordination with radio astronomy |
| **38.25-39 MHz**<br><br>FIXED<br>MOBILE | **38.25-39 MHz**<br><br>FIXED<br>MOBILE | Single Frequency Mobile (36.825 – 38.5 MHz)<br>Government Services<br>Mobile 3 MTX (38.5 – 39.825 MHz) | Paired with 35.5 – 36.825 MHz |
| **39-39.5 MHz**<br><br>FIXED<br>MOBILE<br><br>Radiolocation 5.132A<br><br>5.159 | **39-39.5 MHz**<br><br>FIXED<br>MOBILE<br><br>Radiolocation 5.132A | Mobile 3 MTX (38.5 – 39.825 MHz)<br>Single Frequency Mobile (39.825 – 40.625 MHz)<br>Oceanographic radars | Paired with 35.5 – 36.825 MHz |

[15] http://www.crasa.org/common_up/crasa-setup/10-03-2015_GUIDELINES%20%20ON%20PMR%202014.pdf

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| **39.5-39.986 MHz**<br><br>FIXED<br>MOBILE | **39.5-39.986 MHz**<br><br>FIXED<br>MOBILE | Mobile 3 MTX (38.5 – 39.825 MHz)<br>Single Frequency Mobile (39.825 – 40.625 MHz)<br>PMR | Paired with 35.5 – 36.825 MHz |
| **39.986-40.02 MHz**<br><br>FIXED<br>MOBILE<br><br>Space research | **39.986-40.02 MHz**<br><br>FIXED<br>MOBILE<br><br>Space research | Single Frequency Mobile (39.825 – 40.625 MHz)<br>PMR | |
| **40.02-40.98 MHz**<br><br>FIXED<br>MOBILE<br><br>5.150 | **40.02-40.98 MHz**<br><br>FIXED<br>MOBILE<br><br>5.150 | Single Frequency Mobile (39.825 – 40.625 MHz)<br>Mobile 2 BTX (40.625 – 41.45 MHz)<br>Wireless microphones (40.65 – 40.7 MHz)<br>Non-specific SRD's (40.66 – 40.7 MHz)<br>Surface Model Control (40.665 MHz, 40.675 MHz, 40.685 MHz, 40.695 MHz)<br>ISM applications (40.66 – 40.7 MHz)<br>PMR | Paired with 34.175 – 35 MHz<br>Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).<br>Common international SRD band; see ITU-R Rec. SM.1896 latest version. |

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| **40.98-41.015 MHz**<br><br>FIXED<br>MOBILE<br>Space research<br><br>5.160 5.161 | **40.98-41.015 MHz**<br><br>FIXED<br>MOBILE<br>Space research | Mobile 2 BTX (40.625 – 41.45 MHz)<br>PMR | Paired with 34.175 – 35 MHz |
| **41.015-42 MHz**<br><br>FIXED<br>MOBILE<br><br>5.160 5.161 5.161A | **41.015-42 MHz**<br><br>FIXED<br>MOBILE | Mobile 2 BTX (40.625 – 41.45 MHz)<br>Single Frequency Mobile (41.45 – 41.65 MHz)<br>Mobile 1 BTX (41.65 – 43 MHz)<br>Government Services<br>PMR | Paired with 34.175 – 35 MHz<br><br>Paired with 32.325 – 33.675 MHz |
| **42-42.5 MHz**<br><br>FIXED<br>MOBILE<br><br>Radiolocation 5.132A<br><br>5.160 5.161B | **42-42.5 MHz**<br><br>FIXED<br>MOBILE<br><br>Radiolocation 5.132A | Mobile 1 BTX (41.65 – 43 MHz)<br>Government Services<br>Oceanographic radars | Paired with 32.325 – 33.675 MHz |
| **42.5-44 MHz**<br><br>FIXED<br>MOBILE<br><br>5.160 5.161 5.161A | **42.5-44 MHz**<br><br>FIXED<br>MOBILE | Mobile 1 BTX (41.65 – 43 MHz)<br>Government Services | Paired with 32.325 – 33.675 MHz |



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| **44-47 MHz**<br><br>FIXED<br>MOBILE<br><br>5.162 5.162A | **44-47 MHz**<br><br>FIXED<br>MOBILE | Meteor Burst (45.3 – 46.9 MHz)<br>CT0 Cordless Telephones BTX (46.61 – 46.97 MHz)<br>Government Services<br>PMR | Paired with 47.5 – 49.1 MHz<br>10 frequency pairs assigned to CT0; paired with 49.67 – 49.97 MHz; Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |
| 47-**50 MHz**<br><br>BROADCASTING<br><br>5.162A 5.163 5.164 5.165 | **47-50 MHz**<br><br>BROADCASTING<br><br>LAND MOBILE 5.164 | <br><br><br><br>CT0 Cordless Telephones MTX (49.67 – 49.97 MHz)<br>PMR<br>Meteor Burst (47.5-49.1 MHz)<br>CT0 Cordless Telephony MTX (49.67-49.97 MHz)<br>Government | The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013<br><br>Paired with 45.3-46.9 MHz<br><br>Paired with 46.61 – 46.97 MHz<br>Paired with 45.3-46.9 MHz<br>Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |
| **50-52 MHz**<br><br>BROADCASTING<br>Amateur 5.166A 5.166B 5.166C 5.166D 5.166E 5.169 5.169A 5.169B<br><br>5.162A 5.164 5.165 | **50-54 MHz**<br><br>AMATEUR 5.169 | Government<br><br>Wireless microphones (53 – 54 MHz) | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). |

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| **52-68 MHz**<br><br>BROADCASTING<br><br>5.162A 5.163 5.164 5.165 5.169 5.169A 5.169B 5.171 | **54-68 MHz**<br><br>BROADCASTING<br>FIXED 5.171<br>MOBILE except aeronautical mobile 5.171 | Government Services<br>Model control (54.45 – 54.55 MHz)<br>PMR<br>Single Frequency Mobile (54 – 54.325 MHz)<br>Mobile 1 BTX (54.325 – 54.45 MHz)<br>Mobile 2 BTX (55.45 – 56.85 MHz)<br>Single Frequency Mobile (56.85 – 58.5 MHz)<br>Mobile 2 MTX (58.5 – 59.9 MHz)<br>Mobile 1 MTX (59.9 – 60.025 MHz)<br>Spare60.025-60.215 MHz<br>Sport Stadium Communications (62.8 – 62.85 MHz)<br>National Emergency Alarm Radio (NEAR) (66 – 68 MHz) | The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013<br>Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).<br><br>Paired with 59.9 – 60.025 MHz<br><br>Paired with 58.5 – 59.9 MHz<br><br>Paired with 55.45 – 56.85 MHz<br>Paired with 54.325 – 54.45 MHz |
| **68-74.8 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile | **68-74.8 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile | Single Frequency Mobile (68 – 69.25 MHz)<br>Mobile 1 BTX (69.25 – 70 MHz) | Paired with 76.175 – 76.925 MHz |

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| 5.149 5.175 5.177 5.179 | Amateur (70 – 70.3 MHz) NF2<br>Radio Astronomy (73 – 74.6 MHz)<br>5.149 | Mobile 2 BTX (70 – 70.975 MHz)<br>Single Frequency Mobile (70.975 – 71.475 MHz)<br>Mobile 3 BTX (71.475 – 72.525 MHz)<br>Single Frequency Mobile (72.525 – 73.425 MHz)<br>Mobile 4 BTX (73.425 – 74.8 MHz)<br>PMR and/or PAMR | Paired with 75.2 – 76.175 MHz<br>Current assignments for fire fighting<br>Paired with 76.925 – 77.975 MHz<br>Paired with 78.625 – 80 MHz<br>Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |
| **74.8-75.2 MHz**<br>AERONAUTICAL RADIONAVIGATION<br>5.180 5.181 | **74.8-75.2 MHz**<br>AERONAUTICAL RADIONAVIGATION<br>5.180 | Instrument Landing System<br>Markers 74.80 – 75.20<br>Marker beacons (75 MHz) | |
| **75.2-87.5 MHz**<br>FIXED<br>MOBILE except aeronautical mobile | **75.2-87.5 MHz**<br>FIXED<br>MOBILE except aeronautical mobile | Mobile 2 MTX (75.2 – 76.175 MHz)<br>Mobile 1 MTX (76.175 – 76.925 MHz)<br>Mobile 3 MTX (76.925 – 77.975 MHz)<br>Mobile 4 MTX (78.625 – 80 MHz)<br>Mobile 5 BTX (77.975 – 78.625 MHz) | Paired with 70 – 70.975 MHz<br>Paired with 69.25 – 70 MHz<br>Paired with 71.475 – 72.525 MHz<br>Paired with 73.425 – 74.8 MHz<br>Paired with 82.975 – 83.625 MHz |

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| 5.175 5.179 5.187 | | Mobile 6 BTX (80 – 80.5 MHz)<br>Single Frequency Mobile (80.5 – 81 MHz)<br>Mobile 7 BTX (81 – 81.625 MHz)<br>Mobile 8 BTX (81.625 – 82.975 MHz)<br>Mobile 5 MTX (82.975 – 83.625 MHz)<br>Single Frequency Mobile (83.625 – 85.025 MHz)<br>Mobile 8 MTX (85.025 – 86.375 MHz)<br>Mobile 7 MTX (86.375 – 87 MHz)<br>Mobile 6 MTX (87 – 87.5 MHz)<br>PMR and/or PAMR | Paired with 87 – 87.5 MHz<br><br>Paired with 86.375 - 87 MHz<br>Paired with 85.025 - 86.375 MHz<br>Paired with 77.975 - 78.625 MHz<br><br>Paired with 81.625 - 82.975 MHz<br>Paired with 81 - 81.625 MHz<br>Paired with 80 - 80.5 MHz<br>Radio Frequency Spectrum Assignment Plan GG 42286 Notice 124 of 2019 |
| **87.5-100 MHz**<br>BROADCASTING<br>5.190 | **87.5-100 MHz**<br>BROADCASTING | FM Sound Broadcasting (87.5-108 MHz)<br>Digital sound broadcasting (DSB) | The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013<br>Geneva agreement GE84<br>Digital Sound Broadcasting (DSB) Regulations was published in GG44469 Notice 215 of 2021 |
| **100-108 MHz**<br>BROADCASTING | **100-108 MHz**<br>BROADCASTING | FM Sound Broadcasting (87.5-108 MHz) | |

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| 5.192 5.194 | | Digital sound broadcasting (DSB) | The Terrestrial Broadcasting Frequency Plan (GG no.36321) 02 April 2013<br>Geneva agreement GE84<br>Digital Sound Broadcasting (DSB) Regulations was published in GG44469 Notice 215 of 2021 |
| **108-117.975 MHz**<br><br>AERONAUTICAL RADIONAVIGATION<br><br>5.197 5.197A | **108-112 MHz**<br><br>AERONAUTICAL RADIONAVIGATION<br>AERONAUTICAL MOBILE (R) (ground to air)( ground based TX and associated RX for navigational information for navigational functions)<br><br>5.197A | ILS localiser (108 – 112 MHz)<br>Aeronautical mobile communications (108-117.975 MHz | AM(R)S shall operate in accordance with Res.413(Rev.WRC-07). Safety and regularity of flights; in the band 108-112 MHz AM(R)S limited to ground based transmitters. |
| | **112-117.975 MHz**<br><br>AERONAUTICAL MOBILE (R)<br><br>AERONAUTICAL RADIONAVIGATION<br><br>5.197A | Aeronautical mobile communications (108-117.975 MHz<br>VOR (VHF Omni-directional Range) (112 – 117.975 MHz) | |

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| **117.975-137 MHz**<br><br>AERONAUTICAL MOBILE (R)<br><br>5.111 5.200 5.201 5.202 | **117.975-137 MHz**<br><br>AERONAUTICAL MOBILE (R)<br><br>5.111 5.200 5 201 | Aeronautical mobile communications (117.975-121.450 MHz)<br>International Distress Frequency (121.5 MHz) - (121.450-121.550 MHz)<br><br>Aeronautical mobile communications (121.550-137.000 MHz) | Safety and regularity of flights<br><br>EPIRBs at 121.5 MHz<br>ITU RR Article 31 applies<br>123.1 MHz - auxiliary emergency frequency |
| **137-137.025 MHz**<br><br>SPACE OPERATION (space-to-Earth) 5.203C<br>METEOROLOGICAL-SATELLITE (space-to-Earth)<br>MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208B 5.209<br><br>SPACE RESEARCH (space-to-Earth)<br>Fixed<br>Mobile except aeronautical mobile (R)<br><br>5.204 5.205 5.206 5.207 5.208 | **137-137.025 MHz**<br><br>SPACE OPERATION (space-to-Earth) 5.203C<br>METEOROLOGICAL-SATELLITE (space-to-Earth)<br>MOBILE-SATELLITE (space-to-Earth) (non-GSO) 5.208A 5.208B 5.209<br>SPACE RESEARCH (space-to-Earth)<br>Fixed<br>Mobile except aeronautical mobile (R)<br><br>5.208 | MET SAT | |

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| **137.025-137.175 MHz**<br><br>SPACE OPERATION (space-to-Earth) 5.203C<br>METEOROLOGICAL-SATELLITE (space-to-Earth)<br>SPACE RESEARCH (space-to-Earth)<br>Fixed<br>Mobile-satellite (space-to-Earth) 5.208A 5.208B 5.209<br>Mobile except aeronautical mobile (R)<br><br>5.204 5.205 5.206 5.207 5.208 | **137.025-137.175 MHz**<br><br>SPACE OPERATION (space-to-Earth) 5.203C<br>METEOROLOGICAL-SATELLITE (space-to-Earth)<br>SPACE RESEARCH (space-to-Earth)<br>Fixed<br>Mobile-satellite (space-to-Earth) (non-GSO) 5.208A 5.208B 5.209<br>Mobile except aeronautical mobile (R)<br><br>5.208 | | |
| **137.175-137.825 MHz**<br><br>SPACE OPERATION (space-to-Earth) 5.203C 5.209A<br>METEOROLOGICAL-SATELLITE (space-to-Earth)<br>MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208B 5.209<br><br>SPACE RESEARCH (space-to-Earth)<br>Fixed<br>Mobile except aeronautical mobile (R)<br><br>5.204 5.205 5.206 5.207 5.208 | **137.175-137.825 MHz**<br><br>SPACE OPERATION (space-to-Earth) 5.203C 5.209A<br>METEOROLOGICAL-SATELLITE (space-to-Earth)<br>MOBILE-SATELLITE (space-to-Earth) (non-GSO) 5.208A 5.208B 5.209<br>SPACE RESEARCH (space-to-Earth)<br>Fixed<br>Mobile except aeronautical mobile (R)<br><br>5.208 | NOAA meteorological satellite (137.5 – 137.62 MHz) | |

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| **137.825-138 MHz**<br><br>SPACE OPERATION (space-to-Earth) 5.203C<br>METEOROLOGICAL-SATELLITE (space-to-Earth)<br>SPACE RESEARCH (space-to-Earth)<br>Fixed<br>Mobile-satellite (space-to-Earth) 5.208A 5.208B 5.209<br>Mobile except aeronautical mobile (R)<br><br>5.204 5.205 5.206 5.207 5.208 | **137.825-138 MHz**<br><br>SPACE OPERATION (space-to-Earth) 5.203C<br>METEOROLOGICAL-SATELLITE (space-to-Earth)<br>SPACE RESEARCH (space-to-Earth)<br>Fixed<br>Mobile-satellite (space-to-Earth) (non-GSO) 5.208A 5.208B 5.209<br>Mobile except aeronautical mobile (R)<br><br>5.208 | | |
| **138-143.6 MHz**<br><br>AERONAUTICAL MOBILE (OR)<br><br>5.210 5.211 5.212 5.214 | **138-144 MHz**<br><br>FIXED<br>MOBILE | Single Frequency Alarms (140.5 – 141 MHz)<br>Mobile 1 MTX (138 – 140.5 MHz)<br>Single Frequency Mobile (141 – 141.5 MHz)<br>Mobile 1 BTX (141.5 – 144 MHz)<br>Remote control industrial apparatus (141 – 142 MHz)<br>PMR and / or PAMR | Paired with 141.5 - 144 MHz<br><br>Paired with 138 – 140.5 MHz<br><br>Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |

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| **143.6-143.65 MHz**<br><br>AERONAUTICAL MOBILE (OR)<br>SPACE RESEARCH (space-to-Earth)<br><br>5.211 5.212 5.214 | | Mobile 1 BTX (141.5 – 144 MHz)<br>PMR and / or PAMR | Paired with 138 – 140.5 MHz<br><br>Allocation includes BTX assignments at 142.8 – 143.275 MHz and 143.325 - 143.975 MHz<br><br>Radio Frequency Spectrum Assignment Plan GG 41512 Notice 146 of 2018<br>Final Frequency Migration Plan 2019 (GG No.42337 Notice 36 of 2019) |
| **143.65-144 MHz**<br><br>AERONAUTICAL MOBILE (OR)<br><br>5.210 5.211 5.212 5.214 | | | |
| **144-146 MHz**<br><br>AMATEUR<br>AMATEUR-SATELLITE<br><br>5.216 | **144-146 MHz**<br><br>AMATEUR<br>AMATEUR-SATELLITE | | |
| **146-148 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R) | **146-148 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R) | Mobile 2 MTX (146 – 148.95 MHz)<br>PMR and / or PAMR | Paired with 153.05 – 156 MHz |

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| **148-149.9 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R)<br><br><br><br><br>MOBILE-SATELLITE (Earth-to-space) 5.209<br><br><br><br><br>5.218 5.218A 5.219 5.221 | **148-149.9 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R)<br><br><br><br><br>MOBILE-SATELLITE (Earth-to-space) (non-GSO) 5.209 NF3<br><br>SPACE OPERATION (Earth-to-space)<br><br><br>5.218 5.219 5.221 | <br><br><br>Mobile 2 MTX (146 – 148.95 MHz)<br>Single Frequency Mobile (148.950 – 151 MHz)<br>Wildlife telemetry Tracking (148 – 152 MHz)<br>Low Earth Orbit systems | <br><br><br>Paired with 153.05 – 156 MHz<br><br><br><br>Systems are paired with either 137 – 138 MHz or 400.15 – 401 MHz<br>For some small LEO systems this band is supplemented by the band 149.9-150.05 MHz<br>Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |
| **149.9-150.05 MHz**<br><br>MOBILE-SATELLITE (Earth-to-space) 5.209 5.220 | **149.9-150.05 MHz**<br><br>MOBILE-SATELLITE (Earth-to-space) (non-GSO) 5.209 5.220 NF3 | <br><br>Low Earth Orbit systems<br>Mobile-satellite communications<br>Wildlife telemetry Tracking (148 – 152 MHz)<br><br>Single Frequency Mobile (148.950 – 151 MHz) | <br><br><br>Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).<br><br>Radio Frequency Spectrum Assignment Plan GG 41512 Notice 149 of 2018 |

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| **150.05-153 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile<br><br><br><br><br><br><br><br><br><br>RADIO ASTRONOMY<br><br><br>5.149 | **150.05-153 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile<br><br><br><br><br><br><br><br><br><br>RADIO ASTRONOMY<br><br><br>5.149 | <br><br>Single frequency alarms (152.05 – 152.55 MHz)<br>Alarms, Single Frequency Mobile and Load Shedding (148.950 – 151 MHz)<br>PMR and PAMR<br>Paging<br>Government Services<br>Wildlife Telemetry Tracking (148 – 152 MHz)<br>Single Frequency Mobile (152.55 – 153.05 MHz)<br><br><br><br>Radio Astronomy (continuum band and also used for pulsar and solar observations). | <br><br>Channels 150.550 MHz and 150.5625 MHz are used for load shedding.<br><br>Channels 150.625 MHz and 150.675 MHz are reserved for in-house paging<br>Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).<br>RFSAP was published in GG 41512 Notice 149 0f 2018.<br><br>See section 5 for coordination with radio astronomy |
| **153-154 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R)<br><br><br>Meteorological aids | **153-154 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R)<br><br><br>Meteorological aids | <br><br>Single Frequency Mobile (152.55 – 153.05 MHz)<br>Mobile 2 BTX (153.05 – 156 MHz)<br>PMR and/or PAMR | <br><br>Paired with 146 – 148.95 MHz |

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| **154-156.4875 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R)<br><br>5.225A 5.226 | **154-156.4875 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile (R)<br><br>5.226 | PMR and/or PAMR(154-156 MHz)<br>Maritime Mobile 2 BTX (153.05 – 156 MHz)<br>Mobile 3 MTX (156 – 156.7625 MHz)<br>Single Frequency Mobile (156.375 – 156.7625 MHz) | See Section 7 for details<br><br>Paired with 146 – 148.95 MHz<br><br>Paired with 160.6 – 160.975 MHz<br><br>(156 – 156.375 MHz allocated to Land Mobile MTX in inland areas)<br>Limited to inland areas |
| | | Maritime mobile communications (Ship stations) (156.00-156.4875 MHz)<br>Land mobile in areas remote from coast (156.00-156.4875 MHz) | Paired with 160.625-160.950 MHz, single frequency 156.3 MHz and in the band 156.375-156.475 MHz<br>ITU RR Articles 31 and 52 and Appendix 18 apply. |
| **156.4875-156.5625 MHz**<br><br>MARITIME MOBILE (distress and calling via DSC) | **156.4875-156.5125 MHz**<br><br>MARITIME MOBILE (distress and calling via DSC).<br>FIXED 5.227<br>LAND MOBILE 5.227 | Single Frequency Mobile (156.375 – 156.7625 MHz)<br><br>The band 156.4875-156.5125 MHz may also be used for land mobile services while protecting the maritime mobile service. | The use of this band by the maritime services shall be in accordance with ITU Appendix 18.<br>ITU RR Articles 31 and 52 and Appendix 18 apply. |

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| | 5.111 5.226 5.227 | | NINP basis to Maritime Mobile Service;<br>Limited to inland areas |
| | **156.5125-156.5375 MHz**<br>MARITIME MOBILE (distress and calling via DSC) 5.111<br><br>5.111 5.226 5.227 | Maritime mobile distress, safety and calling frequency 156.525 MHz for maritime mobile VHF radiotelephone service using DSC.<br>Single Frequency Mobile (156.375 – 156.7625 MHz) | The use of this band by the maritime services shall be in accordance with ITU Appendix 18.<br>ITU RR Articles 31 and 52 and Appendix 18 apply. |
| 5.111 5.226 5.227 | **156.5375-156.5625 MHz**<br>FIXED<br>LAND MOBILE<br>MARITIME MOBILE (distress and calling via DSC)<br><br>5.111 5.226 5.227 | The bands 156.5375-156.5625 MHz may also be used for land mobile services while protecting the maritime mobile service.<br>Single Frequency Mobile (156.375 – 156.7625 MHz) | The use of this band by the maritime services shall be in accordance with ITU Appendix 18.<br>ITU RR Articles 31 and 52 and Appendix 18 apply. |
| **156.5625-156.7625 MHz**<br>FIXED<br>MOBILE except aeronautical mobile (R)<br><br>5.226 | **156.5625-156.7625 MHz**<br>FIXED<br>MOBILE except aeronautical mobile (R)<br><br>5.226 | Fixed and Mobile applications.<br>Maritime mobile communications (156.5625-156.7625 MHz).<br>Land mobile in areas remote from coast. | Single frequency applications<br>ITU RR Articles 31 and 52 and Appendix 18 apply. |

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| **156.7625-156.7875 MHz**<br><br>MARITIME MOBILE<br><br>Mobile-satellite (Earth-to-space)<br><br>5.111 5.226 5.228 | **156.7625-156.7875 MHz**<br><br>MARITIME MOBILE<br><br>Mobile-satellite (Earth-to-space)<br><br>5.111 5.226 5.228 | International distress, safety and calling frequency at 156.8 MHz for the maritime mobile VHF radiotelephone service.<br>Distress safety and calling (156.76250 – 156.8375)<br>Reception of AIS emissions of long-range AIS broadcast messages | ITU RR Article 31 and Appendix 18 apply to the use of the frequency 156.8 MHz and this band. |
| **156.7875-156.8125 MHz**<br><br>MARITIME MOBILE (distress and calling)<br><br>5.111 5.226 | **156.7875-156.8125 MHz**<br><br>MARITIME MOBILE (distress and calling)<br><br>5.111 5.226 | Distress safety and calling (156.76250 – 156.8375, channel 16) | See Section 7 for details |
| **156.8125-156.8357 MHz**<br><br>MARITIME MOBILE<br><br>Mobile-satellite (Earth-to-space)<br><br>5.111 5.226 5.228 | **156.8125-156.8375 MHz**<br><br>MARITIME MOBILE<br><br>Mobile-satellite (Earth-to-space) | Distress safety and calling (156.76250 – 156.8375)<br>Reception of AIS emissions of long-range AIS broadcast messages | See section 7 for details. |

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| **156.8357-156.8375 MHz**<br><br>MARITIME MOBILE<br>Mobile-satellite (Earth-to-space)<br><br>5.111 5.226 5.228 | 5.111 5.226 5.228 | | |
| **156.8375-157.1875 MHz**<br><br>FIXED<br>MOBILE -except aeronautical mobile<br><br>5.226 | **156.8375-157.1875 MHz**<br><br>FIXED<br>MOBILE -except aeronautical mobile<br><br>5.226 | Government Services<br>156.8375-157.45 MHz<br>Maritime mobile communications (ship stations).<br>Land mobile in areas remote from coast. | Paired with 161.5-162.0 MHz and single frequency applications; ITU RR Articles 31 and 52 and Appendix 18 apply |
| **157.1875-157.3375 MHz**<br><br>FIXED<br>MOBILE -except aeronautical mobile<br>Maritime mobile-satellite 5.208A 5.208B 5.228AB 5.228AC<br><br>5.226 | **157.1875-157.3375 MHz**<br><br>FIXED<br>MOBILE -except aeronautical mobile<br>Maritime mobile-satellite (Earth-to-space) (non-GSO)<br>Maritime mobile-satellite (space-to-Earth) (non-GSO)<br>5.228AB 5.228AC 5.208A 5.208B<br><br>5.226 | Government Services | Resolution 739 (Rev.WRC-19) apply<br>MSS and Maritime mobile-satellite shall protect RAS in line with 5.208A |

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| **157.3375-161.7875 MHz**<br><br>FIXED<br>MOBILE -except aeronautical mobile<br><br>5.226 | **157.3375-161.7875 MHz**<br><br>FIXED<br>MOBILE -except aeronautical mobile<br><br>5.226 | Government Services (157.450-160.6 MHz)<br>PMR and/or PAMR (160.600-160.975 MHz)<br>Maritime mobile communications (Coast stations).<br>Land mobile in areas remote from coast (160.975-161.475 MHz)<br>PMR and/or PAMR (161.475-162.050 MHz) | Single frequency applications<br><br>Paired with 156.025-156.350 MHz;<br><br>Paired with 156.9-157.4 MHz;<br><br>ITU RR Article 31 and Article 52 apply<br>Appendix 18 apply. |



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|---|---|---|---|
| **161.7875-161.9375 MHz**<br><br>FIXED<br>MOBILE -except aeronautical mobile<br><br>Maritime mobile-satellite 5.208A 5.208B 5.228AB 5.228AC<br><br>5.226 | **161.7875-161.9375 MHz**<br><br>FIXED<br>MOBILE -except aeronautical mobile<br><br>Maritime mobile-satellite (Earth-to-space) (non-GSO) 5.228A 5.228B 5.228AB 5.228AC<br>Maritime mobile-satellite (space-to-Earth) (non-GSO) 5.228A 5.228B 5.228AB 5.228AC<br><br>5.226 | Government Services (161.475-162.050 MHz)<br><br>Maritime mobile communications (Coast stations)<br><br>Land mobile in areas remote from coast<br>Automatic Identification System (AIS) at 161.975 MHz, 162.025 MHz and 162.050-174 MHz<br>PMR and/or PAMR | ITU RR Article 31 and Article 52 Appendix 18 apply. |
| **161.9375 -161.9625 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile<br>Maritime mobile-satellite (Earth-to-space) 5.228AA | **161.9375 -161.9625 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile NF4<br>Maritime mobile-satellite (Earth-to-space) 5.228AA | Sonobuoy (161.875 – 173.875)<br><br>Transmission of meteorological bulletins and notice to navigators<br><br>Mobile 1 MTX-DF (161.475 – 165.0375 MHz) | See Section 7 for details<br><br>Paired with Mobile 1 BTX-DF (156.875 – 160.4375 MHz) |

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| 5.226 | 5.226 | Single Frequency Mobile (160.45 – 161.475 MHz)<br>Single Frequency Mobile (156.8375 – 156.875 MHz)<br>Private Maritime MTX (157.45 – 157.95 MHz) | Inland areas only<br><br>Paired with 162.05 – 162.55 MHz |
| **161.9625-161.9875 MHz**<br><br>FIXED<br><br>MOBILE except aeronautical mobile<br><br>Mobile-satellite (Earth-to-space) 5.228F<br><br>5.226 5.228A 5.228B | **161.9625-161.9875 MHz**<br><br>FIXED<br><br>MOBILE except aeronautical mobile NF4<br><br>Mobile-satellite (Earth-to-space) 5.228F<br><br>5.226 5.228A 5.228B | Search and rescue (air to ground)<br><br>Mobile 1 MTX-DF (161.475 – 165.0375 MHz)<br><br>Reception of AIS emissions from stations in the mms | Search and rescue operations and other safety-related communications (air to ground)<br>Paired with Mobile 1 BTX-DF (156.875 – 160.4375 MHz) |
| **161.9875-162.0125 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile<br>Maritime mobile-satellite (Earth-to-space) 5.228AA<br><br>5.226 5.229 | **161.9875-162.0125 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile NF4<br>Maritime mobile-satellite (Earth-to-space) 5.228AA<br><br>5.226 | Transmission of meteorological bulletins and notice to navigators<br>Mobile 1 MTX-DF (161.475 – 165.0375 MHz) | See Section 7 for details<br><br>Paired with Mobile 1 BTX-DF (156.875 – 160.4375 MHz) |

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| **162.0125-162.0375 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile<br><br>Mobile-satellite (Earth-to-space)<br>5.228F<br><br>5.226 5.228A 5.228B 5.229 | **162.0125-162.0375 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile NF4<br><br>Mobile-satellite (Earth-to-space)<br>5.228F<br><br>5.226 5.228A 5.228B | Mobile 1 MTX-DF (161.475 – 165.0375 MHz)<br><br>Reception of AIS emissions from stations in the mms.<br><br>Search and rescue (air to ground) | Paired with Mobile 1 BTX-DF (156.875 – 160.4375 MHz)<br><br>Search and rescue operations and other safety-related communications (air to ground) |
| **162.0375-174 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile | **162.0375-174 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile NF4 | Sonobuoy in maritime service<br>Mobile 1 MTX-DF (161.475 – 165.0375 MHz)<br>Mobile 2 MTX-DF (165.05 – 165.5375 MHz)<br><br>Single Frequency Mobile (168.95 – 170.05 MHz)<br>Mobile 3 MTX-DF (165.55 – 167.4875 MHz)<br>Single Frequency Mobile (172 – 172.0375 MHz)<br>Mobile 4 MTX-DF (167.5 – 168.9375 MHz)<br>Meter Reading (169.4 – 169.475 MHz) | Paired with Mobile 1 BTX-DF (156.875 – 160.4375 MHz)<br>Paired with Mobile 2 BTX-DF (170.05 – 170.5375 MHz)<br><br>Paired with Mobile 3 BTX-DF (172.05 – 173.9875 MHz)<br><br>Paired with Mobile 4 BTX (170.55 – 171.9875 MHz) |

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|---|---|---|---|
| 5.226 5.229 | 5.226 NF5 | Non-specific SRD's – Telecommand only (173.2125 – 173.2375 MHz)<br>Non-specific SRDs (173.2375 – 173.2875 MHz)<br>Wireless microphones and assistive listening devices (173.7 – 175.1 MHz) | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).<br>. |
| **174-223 MHz**<br><br>BROADCASTING<br><br>5.235 5.237 5.243 | **174-223 MHz**<br><br>BROADCASTING<br><br>NF5 | Analogue Television Broadcasting (174 – 214 MHz)<br><br>T-DAB (214 – 230 MHz) Digital Sound-Broadcasting<br>Digital Television Broadcasting (174 – 214 MHz)<br>Wireless microphones (173.7 – 175.1 MHz) | TV Band III<br>Migration from analogue to digital is harmonised in SADC.<br>Digital Sound Broadcasting (DSB) planned in this band.<br>TV Band III<br>Regulations was published in GG44469 Notice 215 of 2021<br>The Terrestrial Broadcasting Frequency Plan as amended (GG no.36321) 02 April 2013<br>Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015) |

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| **223-230 MHz**<br><br>BROADCASTING<br>Fixed<br>Mobile<br><br>5.243 5.246 5.247 | **223-230 MHz**<br><br>BROADCASTING<br>Fixed<br>Mobile | T-DAB (214 – 230 MHz)<br>Digital Sound Broadcasting | Migration from analogue to digital is harmonised in SADC.<br>Digital sound broadcasting is being planned in this band.<br>Digital Sound Broadcasting (DSB) Regulations was published in GG44469 Notice 215 of 2021<br>The Terrestrial Broadcasting Frequency Plan as amended (GG no.36321) 02 April 2013 |
| **230-235 MHz**<br><br>FIXED<br>MOBILE<br><br>5.247 5.251 5.252 | **230-238 MHz**<br><br>BROADCASTING 5.252 | Digital Television Broadcasting (230 – 238 MHz) | The Terrestrial Broadcasting Frequency Plan as amended (GG no.36321) 02 April 2013 |
| **235-267 MHz**<br><br>FIXED<br>MOBILE | **238-246 MHz**<br><br>FIXED<br>MOBILE | PMR and/or PAMR(238- 242.95 MHz)<br>International Distress Frequency at 243 MHz (242.95 – 243.05 MHz)<br>Low-power devices (243.05-246.00 MHz) | Band available for distress and safety purposes.<br>Low-power devices ancillary to the broadcasting service. |

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| | Mobile-satellite<br><br>5.111 5.252 5.254 5.256 | DAB+ (238-242.95 MHz) | Mobile-satellite may be used in (235 -322 MHz) and (335.4 -399.9 MHz)<br>Future consideration for Digital Sound Broadcasting in the band 238 – 240 MHz<br>Channel 13F (239.2 MHz) can be used nationally for DAB+ as currently used.during DAB+ trials<br>Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015) |
| | **246-254 MHz**<br><br>BROADCASTING<br>5.254 | Digital Television broadcasting (246-254 MHz) | The Terrestrial Broadcasting Frequency Plan as amended (GG no.36321) 02 April 2013 |
| 5.111 5.252 5.254 5.256 5.256A | **254-267 MHz**<br><br>MOBILE<br><br>FIXED<br><br>Mobile-satellite<br><br>5.111 5.254 5.256 | Trunking BTX (254 – 259.4 MHz)<br>Trunking MTX (262 – 267.4 MHz)<br>Government Services (267.4-272 MHz) | Paired with 262 – 267.4 MHz<br>Paired with 254 – 259.4 MHz<br><br>Mobile-satellite may be used in (235 -322 MHz) and (335.4 -399.9 MHz) |
| **267-272 MHz**<br><br>FIXED | **267-272 MHz**<br><br>FIXED | Government Services | |

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| MOBILE<br><br>Space operation (space-to-Earth)<br><br>5.254 5.257 | MOBILE<br>SPACE OPERATION (telemetry)<br>Mobile-satellite<br>Space operation (space-to-Earth)<br><br>5.254 5.257 | Trunking MTX (262 – 267.4 MHz)<br>Space Telemetry (267 – 272 MHz) | Paired with 254 – 259.4 MHz<br><br>Mobile-satellite may be used in (235 -322 MHz) and (335.4 -399.9 MHz) |
| **272-273 MHz**<br><br>SPACE OPERATION (space-to-Earth)<br>FIXED<br>MOBILE<br><br>5.254 | **272-273 MHz**<br><br>SPACE OPERATION (space-to-Earth)<br>FIXED<br>MOBILE<br>Mobile-satellite<br><br>5.254 | Government Services | Mobile-satellite may be used in (235 -322 MHz) and (335.4 -399.9 MHz) |
| **273-312 MHz**<br><br>FIXED<br>MOBILE<br><br>5.254 | **273-312 MHz**<br><br>FIXED<br>MOBILE<br><br>Mobile-satellite<br><br>5.254 | Government Services<br>Single Frequency Mobile (278 – 286 MHz) | Mobile-satellite may be used in (235 -322 MHz) and (335.4 -399.9 MHz) |
| **312-315 MHz**<br><br>FIXED<br>MOBILE<br>Mobile-satellite (Earth-to-space) | **312-315 MHz**<br><br>FIXED<br>MOBILE<br>Mobile-satellite (Earth-to-space) | Government Services | |

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| 5.254 5.255 | 5.254 5.255 | | Mobile-satellite may be used in (235 -322 MHz) and (335.4 -399.9 MHz) |
| **315-322 MHz**<br><br>FIXED<br>MOBILE<br><br>5.254 | **315-322 MHz**<br><br>FIXED<br>MOBILE<br>Mobile-satellite<br><br>5.254 | Government Services | Mobile-satellite may be used in (235 -322 MHz) and (335.4 -399.9 MHz) |
| **322-328.6 MHz**<br><br>FIXED<br>MOBILE<br>RADIO ASTRONOMY<br><br>5.149 | **322-328.6 MHz**<br><br>FIXED<br>MOBILE<br>RADIO ASTRONOMY<br><br>5.149 | Government Services<br><br>Radio Astronomy (Observation of deuterium) | See Section 5 coordination with radio astronomy |
| **328.6-335.4 MHz**<br><br>AERONAUTICAL<br>RADIONAVIGATION 5.258<br><br>5.259 | **328.6-335.4 MHz**<br><br>AERONAUTICAL<br>RADIONAVIGATION 5.258 | ILS Glide Path | |



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| **335.4-387 MHz**<br><br>FIXED<br>MOBILE<br><br><br><br><br><br><br><br><br>5.254 | **335.4-387 MHz**<br><br>FIXED NF6<br><br><br><br><br>MOBILE NF7<br>Mobile-satellite<br><br><br><br><br><br>5.254 | PTP/PTMP<br>FWA (336 – 346 MHz)<br>FWA (356 – 366 MHz)<br>Government Services (366-380 MHz)<br>Digital Trunking (Emergency) (380 – 387 MHz) (PPDR[16])<br>PMR and/or PAMR (335.4-336 MHz)<br>Unmanned Aerial Vehicle (UAV) (366.0-380.0 MHz) | Paired with 356 – 366 MHz<br>Paired with 336 – 346 MHz<br><br><br>Paired with 390 – 397 MHz<br><br><br><br>(Coordination is required with PTP/PTMP in the implement of UAV)<br>Radio Frequency Spectrum Assignment Plan GG 41512 Notice 148 of 2018 |
| **387-390 MHz**<br><br>FIXED<br>MOBILE<br>Mobile-satellite (space-to-Earth) | **387-390 MHz**<br><br>FIXED<br>MOBILE NF7<br>Mobile-satellite (space-to-Earth) | Digital Trunking (387 – 390 MHz) (Govt.)<br>PMR and/or PAMR | Paired with 397 – 399.9 MHz<br>(To be used mainly for digital systems.)<br>Radio Frequency Spectrum Assignment Plan GG 41512 Notice 148 of 2018 |

[16] http://www.crasa.org/common_up/crasa-setup/12-03-2015_GUIDELINES%20ON%20FREQUENCIES%20FOR%20PPDR%202014.pdf

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|---|---|---|---|
| 5.208A 5.208B 5.254 5.255 | 5.208A 5.208B 5.254 5.255 | | Final Frequency Migration Plan 2019 (GG No.42337 Notice 36 of 2019) |
| **390-399.9 MHz**<br><br>FIXED<br>MOBILE<br><br>5.254 | **390-399.9 MHz**<br><br>FIXED<br>MOBILE NF7<br><br>Mobile-satellite<br><br>5.254 | Digital Trunking Emergency) (390 – 397 MHz) (PPDR)<br>Government Services<br>Digital Trunking (397 – 399.9 MHz) (Govt.)<br>PMR and/or PAMR | Paired with 380 – 387 MHz<br><br>Paired with 387 – 390 MHz<br>In accordance with Resolution 646 and Recommendation ITU-R M.2015-2 latest version.<br>Radio Frequency Spectrum Assignment Plan GG 41512 Notice 148 of 2018<br>Final Frequency Migration Plan 2019 (GG No.42337 Notice 36 of 2019) |
| 399.9-400.05 MHz<br><br>MOBILE-SATELLITE (Earth-to-space) 5.209 5.220 5.260A 5.260B | **399.9-400.05 MHz**<br><br>MOBILE-SATELLITE (Earth-to-space) (non-GSO) 5.209 5.220 5.260A 5.260B | | Radio Frequency Spectrum Assignment Plan GG 41512 Notice 148 of 2018 |
| **400.05-400.15 MHz** | **400.05-400.15 MHz** | | |



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| STANDARD FREQUENCY AND TIME SIGNAL-SATELLITE (400.1 MHz)<br><br>5.261 5.262 | STANDARD FREQUENCY AND TIME SIGNAL-SATELLITE (400.1 MHz)<br><br>5.261 5.262 | | |
| **400.15-401 MHz**<br><br>METEOROLOGICAL AIDS<br><br>METEOROLOGICAL-SATELLITE (space-to-Earth)<br><br>MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208B 5.209<br><br>SPACE RESEARCH (space-to-space) 5.263<br><br>Space operation (space-to-Earth)<br><br>5.262 5.264 | **400.15-401 MHz**<br><br>METEOROLOGICAL AIDS<br><br>METEOROLOGICAL-SATELLITE (space-to-Earth)<br><br>MOBILE-SATELLITE (space-to-Earth)(non-GSO) 5.208A 5.208B 5.209<br>SPACE RESEARCH (space-to-space) 5.263<br><br>Space operation (space-to-Earth)<br><br>5.264 | Radiosonde<br>Communication with manned space vehicles | |
| **401-402 MHz**<br><br>METEOROLOGICAL AIDS<br>SPACE OPERATION (space-to-Earth)<br>EARTH EXPLORATION-SATELLITE (Earth-to-space) | **401-402 MHz**<br><br>METEOROLOGICAL AIDS<br>SPACE OPERATION (space-to-Earth)<br>EARTH EXPLORATION-SATELLITE (Earth-to-space) | Radiosonde | Note limitations in e.i.r.p 5.264A |

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| METEOROLOGICAL-SATELLITE (Earth-to-space)<br><br>Fixed<br>Mobile except aeronautical mobile<br><br>5.264A 5.264B | METEOROLOGICAL-SATELLITE (Earth-to-space)<br><br>Fixed<br>Mobile except aeronautical mobile<br><br>5.264A 5.264B | <br><br>Data uplink to Geostationary Satellite orbit | |
| **402-403 MHz**<br><br>METEOROLOGICAL AIDS<br><br>EARTH EXPLORATION-SATELLITE (Earth-to-space)<br><br>METEOROLOGICAL-SATELLITE (Earth-to-space)<br><br>Fixed<br>Mobile except aeronautical mobile<br><br>5.264A 5.264B | **402-403 MHz**<br><br>METEOROLOGICAL AIDS<br><br>EARTH EXPLORATION-SATELLITE (Earth-to-space)<br><br>METEOROLOGICAL-SATELLITE (Earth-to-space)<br><br>Fixed<br>Mobile except aeronautical mobile<br><br>5.264A 5.264B | <br><br>Radiosonde<br><br><br><br><br>Medical implants (402 – 405 MHz)<br>Various SRD's (402 – 406 MHz)<br>SRDs – ultra low power active medical implants | <br><br>Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).<br>Note limitations in e.i.r.p 5.264A<br><br><br><br><br>SRDs (402 – 405 MHz)<br>ITU-R Recommendation. SM.1896-1 latest version<br>ITU-R Recommendation. RS.1346 latest version. |
| **403-406 MHz**<br><br>METEOROLOGICAL AIDS<br>Fixed<br>Mobile except aeronautical mobile | **403-406 MHz**<br><br>METEOROLOGICAL AIDS<br>Fixed<br>Mobile except aeronautical mobile | <br><br>Radiosonde<br><br>Medical implants (402 – 405 MHz)<br>Various SRD's (402 – 406 MHz) | <br><br>Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).<br>Note limitations in e.i.r.p 5.264A<br>SRDs (402 – 405 MHz) |

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| 5.265 | 5.265 | | ITU-R Recommendation. SM.1896-1 latest version<br>ITU-R Recommendation. RS.1346 latest version |
| **406-406.1 MHz**<br><br>MOBILE-SATELLITE (Earth-to-space)<br><br>5.265 5.266 5.267 | **406-406.1 MHz**<br><br>MOBILE-SATELLITE (Earth-to-space)<br><br>5.265 5.266 5.267 | COSPAS – SARSAT: Emergency Position Indicating Radio Beacon (EPIRB)<br>Low power satellite EPIRBs (distress and safety purposes) | Public Locator Beacon<br><br>ITU RR Articles 32 apply<br>ITU RR Articles 34 apply<br>Appendix 15 apply |
| **406.1-410 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile<br><br>RADIO ASTRONOMY<br><br>5.149 5.265 | **406.1-410 MHz**<br><br>FIXED<br><br>MOBILE except aeronautical mobile<br><br>RADIO ASTRONOMY<br><br>5.149 5.265 | Fixed Links (406.1 – 407.625 MHz)<br>Mobile MTX (407.625 – 410 MHz)<br>Government use for public safety<br>PMR and/or PAMR<br>PPDR<br><br>Radio Astronomy (continuum observations) | Paired with 416.1 – 417.625 MHz<br><br>Paired with BTX(417.625 – 420 MHz)<br><br>The use of this band for PPDR to be studied.<br>See section 5 for coordination with radio astronomy. |

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| **410-420 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile<br><br><br><br><br><br><br><br>SPACE RESEARCH (space-to-space)<br><br><br>5.268 | **410-420 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile<br><br><br><br><br><br><br><br>SPACE RESEARCH (space-to-space)<br><br><br>5.268 | <br><br>Government Services<br><br>Mobile MTX (410 – 413 MHz)<br><br>Mobile Data MTX (413-413.7625 MHz)<br>Digital Trunking MTX (413.7625 – 416.1 MHz)<br>Mobile BTX (416.1 – 417.625 MHz)<br>PMR and/or PAMR<br>PPDR<br><br>Communication links with an orbiting, manned space vehicle | <br><br>Paired with BTX (420 – 423 MHz) (Government Services)<br>Paired with BTX (423-423.7625 MHz)<br>Paired with 423.7625 – 426.1 MHz<br><br>Paired with MTX (406.1 – 407.625 MHz)<br><br>The use of this band for PPDR to be studied.<br>Final Frequency Migration Plan 2019 (GG No.42337 Notice 36 of 2019) |
| **420-430 MHz**<br><br>FIXED<br><br><br>MOBILE except aeronautical mobile | **420-430 MHz**<br><br>FIXED<br><br><br>MOBILE except aeronautical mobile | <br><br>Single Frequency Links (426.1 – 430 MHz)<br><br>Digital Trunked Mobile BTX (420 – 423 MHz)<br>Mobile Data BTX (423 – 423.7625 MHz)<br>Digital Trunking BTX (423.7625 – 426.1 MHz)<br>PMR and/or PAMR<br>PPDR | <br><br>Frequencies will only be assigned for SF links where migration above 1 GHz would be impractical<br>Paired with 410 - 413 MHz (Government use)<br>Paired with MTX (413 – 413.7625 MHz)<br>Paired with MTX (413.7626 – 416.1 MHz)<br>The use of this band for PPDR to be studied. |

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| Radiolocation<br><br>5.269 5.270 5.271 | Radiolocation | | Final Frequency Migration Plan 2019 (GG No.42337 Notice 36 of 2019) |
| **430-432 MHz**<br><br>AMATEUR<br>RADIOLOCATION<br><br>5.271 5.274 5.275 5.276 5.277 | **430-432 MHz**<br><br>AMATEUR NF8<br>RADIOLOCATION | Amateur Applications | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |
| **432-438 MHz**<br><br>AMATEUR<br><br>RADIOLOCATION<br><br>Earth exploration-satellite (active) 5.279A<br><br>5.138 5.271 5.276 5.277 5.280 5.281 5.282 | **432-438 MHz**<br><br>AMATEUR NF8<br><br>RADIOLOCATION<br><br>Earth exploration-satellite (active) 5.279A<br><br>Amateur -satellite<br><br>5.138 5.282 | Amateur (432-438 MHz)<br>ISM (433.0-434.79 MHz)<br>Non Specific SRD including RFID (433.05 – 434.79 MHz)<br>ISM applications<br><br>Amateur-satellite (435-438 MHz) | Conditions for amateur satellite service is given in 5.282<br>Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).<br>For earth exploration-satellite see Rec. ITU-R RS.1260-2 latest version<br>Conditions for amateur satellite service is given in 5.282<br>For earth exploration-satellite see Rec. ITU-R RS.1260-2 |

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| **438-440 MHz**<br><br>AMATEUR<br>RADIOLOCATION<br><br>5.271 5.274 5.275 5.276 5.277 5.283 | **438-440 MHz**<br><br>AMATEUR NF8<br>RADIOLOCATION | Amateur | Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015). |
| **440-450 MHz**<br><br>FIXED | **440-450 MHz**<br><br>FIXED | Telemetry / Data BTX (440 – 441 MHz)<br>FIXED (telemetry, dual frequency alarm systems)<br>Agricultural Telemetry Application<br><br>Roving simplex Application<br><br>Simplex Applications | Paired with MTX (445 – 446 MHz)<br><br>Channels 440.0125, 440.3625, 445.0125 and 445.3625 MHz are used for Agricultural Telemetry.<br>Channels 440.275 MHz, 440.2875 MHz, 445.2750 MHz, 445.2875 MHz, 440.375 MHz and 445.375 MHz are roving simplex channels.<br>Channels 440 - 440.100 MHz and 445 – 445.1 MHz are used as simplex. |
| MOBILE except aeronautical mobile | MOBILE except aeronautical mobile | Mobile MTX (441.1 – 445 MHz)<br><br>Single Frequency Mobile (441 – 441.1 MHz)<br>PPDR<br>PMR and/or PAMR446 (446 – 446.1 MHz) | Paired with BTX (446.1 – 450 MHz) 8 channels -<br><br><br><br>PMR446-ERC/DEC/ (98)25 |

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|---|---|---|---|
| Radiolocation<br><br>5.269 5.270 5.271 5.284 5.285 5.286 | SPACE OPERATION (Earth-to-space)<br>SPACE RESEARCH (Earth-to-space)<br>Radiolocation<br><br>5.269 5.270 5.271 5.284 5.285 5.286 | | Radio Frequency Spectrum Assignment Plan GG 42230 Notice 74 of 2019<br>Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).<br>Further studies<br>Final Frequency Migration Plan 2019 (GG No.42337 Notice 36 of 2019) |
| **450-455 MHz**<br><br>FIXED<br><br>MOBILE 5.286AA | **450-455 MHz**<br><br>FIXED<br><br>MOBILE 5.286AA NF9 | Fixed links (450 – 453 MHz)<br>Government Services<br>Single Frequency Mobile (453 – 454 MHz)<br>Paging (454 – 454.425 MHz)<br>Trunked Mobile BTX (454.425 – 460 MHz)<br>IMT450<br>PMR and/or PAMR | Paired with 460 – 463 MHz<br><br>Paired with MTX (464.425 – 470 MHz)<br>This band is currently used for a variety of fixed and mobile systems in the various SADC countries.<br>ITU-R Recommendation M.1036-6 latest version.<br>Resolution 224 (Rev WRC-19)<br>Radio Frequency Spectrum Regulations as amen ded (Annex B) (GG. No. 38641, 30 March 2015). |

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| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| 5.209 5.271 5.286 5.286A 5.286B 5.286C 5.286D 5.286E | SPACE OPERATION (Earth-to-space)<br><br>SPACE RESEARCH (Earth-to-space)<br><br>5.209 5.286 5.286A 5.286B 5.286C | | Radio Frequency Spectrum Assignment Plan 2015, Government Gazette 38640 ( Notice 270 of 2015)<br>International Mobile Telecommunication Roadmap (GG No.42829 Notice 600 of 2019).<br>New RFSAP to be developed. |
| **455-456 MHz**<br><br>FIXED<br>MOBILE 5.286AA<br><br>5.209 5.271 5.286A 5.286B 5.286C 5.286E | **455-456 MHz**<br><br>FIXED<br>MOBILE 5.286AA NF9<br><br>5.209 5.286A 5.286B 5.286C | Government Services<br>Trunked mobile BTX (454.425 – 460 MHz)<br>IMT450 | Paired with 464.425 – 470 MHz<br>ITU-R Recommendation M.1036-6 latest version<br>Resolution 224 (Rev WRC-19)<br>Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015).<br>Radio Frequency Spectrum Assignment Plan 2015, Government Gazette 38640 ( Notice 270 of 2015)<br>International Mobile Telecommunication Roadmap (GG No.42829 Notice 600 of 2019).<br>New RFSAP to be developed |
| **456-459 MHz** | **456-459 MHz** | | |

| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| FIXED<br>MOBILE 5.286AA<br><br>5.271 5.287 5.288 | FIXED<br>MOBILE 5.286AA NF9<br><br>5.287 | Trunked mobile BTX (454.425 – 460 MHz)<br>IMT450<br>Government Services | Paired with 464.425 – 470 MHz<br>ITU-R Recommendation M.1036-6 latest version<br>Resolution 224 (Rev WRC-19)<br>Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015).<br>Radio Frequency Spectrum Assignment Plan<br>2015, Government Gazette 38640 ( Notice 270 of 2015)<br>International Mobile Telecommunication Roadmap (GG No.42829 Notice 600 of 2019).<br>New RFSAP to be developed |
| **459-460 MHz**<br><br>FIXED<br>MOBILE 5.286AA | **459-460 MHz**<br><br>FIXED<br>MOBILE 5.286AA NF9 | Trunked Mobile BTX 454.425 – 460 MHz<br>IMT450<br>Government Services | Paired with 464.425 – 470 MHz<br>ITU-R Recommendation M.1036-6 latest version<br>Resolution 224 (Rev WRC-19)<br>Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015).<br>Radio Frequency Spectrum Assignment Plan<br>2015, Government Gazette 38640 ( Notice 270 of 2015) |



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| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| 5.209 5.271 5.286A 5.286B 5.286C 5.286E | 5.209 5.286A 5.286B 5.286C | | International Mobile Telecommunication Roadmap (GG No.42829 Notice 600 of 2019).<br>New RFSAP to be developed |
| **460-470 MHz**<br><br>FIXED<br>MOBILE 5.286AA<br><br><br><br><br><br><br><br><br><br>Meteorological-satellite (space-to-Earth)<br><br><br><br><br><br>5.287 5.288 5.289 5.290 | **460-470 MHz**<br><br>FIXED<br>MOBILE 5.286AA NF9<br><br><br><br><br><br><br><br><br><br>Meteorological-satellite (space-to-Earth)<br>Earth exploration-satellite (space-to-Earth)<br><br><br><br><br>5.287 5.289 | <br><br>Fixed Links (460 – 463 MHz)<br>Single Frequency Mobile (463.025 – 463.975 MHz)<br>Low Power Mobile Radio (463.975 MHz, 464.125 MHz, 464.175 MHz, 464.325 MHz, 464.375 MHz)<br>Single Frequency Mobile (464.375 – 464.425 MHz)<br>Trunked Mobile MTX (464.425 – 470 MHz)<br>IMT450<br>Security Systems (464.5375 MHz)<br>Non-specific SRDs (464.5 – 464.5875 MHz)<br><br>Government Services | <br><br>Paired with 450 – 453 MHz<br><br><br><br><br><br><br><br>Paired with BTX (454.425 – 460 MHz)<br><br>ITU-R Recommendation M.1036-6 latest versionResolution 224 (Rev WRC-19)<br>Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015).<br>Radio Frequency Spectrum Assignment Plan 2015, GG 38640 ( Notice 270 of 2015)<br>International Mobile Telecommunication Roadmap (GG No.42829 Notice 600 of 2019).<br>New RFSAP to be developed |

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| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| **470-694 MHz**<br><br>BROADCASTING | **470-606 MHz**<br><br>BROADCASTING | DTT Broadcasting (470-694 MHz)<br><br>SAP/SAB Applications<br><br>Applications ancillary to broadcasting and programme-making | Broadcasting Allotments in accordance with GE89 and GE06.<br>Broadcast assignments in accordance with the latest version of the Terrestrial Broadcasting Frequency Plan as amended (GG No.36321) 02 April 2013.<br>Band IV/V Analogue television is to be migrated to digital television and ensure harmonisation with SADC.<br>The use of Television Whitespaces in the band 470 – 694 MHz excluding sub band 606 to 614 MHz, subject to non-Interference non-Protection basis to users under a primary allocation, max. 50 mW ERP.<br>Regulations Television Whitespaces – GG 44373 (Notice 164 of 2021) and Government Gazette No. 41512 (Notice 147 of 2018)<br>Radio Frequency Spectrum Assignment Plan, GG 43341 (Notice 284 of 2020 |
| | Land mobile<br><br>5.149 5.296 5.304 5.306 | | The use of land mobiles in accordance with footnote No. 5.296 |

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| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| | **606-614 MHz**<br><br>BROADCASTING<br><br>RADIO ASTRONOMY<br><br>Land mobile<br><br>5.149 5.296 5.304 5.306 | DTT Broadcasting (470-694 MHz)<br>Radio Astronomy (606 – 614 MHz)<br>SAP/SAB Applications<br>Applications ancillary to broadcasting and programme-making | Broadcasting Allotments in accordance with GE89 and GE06. Broadcast assignments in accordance with the latest version of the Terrestrial Broadcasting Frequency Plan as amended (GG No.36321) 02 April 2013. Band IV/V Analogue television is to be migrated to digital television and ensure harmonisation with SADC.<br>Radio Frequency Spectrum Assignment Plan, GG 43341 Notice 284 of 2020<br>RAS VLBI Observations (608 – 614 MHz).<br>See Section 5 for coordination with radio astronomy. |
| | **614-694 MHz**<br><br>BROADCASTING<br><br>Land mobile | DTT Broadcasting (470-694 MHz)<br>SAP/SAB Applications<br>Applications ancillary to broadcasting and programme-making | Broadcasting Allotments in accordance with GE89 and GE06. Broadcast assignments in accordance with the latest version of the Terrestrial Broadcasting Frequency Plan as amended (GG No.36321) 02 April 2013. Band IV/V Analogue television is to be migrated to digital television and ensure harmonisation with SADC. |

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|---|---|---|---|
| 5.149 5.291A 5.294 5.296 5.300 5.304 5.306 5.312 | 5.149 5.296 5.304 5.306 | | The use of Television Whitespaces in the band 470 – 694 MHz excluding sub band 606 to 614 MHz, subject to non-Interference non-Protection basis (to users under a primary allocation, max. 50 mW ERP). Regulations Television Whitespaces – GG 44373 Notice 164 of 2021 and Government Gazette No. 41512 1913 ( Notice 147 of 2018)<br>Radio Frequency Spectrum Assignment Plan, GG 43341 Notice 284 of 2020 |
| **694-790 MHz**<br><br>MOBILE except aeronautical mobile 5.312A 5.317A<br><br>BROADCASTING | **694-790 MHz**<br><br>MOBILE except aeronautical mobile 5.312A 5.317A NF9<br><br>NF9 | IMT700 MTX (703 – 733 MHz)<br>IMT750 (733 to 758 MHz)<br>LTE<br>LTE Advance | Paired with BTX (758 – 788 MHz)<br>International Mobile Telecommunication Roadmap (GG No.42829 Notice 600 of 2019) .<br>Radio Frequency Spectrum Assignment Plan (GG 38640 Notice 271 and 272 of 2015) as amended<br>IMT in accordance with ITU-R Recommendation ITU-R M.2090 latest version and Resolution **760 (WRC-15)** applies<br>Recommendation ITU-R M.1036-6 |

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| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| 5.300 5.312 | 5.312A 5.317A | | Consideration of the future spectrum needs of Broadband Public Protection and Disaster Relief (PPDR) in the range 694-790 MHz as described in the most recent ITU-R M.2015, while taking into account studies called for by Resolution 646 (WRC15) for technical and operational measures. Band IV/V analogue television is to be migrated to digital television and ensure harmonisation with SADC. WRC-07, WRC-12 and WRC-15 allocated this band to Mobile service except aeronautical mobile and identified it for IMT. Fixed links operating in this band will have to be migrated in order to accommodate IMT. |
| **790-862 MHz**<br><br>FIXED<br><br>MOBILE except aeronautical mobile 5.316B 5.317A<br><br>BROADCASTING | **790-862 MHz**<br><br>FIXED<br><br>MOBILE except aeronautical mobile 5.316B 5.317A NF9<br><br>5.312A 5317A | <br><br>Fixed Links (856 – 864.1 MHz)<br>Wireless Access (827.775 – 832.695 MHz)<br><br>IMT800 MTX (832 - 862 MHz)<br>IMT850 MTX (825 – 830 MHz) | <br><br>Paired with 868.1 – 876 MHz<br>Paired with 827.775- 832.695 MHz<br><br>Paired with BTX (791 – 821 MHz)<br>Paired with BTX (870 – 875 MHz)<br>International Mobile Telecommunication Roadmap (GG No.42829 Notice 600 of 2019) .<br>Radio Frequency Spectrum |

| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| | | | Assignment Plan (GG 38640 Notice 271 and 272 of 2015) as amended<br>IMT in accordance with ITU-R Recommendation ITU-R M.2090 latest version and Resolution **760 (WRC-15**) applies<br>Recommendation ITU-R M.1036-6<br>Consideration of the future spectrum needs of Broadband Public Protection and Disaster Relief (PPDR) in the range 694-790 MHz as described in the most recent ITU-R M.2015, while taking into account studies called for by Resolution 646 (WRC15) for technical and operational measures.<br>Band IV/V analogue television is to be migrated to digital television and ensure harmonisation with SADC.<br>WRC-07, WRC-12 and WRC-15 allocated this band to Mobile service except aeronautical mobile and identified it for IMT.<br>Fixed links operating in this band will have to be migrated in order to accommodate IMT.<br>Radio Frequency Spectrum Assignment Plan GG 42337 Notice 165 of 2019<br>Radio Frequency Spectrum Assignment Plan (GG 38640 Notice 273 of 2015) as amended |



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|---|---|---|---|
| 5.312 5.319 | | | Radio Frequency Spectrum Assignment Plan GG 41082 Notice 648 of 2017 |
| **862-890 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile 5.317A<br>BROADCASTING 5.322<br><br>5.319 5.323 | **862-890 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile 5.317A NF10 | Fixed Links (856 – 864.1 MHz)<br>Wireless Access (872.775 877.695 MHz)<br>GSM-R MTX (877.695 – 880 MHz) NF10<br>IMT900 MTX (880-915 MHz)<br>IMT850 BTX (870-875 MHz)<br>Wireless Audio systems and Wireless microphones (863 – 865 MHz)<br>CT2 cordless phones (864.1 – 868.1 MHz)<br>FWA (864.1 – 868.1 MHz)<br>RFID (865 – 868 MHz)<br>Non-specific SRD and RFID (869.4 – 869.65 MHz)<br>Non Specific SRDs (868 – 868.6 MHz, 868.7 – 869.2 MHz, 869.4 – 869.65 MHz, 869.7 – 870.0 MHz)<br>Alarms (868.6 – 868.7 MHz, 869.25 – 869.3 MHz, 869.65 – 869.7 MHz) | Paired with 868.1 – 876 MHz<br>Paired with 827.775 – 832.695 MHz<br><br>Paired with 921 – 925 MHz<br><br>Paired with BTX (925 – 960 MHz)<br>Paired with MTX (825-830 MHz)<br>Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015).<br>Recommendation ITU-R M.1036-6<br>Radio Frequency Spectrum Assignment Plan GG 42337 Notice 165 of 2019<br>Radio Frequency Spectrum Assignment Plan (GG 38640 Notice 275 of 2015) as amended<br>International Mobile Telecommunication Roadmap GG No.42829 Notice 600 of 2019). |

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|---|---|---|---|
| **890-942 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile 5.317A<br><br>BROADCASTING 5.322<br>Radiolocation<br><br>5.323 | **890-942 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile 5.317A NF9 NF10 NF11<br><br>Radiolocation | IMT900 MTX (880 – 915 MHz)<br>GSM-R (BTX) (921 - 925 MHz)<br><br>RFID (including, passive tags and vehicle location (915.1 – 921 MHz) | Paired with BTX (925 – 960 MHz<br>Paired with MTX (877.695 – 880 MHz)<br>Radio Frequency Spectrum Assignment Plan (GG 38640 Notice 275 of 2015) as amended<br>International Mobile Telecommunication Roadmap GG No.42829 Notice 600 of 2019).<br>Final Frequency Migration Plan 2019 (GG No.42337 Notice 36 of 2019) |
| **942-960 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile 5.317A<br><br>BROADCASTING 5.322<br><br>5.323 | **942-960 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile 5.317A NF9 | IMT900 BTX (925 – 960 MHz) | Paired with MTX(880 – 915 MHz)<br>Recommendation ITU-R M.1036-6 |
| **960-1 164 MHz**<br><br>AERONAUTICAL MOBILE (R)<br>5.327A | **960-1 087.7 MHz**<br><br>AERONAUTICAL MOBILE (R)<br>5.327A | Distance measuring equipment / Secondary surveillance radar | Resolution 425 (rev WRC-19) apply. |

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|---|---|---|---|
| AERONAUTICAL RADIONAVIGATION 5.328 | AERONAUTICAL RADIONAVIGATION 5.328 | (Airborne electronic aids to air navigation and any directly associated ground-based facilities | |
| | **1087.7 -1 093.3 MHz**<br><br>AERONAUTICAL MOBILE (R) 5.327A<br>AERONAUTICAL MOBILE-SATELLITE (R) (Earth-to-space)<br><br>AERONAUTICAL RADIONAVIGATION 5.328 | Space station reception of ADS-B emissions from aircraft transmitters)<br>Airborne electronic aids to air navigation and any directly associated ground-based facilities | Resolution 425 (rev WRC-19) apply. |
| 5.328AA | **1093.3 -1 164 MHz**<br><br>AERONAUTICAL MOBILE (R) 5.327A<br>AERONAUTICAL RADIONAVIGATION 5.328 | Airborne electronic aids to air navigation and any directly associated ground-based facilities | Resolution 425 (rev WRC-19) apply. |
| **1 164-1 215 MHz**<br><br>AERONAUTICAL RADIONAVIGATION 5.328 | **1 164-1 215 MHz**<br><br>AERONAUTICAL RADIONAVIGATION 5.328<br>RADIONAVIGATION-SATELLITE (space-to-Earth) | Galileo (1164 – 1214 MHz)<br>GLONASS (1190.3 – 1213.8 MHz) | |

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|---|---|---|---|
| RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B<br><br>5.328A | (space-to-space)<br><br>5.328A | Airborne electronic aids to air navigation and any directly associated ground-based facilities | |
| **1 215-1 240 MHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>RADIOLOCATION<br>RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.329 5.329A<br><br>SPACE RESEARCH (active)<br><br>5.330 5.331 5.332 | **1 215-1 240 MHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>RADIOLOCATION<br>RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.329 5.329A<br><br>SPACE RESEARCH (active)<br><br>5.331 5.332 | Radar/navigation systems (1215 – 1300 MHz)<br>GPS (1215 – 1260 MHz)<br>GLONASS (1237.8-1253.8 MHz) | |
| **1 240-1 300 MHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>RADIOLOCATION<br><br>RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.329 5.329A<br>SPACE RESEARCH (active) | **1 240-1 260 MHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>RADIOLOCATION<br><br>RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.329 5.329A<br>SPACE RESEARCH (active) | Air Traffic Control Radar (1240 – 1350 MHz)<br>Radar/navigation systems (1215 – 1300 MHz)<br>GPS (1215 – 1260 MHz)<br>GLONASS (1237.8 – 1253.8 MHz) | |

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|---|---|---|---|
| Amateur<br><br>5.282 5.330 5.331 5.332 5.335 5.335A | Amateur<br><br>5.282 5.331 5.332 5.335A | Amateur (1 240 – 1 300 MHz) | |
| | **1 260-1 270 MHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>RADIOLOCATION<br><br>RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.329A<br>SPACE RESEARCH (active)<br>Amateur<br>Amateur-Satellite (Earth-to-space)<br><br>5.331 5.332 5.335A | Air Traffic Control Radar (1 240 – 1 350 MHz)<br>Radar/navigation systems (1215 – 1300 MHz)<br>Galileo (1260 – 1300 MHz)<br><br>Amateur (1 240 – 1 300 MHz) | |

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|---|---|---|---|
| | **1 270-1 300 MHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>RADIOLOCATION<br><br><br><br>RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.329 5.329A<br>SPACE RESEARCH (active)<br>Amateur<br><br>5.282 5.331 5.332 5.335A | <br><br><br>Air Traffic Control Radar (1 240 – 1 350 MHz)<br>Radar/navigation systems (1215 – 1300 MHz)<br>Galileo (1260 – 1300 MHz)<br><br><br><br><br>Amateur (1 240 – 1 300 MHz) | |
| **1 300-1 350 MHz**<br><br>AERONAUTICAL RADIONAVIGATION 5.337<br><br>RADIOLOCATION<br><br>RADIONAVIGATION-SATELLITE (Earth-to-space)<br><br><br><br>5.149 5.337A | **1 300-1 350 MHz**<br><br>AERONAUTICAL RADIONAVIGATION 5.337<br><br>RADIOLOCATION<br><br>RADIONAVIGATION-SATELLITE (Earth-to-space)<br>Radio Astronomy<br><br><br>5.149 5.337A | <br><br>Air Traffic Control Radar (1 240 – 1 350 MHz)<br>Ground-based radars and associated airborne transponders<br><br><br>Radio Astronomy (Doppler shifted radiation from hydrogen | <br><br><br><br><br><br><br>See section 5 for coordination with radio astronomy |

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|---|---|---|---|
| **1 350-1 400 MHz**<br><br>FIXED<br><br><br><br>MOBILE<br>RADIOLOCATION<br><br><br><br><br><br>5.149 5.338 5.338A 5.339 | **1 350-1 400 MHz**<br><br>FIXED NF 14<br><br><br><br>MOBILE<br>RADIOLOCATION<br>Radio Astronomy<br><br><br><br><br>5.149 5.338A 5.339 | 1 350-1 375 MHz<br>Fixed links (duplex)<br>1 375-1 400 MHz<br>Fixed links (duplex)<br><br><br>Radio Astronomy applicable to band 1350 to 1370 MHz.<br>Radio Astronomy (Doppler shifted radiation from hydrogen | Paired with 1492-1517 MHz;<br>ITU-R F.1242 refers.<br>Paired with 1427-1452 MHz;<br>ITU-R F.1242 refers<br>Resolution 528 (Rev. WRC-19)<br>Resolution 739 (Rev. WRC-19).<br>See section 5 for coordination with radio astronomy |
| **1 400-1 427 MHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br><br>SPACE RESEARCH (passive)<br><br><br>5.340 5.341 | **1 400-1 427 MHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br><br>SPACE RESEARCH (passive)<br><br><br>5.340 5.341 | Radio Astronomy (Doppler shifted radiation from hydrogen<br>Passive sensing | All emissions are prohibited in this band |
| **1 427-1 429 MHz**<br><br>SPACE OPERATION (Earth-to-space)<br>FIXED | **1 427-1 429 MHz**<br><br>SPACE OPERATION (Earth-to-space)<br>FIXED NF14 | Fixed links (duplex)( 1 427-1 452 MHz)<br>IMT | Paired with 1 375 – 1 400 MHz<br>In accordance with Recommendation ITU-R F.1242 |

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|---|---|---|---|
| MOBILE except aeronautical mobile 5.341A 5.341B 5.341C<br><br>5.338A 5.341 | MOBILE except aeronautical mobile 5.341A<br><br>5.338A 5.341 | | ITU Res. 223 (Rev.WRC-15)<br>Recommendation ITU-R M.1036-6 (International Mobile Telecommunications (IMT))<br>RFSAP's to be developed<br>Resolution 528 (Rev. WRC-19)<br>Resolution 739 (Rev. WRC-19). |
| **1 429-1 452 MHz**<br><br>FIXED<br><br>MOBILE except aeronautical mobile 5.341A<br><br>5.338A 5.341 5.342 | **1 429-1 452 MHz**<br><br>FIXED<br><br>MOBILE except aeronautical mobile 5.341A<br><br>5.338A 5.341 | Fixed links (duplex)(1 427-1 452 MHz)<br><br>IMT | Paired with 1 375 – 1 400 MHz)<br>In accordance with Recommendation ITU-R F.1242<br>Recommendation ITU-R M.1036-6 (International Mobile Telecommunications (IMT))<br>RFSAP's to be developed<br>Resolution 528 (Rev. WRC-19)<br>Resolution 739 (Rev. WRC-19). |

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| **1 452-1 492 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile 5.346<br>BROADCASTING<br><br>BROADCASTING-SATELLITE 5.208B<br><br>5.341 5.342 5.345 | **1 452-1 492 MHz**<br><br>FIXED NF14<br>MOBILE except aeronautical mobile 5.346<br>BROADCASTING<br><br>BROADCASTING-SATELLITE 5.208B<br><br>5.341 5.345 | <br><br>IMT<br><br>Terrestrial Digital Audio Broadcasting (T-DAB) | <br><br>Resolution 528 (Rev. WRC-19)<br>Resolution 739 (Rev. WRC-19)..<br>Recommendation ITU-R M.1036-6 International Mobile Telecommunications (IMT))<br>Final Frequency Migration Plan 2019 (GG No.42337 Notice 36 of 2019)<br>RFSAP to be Developed. |
| **1 492-1 518 MHz**<br><br>FIXED<br><br>MOBILE except aeronautical mobile 5.341A<br><br>5.341 5.342 | **1 492-1 518 MHz**<br><br>FIXED<br><br>MOBILE except aeronautical mobile 5.341A<br><br>5.341 | <br><br>Fixed Links (1 492 – 1 517 MHz)<br>Single Frequency Links (1 517 – 1 525 MHz)<br>IMT | <br><br>Paired with 1 350 – 1 375 MHz.<br>In accordance with Recommendation ITU-R F.1242<br>ITU-R Res. 223 (Rev.WRC-15)<br>Resolution 528 (Rev. WRC-19) and Resolution 739 (Rev. WRC-19)<br>Recommendation ITU-R M.1036-6 International Mobile Telecommunications (IMT))<br>RFSAP's to be considered |

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| **1 518-1 525 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile<br>MOBILE-SATELLITE (space-to-Earth) 5.348 5.348A 5.348B 5.351A<br><br>5.341 5.342 | **1 518-1 525 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile<br>MOBILE-SATELLITE (space-to-Earth) 5.348 5.348A 5.351A<br><br>5.341 | IMT Satellite component | The band 1518-1559 MHz is identified for satellite component of IMT; Res.225 applies.<br>Radio Frequency Spectrum Assignment Plan GG42286 Notice 125 of 2019<br>Final Frequency Migration Plan 2019 (GG No.42337 Notice 36 of 2019) |
| **1 525-1 530 MHz**<br><br>SPACE OPERATION (space-to-Earth)<br>FIXED<br>MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A<br><br>Earth exploration-satellite<br>Mobile except aeronautical mobile 5.349<br><br>5.341 5.342 5.350 5.351 5.352A 5.354 | **1 525-1 530 MHz**<br><br>SPACE OPERATION (space-to-Earth)<br>FIXED<br>MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A<br><br>Earth exploration-satellite<br>Mobile except aeronautical mobile<br><br>5.341 5.351 5.354 | GMDSS Maritime satellite (1 525 – 1 544 MHz)<br>Mobile satellite (1544 – 1545 MHz)<br>Aeronautical Mobile satellite (1545 – 1555 MHz)<br>Land Mobile satellite (1555 – 1559 MHz) | ITU Resolution 212(Rev.WRC-19) and 225 (Rev WRC-07)<br><br>Paired with 1 626.5 – 1 660.5 MHz<br><br>The band 1518-1559 MHz is identified for satellite component of IMT; Res.225 applies. |

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| **1 530-1 535 MHz**<br><br>SPACE OPERATION (space-to-Earth)<br>MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A 5.353A<br><br>Earth exploration-satellite<br>Fixed<br>Mobile except aeronautical mobile<br><br>5.341 5.342 5.351 5.354 | **1 530-1 535 MHz**<br><br>SPACE OPERATION (space-to-Earth)<br>MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A 5.353A<br><br>Earth exploration-satellite<br>Fixed<br>Mobile except aeronautical mobile<br><br>5.341 5.351 5.354 | GMDSS Maritime satellite (1 525 – 1 544 MHz)<br>Mobile satellite (1544 – 1545 MHz)<br>Aeronautical Mobile satellite (1545 – 1555 MHz)<br>Land Mobile satellite (1555 – 1559 MHz) | Paired with 1 626.5 – 1 660.5 MHz<br><br>The band 1518-1559 MHz is identified for satellite component of IMT; Res.225 applies.<br>In the band 1530-1544 MHz priority for maritime mobile distress, urgency and safety communications (GMDSS); Res.222 applies. |
| **1 535-1 559 MHz**<br><br>MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A | **1 535-1 544 MHz**<br><br>MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A<br><br>5.341 5.351 5.353A 5.354 5.356 5.357 5.357A | GMDSS Maritime satellite (1 525 – 1 544 MHz) | Paired with 1 626.5 – 1 660.5 MHz<br>The band 1518-1559 MHz is identified for satellite component of IMT; Res.225 applies.<br>In the band 1530-1544 MHz priority for maritime mobile distress, urgency and safety communications (GMDSS); Res.222 applies. |
| | **1 544-1 545 MHz**<br><br>MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A | Mobile satellite (1544 – 1545 MHz) | |

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| | 5.341 5.351 5.353A 5.354 5.356 5.357 5.357A | (Distress and safety) | The band 1518-1559 MHz is identified for satellite component of IMT; Res.225 applies. |
| | **1 545-1 555 MHz**<br><br>AERONAUTICAL MOBILE (R)<br><br>MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A<br><br>5.341 5.351 5.353A 5.354 5.356 5.357 5.357A | Aeronautical Mobile satellite (1545 – 1555 MHz)<br>(Air to air)<br>(Ground to air) | The band 1518-1559 MHz is identified for satellite component of IMT; Res.225 applies. |
| 5.341 5.351 5.353A 5.354 5.355 5.356 5.357 5.357A 5.359 5.362A | **1 555-1 559 MHz**<br><br>MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A<br><br>5.341 5.351 5.353A 5.354 5.356 5.357 5.357A | Land Mobile satellite (1555 – 1559 MHz) | The band 1518-1559 MHz is identified for satellite component of IMT; Res.225 applies. |
| **1 559-1 610 MHz**<br><br>AERONAUTICAL RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE (space-to-Earth) | **1 559-1 610 MHz**<br><br>AERONAUTICAL RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE (space-to-Earth) | Global Positioning System (1 563.42 – 1 587.42 MHz)<br>GALILEO (1559.42 – 1591.42 MHz) | |

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| (space-to-space) 5.208B 5.328B 5.329A<br><br>5.341 | (space-to-space) 5.208B 5.328B 5.329A<br><br>5.341 | GLONAS (1592.9 – 1610.5 MHz) | |
| **1 610-1 610.6 MHz**<br><br>MOBILE-SATELLITE (Earth-to-space) 5.351A<br><br>AERONAUTICAL RADIONAVIGATION<br><br>5.341 5.355 5.359 5.364 5.366 5.367 5.368 5.369 5.371 5.372 | **1 610-1 610.6 MHz**<br><br>MOBILE-SATELLITE (Earth-to-space) 5.351A<br><br>AERONAUTICAL RADIONAVIGATION<br><br>Radiodetermination-satellite<br><br>5.341 5.364 5.366 5.367 5.368 5.371 5.372 | MSS (1 610 – 1 626.5 MHz)<br><br>GLONASS (1 592.9 – 1610.5 MHz)<br>Airborne electronic aids to air navigation and any directly associated ground-based or satellite-borne facilities | Paired with 2 483.5 – 2 500 MHz for some systems<br>The band 1610-1645.5 MHz is identified for satellite component of IMT; Res.225 applies.<br>This band is designated world-wide for the MSS. Paired with 2483.5-2484.1 MHz for some systems. |
| **1 610.6-1 613.8 MHz**<br><br>MOBILE-SATELLITE (Earth-to-space) 5.351A | **1 610.6-1 613.8 MHz**<br><br>MOBILE-SATELLITE (Earth-to-space) 5.351A | MSS (1 610 – 1 626.5 MHz) | Paired with 2 483.5 – 2 500 MHz for some systems<br>The band 1610-1645.5 MHz is identified for satellite component of IMT; Res.225 applies.<br>This band is designated world-wide for the MSS. Paired with 2484.1-2487.3 MHz for some systems. |

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| RADIO ASTRONOMY<br><br>AERONAUTICAL RADIONAVIGATION<br><br>5.149 5.341 5.355 5.359 5.364 5.366 5.367 5.368 5.369 5.371 5.372 | RADIO ASTRONOMY<br><br>AERONAUTICAL RADIONAVIGATION<br>Radiodetermination-satellite<br><br>5.149 5.341 5.364 5.366 5.367 5.368 5.371 5.372 | Radio Astronomy (Observation of OH radical and molecules)<br>Airborne electronic aids to air navigation and any directly associated ground-based or satellite-borne facilities | See Section 5 for coordination with radio astronomy |
| **1 613.8-1 621.35 MHz**<br><br>MOBILE-SATELLITE (Earth-to-space) 5.351A<br>AERONAUTICAL RADIONAVIGATION<br><br>Mobile-satellite (space-to-Earth) 5.208B<br><br>5.341 5.355 5.359 5.364 5.365 5.366 5.367 5.368 5.369 5.371 5.372 | **1 613.8-1 621.35 MHz**<br><br>MOBILE-SATELLITE (Earth-to-space) 5.351A<br>AERONAUTICAL RADIONAVIGATION<br><br>Mobile-satellite (space-to-Earth) 5.208B<br>Radiodetermination-satellite<br><br>5.341 5.364 5.365 5.366 5.367 5.368 5.371 5.372 | MSS (1 610 – 1 626.5 MHz)<br><br>Airborne electronic aids to air navigation and any directly associated ground-based or satellite-borne facilities | Paired with 2 483.5 – 2 500 MHz for some systems<br>The band 1610-1645.5 MHz is identified for satellite component of IMT; Res.225 applies.<br>Paired with 1593-1594 MHz for aeronautical public correspondence |

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| **1 621.35-1 626.5 MHz**<br><br>MOBILE-SATELLITE (Earth-to-space) 5.351A<br><br>AERONAUTICAL RADIONAVIGATION<br><br>MARITIME MOBILE-SATELLITE (space-to-Earth) 5.373 5.373A<br>Mobile-satellite (space-to-Earth) except maritime mobile-satellite (space-to-Earth)<br><br>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 MHz**<br><br>MOBILE-SATELLITE (Earth-to-space) 5.351A<br><br>AERONAUTICAL RADIONAVIGATION<br><br>MARITIME MOBILE-SATELLITE (space-to-Earth) 5.373 5.373A<br>Mobile-satellite (space-to-Earth) except maritime mobile-satellite (space-to-Earth ) 5.365<br>Radiodetermination-satellite 5.371<br><br>5.208B 5.341 5.364 5.366 5.368 5.372 | MSS (1 610 – 1 626.5 MHz)<br><br>Airborne electronic aids to air navigation and any directly associated ground-based or satellite-borne facilities | Paired with 2 483.5 – 2 500 MHz for some systems<br>The band 1610-1645.5 MHz is identified for satellite component of IMT; Res.225 applies.<br><br>Recommendation ITU-R RA769-2 and ITU RRA.1513-2 and Recommendation ITU-R M.1583-1 and Recommendation ITU-R RA.1631-0 all apply to this band. |
| **1 626.5-1 660 MHz**<br><br>MOBILE-SATELLITE (Earth-to-space) 5.351A | **1 626.5-1 645.5 MHz**<br><br>MOBILE-SATELLITE (Earth-to-space) 5.351A | GMDSS Maritime satellite (1 525 – 1 544 MHz)<br>Mobile satellite (1544 – 1545 MHz)<br>Aeronautical Mobile satellite (1545 – 1555 MHz)<br>Land Mobile satellite (1555 – 1559 MHz) | Paired with 1 626.5 – 1 660.5 MHz<br>The bands 1610-1645.5 MHz and 1646.5-1660.5 MHz are identified for satellite component of IMT; Res.225 applies.<br>In the band 1626.5-1645.5 MHz priority is given to maritime mobile distress, urgency and safety |

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| | 5.341 5.351 5.353A 5.354 5.357A 5.374 5.375 5.376 | | communications (GMDSS) ; Res.222 applies. |
| | **1 645.5-1 646.5 MHz**<br><br>MOBILE-SATELLITE (Earth-to-space) 5.351A<br><br>5.341 5.351 5.353A 5.354 5.357A 5.374 5.375 5.376 | GMDSS Maritime satellite (1 525 – 1 544 MHz)<br>Mobile satellite (1544 – 1545 MHz)<br>Aeronautical Mobile satellite (1545 – 1555 MHz)<br>Land Mobile satellite (1555 – 1559 MHz)<br>Distress and safety | Paired with 1 626.5 – 1 660.5 MHz<br>The bands 1610-1645.5 MHz and 1646.5-1660.5 MHz are identified for satellite component of IMT; Res.225 applies.<br>In the band 1626.5-1645.5 MHz priority is given to maritime mobile distress, urgency and safety communications (GMDSS) ; Res.222 applies. |
| | **1 646.5-1 656.5 MHz**<br><br>AERONAUTICAL MOBILE (R)<br>MOBILE-SATELLITE (Earth-to-space) 5.351A<br><br>5.341 5.351 5.353A 5.354 5.357A 5.374 5.375 5.376 | GMDSS Maritime satellite (1 525 – 1 544 MHz)<br>Mobile satellite (1544 – 1545 MHz)<br>Aeronautical Mobile satellite (1545 – 1555 MHz)<br>Land Mobile satellite (1555 – 1559 MHz)<br>Air to air<br>Air to ground | Paired with 1 626.5 – 1 660.5 MHz<br>The bands 1610-1645.5 MHz and 1646.5-1660.5 MHz are identified for satellite component of IMT; Res.225 applies.<br>In the band 1626.5-1645.5 MHz priority is given to maritime mobile distress, urgency and safety communications (GMDSS) ; Res.222 applies. |

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| | **1 656.5-1 660 MHz** | | |
| | MOBILE-SATELLITE (Earth-to-space) 5.351A | GMDSS Maritime satellite (1 525 – 1 544 MHz)<br>Mobile satellite (1544 – 1545 MHz)<br>Aeronautical Mobile satellite (1545 – 1555 MHz)<br>Land Mobile satellite (1555 – 1559 MHz) | Paired with 1 626.5 – 1 660.5 MHz<br>The bands 1610-1645.5 MHz and 1646.5-1660.5 MHz are identified for satellite component of IMT; Res.225 applies.<br>In the band 1626.5-1645.5 MHz priority is given to maritime mobile distress, urgency and safety communications (GMDSS) ; Res.222 applies. |
| 5.341 5.351 5.353A 5.354 5.355 5.357A 5.359 5.362A 5.374 5.375 5.376 | 5.341 5.351 5.353A 5.354 5.357A 5.374 5.375 5.376 | | |
| **1 660-1 660.5 MHz** | **1 660-1 660.5 MHz** | | |
| MOBILE-SATELLITE (Earth-to-space) 5.351A | MOBILE-SATELLITE (Earth-to-space) 5.351A | GMDSS Maritime satellite (1 525 – 1 544 MHz)<br>Mobile satellite (1544 – 1545 MHz)<br>Aeronautical Mobile satellite (1545 – 1555 MHz)<br>Land Mobile satellite (1555 – 1559 MHz) | Paired with 1 626.5 – 1 660.5 MHz<br>The band 1610-1645.5 MHz and 1646.5-1660.5 MHz are identified for satellite component of IMT; Res.225 applies. |
| RADIO ASTRONOMY | RADIO ASTRONOMY | Radio Astronomy (Observation of OH radical and molecules) | See Section 5 for coordination with radio astronomy |
| 5.149 5.341 5.351 5.354 5.362A 5.376A | 5.149 5.341 5.351 5.354 5.376A | | |

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| **1 660.5-1 668 MHz**<br><br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br><br>Fixed<br>Mobile except aeronautical mobile<br><br>5.149 5.341 5.379 5.379A | **1 660.5-1 668 MHz**<br><br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br><br>Fixed<br>Mobile except aeronautical mobile<br><br>5.149 5.341 5.379A | Radio Astronomy (Observation of OH radical and molecules)<br><br>Fixed Applications | See Section 5 for coordination with radio astronomy |
| **1 668-1 668.4 MHz**<br><br>MOBILE-SATELLITE (Earth-to-space) 5.351A 5.379B 5.379C<br><br>RADIO ASTRONOMY<br><br>SPACE RESEARCH (passive)<br><br>Fixed<br>Mobile except aeronautical mobile<br><br>5.149 5.341 5.379 5.379A | **1 668-1 668.4 MHz**<br><br>MOBILE-SATELLITE (Earth-to-space) 5.351A 5.379B 5.379C<br><br>RADIO ASTRONOMY<br><br>SPACE RESEARCH (passive)<br><br>Fixed<br>Mobile except aeronautical mobile<br><br>5.149 5.341 5.379A | IMT satellite component (1 668 – 1 675 MHz)<br><br>Radio Astronomy (Observation of OH radical and molecules) | The band 1668-1675 MHz is identified for satellite component of IMT; Res.225 applies.<br>See Section 5 for coordination with radio astronomy |
| **1 668.4-1 670 MHz**<br><br>METEOROLOGICAL AIDS<br>FIXED<br>MOBILE except aeronautical mobile | **1 668.4-1 670 MHz**<br><br>METEOROLOGICAL AIDS<br>FIXED<br>MOBILE except aeronautical mobile | Radiosonde (1 668 – 1 700 MHz) | |

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| MOBILE-SATELLITE (Earth-to-space) 5.351A 5.379B 5.379C<br><br>RADIO ASTRONOMY<br><br>5.149 5.341 5.379D 5.379E | MOBILE-SATELLITE (Earth-to-space) 5.351A 5.379B 5.379C<br><br>RADIO ASTRONOMY<br><br>5.149 5.341 5.379D 5.379E | IMT satellite component (1 668 – 1 675 MHz)<br><br>Radio Astronomy (Observation of OH radical and molecules) | The band 1668-1675 MHz is identified for satellite component of IMT; Res.225 applies.<br>See Section 5 for coordination with radio astronomy<br>Final Frequency Migration Plan 2019 (GG No.42337 Notice 36 of 2019) |
| **1 670-1 675 MHz**<br><br>METEOROLOGICAL AIDS<br>FIXED<br>METEOROLOGICAL-SATELLITE (space-to-Earth)<br>MOBILE<br>MOBILE-SATELLITE (Earth-to-space) 5.351A 5.379B<br><br>5.341 5.379D 5.379E 5.380A | **1 670-1 675 MHz**<br><br>METEOROLOGICAL AIDS<br>FIXED<br>METEOROLOGICAL-SATELLITE (space-to-Earth)<br>MOBILE<br>MOBILE-SATELLITE (Earth-to-space) 5.351A 5.379B<br><br>5.341 5.379D 5.379E 5.380A | Radiosonde (1 668 – 1 700 MHz)<br><br>IMT satellite component (1 668 – 1 675 MHz) | Final Frequency Migration Plan 2019 (GG No.42337 Notice 36 of 2019)<br><br>The band 1668-1675 MHz is identified for satellite component of IMT; Res.225 applies. |
| **1 675-1 690 MHz**<br><br>METEOROLOGICAL AIDS<br>FIXED<br>METEOROLOGICAL-SATELLITE (space-to-Earth)<br><br>MOBILE except aeronautical mobile<br><br>5.341 | **1 675-1 690 MHz**<br><br>METEOROLOGICAL AIDS<br>FIXED<br>METEOROLOGICAL-SATELLITE (space-to-Earth)<br><br>MOBILE except aeronautical mobile<br><br>5.341 | Radiosonde (1 668 – 1 700 MHz)<br>Fixed Applications | |

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| **1 690-1 700 MHz**<br><br>METEOROLOGICAL AIDS<br><br>METEOROLOGICAL-SATELLITE (space-to-Earth)<br>Fixed<br>Mobile except aeronautical mobile<br><br>5.289 5.341 5.382 | **1 690-1 700 MHz**<br><br>METEOROLOGICAL AIDS<br><br>METEOROLOGICAL-SATELLITE (space-to-Earth)<br>Fixed<br>Mobile except aeronautical mobile<br>Earth exploration-satellite (space-to-Earth)<br><br>5.289 5.341 | Radiosonde (1 668 – 1 700 MHz) | Channels 1695.6938 MHz; 1695.7250 MHz; 1695.7562 MHz; 1695.7874 MHz; 1691 MHz and 1694.5 MHz |
| **1 700-1 710 MHz**<br><br>FIXED<br>METEOROLOGICAL-SATELLITE (space-to-Earth)<br>MOBILE except aeronautical mobile<br><br>5.289 5.341 | **1 700-1 710 MHz**<br><br>FIXED<br>METEOROLOGICAL-SATELLITE (space-to-Earth)<br>MOBILE except aeronautical mobile<br>Earth exploration-satellite (space-to-Earth)<br><br>5.289 5.341 | Fixed links (single frequency) | |

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| **1 710-1 930 MHz**<br><br>FIXED<br><br><br><br>MOBILE 5.384A 5.388A 5.388B<br><br><br>

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| **1 930-1 970 MHz**<br><br>FIXED<br>MOBILE 5.388A 5.388B<br><br>5.388 | **1 930-1 970 MHz**<br><br>FIXED<br>MOBILE 5.388A NF9<br><br>5.388 | IMT2100 MTX (1920 – 1980 MHz) | Paired with BTX(2110 – 2170 MHz)<br>[FIXED (HAPS) (base stations for IMT)]<br>Resolution 221 (Rev. WRC-07) (International Mobile Telecommunications (IMT)) |
| **1 970-1 980 MHz**<br><br>FIXED<br>MOBILE 5.388A 5.388B<br><br>5.388 | **1 970-1 980 MHz**<br><br>FIXED<br>MOBILE 5.388A NF9<br><br>5.388 5.388B | IMT2100 MTX (1920 – 1980 MHz) | Paired with BTX( 2110 – 2170 MHz)<br>[FIXED (HAPS) (base stations for IMT)]<br>Resolution 221 (Rev. WRC-07) (International Mobile Telecommunications (IMT)) |
| **1 980-2 010 MHz**<br><br>FIXED<br><br>MOBILE<br>MOBILE-SATELLITE (Earth-to-space) 5.351A<br><br>5.388 5.389A 5.389B 5.389F | **1 980-2 010 MHz**<br><br>FIXED<br><br>MOBILE<br>MOBILE-SATELLITE (Earth-to-space) 5.351A<br><br>5.388 5.389A NF13 | Fixed links (1980 – 2010 MHz)<br>CGC/ATC fixed systems (1980 – 2010 MHz)<br>IMT (satellite) (1980-2010 MHz) | Paired with 2170 – 2200 MHz (International Mobile Telecommunications (IMT))<br>The development of satellites for IMT services to be monitored.<br>Final Frequency Migration Plan 2019 (GG No.42337 Notice 36 of 2019) |

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| **2 010-2 025 MHz**<br><br>FIXED<br><br>MOBILE 5.388A 5.388B<br><br><br><br><br>5.388 | **2 010-2 025 MHz**<br><br>FIXED<br><br>MOBILE 5.388A NF9<br><br><br><br><br>5.388 | <br><br><br><br>IMT (2010 – 2025 MHz) | <br><br>[FIXED (HAPS) (base stations for IMT)]<br>IMT TDD applications<br>Recommendation ITU-R M.1036<br>Resolution 221 (Rev. WRC-07)<br>(International Mobile Telecommunications (IMT)) |
| **2 025-2 110 MHz**<br><br>SPACE OPERATION (Earth-to-space) (space-to-space)<br>EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space)<br>FIXED<br>MOBILE 5.391<br>SPACE RESEARCH (Earth-to-space) (space-to-space)<br><br><br>5.392 | **2 025-2 110 MHz**<br><br>SPACE OPERATION (Earth-to-space) (space-to-space)<br>EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space)<br>FIXED NF14<br>MOBILE 5.391<br>SPACE RESEARCH (Earth-to-space) (space-to-space)<br><br><br>5.392 | <br><br><br>Earth exploration satellite applications<br><br>Fixed Links (2025 – 2110 MHz) | <br><br>Final Frequency Migration Plan 2019 (GG No.42337 Notice 36 of 2019)<br><br><br>Paired with 2200 – 2285 MHz<br>RFSAP GG 42230 Notice 75 of 2019. |
| **2 110-2 120 MHz**<br><br>FIXED | **2 110-2 120 MHz**<br><br>FIXED | | <br><br>FIXED (HAPS) (base stations for IMT)] |

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| MOBILE 5.388A 5.388B<br><br>SPACE RESEARCH (deep space) (Earth-to-space)<br><br>5.388 | MOBILE 5.388A NF9<br><br>SPACE RESEARCH (deep space) (Earth-to-space)<br><br>5.388 5.388B | IMT2100 BTX (2110 – 2170 MHz) | Paired with MTX(1920 – 1980 MHz)<br>Recommendation ITU-R M.1036 [Resolution 221 (Rev. WRC-07) (International Mobile Telecommunications (IMT)) |
| **2 120-2 160 MHz**<br><br>FIXED<br><br>MOBILE 5.388A 5.388B<br><br>5.388 | **2 120-2 160 MHz**<br><br>FIXED<br><br>MOBILE 5.388A NF9<br><br>5.388 5.388B | IMT-2100 BTX (2110 – 2170 MHz) | [FIXED (HAPS) (base stations for IMT)]<br>Paired with MTX(1920 – 1980 MHz)<br>Recommendation ITU-R M.1036 Resolution 221 (Rev. WRC-07) (International Mobile Telecommunications (IMT)) |
| **2 160-2 170 MHz**<br><br>FIXED<br><br>MOBILE 5.388A 5.388B<br><br>5.388 | **2 160-2 170 MHz**<br><br>FIXED<br><br>MOBILE 5.388A NF9<br><br>5.388 5.388B | IMT2100 BTX (2110 – 2170 MHz) | [FIXED (HAPS) (base stations for IMT)]<br>Paired with MTX(1920 – 1980 MHz)<br>Recommendation ITU-R M.1036 Resolution 221 (Rev. WRC-07) (International Mobile Telecommunications (IMT)) |



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| **2 170-2 200 MHz**<br><br>FIXED<br><br>MOBILE<br>MOBILE-SATELLITE (space-to-Earth) 5.351A<br><br>5.388 5.389A 5.389F | **2 170-2 200 MHz**<br><br>FIXED<br><br>MOBILE<br>MOBILE-SATELLITE (space-to-Earth) 5.351A<br><br>5.388 5.389A 5.389F NF13 | Fixed Links (2170 – 2200 MHz)<br>CGC/ATC fixed systems (1980 – 2010 MHz)<br><br>IMT (satellite) (2170-2200 MHz) | Final Frequency Migration Plan 2019 (GG No.42337 Notice 36 of 2019)<br><br>Paired with 1980 – 2010 MHz IMT (satellite) |
| **2 200-2 290 MHz**<br><br>SPACE OPERATION (space-to-Earth) (space-to-space)<br>EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space)<br>FIXED<br><br>MOBILE 5.391<br>SPACE RESEARCH (space-to-Earth) (space-to-space)<br><br>5.392 | **2 200-2 290 MHz**<br><br>SPACE OPERATION (space-to-Earth) (space-to-space)<br>EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space)<br>FIXED NF14<br><br>MOBILE 5.391<br>SPACE RESEARCH (space-to-Earth) (space-to-space)<br><br>5.392 | TT&C received from space<br><br>Earth exploration satellite applications<br><br>Fixed Links (2200 – 2285 MHz)<br>BFWA (2 285-2 300 MHz) | Final Frequency Migration Plan 2019 (GG No.42337 Notice 36 of 2019)<br><br>Paired with 2025 – 2110<br><br>Radio Frequency Spectrum Assignment Plan GG 42230 Notice 75 of 2019. |
| **2 290-2 300 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile | **2 290-2 300 MHz**<br><br>FIXED<br>MOBILE except aeronautical mobile | Fixed Links, BFWA (2 285-2 300 MHz) | Radio Frequency Spectrum Assignment Plan GG 41512 Notice 145 of 2018 |

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| SPACE RESEARCH (deep space) (space-to-Earth) | SPACE RESEARCH (deep space) (space-to-Earth) | (Coordination is expected prior to the implementation of these services) | |
| **2 300-2 450 MHz**<br><br>FIXED<br><br>MOBILE 5.384A<br><br><br><br><br><br><br>Amateur<br>Radiolocation<br><br><br><br><br><br><br><br>5.150 5.282 5.395 | **2 300-2 450 MHz**<br><br>FIXED<br><br>MOBILE 5.384A NF9<br><br><br><br><br><br><br>Amateur<br>Radiolocation<br><br>Amateur-satellite<br><br><br><br><br><br><br>5.150 5.282 5.395 | IMT2300 TDD (2300 – 2400 MHz)<br>WLAN, FDDA and model ctrl. (2400 – 2483.5 MHz)<br>Non-Specific SRDs and low power video surveillance (2400 – 2483.5 MHz)<br>RFID (2 400 – 2 483.5 MHz)<br><br>ISM applications (2400 – 2483.5 MHz)<br>Amateur-satellite (2400 – 2450 MHz) | International Mobile Telecommunication Roadmap (GG No.42829 Notice 600 of 2019) as amended.<br>Common international SRD band; see ITU-R Rec. SM.1896 latest version (above 2400 MHz)<br>Radio Frequency Spectrum Assignment Plan (GG N. 38640) as amended 30 March 2015.<br>Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015).<br>Recommendation ITU-R M.1036 (International Mobile Telecommunications (IMT))<br><br>Radio Frequency Spectrum Assignment Plan to be amended to incorporate capabilities and requirements for IMT2020.<br>Final Frequency Migration Plan 2019 (GG No.42337 Notice 36 of 2019) |

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| **2 450-2 483.5 MHz**<br><br>FIXED<br>MOBILE<br><br><br><br>Radiolocation<br><br><br><br><br><br>5.150 | **2 450-2 483.5 MHz**<br><br>FIXED<br>MOBILE<br><br><br><br>Radiolocation<br><br><br><br><br><br>5.150 | <br><br>WLAN, FDDA and model ctrl. (2400 – 2483.5 MHz)<br>RFID (2400 – 2483.5 MHz)<br>Non-Specific SRDs and low power video surveillance (2400 – 2483.5 MHz)<br>ISM applications (2400 – 2483.5 MHz) | <br><br><br><br>Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015).<br>Common international SRD band; see ITU-R Rec. SM.1896 latest version |
| **2 483.5-2 500 MHz**<br><br>FIXED<br><br>MOBILE<br>MOBILE-SATELLITE (space-to-Earth) 5.351A<br><br>RADIODETERMINATION-SATELLITE (space-to-Earth) 5.398<br>Radiolocation 5.398A<br><br><br><br>5.150 5.399 5.401 5.402 | **2 483.5-2 500 MHz**<br><br>FIXED<br><br>MOBILE<br>MOBILE-SATELLITE (space-to-Earth) 5.351A<br><br>RADIODETERMINATION-SATELLITE (space-to-Earth) 5.398<br><br>Radiolocation<br><br><br><br>5.150 5.399 5.401 5.402 | <br><br>Fixed links PTP/PTMP(2400-2500 MHz<br><br>Aeronautical Mobile Video surveillance<br>MSS (2483.5 – 2500 MHz)<br>The band 2 400-2 500 MHz is designated for ISM applications (5.150).<br>SRD's | <br><br>FS paired with 2300-2400 MHz<br><br>Unmanned aerial vehicles only<br>Some systems are paired with 1610 – 1626.5 MHz<br>The band 2483.5-2500 MHz is identified for satellite component of IMT; Res.225 applies.<br>Common international SRD band; see ITU-R Rec. SM.1896 latest version |

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| **2 500-2 520 MHz**<br><br>FIXED 5.410<br>MOBILE except aeronautical mobile 5.384A<br><br>5.412 | **2 500-2 520 MHz**<br><br>MOBILE except aeronautical mobile 5.384A NF9 | IMT2600 MTX (2500 – 2570 MHz) | Paired with 2620 – 2690 MHz<br>International Mobile Telecommunication Roadmap (GG No.42829 Notice 600 of 2019).<br>Radio Frequency Spectrum Assignment Plan on 22 May 2020 (Government Gazette 43341, Notice 285 of 2020).<br>Radio Frequency Spectrum Assignment Plan GG 43341 Notice 285 of 2020<br>Recommendation ITU-R M.1036 (International Mobile Telecommunications (IMT))<br>Radio Frequency Spectrum Assignment Plan to be amended to incorporate capabilities and requirements for IMT2020. |
| **2 520-2 655 MHz**<br><br>FIXED 5.410<br>MOBILE except aeronautical mobile 5.384A | **2 520-2 655 MHz**<br><br>MOBILE except aeronautical mobile 5.384A NF9 | IMT2600 MTX (2500 – 2570 MHz)<br>IMT2600 TDD (2570 – 2620 MHz)<br>IMT2600 BTX (2620 – 2690 MHz) | Paired with BTX (2620 – 2690 MHz)<br>Paired with 2500 – 2570 MHz<br>International Mobile Telecommunication Roadmap (GG No.42829 Notice 600 of 2019). |

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| BROADCASTING-SATELLITE<br>5.413 5.416<br><br>5.339 5.412 5.418B 5.418C | Earth exploration-satellite (passive)<br><br>Space research (passive)<br><br>5.339 5.418B 5.418C | IMT (2500-2690 MHz)<br><br>Earth exploration-satellite (passive)(2 640-2 655 MHz)<br><br>Space research (passive) (2 640-2 655 MHz) | Radio Frequency Spectrum Assignment Plan on 22 May 2020 (Government Gazette 43341, Notice 285 of 2020).<br>Recommendation ITU-R M.1036 The band 2 500-2 690 MHz is also used for BFWA in some SADC countries.<br>Radio Frequency Spectrum Assignment Plan GG 43341 Notice 285 of 202<br>(International Mobile Telecommunications (IMT))<br>Radio Frequency Spectrum Assignment Plan to be amended to incorporate capabilities and requirements for IMT2020. |
| **2 655-2 670 MHz**<br><br>FIXED 5.410<br>MOBILE except aeronautical mobile 5.384A<br><br>BROADCASTING-SATELLITE<br>5.208B 5.413 5.416<br>Earth exploration-satellite (passive)<br>Radio astronomy | **2 655-2 670 MHz**<br><br>MOBILE except aeronautical mobile 5.384A NF9<br><br>Earth exploration-satellite (passive)<br>Radio astronomy | IMT2600 BTX (2620 – 2690 MHz);<br>IMT2600 MTX (2500-2570 MHz)<br><br>Radio Astronomy (Continuum measurement and galactic studies) | Paired with MTX (2500 – 2570 MHz)<br><br>Radio Astronomy (2655 – 2690 MHz). See section 5 for coordination with radio astronomy |

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| Space research (passive)<br><br>5.149 5.412 | Space research (passive)<br><br>5.149 | | International Mobile Telecommunication Roadmap (GG No.42829 Notice 600 of 2019).<br>Radio Frequency Spectrum Assignment Plan on 22 May 2020 (Government Gazette 43341, Notice 285 of 2020)..<br>Recommendation ITU-R M.1036<br>Radio Frequency Spectrum Assignment Plan GG 43341 Notice 285 of 2020<br>(International Mobile Telecommunications (IMT)) |
| **2 670-2 690 MHz**<br><br>FIXED 5.410<br>MOBILE except aeronautical mobile 5.384A<br>Earth exploration-satellite (passive)<br>Radio astronomy<br>Space research (passive) | **2 670-2 690 MHz**<br><br>MOBILE except aeronautical mobile 5.384A<br>Earth exploration-satellite (passive)<br>Radio astronomy<br>Space research (passive) | IMT2600 BTX (2620 – 2690 MHz)<br>IMT2600 MTX (2500-2570 MHz)<br>Radio Astronomy (Continuum measurement and galactic studies) | Paired with 2500 – 2570 MHz International Mobile<br><br>See section 5 for coordination with radio astronomy<br><br>Telecommunication Roadmap (GG No.42829 Notice 600 of 2019).<br>Radio Frequency Spectrum Assignment Plan on 22 May 2020 |

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| 5.149 5.412 | 5.149 | | (Government Gazette 43341, Notice 285 of 2020).<br>Recommendation ITU-R M.1036 (International Mobile Telecommunications (IMT))<br><br>Radio Frequency Spectrum Assignment Plan to be amended to incorporate capabilities and requirements for IMT2020. |
| **2 690-2 700 MHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br><br>SPACE RESEARCH (passive)<br><br>5.340 5.422 | **2 690-2 700 MHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br><br>SPACE RESEARCH (passive)<br><br>5.340 | Passive sensing<br>Radio Astronomy (Continuum measurement and galactic studies) | |
| **2 700-2 900 MHz**<br><br>AERONAUTICAL RADIONAVIGATION 5.337<br><br>Radiolocation | **2 700-2 900 MHz**<br><br>AERONAUTICAL RADIONAVIGATION 5.337<br>METEOROLOGICAL AIDS<br><br>Radiolocation | Aeronautical radionavigation radars :<br>• Primary surveillance radar<br>• Meteorological radar<br>Government Services<br>Ground-based radars and associated airborne transponders | |

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| 5.423 5.424 | 5.423 | | |
| **2 900-3 100 MHz**<br><br>RADIOLOCATION 5.424A<br>RADIONAVIGATION 5.426<br><br>5.425 5.427 | **2 900-3 100 MHz**<br><br>RADIOLOCATION 5.424A<br>AERONAUTICAL<br>RADIONAVIGATION 5.337<br><br>5.425 5.427 | Aeronautical radionavigation radars :<br>• Primary surveillance radar<br>• Meteorological radar | |
| **3 100-3 300 MHz**<br><br>RADIOLOCATION<br>Earth exploration-satellite (active)<br>Space research (active)<br><br>5.149 5.428 | **3 100-3 300 MHz**<br><br>RADIOLOCATION<br>Earth exploration-satellite (active)<br>Space research (active)<br><br>5.149 | | |
| **3 300-3 400 MHz**<br><br>RADIOLOCATION<br><br>5.149 5.429 5.429A 5.429B 5.430 | **3 300-3 400 MHz**<br><br>RADIOLOCATION<br><br>MOBILE except aeronautical mobile<br><br>5.149 5.429A 5.429B | Radio astronomy (CH Molecules)<br><br>IMT Res. 223 (Rev.WRC-15) | See section 5 for coordination with radio astronomy<br>Recommendation ITU-R M.1036-6 (International Mobile Telecommunications (IMT))<br>Develop a RFSAP for the band |

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| **3 400-3 600 MHz**<br><br>FIXED<br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE except aeronautical mobile 5.430A<br><br>Radiolocation<br><br>5.431 | **3 400-3 600 MHz**<br><br>FIXED<br><br>MOBILE except aeronautical mobile 5.430A NF9<br><br>Radiolocation | BFWA<br><br>IMT3500 TDD (3400 – 3600 MHz) | The band 3400 -3600 MHz is also used for BFWA in some SADC countries<br>International Mobile Telecommunication (GG No.42829 Notice 600 of 2019). Radio Frequency Spectrum Assignment Plan (GG N. 38640) as amended 30 March 2015.<br>Recommendation ITU-R M.1036-6 (International Mobile Telecommunications (IMT)) |
| **3 600-4 200 MHz**<br><br>FIXED<br><br>FIXED-SATELLITE (space-to-Earth)<br><br>Mobile | **3 600-4 200 MHz**<br><br>FIXED<br><br>FIXED-SATELLITE (space-to-Earth)<br>NF14 | Fixed links (4 GHz) (3600 – 4200 MHz)<br>C-band downlink (VSAT/SNG/PTP links)(3600 – 4200 MHz)<br>BFWA (3600 – 3800 MHz) | The sub-band 3 600-3 800 MHz could be used for BFWA where frequency sharing with FS PTP and/or FSS is feasible.<br>The channelling arrangement for PTP links in this band is based on ITU-R Recommendation F.635 latest versionAnnex 1.<br>The sub-band 3 600-4 200 MHz is used for medium and high capacity PTP links and FSS. |

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| | | | In the band 3 600-3 800 MHz, FS PTP and FSS applications will have to operate on coordinated basis.<br>Operators are encouraged to apply for spectrum licenses including registering all C-Band Earth stations on the ICASA online database |
| **4 200-4 400 MHz**<br><br>AERONAUTICAL MOBILE (R) 5.436<br>AERONAUTICAL RADIONAVIGATION 5.438 | **4 200-4 204 MHz**<br><br>AERONAUTICAL MOBILE (R) 5.436<br>AERONAUTICAL RADIONAVIGATION 5.438<br><br>STANDARD FREQUENCY AND TIME SIGNAL-SATELLITE (4 202 MHz) (space-to-Earth)<br>Earth exploration-satellite (passive)<br>Space research (passive)<br><br>5.437 5.440 | Wireless avionics intra-communication systems<br>Radio altimeters on board aircraft and associated ground transponders)<br>Radars | |
| 5.437 5.439 5.440 | **4 204-4 400 MHz**<br><br>AERONAUTICAL MOBILE (R) 5.436<br>AERONAUTICAL RADIONAVIGATION 5.438<br>Earth exploration-satellite (passive)<br>Space research (passive)<br><br>5.437 5.440 | Wireless avionics intra-communication systems<br><br>Radio altimeters on board aircraft and associated ground transponders) | |

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| **4 400-4 500 MHz**<br><br>FIXED<br><br>MOBILE 5.440A | **4 400-4 500 MHz**<br><br>FIXED NF14 NF15<br><br>MOBILE | Fixed links (4.8 GHz) (4400 – 5000 MHz)<br>Government services<br>Outside Broadcast links<br>Electronic News Gathering | |
| **4 500-4 800 MHz**<br><br>FIXED<br><br>FIXED-SATELLITE (space-to-Earth) 5.441<br>MOBILE 5.440A | **4 500-4 800 MHz**<br><br>FIXED NF14<br><br>FIXED-SATELLITE (space-to-Earth) 5.441<br>MOBILE<br>NF15 | Fixed links (4.8 GHz) (4400 – 5000 MHz)<br>Government services<br>Outside Broadcast links<br>Electronic News Gathering<br>SRD(reservoir level probing radar) | The band 4 500-4 800 MHz is part of the APP30B Plan (FSS space-to-Earth). Refer to Annex B.Ultra wideband applications (UWB) see ITU-R Recommendation SN.1896-1. Rec SM.1755 and Rep SM.2153-7 (latest versions) |
| **4 800-4 990 MHz**<br><br>FIXED<br><br>MOBILE 5.440A 5.441A 5.441B 5.442<br><br>Radio astronomy | **4 800-4 825 MHz**<br><br>FIXED NF14<br><br>MOBILE 5.441B<br><br>Radio astronomy<br><br>NF15 | Fixed links (4.8 GHz) (4400 – 5000 MHz)<br>Government services<br>Outside Broadcast Links Electronic News Gathering<br><br>Radio astronomy (Observations of formaldehyde (H2CO) interstellar clouds) | Recommendation ITU-R M.1036-6 (International Mobile Telecommunications (IMT))<br>RFSAP to be developed<br>See section 5 for coordination with radio astronomy |

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| | **4 825-4 835 MHz**<br><br>FIXED NF14 NF15<br><br>MOBILE except aeronautical mobile 5.441B<br><br>Radio astronomy<br><br>5.149 | <br><br>Outside Broadcast Links Electronic News Gathering<br>Government services<br><br>Radio astronomy (Observations of formaldehyde (H2CO) interstellar clouds) | <br><br><br>Recommendation ITU-R M.1036-6 (International Mobile Telecommunications (IMT))<br>RFSAP to be developed<br>See section 5 for coordination with radio astronomy |
| | **4 835-4 950 MHz**<br><br>FIXED NF14 NF15<br><br>MOBILE 5.441B<br><br>Radio astronomy | <br><br>Fixed links (4.8 GHz) (4400 – 5000 MHz)<br>Government services<br>Outside Broadcast Links Electronic News Gathering<br>Radio astronomy (Observations of formaldehyde (H2CO) interstellar clouds) | <br><br>Recommendation ITU-R M.1036-6 (International Mobile Telecommunications (IMT))<br>RFSAP to be developed<br><br>See section 5 for coordination with radio astronomy |
| | **4 950-4 990 MHz**<br><br>FIXED NF14 NF15<br>MOBILE except aeronautical mobile5.441B<br><br>Earth exploration-satellite (passive) | <br><br>Fixed links (4.8 GHz) (4400 – 5000 MHz)<br>Government services<br>Outside Broadcast Links Electronic News Gathering | <br><br>Recommendation ITU-R M.1036-6 (International Mobile Telecommunications (IMT))<br>RFSAP to be developed |



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| | Radio astronomy<br><br>Space research (passive) | Radio astronomy (Observations of formaldehyde (H2CO) interstellar clouds) | See section 5 for coordination with radio astronomy |
| 5.149 5.339 5.443 | 5.149 5.339 | | |
| **4 990-5 000 MHz**<br><br>FIXED<br><br><br><br>MOBILE except aeronautical mobile<br>RADIO ASTRONOMY<br><br>Space research (passive)<br><br>5.149 | **4 990-5 000 MHz**<br><br>FIXED NF14<br><br><br><br>MOBILE except aeronautical mobile<br>RADIO ASTRONOMY<br><br>Space research (passive)<br><br>5.149 NF15 | <br><br>Fixed links (4.8 GHz) (4400 – 5000 MHz)<br>Outside Broadcast links<br>Electronic News Gathering<br>Government services<br><br>Radio astronomy (Observations of formaldehyde (H2CO) interstellar clouds) | <br><br><br><br><br><br><br>See section 5 for coordination with radio astronomy |
| **5 000-5 010 MHz**<br><br>AERONAUTICAL MOBILE-SATELLITE (R) 5.443AA<br>AERONAUTICAL RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE (Earth-to-space) | **5 000-5 010 MHz**<br><br>AERONAUTICAL MOBILE-SATELLITE (R) 5.443AA<br>AERONAUTICAL RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE (Earth-to-space) | | |
| **5 010-5 030 MHz**<br><br>AERONAUTICAL MOBILE-SATELLITE (R) 5.443AA | **5 010-5 030 MHz**<br><br>AERONAUTICAL MOBILE-SATELLITE (R) 5.443AA | | |

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| AERONAUTICAL RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space)<br><br>5.328B 5.443B | AERONAUTICAL RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.443B<br><br>5.328B | | |
| **5 030-5 091 MHz**<br><br>AERONAUTICAL MOBILE (R) 5.443C<br>AERONAUTICAL MOBILE-SATELLITE (R) 5.443D<br>AERONAUTICAL RADIONAVIGATION<br><br>5.444 | **5 030-5 091 MHz**<br><br>AERONAUTICAL MOBILE (R) 5.443C<br>AERONAUTICAL MOBILE-SATELLITE (R) 5.443D<br>AERONAUTICAL RADIONAVIGATION<br><br>5.444 | Microwave Landing System<br><br>AERONAUTICAL RADIONAVIGATION (MLS) (precision approach and landing)] | |
| **5 091-5 150 MHz**<br><br>FIXED-SATELLITE (Earth-to-space) 5.444A<br><br>AERONAUTICAL MOBILE 5.444B<br><br>AERONAUTICAL MOBILE-SATELLITE (R) 5.443AA | **5 091-5 150 MHz**<br><br>FIXED-SATELLITE (Earth-to-space) 5.444A<br><br>AERONAUTICAL MOBILE 5.444B<br>AERONAUTICAL MOBILE (telemetry)<br>AERONAUTICAL MOBILE-SATELLITE (R) 5.443AA | Feeder links of non-GSO-satellite systems in the MSS<br>NGSO MSS feeder links (5091 – 5150 MHz)<br>Surface applications at airports<br><br>Air to ground | Resolution 114 (Rev.WRC-15) |

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| AERONAUTICAL RADIONAVIGATION<br><br>5.444 | AERONAUTICAL RADIONAVIGATION | AERONAUTICAL RADIONAVIGATION (MLS) (precision approach and landing) | |
| **5 150-5 250 MHz**<br><br>AERONAUTICAL RADIONAVIGATION<br>FIXED-SATELLITE (Earth-to-space) 5.447A<br><br>MOBILE except aeronautical mobile 5.446A 5.446B | **5 150-5 216 MHz**<br><br>AERONAUTICAL RADIONAVIGATION<br>FIXED-SATELLITE (Earth-to-space) 5.447A<br>FIXED-SATELLITE (space-to-Earth)<br><br>MOBILE except aeronautical mobile 5.446A 5.446B<br>AERONAUTICAL MOBILE (telemetry)<br>Radiodetermination-satellite (space-to-Earth)<br><br>5.446 5.446C 5.447B 5.447C | Feeder links of non-GSO-satellite systems in the MSS<br>NGSO MSS feeder links (5091 – 5150 MHz)<br>WAS / RLAN (5150 – 5350 MHz)<br><br>Air-to-ground | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015).<br><br>ITU Resolution 229 revised WRC-19 |
| | **5 216-5 250 MHz**<br><br>AERONAUTICAL MOBILE (telemetry) (air to ground)<br><br>AERONAUTICAL RADIONAVIGATION<br>FIXED-SATELLITE (Earth-to-space) 5.447A | WAS / RLAN (5150 – 5350 MHz) (indoor use only – ITU Res229 WRC-19)<br>Air-to-ground<br><br>Feeder links of non-GSO-satellite systems in the MSS | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015).<br><br>ITU Resolution 229 revised WRC-19 |

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| 5.446 5.446C 5.446D 5.447 5.447B 5.447C | MOBILE except aeronautical mobile 5.446A 5.446B<br><br>5.446 5.446C 5.447B 5.447C | | |
| **5 250-5 255 MHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>RADIOLOCATION<br>SPACE RESEARCH 5.447D<br>MOBILE except aeronautical mobile 5.446A 5.447F<br><br>5.447E 5.448 5.448A | **5 250-5 255 MHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>RADIOLOCATION<br>SPACE RESEARCH 5.447D<br>MOBILE except aeronautical mobile 5.446A 5.447F<br>Space research<br><br>5.448A | WAS / RLAN (5150 – 5350 MHz) (indoor use only)<br>Active spaceborne sensors<br>Other than active spaceborne sensors | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015).<br><br>ITU Resolution 229 revised WRC-19 |
| **5 255-5 350 MHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>RADIOLOCATION<br>SPACE RESEARCH (active)<br>MOBILE except aeronautical mobile 5.446A 5.447F<br><br>5.447E 5.448 5.448A | **5 255-5 350 MHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>RADIOLOCATION<br>SPACE RESEARCH (active)<br>MOBILE except aeronautical mobile 5.446A 5.447F<br><br>5.448A | WAS / RLAN (5150 – 5350 MHz) (Power limitation ITU Resolution 229 WRC-19)) | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015).<br><br>ITU Resolution 229 revised WRC-19 |

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| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| **5 350-5 460 MHz**<br><br>EARTH EXPLORATION-SATELLITE (active) 5.448B<br>SPACE RESEARCH (active) 5.448C<br>AERONAUTICAL RADIONAVIGATION 5.449<br>RADIOLOCATION 5.448D | **5 350-5 460 MHz**<br><br>EARTH EXPLORATION-SATELLITE (active) 5.448B<br>SPACE RESEARCH (active) 5.448C<br>AERONAUTICAL RADIONAVIGATION 5.449<br>RADIOLOCATION 5.448D | Ground based airborne weather radars and associated airborne beacons | |
| **5 460-5 470 MHz**<br><br>RADIONAVIGATION 5.449<br><br>EARTH EXPLORATION-SATELLITE (active)<br>SPACE RESEARCH (active)<br>RADIOLOCATION 5.448D<br><br>5.448B | **5 460-5 470 MHz**<br><br>AERONAUTICAL RADIONAVIGATION 5.449<br>EARTH EXPLORATION-SATELLITE (active)<br>SPACE RESEARCH (active)<br>RADIOLOCATION 5.448D<br>RADIONAVIGATION except aeronautical radionavigation<br><br>5.448B | Ground based airborne weather radars and associated airborne beacons | ITU Resolution 229 revised WRC-19 |
| **5 470-5 570 MHz**<br><br>MARITIME RADIONAVIGATION<br>MOBILE except aeronautical mobile 5.446A 5.450A<br>EARTH EXPLORATION-SATELLITE (active) | **5 470-5 570 MHz**<br><br>MARITIME RADIONAVIGATION<br>MOBILE except aeronautical mobile 5.446A 5.450A<br>EARTH EXPLORATION-SATELLITE (active) | WAS / RLAN (5470 – 5725 MHz) | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015).<br><br>ITU Resolution 229 revised WRC-19 |

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|---|---|---|---|
| SPACE RESEARCH (active)<br>RADIOLOCATION 5.450B<br><br>5.448B 5.450 5.451 | SPACE RESEARCH (active)<br>RADIOLOCATION 5.450B<br><br>5.448B | | |
| **5 570-5 650 MHz**<br><br>MARITIME<br>RADIONAVIGATION<br><br>MOBILE except aeronautical mobile 5.446A 5.450A<br>RADIOLOCATION 5.450B<br><br>5.450 5.451 5.452 | **5 570-5 600MHz**<br><br>MARITIME<br>RADIONAVIGATION<br><br>MOBILE except aeronautical mobile 5.446A 5.450A<br>RADIOLOCATION 5.450B<br><br>5.452 | Location Radar<br>WAS / RLAN (5470 – 5725 MHz)<br><br>Weather Radars (5600 – 5650 MHz) | ITU Resolution 229 revised WRC-19<br>Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). |
| | **5 600-5 650MHz**<br><br>MARITIME<br>RADIONAVIGATION<br>METEOROLOGICAL AIDS<br><br>MOBILE except aeronautical mobile 5.446A 5.450A<br>RADIOLOCATION 5.450B<br><br>5.452 | Ground based meteorological radars (5600 – 5650 MHz)<br>WAS / RLAN (5470 – 5725 MHz)<br>Weather Radars (5600 – 5650 MHz) | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015).<br><br>ITU Resolution 229 revised WRC-19 |

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|---|---|---|---|
| **5 650-5 725 MHz**<br><br>RADIOLOCATION<br>MOBILE except aeronautical mobile 5.446A 5.450A<br>Amateur<br><br>Space research (deep space) | **5 650-5 670 MHz**<br><br>RADIOLOCATION<br>MOBILE except aeronautical mobile 5.446A 5.450A<br>Amateur<br>Amateur-satellite (Earth-to-space)<br>Space research (deep space)<br><br>5.282 5.453 | WAS / RLAN (5470 – 5725 MHz) (Power limitation ITU Resolution 229 WRC-19)) | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015).<br><br>ITU Resolution 229 revised WRC-19 |
| 5.282 5.451 5.453 5.454 5.455 | **5 670-5 725 MHz**<br><br>RADIOLOCATION<br>MOBILE except aeronautical mobile 5.446A 5.450A<br>Amateur<br>Space research (deep space)<br><br>5.282 5.453 | WAS / RLAN (5470 – 5725 MHz) (indoor use only) | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). |
| **5 725-5 830 MHz**<br><br>FIXED-SATELLITE (Earth-to-space)<br>RADIOLOCATION<br>Amateur | **5 725-5 830 MHz**<br><br>FIXED-SATELLITE (Earth-to-space)<br>RADIOLOCATION<br>Amateur<br>Fixed NF16 | Fixed links (5725 – 5850 MHz)<br>RTT data (5795 – 5815 MHz)<br>ISM applications (5725 – 5875 MHz)<br>BFWA (5725-5850 MHz)<br>ISM (5725-5875 MHz)<br>RTTT (Road Transport and Traffic Telematics) (5795-5815 MHz) | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015).<br>.<br>BFWA in some SADC countries is limited to below 5850 MHz in order to protect FSS in the band 5850-6425 MHz |

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|---|---|---|---|
| 5.150 5.451 5.453 5.455 | 5.150 5.453 | SRD applications (5 725-5 875 MHz)<br>SRD - Transport and information control systems (5 805-5 815 MHz) | Common international SRD band; see ITU-R Rec. SM.1896 latest version<br>Transport information and control systems Recommendation ITU-R M.1453 |
| **5 830-5 850 MHz**<br><br>FIXED-SATELLITE (Earth-to-space)<br>RADIOLOCATION<br>Amateur<br>Amateur-satellite (space-to-Earth)<br><br>5.150 5.451 5.453 5.455 | **5 830-5 850 MHz**<br><br>FIXED-SATELLITE (Earth-to-space)<br>RADIOLOCATION<br>Amateur<br>Amateur-satellite (space-to-Earth)<br>Fixed NF16<br><br>5.150 5.453 | Fixed links BFWA (5725 – 5850 MHz)<br>ISM applications (5725 – 5875 MHz)<br>SRD's – Reservoir Level Probing Radars | BFWA in some SADC countries is limited to below 5850 MHz in order to protect FSS in the band 5850-6425 MHz<br>Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 3417238641, 3130 March 2015). |
| **5 850-5 925 MHz**<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space)<br>MOBILE | **5 850-5 925 MHz**<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space)<br>MOBILE | PTP<br>C-band uplink (VSAT/SNG links)<br><br>ISM applications (5725 – 5875 MHz)<br>Fixed-satellite uplinks (PTP/VSAT/SNG) (5850-6425 MHz)<br>FIXED links (5850-5925 MHz)<br>ISM (5725-5875 MHz) | FS could be used for temporary OB links. |

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|---|---|---|---|
| 5.150 | 5.150 | | |
| **5 925-6 700 MHz**<br><br>FIXED 5.457<br><br>FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B<br><br>MOBILE 5.457C | **5 925-6 425 MHz**<br><br>FIXED 5.457 NF14<br><br>FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B<br><br>MOBILE<br><br>5.149 5.440 5.458 | Fixed links - Lower 6 GHz (5925-6425 MHz) BFWA<br>Fixed-satellite uplinks (PTP/VSAT/SNG) (5850-6425 MHz)<br>ESVs (5925 – 6425 MHz)<br>Radio astronomy (observation of Methanol) | Channelling plan for L6 GHz band in accordance with ITU-R Rec. F.383 latest version.<br>Earth Station onboard vessels (ESV) also allowed under FSS.<br>Resolution 902 (WRC-03)<br>Consideration may be made for future License exempt provided it is feasible for the protection of incumbent service. |
| | **6 425-6 429 MHz**<br><br>FIXED 5.457 NF14<br><br>FIXED-SATELLITE (Earth-to-space)<br><br>MOBILE<br><br>STANDARD FREQUENCY AND TIME SIGNAL-SATELLITE (6 427 MHz) (space-to-Earth) | Upper 6 GHz (6425-7110 MHz), BFWA<br>Fixed-satellite uplinks (PTP/VSAT/SNG) (5850-6425 MHz)<br>Radio astronomy (observation of Methanol) | Channelling plan for U6 GHz band in accordance with ITU-R Rec. F.384 latest version.<br>Resolution 150 (WRC-12) |

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|---|---|---|---|
| | 5.149 5.440 5.458 | | |
| 5.149 5.440 5.458 | **6 429-6700 MHz**<br><br>FIXED 5.457<br><br>MOBILE<br><br>5.458 | Upper 6 GHz (6425-7110 MHz), BFWA<br><br>Radio astronomy (observation of Methanol) | Channelling plan for U6 GHz band in accordance with ITU-R Rec. F.384 latest version.<br>Resolution 150 (WRC-12) |
| **6 700-7 075 MHz**<br><br>FIXED<br><br>FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.441<br><br>MOBILE<br><br>5.458 5.458A 5.458B | **6 700-7 075 MHz**<br><br>FIXED NF14<br><br>FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.441<br><br>MOBILE<br><br>5.458 5.458A 5.458B | Fixed Links (U6) (6425 – 7110 MHz) | Channelling plan for U6 GHz band in accordance with ITU-R Rec. F.384 latest version.<br>The band 6 725-7 025 MHz is part of the APP30B Plan (FSS Earth-to-space); refer to Annex B. |
| **7 075-7 145 MHz**<br><br>FIXED | **7 075-7 145 MHz**<br><br>FIXED NF14 | Fixed Links (U6) (6425 – 7110 MHz) | Channelling plan for U6 band in accordance with ITU-R Rec. F.384 latest version. |

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| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| MOBILE<br><br>5.458 5.459 | MOBILE<br><br>5.458 | Fixed Links (L7) (7110 – 7425 MHz) | Channelling plan for L7 band is in accordance with ITU-R Rec. F.385 latest version Annex 3. |
| **7 145-7 190 MHz**<br><br>FIXED<br>MOBILE<br>SPACE RESEARCH (deep space) (Earth-to-space)<br><br>5.458 5.459 | **7 145-7 190 MHz**<br><br>FIXED<br>MOBILE<br>SPACE RESEARCH (deep space) (Earth-to-space)<br><br>5.458 | Fixed links - Lower 7 GHz (7110-7425 MHz) | Channelling plan for L7 band in accordance with ITU-R Rec. F.385 latest version Annex 3. |
| **7 190-7 235 MHz**<br><br>EARTH EXPLORATION-SATELLITE (Earth-to-space) 5.460A 5.460B<br>FIXED<br>MOBILE<br>SPACE RESEARCH (Earth-to-space) 5.460<br><br>5.458 5.459 | **7 190-7 235 MHz**<br><br>EARTH EXPLORATION-SATELLITE (Earth-to-space) 5.460A 5.460B<br>FIXED NF14<br>MOBILE<br>SPACE RESEARCH (except deep space) (Earth-to-space) 5.460<br><br>5.458 | Tracking, telemetry and command for spacecraft operation<br><br>Fixed Links (L7) (7110 – 7425 MHz) | SANAS to erected a facility near Matjiesfontein |
| **7 235-7 250 MHz** | **7 235-7 250 MHz** | Tracking, telemetry and command for spacecraft operation | |

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|---|---|---|---|
| EARTH EXPLORATION-SATELLITE (Earth-to-space)<br>5.460A<br>FIXED<br>MOBILE<br><br>5.458 | EARTH EXPLORATION-SATELLITE (Earth-to-space)<br>5.460A<br>FIXED NF14<br>MOBILE<br><br>5.458 | Fixed links - Lower 7 GHz (7110-7425 MHz) | Channelling plan for L7 band in accordance with ITU-R Rec. F.385 latest version Annex 3. |
| **7 250-7 300 MHz**<br><br>FIXED<br><br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE<br><br>5.461 | **7 250-7 300 MHz**<br><br>FIXED NF14<br><br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE<br>MOBILE-SATELLITE (space-to-Earth)<br><br>5.461 | Fixed links - Lower 7 GHz (7110-7425 MHz) | Channelling plan for L7 band in accordance with ITU-R Rec. F.385 latest version Annex 3.<br>RFSAP to be developed. |
| **7 300-7 375 MHz**<br><br>FIXED<br><br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE except aeronautical mobile | **7 300-7 375 MHz**<br><br>FIXED<br><br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE except aeronautical mobile<br>MOBILE-SATELLITE (space-to-Earth) | Fixed links - Lower 7 GHz (7110-7425 MHz) and Upper 7 GHz (7425-7750 MHz) | Channelling plan for L7 band in accordance with ITU-R Rec. F.385 latest version Annex 3.<br>Channelling plan for U7 band in accordance with ITU-R Rec. F.385 latest version Annex 3.<br>RFSAP to be developed. |

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|---|---|---|---|
| 5.461 | 5.461 | | |
| **7 375-7 450 MHz**<br><br>FIXED<br><br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE except aeronautical mobile<br>MARITIME MOBILE SATELLITE (space-to-Earth)<br><br>5.461AA 5.461AB | **7 375-7 450 MHz**<br><br>FIXED NF14<br><br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE except aeronautical mobile<br>MARITIME MOBILE SATELLITE (space-to-Earth) (GSO)<br><br>5.461AA 5.461AB | Fixed links - Lower 7 GHz (7110-7425 MHz) and Upper 7 GHz (7425-7750 MHz) | Channelling plan for L7 band in accordance with ITU-R Rec. F.385 Annex 3.<br>Channelling plan for U7 band in accordance with ITU-R Rec. F.385 latest verssion Annex 3. |
| **7 450-7 550 MHz**<br><br>FIXED<br><br>FIXED-SATELLITE (space-to-Earth)<br>METEOROLOGICAL-SATELLITE (space-to-Earth)<br><br>MOBILE except aeronautical mobile<br>MARITIME MOBILE-SATELLITE (space-to-Earth)<br>5.461AA 5.461AB | **7 450-7 550 MHz**<br><br>FIXED NF14<br>F<br>IXED-SATELLITE (space-to-Earth)<br>METEOROLOGICAL-SATELLITE (GSO) (space-to-Earth)<br>MOBILE except aeronautical mobile<br>MARITIME MOBILE-SATELLITE (space-to-Earth) (GSO) 5.461AA 5.461AB | Fixed links - Upper 7 GHz (7425-7750 MHz) | Channelling plan for U7 band in accordance with ITU-R Rec. F.385 latest version Annex 3. |

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|---|---|---|---|
| 5.461A | 5.461A | | |
| **7 550-7 750 MHz**<br><br>FIXED<br><br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE except aeronautical mobile<br>MARITIME MOBILE-SATELLITE (space-to-Earth)<br><br>5.461AA 5.461AB | **7 550-7 750 MHz**<br><br>FIXED NF14<br><br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE except aeronautical mobile<br>MARITIME MOBILE-SATELLITE (space-to-Earth) | Fixed links - Upper 7 GHz (7425-7750 MHz) | Channelling plan for U7 band in accordance with ITU-R Rec. F.385 latest version Annex 3. |
| **7 750-7 900 MHz**<br><br>FIXED<br><br>METEOROLOGICAL-SATELLITE (space-to-Earth) 5.461B<br>MOBILE except aeronautical mobile | **7 750-7 900 MHz**<br><br>FIXED NF14<br><br>METEOROLOGICAL-SATELLITE(non-GSO) (space-to-Earth) 5.461B<br>MOBILE except aeronautical mobile | Fixed links - Lower 8 GHz (7725-8275 MHz) | Channelling plan for L8 band in accordance with ITU-R Rec. F.386 latest version Annex 1. |
| **7 900-8 025 MHz**<br><br>FIXED<br><br>FIXED-SATELLITE (Earth-to-space)<br>MOBILE | **7 900-8 025 MHz**<br><br>FIXED NF14<br><br>FIXED-SATELLITE (Earth-to-space)<br>MOBILE<br>MOBILE-SATELLITE (Earth-to-space) | Fixed links - Lower 8 GHz (7725-8275 MHz) | Channelling plan for L8 band in accordance with ITU-R Rec. F.386 latest version Annex 1. |

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|---|---|---|---|
| 5.461 | 5.461 | | |
| **8 025-8 175 MHz**<br><br>EARTH EXPLORATION-SATELLITE (space-to-Earth)<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space)<br>MOBILE 5.463<br><br>5.462A | **8 025-8 175 MHz**<br><br>EARTH EXPLORATION-SATELLITE (space-to-Earth)<br><br>FIXED NF14<br>FIXED-SATELLITE (Earth-to-space)<br>MOBILE 5.463<br><br>5.462A 5.463 | Earth exploration satellite systems<br><br>Fixed links - Lower 8 GHz (7725-8275 MHz) | Channelling plan for L8 band in accordance with ITU-R Rec. F.386 latest version Annex 1. |
| **8 175-8 215 MHz**<br><br>EARTH EXPLORATION-SATELLITE (space-to-Earth)<br>FIXED<br><br>FIXED-SATELLITE (Earth-to-space)<br>METEOROLOGICAL-SATELLITE (Earth-to-space)<br>MOBILE 5.463<br><br>5.462A | **8 175-8 215 MHz**<br><br>EARTH EXPLORATION-SATELLITE (space-to-Earth)<br>FIXED NF14<br><br>FIXED-SATELLITE (Earth-to-space)<br>METEOROLOGICAL-SATELLITE (Earth-to-space)<br>MOBILE 5.463<br><br>5.462A 5.463 | Earth exploration satellite systems<br><br>Fixed links - Lower 8 GHz (7725-8275 MHz)<br><br>Ground to air | Channelling plan for L8 band in accordance with ITU-R Rec. F.386 latest version Annex 1. |
| **8 215-8 400 MHz**<br><br>EARTH EXPLORATION-SATELLITE (space-to-Earth)<br>FIXED | **8 215-8 400 MHz**<br><br>EARTH EXPLORATION-SATELLITE (space-to-Earth)<br>FIXED NF14 | Ground to air | |

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|---|---|---|---|
| FIXED-SATELLITE (Earth-to-space)<br>MOBILE 5.463<br><br>5.462A | FIXED-SATELLITE (Earth-to-space)<br>MOBILE 5.463<br><br>5.462A 5.463 | Fixed links - Lower 8 GHz (7725-8275 MHz) and Upper 8 GHz (8275-8500 MHz) | Channelling plan for L8 band in accordance with ITU-R Rec. F.386 Annex 1.<br>Channelling plan for U8 band in accordance with ITU-R Rec. F.386 latesst version Annex 1. |
| **8 400-8 500 MHz**<br><br>FIXED<br><br>MOBILE except aeronautical mobile<br>SPACE RESEARCH (space-to-Earth) 5.465 5.466 | **8 400-8 450 MHz**<br><br>FIXED NF14<br><br>MOBILE except aeronautical mobile<br>SPACE RESEARCH(deep space) (space-to-Earth) 5.465 | Fixed links - Upper 8 GHz (8275-8500 MHz) | Channelling plan for U8 band in accordance with ITU-R Rec. F.386 latest version Annex 1. |
| | **8 450-8 500 MHz**<br><br>FIXED NF14<br><br>MOBILE except aeronautical mobile<br>SPACE RESEARCH (space-to-Earth) | Fixed links - Upper 8 GHz (8275-8500 MHz) | Channelling plan for U8 band in accordance with ITU-R Rec. F.386 latest version Annex 1. |
| **8 500-8 550 MHz**<br><br>RADIOLOCATION<br><br>5.468 5.469 | **8 500-8 550 MHz**<br><br>RADIOLOCATION | RADARS. aeronautical radio navigation e.g. precision airfield approach radars. | |
| **8 550-8 650 MHz** | **8 550-8 650 MHz** | | |

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|---|---|---|---|
| EARTH EXPLORATION-SATELLITE (active)<br>RADIOLOCATION<br>SPACE RESEARCH (active)<br><br>5.468 5.469 5.469A | EARTH EXPLORATION-SATELLITE (active)<br>RADIOLOCATION<br>SPACE RESEARCH (active)<br><br>5.469A | RADARS. aeronautical radionavigation e.g. precision airfield approach radars | |
| **8 650-8 750 MHz**<br><br>RADIOLOCATION<br><br>5.468 5.469 | **8 650-8 750 MHz**<br><br>RADIOLOCATION | RADARS. aeronautical radio navigation e.g. precision airfield approach radars | |
| **8 750-8 850 MHz**<br><br>RADIOLOCATION<br>AERONAUTICAL<br>RADIONAVIGATION 5.470<br><br>5.471 | **8 750-8 850 MHz**<br><br>RADIOLOCATION<br>AERONAUTICAL<br>RADIONAVIGATION 5.470 | RADARS. aeronautical radionavigation e.g. precision airfield approach radars<br>Airborne Doppler navigation aids (8 800 MHz) | |
| **8 850-9 000 MHz**<br><br>RADIOLOCATION<br>MARITIME<br>RADIONAVIGATION 5.472<br><br>5.473 | **8 850-9 000 MHz**<br><br>RADIOLOCATION<br>MARITIME<br>RADIONAVIGATION 5.472 | RADARS. aeronautical radionavigation e.g. precision airfield approach radars<br>Shore-based radars | |
| **9 000-9 200 MHz** | **9 000-9 200 MHz** | | |



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| AERONAUTICAL<br>RADIONAVIGATION 5.337<br>RADIOLOCATION<br><br>5.471 5.473A | AERONAUTICAL<br>RADIONAVIGATION 5.337<br>RADIOLOCATION<br><br>5.473A | Approach radars<br>RADARS. aeronautical radionavigation e.g. precision airfield approach radars<br>Ground-based radars and associated airborne transponders | |
| **9 200-9 300 MHz**<br><br>EARTH EXPLORATION-SATELLITE (active) 5.474A 5.474B 5.474C<br>RADIOLOCATION<br>MARITIME<br>RADIONAVIGATION 5.472 | **9 200-9 225 MHz**<br><br>EARTH EXPLORATION-SATELLITE (active) 5.474A 5.474B 5.474C<br>RADIOLOCATION<br>MARITIME<br>RADIONAVIGATION 5.472<br><br>5.474 5.474D | Field Disturbance and Doppler Apparatus (9200 – 9975 MHz)<br>Harbour radars<br>RADARS. aeronautical radionavigation e.g. precision airfield approach radars<br>Shore-based radars | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). |
| | **9 225-9 300 MHz**<br><br>EARTH EXPLORATION-SATELLITE (active) 5.474A 5.474B 5.474C<br>RADIOLOCATION<br>MARITIME<br>RADIONAVIGATION<br><br>5.474 5.474D | Field Disturbance and Doppler Apparatus (9200 – 9975 MHz)<br>Harbour radars<br>RADARS. aeronautical radionavigation e.g. precision airfield approach radars | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). |

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|---|---|---|---|
| 5.473 5.474 5.474D | | Shore-based radars | |
| **9 300-9 500 MHz**<br><br>RADIONAVIGATION 5.475<br><br>EARTH EXPLORATION-SATELLITE (active)<br>SPACE RESEARCH (active)<br>RADIOLOCATION | **9 300-9 320 MHz**<br><br>RADIONAVIGATION except aeronautical radionavigation<br>EARTH EXPLORATION-SATELLITE (active)<br>SPACE RESEARCH (active)<br>RADIOLOCATION<br><br>AERONAUTICAL RADIONAVIGATION<br><br>5.427 5.474 5.475 5.475A 5.475B 5.476A | Shore based radars (9380 – 9440 MHz)<br>Field Disturbance and Doppler Apparatus (9200 – 9975 MHz)<br>RADARS. aeronautical radionavigation e.g. precision airfield approach radars<br>Airborne weather radars<br>Ground-based radar beacons<br>Ground-based radars | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). |
| | **9 320-9 500 MHz** | | |

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| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| 5.427 5.474 5.475A 5.475B 5.476A | RADIONAVIGATION except aeronautical radionavigation<br>EARTH EXPLORATION-SATELLITE (active)<br>SPACE RESEARCH (active)<br>RADIOLOCATION<br><br>AERONAUTICAL RADIONAVIGATION<br><br>5.427 5.474 5.475 5.475A 5.475B 5.476A | Shore based radars (9380 – 9440 MHz)<br>Field Disturbance and Doppler Apparatus (9200 – 9975 MHz)<br><br>RADARS. aeronautical radionavigation e.g. precision airfield approach radars<br>Airborne weather radars<br>Ground-based radar beacons<br>Ground-based radars<br>Airborne weather radars | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). |
| **9 500-9 800 MHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>RADIOLOCATION<br>RADIONAVIGATION<br>SPACE RESEARCH (active) | **9 500-9 800 MHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>RADIOLOCATION<br>RADIONAVIGATION<br>SPACE RESEARCH (active) | Field Disturbance and Doppler Apparatus (9200 – 9975 MHz)<br>RADARS. aeronautical radionavigation e.g. precision airfield approach radars | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). |

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| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| 5.476A | 5.476A | | |
| **9 800-9 900 MHz**<br><br>RADIOLOCATION<br><br>Earth exploration-satellite (active)<br>Space research (active)<br>Fixed<br><br>5.477 5.478 5.478A 5.478B | **9 800-9 900 MHz**<br><br>RADIOLOCATION<br><br>Earth exploration-satellite (active)<br>Space research (active)<br>Fixed<br><br>5.478A 5.478B | Field Disturbance and Doppler Apparatus (9200 – 9975 MHz) | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). |
| **9 900-10 000 MHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>5.474A 5.474B 5.474C<br>RADIOLOCATION<br>Fixed | **9 900-9 975 MHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>5.474A 5.474B 5.474C<br>RADIOLOCATION<br><br>Fixed<br><br>5.474D 5.479 | Field Disturbance and Doppler Apparatus (9200 – 9975 MHz)<br>RADARS. aeronautical radionavigation e.g. precision airfield approach radars | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). |
| | **9 975-10 000 MHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>5.474A 5.474B 5.474C<br>RADIOLOCATION | Field Disturbance and Doppler Apparatus (9200 – 9975 MHz) | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). |

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|---|---|---|---|
| 5.474D 5.477 5.478 5.479 | Fixed<br>Meteorological-satellite<br><br>5.474D 5.479 | RADARS. aeronautical radionavigation e.g. precision airfield approach radars<br>Weather radars | |
| **10-10.4 GHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>5.474A 5.474B 5.474C<br>FIXED<br>MOBILE<br>RADIOLOCATION<br>Amateur | **10-10.025 GHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>5.474A 5.474B 5.474C<br>FIXED NF14<br>MOBILE<br>RADIOLOCATION<br>Amateur<br>Meteorological-satellite<br><br>5.474D 5.479 | Fixed PtP Links | |
| | **10.025-10.4 GHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>5.474A 5.474B 5.474C<br>FIXED NF14<br>MOBILE<br>RADIOLOCATION<br>Amateur | Fixed PtP Links | |

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|---|---|---|---|
| 5.474D 5.479 | 5.474D 5.479 | | |
| **10.4-10.45 GHz**<br><br>FIXED<br><br>MOBILE<br>RADIOLOCATION<br>Amateur | **10.4-10.45 GHz**<br><br>FIXED NF14<br><br>MOBILE<br>RADIOLOCATION<br>Amateur | Low power video links (10.0 – 10.15 GHz)<br>BFWA (10.15 – 10.3 GHz)<br><br>Motion sensors | Paired with 10.50-10.65 GHz<br>Channelling plan for 10.5 GHz band in accordance with ITU-R Rec. F.1568 latest version Annex 1. |
| **10.45-10.5 GHz**<br><br>RADIOLOCATION<br><br>Amateur<br>Amateur-satellite<br><br>5.481 | **10.45-10.5 GHz**<br><br>RADIOLOCATION<br><br>Amateur<br>Amateur-satellite | Radiolocation Radars<br>Motion Sensors | |
| **10.5-10.55 GHz**<br><br>FIXED<br><br>MOBILE<br><br>Radiolocation | **10.5-10.55 GHz**<br><br>FIXED NF14<br><br>MOBILE<br><br>Radiolocation | BFWA (10.5 – 10.65 GHz)<br>SAP/SAB Applications (Video connections) (10.5 – 10.68 GHz)<br>FDDA (10.5 – 10.6 GHz) | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015).<br>Paired with 10.15-10.30 GHz<br>Channelling plan for 10.5 GHz band in accordance with ITU-R Rec. F.1568 latest version Annex 1. |

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|---|---|---|---|
| | | | |
| **10.55-10.6 GHz**<br><br>FIXED<br><br>MOBILE except aeronautical mobile<br>Radiolocation | **10.55-10.6 GHz**<br><br>FIXED NF14<br><br>MOBILE except aeronautical mobile<br>Radiolocation | BFWA (10.5 – 10.65 GHz)<br>SAP/SAB Applications (video connections) (10.5 – 10.68 GHz)<br>FDDA (10.5 – 10.6 GHz) | Paired with 10.15 – 10.3 GHz Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015).<br>Paired with 10.15-10.30 GHz<br>Channelling plan for 10.5 GHz band in accordance with ITU-R Rec. F.1568 latest version Annex 1 |
| **10.6-10.68 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED<br>MOBILE except aeronautical mobile<br><br>RADIO ASTRONOMY<br><br>RESEARCH (passive)<br>Radiolocation<br><br>5.149 5.482 5.482A | **10.6-10.68 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED NF14<br>MOBILE except aeronautical mobile<br><br>RADIO ASTRONOMY<br><br>RESEARCH (passive)<br>Radiolocation<br><br>5.149 5.482 5.482A | BFWA (10.5 – 10.65 GHz)<br>SAP/SAB Applications (video connections) (10.5 – 10.68 GHz)<br><br>Radio astronomy (Non thermal synchrotron and enigmatic quasars)<br>Motion sensors | Paired with 10.15 – 10.3 GHz<br>Channelling plan for 10.5 GHz band in accordance with ITU-R Rec. F.1568 latest version Annex 1.<br>For sharing between EESS (passive) and the fixed and mobile service Res.751 applies.<br><br>See section 5 for coordination with radio astronomy |
| **10.68-10.7 GHz** | **10.68-10.7 GHz** | | |

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|---|---|---|---|
| EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br><br>5.340 5.483 | EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br><br>5.340 | Radio astronomy (Non thermal synchrotron and enigmatic quasars) | See section 5 for coordination with radio astronomy |
| **10.7-10.95 GHz**<br><br>FIXED<br><br><br>FIXED-SATELLITE (space-to-Earth) 5.441 (Earth-to-space) 5.484<br><br>MOBILE except aeronautical mobile | **10.7-10.95 GHz**<br><br>FIXED<br><br><br>FIXED-SATELLITE (space-to-Earth) 5.441 (Earth-to-space) 5.484<br><br>MOBILE except aeronautical mobile | Feeder links in the BSS<br>Fixed Links (11 GHz) (10.7 – 11.7 GHz)<br><br>DTH Applications under the FSS | This band is used for Fixed links (11 GHz) (10.7-11.7 GHz). The channeling plan for FS Links are in accordance with ITU-R Rec.F387.latest version<br>The band is also available for FSS Planned services (see Appendix 30B).<br>The use of the band 10.7-11.7 GHz by the fixed-satellite service (Earth-to-space) is limited, can also be used for BSS feeder links (see 5.484). |
| **10.95-11.2 GHz**<br><br>FIXED | **10.95-11.2 GHz**<br><br>FIXED | Feeder links in the BSS<br>Fixed Links (11 GHz) (10.7 – 11.7 GHz)<br><br>DTH Applications under the FSS Ku-band downlink (VSAT/SNG) | This band is used for Fixed links (11 GHz) (10.7-11.7 GHz).<br>The channeling plan for FS Links are in accordance with ITU-R Rec.F387 latest version.. |

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| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B (Earth-to-space) 5.484<br><br>MOBILE except aeronautical mobile | FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B (Earth-to-space) 5.484<br><br>MOBILE except aeronautical mobile | | This band is also used for FSS (downlink) (VSAT/SNG/BSS feeder links).<br>The use of the band 10.7-11.7 GHz by the fixed-satellite service (Earth-to-space) is limited to can also be used for BSS feeder links (see 5.484). |
| **11.2-11.45 GHz**<br><br>FIXED<br><br>FIXED-SATELLITE (space-to-Earth) 5.441 (Earth-to-space) 5.484<br><br>MOBILE except aeronautical mobile | **11.2-11.45 GHz**<br><br>FIXED<br><br>FIXED-SATELLITE (space-to-Earth) 5.441 (Earth-to-space) 5.484<br><br>MOBILE except aeronautical mobile | Feeder links in the BSS<br>Fixed Links (11 GHz) (10.7 – 11.7 GHz)<br><br>DTH Applications under the FSS | This band is used for Fixed links (11 GHz) (10.7-11.7 GHz). The channeling plan for FS Links are in accordance with ITU-R Rec.F387 latest version.<br>The band is also available for FSS Planned services (see Appendix 30B).<br>The use of the band 10.7-11.7 GHz by the fixed-satellite service (Earth-to-space) is limited to can also be used for BSS feeder links (see 5.484). |
| **11.45-11.7 GHz**<br><br>FIXED | **11.45-11.7 GHz**<br><br>FIXED NF14 | Fixed Links (11 GHz) (10.7 – 11.7 GHz) | This band is used for Fixed links (11 GHz) (10.7-11.7 GHz). The channeling plan for FS Links are in |

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|---|---|---|---|
| FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B (Earth-to-space) 5.484<br><br>MOBILE except aeronautical mobile | FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B (Earth-to-space) 5.484<br><br>MOBILE except aeronautical mobile | Fixed-satellite downlinks (PTP/VSAT/SNG),<br>Feeder links in the BSS<br>DTH Applications under the FSS | accordance with ITU-R Rec.F387 latest version.<br>This band is also used for FSS (downlink) (VSAT/SNG/BSS feeder links).<br>The use of the band 10.7-11.7 GHz by the fixed-satellite service (Earth-to-space) is limited to can also be used for BSS feeder links (see 5.484). |
| **11.7-12.5 GHz**<br><br>FIXED<br><br>MOBILE except aeronautical mobile<br>BROADCASTING<br>BROADCASTING-SATELLITE 5.492<br><br>5.487 5.487A | **11.7-12.5 GHz**<br><br>FIXED<br><br>MOBILE except aeronautical mobile<br>BROADCASTING<br>BROADCASTING-SATELLITE 5.492<br>FIXED-SATELLITE (non-GSO) (space-to-Earth)<br><br>5.487 5.487A | Fixed links<br>OB links<br>ENG<br><br>Broadcast satellite systems<br><br>BSS feeder links | This band is available for BSS in accordance with Appendix 30 of ITU RR. Refer to Annex B. |
| **12.5-12.75 GHz**<br><br>FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B (Earth-to-space) | **12.5-12.75 GHz**<br><br>FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B (Earth-to-space) | FSS uplinks (VSAT/SNG) 12.5 – 12.75 GHz<br>Aeronautical Earth Stations/ESV/ESIM Applications | Article 9.12 applies<br>Res. 155 (WRC-195) applies |

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|---|---|---|---|
| 5.494 5.495 5.496 | | NGSO FSS<br>Fixed Links | |
| **12.75-13.25 GHz**<br><br>FIXED<br><br>FIXED-SATELLITE (Earth-to-space) 5.441<br><br>MOBILE<br>Space research (deep space) (space-to-Earth) | **12.75-13.25 GHz**<br><br>FIXED NF14<br><br>FIXED-SATELLITE (Earth-to-space) 5.441<br><br>MOBILE<br>Space research (deep space) (space-to-Earth) | Fixed Links (13 GHz) (12.75 – 13.25 GHz) | Channelling plan for 13 GHz band in accordance with ITU-R Rec. F.497 latest version.<br>The band 12.75-13.25 GHz is part of the APP30B Plan (FSS Earth-to-space); refer to Annex B.<br>Article 9.12 applies<br>Res. 172 (WRC-19) applies |
| **13.25-13.4 GHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>AERONAUTICAL RADIONAVIGATION 5.497<br><br>SPACE RESEARCH (active)<br><br>5.498A 5.499 | **13.25-13.4 GHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>AERONAUTICAL RADIONAVIGATION 5.497<br><br>SPACE RESEARCH (active)<br><br>5.498A | Airborne Doppler Radar<br>Doppler navigation aids | |
| **13.4-13.65 GHz** | **13.4-13.65 GHz** | SRD: | ITU-R Rec SM 1896-1 and |

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|---|---|---|---|
| EARTH EXPLORATION-SATELLITE (active)<br>FIXED SATELLITE (space-to-Earth) 5.499A 5.499B<br><br>RADIOLOCATION<br>SPACE RESEARCH 5.499C 5.499D<br><br>Standard frequency and time signal-satellite (Earth-to-space)<br><br>5.499E 5.500 5.501 5.501B | EARTH EXPLORATION-SATELLITE (active)<br>FIXED SATELLITE (GSO) (space-to-Earth) 5.499A 5.499B<br>RADIOLOCATION<br>SPACE RESEARCH 5.499C 5.499D<br><br>SPACE RESEARCH (space-to-Earth)<br>SPACE RESEARCH (space-to-space)<br>Standard frequency and time signal-satellite (Earth-to-space)<br><br>5.499E 5.501B<br>5.499 5.499E 5.500 5.501 5.501B | Radio Determination Allications<br><br>Active spaceborne sensors<br>Relay data from GSO space stations to associated Earth stations<br>Relay data from GSO space stations to associated non-GSO space stations<br><br>Space research | Report ITU-R SM.2153-7 latest versions |
| **13.65-13.75 GHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>RADIOLOCATION<br>SPACE RESEARCH 5.501A<br><br>Standard frequency and time signal-satellite (Earth-to-space)<br><br>5.499 5.500 5.501 5.501B | **13.65-13.75 GHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>RADIOLOCATION<br>SPACE RESEARCH 5.501A<br><br>Standard frequency and time signal-satellite (Earth-to-space)<br><br>5.501B | FDDA (13.4 – 14 GHz)<br>RADIOLOCATION<br>Active spaceborne sensors<br>Other than active spaceborne sensors | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). |

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|---|---|---|---|
| **13.75-14 GHz**<br><br>FIXED-SATELLITE (Earth-to-space) 5.484A<br><br>RADIOLOCATION<br>Earth exploration-satellite<br>Standard frequency and time signal-satellite (Earth-to-space)<br>Space research<br><br>5.499 5.500 5.501 5.502 5.503 | **13.75-14 GHz**<br><br>FIXED-SATELLITE (Earth-to-space) 5.484A<br><br>RADIOLOCATION<br>Earth exploration-satellite<br>Standard frequency and time signal-satellite (Earth-to-space)<br>Space research<br><br>5.502 5.503 | FSS uplinks (PTP/VSAT/SNG) (13.75-14.5 GHz)<br>FDDA (13.4 – 14 GHz) | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). |
| **14-14.25 GHz**<br><br>FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.484B 5.506 5.506B<br><br>RADIONAVIGATION 5.504<br>Mobile-satellite (Earth-to-space) 5.504B 5.504C 5.506A<br>Space research<br><br>5.504A 5.505 | **14-14.25 GHz**<br><br>FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.484B 5.506 5.506B NF17<br><br>RADIONAVIGATION 5.504<br>Mobile-satellite (Earth-to-space) 5.504B 5.504C 5.506A<br>Space research<br><br>5.504A | FSS uplinks (PTP/VSAT/SNG) (13.75-14.5 GHz)<br>ESVs (14 -14.5 GHz)<br>Feeder links in the BSS | Earth Station onboard vessels (ESV) also allowed under FSS; Res. 902 applies.<br><br>The band 14.0-14.5 GHz may also be used for AES (aircraft-to-space station). |
| **14.25-14.3 GHz**<br><br>FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.484B 5.506 5.506B | **14.25-14.3 GHz**<br><br>FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.484B 5.506 5.506B NF17 | FSS uplinks (PTP/VSAT/SNG) (13.75-14.5 GHz)<br>ESVs (14 -14.5 GHz) | Earth Station onboard vessels (ESV) also allowed under FSS; Res. 902 applies. |

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|---|---|---|---|
| RADIONAVIGATION 5.504<br>Mobile-satellite (Earth-to-space) 5.504B 5.506A 5.508A<br>Space research<br><br>5.504A 5.505 5.508 | RADIONAVIGATION 5.504<br>Mobile-satellite (Earth-to-space) 5.504B 5.506A<br>Space research<br><br>5.504A 5.508A | Feeder links in the BSS<br>Aeronautical earth stations/ESV/ESIM Applications<br>Fixed links | The band 14.0-14.5 GHz may also be used for AES (aircraft-to-space station).<br>Recommendation ITU-R M.1643-0 (WRC-15) |
| **14.3-14.4 GHz**<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.484B 5.506 5.506B<br><br>MOBILE except aeronautical mobile<br>Mobile-satellite (Earth-to-space) 5.504B 5.506A 5.509A<br>Radionavigation-satellite<br><br>5.504A | **14.3-14.4 GHz**<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.484B 5.506 5.506B NF17<br><br>MOBILE except aeronautical mobile<br>Mobile-satellite (Earth-to-space) 5.504B 5.506A 5.509A<br>Radionavigation-satellite<br><br>5.504A | FSS uplinks (PTP/VSAT/SNG) (13.75-14.5 GHz)<br>ESVs (14 -14.5 GHz)<br>Feeder links in the BSS<br>Aeronautical earth stations/ESV/ESIM Applications<br>Fixed links | Earth Station on board vessels (ESV) also allowed under FSS; Res. 902 applies.<br>The band 14.0-14.5 GHz may also be used for AES (aircraft-to-space station).<br>Recommendation ITU-R M.1643-0 (WRC-15) |

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|---|---|---|---|
| **14.4-14.47 GHz**<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.484B 5.506 5.506B<br><br>MOBILE except aeronautical mobile<br>Mobile-satellite (Earth-to-space) 5.504B 5.506A 5.509A<br>Space research (space-to-Earth)<br><br>5.504A | **14.4-14.47 GHz**<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.484B 5.506 5.506B NF17<br><br>MOBILE except aeronautical mobile<br>Mobile-satellite (Earth-to-space) 5.504B 5.506A 5.509A<br>Space research (space-to-Earth)<br><br>5.504A | FSS uplinks (PTP/VSAT/SNG) (13.75-14.5 GHz)<br>ESVs (14 -14.5 GHz)<br>Feeder links in the BSS<br>Aeronautical earth stations/ESV/ESIM Applications<br>Fixed links | Earth Station onboard vessels (ESV) also allowed under FSS; Res. 902 applies.<br>The band 14.0-14.5 GHz may also be used for AES (aircraft-to-space station).<br>Recommendation ITU-R M.1643-0 (WRC-15) |
| **14.47-14.5 GHz**<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.506 5.506B<br><br>MOBILE except aeronautical mobile<br>Mobile-satellite (Earth-to-space) 5.504B 5.506A 5.509A<br>Radio astronomy<br><br>5.149 5.504A | **14.47-14.5 GHz**<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.506 5.506B NF17<br><br>MOBILE except aeronautical mobile<br>Mobile-satellite (Earth-to-space) 5.504B 5.506A<br>Radio astronomy<br><br>5.149 5.504A | FSS uplinks (PTP/VSAT/SNG) (13.75-14.5 GHz)<br>ESVs (14 -14.5 GHz)<br>Feeder links in the BSS<br>Aeronautical earth stations/ESV/ESIM Applications<br>Fixed links<br><br>Radio Astronomy (non-thermal synchrotron and enigmatic quasars | Earth Station onboard vessels (ESV) also allowed under FSS; Res. 902 applies.<br>The band 14.0-14.5 GHz may also be used for AES (aircraft-to-space station).<br><br>See section 5 for coordination with radio astronomy |
| **14.5-14.75 GHz**<br><br>FIXED | **14.5-14.75 GHz**<br><br>FIXED | | |

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| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| FIXED-SATELLITE (Earth-to-space) 5.509B 5.509C 5.509D 5.509E 5.509F 5.510<br><br>MOBILE<br>Space research 5.509G | FIXED-SATELLITE (Earth-to-space) 5.509B 5.509C 5.509D 5.509E 5.509F 5.510<br><br>MOBILE<br>SPACE RESEARCH (Earth-to-space) 5.509G | Fixed links - 15 GHz (14.5-15.35 GHz)<br>Feeder links in the BSS<br>Relay data to GSO space stations from associated Earth stations<br>Other than relay data to GSO space stations from associated Earth stations | Channelling plan for 15 GHz band in accordance with ITU-R Rec. F.636.latest version<br>The band 14.5-14.8 GHz is part of the APP30A Plan (Feeder Links for BSS) for some SADC countries.<br>Refer to Annex B. |
| **14.75-14.8 GHz**<br><br>FIXED<br><br>FIXED-SATELLITE (Earth-to-space) 5.510<br><br>MOBILE<br><br>Space research 5.509G | **14.75-14.8 GHz**<br><br>FIXED NF14<br><br>FIXED-SATELLITE (Earth-to-space) 5.510<br><br>MOBILE<br><br>SPACE RESEARCH (Earth-to-space) 5.509G | Fixed Links (15 GHz) (14.5 – 15.35 GHz)<br>BSS feeder links<br>Relay data to GSO space stations from associated Earth stations<br>Other than relay data to GSO space stations from associated Earth stations | Channelling plan for 15 GHz band in accordance with ITU-R Rec. F.636 latest version.<br>The band 14.5-14.8 GHz is part of the APP30A Plan (Feeder Links for BSS) for some SADC countries.<br>Refer to Annex B. |
| **14.8-15.35 GHz** | **14.8-15.2 GHz** | | |

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| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| FIXED<br>MOBILE<br>Space research<br><br>5.339 | FIXED NF14<br>MOBILE<br>Space research<br><br>5.339 | Fixed Links (15 GHz) (14.5 – 15.35 GHz) | Channelling plan for 15 GHz band in accordance with ITU-R Rec. F.636 latest version.<br><br>. |
| | **15.2-15.35 GHz**<br><br>FIXED<br>MOBILE<br>Earth exploration-satellite (passive)<br>Space research<br>Space research (passive)<br><br>5.339 | Fixed Links (15 GHz) (14.5 – 15.35 GHz) | Channelling plan for 15 GHz band in accordance with ITU-R Rec. F.636 latest version. |
| **15.35-15.4 GHz**<br><br>EARTH EXPLORATION-<br><br>SATELLITE (passive)<br>RADIO ASTRONOMY<br><br>SPACE RESEARCH (passive)<br><br>5.340 5.511 | **15.35-15.4 GHz**<br><br>EARTH EXPLORATION-<br><br>SATELLITE (passive)<br>RADIO ASTRONOMY<br><br>SPACE RESEARCH (passive)<br><br>5.340 | Very long base inferometry Observations<br><br>Radio Astronomy (non-thermal synchrotron and enigmatic quasars<br>Passive sensing | |
| **15.4-15.43 GHz**<br><br>RADIOLOCATION 5.511E<br>5.511F<br>AERONAUTICAL<br>RADIONAVIGATION | **15.4-15.43 GHz**<br><br>RADIOLOCATION 5.511E<br>5.511F<br>AERONAUTICAL<br>RADIONAVIGATION | Radio Altimeters/Dopler Radars | ICAO: Guidelines on Radiocommunication (Annex 10) |

| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| | | | |
| **15.43-15.63 GHz**<br><br>FIXED-SATELLITE (Earth-to-space) 5.511A<br>RADIOLOCATION 5.511E<br>5.511F<br>AERONAUTICAL RADIONAVIGATION<br><br>5.511C | **15.43-15.63 GHz**<br><br>FIXED-SATELLITE (Earth-to-space) 5.511A<br>RADIOLOCATION 5.511E<br>5.511F<br>AERONAUTICAL RADIONAVIGATION<br><br>5.511C | Feeder links of non-GSO-satellite systems in the MSS<br>Radio Altimeters<br>Dopler Radars | ICAO: Guidelines on Radiocommunication (Annex 10) |
| **15.63-15.7 GHz**<br><br>RADIOLOCATION 5.511E<br>5.511F<br>AERONAUTICAL RADIONAVIGATION | **15.63-15.7 GHz**<br><br>RADIOLOCATION 5.511E<br>5.511F<br>AERONAUTICAL RADIONAVIGATION | Radio Altimeters<br>Dopler Radars | ICAO: Guidelines on Radiocommunication (Annex 10) |
| **15.7-16.6 GHz**<br><br>RADIOLOCATION<br><br>5.512 5.513 | **15.7-16.6 GHz**<br><br>RADIOLOCATION | Dopler Radars<br>Government Services | Altimeters / Distance measuring equipment |
| **16.6-17.1 GHz**<br><br>RADIOLOCATION<br>Space research (deep space) (Earth-to-space) | **16.6-17.1 GHz**<br><br>RADIOLOCATION<br>Space research (deep space) (Earth-to-space) | | |



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|---|---|---|---|
| 5.512 5.513 | | | |
| **17.1-17.2 GHz**<br><br>RADIOLOCATION<br><br>5.512 5.513 | **17.1-17.2 GHz**<br><br>RADIOLOCATION | WAS / RLAN (17.1 – 17.3 GHz) | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). |
| **17.2-17.3 GHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>RADIOLOCATION<br>SPACE RESEARCH (active)<br><br>5.512 5.513 5.513A | **17.2-17.3 GHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>RADIOLOCATION<br>SPACE RESEARCH (active)<br><br>5.513A | WAS / RLAN (17.1 – 17.3 GHz) | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). |
| **17.3-17.7 GHz**<br><br>FIXED-SATELLITE (Earth-to-space) 5.516 (space-to-Earth) 5.516A 5.516B<br><br>Radiolocation | **17.3-17.7 GHz**<br><br>FIXED-SATELLITE (Earth-to-space) 5.516 (space-to-Earth) 5.516A 5.516B (non-GSO) (Earth-to-space)<br><br>Radiolocation | Feeder links of GSO-satellite systems in the BSS [HIGH-DENSITYAPPLICATIONS IN THE FSS (space-to-Earth)] | The band 17.3-17.7 GHz is part of the APP30A Plan (Feeder Links for BSS) for many SADC countries; refer to Annex B.<br>The band 17.3-17.7 GHz is identified for HDFSS; Res.143 applies. |

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|---|---|---|---|
| 5.514 | | | |
| **17.7-18.1 GHz**<br><br>FIXED<br>FIXED-SATELLITE<br>(space-to-Earth) 5.484A 5.517A<br>(Earth-to-space) 5.516<br><br>MOBILE | **17.7-18.1 GHz**<br><br>FIXED NF14<br>FIXED-SATELLITE<br>(space-to-Earth) 5.484A 5.517A<br>(Earth-to-space) 5.516<br>(non-GSO) (Earth-to-space)<br>MOBILE | Fixed Links (18 GHz) (17.7 – 19.7 GHz)<br>BSS Feeder Links<br>Feeder links of GSO-satellite systems in the BSS | Channelling plan for 18 GHz band in accordance with ITU-R Rec. F.595 latest version Annex 1.<br><br>Resolution 169 (WRC-19) |
| **18.1-18.4 GHz**<br><br>FIXED<br><br>FIXED-SATELLITE<br>(space-to-Earth) 5.484A 5.516B 5.517A<br>(Earth-to-space) 5.520<br><br>MOBILE<br><br>5.519 5.521 | **18.1-18.4 GHz**<br><br>FIXED NF14<br><br>FIXED-SATELLITE<br>(space-to-Earth) 5.484A 5.516B 5.517A<br>(Earth-to-space) 5.520<br><br>MOBILE<br>METEOROLOGICAL-SATELLITE (GSO) (space-to-Earth)<br><br>5.519 | Fixed Links (18 GHz) (17.7 – 19.7 GHz)<br>BSS Feeder Links<br>ESIMS (under the FSS)<br>Feeder links of GSO-satellite systems in the BSS | Channelling plan for 18 GHz band in accordance with ITU-R Rec. F.595 latest version Annex 1.<br><br>Resolution 169 (WRC-19) |
| **18.4-18.6 GHz**<br><br>FIXED<br><br>FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B 5.517A | **18.4-18.6 GHz**<br><br>FIXED NF14<br><br>FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B 5.517A | Fixed Links (18 GHz) (17.7 – 19.7 GHz)<br>ESIMS (under the FSS) | Channelling plan for 18 GHz band in accordance with ITU-R Rec. F.595 latest version Annex 1.<br>Resolution 169 (WRC-19) |

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| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| MOBILE | MOBILE | | |
| **18.6-18.8 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED<br><br>FIXED-SATELLITE (space-to-Earth) 5.517A 5.522B<br><br>MOBILE except aeronautical mobile<br>Space research (passive)<br><br>5.522A 5.522C | **18.6-18.8 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED NF14<br><br>FIXED-SATELLITE (space-to-Earth) 5.517A 5.522B<br><br>MOBILE except aeronautical mobile<br>Space research (passive)<br><br>5.522A 5.522C | <br><br><br>Fixed Links (18 GHz) (17.7 – 19.7 GHz)<br>System with orbit apogee greater than 20 000 km<br>ESIMS (under the FSS)<br><br><br>Passive Sensing | <br><br>Channelling plan for 18 GHz band in accordance with ITU-R Rec. F.595 latest version Annex 1<br><br>Resolution 169 (WRC-19) |
| **18.8-19.3 GHz**<br><br>FIXED<br><br>FIXED-SATELLITE (space-to-Earth) 5.517A 5.523A<br>MOBILE | **18.8-19.3 GHz**<br><br>FIXED NF14<br><br>FIXED-SATELLITE (space-to-Earth) 5.517A 5.523A<br>MOBILE | <br><br>Fixed Links (18 GHz) (17.7 – 19.7 GHz)<br>ESIMS (under the FSS) | <br><br>Channelling plan for 18 GHz band in accordance with ITU-R Rec. F.595 latest version Annex 1<br><br>Resolution 169 (WRC-19) |
| **19.3-19.7 GHz**<br><br>FIXED | **19.3-19.6 GHz**<br><br>FIXED NF14 | | |

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| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| FIXED-SATELLITE (space-to-Earth) 5.517A 5.523B 5.523C 5.523D 5.523E<br>(Earth-to-space) 5.523B 5.523C 5.523D 5.523E<br>MOBILE | FIXED-SATELLITE (space-to-Earth) 5.517A 5.523B 5.523C 5.523D 5.523E<br>(Earth-to-space) 5.523B 5.523C 5.523D 5.523E<br>MOBILE | Fixed Links (18 GHz) (17.7 – 19.7 GHz)<br>Feeder links of non-GSO-satellite systems in the MSS<br>ESIMS (under the FSS) | Channelling plan for 18 GHz band in accordance with ITU-R Rec. F.595 latest version Annex 1.<br>Resolution 169 (WRC-19) |
| | **19.6-19.7 GHz**<br><br>FIXED NF14<br><br>FIXED-SATELLITE (space-to-Earth) 5.523C 5.523D 5.523E<br>(Earth-to-space) 5.523C 5.523D 5.523E<br>MOBILE | Fixed Links (18 GHz) (17.7 – 19.7 GHz)<br>Feeder links of non-GSO-satellite systems in the MSS<br>ESIMS (under the FSS) | Channelling plan for 18 GHz band in accordance with ITU-R Rec. F.595 latest version Annex 1.<br>Resolution 169 (WRC-19) |
| **19.7-20.1 GHz**<br><br>FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B 5.516B 5.527A<br><br>Mobile-satellite (space-to-Earth)<br><br>5.524 | **19.7-20.1 GHz**<br><br>FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B 5.516B 5.527A<br><br>Mobile-satellite (space-to-Earth) | ESIMS (under the FSS)<br>GSO/FSS<br>[HIGH-DENSITYAPPLICATIONS IN THE FSS (space-to-Earth)] | The band 19.7-20.2 GHz is identified for HDFSS; Res.143 applies.<br>Resolution 156 (WRC-15) applies to ESIMS |

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|---|---|---|---|
| **20.1-20.2 GHz**<br><br>FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B 5.516B 5.527A<br><br>MOBILE-SATELLITE (space-to-Earth)<br><br>5.524 5.525 5.526 5.527 5.528 | **20.1-20.2 GHz**<br><br>FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B 5.516B 5.527A<br><br>MOBILE-SATELLITE (space-to-Earth)<br><br>5.525 5.526 5.527 5.528 | ESIMS (under the FSS)<br>[HIGH-DENSITYAPPLICATIONS IN THE FSS (space-to-Earth)] | The band 19.7-20.2 GHz is identified for HDFSS; Res.143 applies.<br>Resolution 156 (WRC-15) applies to ESIMS |
| **20.2-21.2 GHz**<br><br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE-SATELLITE (space-to-Earth)<br>Standard frequency and time signal-satellite (space-to-Earth)<br><br>5.524 | **20.2-21.2 GHz**<br><br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE-SATELLITE (space-to-Earth)<br>Standard frequency and time signal-satellite (space-to-Earth) | Fixed Satellite Systems(TVRO) | |
| **21.2-21.4 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED<br><br>MOBILE<br>SPACE RESEARCH (passive) | **21.2-21.4 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED NF14<br><br>MOBILE<br>SPACE RESEARCH (passive) | Passive Sensing<br>Fixed Links (23 GHz) (21.2 – 23.6 GHz) | Channelling plan for 23 GHz band in accordance with ITU-R Rec. F.637 latest version Annex 1. |
| **21.4-22 GHz** | **21.4-22 GHz** | | |

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|---|---|---|---|
| FIXED<br><br>MOBILE<br>BROADCASTING-SATELLITE<br>5.208B<br><br>5.530A 5.530B | FIXED NF14<br><br>MOBILE<br>BROADCASTING-SATELLITE<br>5.208B<br><br>5.530A 5.530B | Fixed Links (23 GHz) (21.2 – 23.6 GHz)<br>Broadcast satellite systems | Channelling plan for 23 GHz band in accordance with ITU-R Rec. F.637 latest version Annex 1.<br>The use of BSS in this band is subject to the provisions of WRC - 15 Resolutions 552 (Rev.WRC-19), and 553 (Rev. WRC-15) and 555." Resolution 555 (Rev. WRC-15) was abrogated on 23 November 2019 (Resolution 99 (Rev. WRC-19)) |
| **22-22.21 GHz**<br><br>FIXED<br><br>MOBILE except aeronautical mobile<br><br>5.149 | **22-22.21 GHz**<br><br>FIXED NF14<br><br>MOBILE except aeronautical mobile<br><br>5.149 | Fixed Links (23 GHz) (21.2 – 23.6 GHz)<br><br>Radio astronomy (red-shifted $H_2O$ Passive Sensing | Channelling plan for 23 GHz band in accordance with ITU-R Rec. F.637 latest version Annex 1.<br>See section 5 for coordination with radio astronomy |
| **22.21-22.5 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED<br><br>MOBILE except aeronautical mobile<br>RADIO ASTRONOMY<br><br>SPACE RESEARCH (passive) | **22.21-22.5 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED NF14<br><br>MOBILE except aeronautical mobile<br>RADIO ASTRONOMY<br><br>SPACE RESEARCH (passive) | Fixed Links (23 GHz) (21.2 – 23.6 GHz)<br><br>Radio astronomy (red-shifted $H_2O$ Passive Sensing | Channelling plan for 23 GHz band in accordance with ITU-R Rec. F.637 latest version Annex 1.<br><br>See section 5 for coordination with radio astronomy |

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|---|---|---|---|
| 5.149 5.532 | 5.149 5.532 | | |
| **22.5-22.55 GHz**<br><br>FIXED<br><br>MOBILE | **22.5-22.55 GHz**<br><br>FIXED NF14<br><br>MOBILE | Fixed Links (23 GHz) (21.2 – 23.6 GHz) | Channelling plan for 23 GHz band in accordance with ITU-R Rec. F.637 latest version Annex 1 |
| **22.55-23.15 GHz**<br><br>FIXED<br><br>INTER-SATELLITE 5.338A<br>MOBILE<br>SPACE RESEARCH (Earth-to-space) 5.532A<br><br>5.149 | **22.55-23.15 GHz**<br><br>FIXED NF14<br><br>INTER-SATELLITE 5.338A<br>MOBILE<br>SPACE RESEARCH (Earth-to-space) 5.532A<br><br>5.149 | Fixed Links (23 GHz) (21.2 – 23.6 GHz) | Channelling plan for 23 GHz band in accordance with ITU-R Rec. F.637 latest version Annex 1.<br>See section 5 for coordination with radio astronomy |
| **23.15-23.55 GHz**<br><br>FIXED<br><br>INTER-SATELLITE 5.338A<br>MOBILE | **23.15-23.55 GHz**<br><br>FIXED NF14<br><br>INTER-SATELLITE 5.338A<br>MOBILE | Fixed Links (23 GHz) (21.2 – 23.6 GHz) | |
| **23.55-23.6 GHz**<br><br>FIXED | **23.55-23.6 GHz**<br><br>FIXED NF14 | Fixed Links (23 GHz) (21.2 – 23.6 GHz) | |

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|---|---|---|---|
| MOBILE | MOBILE | | Channelling plan for 23 GHz band in accordance with ITU-R Rec. F.637 latest version Annex 1 |
| **23.6-24 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br><br>SPACE RESEARCH (passive)<br><br>5.340 | **23.6-24 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br><br>SPACE RESEARCH (passive)<br><br>5.340 | <br><br><br>Radio astronomy (observation of ammonia and continuum observations)<br>Passive Sensing | <br><br>See section 5 for coordination with radio astronomy |
| **24-24.05 GHz**<br><br>AMATEUR<br>AMATEUR-SATELLITE<br><br>5.150 | **24-24.05 GHz**<br><br>AMATEUR<br>AMATEUR-SATELLITE<br><br>5.150 | <br><br>Non-specific SRDs (24-24.25 GHz)<br>ISM (24.0-24.25 GHz)<br>SRD applications (24-24.25 GHz) | <br><br>Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015).<br>Common international SRD band; see ITU-R Rec. SM.1896 latest version.<br>The band 24.0-24.25 GHz is designated for ISM applications (5.150). |
| **24.05-24.25 GHz**<br><br>RADIOLOCATION<br>Amateur<br>Earth exploration-satellite (active) | **24.05-24.25 GHz**<br><br>RADIOLOCATION<br>Amateur<br>Earth exploration-satellite (active) | <br><br>FDDA (24.05 – 24.25 GHz)<br><br>SRDs (24-24.25 GHz) (Reservoir Level Probing Radar) | <br><br>Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). |

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|---|---|---|---|
| 5.150 | 5.150 | | The band 24.0-24.25 GHz is designated for ISM applications (5.150).<br>Common international SRD band; see ITU-R Rec. SM.1896<br>ITU-R Report SM.2153-7 latest version applies |
| **24.25-24.45 GHz**<br><br>FIXED<br><br><br><br><br><br>MOBILE except aeronautical mobile 5.338A 5.532AB | **24.25-24.45 GHz**<br><br>FIXED<br><br><br><br><br><br>MOBILE except aeronautical mobile 5.338A 5.532AB NF9 | <br><br>Fixed links – 26 GHz (24.25-26.5 GHz)<br>IMT (24.25 – 27.5 GHz) | <br><br>Channelling plan for 26 GHz band in accordance with ITU-R Rec. F.748 latest version Annex 1<br>Temporary fixed links for ENG/OB Resolution 242 **(WRC-19)**<br>Recommendation ITU-R M.1036-6 currently being updated and revised within the ITU-R<br>(International Mobile Telecommunications (IMT))<br>RFSAP to be developed |
| **24.45-24.65 GHz**<br><br>FIXED<br><br><br>INTER-SATELLITE | **24.45-24.65 GHz**<br><br>FIXED NF14<br><br><br>INTER-SATELLITE | <br><br>Fixed links – 26 GHz (24.5-26.5 GHz)<br>BFWA (24.5-26.5 GHz)<br><br><br>IMT (24.25 – 27.5 GHz) | <br><br>Channelling plan for 26 GHz band in accordance with ITU-R Rec. F.748 latest version Annex 1.<br>Resolution 242 **(WRC-19)**<br>Recommendation ITU-R M.1036-6 currently being updated and revised within the ITU-R |

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|---|---|---|---|
| MOBILE except aeronautical mobile 5.338A 5.532AB | MOBILE except aeronautical mobile 5.338A 5.532AB NF9 | | (International Mobile Telecommunications (IMT))<br>RFSAP to be developed |
| **24.65-24.75 GHz**<br><br>FIXED<br><br>FIXED-SATELLITE (Earth-to-space) 5.532B<br>INTER-SATELLITE<br><br>MOBILE except aeronautical mobile 5.338A 5.532AB | **24.65-24.75 GHz**<br><br>FIXED NF14<br><br>FIXED-SATELLITE (Earth-to-space) 5.532B<br>INTER-SATELLITE<br><br>MOBILE except aeronautical mobile 5.338A 5.532AB NF9 | Fixed links – 26 GHz (24.5-26.5 GHz)<br>BFWA (24.5-26.5 GHz)<br><br>IMT (24.25 – 27.5 GHz) | Channelling plan for 26 GHz band in accordance with ITU-R Rec. F.748 latest version Annex 1.<br>Resolution 242 (WRC-19)<br>Recommendation ITU-R M.1036-6 currently being updated and revised within the ITU-R<br>(International Mobile Telecommunications (IMT))<br>RFSAP to be developed |
| **24.75-25.25 GHz**<br><br>FIXED<br><br>FIXED-SATELLITE (Earth-to-space) 5.532B<br><br>MOBILE except aeronautical mobile 5.338A 5.532AB | **24.75-25.25 GHz**<br><br>FIXED NF14<br><br>FIXED-SATELLITE (Earth-to-space) 5.532B<br><br>MOBILE except aeronautical mobile 5.338A 5.532AB NF9 | Fixed links - 26 GHz (24.5-26.5 GHz)<br>BFWA (24.5-26.5 GHz)<br><br>IMT (24.25 – 27.5 GHz) | Channelling plan for 26 GHz band in accordance with ITU-R Rec. F.748 latest version Annex 1.<br>Resolution 242 **(WRC-19)**<br>Recommendation ITU-R M.1036-6 currently being updated and revised within the ITU-R<br>(International Mobile Telecommunications (IMT))<br>RFSAP to be developed |
| **25.25-25.5 GHz** | **25.25-25.5 GHz** | | |

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| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| FIXED 5.534A<br><br>INTER-SATELLITE 5.536<br><br><br><br><br><br>MOBILE 5.338A 5.532AB<br>Standard frequency and time signal-satellite (Earth-to-space) | FIXED NF14<br><br>INTER-SATELLITE (Earth exploration-satellite applications) 5.536<br>INTER-SATELLITE (space research applications) 5.536<br>INTER-SATELLITE (transmissions of data originating from industrial and medical activities in space)<br>MOBILE 5.338A 5.532AB NF9<br>Standard frequency and time signal-satellite (Earth-to-space) | Fixed Links (26 GHz) (24.5 – 26.5 GHz)<br>BFWA (24.5-26.5 GHz<br><br><br><br><br><br>IMT (24.25 – 27.5 GHz) | Channelling plan for 26 GHz band in accordance with ITU-R Rec. F.748 latest version Annex 1.<br>Resolution 242 **(WRC-19)**<br>Recommendation ITU-R M.1036-6 currently being updated and revised within the ITU-R<br><br><br><br><br>(International Mobile Telecommunications (IMT))<br>RFSAP to be developed |
| **25.5-27 GHz**<br><br>EARTH EXPLORATION-SATELLITE (space-to Earth) 5.536B<br><br><br>FIXED 5.534A<br><br>INTER-SATELLITE 5.536 | **25.5-27 GHz**<br><br>EARTH EXPLORATION-SATELLITE (space-to Earth) 5.536B<br><br><br>FIXED NF14<br><br>INTER-SATELLITE (Earth exploration-satellite applications) 5.536<br>INTER-SATELLITE (space research applications) 5.536 | National Polar-Orbiting Operational Environment Satellite System (NPOESS)<br>Fixed Links (26 GHz) (24.5 – 26.5 GHz)<br>BFWA (24.5-26.5 GHz | Channelling plan for 26 GHz band in accordance with ITU-R Rec. F.748 latest version Annex 1.<br>Resolution 242 **(WRC-19)**<br>Recommendation ITU-R M.1036-6 currently being updated and revised within the ITU-R |

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|---|---|---|---|
| MOBILE 5.338A 5.532AB<br><br>SPACE RESEARCH (space-to-Earth) 5.536C<br>Standard frequency and time signal-satellite (Earth-to-space)<br><br>5.536A | INTER-SATELLITE (transmissions of data originating from industrial and medical activities in space)<br><br>MOBILE 5.338A 5.532AB NF9<br><br>SPACE RESEARCH (space-to-Earth) 5.536C<br>Standard frequency and time signal-satellite (Earth-to-space)<br><br>5.536A | IMT (24.25 – 27.5 GHz) | (International Mobile Telecommunications (IMT))<br>RFSAP to be developed |
| **27-27.5 GHz**<br><br>FIXED<br>INTER-SATELLITE 5.536<br><br>MOBILE 5.338A 5.532AB | **27-27.5 GHz**<br><br>FIXED<br>INTER-SATELLITE (Earth exploration-satellite applications) 5.536<br>INTER-SATELLITE (space research applications) 5.536<br>INTER-SATELLITE (transmissions of data originating from industrial and medical activities in space)<br><br>MOBILE 5.338A 5.532AB NF9 | I<br><br>IMT (24.25 – 27.5 GHz) | Recommendation ITU-R M.1036-6 currently being updated and revised within the ITU-R<br>Resolution 242 (WRC-19)<br><br>(International Mobile Telecommunications (IMT))<br>RFSAP to be developed |
| **27.5-28.5 GHz**<br><br>FIXED 5.537A | **27.5-27.501 GHz**<br><br>FIXED 5.537A NF14 | | |

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| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.517A 5.539<br>MOBILE | FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.517A 5.539<br>FIXED-SATELLITE (space-to-Earth)<br><br>MOBILE<br><br>5.538 5.540 | Fixed Links (28 GHz) (27.5 – 29.5 GHz),<br>Beacon transmission for up-link power control<br>[HIGH-DENSITYAPPLICATIONS IN THE FSS (space-to-Earth)]<br>ESIMS (under the FSS) | Channelling plan for 28 GHz band in accordance with ITU-R Rec. F.748 latest version Annex 2.<br>The band 27.5-27.82 GHz is identified for HDFSS; Res.143 applies.<br>The band 27.5-30 GHz may be used by the FSS for BSS feeder links. Resolution 169 (WRC-19)<br>RFSAP to be developed. |
| | **27.501-27.82 GHz**<br><br>FIXED 5.537A NF14 NF18<br><br>FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.517 A 5.539<br>Fixed-satellite (space-to-Earth)<br><br>MOBILE<br><br>5.538 5.540 | Fixed Links (28 GHz) (27.5 – 29.5 GHz),<br>Beacon transmission for up-link power control)<br>HIGH-DENSITYAPPLICATIONS IN THE FSS (space-to-Earth)]<br>ESIMS (under the FSS) | Channelling plan for 28 GHz band in accordance with ITU-R Rec. F.748 latest version Annex 2.<br>The band 27.5-27.82 GHz is identified for HDFSS; Res.143 applies.<br>The band 27.5-30 GHz may be used by the FSS for BSS feeder links. Resolution 169 (WRC-19)<br>RFSAP to be developed. |
| | **27.82-28.45 GHz**<br><br>FIXED 5.537A NF14 | Fixed Links (28 GHz) (27.5 – 29.5 GHz), | Channelling plan for 28 GHz band in accordance with ITU-R Rec. F.748 latest version Annex 2. |

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|---|---|---|---|
| | FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.517A 5.539<br>Fixed-satellite (space-to-Earth)<br><br>MOBILE<br><br>5.538 5.540 | Beacon transmission for up-link power control)<br>ESIMS (under the FSS) | The band 27.5-27.82 GHz is identified for HDFSS; Res.143 applies.<br>The band 27.5-30 GHz may be used by the FSS for BSS feeder links.<br>RFSAP to be developed. |
| 5.538 5.540 | **28.45-28.5 GHz**<br><br>FIXED 5.537A NF14<br><br>FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.517 5.539<br>Fixed-satellite (space-to-Earth)<br><br>MOBILE<br><br>5.538 5.540 | Fixed Links (28 GHz) (27.5 – 29.5 GHz)<br>Beacon transmission for up-link power control)<br>HIGH-DENSITYAPPLICATIONS IN THE FSS (space-to-Earth)]<br>ESIMS (under the FSS) | Channelling plan for 28 GHz band in accordance with ITU-R Rec. F.748 latest version Annex 2.<br>The band 27.5-27.82 GHz is identified for HDFSS; Res.143 applies.<br>The band 27.5-30 GHz may be used by the FSS for BSS feeder links.<br>RFSAP to be developed. |
| **28.5-29.1 GHz**<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.517A 5.523A 5.539<br>MOBILE<br>Earth exploration-satellite (Earth-to-space) 5.541 | **28.5-28.94 GHz**<br><br>FIXED NF14<br>FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.517A 5.523A 5.539<br>MOBILE<br>Earth exploration-satellite (Earth-to-space) 5.541<br>Fixed-satellite (space-to-Earth) | Fixed Links (28 GHz) (27.5 – 29.5 GHz)<br>Transfer of data between stations<br>Beacon transmission for up-link power control)<br>HIGH-DENSITYAPPLICATIONS IN THE FSS (space-to-Earth)]<br>ESIMS (under the FSS) | Channelling plan for 28 GHz band in accordance with ITU-R Rec. F.748 latest version Annex 2.<br>Resolution 169 (WRC-19)<br>The band 28.45-28.94 GHz is identified for HDFSS; Res.143 applies.<br>The band 27.5-30 GHz may be used by the FSS for BSS feeder links. |

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|---|---|---|---|
| | 5.540 | | RFSAP to be developed. |
| 5.540 | **28.94-29.1 GHz**<br><br>FIXED NF14<br><br>FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.517A 5.523A 5.539<br>MOBILE<br>Earth exploration-satellite (Earth-to-space) 5.541<br>Fixed-satellite (space-to-Earth)<br><br>5.540 | Transfer of data between stations<br><br>Beacon transmission for up-link power control<br>ESIMS (under the FSS) | Channelling plan for 28 GHz band in accordance with ITU-R Rec. F.748 latest version Annex 2.<br>Resolution 169 (WRC-19)<br>RFSAP to be developed. |
| **29.1-29.5 GHz**<br><br>FIXED<br><br>FIXED-SATELLITE (Earth-to-space) 5.516B 5.517A 5.523C 5.523E 5.535A 5.539 5.541A<br>MOBILE<br>Earth exploration-satellite (Earth-to-space) 5.541 | **29.1-29.46 GHz**<br><br>FIXED NF14<br><br>FIXED-SATELLITE (Earth-to-space) 5.516B 5.517A 5.523C 5.523E 5.535A 5.539 5.541A<br>FIXED-SATELLITE (GSO) (Earth-to-space)<br><br>MOBILE<br>Earth exploration-satellite (Earth-to-space) 5.541 | Fixed Links (28 GHz) (27.5 – 29.5 GHz)<br>ESIMS (under the FSS)<br>Feeder links of non-GSO-satellite systems in the MSS<br>Transfer of data between stations<br>Beacon transmission for up-link power control | Channelling plan for 28 GHz band in accordance with ITU-R Rec. F.748 latest version Annex 2.<br>Resolution 169 (WRC-19)<br><br>`RFSAP to be developed. |

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|---|---|---|---|
| | Fixed-satellite (space-to-Earth)<br><br>5.540 | | |
| 5.540 | **29.46-29.5**<br><br>FIXED NF14<br><br>FIXED-SATELLITE (Earth-to-space) 5.516B 5.517A 5.523C 5.523E 5.535A 5.539 5.541A<br>FIXED-SATELLITE (GSO) (Earth-to-space)<br><br>MOBILE<br>Earth exploration-satellite (Earth-to-space) 5.541<br>Fixed-satellite (space-to-Earth)<br><br>5.540 | ESIMS (under the FSS)<br>Feeder links of non-GSO-satellite systems in the MSS<br>Transfer of data between stations<br>Beacon transmission for up-link power control<br>HIGH-DENSITYAPPLICATIONS IN THE FSS (space-to-Earth)] | Channelling plan for 28 GHz band in accordance with ITU-R Rec. F.748 latest version Annex 2.<br>Resolution 169 (WRC-19)<br>RFSAP to be developed. |
| **29.5-29.9 GHz**<br><br>FIXED-SATELLITE (Earth-to-space) 5.484A 5.484B 5.516B 5.527A 5.539<br>Earth exploration-satellite (Earth-to-space) 5.541 | **29.5-29.9 GHz**<br><br>FIXED-SATELLITE (Earth-to-space) 5.484A 5.484B 5.516B 5.527A 5.539<br>Earth exploration-satellite (Earth-to-space) 5.541<br>Fixed-satellite (space-to-Earth) | ESIMS (under the FSS)<br>Transfer of data between stations<br>Beacon transmission for up-link power control<br>HIGH-DENSITYAPPLICATIONS IN THE FSS (space-to-Earth)] | The band 29.46-30.0 GHz is identified for HDFSS;<br>Res.143 applies for HDFSS<br>Res 156 (WRC-15) applies for ESIM |

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| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| Mobile-satellite (Earth-to-space)<br><br>5.540 5.542 | Mobile-satellite (Earth-to-space)<br><br>5.540 | | |
| **29.9-30 GHz**<br><br>FIXED-SATELLITE (Earth-to-space) 5.484A 5.484B 5.516B 5.527A 5.539<br>MOBILE-SATELLITE (Earth-to-space)<br>Earth exploration-satellite (Earth-to-space) 5.541 5.543 | **29.9-29.95 GHz**<br><br>FIXED-SATELLITE (Earth-to-space) 5.484A 5.484B 5.516B 5.527A 5.539<br>MOBILE-SATELLITE (Earth-to-space)<br>Earth exploration-satellite (Earth-to-space) 5.541 5.543<br>Fixed-satellite (space-to-Earth)<br><br>5.525 5.526 5.527 5.538 5.540 | ESIMS (under the FSS)<br>Transfer of data between stations<br>Beacon transmission for up-link power control<br>HIGH-DENSITY APPLICATIONS IN THE FSS (space-to-Earth)] | The band 29.46-30.0 GHz is identified for HDFSS;<br>Res.143 applies for HDFSS<br>Res 156 (WRC-15) applies for ESIM |
| | **29.95-29.999 GHz**<br><br>FIXED-SATELLITE (Earth-to-space) 5.484A 5.484B 5.516B 5.527A 5.539<br>MOBILE-SATELLITE (Earth-to-space)<br>Earth exploration-satellite (Earth-to-space) 5.541 5.543<br>Earth exploration-satellite (space-to-space)<br>Fixed-satellite (space-to-Earth) | ESIMS (under the FSS)<br>Transfer of data between stations<br>Telemetry, tracking and control<br>Beacon transmission for up-link power control<br>HIGH-DENSITY APPLICATIONS IN THE FSS (space-to-Earth)] | The band 29.46-30.0 GHz is identified for HDFSS;<br>Res.143 applies for HDFSS<br>Res 156 (WRC-15) applies for ESIM |

| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| | 5.525 5.526 5.527 5.538 5.540 | | |
| 5.525 5.526 5.527 5.538 5.540<br>5.542 | **29.999-30 GHz**<br><br>FIXED-SATELLITE (Earth-to-space) 5.484A 5.484B 5.516B 5.527A 5.539<br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE-SATELLITE (Earth-to-space)<br>Earth exploration-satellite (Earth-to-space) 5.541 5.543<br>Earth exploration-satellite (space-to-space)<br><br>5.525 5.526 5.527 5.538 5.540 | ESIMS (under the FSS)<br>Beacon transmission for up-link power control<br>Transfer of data between stations<br>Telemetry, tracking and control<br>HIGH-DENSITYAPPLICATIONS IN THE FSS (space-to-Earth)] | The band 29.46-30.0 GHz is identified for HDFSS;<br>Res.143 applies for HDFSS<br>Res 156 (WRC-15) applies for ESIM |
| **30-31 GHz**<br><br>FIXED-SATELLITE (Earth-to-space) 5.338A<br>MOBILE-SATELLITE (Earth-to-space)<br>Standard frequency and time signal-satellite (space-to-Earth)<br><br>5.542 | **30-31 GHz**<br><br>FIXED-SATELLITE (Earth-to-space) 5.338A<br>MOBILE-SATELLITE (Earth-to-space)<br>Standard frequency and time signal-satellite (space-to-Earth) | | |
| **31-31.3 GHz** | **31-31.3 GHz** | | |



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|---|---|---|---|
| FIXED 5.338A 5.543B<br>MOBILE<br>Standard frequency and time signal-satellite (space-to-Earth)<br>Space research 5.544 5.545<br><br>5.149 | FIXED 5.338A 5.543B<br>MOBILE<br>Standard frequency and time signal-satellite (space-to-Earth)<br>Space research 5.544<br><br>5.149 | [FIXED (HAPS)]<br>Fixed Links<br>Fixed satellite links<br><br>Radio astronomy (Continuum Observations) | Paired with 27.5 – 28.35 GHz (base station to subscriber)<br>Resolution 167 (WRC-19)<br><br>See section 5 for coordination with radio astronomy |
| **31.3-31.5 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br><br>SPACE RESEARCH (passive)<br><br>5.340 | **31.3-31.5 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br><br>SPACE RESEARCH (passive)<br><br>5.340 | Radio astronomy (Continuum Observations) | Radio astronomy (Continuum Observations) |
| **31.5-31.8 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br><br>SPACE RESEARCH (passive)<br>Fixed<br>Mobile except aeronautical mobile | **31.5-31.8 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br><br>SPACE RESEARCH (passive)<br>Fixed 5.546<br>Mobile except aeronautical mobile 5.546 | Radio astronomy (Continuum Observations)<br>Passive Sensing | Radio astronomy (Continuum Observations) |

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|---|---|---|---|
| 5.149 5.546 | 5.149 | | |
| **31.8-32 GHz**<br><br>FIXED 5.547A<br>RADIONAVIGATION<br>SPACE RESEARCH (deep space) (space-to-Earth)<br><br>5.547 5.547B 5.548 | **31.8-32 GHz**<br><br>FIXED 5.547A NF14<br>RADIONAVIGATION<br>SPACE RESEARCH (deep space) (space-to-Earth)<br><br>5.547 5.548 | HDFS (31.8 – 33.4 GHz) | Channelling plan for 32 GHz band in accordance with ITU-R Rec. F.1520 latest version Annex 1. The band 31.8-33.4 GHz is identified for HDFS; Res.75 applies. |
| **32-32.3 GHz**<br><br>FIXED 5.547A<br>RADIONAVIGATION<br>SPACE RESEARCH (deep space) (space-to-Earth)<br><br>5.547 5.547C 5.548 | **32-32.3 GHz**<br><br>FIXED 5.547A NF14<br>RADIONAVIGATION<br>SPACE RESEARCH (deep space) (space-to-Earth)<br><br>5.547 5.548 | HDFS (31.8 – 33.4 GHz) | Channelling plan for 32 GHz band in accordance with ITU-R Rec. F.1520 latest version Annex 1. The band 31.8-33.4 GHz is identified for HDFS; Res.75 applies. |
| **32.3-33 GHz**<br><br>FIXED 5.547A<br>INTER-SATELLITE<br>RADIONAVIGATION<br><br>5.547 5.547D 5.548 | **32.3-33 GHz**<br><br>FIXED 5.547A NF14<br>INTER-SATELLITE<br>RADIONAVIGATION<br><br>5.547 5.548 | HDFS (31.8 – 33.4 GHz) | Channelling plan for 32 GHz band in accordance with ITU-R Rec. F.1520 latest version Annex 1. The band 31.8-33.4 GHz is identified for HDFS; Res.75 applies. |
| **33-33.4 GHz**<br><br>FIXED 5.547A | **33-33.4 GHz**<br><br>FIXED 5.547A NF14 | HDFS (31.8 – 33.4 GHz) | |

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|---|---|---|---|
| RADIONAVIGATION<br><br>5.547 5.547E | RADIONAVIGATION<br><br>5.547 | | Channelling plan for 32 GHz band in accordance with ITU-R Rec. F.1520 latest version Annex 1. The band 31.8-33.4 GHz is identified for HDFS; Res.75 applies. |
| **33.4-34.2 GHz**<br><br>RADIOLOCATION<br><br>5.549 | **33.4-34.2 GHz**<br><br>RADIOLOCATION | Government Services | |
| **34.2-34.7 GHz**<br><br>RADIOLOCATION<br>SPACE RESEARCH (deep space) (Earth-to-space)<br><br>5.549 | **34.2-34.7 GHz**<br><br>RADIOLOCATION<br>SPACE RESEARCH (deep space) (Earth-to-space) | Government Services | |
| **34.7-35.2 GHz**<br><br>RADIOLOCATION<br>Space research 5.550<br><br>5.549 | **34.7-35.2 GHz**<br><br>RADIOLOCATION<br>Space research | Government Services | |
| **35.2-35.5 GHz**<br><br>METEOROLOGICAL AIDS<br>RADIOLOCATION<br><br>5.549 | **35.2-35.5 GHz**<br><br>METEOROLOGICAL AIDS<br>RADIOLOCATION | Government Services | |
| **35.5-36 GHz** | **35.5-36 GHz** | | |

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|---|---|---|---|
| METEOROLOGICAL AIDS<br>EARTH EXPLORATION-SATELLITE (active)<br>RADIOLOCATION<br>SPACE RESEARCH (active)<br><br>5.549 5.549A | METEOROLOGICAL AIDS<br>EARTH EXPLORATION-SATELLITE (active)<br>RADIOLOCATION<br>SPACE RESEARCH (active)<br><br>5.549A | Government Services | |
| **36-37 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED<br>MOBILE<br>SPACE RESEARCH (passive)<br><br>5.149 5.550A | **36-37 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED<br>MOBILE<br>SPACE RESEARCH (passive)<br><br>5.149 5.550A | Government Services<br>Passive Sensing<br><br>Radio astronomy (HC3N and OH lines) | See section 5 for coordination with radio astronomy |
| **37-37.5 GHz**<br><br>FIXED<br>MOBILE except aeronautical mobile 5.550B<br>SPACE RESEARCH (space-to-Earth)<br><br>5.547 | **37-37.5 GHz**<br><br>FIXED NF14<br>MOBILE except aeronautical mobile 5.550B<br>SPACE RESEARCH (space-to-Earth)<br><br>5.547 | Fixed Links (38 GHz) (37.0 – 39.5 GHz)<br>IMT | Resolution **243 (WRC-19)**<br>Recommendation ITU-R M.1036-6 currently being updated and revised within the ITU-R (International Mobile Telecommunications (IMT))<br>RFSAP to be developed |
| **37.5-38 GHz**<br><br>FIXED | **37.5-38 GHz**<br><br>FIXED NF14 | Fixed Links (38 GHz) (37.0 – 39.5 GHz) | The band 37-40 GHz is identified for HDFS; Res.75 applies. |

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|---|---|---|---|
| FIXED-SATELLITE (space-to-Earth) 5.550C<br>MOBILE except aeronautical mobile 5.550B<br>SPACE RESEARCH (space-to-Earth)<br>Earth exploration-satellite (space-to-Earth)<br><br>5.547 | FIXED-SATELLITE (space-to-Earth) 5.550C<br>MOBILE except aeronautical mobile 5.550B<br>SPACE RESEARCH (space-to-Earth)<br>Earth exploration-satellite (space-to-Earth)<br><br>5.547 | IMT | Resolution **770 (WRC-19)**<br>Resolution **243 (WRC-19)**<br>Channelling plan for 38 GHz band in accordance with ITU Rec. F.749 Annex 1.<br>Recommendation ITU-R M.1036-6 currently being updated and revised within the ITU-R (International Mobile Telecommunications (IMT))<br>RFSAP to be developed |
| **38-39.5 GHz**<br><br>FIXED 5.550D<br><br>FIXED-SATELLITE (space-to-Earth) 5.550C<br>MOBILE 5.550B<br>Earth exploration-satellite (space-to-Earth) | **38-39.5 GHz**<br><br>FIXED 5.550D NF14<br><br>FIXED-SATELLITE (space-to-Earth) 5.550C<br>MOBILE 5.550B<br>Earth exploration-satellite (space-to-Earth) | Fixed Links (38 GHz) (37.0 – 39.5 GHz)<br><br>[FIXED (HAPS)]<br><br>IMT (37-43.5 GHz) | Channelling plan for 38 GHz band in accordance with ITU Rec. F.749 Annex 1.<br>The band 37-40 GHz is identified for HDFS; Res.75 applies.<br>Resolution **770 (WRC-19)**<br>Resolution **243 (WRC-19)**<br>Recommendation ITU-R M.1036-6 currently being updated and revised within the ITU-R (International Mobile Telecommunications (IMT))<br>RFSAP to be developed |



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|---|---|---|---|
| 5.547 | 5.547 | | |
| **39.5-40 GHz**<br><br>FIXED<br>FIXED-SATELLITE (space-to-Earth) 5.516B 5.550C<br>MOBILE 5.550B<br>MOBILE-SATELLITE (space-to-Earth)<br>Earth exploration-satellite (space-to-Earth)<br><br>5.547 5.550E | **39.5-40 GHz**<br><br>FIXED<br>FIXED-SATELLITE (space-to-Earth) 5.516B 5.550C<br>MOBILE 5.550B<br>MOBILE-SATELLITE (space-to-Earth)<br>Earth exploration-satellite (space-to-Earth)<br><br>5.547 5.550E | HIGH-DENSITY APPLICATIONS IN THE FSS (space-to-Earth)]<br>IMT (37-43.5 GHz)<br>Fixed links | Resolution **770 (WRC-19)**<br>Resolution **243 (WRC-19)**<br>The band 37-40 GHz is identified for HDFS; Res.75 applies.<br>The band 39.5-40 GHz is identified for HDFSS; Res.143 applies.<br>Recommendation ITU-R M.1036-6 currently being updated and revised within the ITU-R<br>International Mobile Telecommunications (IMT))<br>RFSAP to be developed |
| **40-40.5 GHz**<br><br>EARTH EXPLORATION-SATELLITE (Earth-to-space)<br>FIXED<br>FIXED-SATELLITE (space-to-Earth) 5.516B 5.550C<br>MOBILE 5.550B<br>MOBILE-SATELLITE (space-to-Earth)<br>SPACE RESEARCH (Earth-to-space)<br>Earth exploration-satellite (space-to-Earth) | **40-40.5 GHz**<br><br>EARTH EXPLORATION-SATELLITE (Earth-to-space)<br>FIXED<br>FIXED-SATELLITE (space-to-Earth) 5.516B 5.550C<br>MOBILE 5.550B<br>MOBILE-SATELLITE (space-to-Earth)<br>SPACE RESEARCH (Earth-to-space)<br>Earth exploration-satellite (space-to-Earth) | Government Services<br><br>HIGH-DENSITY APPLICATIONS IN THE FSS (space-to-Earth)]<br>IMT (37-43.5 GHz) | The band 40-40.5 GHz is identified for HDFSS; Res.143 applies.<br>Resolution **770 (WRC-19)**<br>Resolution **243 (WRC-19)**<br>Recommendation ITU-R M.1036-6 currently being updated and revised within the ITU-R<br>(International Mobile Telecommunications (IMT))<br>RFSAP to be developed |

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|---|---|---|---|
| 5.550E | 5.550E | | |
| **40.5-41 GHz**<br><br>FIXED<br>FIXED-SATELLITE (space-to-Earth) 5.550C<br>BROADCASTING<br>BROADCASTING-SATELLITE<br>LAND MOBILE 5.550B<br>Aeronautical mobile<br>Maritime mobile<br><br>5.547 | **40.5-41 GHz**<br><br>FIXED NF14<br>FIXED-SATELLITE (space-to-Earth) 5.550C<br>BROADCASTING<br>BROADCASTING-SATELLITE<br>LAND MOBILE 5.550B<br>Aeronautical mobile<br>Maritime mobile<br><br>5.547 | Fixed links (40.5 – 43.5 GHz)<br><br>IMT (37-43.5 GHz) | Resolution **770 (WRC-19**<br>BFWA or MWS (40.5-43.5 GHz).<br>The band 40.5-43.5 GHz is identified for HDFS; Res.75 applies.<br>Resolution **243 (WRC-19)**<br>Recommendation ITU-R M.1036-6 currently being updated and revised within the ITU-R (International Mobile Telecommunications (IMT))<br><br>RFSAP to be developed |
| **41-42.5 GHz**<br><br>FIXED<br>FIXED-SATELLITE (space-to-Earth) 5.516B 5.550C<br>BROADCASTING<br>BROADCASTING-SATELLITE<br>LAND MOBILE 5.550B<br><br>Aeronautical mobile<br><br>Maritime mobile<br><br>5.547 5.551F 5.551H 5.551I | **41-42.5 GHz**<br><br>FIXED NF14<br>FIXED-SATELLITE (space-to-Earth) 5.516B 5.550C<br>BROADCASTING<br>BROADCASTING-SATELLITE<br><br>LAND MOBILE 5.550B<br><br>Aeronautical mobile<br><br>Maritime mobile<br><br>5.547 5.551H 5.551I | Fixed links (40.5 – 43.5 GHz)<br><br>IMT (37-43.5 GHz) | Resolution **143 (WRC-19**<br>Resolution **770 (WRC-19**<br>BFWA or MWS (40.5-43.5 GHz).<br>The band 40.5-43.5 GHz is identified for HDFS; Res.75 applies.<br>Recommendation ITU-R M.1036-6 currently being updated and revised within the ITU-R (International Mobile Telecommunications (IMT))<br>RFSAP to be developed |

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|---|---|---|---|
| | | | |
| **42.5-43.5 GHz**<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space) 5.552<br>MOBILE except aeronautical mobile 5.550B<br><br>RADIO ASTRONOMY<br><br>5.149 5.547 | **42.5-43.5 GHz**<br><br>FIXED NF14<br>FIXED-SATELLITE (Earth-to-space) 5.552<br>MOBILE except aeronautical mobile 5.550B<br><br>RADIO ASTRONOMY<br><br>5.149 5.547 | Fixed links (40.5 – 43.5 GHz)<br><br>IMT (37-43.5 GHz)<br>Government Services (43.5-45.5 GHz)<br><br>Radio astronomy (Observation of silicon monoxide) | BFWA or MWS (40.5-43.5 GHz). The band 40.5-43.5 GHz is identified for HDFS; Res.75 applies. Resolution **243 (WRC-19** Recommendation ITU-R M.1036-6 currently being updated and revised within the ITU-R (International Mobile Telecommunications (IMT)) RFSAP to be developed<br>See section 5 for coordination with radio astronomy |
| **43.5-47 GHz**<br><br>MOBILE 5.553<br>MOBILE-SATELLITE<br>RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE | **43.5-45.5 GHz**<br><br>**MOBILE 5.553**<br>MOBILE-SATELLITE<br>RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE<br><br>5.554 | | |
| | **45.5-47 GHz** | | |

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|---|---|---|---|
| 5.554 | **MOBILE 5.553** 5.553A<br>MOBILE-SATELLITE<br>RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE<br>5.554 | IMT | Resolution **244 (WRC-19**<br>Recommendation ITU-R M.1036-6 currently being updated and revised within the ITU-R<br>(International Mobile Telecommunications (IMT))<br>RFSAP to be developed |
| **47-47.2 GHz**<br>AMATEUR<br>AMATEUR-SATELLITE | **47-47.2 GHz**<br>AMATEUR<br>AMATEUR-SATELLITE | Amateur<br>Amateur satellite | |
| **47.2-47.5 GHz**<br>FIXED<br>FIXED-SATELLITE (Earth-to-space) 5.550C 5.552<br>MOBILE 5.553B<br>5.552A | **47.2-47.5 GHz**<br>FIXED<br>FIXED-SATELLITE (Earth-to-space) 5.550C 5.552<br>MOBILE 5.553B<br>5.552A | [FIXED (HAPS)]<br>IMT | Resolution **770 (WRC-19)**<br>Resolution **243 (WRC-19)**<br>Recommendation ITU-R M.1036-6 currently being updated and revised within the ITU-R<br>(International Mobile Telecommunications (IMT))<br>RFSAP to be developed |
| **47.5-47.9 GHz**<br>FIXED<br>FIXED-SATELLITE (Earth-to-space) 5.550C 5.552 (space-to-Earth) 5.516B 5.554A | **47.5-47.9 GHz**<br>FIXED<br>FIXED-SATELLITE (Earth-to-space) 5.550C 5.552 | The band 47.5-47.9 GHz is identified for HDFSS; Res.143 applies. | Resolution **770 (WRC-19)**<br>Resolution **243 (WRC-19)** |

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|---|---|---|---|
| MOBILE 5.553B | (GSO) (space-to-Earth) 5.516B 5.554A<br><br>MOBILE 5.553B | HIGH-DENSITYAPPLICATIONS IN THE FSS (space-to-Earth)]<br>IMT | Recommendation ITU-R M.1036-6 currently being updated and revised within the ITU-R (International Mobile Telecommunications (IMT))<br>RFSAP to be developed |
| **47.9-48.2 GHz**<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space) 5.550C 5.552<br>MOBILE 5.553B<br><br>5.552A | **47.9-48.2 GHz**<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space) 5.550C 5.552<br>MOBILE 5.553B<br><br>5.552A | [FIXED (HAPS)]<br><br>IMT | Resolution **770 (WRC-19)**<br>Resolution **243 (WRC-19)**<br>Recommendation ITU-R M.1036-6 currently being updated and revised within the ITU-R (International Mobile Telecommunications (IMT))<br>RFSAP to be developed |
| **48.2-48.54 GHz**<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space) 5.550C 5.552<br>(space-to-Earth) 5.516B 5.554A 5.555B<br>MOBILE | **48.2-48.54 GHz**<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space) 5.550C 5.552<br>(GSO) (space-to-Earth) 5.516B 5.554A 5.555B<br>MOBILE | HIGH-DENSITYAPPLICATIONS IN THE FSS (space-to-Earth)] | The band 48.2-48.54 GHz is identified for HDFSS; Res.143 applies.<br>Resolution **770 (WRC-19**<br>Recommendation ITU-R M.1036-6 currently being up<br>dated and revised within the ITU-R |
| **48.54-49.44 GHz** | **48.54-48.94 GHz** | | |

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|---|---|---|---|
| FIXED<br>FIXED-SATELLITE<br>(Earth-to-space) 5.550C 5.552<br>MOBILE | FIXED<br>FIXED-SATELLITE<br>(Earth-to-space) 5.550C 5.552<br>MOBILE<br><br>5.149 5.340 5.555 | | Resolution 770 (WRC-19 |
| | **48.94-49.04 GHz**<br><br>FIXED<br>FIXED-SATELLITE<br>(Earth-to-space) 5.550C 5.552<br>MOBILE<br>RADIO ASTRONOMY<br><br>5.149 5.340 5.555 | Radio astronomy (diatomic molecules and other molecules) | See section 5 for coordination with radio astronomy |
| 5.149 5.340 5.555 | **49.04-49.44 GHz**<br><br>FIXED<br>FIXED-SATELLITE<br>(Earth-to-space) 5.550C 5.552<br>MOBILE<br><br>5.149 5.340 5.555 | | Resolution **770 (WRC-19** |
| **49.44-50.2 GHz**<br><br>FIXED<br>FIXED-SATELLITE<br>(Earth-to-space) 5.338A 5.550C 5.552 | **49.44-50.2 GHz**<br><br>FIXED<br>FIXED-SATELLITE<br>(Earth-to-space) 5.338A 5.550C 5.552 | HIGH-DENSITYAPPLICATIONS IN THE FSS (space-to-Earth)] | Resolution **770 (WRC-19**<br>The band 49.44-50.2 GHz is identified for HDFSS; Res.143 applies. |

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|---|---|---|---|
| (space-to-Earth) 5.516B<br>5.554A 5.555B<br>MOBILE | (GSO) (space-to-Earth) 5.516B<br>5.554A 5.555B<br>MOBILE | | |
| **50.2-50.4 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>SPACE RESEARCH (passive)<br><br>5.340 | **50.2-50.4 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>SPACE RESEARCH (passive)<br><br>5.340 | | |
| **50.4-51.4 GHz**<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space) 5.338A 5.550C<br>MOBILE<br>Mobile-satellite (Earth-to-space) | **50.4-51.4 GHz**<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space) 5.338A 5.550C<br>MOBILE<br>Mobile-satellite (Earth-to-space) | Fixed links | Resolution **770 (WRC-19** |
| **51.4-52.4 GHz**<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space) 5.555C<br>MOBILE<br><br>5.338A 5.547 5.556 | **51.4-52.4 GHz**<br><br>FIXED 5.338A<br><br>FIXED-SATELLITE (GSO) (Earth-to-space) 5.555CMOBILE<br><br>5.547 5.556 | | The band 51.4-52.6 GHz is identified for HDFS; Res.75 applies. |
| **52.4-52.6 GHz** | **52.4-52.6 GHz** | | |

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|---|---|---|---|
| FIXED 5.338A<br>MOBILE<br><br>5.547 5.556 | FIXED 5.338A<br>MOBILE<br><br>5.547 5.556 | | |
| **52.6-54.25 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>SPACE RESEARCH (passive)<br><br>5.340 5.556 | **52.6-54.25 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>SPACE RESEARCH (passive)<br><br>5.340 5.556 | Passive Sensing (53.6 – 59.3 GHz) | |
| **54.25-55.78 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>INTER-SATELLITE 5.556A<br><br>SPACE RESEARCH (passive)<br><br>5.556B | **54.25-55.78 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>INTER-SATELLITE (GSO) 5.556A<br>SPACE RESEARCH (passive) | Passive Sensing (53.6 – 59.3 GHz) | |
| **55.78-56.9 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED 5.557A<br>INTER-SATELLITE 5.556A<br><br>MOBILE 5.558<br>SPACE RESEARCH (passive) | **55.78-56.9 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED 5.557A NF14<br>INTER-SATELLITE (GSO) 5.556A<br>MOBILE 5.558<br>SPACE RESEARCH (passive) | Passive Sensing (53.6 – 59.3 GHz) | The band 55.78-59 GHz is identified for HDFS; Res.75 applies. |

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| 5.547 5.557 | 5.547 | | |
| **56.9-57 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED<br>INTER-SATELLITE 5.558A<br><br>MOBILE 5.558<br>SPACE RESEARCH (passive)<br><br>5.547 5.557 | **56.9-57 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED NF14<br>INTER-SATELLITE (GSO) 5.558A<br>INTER-SATELLITE (non-GSO)<br>MOBILE 5.558<br>SPACE RESEARCH (passive)<br><br>5.547 | Passive Sensing (53.6 – 59.3 GHz)<br><br>Transmission from HEO to LEO | The band 55.78-59 GHz is identified for HDFS; Res.75 applies. |
| **57-58.2 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED<br>INTER-SATELLITE 5.556A<br><br>MOBILE 5.558<br>SPACE RESEARCH (passive)<br><br>5.547 5.557 | **57-58.2 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED NF14<br>INTER-SATELLITE (GSO) 5.556A<br>MOBILE 5.558<br>SPACE RESEARCH (passive)<br><br>5.547 | Passive Sensing (53.6 – 59.3 GHz)<br>Fixed links<br>Multiple GIGABIT wireless systems WAS/RLAN<br>SRD applications (57 – 64 GHz) | The band 55.78-59 GHz is identified for HDFS; Res.75 applies.<br>Radio Frequency Spectrum Regulations Amendments, (Government Gazette Number 40436, 22 November 2016).<br>ITU-R Recommendation M.2003 latest version (“Multiple Gigabit Wireless Systems in frequencies around 60 GHz”)<br>Amendment to the Radio Frequency Spectrum Regulations, 2015 Government Gazette 40436 ( Notice 781 of 2016) |

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| **58.2-59 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED<br>MOBILE<br>SPACE RESEARCH (passive)<br><br>5.547 5.556 | **58.2-59 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED NF14<br>MOBILE<br>SPACE RESEARCH (passive)<br><br>5.547 5.556 | Multiple GIGABIT wireless systems WAS/RLAN<br>Passive Sensing (53.6 – 59.3 GHz) | The band 55.78-59 GHz is identified for HDFS; Res.75 applies.<br>Radio Frequency Spectrum Regulations Amendments, (Government Gazette Number 40436, 22 November 2016.<br>ITU-R Recommendation M.2003 latest version ("Multiple Gigabit Wireless Systems in frequencies around 60 GHz")<br>Amendment to the Radio Frequency Spectrum Regulations, 2015 Government Gazette 40436 ( Notice 781 of 2016) |
| **59-59.3 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED<br><br>INTER-SATELLITE 5.556A<br><br>MOBILE 5.558<br>RADIOLOCATION 5.559<br>SPACE RESEARCH (passive) | **59-59.3 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED<br>INTER-SATELLITE (GSO) 5.556A<br>MOBILE 5.558<br>RADIOLOCATION 5.559<br>SPACE RESEARCH (passive) | Multiple GIGABIT wireless systems WAS/RLAN<br>Passive Sensing (53.6 – 59.3 GHz) | Radio Frequency Spectrum Regulations Amendments, (Government Gazette Number 40436, 22 November 2016<br>ITU-R Recommendation M.2003 latest version ("Multiple Gigabit Wireless Systems in frequencies around 60 GHz")<br>Amendment to the Radio Frequency Spectrum Regulations, 2015 |

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| | | | Government Gazette 40436 ( Notice 781 of 2016) |
| **59.3-64 GHz**<br><br>FIXED<br>INTER-SATELLITE<br>MOBILE 5.558<br>RADIOLOCATION 5.559<br><br>5.138 | **59.3-64 GHz**<br><br>FIXED<br>INTER-SATELLITE<br>MOBILE 5.558<br>RADIOLOCATION 5.559<br><br>5.138 | Multiple GIGABIT wireless systems WAS/RLAN<br>SRD applications (57 – 64 GHz)<br>Government Services | Radio Frequency Spectrum Regulations Amendments (Government Gazette Number 40436, 22 November 2016<br>The band 61-61.5 GHz is designated for ISM applications (5.138).<br>The band 59 - 61 GHz reserved for government use.<br>Common international SRD band; see ITU-R RecSM. 1896<br>ITU-R Recommendation M.2003 latest version ("Multiple Gigabit Wireless Systems in frequencies around 60 GHz")<br>Amendment to the Radio Frequency Spectrum Regulations, 2015 Government Gazette 40436 ( Notice 781 of 2016) |
| **64-65 GHz**<br><br>FIXED<br>INTER-SATELLITE<br>MOBILE except aeronautical mobile | **64-65 GHz**<br><br>FIXED<br>INTER-SATELLITE<br>MOBILE except aeronautical mobile | | The band 64-66 GHz is identified for HDFS; Res.75 applies.<br>Radio Frequency Spectrum Regulations Amendments |

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| 5.547 5.556 | 5.547 5.556 | | (Government Gazette Number 40436, 22 November 2016.<br>ITU-R Recommendation M.2003 latest version ("Multiple Gigabit Wireless Systems in frequencies around 60 GHz")<br>Amendment to the Radio Frequency Spectrum Regulations, 2015 Government Gazette 40436 ( Notice 781 of 2016) |
| **65-66 GHz**<br><br>EARTH EXPLORATION-SATELLITE<br>FIXED<br>INTER-SATELLITE<br>MOBILE except aeronautical mobile<br>SPACE RESEARCH<br><br>5.547 | **65-66 GHz**<br><br>EARTH EXPLORATION-SATELLITE<br>FIXED<br>INTER-SATELLITE<br>MOBILE except aeronautical mobile<br>SPACE RESEARCH<br><br>5.547 | Multiple GIGABIT wireless systems WAS/RLAN | The band 64-66 GHz is identified for HDFS; Res.75 applies.<br>Radio Frequency Spectrum Regulations Amendments (Government Gazette Number 40436, 22 November 2016<br>ITU-R Recommendation M.2003 latest version ("Multiple Gigabit Wireless Systems in frequencies around 60 GHz")<br>Amendment to the Radio Frequency Spectrum Regulations, 2015 Government Gazette 40436 ( Notice 781 of 2016) |
| **66-71 GHz**<br><br>**INTER-SATELLITE**<br>MOBILE 5.553 5.558 5.559AA | **66-71 GHz**<br><br>INTER-SATELLITE<br>MOBILE 5.553 5.558 5.559AA | IMT | Resolution **241 (WRC-19** |

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| MOBILE-SATELLITE<br>RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE<br><br>5.554 | MOBILE-SATELLITE<br>RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE<br><br>5.554 | | Recommendation ITU-R M.1036-6 latest version currently being updated revied within the ITU-R (International Mobile Telecommunications (IMT))<br>RFSAP to be developed.<br>Amendment to the Radio Frequency Spectrum Regulations, 2015 Government Gazette 40436 ( Notice 781 of 2016) |
| **71-74 GHz**<br><br>FIXED<br><br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE<br>MOBILE-SATELLITE (space-to-Earth) | **71-74 GHz**<br><br>FIXED NF14<br><br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE<br>MOBILE-SATELLITE (space-to-Earth) | Fixed Links (80 GHz) (71 – 76 GHz)<br>Government use<br>Fixed links (71-76 GHz) | Paired with 81 – 86 GHz.<br><br>Radio Frequency Spectrum Regulations Amendments (Government Gazette Number 40436, 22 November 2016) |
| **74-76 GHz**<br><br>FIXED<br><br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE<br>BROADCASTING<br>BROADCASTING-SATELLITE<br>Space research (space-to-Earth)<br><br>5.561 | **74-76 GHz**<br><br>FIXED NF14<br><br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE<br>BROADCASTING<br>BROADCASTING-SATELLITE<br>Space research (space-to-Earth)<br><br>5.561 | Fixed Links (80 GHz) (71 – 76 GHz) | Paired with 81 – 86 GHz.<br><br>Radio Frequency Spectrum Regulations Amendments (Government Gazette Number 40436, 22 November 2016) |

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|---|---|---|---|
| **76-77.5 GHz**<br><br>RADIO ASTRONOMY<br>RADIOLOCATION<br>Amateur<br>Amateur-satellite<br>Space research (space-to-Earth)<br><br>5.149 | **76-77.5 GHz**<br><br>RADIO ASTRONOMY<br>RADIOLOCATION<br>Amateur<br>Amateur-satellite<br>Space research (space-to-Earth)<br><br>5.149 | RTTT (76 – 77 GHz)<br><br>SRD - Road Transport and Traffic Telematics Radar (76 – 77 GHz) | Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). Common international SRD band; see ITU-R Rec. SM.1896 and Rec. M.1452 latest version applies. |
| **77.5-78 GHz**<br><br>AMATEUR<br>AMATEUR-SATELLITE<br>RADIOLOCATION 5.559B<br><br>Radio astronomy<br>Space research (space-to-Earth)<br><br>5.149 | **77.5-78 GHz**<br><br>AMATEUR<br>AMATEUR-SATELLITE<br>RADIOLOCATION 5.559B<br><br>Radio astronomy<br>Space research (space-to-Earth)<br><br>5.149 | Short-range radars from ground-based applications, including automotive radars | |
| **78-79 GHz**<br><br>RADIOLOCATION<br>Amateur<br>Amateur-satellite<br>Radio astronomy<br>Space research (space-to-Earth)<br><br>5.149 5.560 | **78-79 GHz**<br><br>RADIOLOCATION<br>Amateur<br>Amateur-satellite<br>Radio astronomy<br>Space research (space-to-Earth)<br><br>5.149 5.560 | | |
| **79-81 GHz** | **79-81 GHz** | | |

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|---|---|---|---|
| RADIO ASTRONOMY<br>RADIOLOCATION<br>Amateur<br>Amateur-satellite<br>Space research (space-to-Earth)<br><br>5.149 | RADIO ASTRONOMY<br>RADIOLOCATION<br>Amateur<br>Amateur-satellite<br>Space research (space-to-Earth)<br><br>5.149 | | |
| **81-84 GHz**<br><br>FIXED 5.338A<br><br>FIXED-SATELLITE (Earth-to-space)<br>MOBILE<br>MOBILE-SATELLITE (Earth-to-space)<br>RADIO ASTRONOMY<br><br>Space research (space-to-Earth) | **81-81.5 GHz**<br><br>FIXED 5.338A NF14<br><br>FIXED-SATELLITE (Earth-to-space)<br>MOBILE<br>MOBILE-SATELLITE (Earth-to-space)<br>RADIO ASTRONOMY<br>Amateur<br>Amateur-satellite<br>Space research (space-to-Earth)<br><br>5.149 5.561A | Fixed Links (80 GHz) (81 –86 GHz) | Paired with 71 – 76 GHz.<br><br>Radio Frequency Spectrum Regulations Amendments (Government Gazette Number 40436, 22 November 2016) |
| | **81.5-84 GHz**<br><br>FIXED 5.338A NF14<br><br>FIXED-SATELLITE (Earth-to-space)<br>MOBILE | Fixed Links (80 GHz) (81 –86 GHz) | Paired with 71 – 76 GHz.<br><br>Radio Frequency Spectrum Regulations Amendments (Government Gazette Number 40436, 22 November 2016) |

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| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| 5.149 5.561A | MOBILE-SATELLITE (Earth-to-space)<br>RADIO ASTRONOMY<br>Space research (space-to-Earth)<br>5.149 5.561A | | |
| **84-86 GHz**<br>FIXED 5.338A<br>FIXED-SATELLITE (Earth-to-space) 5.561B<br>MOBILE<br>RADIO ASTRONOMY<br>5.149 | **84-86 GHz**<br>FIXED 5.338A NF14<br>FIXED-SATELLITE (Earth-to-space) 5.561B<br>MOBILE<br>RADIO ASTRONOMY<br>5.149 | Fixed Links (80 GHz) (81 –86 GHz) | Radio Frequency Spectrum Regulations Amendments (Government Gazette Number 40436, 22 November 2016) |
| **86-92 GHz**<br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br>5.340 | **86-92 GHz**<br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br>5.340 | | |
| **92-94 GHz**<br>FIXED 5.338A<br>MOBILE<br>RADIO ASTRONOMY | **92-94 GHz**<br>FIXED 5.338A NF14<br>MOBILE<br>RADIO ASTRONOMY | | |

| ITU Region 1 allocations and footnotes | South African allocations and footnotes | Typical Applications | Notes and Comments |
|---|---|---|---|
| RADIOLOCATION<br><br>5.149 | RADIOLOCATION<br><br>5.149 | | |
| **94-94.1 GHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>RADIOLOCATION<br>SPACE RESEARCH (active)<br>Radio astronomy<br><br>5.562 5.562A | **94-94.1 GHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>RADIOLOCATION<br>SPACE RESEARCH (active)<br>Radio astronomy<br><br>5.562 5.562A | <br><br><br>Spaceborne cloud radars<br>Short Range Radar. Cloud profile radar.<br>Spaceborne cloud radars | |
| **94.1-95 GHz**<br><br>FIXED<br>MOBILE<br>RADIO ASTRONOMY<br>RADIOLOCATION<br><br>5.149 | **94.1-95 GHz**<br><br>FIXED NF14<br>MOBILE<br>RADIO ASTRONOMY<br>RADIOLOCATION<br><br>5.149 | <br><br><br><br>Short Range Radar | |
| **95-100 GHz**<br><br>FIXED<br>MOBILE<br>RADIO ASTRONOMY<br>RADIOLOCATION<br>RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE<br><br>5.149 5.554 | **95-100 GHz**<br><br>FIXED<br>MOBILE<br>RADIO ASTRONOMY<br>RADIOLOCATION<br>RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE<br><br>5.149 5.554 | | |



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|---|---|---|---|
| **100-102 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br><br>5.340 5.341 | **100-102 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br><br>5.340 5.341 | Passive sensing | |
| **102-105 GHz**<br><br>FIXED<br>MOBILE<br>RADIO ASTRONOMY<br><br>5.149 5.341 | **102-105 GHz**<br><br>FIXED<br>MOBILE<br>RADIO ASTRONOMY<br><br>5.149 5.341 | | |
| **105-109.5 GHz**<br><br>FIXED<br>MOBILE<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br>5.562B<br><br>5.149 5.341 | **105-109.5 GHz**<br><br>FIXED<br>MOBILE<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br>5.562B<br><br>5.149 5.341 | Space-based radio astronomy | |
| **109.5-111.8 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive) | **109.5-111.8 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive) | Passive Sensing | |

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|---|---|---|---|
| 5.340 5.341 | 5.340 5.341 | | |
| **111.8-114.25 GHz**<br><br>FIXED<br>MOBILE<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br>5.562B<br><br>5.149 5.341 | **111.8-114.25 GHz**<br><br>FIXED<br>MOBILE<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br>5.562B<br><br>5.149 5.341 | Space-based radio astronomy | |
| **114.25-116 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br><br>5.340 5.341 | **114.25-116 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br><br>5.340 5.341 | | |
| **116-119.98 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>INTER-SATELLITE 5.562C<br><br>SPACE RESEARCH (passive)<br><br>5.341 | **116-119.98 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>INTER-SATELLITE (GSO)<br>5.562C<br>SPACE RESEARCH (passive)<br><br>5.341 | Passive Sensing | |
| **119.98-122.25 GHz** | **119.98-122.25 GHz** | | |

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|---|---|---|---|
| EARTH EXPLORATION-SATELLITE (passive)<br>INTER-SATELLITE 5.562C<br>SPACE RESEARCH (passive)<br><br>5.138 5.341 | EARTH EXPLORATION-SATELLITE (passive)<br>INTER-SATELLITE 5.562C<br>SPACE RESEARCH (passive)<br><br>5.138 5.341 | Passive Sensing (114.25 – 122.25 GHz) | |
| **122.25-123 GHz**<br><br>FIXED<br>INTER-SATELLITE<br>MOBILE 5.558<br>Amateur<br><br>5.138 | **122.25-123 GHz**<br><br>FIXED<br>INTER-SATELLITE<br>MOBILE 5.558<br>Amateur<br><br>5.138 | Collision Avoidance<br>Automation<br>SRD's | |
| **123-130 GHz**<br><br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE-SATELLITE (space-to-Earth)<br>RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE<br>Radio astronomy 5.562D<br><br>5.149 5.554 | **123-130 GHz**<br><br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE-SATELLITE (space-to-Earth)<br>RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE<br>Radio astronomy<br><br>5.149 5.554 | | |
| **130-134 GHz**<br><br>EARTH EXPLORATION-SATELLITE (active) 5.562E<br>FIXED<br>INTER-SATELLITE | **130-133.5 GHz**<br><br><br><br>FIXED<br>INTER-SATELLITE | | |

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|---|---|---|---|
| MOBILE 5.558<br>RADIO ASTRONOMY<br><br>5.149 5.562A | MOBILE 5.558<br>RADIO ASTRONOMY<br><br>5.149 5.562A | | |
| | **133.5-134 GHz**<br><br>EARTH EXPLORATION-SATELLITE (active) 5.562E<br>FIXED<br>INTER-SATELLITE<br>MOBILE 5.558<br>RADIO ASTRONOMY<br><br>5.149 5.562A | | |
| **134-136 GHz**<br><br>AMATEUR<br>AMATEUR-SATELLITE<br>Radio astronomy | **134-136 GHz**<br><br>AMATEUR<br>AMATEUR-SATELLITE<br>Radio astronomy | | |
| **136-141 GHz**<br><br>RADIO ASTRONOMY<br>RADIOLOCATION<br>Amateur<br>Amateur-satellite<br><br>5.149 | **136-141 GHz**<br><br>RADIO ASTRONOMY<br>RADIOLOCATION<br>Amateur<br>Amateur-satellite<br><br>5.149 | | |
| **141-148.5 GHz**<br><br>FIXED | **141-148.5 GHz**<br><br>FIXED | | |

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|---|---|---|---|
| MOBILE<br>RADIO ASTRONOMY<br>RADIOLOCATION<br><br>5.149 | MOBILE<br>RADIO ASTRONOMY<br>RADIOLOCATION<br><br>5.149 | | |
| **148.5-151.5 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br><br>5.340 | **148.5-151.5 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br><br>5.340 | Passive Sensing | |
| **151.5-155.5 GHz**<br><br>FIXED<br>MOBILE<br>RADIO ASTRONOMY<br>RADIOLOCATION<br><br>5.149 | **151.5-155.5 GHz**<br><br>FIXED<br>MOBILE<br>RADIO ASTRONOMY<br>RADIOLOCATION<br><br>5.149 | | |
| **155.5-158.5 GHz**<br>FIXED<br>MOBILE<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br>5.562B<br><br>5.149 5.562F 5.562G | **155.5-158.5 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED<br>MOBILE<br>RADIO ASTRONOMY | Passive Sensing | |

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|---|---|---|---|
| | SPACE RESEARCH (passive)<br>5.562B<br><br>5.149 5.562F 5.562G | | |
| **158.5-164 GHz**<br><br>FIXED<br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE<br>MOBILE-SATELLITE (space-to-Earth) | **158.5-164 GHz**<br><br>FIXED<br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE<br>MOBILE-SATELLITE (space-to-Earth) | | |
| **164-167 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br><br>5.340 | **164-167 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br><br>5.340 | Passive Sensing | |
| **167-174.5 GHz**<br><br>FIXED<br>FIXED-SATELLITE (space-to-Earth)<br>INTER-SATELLITE<br>MOBILE 5.558<br><br>5.149 5.562D | **167-174.5 GHz**<br><br>FIXED<br>FIXED-SATELLITE (space-to-Earth)<br>INTER-SATELLITE<br>MOBILE 5.558<br><br>5.149 | | |



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|---|---|---|---|
| **174.5-174.8 GHz**<br><br>FIXED<br>INTER-SATELLITE<br>MOBILE 5.558 | **174.5-174.8 GHz**<br><br>FIXED<br>INTER-SATELLITE<br>MOBILE 5.558 | | |
| **174.8-182 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br><br>INTER-SATELLITE 5.562H<br><br>SPACE RESEARCH (passive) | **174.8-182 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>INTER-SATELLITE (GSO)<br>5.562H<br>SPACE RESEARCH (passive) | Passive sensing (174.8 – 191.8 GHz) | |
| **182-185 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br><br>5.340 | **182-185 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br><br>5.340 | Passive sensing (174.8 – 191.8 GHz) | |
| **185-190 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>INTER-SATELLITE 5.562H<br>SPACE RESEARCH (passive) | **185-190 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>INTER-SATELLITE (GSO)<br>5.562H<br>SPACE RESEARCH (passive) | Passive sensing (174.8 – 191.8 GHz) | |
| **190-191.8 GHz** | **190-191.8 GHz** | | |

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|---|---|---|---|
| EARTH EXPLORATION-SATELLITE (passive)<br>SPACE RESEARCH (passive)<br><br>5.340 | EARTH EXPLORATION-SATELLITE (passive)<br>SPACE RESEARCH (passive)<br><br>5.340 | Passive sensing (174.8 – 191.8 GHz) | |
| **191.8-200 GHz**<br><br>FIXED<br>INTER-SATELLITE<br>MOBILE 5.558<br>MOBILE-SATELLITE<br>RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE<br><br>5.149 5.341 5.554 | **191.8-200 GHz**<br><br>FIXED<br>INTER-SATELLITE<br>MOBILE 5.558<br>MOBILE-SATELLITE<br>RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE<br><br>5.149 5.341 5.554 | | |
| **200-209 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br><br>5.340 5.341 5.563A | **200-209 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br><br>5.340 5.341 5.563A | Passive sensing. | |
| **209-217 GHz**<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space)<br>MOBILE<br>RADIO ASTRONOMY | **209-217 GHz**<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space)<br>MOBILE<br>RADIO ASTRONOMY | | |



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| 5.149 5.341 | 5.149 5.341 | | |
| **217-226 GHz**<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space)<br>MOBILE<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br>5.562B<br><br>5.149 5.341 | **217-226 GHz**<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space)<br>MOBILE<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br>5.562B<br><br>5.149 5.341 | Space-based radio astronomy | |
| **226-231.5 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br><br>5.340 | **226-231.5 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br><br>5.340 | Passive Sensing (226 – 232 GHz) | |
| **231.5-232 GHz**<br><br>FIXED<br>MOBILE<br>Radiolocation | **231.5-232 GHz**<br><br>FIXED<br>MOBILE<br>Radiolocation | | |
| **232-235 GHz**<br><br>FIXED<br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE | **232-235 GHz**<br><br>FIXED<br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE | | |

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| Radiolocation | Radiolocation | | |
| **235-238 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED-SATELLITE (space-to-Earth)<br>SPACE RESEARCH (passive)<br><br>5.563A 5.563B | **235-237.9 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED-SATELLITE (space-to-Earth)<br>SPACE RESEARCH (passive)<br><br>5.563A 5.563B | Passive Sensing | |
| | **237.9-238 GHz**<br><br>EARTH EXPLORATION-SATELLITE (active)<br>EARTH EXPLORATION-SATELLITE (passive)<br>FIXED-SATELLITE (space-to-Earth)<br>SPACE RESEARCH (active)<br>SPACE RESEARCH (passive)<br><br>5.563A 5.563B | | |
| **238-240 GHz**<br><br>FIXED<br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE<br>RADIOLOCATION<br>RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE | **238-240 GHz**<br><br>FIXED<br>FIXED-SATELLITE (space-to-Earth)<br>MOBILE<br>RADIOLOCATION<br>RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE | | |

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| | | | |
| **240-241 GHz**<br><br>FIXED<br>MOBILE<br>RADIOLOCATION | **240-241 GHz**<br><br>FIXED<br>MOBILE<br>RADIOLOCATION | | |
| **241-248 GHz**<br><br>RADIO ASTRONOMY<br>RADIOLOCATION<br>Amateur<br>Amateur-satellite<br><br>5.138 5.149 | **241-248 GHz**<br><br>RADIO ASTRONOMY<br>RADIOLOCATION<br>Amateur<br>Amateur-satellite<br><br>5.138 5.149 | | |
| **248-250 GHz**<br><br>AMATEUR<br>AMATEUR-SATELLITE<br>Radio astronomy<br><br>5.149 | **248-250 GHz**<br><br>AMATEUR<br>AMATEUR-SATELLITE<br>Radio astronomy<br><br>5.149 | | |
| **250-252 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br><br>5.340 5.563A | **250-252 GHz**<br><br>EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br><br>5.340 5.563A | Passive Sensing | |
| **252-265 GHz** | **252-265 GHz** | | |

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| FIXED<br>MOBILE<br>MOBILE-SATELLITE (Earth-to-space)<br>RADIO ASTRONOMY<br>RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE<br><br>5.149 5.554 | FIXED<br>MOBILE<br>MOBILE-SATELLITE (Earth-to-space)<br>RADIO ASTRONOMY<br>RADIONAVIGATION<br>RADIONAVIGATION-SATELLITE<br><br>5.149 5.554 | | |
| **265-275 GHz**<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space)<br>MOBILE<br>RADIO ASTRONOMY<br><br>5.149 5.563A | **265-275 GHz**<br><br>FIXED<br>FIXED-SATELLITE (Earth-to-space)<br>MOBILE<br>RADIO ASTRONOMY<br><br>5.149 5.563A | | |
| **275-3 000 GHz**<br><br>(Not allocated) 5.565<br><br>5.564A 5.565 | **275-1 000 GHz**<br><br>(Not allocated) 5.565<br><br>5.564A | Radio astronomy service<br>Earth exploration-satellite service (passive)<br>Space research (passive) | |
| | **1 000-3 000 GHz**<br>(Not allocated) 5.565<br><br>5.564A | | Assignments may be considered for Amateur services on a secondary basis above 1000 GHz |

# 5 RADIO ASTRONOMY

The Astronomy Geographic Act, 2007 (AGA Act No. 21 of 2007) provides the legal basis and framework for the declaration of astronomy advantage area and protection of such areas from harmful radio frequency interference that may hamper the cosmic observations by scientific instruments located within those areas. The authority develops the national spectrum allocation, assign frequencies to licensees, and monitor compliance with licence terms. The Astronomy Management Authority (AMA) within the Department of Science and Innovation was assigned to manage the declared Karoo Central Astronomy Advantage Areas (KCAAAs). The Authority gave notice to all radio frequency spectrum licensees operating within the KCAAAs to apply for a permit with the AMA in terms of KCAAAs Regulations; through GG No. 42080 under Notice No. 765 of 4 December 2018.

This section provides information on the regulatory framework established for the protection of radio astronomy in South Africa.

## 5.1 DECLARATION OF ASTRONOMY ADVANTAGE AREAS

The Minister responsible for science and technology may declare any area or part of an area in the Province of the Northern Cape as an astronomy advantage area to be protected, preserved and properly maintained in respect of radio frequency interference or interference in any other way.

i. The whole of the territory of the Northern Cape Province excluding Sol Plaatje Municipality is declared for radio astronomy purpose, as Declared in GG No. 32951 Notice No. 115 of 19 February 2010.

ii. The Karoo Core Astronomy Advantage Area (KCoreAAA) is used for the purposes of radio astronomy and related scientific endeavours, as declared in GG No. 33462 Notice No. 723 of 20 August 2010.

iii. The Karoo Central Astronomy Advantage Area (KCAAAs) is used for the purpose of radio astronomy and related scientific endeavours, as declared in GG No. 37434 Notice No. 198 of 12 March 2014.

The purpose of the declaration of areas as astronomy advantage areas is to ensure that the geographic area, which are suitable for astronomy and related scientific endeavours is protected, preserved and properly maintained in accordance with good national and international practices.

## 5.2 REGULATIONS OF ASTRONOMY ADVANTAGE AREAS

The Minister responsible for science and technology may make regulations for the management and protection of astronomy advantage areas.

i. Regulations on radio astronomy protection levels in astronomy advantage areas declared for the purpose of radio astronomy were published in Government Gazette No. 35007 under Notice No. R. 90 of 10 February 2012.

ii. Regulations to prohibit or restrict certain activities in the core astronomy advantage areas declared for the radio astronomy purposes were published in Government Gazette No.35450, under notice No. R. 465of 22 June 2012.

iii. Regulations on the protection of the Karoo central astronomy advantage areas declared for the purpose of radio astronomy were published in Government Gazette No. 41321, under Notice No. 1411 of 15 December 2017.



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The Minister obtained concurrence of ICASA when making regulations for prohibiting or restricting activities that have an adverse effect on astronomy and related scientific endeavours.

### 5.3 ASTRONOMY DEVICES

The Minister may declare any existing or proposed scientific endeavour to be astronomy and related scientific endeavours for the purpose of the Astronomy Geographic Advantage Act.

i. The establishment and operation of MeerKAT telescope is declared a scientific endeavour in Government Gazette No. 33614, under Notice No. 897 of 15 October 2010.

ii. The establishment and operation of Square Kilometre Array (SKA) telescope is declared a scientific endeavour in Government Gazette No. 33614, under Notice No. 897 of 15 October 2010.

iii. The operation of C-BASS telescope within the spectrum between 4.5 GHz and 6.5 GHz is declared a scientific endeavour in Government Gazette No. 36826, under Notice No. 684 of 13 September 2013.

iv. The development and operation of PAPER telescope and HERA telescope within the spectrum between 100 MHz and 200 MHz is declared a scientific endeavour in Government Gazette No. 36826, under Notice No. 684 of 13 September 2013.

### 5.4 SPECTRUM LIST EXEMPTED FROM PROHIBITION

From one (1) year after the date that KCAAAs Regulations become operational, no licensee or licence exempted operator shall use, or continue to use the radio frequency spectrum from 100 MHz to 25.5 GHz to conduct radio transmissions within the declared KCAAAs, unless the spectrum is exempted from prohibition. The Minister published a list of the radio frequency spectrum and applications that are exempted from the prohibition of use for transmissions located within the KCAAAs in Government Gazette No. 45045, under Notice No. 753 of 26 August 2021.

### 5.5 ASTRONOMY FACILITIES WITHIN THE DECLARED AREAS

The use of radio frequency bands in the areas declared as Karoo Core and Central Astronomy Advantage Areas are regulated as follows:

Unless required for the purpose of radio astronomy and related scientific endeavours the use of the radio frequency spectrum in Table 2 is restricted within the declared as Karoo Core and Central Astronomy Advantage Areas.

Table 2: Restrictions on the use of radio frequency spectrum

| Declared Area | Prohibited Band |
|---|---|
| KCoreAAA | 9 kHz to 3 000 GHz |
| KCAAA 1 | 100 MHz to 2 170 MHz |
| KCAAA 2 | 100 MHz to 6 GHz |
| KCAAA 3 | 100 MHz to 25.5 GHz |



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In terms of section 22(6) of the AGA Actread with section 30(1) and section 31 of the Electronic Communications Act, 2005 (Act No. 36 of 2005) ("ECA"), the Authority has an obligation not to issue Radio Frequency Spectrum Licences where frequency used could cause radio frequency interference ("RFI") in the KCAAA. As a result, the Authority has put measures in place to ensure that it fulfils its role of preventing RFI in the KCAAA when licensing radio communication and broadcasting spectrum licenses. The Authority shall apply the necessary enforcement steps in terms of section 31 of the ECA and relevant regulations pertaining to the failure by a Radio Frequency Spectrum Licensees to comply with the provisions of the ECA including Notice No. 765 in Government Gazette No. 42080 of 4 December 2018.

## 5.6 ASTRONOMY FACILITIES OUTSIDE THE DECLARED AREAS

The radio instruments located at Hartebeesthoek Radio Astronomy Observatory near Pretoria are registered in the ITU-R MIFR and they include HART15M, HARTRAO and HARTVGS. The observations undertaken by these instruments in RAS bands are globally recognised and internationally protected. The applications and services operating within a 15 km radius from the location; Latitude 25°53'24.06"S and Longitude 27°41'7.45"E; must coordinate with SARAO and give due consideration when operating stations in frequency bands listed under No. 5.149, also identified in the NRFP2021 table of frequency allocation.



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# 6 NATIONAL FOOTNOTES TO THE TABLE OF FREQUENCY ALLOCATIONS

**NF0 (5350 - 5450 KHz)**

The band 5350 – 5450KHz and the channel 5290KHz is allocated on secondary basis to radio amateurs under the Article 4.4 of the ITU Radio Regulations.

**NF1 (29.7 - 30 MHz)**

This portion of the spectrum is allocated to the amateur service on a secondary basis for use during disaster exercises and emergency situations. This is in addition to the existing exclusive amateur band 28 - 29.7 MHz, which retains its primary status. The additional spectrum is used for single frequency mobile applications.

**NF2 (70 - 70.3 MHz)**
This sub-band is allocated to the amateur service on a secondary basis in order to undertake experimental work on propagation. The channels 70.025 – 70.150 MHz are used for civil defence purposes.

**NF3 (148 - 150.05 MHz)**

This frequency band was allocated internationally at WARC-92 for the mobile satellite service (MSS) in the Earth-to-space direction. The space-to-Earth link is provided at either 137 – 138 MHz or 400.15 - 401 MHz, depending on the satellite system.

**NF4 (161.875 - 173.875 MHz)**

The frequency band is used for sonobouy in the maritime service. Assignments were previously not allowed within a distance of 200 km from the coast. It is generally agreed that there is scope for increased sharing even near the coast. Proper care will be taken in making assignments near the coast in this frequency band and frequency coordination is to be performed with existing services on case by case basis.

**NF5 (173.7 – 175.1 MHz)**
This frequency band may be used for wireless microphones for services ancillary to Broadcasting (SAB) and services ancillary to programme (SAP) making. Use of wireless microphones must be co-ordinated and licensed.

**NF6 (336 - 366 MHz)**

The frequency band 336 – 346 MHz, paired with the frequency band 356 – 366 MHz, is allocated to fixed services on a primary basis and is applicable for use by Fixed Wireless Access (FWA) systems. Within this frequency band, the sub-band 337 – 344 MHz paired with 357 – 364 MHz is to be used for WAS whereas the sub-band 344 – 346 MHz paired with 364 – 366 MHz is to be used for alarm monitoring and tracking services using DSSS. The band is also considered for use by the Unmanned Aerial Vehicle (UAV) including Remotely Piloted Aircraft System (RPAS) within the sub band 336-346 paired with 356-366 MHz.This spectrum is potentially very useful for providing electronic communications services, in particular in rural areas considering its excellent propagation conditions.



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**NF7 (380 – 399.9 MHz)**

The frequency band 380 –399.9 MHz is allocated through ITU Resolution 646 (Rev.WRC-15) to Public Protection and Disaster Relief (PPDR) applications in line with ITU-R M.2015.

**NF8 (430 - 440 MHz)**

This frequency band is allocated to the amateur service in South Africa in line with ITU Region 1. The sub-band 433.05 - 434.79 MHz, however, is also designated as an ISM band in Region 1, subject to the special authorisation of the administration concerned (see RR 5.138). Furthermore, the sub-band 433.05 - 434.79 MHz can be used for non-specific short range devices on an unlicensed basis in accordance with the prescribed Regulations. The consequence of this is that the amateur service may not claim protection from (in-band) emissions from ISM equipment operating in the band, nor can ISM equipment and low power devices claim protection from amateur users operating in the band.

**NF9 (IMT Frequency Bands - Terrestrial)**

The table below list all possible IMT frequency bands identified by the ITU, relevant ITU Radio Regulation footnote as well as the applicable ITU-R channel plan.

| Band | Frequency band | Bandwidth (MHz) | RR FN | Channel Plan | WRC Resolution/s |
|---|---|---|---|---|---|
| 450 MHz | 450 – 470 MHz | 20 MHz | 5.286AA | Recommendation ITU-R M.1036-6 | 224 (Rev. WRC-15) |
| 700 MHz | 694 – 790 MHz | 96 MHz | 5.312A and 5.317A | Recommendation ITU-R M.1036-6 | 224 (Rev.WRC-15) and 760 (WRC-15) |
| 800 MHz | 790 — 862 MHz | 72 MHz | 5.316B and 5.317A | Recommendation ITU-R M.1036-6 (A3) | 224 (Rev. WRC-15) and 749 (Rev. WRC-15) |
| 850 MHz | 825—830 MHz 870—875 MHz | 10 MHz | NF10 | Recommendation ITU-R M.1036-6 | 224 (Rev. WRC-19) |
| 900 MHz | 880 – 915 MHz // 925 – 960 MHz | 35 MHz | 5.317A | Recommendation ITU-R M.1036-6 (A2) | 224 (Rev. WRC-15) and 749 (Rev. WRC-15) |
| 1500 MHz | 1 427-1 518 MHz | 91 MHz | 5.341A, 5.346, and 5.346A | Recommendation ITU-R M.1036-6[17] | 223 (Rev. WRC-15), 750 (Rev. WRC-15), and 761 (WRC-15) |
| 1800 MHz | 1710 – 1785 MHz // 1805 – 1880 MHz | 75 MHz | 5.384A | Recommendation ITU- | 223 (Rev. WRC-15) |

[17] Channelling arrangement for 1 427-1 518 MHz is under study at the ITU-R Working Party 5D



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| | | | | | |
|---|---|---|---|---|---|
| | | | | R M.1036-6 (B2) | |
| 1900 MHz | 1900 – 1920MHz | 20 MHz | 5.388 | Recommendation ITU-R M.1036-6 (B4) | Resolution **212 (Rev.WRC-19)** |
| 2100 MHz | 1920 – 1980 MHz // 2110 – 2170 MHz | 60 MHz | 5.388 | Recommendation ITU-R M.1036-6 (B1) | 212 (Rev. WRC-07) and 223 (Rev. WRC-12) |
| 2100 MHz (TDD) | 1900 – 1920 MHz, 2010 – 2025 MHz | 20 MHz | 5.388 | Recommendation ITU-R M.1036-6 (B1) | 212 (Rev. WRC-07) and 223 (Rev. WRC-12) |
| 2300 MHz | 2300 – 2400 MHz | 100 MHz | 5.384A | Recommendation ITU-R M.1036-6 (E1) | 223 (Rev. WRC-12) |
| 2600 MHz | 2500 – 2690 MHz | 190 MHz | 5.384A | Recommendation ITU-R M.1036-6 (C1) | 223 (Rev. WRC-12) |
| 3500 MHz | 3300 – 3400 MHz | 100 MHz | 5.429B | Recommendation ITU-R M.1036-6[18] | 223 (Rev. WRC-19), |
| 3.5 GHz | 3400 – 3600 MHz | 200 MHz | 5.430A | Recommendation ITU-R M.1036-6 (F1) | NA |
| 4.9 GHz | 4800 – 4990 MHz | 190 MHz | 5.441A | Recommendation ITU-R M.1036-6 | 223 (Rev. WRC-19) |
| 26 GHz | 24.25 – 27.5 GHz | 3250 MHz | 5.532AB | Recommendation ITU-R M.1036-6 | 242 (Rev. WRC-19) |
| 40 GHz | 37 – 43.5 GHz | 6500 MHz | 5.550B | Recommendation ITU-R M.1036-6 | 243 (Rev. WRC-19) |
| 48 GHz | 47.2 – 48.2 GHz | 1000 MHz | 5.553B | Recommendation ITU-R M.1036-6 | 243 (Rev. WRC-19) |
| 66 GHz | 66 – 71 GHz | 5000 MHz | 5.559B | Recommendation ITU-R M.1036-6 | 241 (Rev. WRC-19) |

**NF10 (876 - 880 // 921 - 925 MHz)**

This frequency band is used by GSM-R systems.

[18] Channelling arrangement for 3300 – 3400 MHz is under study at the ITU-R Working Party 5D



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**NF11 (915 - 921 MHz) – Suppressed**

**NF12 (1452 - 1492 MHz) – Suppressed**

**NF13 (1980 – 2010 MHz paired with 2170 – 2200 MHz)**

These frequency bands are allocated, amongst others, to both the mobile and mobile-satellite services and are also earmarked for the satellite component of IMT. Further, guidance on the implementation of technical and operational measures to facilitate coexistence between terrestrial and satellite components of International Mobile Telecommunications in the frequency bands 1 980- 2 010 MHz and 2 170-2 200 MHz is addressed within ITU-R in accordance with Resolution **212 (Rev. WRC-19)**,

**NF14 (Channel arrangements for Fixed Services Systems)**

The table below list the main fixed services frequency bands and the applicable ITU-R Recommendation specifying the applicable frequency channel arrangement. Different channel spacing for each frequency band will allowed in accordance with the relevant ITU-R Recommendation. Sub-division of channels will also be allowed to cater for smaller bandwidth systems. Hop distances will be determined, amongst others, by propagation conditions. Sharing with services other than fixed services is indicated in the comments column.

| Band | Band limits | Channel Plan | Comments |
|---|---|---|---|
| 1-2GHz | 1350 - 1375 MHz // 1492 – 1517 MHz<br><br>1375 – 1400 MHz // 1427 – 1452 MHz | ITU-R F.1242 | |
| 2 GHz | 2025-2110 MHz // 2200-2285 MHz | ITU-R F.1098 | |
| 4 GHz | 3600 – 4200 MHz | ITU-R F.635, Annex 1 | Shared with FSS (downlink) (Note 1) |
| 4.8 GHz | 4400 – 5000 MHz | ITU-R F.1099, Annex 1 | Government Services |
| Lower 6 GHz | 5925 – 6425 MHz | ITU-R F.383 | Shared with FSS (uplink) (Note 2) |
| Upper 6 GHz | 6425 – 7110 MHz | ITU-R F.384 | Shared with FSS (Note 3) |
| 7 GHz (L7 + U7) | 7110 – 7750 MHz | ITU-R F385, Annex 3 | |
| Lower 8 GHz | 7725 – 8275 MHz | ITU-R F.386, Annex 6 | |
| Upper 8 GHz | 8275 – 8500 MHz | ITU-R F.386, Annex 1 | |
| 10.5 GHz | 10.15-10.3 GHz// 10.5-10.65 GHz | ITU-R F.1568, Annex 1 | |
| 11 GHz | 10.7 – 11.7 GHz | ITU-R F.387 | Shared with FSS (Note 4) |



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| | | | |
|---|---|---|---|
| 13 GHz | 12.75 – 13.25 GHz | ITU-R F.497 | |
| 15 GHz | 14.5 – 15.35 GHz | ITU-R F.636 | |
| 18 GHz | 17.7 – 19.7 GHz | ITU-R F.595, Annex 1 | |
| 23 GHz | 21.2-23.6 GHz or | ITU-R F.637, Annex 1 | Shared with BSS (Note 5) |
| 26 GHz | 24.5 – 26.5 GHz | ITU-R F.748, Annex 1 | Shared with EESS (Note 6) |
| 28 GHz | 27.5 – 29.5 GHz | ITU-R F.748-4, Annex 2 | |
| 32 GHz | 31.8 – 33.4 GHz | ITU-R F.1520, Annex 1 | |
| 38 GHz | 37.0 – 39.5 GHz | ITU-R F.749 Annex 1 | |
| 42 GHz | 40.5 – 43.5 GHz | ITU-R F. 2005 | |
| 57 GHz | 55.78 – 59 GHz | ITU-R F 1497 | |
| 80 GHz | 71 – 76 GHz // 81 – 86 GHz | ITU-R F.2006 | (Note 7) |
| 94 GHz | 92 – 94 GHz 94.1 – 95 GHz | ITU –R F. 2004 | |

**Note 1:** The band 3600 – 4200 MHz is used on a national basis for high capacity, core network telecommunication services under the fixed service using (for fixed services links generally over long hop lengths. The band 3625 – 4200 MHz, part of the C-band, is used extensively for FSS (space-to-Earth) applications. This band is shared between FS and FSS.

**Note 2:** In addition to deployment of fixed services links under the fixed services, the band 5850 – 6425 MHz, part of the C-band, is also used for FSS (Earth-to-space) applications on a shared basis with FS. The C-band is also used for satellite news gathering (SNG) operations, which will require frequency co-ordination with fixed links on a case-by-case basis. Users are encouraged to, as far as possible, use the Ku-band for SNG operations in South Africa in order to avoid the need for frequency coordination and the interference problems associated with C-band SNG operations. The band 5850 – 5926 MHz may also be used for temporary deployment for ENG and OB links under the mobile and fixed services respectively on a strictly coordinated basis.

**Note 3:** This band is used on a national basis for fixed services links under the fixed service. Fixed links are shared with NGSO MSS (space-to-Earth) feeder links and geo-stationary satellite orbit (GSO) FSS (Earth-to-space) systems on a strictly controlled and co-ordinated basis.

**Note 4:** This band is used on a national basis for fixed services links under the fixed service. The bands 10.95 – 11.2 GHz and 11.45 – 11.7 GHz are also shared with FSS (space-to-Earth) systems (typically VSAT/SNG and PTP links). The sub-bands 10.95 – 11.2 GHz and 11.45 – 11.7 GHz is also used DTH satellite broadcasting services on a secondary basis to the FS and FSS services.

**Note 5:** In addition to the fixed services, the band 21.2 – 23 GHz is also allocated to the BSS on a co-primary basis. In accordance with 5.530A, all fixed links must comply to the prescribed pfd limits at national borders, unless otherwise agreed with the administration concerned. In



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line with 5.530B, the band 21.2 – 23 GHz will not be used for mobile services in South Africa and fixed service deployments will be restricted to for fixed services links.

**Note 6:** An unmanned receive only earth station, forming part of the National Polar-Orbiting Operational Environmental Satellite System (NPOESS) is located in South Africa, and this system operates within the frequency band 25.5 to 27 GHz in the Earth Exploration Satellite (space-to-earth) service.

**Note 7:** The frequency bands 71 – 76 GHz paired with 81 – 86 GHz are allocated to the fixed services and is earmarked for very high capacity Broadband Fixed Wireless Systems over very short hop lengths. Radio frequency channel arrangements for fixed service systems operating in the bands 71-76 GHz and81-86 GHz are according to the Radio Frequency Spectrum Regulations (GG. No.38641, 30 March 2015).

**NF15 (4400 – 5000 MHz)**

The frequency band 4400 – 5000 MHz is allocated to electronic news gathering (ENG) and outside broadcasting (OB) services under the mobile and fixed services respectively, and is shared with Government Services.
NF16 (5725 – 5850 MHz)
The band 5725 – 5875 MHz is designated as an ISM band through ITU-R footnote 5.150. In addition to ISM applications, the band 5725 – 5850 MHz is also available for fixed links on a license-exempt basis, provided adherence to the provisions indicated below. Type Approval of these systems is mandatory. See also Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).
(for additional requirements in using this band.

| Frequency Range | Maximum Power | Modulation | Restrictions |
|---|---|---|---|
| 5.725 – 5.850 GHz | 1 watt peak e.i.r.p | Any modulation | No other restriction other than those related to the maximum power and the modulation scheme. |
| 5.725 – 5.850 GHz | 4 watt peak e.i.r.p | Frequency hopping or digital modulation only | No other restriction other than those related to the maximum power and the modulation scheme. |
| 5.725 – 5.850 GHz | 200 watt peak e.i.r.p with a max 1 watt peak transmitter power | Digital modulation only | - Fixed Radio Link devices only<br>- Peak power spectral density must not exceed 17dBm /MHz |

The Authority reserves the right to require users to change the frequency, reduce the power, or cease operations, where harmful interference is caused.



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**NF17 (14.0 – 14.5 GHz)**

The frequency band 14.0 – 14.5 GHz, part of the Ku-band is used extensively for FSS (Earth-to-space) applications (VSAT/SNG/PTP links).

**NF18 (27.5 – 28.35 GHz)**

The frequency bands 27.5 – 28.35 GHz (base station to subscriber) and 31.000 – 31.300 MHz (subscriber to base station) are allocated to broadband service - local multipoint distribution services (LMDS) under the fixed service using a PTMP topology.

# 7 ITU RADIO REGULATIONS FOOTNOTES

The ITU Radio Regulations footnote listed are those that are applicable to Region 1.

| | |
|---|---|
| **5.53** | Administrations authorising the use of frequencies below 8.3 kHz shall ensure that no harmful interference is caused thereby to the services to which the bands above 8.3 kHz are allocated. |
| **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. |
| **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. |
| **5.54B** | *Additional allocation:* in Algeria, Saudi Arabia, Bahrain, Egypt, the United Arab Emirates, the Russian Federation, Iran (Islamic Republic of), Iraq, Kuwait, Lebanon, Morocco, Qatar, the Syrian Arab Republic, Sudan and Tunisia, the frequency band 8.3-9 kHz is also allocated to the radionavigation, fixed and mobile services on a primary basis. (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. |
| **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, Bulgaria, 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. (WRC-2000) |
| **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 No. **5.33**). (WRC-2000) |
| **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. |



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| **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. |
| **5.63** | SUP ( WRC-97) |
| **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 No. 5.33). (WRC-2000) |
| **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 No. **5.33**) and to the radionavigation service on a secondary basis (see No. **5.32**). |
| **5.67** | *Additional allocation:* in Kyrgyzstan and Turkmenistan, the frequency 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 frequency band 135.7-137.8 kHz in Algeria, Egypt, 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 frequency 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), Eswatini, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Nigeria, Oman, the Dem. Rep. of the Congo, South Africa, Tanzania, Chad, Zambia and Zimbabwe, the frequency band 200-283.5 kHz is allocated to the aeronautical radionavigation service on a primary basis. (WRC-19) |
| **5.71** | SUP (WRC-19) |
| **5.72** | SUP (WRC-12) |



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| **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. (WRC-97) |
| **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. |



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| **5.80A** | The maximum equivalent isotropically radiated power (e.i.r.p.) of stations in the amateur service using frequencies in the band 472-479 kHz shall not exceed 1 W. Administrations may increase this limit of e.i.r.p. to 5 W in portions of their territory which are at a distance of over 800 km from the borders of Algeria, Saudi Arabia, Azerbaijan, Bahrain, Belarus, China, Comoros, Djibouti, Egypt, United Arab Emirates, the Russian Federation, Iran (Islamic Republic of), Iraq, Jordan, Kazakhstan, Kuwait, Lebanon, Libya, Morocco, Mauritania, Oman, Uzbekistan, Qatar, Syrian Arab Republic, Kyrgyzstan, Somalia, Sudan, Tunisia, Ukraine and Yemen. In this frequency band, stations in the amateur service shall not cause harmful interference to, or claim protection from, stations of the aeronautical radionavigation service. |
| **5.80B** | The use of the frequency band 472-479 kHz in Algeria, Saudi Arabia, Azerbaijan, Bahrain, Belarus, China, Comoros, Djibouti, Egypt, United Arab Emirates, the Russian Federation, Iraq, Jordan, Kazakhstan, Kuwait, Lebanon, Libya, Mauritania, Oman, Uzbekistan, Qatar, Syrian Arab Republic, Kyrgyzstan, Somalia, Sudan, Tunisia and Yemen is limited to the maritime mobile and aeronautical radionavigation services. The amateur service shall not be used in the abovementioned countries in this frequency band, and this should be taken into account by the countries authorizing such use. |
| **5.81** | SUP (WRC-2000) |
| **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) |
| **5.82A** | SUP (WRC-12) |
| **5.82B** | Administrations authorizing the use of frequencies in the band 495-505 kHz by services other than the maritime mobile service shall ensure that no harmful interference is caused to the maritime mobile service in this band or to the services having allocations in the adjacent bands, noting in particular the conditions of use of the frequencies 490 kHz and 518 kHz, as prescribed in Articles **31** and **52**. (WRC-07) |
| **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) |
| **5.83** | SUP (WRC-07) |
| **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) |
| **5.85** | Not used. |
| **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 |



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| | limited to ground-based radiobeacons in operation on 27 October 1997 until the end of their lifetime. (WRC-97) |
| **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).<br>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. (WRC-97) |
| **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) |
| **5.94** | Not used |
| **5.95** | Not used. |
| **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 frequency 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 frequency band 1 810-1 830 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-15) |



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| **5.99** | *Additional allocation:* in Saudi Arabia, Austria, Iraq, Libya, Uzbekistan, Slovakia, Romania, Serbia, 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**. |
| **5.101** | SUP (WRC12) |
| **5.102** | *Alternative allocation:* in Bolivia, Chile, Paraguay and Peru, the frequency 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**. |



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| **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 Nos. **5.16** to **5.20**, **5.21** and **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.<br>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 frequency band 3 500-3 750 kHz is also allocated to the fixed and mobile services on a primary basis. (WRC-15) |
| **5.120** | SUP (WRC-2000) |
| **5.121** | Not used. |
| **5.122** | *Alternative allocation:* in Bolivia, Chile, Ecuador, Paraguay and Peru, the frequency 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) |
| **5.124** | SUP (WRC-2000) |
| **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. |



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| **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 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) |
| **5.129** | SUP (WRC-07) |
| **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. (WRC-97) |
| **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 (**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 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) |



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| **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) |
| **5.135** | SUP (WRC-97) |
| **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:<br>6 765-6 795 kHz (centre frequency 6 780 kHz),<br>433.05-434.79 MHz (centre frequency 433.92 MHz) in Region 1<br>except in the countries mentioned in No. **5.280**,<br>61-61.5 GHz (centre frequency 61.25 GHz),<br>122-123 GHz (centre frequency 122.5 GHz), and<br>244-246 GHz (centre frequency 245 GHz)<br>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. (WRC-03) |
| **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 frequency 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. (WRC-03) |



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| **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. (WRC-03) |
| **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. (WRC-03) |
| **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. (WRC-03) |
| **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. (WRC-03) |
| **5.143C** | Additional allocation: after 29 March 2009 in Algeria, Saudi Arabia, Bahrain, Comoros, Djibouti, Egypt, United Arab Emirates, Iran (Islamic Republic of), Libya, Jordan, Kuwait, Morocco, Mauritania, 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 |



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| | account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations. (WRC-03) |
| **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. (WRC-03) |
| **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** (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. |



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| **5.149** | In making assignments to stations of other services to which the bands:<br>13 360-13 410 kHz, 25 550-25 670 kHz,<br>37.5-38.25 MHz, 73-74.6 MHz in Regions 1 and 3,<br>150.05-153 MHz in Region 1, 322-328.6 MHz,<br>406.1-410 MHz, 608-614 MHz in Regions 1 and 3<br>1 330-1 400 MHz, 1 610.6-1 613.8 MHz,<br>1 660-1 670 MHz, 1 718.8-1 722.2 MHz,<br>2 655-2 690 MHz, 3 260-3 267 MHz,<br>3 332-3 339 MHz, 3 345.8-3 352.5 MHz,<br>4 825-4 835 MHz, 4 950-4 990 MHz,<br>4 990-5 000 MHz, 6 650-6 675.2 MHz,<br>10.6-10.68 GHz, 14.47-14.5 GHz,<br>22.01-22.21 GHz, 22.21-22.5 GHz,<br>22.81-22.86 GHz, 23.07-23.12 GHz,<br>31.2-31.3 GHz, 31.5-31.8 GHz in Regions 1 and 3,<br>36.43-36.5 GHz, 42.5-43.5 GHz,<br>48.94-49.04 GHz, 76-86 GHz,<br>92-94 GHz, 94.1-100 GHz,<br>102-109.5 GHz, 111.8-114.25 GHz,<br>128.33-128.59 GHz, 129.23-129.49 GHz,<br>130-134 GHz, 136-148.5 GHz,<br>151.5-158.5 GHz, 168.59-168.93 GHz,<br>171.11-171.45 GHz, 172.31-172.65 GHz,<br>173.52-173.85 GHz, 195.75-196.15 GHz,<br>209-226 GHz, 241-250 GHz,<br>252-275 GHz<br><br>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:<br><br>13 553-13 567 kHz (centre frequency 13 560 kHz),<br>26 957-27 283 kHz (centre frequency 27 120 kHz),<br>40.66-40.70 MHz (centre frequency 40.68 MHz),<br>902-928 MHz in Region 2 (centre frequency 915 MHz),<br>2 400-2 500 MHz (centre frequency 2 450 MHz),<br>5 725-5 875 MHz (centre frequency 5 800 MHz), and<br>24-24.25 GHz (centre frequency 24.125 GHz)<br>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**. |



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| **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. (WRC-03) |
| **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. (WRC-03) |
| **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) |
| **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. |



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| **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, 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) |
| **5.162** | *Additional allocation:* in Australia, the band 44-47 MHz is also allocated to the broadcasting service on a primary basis. |
| **5.162A** | Additional allocation: in Germany, Austria, Belgium, Bosnia and Herzegovina, China, Vatican, Denmark, Spain, Estonia, the Russian Federation, Finland, France, Ireland, Iceland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, North Macedonia, Monaco, Montenegro, Norway, the Netherlands, Poland, Portugal, the Czech Rep., the United Kingdom, Serbia, Slovenia, Sweden and Switzerland the frequency band 46-68 MHz is also allocated to the radiolocation service on a secondary basis. This use is limited to the operation of wind profiler radars in accordance with Resolution **217 (WRC-97)**. (WRC-19) |
| **5.163** | *Additional allocation:* in Armenia, Belarus, the Russian Federation, Georgia, Hungary, Kazakhstan, Latvia, Lithuania, Moldova, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the 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-12) |
| **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 frequency band 47-68 MHz, in South Africa the frequency band 47-50 MHz, and in Latvia the frequency bands 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) |
| **5.166** | SUP (WRC-15) |



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| **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 frequency 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 frequency 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 frequency 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) |



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| **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 frequency 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 frequency 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 frequency 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) |



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| **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, Slovakia, 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-07) |
| **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**. (WRC-03) |
| **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. |
| **5.184** | SUP (WRC-07) |
| **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 frequency band 76-88 MHz to the fixed and mobile services is on a primary basis (see No. **5.33**). (WRC-15) |
| **5.186** | SUP (WRC-97) |
| **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. |
| **5.189** | Not used. |
| **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**. (WRC-97) |
| **5.191** | Not used. |



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| **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. (WRC-97) |
| **5.193** | Not used. |
| **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) |
| **5.195** | Not used |
| **5.196** | Not used. |
| **5.197** | *Additional allocation:* in 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-12 ) |
| **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) |
| **5.200** | In the band 117.975-137 MHz, the frequency 121.5 MHz is the aeronautical emergency frequency and, where required, the frequency 123.1 MHz is the aeronautical frequency auxiliary to 121.5 MHz. Mobile stations of the maritime mobile service may communicate on these frequencies under the conditions laid down in Article **31** for distress and safety purposes with stations of the aeronautical mobile service. (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) |
| **5.203** | SUP (WRC-07) |
| **5.203A** | SUP(WRC-07) |
| **5.203B** | SUP(WRC-07) |



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| **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 No. **5.33**). |
| **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**). (WRC-2000) |
| **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**. (WRC-97) |
| **5.208A** | In making assignments to space stations in the mobile-satellite service in the frequency bands 137-138 MHz, 387-390 MHz and 400.15-401 MHz and in the maritime mobile-satellite service (space-to-Earth) in the frequency bands 157.1875-157.3375 MHz and 161.7875- 161.9375 MHz, administrations shall take all practicable steps to protect the radio astronomy service in the frequency bands 150.05-153 MHz, 322-328.6 MHz, 406.1-410 MHz and 608-614 MHz from harmful interference from unwanted emissions as shown in the most recent version of Recommendation ITU-R RA.769. (WRC-19) |
| **5.208B*** | In the frequency bands:<br><br>137-138 MHz,<br>157.1875-157.3375 MHz,<br>161.7875-161.9375 MHz,<br>387-390 MHz,<br>400.15-401 MHz,<br>1 452-1 492 MHz,<br>1 525-1 610 MHz,<br>1 613.8-1 626.5 MHz,<br>2 655-2 690 MHz,<br>21.4-22 GHz,<br>Resolution **739 (Rev.WRC-19**) applies. (WRC-19)<br><br>* This provision was previously numbered as No. **5.347A**. It was renumbered to preserve the sequential order. |
| **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. (WRC-97) |



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| **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) |
| **5.215** | Not used. |
| **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 |



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| | limit is exceeded, agreement under No. **9.21** is required to be obtained from countries mentioned in this footnote. (WRC-19) |
| **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 frequency 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. (WRC-19) |
| **5.222** | SUP (WRC-15) |
| **5.223** | SUP (WRC-15) |
| **5.224** | SUP (WRC-97) |
| **5.224A** | SUP (WRC-15) |
| **5.224B** | SUP (WRC-15) |
| **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. |



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| **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(V/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**.<br><br>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**.<br><br>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**).<br><br>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.<br><br>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** | SUP (WRC-12) |
| **5.228** | The use of the frequency bands 156.7625-156.7875 MHz and 156.8125-156.8375 MHz by the mobilesatellite 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, |



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| | emissions in these frequency bands by systems operating in the maritime mobile service for communications shall not exceed 1W. (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 the frequency bands 161.9375-161.9625 MHz and 161.9875-162.0125 MHz by the maritime mobile-satellite (Earth-to-space) service is limited to the systems which operate in accordance with Appendix 18. (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-GSO 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-GSO 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. |



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| **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) |
| **5.232** | SUP (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. |
| **5.234** | SUP (WRC-12) |
| **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, the 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. |
| **5.239** | Not used. |
| **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. |
| **5.244** | SUP (WRC-97) |
| **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 No. **5.33**) 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 |



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| | 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. |
| **5.248** | Not used |
| **5.249** | Not used. |
| **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) |
| **5.253** | Not used. |
| **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**. (WRC-03) |
| **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 frequency 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 frequency 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) |
| **5.260** | SUP (WRC-15) |



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| **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.<br><br>In the frequency band 399.99-400.02 MHz, the e.i.r.p. limits as specified above shall apply after 22 November 2022 to all systems within the mobile-satellite service. Administrations are requested that their mobile-satellite service satellite links in the 399.99-400.02 MHz frequency band comply with the e.i.r.p. limits as specified above, after 22 November 2019. (WRC-19) |
| **5.260B** | In the frequency band 400.02-400.05 MHz, the provisions of No. **5.A12** 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, Uzbekistan, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, Kyrgyzstan, Romania, 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 systems and non-geostationary systems with an orbit of apogee equal or greater than 35 786 km.<br><br>The maximum e.i.r.p. of any emission of each earth station in the meteorologicalsatellite service and the Earth exploration-satellite service shall not exceed 7 dBW in any 4 kHz band for non-geostationary systems with an orbit of apogee lower than 35 786 km.<br><br>The maximum e.i.r.p. of each earth station in the meteorological-satellite service and the Earth exploration-satellite service shall not exceed 22 dBW for geostationary systems and nongeostationary systems with an orbit of apogee equal or greater than 35 786 km in the whole 401-403 MHz frequency band.<br><br>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- |



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| | geostationary systems with an orbit of apogee lower than 35 786 km in the whole 401-403 MHz frequency band.<br><br>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 exploration-satellite service for which complete notification information has been received by the Radiocommunication Bureau before 28 April 2007 are exempt from provisions of No. **5.264A** and may continue to operate in the frequency band 401.898- 402.522 MHz on a primary basis without exceeding a maximum e.i.r.p. level of 12 dBW. (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 frequency band 410-420 MHz by the space research service is limited to space-to-space communication links with an orbiting, manned space vehicle. The power flux-density at the surface of the Earth produced by emissions from transmitting stations of the space research service (space-to-space) in the frequency band 410-420 MHz shall not exceed –153 dB(W/m$^2$) for $0^o \leq \delta \leq 5^o$, -153+ 0.077 (d – 5) dB(W/m$^2$) for $5^o \leq \delta \leq 70^o$ and –148 dB(W/m$^2$) for $70^o \leq \delta \leq 90^o$, where $\delta$ is the angle of arrival of the radio-frequency wave and the reference bandwidth is 4 kHz. In this frequency band, stations of the space research service (space-to-space) shall not claim protection from, nor constrain the use and development of, stations of the fixed and mobile services. No. **4.10** does not apply. (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 No. **5.33**). |
| **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** | SUP (WRC-12 ) |
| **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.(WRC12) |
| **5.275** | *Additional allocation:* in Croatia, Estonia, Finland, Libya, North Macedonia, 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, |



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| | Switzerland, Thailand, Togo, Turkey and Yemen, the frequency band 430-440 MHz is also allocated to the fixed service on a primary basis and the frequency bands 430-435 MHz and 438-440 MHz are also allocated, except in Ecuador, to the mobile, except aeronautical mobile, service on a primary basis. (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 mobile, except aeronautical mobile, service, and on a secondary basis to the fixed 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-satellitecservice (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 and communities 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 No. **5.33**). |



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| **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**. (WRC-97) |
| **5.286AA** | The frequency band 450-470 MHz is identified for use by administrations wishing to implement International Mobile Telecommunications (IMT) - see Resolution **224 (Rev.WRC-19)**. This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. (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. (WRC-97) |
| **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 notconstrain the development and use of the fixed and mobile services operating in accordance with the Table of Frequency Allocations. (WRC-97) |
| **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 MHz 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. |



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| **5.291A** | *Additional allocation:* in Germany, Austria, Denmark, Estonia, Liechtenstein, the Czech Rep., Serbia and Switzerland, the frequency 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 frequency band 470-512 MHz 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, Jamaica and Panama, the allocation of the frequency 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 the Bahamas, Barbados, Canada, Chile, Cuba, the United States, Guyana, Jamaica, Mexico and Panama, the allocation of the frequency 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 frequency 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 frequency 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, Ukraine, Zambia and Zimbabwe, the frequency band 470-694 MHz is also allocated on a secondary basis to the land mobile service, intended for applications ancillary to broadcasting and programme-making. Stations of the land mobile service in the countries listed in this footnote shall not cause harmful interference to existing or planned stations operating in accordance with the Table in countries other than those listed in this footnote. (WRC-19) |



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| **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. |
| **5.299** | Not used. |
| **5.300** | *Additional allocation:* in Saudi Arabia, Cameroon, Egypt, United Arab Emirates, Israel, Jordan, Libya, Oman, Qatar, the Syrian Arab Republic and Sudan, the frequency band 582-790 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis. (WRC-15) |
| **5.301** | Not used. |
| **5.302** | SUP (WRC-12) |
| **5.303** | Not used. |
| **5.304** | *Additional allocation:* in the African Broadcasting Area (see Nos. **5.10** to **5.13**), 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 Nos. **5.10** to **5.13**), and in Region 3, the band 608-614 MHz is also allocated to the radio astronomy service on a secondary basis. |
| **5.307** | *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** | 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 |



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| | 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 frequency 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) |
| **5.310** | SUP (WRC-97) |
| **5.311** | SUP (WRC-07) |
| **5.311A** | SUP (WRC-19) |
| **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 frequency 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) |
| **5.313** | SUP (WRC-97) |
| **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) |
| **5.313B** | SUP (WRC-15) |
| **5.314** | SUP (WRC-15) |
| **5.315** | SUP (WRC-15) |
| **5.316** | SUP (WRC-15) |
| **5.316A** | SUP (WRC-15) |
| **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 frequency 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 MHz in Region 1 and 790- 960 MHz in Regions 1 and 3 which are allocated to the mobile service on a primary basis are identified for use by administrations wishing to implement International Mobile Telecommunications (IMT) – see Resolutions **224 (Rev.WRC- 19)**, **760 (Rev.WRC-19)** and **749 (Rev.WRC-19)**, where applicable. This identification does not preclude the use of these frequency bands by any application of the |



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| | 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. |
| **5.321** | SUP (WRC-07) |
| **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 862-880 MHz and 915-925 MHz, 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) |
| **5.324** | Not used. |
| **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 No. **5.33**), 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 902-928 MHz is allocated to the mobile, except aeronautical mobile, service on a primary basis. In Colombia, 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 No. **5.33**). |



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| **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. (WRC-2000) |
| **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 (Rev.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 thebands 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 frequency band 1 215-1 300 MHz shall be subject to the condition that no harmful interference is caused to the radiolocation service. No. **5.43** shall not apply in respect of the radiolocation service. Resolution **608 (Rev.WRC-19)** shall apply. (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 ) |



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| **5.331** | *Additional allocation:* in Algeria, Germany, Saudi Arabia, Australia, Austria, Bahrain, Belarus, Belgium, Benin, Bosnia and Herzegovina, Brazil, Burkina Faso, Burundi, Cameroon, China, Korea (Rep. of), Croatia, Denmark, Egypt, the United Arab Emirates, Estonia, the Russian Federation, Finland, France, Ghana, Greece, Guinea, Equatorial Guinea, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Ireland, Israel, Jordan, Kenya, Kuwait, Lesotho, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, North Macedonia, Madagascar, Mali, Mauritania, Montenegro, Nigeria, Norway, Oman, Pakistan, the Kingdom of the Netherlands, Poland, Portugal, Qatar, the Syrian Arab Republic, Dem. People's Rep. of Korea, Slovakia, the United Kingdom, Serbia, Slovenia, Somalia, Sudan, South Sudan, Sri Lanka, South Africa, Sweden, Switzerland, Thailand, Togo, Turkey, Venezuela and Viet Nam, the frequency band 1 215-1 300 MHz is also allocated to the radionavigation service on a primary basis. In Canada and the United States, the frequency band 1 240- 1 300 MHz is also allocated to the radionavigation service, and use of the radionavigation service shall be limited to the aeronautical radionavigation service. (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. (WRC-2000) |
| **5.333** | SUP (WRC-97) |
| **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. (WRC-03) |
| **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. (WRC-97) |
| **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. (WRC-2000) |
| **5.336** | Not used. |
| **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. (WRC-2000) |
| **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, 51.4-52.6 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. |



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| **5.339A** | SUP (WRC-07) |
| **5.340** | All emissions are prohibited in the following bands:<br>1 400-1 427 MHz,<br>2 690-2 700 MHz,except those provided for by No. **5.422,**<br>10.68-10.7 GHz, except those rovided for by No. **5.483**,<br>15.35-15.4 GHz,except those provided for by No. **5.511**,<br>23.6-24 GHz,<br>31.3-31.5 GHz,<br>31.5-31.8 GHz, in Region 2,<br>48.94-49.04 GHz, from airborne stations<br>50.2-50.4 GHz[2],<br>52.6-54.25 GHz,<br>86-92 GHz,<br>100-102 GHz,<br>109.5-111.8 GHz,<br>114.25-116 GHz,<br>148.5-151.5 GHz,<br>164-167 GHz,<br>182-185 GHz,<br>190-191.8 GHz,<br>200-209 GHz,<br>226-231.5 GHz,<br>250-252 GHz. (WRC-03)<br><br>[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. (WRC-97) |
| **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 b 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 |



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| | 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**). |
| **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**1, Qatar, Dem. Rep. of the Congo, Rwanda, Senegal, Seychelles, Sudan, South Sudan, South Africa, Tanzania, Chad, Togo, Tunisia, Zambia, and Zimbabwe, the frequency band 1 452-1 492 MHz is identified for use by administrations listed above wishing to implement International Mobile Telecommunications (IMT) in accordance with Resolution **223 (Rev.WRC-15)**. This identification does not preclude the use of this frequency band by any other application of the services to which it is allocated and does not establish priority in the Radio Regulations. The use of this frequency band for the implementation of IMT is subject to agreement obtained under No. **9.21** with respect to the aeronautical mobile service used for aeronautical telemetry in accordance with No. **5.342**. See also Resolution **761 (WRC-19)**. (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. (WRC-03) |
| **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/m2) 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 |



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| | stations in the mobile service in the territory of Japan. No. **5.43A** does not apply. (WRC-03) |
| **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. (WRC-03) |
| **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) |
| **5.352** | SUP (WRC-97) |
| **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) |
| **5.353** | SUP (WRC-97) |
| **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.) (WRC-2000) |
| **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 ) |



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| **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 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.<br>(The provisions of Resolution **222 (WRC-12 )*** shall apply.) (WRC-12 )<br><br>* Note by the Secretariat: This Resolution was revised by WRC-07. |
| **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. (WRC-97) |
| **5.362B** | SUP (WRC-12) |
| **5.362C** | SUP (WRC-12) |
| **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 |



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| | 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 bands 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**. |
| **5.368** | The provisions of No. **4.10** do not apply with respect to the radiodetermination-satellite and mobile-satellite services in the frequency band 1 610-1 626.5 MHz. However, No. **4.10** applies in the frequency band 1 610-1 626.5 MHz with respect to the aeronautical radionavigation-satellite service when operating in accordance with No. **5.366**, the aeronautical mobile satellite (R) service when operating in accordance with No. **5.367,** and in the frequency band 1 621.35-1 626.5 MHz with respect to the maritime mobile-satellite service when used for GMDSS. (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 bands 1 610-1 626.5 MHz (Earth-to-space) (space-to-Earth) is also allocated to the radiodetermination-satellite service on a secondary basis, subject to agreement obtained under No. **9.21**. (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 mobilesatellite 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 1 610-1621.35 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) |



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| **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**. (WRC- 97) |
| **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. (WRC-97) |
| **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/m2) in 10 MHz and -194 dB(W/m2) in any 20 kHz at any radio astronomy station recorded in the Master International Frequency Register, for more than 2% of integration periods of 2 000 s. (WRC-03) |
| **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. (WRC-03) |
| **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 ) |



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| **5.382** | *Different category of service:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Congo (Rep. of the), Egypt, the United Arab Emirates, Eritrea, Ethiopia, the Russian Federation, Guinea, Iraq, Israel, Jordan, Kazakhstan, Kuwait, Lebanon, North Macedonia, Mauritania, Moldova, Mongolia, Oman, Uzbekistan, Poland, Qatar, the Syrian Arab Republic, Kyrgyzstan, Somalia, Tajikistan, Turkmenistan, Ukraine and Yemen, the allocation of the frequency band 1 690-1 700 MHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (see No. **5.33**), and in the Dem. People's Rep. of Korea, the allocation of the frequency band 1 690-1 700 MHz to the fixed service is on a primary basis (see No. **5.33**) and to the mobile, except aeronautical mobile, service on a secondary basis. (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. (WRC-97) |
| **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 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. (WRC-2000) |
| **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 frequency 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 frequency bands by other services to which they are allocated. The frequency bands should be made available for IMT in accordance with Resolution **212 (Rev.WRC-19)** (see also Resolution **223 (Rev.WRC-19)**). (WRC-19) |
| **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. (WRC- 03) |



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| **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) |
| **5.389C** | The use of the bands 2 010-2 025 MHz and 2 160-2 170 MHz in Region 2 by the mobile-satellite service 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 mobilesatellite 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) |
| **5.390** | SUP (WRC-07) |
| **5.391** | In making assignments to the mobile service in the frequency bands 2 025-2 110 MHz and 2 200-2 290 MHz, administrations shall not introduce high-density mobile systems, as described in Recommendation ITU-R SA.1154-0, and shall take that Recommendation into account for the introduction of any other type of mobile system. (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 |



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| | 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. (WRC-03) |
| **5.396** | SUP (WRC-19) |
| **5.397** | SUP (WRC-12) |
| **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.B118**, 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.A118**. (WRC-12) |
| **5.400** | SUP (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 radiodetermination-satellite 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) |



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| **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** |
| **5.405** | SUP (WRC-12) |
| **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/(m2 Ill 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:<br>$-136$ dB(W/(m$^2$ · MHz)) for $0° \leq \Theta \leq 5°$<br>$-136 + 0.55\,(\Theta - 5)$ dB(W/(m$^2$ · MHz)) for $5° < \Theta \leq 25°$<br>$-125$ dB(W/(m$^2$ · MHz)) for $25° < \Theta \leq 90°$<br>where $\Theta$ 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 |



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| | mobile-satellite service (space-to-Earth) for operation limited to within their national boundaries. (WRC-2000) |
| **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) |
| **5.417** | SUP RC-0) |
| **5.417A** | SUP (WRC-15) |
| **5.417B** | SUP (WRC-15) |
| **5.417C** | SUP (WRC-15) |
| **5.417D** | SUP (WRC-15) |
| **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 broadcastingsatellite service (sound) is subject to Resolution **539 (Rev.WRC-19)**. Geostationary broadcastingsatellite 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 fluxdensity at the Earth's surface produced by emissions from a geostationary broadcasting-satellite service (sound) space station operating in the frequency 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:<br>$-130$ dB(W/(m$^2$ · MHz)) for $0^o \leq \Theta \leq 5^o$<br>$-130 + 0.4(\Theta - 5)$dB(W/(m$^2$ · MHz)) for $5^o < \Theta \leq 25^o$<br>–-122 dB(W/(m$^2$ · MHz)) for $25^o < \Theta \leq 90^o$<br>where $\Theta$ 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 f −122 dB(W/(m2 · 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.<br><br>In addition, an administration listed in this provision shall not have simultaneously two 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 |



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| | geostationary-satellite networks for which complete Appendix **4** coordination information, or notification information, is considered to have been received before 3 June 2000. (WRC-03)+B509 |
| **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**. (WRC-03) |
| **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. (WRC-03) |
| **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. (WRC-03) |
| **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. |



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| **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 Saudi Arabia, Bahrain, Bangladesh, Benin, Brunei Darussalam, Cambodia, Cameroon, China, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Egypt, the United Arab Emirates, India, Indonesia, Iran (Islamic Republic of), Iraq, Japan, Jordan, Kenya, Kuwait, Lebanon, Libya, Malaysia, New Zealand, Oman, Uganda, Pakistan,Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, the Dem. People's Rep. of Korea, Sudan and Yemen, the frequency band 3 300-3 400 MHz is also allocated to the fixed and mobile services on a primary basis. New Zealand and the countries bordering the Mediterranean shall not claim protection for their fixed and mobile services from the radiolocation service. (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-15)**. 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) |



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| **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-15)**. 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-15)**. 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:* in Kyrgyzstan 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 frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. The provisions of Nos. 9.17 and 9.18 shall also apply in the coordination phase. Before an administration brings into use a (base or mobile) station of the mobile service in this frequency band, it shall ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed -154.5 dB(W/(m2 · 4 kHz)) for more than 20% of time at the border of the territory of any other administration. This limit may be exceeded on the territory of any country whose administration has so agreed. In order to ensure that the pfd limit at the border of the territory of any other administration is met, the calculations and verification shall be made, taking into account all relevant information, with the mutual agreement of both administrations (the administration responsible for the terrestrial station and the administration responsible for the earth station) and with the assistance of the Bureau if so requested. In case of disagreement, calculation and verification of the pfd shall be made by the Bureau, taking into account the information referred to above. Stations of the mobile service in the frequency band 3 400-3 600 MHz shall not |



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| | 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 frequency 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) (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 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 |



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| | 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 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 |



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| | 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) |
| **5.436** | 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 frequency band 4 200-4 400 MHz by the aeronautical radionavigation service is reserved exclusively for radio altimeters installed on board aircraft and for the associated transponders on the ground. (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) |



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| **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. (WRC-2000) |
| **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) |



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| **5.442** | In the frequency 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 frequency 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 No. 5.33). |
| **5.443A** | SUP (WRC-0#) |
| **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 frequency band 5 030-5 150 MHz by all the space stations within any radionavigation-satellite service system (space-to-Earth) operating in the frequency band 5 010-5 030 MHz shall not exceed -124.5 dB(W/m2) in a 150 kHz band. In order not to cause harmful interference to the radio astronomy service in the frequency band 4 990-5 000 MHz, radionavigation-satellite service systems operating in the frequency band 5 010-5 030 MHz shall comply with the limits in the frequency 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 frequency 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-geostationary satellite systems in the mobile-satellite service and is subject to coordination under No. **9.11A**. The use of the frequency band 5 091-5 150 MHz by feeder links of non-geostationary satellite systems in the mobile-satellite service shall be subject to application of Resolution **114 (Rev.WRC-15)**. Moreover, to ensure that the aeronautical radionavigation service is protected from harmful interference, coordination is required for feeder-link earth stations of the non-geostationary satellite systems in the mobile-satellite service which are separated |



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| | 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:<br>– 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)**;<br>– 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 frequency 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 frequency 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 frequency 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 radiodeterminationsatellite service operating in the frequency bands 1 610-1 626.5 MHz and/or 2 483.5-2 500 MHz. The total power fluxdensity at the Earth's surface shall in no case exceed -159 dB(W/m2) in any 4 kHz band for all angles of arrival. (WRC-15) |
| **5.446A** | The use of the 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. (WRC-03) |
| **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**. |



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| **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/m2) 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 frequency 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 frequency 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 service, the Earth exploration-satellite service (active) and the space research service (active) shall not impose more stringent conditions upon the mobile service than those stipulated in Resolution **229 (Rev.WRC-19)**. (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. (WRC-03) |
| **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. (WRC-03) |
| **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. (WRC-03 |



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| **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.** (WRC-03) |
| **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 conditions 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. (WRC-03) |
| **5.451** | Additional allocation: in the United Kingdom, the band 5470-5 850 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. Rep. of Korea, Singapore, Sri Lanka, Tanzania, Chad, Thailand, Togo, Viet Nam and Yemen, the band 5 650-5 850 MHz is also allocated to the fixed and mobile services on a primary basis. In this case, the provisions of Resolution **229** (**Rev.WRC-12**) do not apply. In addition, in Afghanistan, Angola, Benin, Bhutan, Botswana, Burkina Faso, Burundi, Dem. Rep. of the Congo, Fiji, Ghana, Kiribati, Lesotho, Malawi, Maldives, Mauritius, Micronesia, Mongolia, Mozambique, Myanmar, Namibia, Nauru, New Zealand, Papua New Guinea, Rwanda, Solomon Islands, South Sudan, South Africa, Tonga, Vanuatu, Zambia and Zimbabwe, the band 5 725-5 850 MHz is allocated to the fixed service on a primary basis, and stations operating in the fixed service shall not cause harmful interference to and shall not claim protection from other primary services in the frequency band. (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) |
| **5.456** | SUP (WRC-15) |



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| **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 frequency 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 frequency bands 5 925-6 425 MHz and 14-14.5 GHz, earth stations located on board vessels may operate with the characteristics and under the conditions contained in Resolution **902 (WRC-03)** in Algeria, Saudi Arabia, Bahrain, Comoros, Djibouti, Egypt, United Arab Emirates, Jordan, Kuwait, Libya, Morocco, Mauritania, Oman, Qatar, the Syrian Arab Republic, Sudan, Tunisia and Yemen, in the maritime mobile-satellite service on a secondary basis. Such use shall be in accordance with Resolution **902 (WRC-03)**. (WRC-15) |
| **5.457C** | In Region 2 (except Brazil, Cuba, French overseas departments and communities, Guatemala, Mexico, Paraguay, Uruguay and Venezuela), the frequency 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, or claim protection from, the fixed-satellite and fixed services. Any such use does not preclude the use of this frequency band by other mobile 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. (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**. |



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| **5.458C** | SUP (WRC-15) |
| **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 frequency band 7 190-7 235 MHz. Geostationary satellites in the space research service operating in the frequency 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. (WRC-97) |
| **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 ) |
| **5.462** | SUP (WRC-97) |
| **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 provisional values for angles of arrival (θ), without the consent of the affected administration: |



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| | $-135$ dB(W/m$^2$) in a 4 kHz band for $0^o \leq \Theta < 5^o$<br>$-135 + 0.5(\Theta - 5)$ dB(W/m$^2$) in a 4 for $5^o \leq \Theta < 25^o$<br>$-125$ dB(W/m$^2$) in a 1 MHz band for $25^o \leq \Theta \leq 90^o$ |
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| **5.463** | Aircraft stations are not permitted to transmit in the band 8025-8 400 MHz. (WRC-97) |
| **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. (WRC-97) |
| **5.470** | The use of the band 8 750-8 850 MHz by the aeronautical radionavigation service is limited to airborne Doppler navigation aids on a centre frequency of 8 800 MHz. |
| **5.471** | Additional allocation: in Algeria, Germany, Bahrain, Belgium, China, Egypt, the United Arab Emirates, France, Greece, Indonesia, Iran (Islamic Republic of), Libya, the Netherlands, Qatar and Sudan, the frequency bands 8 825-8 850 MHz and 9 000-9 200 MHz are also allocated to the maritime radionavigation service, on a primary basis, for use by shore- based radars only. (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, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Romania, Tajikistan, Turkmenistan and Ukraine, the bands 8 850-9 000 MHz and 9 200-9 300 MHz are also allocated to the radionavigation service on a primary basis. (WRC-07) |
| **5.473A** | *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) |
| **5.474** | 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**). |



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| **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) |
| **5.476** | SUP (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 radionavigation 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 frequency 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) |



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| **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 frequency 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. |



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| **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. (WRC-2000) |
| **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**. (WRC-03) |
| **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. (WRC-03) |
| **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 |



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| | 3. For the use of the band 12.2-12.7 GHz by the broadcasting-satellite service in Region 2, see Appendix **30**. (WRC-03) |
| **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. (WRC-2000) |
| **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/(m2 ⋅ 27 MHz)) for all conditions and for all methods of modulation at the edge of the service area. (WRC-97) |
| **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. (WRC-2000) |
| **5.497** | The use of the band 13.25-13.4 GHz by the aeronautical radionavigation service is limited to Doppler navigation aids. |
| **5.498** | SUP (WRC-97) |
| **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. (WRC-97) |
| **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 |



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| | 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:<br>– 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,<br>– active spaceborne sensors,<br>– 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.<br>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 frequency 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, Mongolia, 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. (WRC-97) |
| **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 |



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| | 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 diameter smaller than 4.5 m, it shall ensure that the power flux-density produced by this earth station does not exceed:<br>– –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;<br>– –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.<br>For earth stations within the fixed-satellite service having an antenna diameter greater than or equal to 4.5 m, the e.i.r.p. of any emission should be at least 68 dBW and should not exceed 85 dBW. (WRC-03) |
| **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:<br>– 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:<br>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;<br>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;<br>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;<br>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;<br>– the e.i.r.p. density of emissions from any earth station in the fixed- |



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| | 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.<br><br>Automatic power control may be used to increase the e.i.r.p. density in these frequency ranges to compensate for rain attenuation, to the extent that the power flux-density at the fixed-satellite service space station does not exceed the value resulting from use by an earth station of an e.i.r.p. meeting the above limits in clear-sky conditions. (WRC-03) |
| **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 Nos. **5.29**, **5.30** and **5.31** apply. (WRC- 03) |
| **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 frequency 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. (WRC-03) |
| **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) |



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| **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) |
| **5.509** | SUP (WRC-07) |
| **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)** and 14.5-14.8 GHz in countries listed in Resolution **164 (WRC-15)** by the fixed-satellite service (Earth-to-space) not for feeder links for the broadcasting-satellite service is limited to geostationary-satellites. (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/(m2 · 4 kHz)) produced at all altitudes from 0 m to 19 000 m above sea level at 22 km seaward from all coasts, defined as the low-water mark, as officially recognized by each coastal State. (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-to-space) not for feeder links for the broadcasting-satellite service shall not constrain the future deployment of the fixed and mobile services. (WRC-15) |



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| **5.509G** | The frequency band 14.5-14.8 GHz is also allocated to the space research service on a primary basis. However, such use is limited to the satellite systems operating in the space research service (Earth-to-space) to relay data to space stations in the geostationary-satellite orbit from associated earth stations. Stations in the space research service shall not cause harmful interference to, or claim protection from, stations in the fixed and mobile services and in the fixed satellite service limited to feeder links for the broadcasting-satellite service and associated space operations functions using the 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, Pakistan, Qatar, the Syrian Arab R epublic 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) |
| **5.511D** | SUP (WRC-12) |
| **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/m2) 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 frequency 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**. |



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| **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. (WRC-97) |
| **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. (WRC-2000) |
| **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. (WRC-03) |
| **5.516B** | The following bands are identified for use by high-density applications in the fixed-satellite service:<br>17.3-17.7 GHz (space-to-Earth) in Region 1,<br>18.3-19.3 GHz (space-to-Earth) in Region 2,<br>19.7-20.2 GHz (space-to-Earth) in all Regions,<br>39.5-40 GHz (space-to-Earth) in Region 1,<br>40-40.5 GHz (space-to-Earth) in all Regions,<br>40.5-42 GHz (space-to-Earth) in Region 2,<br>47.5-47.9 GHz (space-to-Earth) in Region 1, |



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| | 48.2-48.54 GHz (space-to-Earth) in Region 1<br>49.44-50.2 GHz (space-to-Earth) in Region 1,<br>and<br>27.5-27.82 GHz (Earth-to-space) in Region 1,<br>28.35-28.45 GHz (Earth-to-space) in Region 2,<br>28.45-28.94 GHz (Earth-to-space) in all Regions,<br>28.94-29.1 GHz (Earth-to-space) in Region 2 and 3,<br>29.25-29.46 GHz (Earth-to-space) in Region 2,<br>29.46-30 GHz (Earth-to-space) in all Regions,<br>48.2-50.2 GHz (Earth-to-space) in Region 2.<br><br>This identification does not preclude the use of these frequency bands by other fixed-satellite service applications or by other services to which these frequency bands are allocated on a co-primary basis and does not establish priority in these Radio Regulations among users of the frequency bands. Administrations should take this into account when considering regulatory provisions in relation to these frequency bands. See Resolution **143 (Rev.WRC-19)**. (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) |
| **5.518** | SUP (WRC-07) |
| **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. (WRC-2000) |
| **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) |
| **5.522** | SUP (WRC-2000) |
| **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. (WRC-2000) |
| **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. (WRC-2000) |



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| **5.522C** | In the band 18.6-18.8 GHz, in Algeria, Saudi Arabia, Bahrain, Egypt, the United Arab Emirates, the Libyan Arab Jamahiriya, Jordan, Lebanon, Morocco, Oman, Qatar, the Syrian Arab Republic, Tunisia and Yemen, fixed-service systems in operation at the date of entry into force of the Final Acts of WRC-2000 are not subject to the limits of No. **21.5A**. (WRC-2000) |
| **5.523** | SUP (WRC-2000) |
| **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. (WRC-97) |
| **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. (WRC-97) |
| **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. (WRC-97) |
| **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. (WRC-97) |
| **5.524** | *Additional allocation:* in Afghanistan, Algeria, Saudi Arabia, Bahrain, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Costa Rica, Egypt, the United Arab Emirates, Gabon, Guatemala, Guinea, India, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, South Sudan, Chad, Togo and Tunisia, the frequency band 19.7-21.2 GHz is also allocated to the fixed and mobile services on a primary basis. This additional use shall not impose any limitation on the power flux-density of space stations in the fixed-satellite service in the frequency band 19.7-21.2 GHz and of space stations in the mobile- satellite service in the frequency band 19.7-20.2 GHz where the allocation to the mobile-satellite service is on a primary basis in the latter frequency band. (WRC-15) |



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| **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**. |
| **5.530** | SUP (WRC-12) |
| **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/(m2 · 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) |
| **5.530C** | SUP (WRC-15) |
| **5.530D** | SUP (WRC-19) |
| **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. |



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| **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 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 4.5m. (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. |
| **5.534** | SUP (WRC-03) |
| **5.534A** | The allocation to the fixed service in the frequency band 25.25-27.5 GHz is identified in Region 2 for use by 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 co-primary 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**. (WRC-97) |
| **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. |



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| **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, Slovenia, Sudan, Sweden, Tanzania, Turkey, Viet Nam and Zimbabwe, earth stations operating in the Earth exploration-satellite service in the frequency band 25.5-27 GHz shall not claim protection from, or constrain the use and deployment of, stations of the fixed and mobile services. Resolution **242 (WRC-19)** applies. (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 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. |



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| **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. (WRC-2000) |
| **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 GH 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 )z is also allocated |
| **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. |
| **5.543A** | SUP (WRC-19) |
| **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, Mongolia, Kyrgyzstan, Tajikistan and Turkmenistan, the allocation of the band 31-31.3 GHz to the space research service is on a primary basis (see No. **5.33**). (WRC-07) |
| **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 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) |



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| **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. (WRC-2000) |
| **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. (WRC-97) |
| **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. (WRC-03) |
| **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. (WRC-97) |
| **5.547E** | *Alternative allocation*: in the United States, the band 33-33.4 GHz is allocated to the radionavigation service on a primary basis. (WRC-97) |
| **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**). (WRC-03) |
| **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/m2) in this band. (WRC-03) |
| **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) |



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| **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) |
| **5.551B** | SUP (WRC-2000) |
| **5.551C** | SUP (WRC-2000) |
| **5.551D** | SUP (WRC-2000) |
| **5.551E** | SUP (WRC-2000) |
| **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 No. **5.33**). (WRC-97) |
| **5.551G** | SUP (WRC-03) |
| **5.551H** | The equivalent power flux-density (epfd) produced in the frequency 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 frequency band 42-42.5 GHz, shall not exceed the following values at the site of any radio astronomy station for more than 2% of the time:<br>– 230 dB(W/m$^2$) in 1 GHz and –246 dB(W/m$^2$) in any 500 kHz of the 42.5-43.5 GHz band at the site of any radio astronomy station registered as a single-dish telescope; and<br>– 209 dB(W/m$^2$) in any 500 kHz of the 42.5-43.5 GHz band at the site of any radio astronomy station registered as a very long baseline interferometry station.<br>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 $\theta_{min}$ of the radiotelescope (for which a default value of 5° should be adopted in the absence |



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| | of notified information).<br>These values shall apply at any radio astronomy station that either:<br>− was in operation prior to 5 July 2003 and has been notified to the Bureau before 4 January 2004; or<br>− 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.<br>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 operating in the 42-42.5 GHz band, shall not exceed the following values at the site of any radio astronomy station:<br>– 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<br>– 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.<br>These values shall apply at the site of any radio astronomy station that either:<br>– was in operation prior to 5 July 2003 and has been notified to the Bureau before 4 January 2004; or<br>– 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.<br>Other radio astronomy stations notified after these dates may seek an agreement with administrations that have authorized the space stations. In Region 2, Resolution **743 (WRC-03)** shall apply. The limits in this footnote may be exceeded at the site of a radio astronomy station of any country whose administration so agreed. (WRC-03) |
| **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) |



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| **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**). (WRC-2000) |
| **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. |
| **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. (WRC-2000) |
| **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. (WRC-03) |
| **5.555** | *Additional allocation:* the band 48.94-49.04 GHz is also allocated to the radio astronomy service on a primary basis. (WRC-2000) |
| **5.555A** | SUP (WRC-03) |
| **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/m2) in any 500 kHz band at the site of any radio astronomy station. (WRC-03) |



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| **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. (WRC-2000) |
| **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/(m2 Ill 100 MHz)) for all angles of arrival. (WRC-97) |
| **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. (WRC-97) |
| **5.557** | *Additional allocation:* in Japan, the band 55.78-58.2 GHz is also allocated to the radiolocation service on a primary basis. (WRC-97) |
| **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). (WRC-2000) |
| **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**). (WRC-2000) |
| **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/(m2 Ill 100 MHz)) for all angles of arrival. (WRC-97) |
| **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**). (WRC-2000) |
| **5.559A** | SUP (WRC-07) |
| **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 |



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| | decisions of the appropriate frequency assignment planning conference for the broadcasting-satellite service. (WRC-2000) |
| **5.561A** | The 81-81.5 GHz band is also allocated to the amateur and amateur-satellite services on a secondary basis. (WRC-2000) |
| **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. (WRC-2000) |
| **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. (WRC-97) |
| **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. (WRC-2000) |
| **5.562B** | In the 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/(m2 · MHz)) for all angles of arrival. (WRC-2000) |
| **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. (WRC-2000) |
| **5.562F** | SUP (WRC-19) |
| **5.562G** | SUP (WRC-19) |
| **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/(m2 · MHz)) for all angles of arrival. (WRC-2000) |
| **5.563** | SUP (WRC-03) |
| **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. (WRC-2000) |
| **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. (WRC-2000) |
| **5.564** | SUP (WRC-2000) |



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| **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.<br><br>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)**.<br><br>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)**.<br><br>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:<br>– 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;<br>– Earth exploration-satellite service (passive) and space research service (passive):<br>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.<br>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.<br><br>All frequencies in the range 1 000-3 000 GHz may be used by both active and passive services. (WRC-12) |



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# 8 LIST OF FREQUENCY BANDS USED FOR MARITIME SERVICES

| Frequency Band | Frequency Used | Services |
|---|---|---|
| 505-526.5 kHz | 518 kHz | [Transmission of Maritime Safety Information (Appendix 15 of ITU RR)[19] (Meteorological, navigational and other urgent information) |
| 2 173.5-2 190.5 kHz | 2 182 kHz | Distress, Urgency and Safety communications (traffic) by radio telephony (voice) (Appendix 15 of ITU RR) |
| | 2 187 kHz | DSC Watchkeeping (Article 31) (Appendix 15 of ITU RR) |
| 4 063-4 438 kHz | | (Appendix 17)[20] |
| | | (Appendix 17) |
| | 4 125 kHz | Distress, Urgency and Safety communications (traffic) by radio telephony (voice) (Appendix 15 of ITU RR) |
| | 4 207.5 kHz | DSC watchkeeping (Article 31) (Appendix 15 of ITU RR) |
| | 4 369 kHz | (Appendix 17) |
| | 4 375 kHz | Transmission of meteorological bulletins; notices to navigators; (Appendix 17) |
| | 4 417 kHz | Coast Station duplex transmission of Channel 421. |
| 6 200-6 525 kHz | 6 203 kHz | (Appendix 17) |
| | 6 215 kHz | Distress, Urgency and Safety communications (traffic) by radio telephony (voice) (Appendix 15 of ITU RR) |
| | 6 312 kHz | DSC watchkeeping (Article 31) (Appendix 15 of ITU RR) |
| | 6 504 kHz | (Appendix 17) |
| 8 195-8 815 kHz | 8 207 kHz | (Appendix 17) |
| | 8 216 kHz | (Appendix 17) |
| | 8 255 kHz | (Appendix 17) |
| | 8 291 kHz | Distress, Urgency and Safety communications (traffic) by radio telephony (voice) (Appendix 15 of ITU RR) |
| | 8 731 kHz | (Appendix 17) |
| | 8 740 kHz | Transmission of meteorological bulletins; notices to navigators; (Appendix 17) |

[19] Only distress and safety communications are provided, with MSI and Medical Assistance at sea. All MF/HF public correspondence ceased as it was no longer commercially viable and sustainable. Other technologies accommodate this type of communications. (Satellite, GSM, Trunked radio networks, etc.).

[20] Public Correspondence facilities with effect from 1 September 2014 has been discontinued.



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| Frequency Band | Frequency Used | Services |
|---|---|---|
| | 8 779 kHz | (Appendix 17) |
| | 8 414.5 kHz | DSC watchkeeping (Article 31) |
| 12 230-13 200 kHz | 12 254 kHz | (Appendix 17) |
| | 12 290 kHz | (Appendix 17) |
| | 12 299 kHz | (Appendix 17) |
| | 12 359 kHz | (Appendix 17) |
| | 12 577 kHz | DSC watchkeeping (Article 31) (Appendix 15 of ITU RR) |
| | 13 101 kHz | (Appendix 17) |
| | 13 146 kHz | Transmission of meteorological bulletins; notices to navigators; (Appendix 17) |
| 16 360-17 410 kHz | 16 381 kHz | (Appendix 17) |
| | 16 420 kHz | Distress, Urgency and Safety communications (traffic) by radio telephony (voice) (Appendix 15 of ITU RR) |
| | 16 456 kHz | (Appendix 17) |
| | 16 537 kHz | (Appendix 17) |
| | 16 804.5 kHz | DSC watchkeeping (Appendix 15 of ITU RR) |
| | 17 263 kHz | (Appendix 17) |
| | 17 338 kHz | (Appendix 17) |

| Frequency Band as per NRFP | Frequency Used | Services |
|---|---|---|
| 154-156.4875 MHz | Several channels used within this range in accordance with Appendix 18 of the ITU RR<br><br>**Channel 2006 – 160.900 MHz** | APPENDIX 18<br>Channel 2006 allocated for Man Overboard Devices used for search and rescue operations. New AIS technologies. |
| 156.7875-156.8125 MHz | Channel 16 in accordance with Appendix 18 of the ITU RR<br><br>**156.7750**<br>**156.8250** | **Appendix 18.**<br>**Mobile Satellite Earth to Space for long range AIS broadcasts (ship stations)** |
| 156.8375-162.0250 MHz | Several channels used within this range in accordance with Appendix 18 of the ITU RR | |



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| | | |
|---|---|---|
| | Channel 28 in accordance with Appendix 18 of the ITU RR | **APPENDIX 18** services allocated:<br>Coast Station Analogue Maritime Safety Information (MSI) transmissions using Simplex configurations -<br>01 to 05; and<br>60 to 65.<br>Priority to digital transmissions as per Footnote w) from 1 January 2017.<br>Protection of Channel 70 for DSC and Channel 16 distress communications, AIS1 (161.975MHz) and AIS2 (162.025) for navigational safety |

**Short Title**

This document shall be called the "*National Radio Frequency Plan 2021"*

**Repeals**

1. The National Radio Frequency Plan 2018 …



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# 9 REFERENCE INFORMATION SOURCES

**ITU documents**

- SM.2015: Methods for determining national long-term strategies for spectrum utilization
- Report ITU-R SM.2012-6 (06/2018)
- Final Acts from WRC-2019
- Report ITU-R M.2290-0 (12/2013) Future spectrum requirements estimate for terrestrial IMT
- Report ITU-R M.2078, "Estimated Spectrum Bandwidth Requirements for the Future Development of IMT-2000 and IMT-Advanced," 2006
- The Radio Regulations from 2016
- The Radio Regulations from 2020

**ICASA Published & similar Documents**

- SABRE I
- SABRE II
- SATFA 1997
- NRFP 2010
- NRFP 2013
- NRFP 2018
- CRASA/SADC Radio Frequency Spectrum Allocation Plan 2020.
- ECA and associated documents
- The ICASA Frequency Migration Plan 2019
- RFSAP's will be included in the NRFP 2021.
- IMT Road Maps
- ICASA Radio Frequency Migration Plans
- ICASA IMT Roadmaps

**Software Used during the project**

- RR5 ITU software for extraction of Radio Regulation Navigation Tool version 5.0.4.0 RR 2020 Edition
- Own developed software for SA NRFP comparison exercise



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