



Department of Telecommunications
Ministry of Communications & Information Technology
Government of India



राष्ट्रीय आवृत्ति नियतन योजना - 2011
NATIONAL FREQUENCY
ALLOCATION PLAN - 2011



बेतार योजना एवं समन्वय स्कन्ध
Wireless Planning and Coordination Wing

*We should not depend on
others to do our work, we
ourselves must do our work,
but before we can do this,
we must get over our pride*

*Acharya Jagadish
Chandra Bose*



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**राष्ट्रीय आवृत्ति नियतन योजना-2011
NATIONAL FREQUENCY ALLOCATION PLAN-2011**

**बेतार आयोजना एवं समन्वय स्कंध
Wireless Planning and Coordination Wing**

कपिल सिब्बल
KAPIL SIBAL



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GOVERNMENT OF INDIA
NEW DELHI - 110 115

MESSAGE

12 SEP 2011

I am happy to know that the National Frequency Allocation Plan-2011 (NFAP-2011) developed after wide consultation with all stake holders within the framework of International Telecommunication Union (ITU) by Wireless Planning and Coordination Wing, Department of Telecom, Ministry of Communications & Information Technology will cater to the needs of all wireless users for the next two years.

As the work of drafting the New Telecom Policy-2011 is underway, which inter-alia includes deliberations on issues relating to domestic telecom manufacturing including wireless based equipment, there is a felt need to make appropriate provision in NFAP-2011 in order to encourage development of indigenous manufacturing/technologies. In this context, the NFAP-2011 has enabling provisions to consider spectrum requirement for development/promotion of indigenous manufacturing/technologies in the country.

I am confident that NFAP-2011 will prove to be an important policy document for spectrum managers, wireless users and manufacturers in the country and will facilitate optimal utilization of radiofrequency spectrum for various services/applications.

(Kapil Sibal)

Place : New Delhi
Date : September 11, 2011

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FOREWORD

Radio frequency spectrum and geo-stationary satellite orbit are limited natural resources to be used rationally, efficiently and economically so that equitable access is available to all spectrum users for different radiocommunication services. Accordingly, radio frequency is shared by various radiocommunication services for a variety of applications.

2. In today's society, radio spectrum is becoming increasingly important for all walks of life and therefore there is a need for its efficient and effective management. Whilst spectrum management has always been important, in recent years the complexity of the task has been compounded by the proliferation of both traditional and entirely new radio spectrum frequency-using services. The growing demand for information rich content, faster access speeds and mobility by both business and private users is increasingly being met by broadband wireless applications.

3. The economic importance of radio spectrum has been vividly demonstrated in recent years by the outcome of market based licensing processes and the proliferation of radio based applications. There is a clear relationship between the range of radio applications, the number of users and the value of spectrum to society. This has been further evidenced by the auction money government has earned in 3G and BWA auctions.

4. The long lead time needed for the introduction of major new services necessitates the requirement of long term planning. This is often conducted in the absence of certainty with respect to whether the envisaged new services will actually come to market. For example, the first global allocation of spectrum for third generation (3G) mobile services, then known as FPLMTS (Future Public Land Mobile Telecommunications System) was agreed to at the International Telecommunication Union's (ITU) World Administrative Radiocommunication Conference in 1992, about 18 years before the entry into commercial operation of the service. However, the preparatory work in various international bodies began considerably earlier than that.

5. Technology convergence between fixed and mobile telecommunications services as well as broadcasting is increasingly causing the traditional boundaries between these services to become blurred and challenging the allocation categories for radio spectrum. Near term developments such as short range, low power ultra-wideband (UWB) technology may also have profound implications for spectrum management.

6 Government of India attaches great significance to spectrum management and radio regulatory process. With the emergence of new technologies and with the astounding growth of telecommunication services all over the world, spectrum management process has become extremely complex and intricate. It is necessary that all the spectrum and orbit users, whether government or private, work in the spirit of mutual understanding and cooperation and utilize these resources in most optimal manner with self-discipline.

7 As per New Telecom Policy-99, the NFAP is to be revised generally every two years in line with the decisions of World Radiocommunication Conferences. Last World Radiocommunication Conference was held in 2007 and NFAP-2008 has been revised in line with outcome of WRC-07. In order to meet spectrum requirements of fast emerging new wireless technologies, NFAP-2008 has been revised. NFAP-2011 has been developed with special emphasis to encourage/ promote indigenous manufacturing/ technologies by provisioning of small chunk of the spectrum in certain frequency band/ sub-bands in limited geographical area.

8 The task of review/ revision of NFAP was very challenging and complex. A lot of efforts have been put into review/ revision and bring out the new NFAP effective from October 1, 2011. I would also like to express my appreciation to the Wireless Adviser & his team of officers and stake holders for their efforts in the development of NFAP-2011. I would also like to compliment all the participants from government and private sector as well as the industry for their valuable contributions in this detailed exercise.

9 I am sure that NFAP-2011 will prove to be an important tool in spectrum management in the country.



(R. Chandrashekhar)

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PREFACE

Spectrum Management is the combination of administrative and technical procedures necessary to ensure the efficient operation of radio communication services. Therefore, efficient spectrum management needs to be the art and science of carefully planning spectrum allocation in a coordinated manner without compromising national interests and efficiently assigning frequencies for the benefit of users at large and with minimum scope of harmful interference. It is equally important that users should plan, establish and operate their radiocommunication networks optimally using spectrum efficient technologies with optimal technical parameters and should take all necessary measures for coexistence and for optimal sharing of the resources. Radiocommunication networks are like global society necessitating appropriate discipline. Therefore Spectrum management is carried out in four levels of regulatory framework namely International allocation of Frequency bands for 41 different type of services defined in Radio Regulations, Regional allocation of frequency band, National Frequency Allocation Plan and Licensing

Radio frequency spectrum & satellite orbits including geostationary satellite orbits are scarce natural resource, susceptible to harmful interference and are international in character since radio waves cannot be confined to national boundaries. Like any other natural resource it cannot be owned but used/ shared amongst countries, services, users, technologies, etc without any element of exclusiveness. No ownership of any frequency band is conferred on any entity. It's essential these scarce resources be used rationally, optimally, efficiently and economically so that equitable access could be available to large radiocommunication networks in an interference free radio environment.

National Frequency Allocation Plan, 2011 (NFAP-2011) has been evolved /developed after a series of meetings held with all the stakeholders, Government Departments, Private entities including telecom equipment manufacturer. The salient features of NFAP-2011 are:

- It is in line with the decisions of World Radiocommunication Conference 2007 of the International Telecommunication Union contained in Radio Regulations (ed. 2008)
- It has been developed to cater to newly emerging technologies such as Ultra Wide Band (UWB), Intelligent Transport System (ITS), Short Range Devices, etc
- Efforts have been made to ensure equitable and optimum utilization of the scarce limited natural resource of radio frequency spectrum.
- It has enabled provisions in few frequency bands for indigenous development and manufacturing.
- Due care has been taken to ensure protection of existing services.

It is hoped that NFAP-2011 will provide the basis for development, manufacturing and spectrum utilization activities in the country, both for government and private sectors.

(Dr Ashok Chandra)

James Clerk Maxwell

1831-1879



James Clerk Maxwell

James Clerk Maxwell's prominent achievement was formulating classical electromagnetic theory. This united all previously unrelated observations, experiments and equations of electricity, magnetism and even optics into a consistent theory. Maxwell's equations demonstrated that electricity, magnetism and even light are all manifestations of the same phenomenon, namely the electromagnetic field.

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INTRODUCTION

The current policy document on spectrum viz. the National Frequency Allocation Plan- 2008 (NFAP-2008) was made effective from 1 April 2009. The fast emergence of new wireless technologies and applications necessitated the review of NFAP-2008. Accordingly, the review/ revision of NFAP has been undertaken which is also in line with the New Telecom Policy, 1999.

2 Although spectrum allocations is available from 9kHz to 1000 GHz in the radio regulations yet usable part of spectrum is much less due to availability of equipment and economy of scale. There fore spectrum review is basically for the frequency band below 100 GHz.

3 The radio frequency spectrum is shared by various radiocommunication services for variety of applications including public telecom services, aeronautical/maritime safety communications, radars, seismic surveys, rocket and satellite launching, earth exploration, natural calamities forecasting etc.

4 NFAP-2011 has been developed with special emphasis to encourage/ promote Indigenous manufacturing/ technologies by provisioning of small chunk of the spectrum in certain frequency band/sub-bands in limited geographical area.

4.1 The committee constituted by the Government in its report on “Measures for enhancing indigenous manufacturing in R&D in Telecom – Spectrum requirement, considering GSM being the dominant technology as recommended to reserve” has recommended that suitable provisions in NFAP for encouragement of indigenous technologies/ manufacturing may be made.

4.2 Further, this NFAP has made certain provisions for new technologies/ applications like ultra wideband devices, Short range low power devices, intelligent transport system, E Band, etc . The broad definitions of these technologies are given below:

4.2.1 Ultra Wideband (UWB): UWB is a short range low power technology that will enable a range of applications such as WPANs (information technology / multimedia entertainment / consumer applications), public protection, construction, engineering, science, medical and transportation. Its low energy feature enables unique coexistence properties that allow UWB to operate as an unlicensed wireless technology in presence of other licensed service without causing harmful interference to them. This feature has the effect of increasing spectral efficiency by enabling reuse of spectrum. These devices will also

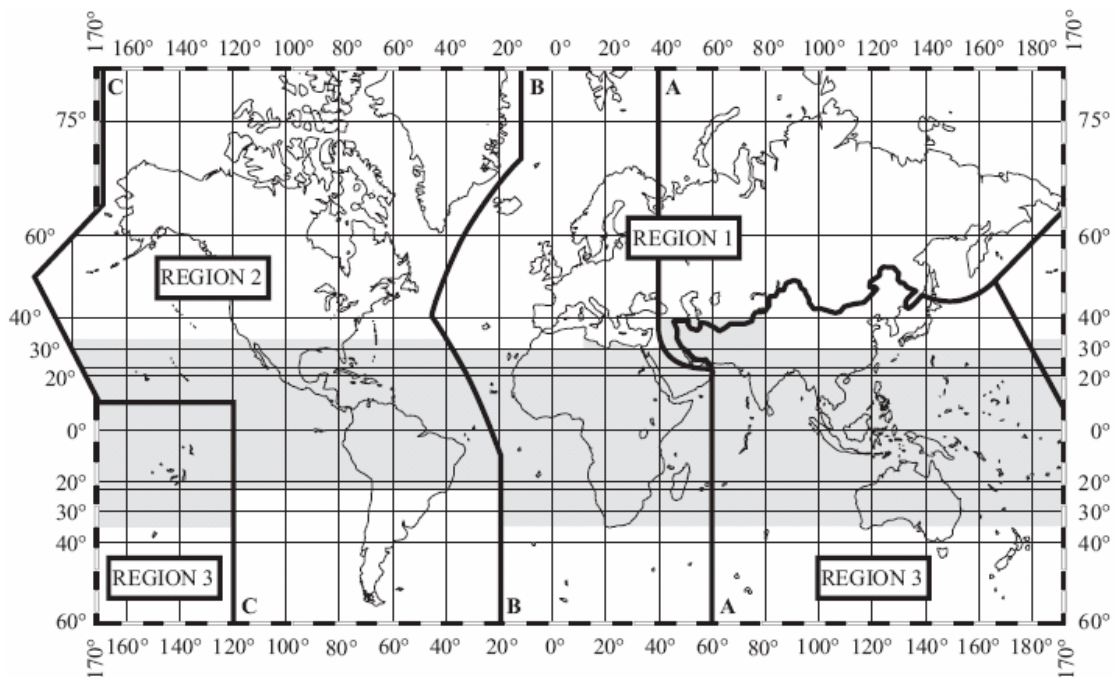
implement next generation cognitive concepts such as Detect and Avoid (DAA) to ensure coexistence with primary users.

4.2.2 Intelligent Transport System (ITS): ITS may be defined as systems utilizing a combination of computers, communications, positioning and automation technologies to use available data to improve the safety, management and efficiency of terrestrial transport, and to reduce environmental impact. One of the major communication mode in these systems is Digital Short Range communication (DSRC) systems. These devices are mounted on the roadside and the corresponding transceivers are on board the vehicle. Such devices operate over 5-10 MHz bandwidth, with transmit power up to 8 Watts.

4.2.3 E- band Radio: Developments in millimetre wave radio technology have caused interest in E-band Wireless as it provides alternative frequency bands for multi-megabit and even gigabit per second speed required by newer generation communication and multimedia services.

5 The National Frequency Allocation Plan-2011 (NFAP-2011), contains the international frequency allocation table for ITU Regions 1, 2 and 3 as per Article 5 of Radio Regulation (Edition 2008) on the left side and national frequency allocation table on right hand side.

5.1 The ITU regions 1, 2 and 3 in the World map are defined as per below



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, 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. (RR5.3)

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

Region 3: Region 3 includes the area limited on the east by line C and on the west by line A, except any of the territory of Armenia, Azerbaijan, 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. (RR-5.5)

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

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

Line C: Line C extends from the North Pole by great circle arc to the intersection of parallel 65° 30' North with the international boundary in Bering Strait; thence by great circle arc to the intersection of meridian 165° East of Greenwich and parallel 50° North; thence by great circle arc to the intersection of meridian 170° West and parallel 10° North; thence along parallel 10° North to its intersection with meridian 120° West; thence along meridian 120° West to the South Pole. (RR-5.9)

- 6 When more than one services are listed as having same status, order of their listing does not indicate any relative priority among such services.

7 The Terms and Radio services used in the NFAP-2011 are the same as contained in the Article 1 of Radio Regulations (Edition 2008). The definitions of these Terms and Radio Services are given below:

7.1 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).

7.2 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).

7.3 *Primary Services*: services the names of which are printed in “capitals” (example: FIXED); these are called “primary” services (RR-5.25);

7.4 *Secondary Services*: services the names of which are printed in “normal characters” (example: Mobile); these are called “secondary” services (RR-Nos. 5.26)

7.4.1 Stations of a secondary service:

- a) shall not cause harmful interference to stations of primary services to which frequencies are already assigned or to which frequencies may be assigned at a later date (RR-5.29)
- b) cannot claim protection from harmful interference from stations of a primary service to which frequencies are already assigned or may be assigned at a later date (RR-5.30)
- c) can claim protection, however, from harmful interference from stations of the same or other secondary service(s) to which frequencies may be assigned at a later date (RR-5.31)

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

7.6 Radio waves or hertzian waves: Electromagnetic waves of frequencies arbitrarily lower than 3 000 GHz, propagated in space without artificial guide.

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

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

7.9 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.

7.10 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.

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

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

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

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

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

7.16 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.

7.17 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.

7.18 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.

7.19 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.

7.20 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.

7.21 Fixed service: A radio-communication service between specified fixed points.

7.22 Fixed-satellite service: A radio-communication 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.

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

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

7.25 Mobile service: A radio-communication service between mobile and land stations, or between mobile stations (CV).

7.26 Mobile-satellite service: A radio-communication service between mobile earth stations and one or more space stations, or between space stations used by this service; or - between mobile earth stations by means of one or more space stations. This service may also include feeder links necessary for its operation.

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

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

7.29 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.

7.30 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.

7.31 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.

7.32 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.

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

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

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

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

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

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

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

7.39 Broadcasting-satellite service: A radio-communication service in which signals transmitted or retransmitted by space stations are intended for direct reception by the general public. In the broadcasting-satellite service, the term “direct reception” shall encompass both individual reception and community reception.

7.40 Radiodetermination service: A radio-communication service for the purpose of radiodetermination.

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

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

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

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

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

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

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

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

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

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

7.51 Earth exploration-satellite service: A radiocommunication service between earth stations and one or more space stations, which may include links between space stations, in which: - information relating to the characteristics of the Earth and its natural phenomena, including data relating to the state of the environment, is obtained from active sensors or passive sensors on Earth satellites; - similar information is collected from airborne or Earth-based platforms; - such information may be distributed to earth stations within the system concerned; - platform interrogation may be included. This service may also include feeder links necessary for its operation.

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

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

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

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

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

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

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

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

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

8 Existing assignments will be protected under their existing status, unless and until it is decided to modify or relocate these assignments. However, for the purpose of the overall development of telecommunication and information, the frequencies shall be harmoniously and effectively shared among the services and allocation shall be periodically reviewed/ revised by WPC Wing Ministry of Communications & IT.

9 Radio Frequency Channelling Plans as per ITU-R recommendations shall be followed unless specified otherwise.

10 Spectrum efficient technologies and systems shall be deployed for exploitation of radiofrequency spectrum.

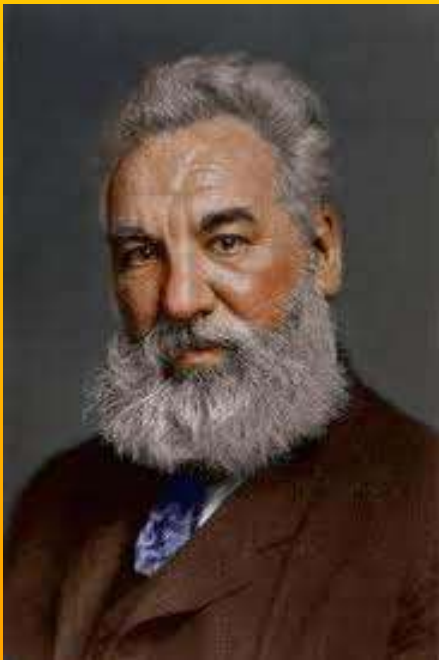
11. All necessary technical, operational, regulatory and administrative measures shall be taken so as to avoid harmful interference.

12. Permitting exploitation in portion of earmarked frequency bands for particular system by other systems in the areas where exploitation of total spectrum is not envisaged by the earmarked systems and other systems have specific needs for exploitation may be considered without putting undue constraints on the earmarked systems. Suitable time frames be also kept in view in this context.

13. The effective date of NFAP-2011 is 01.10.2011.

Graham Bell

1847-1922



Graham Bell

Alexander Graham Bell was an eminent scientist, inventor, engineer and innovator who is credited with inventing the first practical telephone. His research on hearing and speech further led him to experiment with hearing devices which eventually culminated in Bell being awarded the first U.S. patent for the telephone in 1876.

INTERNATIONAL
AND
NATIONAL
FREQUENCY ALLOCATION TABLE

International Frequency Allocation Table

9-110 kHz

Allocation to Services		
Region 1	Region 2	Region 3
Below 9	(Not allocated) 5.53 5.54	
9-14	RADIONAVIGATION	
14-19.95	FIXED MARITIME MOBILE 5.57 5.55 5.56	
19.95-20.05	STANDARD FREQUENCY AND TIME SIGNAL (20 kHz)	
20.05-70	FIXED MARITIME MOBILE 5.57 5.56 5.58	
70-72 RADIONAVIGATION 5.60	70-90 FIXED MARITIME MOBILE 5.57 MARITIME RADIO- NAVIGATION 5.60 Radiolocation 5.61	70-72 RADIONAVIGATION 5.60 Fixed Maritime mobile 5.57 5.59
72-84 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60 5.56		72-84 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60
84-86 RADIONAVIGATION 5.60		84-86 RADIONAVIGATION 5.60 Fixed Maritime mobile 5.57 5.59
86-90 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.56		86-90 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60
90-110	RADIONAVIGATION 5.62 Fixed 5.64	

National Frequency Allocation Table

kHz 9 - 110 NATIONAL ALLOCATIONS	
INDIA	REMARKS
Below 9 (not allocated) 5.53 5.54	
9 - 14 RADIONAVIGATION	
14 - 19.95 FIXED MARITIME MOBILE 5.57 5.56	
19.95 - 20.05 STANDARD FREQUENCY AND TIME SIGNAL (20 kHz)	
20.05 - 70 FIXED MARITIME MOBILE 5.57 5.56	IND01
70 - 72 RADIONAVIGATION 5.60 Fixed Maritime Mobile 5.57	IND01
72 - 84 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60	IND01
84 - 86 RADIONAVIGATION 5.60 Fixed Maritime Mobile 5.57	IND01
86 - 90 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60	IND01
90 - 110 RADIONAVIGATION 5.62 Fixed 5.64	IND03 IND01

International Frequency Allocation Table

110-255 KHz

Allocation to Services		
Region 1	Region 2	Region 3
110-112 FIXED MARITIME MOBILE RADIONAVIGATION 5.64	110-130 FIXED MARITIME MOBILE MARITIME RADIO NAVIGATION 5.60 Radiolocation	110-112 FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64
112-115 RADIONAVIGATION 5.60		112-117.6 RADIONAVIGATION 5.60 Fixed Maritime mobile 5.64 5.65
115-117.6 RADIONAVIGATION 5.60 Fixed Maritime mobile 5.64 5.66		
117.6-126 FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64		117.6-126 FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64
126-129 RADIONAVIGATION 5.60		126-129 RADIONAVIGATION 5.60 Fixed Maritime mobile 5.64 5.65
129-130 FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64 130-135.7 FIXED MARITIME MOBILE 5.64 5.67	5.61 5.64 130-135.7 FIXED MARITIME MOBILE 5.64	129-130 FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64 130-135.7 FIXED MARITIME MOBILE RADIONAVIGATION 5.64
135.7-137.8 FIXED MARITIME MOBILE Amateur 5.67A 5.64 5.67 5.67B	135.7-137.8 FIXED MARITIME MOBILE Amateur 5.67A 5.64	135.7-137.8 FIXED MARITIME MOBILE RADIONAVIGATION Amateur 5.67A 5.64 5.67B
137.8-148.5 FIXED MARITIME MOBILE 5.64 5.67	137.8-160 FIXED MARITIME MOBILE 5.64	137.8-160 FIXED MARITIME MOBILE RADIONAVIGATION 5.64
148.5-255 BROADCASTING 5.68 5.69 5.70	160-190 FIXED	160-190 FIXED Aeronautical radionavigation
	190-200 AERONAUTICAL RADIONAVIGATION	

National Frequency Allocation Table

kHz 110 - 200 NATIONAL ALLOCATIONS	
INDIA	REMARKS
110 - 112 FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64	IND01
112 - 117.6 RADIONAVIGATION 5.60 Fixed Maritime Mobile 5.64	IND01
117.6 - 126 FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64	IND 01 IND02 IND03
126 - 129 RADIONAVIGATION 5.60 Fixed Maritime Mobile 5.64	IND01 IND02
129 - 130 FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64	IND01 IND02
130-135.7 FIXED MARITIME MOBILE RADIONAVIGATION 5.64	IND01 IND02
135.7-137.8 FIXED MARITIME MOBILE RADIONAVIGATION Amateur 5.67A 5.64	IND01
137.8-160 FIXED MARITIME MOBILE RADIONAVIGATION 5.64	IND03 IND01
160 - 190 FIXED Aeronautical Radionavigation	IND01
190 - 200 AERONAUTICAL RADIONAVIGATION	IND01

International Frequency Allocation Table

200-495 kHz

Allocation to services			
Region 1	Region 2	Region 3	
	200-275 AERONAUTICAL RADIONAVIGATION Aeronautical mobile	200-285 AERONAUTICAL RADIONAVIGATION Aeronautical mobile	
255-283.5 BROADCASTING AERONAUTICAL RADIONAVIGATION 5.70 5.71	275-285 AERONAUTICAL RADIONAVIGATION Aeronautical mobile Maritime radionavigation (radiobeacons)		
283.5-315 AERONAUTICAL RADIONAVIGATION MARITIME RADIONAVIGATION (radiobeacons) 5.73 5.72 5.74	285-315 AERONAUTICAL RADIONAVIGATION MARITIME RADIONAVIGATION (radiobeacons) 5.73		
315-325 AERONAUTICAL RADIONAVIGATION Maritime radionavigation (radiobeacons) 5.73 5.72 5.75	315-325 MARITIME RADIONAVIGATION (radiobeacons) 5.73 Aeronautical radionavigation	315-325 AERONAUTICAL RADIONAVIGATION MARITIME RADIONAVIGATION (radiobeacons) 5.73	
325-405 AERONAUTICAL RADIONAVIGATION 5.72		325-335 AERONAUTICAL RADIONAVIGATION Aeronautical mobile Maritime radionavigation (radiobeacons)	325-405 AERONAUTICAL RADIONAVIGATION Aeronautical mobile
		335-405 AERONAUTICAL RADIONAVIGATION Aeronautical mobile	
405-415 RADIONAVIGATION 5.76 5.72	405-415 RADIONAVIGATION 5.76 Aeronautical mobile		
415-435 MARITIME MOBILE 5.79 AERONAUTICAL RADIONAVIGATION 5.72	415-495 MARITIME MOBILE 5.79 5.79A Aeronautical radionavigation 5.80 5.77 5.78 5.82		
435-495 MARITIME MOBILE 5.79 5.79A Aeronautical radionavigation 5.72 5.82			

National Frequency Allocation Table

kHz 200 - 495 NATIONAL ALLOCATIONS	
INDIA	REMARKS
200 - 285 AERONAUTICAL RADIONAVIGATION Aeronautical Mobile	
285 - 325 AERONAUTICAL RADIONAVIGATION MARITIME RADIONAVIGATION (radiobeacons) 5.73	
325 - 405 AERONAUTICAL RADIONAVIGATION Aeronautical Mobile	
405 - 415 RADIONAVIGATION 5.76 Aeronautical Mobile	
415 - 495 MARITIME MOBILE 5.79 5.79A Aeronautical radionavigation 5.80 5.77 5.82	

International Frequency Allocation Table
495-1 800 kHz

Allocation to services		
Region 1	Region 2	Region 3
495-505	MOBILE 5.82A 5.82B	
505-526.5 MARITIME MOBILE 5.79 5.79A MOD5.84 AERONAUTICAL RADIONAVIGATION 5.72	505-510 MARITIME MOBILE 5.79	505-526.5 MARITIME MOBILE 5.79 5.79A 5.84 AERONAUTICAL RADIONAVIGATION Aeronautical mobile Land mobile
	510-525 MOBILE 5.79A 5.84 AERONAUTICAL RADIONAVIGATION	
526.5-1 606.5 BROADCASTING 5.87 5.87A	525-535 BROADCASTING 5.86 AERONAUTICAL RADIONAVIGATION	526.5-535 BROADCASTING Mobile 5.88
	535-1 605 BROADCASTING	535-1 606.5 BROADCASTING
	1 605-1 625	
1 606.5-1 625 FIXED MARITIME MOBILE 5.90 LAND MOBILE 5.92	BROADCASTING 5.89 5.90	1 606.5-1 800 FIXED MOBILE RADIOLOCATION RADIONAVIGATION 5.91
1 625-1 635 RADIOLOCATION 5.93	1 625-1 705 FIXED MOBILE BROADCASTING 5.89 Radiolocation 5.90	
1 635-1 800 FIXED MARITIME MOBILE 5.90 LAND MOBILE 5.92 5.96	1 705-1 800 FIXED MOBILE RADIOLOCATION AERONAUTICAL RADIONAVIGATION	

National Frequency Allocation Table

kHz 495 - 1800 NATIONAL ALLOCATIONS	
INDIA	REMARKS
495 - 505 MOBILE (distress and calling) 5.83	
505 - 526.5 MARITIME MOBILE 5.79 5.79A 5.84 AERONAUTICAL RADIONAVIGATION Aeronautical Mobile Land Mobile	
526.5 - 535 BROADCASTING Mobile	
535-1606.5 BROADCASTING	
1606.5 -1800 FIXED MOBILE RADIOLOCATION RADIONAVIGATION	IND 04

International Frequency Allocation Table
1 800-2 194 kHz

Allocation to services			
Region 1	Region 2	Region 3	
1 800-1 810 RADIOLOCATION 5.93	1 800-1 850 AMATEUR	1 800-2 000 AMATEUR FIXED MOBILE except aeronautical mobile RADIONAVIGATION Radiolocation	
1 810-1 850 AMATEUR 5.98 5.99 5.100 5.101			
1 850-2 000 FIXED MOBILE except aeronautical mobile 5.92 5.96 5.103	1 850-2 000 AMATEUR FIXED MOBILE except aeronautical mobile RADIOLOCATION RADIONAVIGATION 5.102		5.97
2 000-2 025 FIXED MOBILE except aeronautical mobile (R) 5.92 5.103	2 000-2 065 FIXED MOBILE		
2 025-2 045 FIXED MOBILE except aeronautical mobile (R) Meteorological aids 5.104 5.92 5.103			
2 045-2 160 FIXED MARITIME MOBILE LAND MOBILE 5.92	2 065-2 107 MARITIME MOBILE 5.105 5.106		
2 160-2 170 RADIOLOCATION 5.93 5.107	2 107-2 170 FIXED MOBILE		
2 170-2 173.5		MARITIME MOBILE	
2 173.5-2 190.5		MOBILE (distress and calling) 5.108 5.109 5.110 5.111	
2 190.5-2 194		MARITIME MOBILE	

National Frequency Allocation Table

kHz 1800 - 2194 NATIONAL ALLOCATIONS	
INDIA	REMARKS
1800 - 2000 AMATEUR FIXED MOBILE except aeronautical mobile RADIONAVIGATION Radiolocation 5.97	IND 05
2000 - 2065 FIXED MOBILE	IND 06
2065 - 2107 MARITIME MOBILE 5.106	
2107 - 2170 FIXED MOBILE	
2170 - 2173.5 MARITIME MOBILE	
2173.5 - 2190.5 MOBILE (distress and calling) 5.108 5.109 5.110 5.111	
2190.5 - 2194 MARITIME MOBILE	

International Frequency Allocation Table
2 194-3 230 kHz

Allocation to services		
Region 1	Region 2	Region 3
2 194-2 300 FIXED MOBILE except aeronautical mobile (R) 5.92 5.103 5.112	2 194-2 300 FIXED MOBILE 5.112	
2 300-2 498 FIXED MOBILE except aeronautical mobile (R) BROADCASTING 5.113 5.103	2 300-2 495 FIXED MOBILE BROADCASTING 5.113	
	2 495-2 501 STANDARD FREQUENCY AND TIME SIGNAL (2 500 kHz)	
2 498-2 501 STANDARD FREQUENCY AND TIME SIGNAL (2 500 kHz)		
2 501-2 502	STANDARD FREQUENCY AND TIME SIGNAL Space Research	
2 502-2 625 FIXED MOBILE except aeronautical mobile (R) 5.92 5.103 5.114	2 502-2 505 STANDARD FREQUENCY AND TIME SIGNAL	
	2 505-2 850 FIXED MOBILE	
2 625-2 650 MARITIME MOBILE MARITIME RADIONAVIGATION 5.92		
2 650-2 850 FIXED MOBILE except aeronautical mobile (R) 5.92 5.103		
2 850-3 025	AERONAUTICAL MOBILE (R) 5.111 5.115	
3 025-3 155	AERONAUTICAL MOBILE (OR)	
3 155-3 200	FIXED MOBILE except aeronautical mobile (R) 5.116 5.117	
3 200-3 230	FIXED MOBILE except aeronautical mobile (R) BROADCASTING 5.113 5.116	

National Frequency Allocation Table

kHz 2194- 3230 NATIONAL ALLOCATIONS	
INDIA	REMARKS
2194 - 2300 FIXED MOBILE	
2300 - 2495 FIXED MOBILE BROADCASTING 5.113	
2495 - 2501 STANDARD FREQUENCY AND TIME SIGNAL (2500 kHz)	
2501 - 2502 STANDARD FREQUENCY AND TIME SIGNAL Space Research	
2502 - 2505 STANDARD FREQUENCY AND TIME SIGNAL	
2505 - 2850 FIXED MOBILE	
2850 - 3025 AERONAUTICAL MOBILE (R) 5.111 5.115	
3025 - 3155 AERONAUTICAL MOBILE (OR)	
3155 - 3200 FIXED MOBILE except aeronautical mobile (R) 5.116	
3200 - 3230 FIXED MOBILE except aeronautical mobile (R) BROADCASTING 5.113 5.116	IND 07

International Frequency Allocation Table

3 230-5 003 kHz

Allocation to services		
Region 1	Region 2	Region 3
3 230-3 400	FIXED MOBILE except aeronautical mobile BROADCASTING 5.113 5.116 5.118	
3 400-3 500	AERONAUTICAL MOBILE (R)	
3 500-3 800 AMATEUR FIXED MOBILE except aeronautical mobile 5.92	3 500-3 750 AMATEUR 5.119	3 500-3 900 AMATEUR FIXED MOBILE
3 800-3 900 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE	3 750-4 000 AMATEUR FIXED MOBILE except aeronautical mobile (R)	
3 900-3 950 AERONAUTICAL MOBILE (OR) 5.123		
3 950-4 000 FIXED BROADCASTING		
	5.122 5.125	3 900-3 950 AERONAUTICAL MOBILE BROADCASTING
		3 950-4 000 FIXED BROADCASTING 5.126
4 000-4 063	FIXED MARITIME MOBILE 5.127 5.126	
4 063-4 438	MARITIME MOBILE 5.79A 5.109 5.110 5.130 5.131 5.132 5.128 5.129	
4 438-4 650 FIXED MOBILE except aeronautical mobile (R)		4 438-4 650 FIXED MOBILE except aeronautical mobile
4 650-4 700 AERONAUTICAL MOBILE (R)		
4 700-4 750 AERONAUTICAL MOBILE (OR)		
4 750-4 850 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE BROADCASTING 5.113	4 750-4 850 FIXED MOBILE except aeronautical mobile (R) BROADCASTING 5.113	4 750-4 850 FIXED BROADCASTING 5.113 Land mobile
4 850-4 995 FIXED LAND MOBILE BROADCASTING 5.113		
4 995-5 003 STANDARD FREQUENCY AND TIME SIGNAL (5 000 kHz)		

National Frequency Allocation Table

kHz 3230 - 5003 NATIONAL ALLOCATIONS	
INDIA	REMARKS
3230 - 3400 FIXED MOBILE except aeronautical mobile BROADCASTING 5.113 5.116	
3400 - 3500 AERONAUTICAL MOBILE (R)	
3500-3900 FIXED MOBILE AMATEUR	IND 05, IND 08
3900 - 3950 AERONAUTICAL MOBILE BROADCASTING	
3950 - 4000 FIXED BROADCASTING 5.126	
4000 - 4063 FIXED MARITIME MOBILE 5.127 5.126	
4063- 4438 MARITIME MOBILE 5.79A 5.109 5.110 5.130 5.131 5.132 5.128 5.129	
4438 - 4650 FIXED MOBILE except aeronautical mobile	
4650 - 4700 AERONAUTICAL MOBILE (R)	
4700 - 4750 AERONAUTICAL MOBILE (OR)	
4750 - 4850 FIXED BROADCASTING 5.113 Land Mobile	
4850 - 4995 FIXED LAND MOBILE BROADCASTING 5.113	
4995 - 5003 STANDARD FREQUENCY AND TIME SIGNAL (5000 kHz)	

International Frequency Allocation Table

5 003-7 450 kHz

Allocation to services		
Region 1	Region 2	Region 3
5 003-5 005	STANDARD FREQUENCY AND TIME SIGNAL Space research	
5 005-5 060	FIXED BROADCASTING 5.113	
5 060-5 250	FIXED Mobile except aeronautical mobile 5.133	
5 250-5 450	FIXED MOBILE except aeronautical mobile	
5 450-5 480 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE	5 450-5 480 AERONAUTICAL MOBILE (R)	5 450-5 480 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE
5 480-5 680	AERONAUTICAL MOBILE (R) 5.111 5.115	
5 680-5 730	AERONAUTICAL MOBILE (OR) 5.111 5.115	
5 730-5 900 FIXED LAND MOBILE	5 730-5 900 FIXED MOBILE except aeronautical mobile (R)	5 730-5 900 FIXED Mobile except aeronautical mobile (R)
5 900-5 950	BROADCASTING 5.134 5.136	
5 950-6 200	BROADCASTING	
6 200-6 525	MARITIME MOBILE 5.109 5.110 5.130 5.132 5.137	
6 525-6 685	AERONAUTICAL MOBILE (R)	
6 685-6 765	AERONAUTICAL MOBILE (OR)	
6 765-7 000	FIXED MOBILE except aeronautical mobile (R) 5.138 5.138A 5.139	
7 000-7 100	AMATEUR AMATEUR-SATELLITE 5.140 5.141 5.141A	
7 100-7 200	AMATEUR 5.141A 5.141B 5.141C 5.142	
7 200-7 300 BROADCASTING	7 200-7 300 AMATEUR 5.142	7 200-7 300 BROADCASTING
7 300-7 400	BROADCASTING 5.134 5.143 5.143A 5.143B 5.143C 5.143D	
7 400-7 450 BROADCASTING 5.143B 5.143C	7 400-7 450 FIXED MOBILE except aeronautical mobile (R)	7 400-7 450 BROADCASTING 5.143A 5.143C

National Frequency Allocation Table

KHz 5003 - 7450 NATIONAL ALLOCATIONS	
INDIA	REMARKS
5003-5005 STANDARD FREQUENCY AND TIME SIGNAL Space Research	
5005 - 5060 FIXED BROADCASTING 5.113	
5060 - 5250 FIXED Mobile except aeronautical mobile	IND 07
5250 - 5450 FIXED MOBILE except aeronautical mobile	
5450 - 5480 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE	
5480 - 5680 AERONAUTICAL MOBILE (R) 5.111 5.115	
5680 - 5730 AERONAUTICAL MOBILE (OR) 5.111 5.115	
5730 - 5900 FIXED Mobile except Aeronautical mobile (R)	IND 08
5900 - 5950 BROADCASTING 5.134 5.136	
5950 - 6200 BROADCASTING	
6200 - 6525 MARITIME MOBILE 5.109 5.110 5.130 5.132 5.137	
6525 - 6685 AERONAUTICAL MOBILE (R)	
6685 - 6765 AERONAUTICAL MOBILE (OR)	
6765 - 7000 FIXED MOBILE except aeronautical mobile (R) 5.138 5.138A	
7000 - 7100 AMATEUR AMATEUR - SATELLITE	IND 05
7100-7200 AMATEUR	
7200 - 7300 BROADCASTING	
7300 - 7450 BROADCASTING 5.134 5.143 5.143A	

International Frequency Allocation Table

7 450-13 360 kHz

Allocation to services		
Region 1	Region 2	Region 3
7 450-8 100	FIXED MOBILE except aeronautical mobile (R) 5.143E 5.144	
8 100-8 195	FIXED MARITIME MOBILE	
8 195-8 815	MARITIME MOBILE 5.109 5.110 5.132 5.145 5.111	
8 815-8 965	AERONAUTICAL MOBILE (R)	
8 965-9 040	AERONAUTICAL MOBILE (OR)	
9 040-9 400	FIXED	
9 400-9 500	BROADCASTING 5.134 5.146	
9 500-9 900	BROADCASTING 5.147	
9 900-9 995	FIXED	
9 995-10 003	STANDARD FREQUENCY AND TIME SIGNAL (10 000 kHz) 5.111	
10 003-10 005	STANDARD FREQUENCY AND TIME SIGNAL Space research 5.111	
10 005-10 100	AERONAUTICAL MOBILE (R) 5.111	
10 100-10 150	FIXED Amateur	
10 150-11 175	FIXED Mobile except aeronautical mobile (R)	
11 175-11 275	AERONAUTICAL MOBILE (OR)	
11 275-11 400	AERONAUTICAL MOBILE (R)	
11 400-11 600	FIXED	
11 600-11 650	BROADCASTING 5.134 5.146	
11 650-12 050	BROADCASTING 5.147	
12 050-12 100	BROADCASTING 5.134 5.146	
12 100-12 230	FIXED	
12 230-13 200	MARITIME MOBILE 5.109 5.110 5.132 5.145	
13 200-13 260	AERONAUTICAL MOBILE (OR)	
13 260-13 360	AERONAUTICAL MOBILE (R)	

National Frequency Allocation Table

kHz 7450 - 13360 NATIONAL ALLOCATIONS	
INDIA	REMARKS
7450 - 8100 FIXED MOBILE except aeronautical mobile (R) 5.144	
8100 - 8195 FIXED MARITIME MOBILE	
8195 - 8815 MARITIME MOBILE 5.109 5.110 5.132 5.145 5.111	IND 09
8815 - 8965 AERONAUTICAL MOBILE (R)	
8965 - 9040 AERONAUTICAL MOBILE (OR)	
9040 - 9400 FIXED	
9400 - 9500 BROADCASTING 5.134 5.146	
9500 - 9900 BROADCASTING 5.147	
9900 - 9995 FIXED	
9995 - 10003 STANDARD FREQUENCY AND TIME SIGNAL (10000 kHz) 5.111	
10003 - 10005 STANDARD FREQUENCY AND TIME SIGNAL Space Research 5.111	
10005 - 10100 AERONAUTICAL MOBILE (R) 5.111	
10100 - 10150 FIXED Amateur	
10150 - 11175 FIXED Mobile except aeronautical mobile (R)	
11175 - 11275 AERONAUTICAL MOBILE (OR)	
11275 - 11400 AERONAUTICAL MOBILE (R)	
11400 - 11600 FIXED	
11600 - 11650 BROADCASTING 5.134 5.146	
11650 - 12050 BROADCASTING 5.147	
12050 - 12100 BROADCASTING 5.134 5.146	
12100 - 12230 FIXED	
12230 - 13200 MARITIME MOBILE 5.109 5.110 5.132 5.145	IND 09
13200 - 13260 AERONAUTICAL MOBILE(OR)	
13260 - 13360 AERONAUTICAL MOBILE(R)	

International Frequency Allocation Table**13 360-18 030 kHz**

Allocation to services		
Region 1	Region 2	Region 3
13 360-13 410	FIXED RADIO ASTRONOMY 5.149	
13 410-13 570	FIXED Mobile except aeronautical mobile (R) 5.150	
13 570-13 600	BROADCASTING 5.134 5.151	
13 600-13 800	BROADCASTING	
13 800-13 870	BROADCASTING 5.134 5.151	
13 870-14 000	FIXED Mobile except aeronautical mobile (R)	
14 000-14 250	AMATEUR AMATEUR-SATELLITE	
14 250-14 350	AMATEUR 5.152	
14 350-14 990	FIXED Mobile except aeronautical mobile (R)	
14 990-15 005	STANDARD FREQUENCY AND TIME SIGNAL (15 000 kHz) 5.111	
15 005-15 010	STANDARD FREQUENCY AND TIME SIGNAL Space research	
15 010-15 100	AERONAUTICAL MOBILE (OR)	
15 100-15 600	BROADCASTING	
15 600-15 800	BROADCASTING 5.134 5.146	
15 800-16 360	FIXED 5.153	
16 360-17 410	MARITIME MOBILE 5.109 5.110 5.132 5.145	
17 410-17 480	FIXED	
17 480-17 550	BROADCASTING 5.134 5.146	
17 550-17 900	BROADCASTING	
17 900-17 970	AERONAUTICAL MOBILE (R)	
17 970-18 030	AERONAUTICAL MOBILE (OR)	

National Frequency Allocation Table

kHz 13360 - 18030 NATIONAL ALLOCATIONS	
INDIA	REMARKS
13360 - 13410 FIXED RADIO ASTRONOMY 5.149	
13410 - 13570 FIXED Mobile except aeronautical mobile ® 5.150	
13570 - 13600 BROADCASTING 5.134 5.151	
13600 - 13800 BROADCASTING	
13800 - 13870 BROADCASTING 5.134 5.151	IND 07
13870 - 14000 FIXED Mobile except aeronautical mobile (R)	
14000 - 14250 AMATEUR AMATEUR-SATELLITE	IND 05
14250 - 14350 AMATEUR	IND 05
14350 - 14990 FIXED Mobile except aeronautical mobile (R)	
14990 - 15005 STANDARD FREQUENCY AND TIME SIGNAL (15 000 kHz) 5.111	
15005 - 15010 STANDARD FREQUENCY AND TIME SIGNAL Space Research	
15010 - 15100 AERONAUTICAL MOBILE (OR)	
15100 - 15600 BROADCASTING	
15600 - 15800 BROADCASTING 5.134 5.146	
15800 - 16360 FIXED 5.153	
16360 - 17410 MARITIME MOBILE 5.109 5.110 5.132 5.145	
17410 - 17480 FIXED	
17480 - 17550 BROADCASTING 5.134 5.146	
17550 - 17900 BROADCASTING	
17900 - 17970 AERONAUTICAL MOBILE (R)	
17970 - 18030 AERONAUTICAL MOBILE (OR)	

International Frequency Allocation Table

18 030-23 350 kHz

Allocation to services		
Region 1	Region 2	Region 3
18 030-18 052	FIXED	
18 052-18 068	FIXED Space research	
18 068-18 168	AMATEUR AMATEUR-SATELLITE 5.154	
18 168-18 780	FIXED Mobile except aeronautical mobile	
18 780-18 900	MARITIME MOBILE	
18 900-19 020	BROADCASTING 5.134 5.146	
19 020-19 680	FIXED	
19 680-19 800	MARITIME MOBILE 5.132	
19 800-19 990	FIXED	
19 990-19 995	STANDARD FREQUENCY AND TIME SIGNAL Space research 5.111	
19 995-20 010	STANDARD FREQUENCY AND TIME SIGNAL (20 000 kHz) 5.111	
20 010-21 000	FIXED Mobile	
21 000-21 450	AMATEUR AMATEUR-SATELLITE	
21 450-21 850	BROADCASTING	
21 850-21 870	FIXED 5.155A 5.155	
21 870-21 924	FIXED 5.155B	
21 924-22 000	AERONAUTICAL MOBILE (R)	
22 000-22 855	MARITIME MOBILE 5.132 5.156	
22 855-23 000	FIXED 5.156	
23 000-23 200	FIXED Mobile except aeronautical mobile (R) 5.156	
23 200-23 350	FIXED 5.156A AERONAUTICAL MOBILE (OR)	

National Frequency Allocation Table

kHz 18030 - 23350 NATIONAL ALLOCATIONS	
INDIA	REMARKS
18030 - 18052 FIXED	
18052 - 18068 FIXED Space Research	
18068 - 18168 AMATEUR AMATEUR-SATELLITE	IND 05
18168 - 18780 FIXED Mobile except aeronautical mobile	
18780 - 18900 MARITIME MOBILE	
18900 - 19020 BROADCASTING 5.134 5.146	
19020 - 19680 FIXED	
19680 - 19800 MARITIME MOBILE 5.132	
19800 - 19990 FIXED	
19990-19995 STANDARD FREQUENCY AND TIME SIGNAL Space Research 5.111	
19995 - 20010 STANDARD FREQUENCY AND TIME SIGNAL (20000 kHz) 5.111	
20010 - 21000 FIXED Mobile	
21000 - 21450 AMATEUR AMATEUR-SATELLITE	IND 05
21450 - 21850 BROADCASTING	
21850 - 21870 FIXED	
21870 - 21924 FIXED 5.155B	
21924 - 22000 AERONAUTICAL MOBILE (R)	
22000 - 22855 MARITIME MOBILE 5.132	
22855 - 23000 FIXED	
23000 - 23200 FIXED Mobile except aeronautical mobile (R)	
23200 - 23350 FIXED 5.156A AERONAUTICAL MOBILE (OR)	

International Frequency Allocation Table**23 350-27 500 kHz**

Allocation to services		
Region 1	Region 2	Region 3
23 350-24 000	FIXED MOBILE except aeronautical mobile 5.157	
24 000-24 890	FIXED LAND MOBILE	
24 890-24 990	AMATEUR AMATEUR-SATELLITE	
24 990-25 005	STANDARD FREQUENCY AND TIME SIGNAL (25 000 kHz)	
25 005-25 010	STANDARD FREQUENCY AND TIME SIGNAL Space research	
25 010-25 070	FIXED MOBILE except aeronautical mobile	
25 070-25 210	MARITIME MOBILE	
25 210-25 550	FIXED MOBILE except aeronautical mobile	
25 550-25 670	RADIO ASTRONOMY 5.149	
25 670-26 100	BROADCASTING	
26 100-26 175	MARITIME MOBILE 5.132	
26 175-27 500	FIXED MOBILE except aeronautical mobile 5.150	

National Frequency Allocation Table

kHz 23350 - 27500 NATIONAL ALLOCATIONS	
INDIA	REMARKS
23350 - 24000 FIXED MOBILE except aeronautical mobile 5.157	
24000 - 24890 FIXED LAND MOBILE	
24890 - 24990 AMATEUR AMATEUR-SATELLITE	IND 05
24990 - 25005 STANDARD FREQUENCY AND TIME SIGNAL (25000 kHz)	
25005 - 25010 STANDARD FREQUENCY AND TIME SIGNAL Space Research	
25010 - 25070 FIXED MOBILE except aeronautical mobile	
25070 - 25210 MARITIME MOBILE	
25210 - 25550 FIXED MOBILE except aeronautical mobile	
25550 - 25670 RADIO ASTRONOMY 5.149	
25670 - 26100 BROADCASTING	
26100 - 26175 MARITIME MOBILE 5.132	
26175 - 27500 FIXED MOBILE except aeronautical mobile 5.150	IND 04, IND 10

International Frequency Allocation Table

27.5-47 MHz

Allocation to services		
Region 1	Region 2	Region 3
27.5-28	METEOROLOGICAL AIDS FIXED MOBILE	
28-29.7	AMATEUR AMATEUR-SATELLITE	
29.7-30.005	FIXED MOBILE	
30.005-30.01	SPACE OPERATION (satellite identification) FIXED MOBILE SPACE RESEARCH	
30.01-37.5	FIXED MOBILE	
37.5-38.25	FIXED MOBILE Radio astronomy 5.149	
38.25-39.986	FIXED MOBILE	
39.986-40.02	FIXED MOBILE Space research	
40.02-40.98	FIXED MOBILE 5.150	
40.98-41.015	FIXED MOBILE Space research 5.160 5.161	
41.015-44	FIXED MOBILE 5.160 5.161	
44-47	FIXED MOBILE 5.162 5.162A	

National Frequency Allocation Table

MHz 27.5 - 47 NATIONAL ALLOCATIONS	
INDIA	REMARKS
27.5 - 28 METEOROLOGICAL AIDS FIXED MOBILE	
28 - 29.7 AMATEUR AMATEUR-SATELLITE	IND 05
29.7 - 30.005 FIXED MOBILE	
30.005 - 30.01 SPACE OPERATION (satellite identification) FIXED MOBILE SPACE RESEARCH	
30.01 - 37.5 FIXED MOBILE	IND 11
37.5 - 38.25 FIXED MOBILE Radio Astronomy 5.149	IND 11
38.25-39.986 FIXED MOBILE	
39.986-40.02 FIXED MOBILE Space Research	
40.02-40.98 FIXED MOBILE 5.150	
40.98-41.015 FIXED MOBILE Space Research	
41.015-44 FIXED MOBILE	IND 04
44-47 FIXED MOBILE	IND 04

International Frequency Allocation Table
47-75.2 MHz

Allocation to services		
Region 1	Region 2	Region 3
47-68 BROADCASTING 		

National Frequency Allocation Table

MHz 47 - 75.2 NATIONAL ALLOCATIONS	
INDIA	REMARKS
47-50 FIXED MOBILE BROADCASTING	IND 04
50-54 FIXED MOBILE BROADCASTING	
54---68 FIXED MOBILE BROADCASTING	IND 12
68---74.8 FIXED MOBILE 5.149	IND 07
74.8 - 75.2 AERONAUTICAL RADIONAVIGATION 5.180	

International Frequency Allocation Table

75.2-137.175 MHz

Allocation to services		
Region 1	Region 2	Region 3
75.2-87.5 FIXED MOBILE except aeronautical mobile 5.175 5.179 5.184 5.187	75.2-75.4 FIXED MOBILE 5.179	
	75.4-76 FIXED MOBILE	75.4-87 FIXED MOBILE 5.182 5.183 5.188
	76-88 BROADCASTING Fixed Mobile	
	5.185	87-100 FIXED MOBILE BROADCASTING
	88-100 BROADCASTING	
87.5-100 BROADCASTING 5.190		
100-108	BROADCASTING 5.192 5.194	
108-117.975	AERONAUTICAL RADIONAVIGATION 5.197 5.197A	
117.975-137	AERONAUTICAL MOBILE (R) 5.111 5.200 5.201 5.202	
137-137.025	SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208 B 5.209 SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) 5.204 5.205 5.206 5.207 5.208	
137.025-137.175	SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Fixed Mobile-satellite (space-to-Earth) 5.208A 5.208 B 5.209 Mobile except aeronautical mobile (R) 5.204 5.205 5.206 5.207 5.208	

National Frequency Allocation Table

MHz 75.2 – 137.175 NATIONAL ALLOCATIONS	
INDIA	REMARKS
75.2 - 75.4 FIXED MOBILE	
75.4 - 87 FIXED MOBILE	IND 07
87 - 100 FIXED MOBILE BROADCASTING	IND 13, IND 14, IND15
100 - 108 BROADCASTING	IND15
108 - 117.975 AERONAUTICAL RADIONAVIGATION 5.197A	
117.975 - 137 AERONAUTICAL MOBILE (R) 5.111 5.200	
137 - 137.025 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.209 SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) 5.204 5.208	
137.025 - 137.175 SPACE OPERATION (space to Earth) METEOROLOGICAL-SATELLITE(space-to-Earth) SPACE RESEARCH (space to Earth) Fixed Mobile satellite (space-to-Earth) 5.208A 5.208B 5.209 Mobile except aeronautical mobile (R) 5.204 5.208	

International Frequency Allocation Table

137.175-148 MHz

Allocation to services		
Region 1	Region 2	Region 3
137.175-137.825	SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208 B 5.209 SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) 5.204 5.205 5.206 5.207 5.208	
137.825-138	SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Fixed Mobile-satellite (space-to-Earth) 5.208A 5.208 B 5.209 Mobile except aeronautical mobile (R) 5.204 5.205 5.206 5.207 5.208	
138-143.6 AERONAUTICAL MOBILE (OR) 5.210 5.211 5.212 5.214	138-143.6 FIXED MOBILE RADIOLOCATION Space research (space-to-Earth)	138-143.6 FIXED MOBILE Space research (space-to-Earth) 5.207 5.213
143.6-143.65 AERONAUTICAL MOBILE (OR) SPACE RESEARCH (space-to-Earth) 5.211 5.212 5.214	143.6-143.65 FIXED MOBILE RADIOLOCATION SPACE RESEARCH (space-to-Earth)	143.6-143.65 FIXED MOBILE SPACE RESEARCH (space-to-Earth) 5.207 5.213
143.65-144 AERONAUTICAL MOBILE (OR) 5.210 5.211 5.212 5.214	143.65-144 FIXED MOBILE RADIOLOCATION Space research (space-to-Earth)	143.65-144 FIXED MOBILE Space research (space-to-Earth) 5.207 5.213
144-146	AMATEUR AMATEUR-SATELLITE 5.216	
146-148 FIXED MOBILE except aeronautical mobile (R)	146-148 AMATEUR 5.217	146-148 AMATEUR FIXED MOBILE 5.217

National Frequency Allocation Table

MHz 137.175 – 148 NATIONAL ALLOCATIONS	
INDIA	REMARKS
137.175 - 137.825 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208 5.208A 5.208 B 5.209 SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) 5.204	
137.825 - 138 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) FIXED 5.204 MOBILE except aeronautical mobile (R) 5.204 Mobile-satellite (space-to-Earth) 5.208A 5.208 B 5.209 5.208	
138 - 143.6 FIXED MOBILE Space Research (space-to-Earth)	
143.6 - 143.65 FIXED MOBILE SPACE RESEARCH (space-to-Earth)	
143.65 - 144 FIXED MOBILE Space Research (space-to-Earth)	IND 14
144 - 146 AMATEUR AMATEUR-SATELLITE	IND 05
146 - 148 FIXED MOBILE	IND 17

International Frequency Allocation Table

148-223 MHz

[illegible]

National Frequency Allocation Table

MHz 148 - 223 NATIONAL ALLOCATIONS	
INDIA	REMARKS
148 - 149.9 FIXED MOBILE MOBILE-SATELLITE (Earth to space) 5.209 5.218 5.219 5.221	IND 18
149.9 - 150.05 MOBILE-SATELLITE (Earth to Space) 5.209 5.224A RADIONAVIGATION-SATELLITE 5.224B 5.220 5.222 5.223	
150.05 – 156.4875 FIXED MOBILE RADIO ASTRONOMY 5.226	IND 04, IND 09, IND 16, IND 17, IND 20, IND 21
156.4875-156.5625 MARITIME MOBILE (Distress and calling via DSC) 5.111, 5.226	IND 09, IND 16, IND 17, IND 20, IND 21
156.5625– 156.7625 FIXED MOBILE 5.225, 5.526	IND 04, IND 09, IND 16, IND 17, IND 20, IND 21
156.7625 - 156.8375 MARITIME MOBILE (distress and calling) 5.111 5.226	IND 04, IND 09, IND 16, IND 17, IND 20, IND 21
156.8375 -174 FIXED MOBILE 5.226, 5.227A	IND 09, IND 16, IND 17, IND 18, IND 20, IND 21
174 - 223 FIXED MOBILE BROADCASTING	IND22, IND23

International Frequency Allocation Table
220-335.4 MHz

Allocation to services		
Region 1	Region 2	Region 3
	220-225	
223-230 BROADCASTING Fixed Mobile 5.243 5.246 5.247	AMATEUR FIXED MOBILE Radiolocation 5.241	223-230 FIXED MOBILE BROADCASTING AERONAUTICAL RADIONAVIGATION Radiolocation 5.250
	225-235 FIXED MOBILE	
230-235 FIXED MOBILE 5.247 5.251 5.252		230-235 FIXED MOBILE AERONAUTICAL RADIONAVIGATION 5.250
235-267	FIXED MOBILE 5.111 5.199 5.252 5.254 5.256 5.256A	
267-272	FIXED MOBILE Space operation (space-to-Earth) 5.254 5.257	
272-273	SPACE OPERATION (space-to-Earth) FIXED MOBILE 5.254	
273-312	FIXED MOBILE 5.254	
312-315	FIXED MOBILE Mobile-satellite (Earth-to-space) 5.254 5.255	
315-322	FIXED MOBILE 5.254	
322-328.6	FIXED MOBILE RADIO ASTRONOMY 5.149	
328.6-335.4	AERONAUTICAL RADIONAVIGATION 5.258 5.259	

National Frequency Allocation Table

MHz 223 - 335.4 NATIONAL ALLOCATIONS	
INDIA	REMARKS
223 – 230 FIXED MOBILE BROADCASTING AERONAUTICAL RADIONAVIGATION Radiolocation	IND 22, IND23
230 – 235 FIXED MOBILE AERONAUTICAL RADIONAVIGATION	IND24
235 – 267 FIXED MOBILE 5.111 5.199 5.254 5.256	
267 - 272 FIXED MOBILE Space Operation (space-to-Earth) 5.254 5.257	
272 – 273 SPACE OPERATION (space-to-Earth) FIXED MOBILE 5.254	
273 – 312 FIXED MOBILE 5.254	IND 25
312 – 315 FIXED MOBILE Mobile-Satellite (Earth to Space) 5.254 5.255	
315 – 322 FIXED MOBILE 5.254	
322 - 328.6 FIXED MOBILE RADIO ASTRONOMY 5.149	
328.6 - 335.4 AERONAUTICAL RADIONAVIGATION 5.258	

International Frequency Allocation Table
335.4-410 MHz (A2)

Allocation to services		
Region 1	Region 2	Region 3
335.4-387	FIXED MOBILE 5.254	
387-390	FIXED MOBILE Mobile-satellite (space-to-Earth) 5.208A 5.208 B 5.254 5.255	
390-399.9	FIXED MOBILE 5.254	
399.9-400.05	MOBILE-SATELLITE (Earth-to-space) 5.209 5.224A RADIONAVIGATION-SATELLITE 5.222 5.224B 5.260 5.220	
400.05-400.15	STANDARD FREQUENCY AND TIME SIGNAL- SATELLITE (400.1 MHz) 5.261 5.262	
400.15-401	METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208 B 5.209 SPACE RESEARCH (space-to-Earth) 5.263 Space operation (space-to-Earth) 5.262 5.264	
401-402	METEOROLOGICAL AIDS SPACE OPERATION (space-to-Earth) EARTH EXPLORATION-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) Fixed Mobile except aeronautical mobile	
402-403	METEOROLOGICAL AIDS EARTH EXPLORATION-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) Fixed Mobile except aeronautical mobile	
403-406	METEOROLOGICAL AIDS Fixed Mobile except aeronautical mobile	
406-406.1	MOBILE-SATELLITE (Earth-to-space) 5.266 5.267	
406.1-410	FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY 5.149	

National Frequency Allocation Table

MHz 335.4 - 410 NATIONAL ALLOCATIONS	
INDIA	REMARKS
335.4 - 387 FIXED MOBILE 5.254	IND 27, IND 26, IND28, IND29, IND30, IND 82
387 – 390 FIXED MOBILE Mobile-satellite (space-to-Earth) 5.208A, 5.208B 5.254 5.255	IND 29, IND 82
390 - 399.9 FIXED MOBILE Mobile Satellite (space-to-earth) 5.254	IND29, IND 82
399.9 - 400.05 MOBILE SATELLITE (Earth-to-space) 5.209 5.224A RADIONAVIGATION-SATELLITE 5.222 5.224B 5.260 5.220	IND 82
400.05 - 400.15 STANDARD FREQUENCY AND TIME SIGNAL-SATELLITE (400.1 MHz) 5.261	
400.15 - 401 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE 5.208A, 5.208B, 5.209 (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208B 5.209 SPACE RESEARCH (space-to-Earth) 5.263 Space Operation (space-to-Earth) 5.264	
401 – 402 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (Earth-to-space) SPACE OPERATIONS (space-to-Earth) EARTH EXPLORATION-SATELLITE (Earth-to-space) Fixed Mobile except aeronautical mobile	
402 - 403 METEOROLOGICAL AIDS EARTH EXPLORATION-SATELLITE (Earth-to-space) METEOROLOGICAL -SATELLITE (Earth-to-space) Fixed Mobile except aeronautical mobile	IND31
403 - 406 METEOROLOGICAL AIDS Fixed Mobile except aeronautical mobile	IND31
406 - 406.1 MOBILE-SATELLITE (Earth-to-space) 5.266 5.267	
406.1 - 410 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY 5.149	IND32, IND 82

International Frequency Allocation Table
410-460 MHz

Allocation to services		
Region 1	Region 2	Region 3
410-420	FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-space) 5.268	
420-430	FIXED MOBILE except aeronautical mobile Radiolocation 5.269 5.270 5.271	
430-432 AMATEUR RADIOLOCATION 5.271 5.272 5.273 5.274 5.275 5.276 5.277	430-432 RADIOLOCATION Amateur 5.271 5.276 5.277 5.278 5.279	
432-438 AMATEUR RADIOLOCATION Earth exploration-satellite (active) 5.279A 5.138 5.271 5.272 5.276 5.277 5.280 5.281 5.282	432-438 RADIOLOCATION Amateur Earth exploration-satellite (active) 5.279A 5.271 5.276 5.277 5.278 5.279 5.281 5.282	
438-440 AMATEUR RADIOLOCATION 5.271 5.273 5.274 5.275 5.276 5.277 5.283	438-440 RADIOLOCATION Amateur 5.271 5.276 5.277 5.278 5.279	
440-450	FIXED MOBILE except aeronautical mobile Radiolocation 5.269 5.270 5.271 5.284 5.285 5.286	
450-455	FIXED MOBILE 5.286 A A 5.209 5.271 5.286 5.286A 5.286B 5.286C 5.286D 5.286E	
455-456 FIXED MOBILE 5.286 A A 5.209 5.271 5.286A 5.286B 5.286C 5.286E	455-456 FIXED MOBILE 5.286 A A MOBILE-SATELLITE (Earth-to-space) 5.286A 5.286B 5.286C 5.209	455-456 FIXED MOBILE 5.286 A A 5.209 5.271 5.286A 5.286B 5.286C 5.286E
456-459	FIXED MOBILE 5.286 A A 5.271 5.287 5.288	
459-460 FIXED MOBILE 5.286 A A 5.209 5.271 5.286A 5.286B 5.286C 5.286E	459-460 FIXED MOBILE 5.286 A A MOBILE-SATELLITE (Earth-to-space) 5.286A 5.286B 5.286C 5.209	459-460 FIXED MOBILE 5.286 A A 5.209 5.271 5.286A 5.286B 5.286C 5.286E

National Frequency Allocation Table

MHz 410 - 460 NATIONAL ALLOCATIONS	
INDIA	REMARKS
410 - 420 FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-space) 5.268	IND 29, IND32, IND 82
420 - 430 FIXED MOBILE except aeronautical mobile RADIOLOCATION 5.271	IND 29, IND32, IND 82
430-432 RADIOLOCATION FIX MOBILE except Aeronautical Mobile Amateur 5.271	IND 05, IND 07, IND 32, IND33
432-438 RADIOLOCATION FIX MOBILE except Aeronautical Mobile 5.276 Amateur Earth Exploration-Satellite (active) 5.271	IND 05, IND 07, IND 32
438-440 RADIOLOCATION FIX MOBILE except Aeronautical Mobile Amateur 5.271	IND 05, IND 07, IND 32
440 – 450 FIXED MOBILE except aeronautical mobile RADIOLOCATION 5. 271 5.286	IND 32, IND 34, IND 82
450 – 455 FIXED MOBILE 5.286AA 5.209 5.271 5.286 5.286A	IND 35, IND 82
455- 456 FIXED MOBILE 5.286AA 5.209 5.271 5.286 5.286A	IND 35, IND 82
456-459 FIXED MOBILE 5.286AA 5.271, 5.287	IND 35, IND 82
459 – 460 FIXED MOBILE 5.286AA 5.209 5.271 5.286A	IND 30, IND 35, IND 82

International Frequency Allocation Table

460-890 MHz

Allocation to services									
Region 1				Region 2				Region 3	
460-470				FIXED MOBILE 5.286 A A Meteorological-Satellite (space-to-Earth) 5.287 5.288 5.289 5.290					
470-790 BROADCASTING 									

National Frequency Allocation Table

MHz 460 – 890 NATIONAL ALLOCATIONS	
INDIA	REMARKS
460-470 FIXED MOBILE 5.286AA Meteorological Satellite (Space to Earth) 5.287 5.289	IND 07, IND 34, IND 35, IND 82
470 – 585 FIXED MOBILE BROADCASTING 5.298	IND 36
585-610 FIXED MOBILE BROADCASTING RADIO NAVIGATION RADIO ASTRONOMY 5.307 5.149	IND37, IND38
610-890 FIXED MOBILE 5.313A 5.317A BROADCASTING RADIO ASTRONOMY 5.307 5.149 5.311A 5.320	IND37, IND 38, IND39 IND 40, IND 41, IND42, IND 43, IND44, IND45, IND46, IND 82

International Frequency Allocation Table
890-1 300 MHz

Allocation to services		
Region 1	Region 2	Region 3
890-942 FIXED MOBILE except aeronautical mobile 5.317A BROADCASTING 5.322 Radiolocation 5.323	890-902 FIXED MOBILE except aeronautical mobile 5.317A Radiolocation 5.318 5.325	890-942 FIXED MOBILE 5.317A BROADCASTING Radiolocation 5.327
	902-928 FIXED Amateur Mobile except aeronautical mobile 5.325A Radiolocation 5.150 5.325 5.326	
	928-942 FIXED MOBILE except aeronautical mobile 5.317A Radiolocation 5.325	
942-960 FIXED MOBILE except aeronautical mobile 5.317 A BROADCASTING 5.322 5.323	942-960 FIXED MOBILE 5.317A	942-960 FIXED MOBILE 5.317A BROADCASTING 5.320
960-1 164	AERONAUTICAL RADIONAVIGATION 5.328 AERONAUTICAL MOBILE (R) 5.327 A	
1 164-1 215	AERONAUTICAL RADIONAVIGATION 5.328 RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.328A	
1 215-1 240	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.329 5.329A SPACE RESEARCH (active) 5.330 5.331 5.332	
1 240-1 300	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.329 5.329A SPACE RESEARCH (active) Amateur 5.282 5.330 5.331 5.332 5.335 5.335A	

National Frequency Allocation Table

MHz 890 – 1300 NATIONAL ALLOCATIONS	
INDIA	REMARKS
890–942 FIXED 5.317A MOBILE BROADCASTING Radiolocation	IND 25, IND 45, IND 47, IND48, IND 49, IND50, IND51, IND52
942—960 FIXED MOBILE 5.317A BROADCASTING 5.320	IND 47, IND48, IND49, IND51
960 – 1164 AERONAUTICAL RADIONAVIGATION 5.328 AERONAUTICAL MOBILE (R) 5.327A	
1164-1215 AERONAUTICAL RADIONAVIGATION 5.328 RADIONAVIGATION SATELLITE (space-to- Earth) (space-to-space) 5.328B 5.328A	
1215 – 1240 EARTH EXPLORATION SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) SPACE RESEARCH (active) 5.328B 5.329 5.329A 5.330 5.331 5.332	
1240 – 1300 EARTH EXPLORATION SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.329 5.329A SPACE RESEARCH (active) Amateur 5.282 5.330 5.331 5.332 5.335A	IND 05

International Frequency Allocation Table

1 300-1 525 MHz

Allocation to services		
Region 1	Region 2	Region 3
1 300-1 350	AERONAUTICAL RADIONAVIGATION 5.337 RADIOLOCATION RADIONAVIGATION SATELLITE (Earth-to-space) 5.149 5.337A	
1 350-1 400 FIXED MOBILE RADIOLOCATION 5.149 5.338 5.338 A 5.339	1 350-1 400 RADIOLOCATION 5.338A 5.149 5.334 5.339	
1 400-1 427	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341	
1 427-1 429	SPACE OPERATION (Earth-to-space) FIXED MOBILE except aeronautical mobile 5.338 A 5.341	
1 429-1 452 FIXED MOBILE except aeronautical mobile 5.338 A 5.341 5.342	1 429-1 452 FIXED MOBILE 5.343 5.338 A 5.341	
1 452-1 492 FIXED MOBILE except aeronautical mobile BROADCASTING 5.345 BROADCASTING-SATELLITE 5.208 B 5.345 5.341 5.342	1 452-1 492 FIXED MOBILE 5.343 BROADCASTING 5.345 BROADCASTING-SATELLITE 5.208 B 5.345 5.341 5.344	
1 492-1 518 FIXED MOBILE except aeronautical mobile 5.341 5.342	1 492-1 518 FIXED MOBILE 5.343 5.341 5.344	1 492-1 518 FIXED MOBILE 5.341
1 518-1 525 FIXED MOBILE except aeronautical mobile MOBILE-SATELLITE (space-to-Earth) 5.348 5.348A 5.348B 5.351A 5.341 5.342	1 518-1 525 FIXED MOBILE 5.343 MOBILE-SATELLITE (space-to-Earth) 5.348 5.348A 5.348B 5.351A 5.341 5.344	1 518-1 525 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.348 5.348A 5.348B MOD 5.351A 5.341

National Frequency Allocation Table

MHz 1300 - 1525 NATIONAL ALLOCATIONS	
INDIA	REMARKS
1300 – 1350 AERONAUTICAL RADIONAVIGATION 5.337 RADIOLOCATION RADIONAVIGATION SATELLITE (Earth-to-space) 5.149 5.337A	
1350 - 1400 RADIOLOCATION 5.338A 5.149 5.339	
1400 - 1427 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341	
1427 - 1429 SPACE OPERATION (Earth to space) FIXED MOBILE except aeronautical mobile 5.338A 5.341	
1429 – 1452 FIXED MOBILE 5.338A 5.341	
1452 – 1492 FIXED MOBILE BROADCASTING 5.345 BROADCASTING SATELLITE 5.208 B 5.345 5.341	
1492 – 1518 FIXED MOBILE 5.341	
1518-1525 FIXED MOBILE MOBILE SATELLITE (space-to-Earth) 5.348 5.348A 5.351A 5.341	

International Frequency Allocation Table

1 525-1 610 MHz

Allocation to services		
Region 1	Region 2	Region 3
1 525-1 530 SPACE OPERATION (space-to-Earth) FIXED MOBILE-SATELLITE (space-to-Earth) 5.347A 5.351A Earth exploration-satellite Mobile except aeronautical mobile 5.349 5.341 5.342 5.350 5.351 5.352A 5.354	1 525-1 530 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.347A 5.351A Earth exploration-satellite Fixed Mobile 5.343 5.341 5.351 5.354	1 525-1 530 SPACE OPERATION (space-to-Earth) FIXED MOBILE-SATELLITE (space-to-Earth) 5.347A 5.351A Earth exploration-satellite Mobile 5.349 5.341 5.351 5.352A 5.354
1 530-1 535 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.347A 5.351A 5.353A Earth exploration-satellite Fixed Mobile except aeronautical mobile 5.341 5.342 5.351 5.354	1 530-1 535 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.347A 5.351A 5.353A Earth exploration-satellite Fixed Mobile 5.343 5.341 5.351 5.354	
1 535-1 559	MOBILE-SATELLITE (space-to-Earth) 5.347A 5.351A 5.341 5.351 5.353A 5.354 5.355 5.356 5.357 5.357A 5.359 5.362A	
1 559-1 610	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.208 B 5.328B 5.329A 5.341 5.362B 5.362C	

National Frequency Allocation Table

MHz 1525 – 1610 NATIONAL ALLOCATIONS	
INDIA	REMARKS
1525 – 1530 SPACE OPERATION (space-to-Earth) FIXED MOBILE-SATELLITE (space-to-Earth) 5.351A Earth Exploration-Satellite Mobile 5.341 5.351 5.352A 5.354	
1530 – 1535 SPACE OPERATION (space-to-Earth) MOBILE –SATELLITE (space-to-Earth) 5.353A 5.351A Earth Exploration-Satellite Fixed Mobile 5.341, 5.351, 5.354	
1535 – 1559 MOBILE-SATELLITE (space-to-Earth) 5.351A 5.341, 5.351, 5.353A, 5.354, 5.356, 5.357, 5.357A	
1559 – 1610 AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.208B 5.328B 5.329A 5.341	

International Frequency Allocation Table

1 610-1 660 MHz

Allocation to services		
Region 1	Region 2	Region 3
1 610-1 610.6 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION 5.341 5.355 5.359 5.363 5.364 5.366 5.367 5.368 5.369 5.371 5.372	1 610-1 610.6 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION RADIODETERMINATION- SATELLITE (Earth-to-space) 5.341 5.364 5.366 5.367 5.368 5.370 5.372	1 610-1 610.6 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Radiodetermination-satellite (Earth-to-space) 5.341 5.355 5.359 5.364 5.366 5.367 5.368 5.369 5.372
1 610.6-1 613.8 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION 5.149 5.341 5.355 5.359 5.363 5.364 5.366 5.367 5.368 5.369 5.371 5.372	1 610.6-1 613.8 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION RADIODETERMINATION- SATELLITE (Earth-to-space) 5.149 5.341 5.364 5.366 5.367 5.368 5.370 5.372	1 610.6-1 613.8 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION Radiodetermination-satellite (Earth-to-space) 5.149 5.341 5.355 5.359 5.364 5.366 5.367 5.368 5.369 5.372
1 613.8-1 626.5 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to-Earth) 5.347A 5.341 5.355 5.359 5.363 5.364 5.365 5.366 5.367 5.368 5.369 5.371 5.372	1 613.8-1 626.5 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION RADIODETERMINATION- SATELLITE (Earth-to-space) Mobile-satellite (space-to-Earth) 5.347A 5.341 5.364 5.365 5.366 5.367 5.368 5.370 5.372	1 613.8-1 626.5 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to-Earth) 5.347A Radiodetermination-satellite (Earth-to-space) 5.341 5.355 5.359 5.364 5.365 5.366 5.367 5.368 5.369 5.372
1 626.5-1 660	MOBILE-SATELLITE (Earth-to-space) 5.351A 5.341 5.351 5.353A 5.354 5.355 5.357A 5.359 5.362A 5.374 5.375 5.376	

National Frequency Allocation Table

MHz 1610 - 1660 NATIONAL ALLOCATIONS	
INDIA	REMARKS
1610 - 1610.6 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Radiodetermination- satellite (Earth-to-space) 5.369 5.341 5.364 5.366 5.367 5.368 5.372	
1610.6 - 1613.8 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION Radiodetermination-satellite (Earth-to-space) 5.369 5.149 5.341 5.364 5.366 5.367 5.368 5.372	
1613.8 - 1626.5 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to-Earth) 5.347A Radiodetermination satellite (Earth-to-space) 5.369 5.341 5.364 5.365 5.366 5.368 5.372	
1626.5 – 1660 MOBILE-SATELLITE (Earth-to-space) 5.351A 5.341 5.351 5.353A 5.354 5.374 5.375 5.376	

International Frequency Allocation Table

1 660-1 710 MHz

Allocation to services		
Region 1	Region 2	Region 3
1 660-1 660.5	MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY 5.149 5.341 5.351 5.354 5.362A 5.376A	
1 660.5-1 668	RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149 5.341 5.379 5.379A	
1 668-1 668.4	MOBILE-SATELLITE (Earth-to-space) 5.351A 5.379B 5.379C RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149 5.341 5.379 5.379A	
1 668.4-1 670	METEOROLOGICAL AIDS FIXED MOBILE except aeronautical mobile MOBILE-SATELLITE (Earth-to-space) 5.351A 5.379B 5.379C RADIO ASTRONOMY 5.149 5.341 5.379D 5.379E	
1 670-1 675	METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (Earth-to-space) 5.351A 5.379B 5.341 5.379D 5.379E 5.380A	
1 675-1 690	METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.341	
1 690-1 700 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) Fixed Mobile except aeronautical mobile 5.289 5.341 5.382	1 690-1 700 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) 5.289 5.341 5.381	
1 700-1 710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.289 5.341	1 700-1 710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.289 5.341 5.384	

National Frequency Allocation Table

MHz 1660 - 1710 NATIONAL ALLOCATIONS	
INDIA	REMARKS
1660 - 1660.5 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY 5.149 5.341 5.351 5.354 5.376A	
1660.5 - 1668 RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile Meteorological Aids 5.149 5.341 5.379A	
1668-1668.4 MOBILE-SATELLITE (EARTH-TO-SPACE) 5.351A, 5.379B, 5.379C RADIOASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile Meteorological Aids 5.149 5.341 5.379A	
1668.4 - 1670 METEOROLOGICAL AIDS FIXED MOBILE except aeronautical mobile MOBILE-SATELLITE (Earth-to-space) 5.351A 5.379B 5.379C RADIO ASTRONOMY 5.149 5.341 5.379D	
1670 – 1675 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (Earth-to-space) 5.351A 5.379B 5.341 5.379D 5.380A	
1675 – 1690 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.341	
1690 – 1700 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) FIXED MOBILE except Aeronautical 5.289 5.341	
1700 – 1710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.289 5.341 5.384	IND54, IND56

International Frequency Allocation Table

1 710-2 170 MHz

Allocation to services		
Region 1	Region 2	Region 3
1 710-1 930	FIXED MOBILE 5.384A 5.388A 5.388B 5.149 5.341 5.385 5.386 5.387 5.388	
1 930-1 970 FIXED MOBILE 5.388A 5.388B 5.388	1 930-1 970 FIXED MOBILE 5.388A 5.388B Mobile-satellite (Earth-to-space) 5.388	1 930-1 970 FIXED MOBILE 5.388A 5.388B 5.388
1 970-1 980	FIXED MOBILE 5.388A 5.388B 5.388	
1 980-2 010	FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.351A 5.388 5.389A 5.389B 5.389F	
2 010-2 025 FIXED MOBILE 5.388A 5.388B 5.388	2 010-2 025 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.388 5.389C 5.389E	2 010-2 025 FIXED MOBILE 5.388A 5.388B 5.388
2 025-2 110	SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (Earth-to-space) (space-to-space) 5.392	
2 110-2 120	FIXED MOBILE 5.388A 5.388B SPACE RESEARCH (deep space) (Earth-to-space) 5.388	
2 120-2 160 FIXED MOBILE 5.388A 5.388B 5.388	2 120-2 160 FIXED MOBILE 5.388A 5.388B Mobile-satellite (space-to-Earth) 5.388	2 120-2 160 FIXED MOBILE 5.388A 5.388B 5.388
2 160-2 170 FIXED MOBILE 5.388A 5.388B 5.388	2 160-2 170 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.388 5.389C 5.389E	2 160-2 170 FIXED MOBILE 5.388A 5.388B 5.388

National Frequency Allocation Table

MHz 1710 – 2170 NATIONAL ALLOCATION	
INDIA	REMARKS
1710 – 1930 FIXED MOBILE 5.384A 5.388A 5.149, 5.341 5.385 5.386 5.388 5.388B	IND 54, IND 56, IND 57, IND 58, IND59
1930-1980 FIXED MOBILE 5.388A 5.388,	IND 54, IND57,IND58,IND59
1980 – 2010 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.351A 5.388 5.389A	IND 54, IND59
2010 – 2025 FIXED MOBILE 5.388A 5.388	IND 59
2025—2110 SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION SATELLITE (Earth-to-space) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (Earth-to-space) (space-to-space) 5.392	
2110 – 2120 FIXED MOBILE 5.388A 5.388B SPACE RESEARCH (deep space) (Earth-to-space) 5.388	IND59, IND60
2120 – 2160 FIXED MOBILE 5.388A 5.388 5.388B	IND 59
2160-2170 FIXED MOBILE 5.388 5.388B	

International Frequency Allocation Table

2 170-2 520 MHz

Allocation to services		
Region 1	Region 2	Region 3
2 170-2 200	FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A 5.388 5.389A 5.389F	
2 200-2 290	SPACE OPERATION (space-to-Earth) (space-to-space) EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (space-to-Earth) (space-to-space) 5.392	
2 290-2 300	FIXED MOBILE except aeronautical mobile SPACE RESEARCH (deep space) (space-to-Earth)	
2 300-2 450 FIXED MOBILE 5.384 A Amateur Radiolocation 5.150 5.282 5.395	2 300-2 450 FIXED MOBILE 5.384 A RADIOLOCATION Amateur 5.150 5.282 5.393 5.394 5.396	
2 450-2 483.5 FIXED MOBILE Radiolocation 5.150 5.397	2 450-2 483.5 FIXED MOBILE RADIOLOCATION 5.150	
2 483.5-2 500 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A Radiolocation 5.150 5.371 5.397 5.398 5.399 5.400 5.402	2 483.5-2 500 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A RADIOLOCATION RADIODETERMINATION- SATELLITE (space-to-Earth) 5.398 5.150 5.402	2 483.5-2 500 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A RADIOLOCATION Radiodetermination-satellite (space-to-Earth) 5.398 5.150 5.400 5.402
2 500-2 520 FIXED 5.410 MOBILE except aeronautical mobile 5.384A 5.405 5.412	2 500-2 520 FIXED 5.410 FIXED-SATELLITE (space- to- Earth) 5.415 MOBILE except aeronautical mobile 5.384A 5.404	2 500-2 520 FIXED 5.410 FIXED-SATELLITE (space- to- Earth) 5.415 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE(space-to- Earth) 5.351A 5.407 5.414 5.404 5.415A

National Frequency Allocation Table

MHz 2170 - 2520 NATIONAL ALLOCATION	
INDIA	REMARKS
2170 - 2200 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A 5.388 5.389A	IND 59
2200 – 2290 SPACE OPERATION (space-to-Earth) (space-to-space) EARTH-EXPLORATION SATELLITE (space-to-Earth) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (space-to-Earth) (space-to-space) 5.392	
2290—2300 FIXED MOBILE except aeronautical mobile SPACE RESEARCH (deep space) (space-to-Earth)	IND60
2300 – 2450 FIXED MOBILE 5.384A RADIOLOCATION Amateur 5.150 5.282 5.393 5.396	IND 62
2450 – 2483.5 FIXED MOBILE RADIOLOCATION 5.150	IND 62
2483.5 – 2500 FIXED MOBILE MOBILE SATELLITE (space-to-Earth) 5.351A RADIOLOCATION Radiodetermination satellite (space-to-Earth) 5.398, 5.400 5.150 5.402	
2500 – 2520 FIXED 5.409 5.411 FIXED-SATELLITE (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (space-to-Earth) 5.414A 5. 351 A 5.404 5.407 5.414 5.415A	

International Frequency Allocation Table

2 520-2 700 MHz

Allocation to services		
Region 1	Region 2	Region 3
2 520-2 655 FIXED 5.410 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.339 5.405 5.412 5.417C 5.417D 5.418B 5.418C 2 655-2 670 FIXED 5.410 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.208B 5.413 5.416 Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.412	2 520-2 655 FIXED 5.410 FIXED-SATELLITE (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.339 5.417C 5.417D 5.418B 5.418C 2 655-2 670 FIXED 5.410 FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.208B	2 520-2 535 FIXED 5.410 FIXED-SATELLITE (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.403 5.414A, 5.415A 2 535-2 655 FIXED 5.410 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.339 5.417A 5.417B 5.417C 5.417D 5.418 5.418A 5.418B 5.418C 2 655-2 670 FIXED 5.410 FIXED-SATELLITE (Earth-to-space) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.208B 5.420
2 670-2 690 FIXED 5.410 MOBILE except aeronautical mobile 5.384A Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.412	2 670-2 690 FIXED 5.410 FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.208B 5.415 MOBILE except aeronautical mobile 5.384A Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149	2 670-2 690 FIXED 5.410 FIXED-SATELLITE (Earth-to-space) 5.415 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (Earth-to-space) 5.351A 5.419 Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149
2 690-2 700	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.422	

National Frequency Allocation Table

MHz 2520 - 2700 NATIONAL ALLOCATION	
INDIA	REMARKS
2520 - 2535 FIXED FIXED-SATELLITE (space-to-Earth) 5.415 MOBILE except Aeronautical Mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.403 5.414A 5.415A	
2535 - 2655 FIXED MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.418 5.339 5.413 5.416 5.418A 5.418B 5.418C	IND 63
2655 - 2670 FIXED FIXED-SATELLITE (Earth-to-space) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 Earth Exploration-Satellite (passive) Radio Astronomy Space Research (passive) 5.149 5.208B 5.420	
2670 - 2690 FIXED FIXED-SATELLITE (Earth-to-space) 5.415 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (Earth-to-space) 5.351A, 5.419 Earth Exploration-Satellite (passive) Radio Astronomy Space Research (passive) 5.149	
2690 - 2700 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	

International Frequency Allocation Table

2 700-4 800 MHz

Allocation to services		
Region 1	Region 2	Region 3
2 700-2 900	AERONAUTICAL RADIONAVIGATION 5.337 Radiolocation 5.423 5.424	
2 900-3 100	RADIOLOCATION 5.424A RADIONAVIGATION 5.426 5.425 5.427	
3 100-3 300	RADIOLOCATION Earth exploration-satellite (active) Space research (active) 5.149 5.428	
3 300-3 400 RADIOLOCATION 5.149 5.429 5.430	3 300-3 400 RADIOLOCATION Amateur Fixed Mobile 5.149	3 300-3 400 RADIOLOCATION Amateur 5.149 5.429
3 400-3 600 FIXED FIXED-SATELLITE (space-to-Earth) Mobile 5.430A Radiolocation 5.431	3 400-3 500 FIXED FIXED-SATELLITE (space-to-Earth) Amateur Mobile 5.431A Radiolocation 5.433 5.282	3 400-3 500 FIXED FIXED-SATELLITE (space-to-Earth) Amateur Mobile 5.432B Radiolocation 5.433 5.282 5.432 5.432A
3 600-4 200 FIXED FIXED-SATELLITE (space-to-Earth) Mobile	3 500-3 700 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile Radiolocation 5.433	3 500-3 600 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.433A Radiolocation 5.433 5.435
		3 600-3 700 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile Radiolocation 5.433 5.435
	3700-4200 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile	
4 200-4 400	AERONAUTICAL RADIONAVIGATION 5.438 5.439 5.440	
4 400-4 500	FIXED MOBILE 5.440A	
4 500-4 800	FIXED FIXED-SATELLITE (space-to-Earth) 5.441 5.440A	

National Frequency Allocation Table

MHz 2700 - 4800 NATIONAL ALLOCATION	
INDIA	REMARKS
2700 - 2900 AERONAUTICAL RADIONAVIGATION 5.337 Radiolocation 5.423	IND 64
2900 – 3100 RADIOLOCATION 5.424A RADIONAVIGATION 5.426 5.425 5.427	
3100 - 3300 RADIOLOCATION Earth Exploration Satellite(active) Space Research(active) 5.149	
3300 - 3400 RADIOLOCATION FIXED MOBILE Amateur 5.149	IND65
3400 - 3500 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except Aeronautical Mobile Amateur Radiolocation 5.433 5.282	IND66
3500 - 3600 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.433A Radiolocation 5.433	IND66
3600 - 3700 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile Radiolocation 5.435	
3700 - 4200 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile	
4200 - 4400 AERONAUTICAL RADIONAVIGATION 5.438 5.440	
4400 - 4500 FIXED MOBILE	
4500 - 4800 FIXED FIXED-SATELLITE (space-to-Earth) 5.441 MOBILE	

International Frequency Allocation Table

4 800-5 570 MHz

Allocation to services		
Region 1	Region 2	Region 3
4 800-4 990	FIXED MOBILE 5.440A 5.442 Radio astronomy 5.149 5.339 5.443	
4 990-5 000	FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY Space research (passive) 5.149	
5 000-5 010	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (Earth-to-space) 5.367	
5 010-5 030	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-space) 5.328B 5.443B 5.367	
5 030-5 091	AERONAUTICAL RADIONAVIGATION 5.367 5.444	
5 091-5 150	AERONAUTICAL RADIONAVIGATION AERONAUTICAL MOBILE ADD 5.444B 5.367 5.444 5.444A	
5 150-5 250	AERONAUTICAL RADIONAVIGATION FIXED-SATELLITE (Earth-to-space) 5.447A MOBILE except aeronautical mobile 5.446A 5.446B 5.446,5.446C 5.447 5.447B 5.447C	
5 250-5 255	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH 5.447D MOBILE except aeronautical mobile 5.446A 5.447F 5.447E 5.448 5.448A	
5 255- 5 350	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) MOBILE except aeronautical mobile 5.446A 5.447F 5.447E 5.448 5.448A	
5 350-5 460	EARTH EXPLORATION-SATELLITE (active) 5.448B SPACE RESEARCH (active) 5.448C AERONAUTICAL RADIONAVIGATION 5.449 RADIOLOCATION 5.448D	
5 460-5 470	RADIONAVIGATION 5.449 EARTH EXPLORATION-SATELLITE (active) SPACE RESEARCH (active) RADIOLOCATION 5.448D 5.448B	
5 470-5 570	MARITIME RADIONAVIGATION MOBILE except aeronautical mobile 5.446A 5.450A EARTH EXPLORATION-SATELLITE (active) SPACE RESEARCH (active) RADIOLOCATION 5.450B 5.448B 5.450 5.451	

National Frequency Allocation Table

MHz 4800 - 5570 NATIONAL ALLOCATION	
INDIA	REMARKS
4800 - 4990 FIXED MOBILE 5.442 Radio Astronomy 5.149 5.339	IND82
4990 - 5000 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY Space Research (passive) 5.149	
5000-5010 AERONAUTICAL RADIONAVIGATION RADIONAVIGATION SATELLITE (space-to-Earth) (space-to-space) 5.367	
5010-5030 AERONAUTICAL RADIONAVIGATION RADIONAVIGATION SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.443B 5.367	
5030-5091 AERONAUTICAL RADIONAVIGATION 5.367 5.444	
5091-5150 AERONAUTICAL RADIONAVIGATION AERONAUTICAL MOBILE 5.444B 5.367 5.444 5.444A	
5150 - 5250 AERONAUTICAL RADIONAVIGATION FIXED SATELLITE SERVICE (Earth to space) 5.447A MOBILE except aeronautical mobile 5.446A 5.447B 5.446 5.447C	IND67, IND 68
5250 - 5255 EARTH EXPLORATION SATELLITE (active) RADIOLOCATION SPACE RESEARCH 5.447D MOBILE except aeronautical mobile 5.446A 5.446F FIXED 5.448A	IND67, IND 68
5255 - 5350 EARTH EXPLORATION SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) MOBILE except aeronautical mobile 5.446A 5.447F FIXED 5.448A	IND67, IND 68
5350 - 5460 EARTH EXPLORATION SATELLITE (active) 5.448B SPACE RESEARCH (active) 5.448C AERONAUTICAL RADIONAVIGATION 5.449 RADIOLOCATION 5.448D	
5460 - 5470 RADIONAVIGATION 5.449 EARTH EXPLORATION SATELLITE (active) SPACE RESEARCH (active) RADIOLOCATION 5.448D 5.448B	
5470 - 5570 MARITIME RADIONAVIGATION MOBILE except aeronautical mobile 5.446A 5.450A EARTH EXPLORATION SATELLITE (active) SPACE RESEARCH (active) RADIOLOCATION 5.450B 5.448B	

International Frequency Allocation Table

5 570-7 250 MHz

Allocation to services		
Region 1	Region 2	Region 3
5 570-5 650	MARITIME RADIONAVIGATION MOBILE except aeronautical mobile 5.446A 5.450A RADIOLOCATION 5.450B 5.450 5.451 5.452	
5 650-5 725	RADIOLOCATION MOBILE except aeronautical mobile 5.446A 5.450A Amateur Space research (deep space) 5.282 5.451 5.453 5.454 5.455	
5 725-5 830 FIXED-SATELLITE (Earth-to-space) RADIOLOCATION Amateur 5.150 5.451 5.453 5.455 5.456	5 725-5 830 RADIOLOCATION Amateur 5.150 5.453 5.455 5 830-5 850 RADIOLOCATION Amateur Amateur-satellite (space-to-Earth) 5.150 5.453 5.455	
5 830-5 850 FIXED-SATELLITE (Earth-to-space) RADIOLOCATION Amateur Amateur-satellite (space-to-Earth) 5.150 5.451 5.453 5.455 5.456		
5 850-5 925 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.150	5 850-5 925 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Amateur Radiolocation 5.150	5 850-5 925 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Radiolocation 5.150
5 925-6 700	FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B MOBILE 5.457C 5.149 5.440 5.458	
6 700-7 075	FIXED FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.441 MOBILE 5.458 5.458A 5.458B 5.458C	
7 075-7 145	FIXED MOBILE 5.458 5.459	
7 145-7 235	FIXED MOBILE SPACE RESEARCH (Earth-to-space) 5.460 5.458 5.459	
7 235-7 250	FIXED MOBILE 5.458	

National Frequency Allocation Table

MHz 5570 - 7250 NATIONAL ALLOCATION	
INDIA	REMARKS
5570-5650 MARITIME RADIONAVIGATION MOBILE except aeronautical mobile 5.446A 5.450A RADIOLOCATION 5.450B 5. 452	IND69
5650- 5725 RADIOLOCATION MOBILE except aeronautical mobile 5.446A 5.450A FIXED MOBILE Amateur Space research (deep space) 5.282	IND69
5725- 5830 RADIOLOCATION FIXED MOBILE Amateur 5.150	IND70 , IND 71, IND72
5830-5850 RADIOLOCATION FIXED MOBILE Amateur Amateur satellite (space-to-Earth) 5.150	IND 70, IND 71, IND72
5850- 5925 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Radiolocation 5.150	IND70, IND 72, IND 82
5925-6700 FIXED FIXED-SATELLITE (Earth-to-space) 5.457A MOBILE 5.149 5.440 5. 458	IND 73
6700-7075 FIXED FIXED SATELLITE (Earth-to-space) (space –to- Earth) 5.441 MOBILE 5.458 5.458A 5.458B 5.458C	IND 73
7075-7145 FIXED MOBILE 5.458	IND 73
7145-7235 FIXED MOBILE SPACE RESEARCH (Earth-to-space) 5.460 5.458	IND 73
7235-7250 FIXED MOBILE 5.458	IND 73

International Frequency Allocation Table

7 250-8 500 MHz

Allocation to services		
Region 1	Region 2	Region 3
7 250-7 300	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE 5.461	
7 300-7 450	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.461	
7 450-7 550	FIXED FIXED-SATELLITE (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.461A	
7 550-7 750	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile	
7 750-7 850	FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) 5.461B MOBILE except aeronautical mobile	
7 850-7 900	FIXED MOBILE except aeronautical mobile	
7 900-8 025	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.461	
8 025-8 175	EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A	
8 175-8 215	EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A	
8 215-8 400	EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A	
8 400-8 500	FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-Earth) 5.465 5.466	

National Frequency Allocation Table

MHz 7250 – 8500 NATIONAL ALLOCATION	
INDIA	REMARKS
7250-7300 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE 5.461	IND 73
7300 - 7450 FIXED FIXED-SATELLITE (Space-To-Earth) MOBILE except aeronautical mobile 5.461	IND 73
7450 - 7550 FIXED FIXED-SATELLITE (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.461A	IND 73
7550 - 7750 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile	IND 73
7750 - 7850 FIXED METEOROLOGICAL SATELLITE (space to Earth) 5.461B MOBILE except aeronautical mobile	IND 73
7850--7900 FIXED MOBILE except aeronautical mobile	IND 73
7900 - 8025 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.461	IND 73
8025 - 8175 EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A	IND 73
8175 - 8215 EARTH EXPLORATION SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A	IND 73
8215 - 8400 EARTH EXPLORATION SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A	IND 73
8400 - 8500 FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-Earth) 5.465	IND 73

International Frequency Allocation Table

8 500-10 000 MHz

Allocation to services		
Region 1	Region 2	Region 3
8 500-8 550	RADIOLOCATION 5.468 5.469	
8 550-8 650	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) 5.468 5.469 5.469A	
8 650-8 750	RADIOLOCATION 5.468 5.469	
8 750-8 850	RADIOLOCATION AERONAUTICAL RADIONAVIGATION 5.470 5.471	
8 850-9 000	RADIOLOCATION MARITIME RADIONAVIGATION 5.472 5.473	
9 000-9 200	AERONAUTICAL RADIONAVIGATION 5.337 RADIOLOCATION 5.471 5.473A	
9 200-9 300	RADIOLOCATION MARITIME RADIONAVIGATION 5.472 5.473 5.474	
9 300-9 500	RADIONAVIGATION EARTH EXPLORATION-SATELLITE (active) SPACE RESEARCH (active) RADIOLOCATION 5.427 5.474 5.475 5.475A 5.475B 5.476A	
9 500-9 800	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION SPACE RESEARCH (active) 5.476A	
9 800-9 900	RADIOLOCATION Earth exploration-satellite(active) Space research(active) Fixed 5.477 5.478 5.478A 5.478B	
9 900-10 000	RADIOLOCATION Fixed 5.477 5.478 5.479	

National Frequency Allocation Table

MHz 8750 - 10000 NATIONAL ALLOCATION	
INDIA	REMARKS
8500 - 8550 RADIOLOCATION	IND 73
8550--8650 EARTH EXPLORATION SATELLITE (active) RADIO LOCATION SPACE RESEARCH (active) 5.469A	IND 73
8650 - 8750 RADIOLOCATION	IND 73
8750 - 8850 RADIOLOCATION AERONAUTICAL RADIONAVIGATION 5.470	IND 73
8850 - 9000 RADIOLOCATION MARITIME RADIONAVIGATION 5.472	IND 73
9000 - 9200 AERONAUTICAL RADIONAVIGATION 5.337 RADIOLOCATION 5.473A	
9200 - 9300 RADIOLOCATION MARITIME RADIONAVIGATION 5.472 5.474	
9300 - 9500 RADIONAVIGATION EARTH EXPLORATION-SATELLITE (active) SPACE RESEARCH (active) RADIOLOCATION 5.427 5.474 5.475 5.475B 5.476A	
9500 - 9800 EARTH EXPLORATION SATELLITE (active) RADIOLOCATION RADIONAVIGATION SPACE RESEARCH (active) 5.476A	
9800 - 9900 RADIOLOCATION FIXED Earth exploration-satellite (active) Space Research (active) Fixed 5.478A 5.478B	
9900 - 10000 RADIOLOCATION FIXED 5.479	

International Frequency Allocation Table
10-11.7 GHz

Allocation to services		
Region 1	Region 2	Region 3
10-10.45 FIXED MOBILE RADIOLOCATION Amateur 5.479	10-10.45 RADIOLOCATION Amateur 5.479 5.480	10-10.45 FIXED MOBILE RADIOLOCATION Amateur 5.479
10.45-10.5	RADIOLOCATION Amateur Amateur-satellite 5.481	
10.5-10.55 FIXED MOBILE Radiolocation	10.5-10.55 FIXED MOBILE RADIOLOCATION	
10.55-10.6	FIXED MOBILE except aeronautical mobile Radiolocation	
10.6-10.68	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive) Radiolocation 5.149 5.482 5.482A	
10.68-10.7	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.483	
10.7-11.7 FIXED FIXED-SATELLITE (space-to-Earth) 5.441 5.484A (Earth-to-space) 5.484 MOBILE except aeronautical mobile	10.7-11.7 FIXED FIXED-SATELLITE (space-to-Earth) 5.441 5.484A MOBILE except aeronautical mobile	

National Frequency Allocation Table

GHz 10 - 11.7 NATIONAL ALLOCATION	
INDIA	REMARKS
10 - 10.45 FIXED MOBILE RADIOLOCATION Amateur 5.479	IND 74
10.45 - 10.5 RADIOLOCATION Amateur Amateur-Satellite	IND 74
10.5 - 10.55 FIXED MOBILE RADIOLOCATION	IND 74
10.55 - 10.6 FIXED MOBILE except aeronautical mobile Radiolocation	IND 74
10.6 - 10.68 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive) Radiolocation 5.149 5.482 5.482A	IND 74
10.68 - 10.7 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	
10.7 - 11.7 FIXED FIXED-SATELLITE (space-to-Earth) 5.441 5.484A MOBILE except aeronautical mobile	IND 75

International Frequency Allocation Table

11.7-14 GHz

Allocation to services		
Region 1	Region 2	Region 3
11.7-12.5 FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE 5.492 5.487 5.487A	11.7-12.1 FIXED 5.486 FIXED-SATELLITE (space-to-Earth) 5.484A 5.488 Mobile except aeronautical mobile 5.485	11.7-12.2 FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE 5.487 5.487A 5.492
	12.1-12.2 FIXED-SATELLITE (space-to-Earth) 5.484A 5.488 5.485 5.489	
	12.2-12.7 FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE 5.492 5.487A 5.488 5.490	12.2-12.5 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile BROADCASTING 5.484A 5.487
	12.7-12.75 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE except aeronautical mobile	12.5-12.75 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A MOBILE except aeronautical mobile BROADCASTING-SATELLITE 5.493
12.5-12.75 FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.494 5.495 5.496		
12.75-13.25 FIXED FIXED-SATELLITE (Earth-to-space) 5.441 MOBILE Space research (deep space) (space-to-Earth)		
13.25-13.4 EARTH EXPLORATION-SATELLITE (active) AERONAUTICAL RADIONAVIGATION 5.497 SPACE RESEARCH (active) 5.498A 5.499		
13.4-13.75 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH 5.501A Standard frequency and time signal-satellite (Earth-to-space) 5.499 5.500 5.501 5.501B		
13.75-14 FIXED-SATELLITE (Earth-to-space) 5.484A RADIOLOCATION Earth exploration-satellite Standard frequency and time signal-satellite (Earth-to-space) Space research 5.499 5.500 5.501 5.502 5.503		

National Frequency Allocation Table

GHz 11.7 - 14.00 NATIONAL ALLOCATION	
INDIA	REMARKS
11.7 - 12.2 FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE 5.487 5.492	
12.2 - 12.5 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile BROADCASTING 5.484A 5.487	IND 75
12.5 - 12.75 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A MOBILE except aeronautical mobile BROADCASTING-SATELLITE 5.493	IND 75
12.75 - 13.25 FIXED FIXED-SATELLITE (Earth-to-space) 5.441 MOBILE Space Research (Deep Space) (Space To Earth)	
13.25 - 13.4 EARTH EXPLORATION SATELLITE (active) AERONAUTICAL RADIONAVIGATION 5.497 SPACE RESEARCH (active) FIXED 5.498A	
13.4 - 13.75 EARTH EXPLORATION SATELLITE (active) RADIOLOCATION SPACE RESEARCH 5.501A FIXED Standard Frequency and Time Signal-Satellite (Earth-to-space) 5.501B	
13.75 - 14 FIXED-SATELLITE (Earth-to-space) 5.484A RADIOLOCATION FIXED Earth exploration- satellite Standard Frequency and Time Signal-Satellite (Earth-to-space) Space Research 5.502 5.503	

International Frequency Allocation Table

14-15.4 GHz

Allocation to services		
Region 1	Region 2	Region 3
14-14.25	FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.506 5.506B RADIONAVIGATION 5.504 Mobile-satellite (Earth-to-space) 5.504B 5.504C 5.506A Space research 5.504A 5.505	
14.25-14.3	FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.506 5.506B RADIONAVIGATION 5.504 Mobile-satellite (Earth-to-space) 5.504B 5.506A 5.508A Space research 5.504A 5.505 5.508 5.509	
14.3-14.4 FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.506 5.506B MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.504B 5.506A 5.509A Radionavigation-satellite 5.504A	14.3-14.4 FIXED-SATELLITE (Earth-to-space) 5.457A 5.484A 5.506 5.506B Mobile-satellite (Earth-to-space) 5.506A Radionavigation-satellite 5.504A	14.3-14.4 FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.484A 5.506 5.506B MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.504B 5.506A 5.509A Radionavigation-satellite 5.504A
14.4-14.47	FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.506 5.506B MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.504B 5.506A 5.509A Space research (space-to-Earth) 5.504A	
14.47-14.5	FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.506 5.506B MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.504B 5.506A 5.509A Radio astronomy 5.149 5.504A	
14.5-14.8	FIXED FIXED-SATELLITE (Earth-to-space) 5.510 MOBILE Space research	
14.8-15.35	FIXED MOBILE Space research 5.339	
15.35-15.4	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.511	

National Frequency Allocation Table

GHz 14.00- 15.4 NATIONAL ALLOCATION	
INDIA	REMARKS
14 - 14.25 FIXED-SATELLITE (Earth-to-space) 5.457A 5.484A 5.506 RADIONAVIGATION 5.504 FIXED Mobile satellite (Earth-to-space) 5.504C 5.506A Space Research 5.504A	
14.25 - 14.3 FIXED-SATELLITE (Earth-to-space) 5.457A 5.484A 5.506 RADIONAVIGATION 5.504 FIXED Mobile-Satellite (Earth-to-space) 5.506A 5.508A Space Research 5.504A	
14.3 - 14.4 FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.484A 5.506 MOBILE except aeronautical mobile Mobile satellite (Earth-to-space) 5.506A 5.509A Radionavigation-Satellite 5.504A	
14.4 - 14.47 FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.484A 5.506 MOBILE except aeronautical mobile Mobile-satellite (Earth to space) 5.506A 5.509A Space Research (space-to-Earth) 5.504A	
14.47 - 14.5 FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.484A 5.506 MOBILE except aeronautical mobile Mobile-satellite (Earth to space) 5.506A 5.509A Radio Astronomy 5.149 5.504A	
14.5 - 14.8 FIXED FIXED-SATELLITE (Earth-to-space) 5.510 MOBILE Space Research	
14.8 - 15.35 FIXED MOBILE Space Research 5.339	
15.35 - 15.4 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	

International Frequency Allocation Table
15.4-18.4 GHz(A16)

Allocation to services		
Region 1	Region 2	Region 3
15.4-15.43	AERONAUTICAL RADIONAVIGATION 5.511D	
15.43-15.63	FIXED-SATELLITE (Earth-to-space) 5.511A AERONAUTICAL RADIONAVIGATION 5.511C	
15.63-15.7	AERONAUTICAL RADIONAVIGATION 5.511D	
15.7-16.6	RADIOLOCATION 5.512 5.513	
16.6-17.1	RADIOLOCATION Space research (deep space) (Earth-to-space) 5.512 5.513	
17.1-17.2	RADIOLOCATION 5.512 5.513	
17.2-17.3	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) 5.512 5.513 5.513A	
17.3-17.7 FIXED-SATELLITE (Earth-to-space) 5.516 (space-to-Earth) 5.516A 5.516B Radiolocation 5.514	17.3-17.7 FIXED-SATELLITE (Earth-to-space) 5.516 BROADCASTING-SATELLITE Radiolocation 5.514 5.515	17.3-17.7 FIXED-SATELLITE (Earth-to-space) 5.516 Radiolocation 5.514
17.7-18.1 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.516 MOBILE	17.7-17.8 FIXED FIXED-SATELLITE (space-to-Earth) 5.517 (Earth-to-space) 5.516 BROADCASTING-SATELLITE Mobile 5.515	17.7-18.1 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.516 MOBILE
	17.8-18.1 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.516 MOBILE 5.519	
18.1-18.4	FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B (Earth-to-space) 5.520 MOBILE 5.519 5.521	

National Frequency Allocation Table

GHz 15.4 - 18.4 NATIONAL ALLOCATION	
INDIA	REMARKS
15.4-15.43 AERONAUTICAL RADIONAVIGATION 5.511D	
15.43- 15.63 FIXED SATELLITE (Earth-To-Space) 5.511A AERONAUTICAL RADIONAVIGATION 5.511C	
15.63 - 15.7 AERONAUTICAL RADIONAVIGATION 5.511D	
15.7 - 16.6 RADIOLOCATION FIXED MOBILE	
16.6 - 17.1 RADIOLOCATION FIXED MOBILE Space Research (deep space) (Earth-to-space)	
17.1 - 17.2 RADIOLOCATION FIXED MOBILE	
17.2 - 17.3 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) FIXED MOBILE 5.513A	
17.3 - 17.7 FIXED-SATELLITE (Earth-to-space) 5.516 Radiolocation Fixed Mobile	
17.7 - 18.1 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.516 MOBILE	
18.1 - 18.4 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B (Earth-to-space) 5.520 MOBILE 5.519	

International Frequency Allocation Table

18.4-22 GHz

Allocation to services		
Region 1	Region 2	Region 3
18.4-18.6	FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B MOBILE	
18.6-18.8 EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) 5.522B MOBILE except aeronautical mobile Space research (passive) 5.522A 5.522C	18.6-18.8 EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) 5.516B 5.522B MOBILE except aeronautical mobile SPACE RESEARCH (passive) 5.522A	18.6-18.8 EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) 5.522B MOBILE except aeronautical mobile Space research (passive) 5.522A
18.8-19.3	FIXED FIXED-SATELLITE (space-to-Earth) 5.516.B 5.523A MOBILE	
19.3-19.7	FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 5.523B 5.523C 5.523D 5.523E MOBILE	
19.7-20.1 FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B Mobile-satellite (space-to-Earth) 5.524	19.7-20.1 FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B MOBILE-SATELLITE (space-to-Earth) 5.524 5.525 5.526 5.527 5.528 5.529	19.7-20.1 FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B Mobile-satellite (space-to-Earth) 5.524
20.1-20.2	FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B MOBILE-SATELLITE (space-to-Earth) 5.524 5.525 5.526 5.527 5.528	
20.2-21.2	FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) Standard frequency and time signal-satellite (space-to-Earth) 5.524	
21.2-21.4	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive)	
21.4-22 FIXED MOBILE BROADCASTING-SATELLITE 5.347A 5.530	21.4-22 FIXED MOBILE	21.4-22 FIXED MOBILE BROADCASTING-SATELLITE 5.347A 5.530 5.531

National Frequency Allocation Table

GHz 18.4 - 22.0 NATIONAL ALLOCATION	
INDIA	REMARKS
18.4 - 18.6 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B MOBILE	
18.6 - 18.8 EARTH EXPLORATION SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) 5.522B MOBILE except aeronautical mobile Space Research (passive) 5.522A	IND 76
18.8 - 19.3 FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 5.516B 5.523A MOBILE	
19.3 - 19.7 FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 5.523B 5.523C 5.523D 5.523E MOBILE	
19.7 - 20.1 FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B FIXED MOBILE Mobile-satellite (space-to-Earth)	IND 77
20.1 – 20.2 FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B MOBILE-SATELLITE (space-to-Earth) FIXED MOBILE 5.525 5.526 5.527 5.528	IND 77
20.2 – 21.2 FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) FIXED MOBILE Standard Frequency and Time Signal-Satellite (space-to-Earth)	IND 77
21.2 – 21.4 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive)	
21.4 - 22 FIXED MOBILE BROADCASTING-SATELLITE 5.347A 5.530	

International Frequency Allocation Table
22-24.75 GHz

Allocation to services		
Region 1	Region 2	Region 3
22-22.21	FIXED MOBILE except aeronautical mobile 5.149	
22.21-22.5	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive) 5.149 5.532	
22.5-22.55	FIXED MOBILE	
22.55-23.55	FIXED INTER-SATELLITE 5.338A MOBILE 5.149	
23.55-23.6	FIXED MOBILE	
23.6-24	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	
24-24.05	AMATEUR AMATEUR-SATELLITE 5.150	
24.05-24.25	RADIOLOCATION Amateur Earth exploration-satellite (active) 5.150	
24.25-24.45 FIXED	24.25-24.45 RADIONAVIGATION	24.25-24.45 RADIONAVIGATION FIXED MOBILE
24.45-24.65 FIXED INTER-SATELLITE	24.45-24.65 INTER-SATELLITE RADIONAVIGATION 5.533	24.45-24.65 FIXED INTER-SATELLITE MOBILE RADIONAVIGATION 5.533
24.65-24.75 FIXED INTER-SATELLITE	24.65-24.75 INTER-SATELLITE RADIOLOCATION- SATELLITE (Earth-to-space)	24.65-24.75 FIXED INTER-SATELLITE MOBILE 5.533

National Frequency Allocation Table

GHz 22.0 - 24.75 NATIONAL ALLOCATION	
INDIA	REMARKS
22 - 22.21 FIXED MOBILE except aeronautical mobile 5.149	
22.21 - 22.5 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive) 5.149 5.532	
22.5 - 22.55 FIXED MOBILE	
22.55 - 23.55 FIXED INTER-SATELLITE 5.338A MOBILE 5.149	
23.55 - 23.6 FIXED MOBILE	
23.6 - 24 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	
24 - 24.05 AMATEUR AMATEUR-SATELLITE 5.150	IND 78
24.05 - 24.25 RADIOLOCATION Amateur Earth exploration-satellite (active) 5.150	IND 78
24.25 - 24.45 RADIONAVIGATION FIXED MOBILE	
24.45 - 24.65 FIXED INTER-SATELLITE MOBILE RADIONAVIGATION 5.533	IND79
24.65 - 24.75 FIXED INTER-SATELLITE MOBILE 5.533	IND79

International Frequency Allocation Table

24.75-29.9 GHz

Allocation to services		
Region 1	Region 2	Region 3
24.75-25.25 FIXED	24.75-25.25 FIXED-SATELLITE (Earth-to-space) 5.535	24.75-25.25 FIXED FIXED-SATELLITE (Earth-to-space) 5.535 MOBILE
25.25-25.5	FIXED INTER-SATELLITE 5.536 MOBILE Standard frequency and time signal-satellite (Earth-to-space)	
25.5-27	EARTH EXPLORATION-SATELLITE (space-to Earth)5.536B FIXED INTER-SATELLITE 5.536 MOBILE SPACE RESEARCH (space-to-Earth) 5.536C Standard frequency and time signal-satellite (Earth-to-space) 5.536A	
27-27.5 FIXED INTER-SATELLITE 5.536 MOBILE	27-27.5 FIXED FIXED-SATELLITE (Earth-to-space) INTER-SATELLITE 5.536 5.537 MOBILE	
27.5-28.5	FIXED 5.537A FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.539 MOBILE 5.538 5.540	
28.5-29.1	FIXED FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.523A 5.539 MOBILE Earth exploration-satellite (Earth-to-space) 5.541 5.540	
29.1-29.5	FIXED FIXED-SATELLITE (Earth-to-space) 5.516B 5.523C 5.523E 5.535A 5.539 5.541A MOBILE Earth exploration-satellite (Earth-to-space) 5.541 5.540	
29.5-29.9 FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.539 Earth exploration-satellite (Earth-to-space) 5.541 Mobile-satellite (Earth-to-space) 5.540 5.542	29.5-29.9 FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.539 MOBILE-SATELLITE (Earth-to-space) Earth exploration-satellite (Earth-to-space) 5.541 5.525 5.526 5.527 5.529 5.540 5.542	29.5-29.9 FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.539 Earth exploration-satellite (Earth-to-space) 5.541 Mobile-satellite (Earth-to-space) 5.540 5.542

National Frequency Allocation Table

GHz 24.75 - 29.9 NATIONAL ALLOCATION	
INDIA	REMARKS
24.75 - 25.25 FIXED FIXED-SATELLITE (Earth-to-space) 5.535 MOBILE	IND79
25.25 - 25.5 FIXED INTER-SATELLITE 5.536 MOBILE Standard Frequency and Time Signal-Satellite (Earth-to-space)	IND79
25.5 - 27 EARTH EXPLORATION-SATELLITE (space-to-Earth) 5.536B FIXED INTER-SATELLITE 5.536 MOBILE SPACE RESEARCH (space-to-Earth) Standard Frequency and Time Signal-Satellite (Earth-to-space) 5. 536A	IND79
27 - 27.5 FIXED FIXED-SATELLITE (Earth-to-space) INTER-SATELLITE 5.536 5.537 MOBILE	
27.5 - 28.5 FIXED FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.539 MOBILE 5.538 5.540	IND 79
28.5 - 29.1 FIXED FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.523A 5.539 MOBILE Earth exploration-satellite (Earth-to-space) 5.541 5.540	IND79
29.1 - 29.5 FIXED FIXED-SATELLITE (Earth-to-space) 5.516B 5.523C 5.523E 5.535A 5.539 5.541A MOBILE Earth Exploration-Satellite (Earth-to-space) 5.541 5.540	IND79
29.5 - 29.9 FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.539 Earth Exploration-Satellite (Earth-to-space) 5.541 Mobile-satellite (Earth-to-space) Fixed Mobile 5.540	IND 77

International Frequency Allocation Table
29.9-34.2 GHz

Allocation to services		
Region 1	Region 2	Region 3
29.9-30	FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.539 MOBILE-SATELLITE (Earth-to-space) Earth exploration-satellite (Earth-to-space) 5.541 5.543 5.525 5.526 5.527 5.538 5.540 5.542	
30-31	FIXED-SATELLITE (Earth-to-space) 5.338A MOBILE-SATELLITE (Earth-to-space) Standard frequency and time signal-satellite (space-to-Earth) 5.542	
31-31.3	FIXED 5.338A 5.543A MOBILE Standard frequency and time signal-satellite (space-to-Earth) Space research 5.544 5.545 5.149	
31.3-31.5	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	
31.5-31.8 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149 5.546	31.5-31.8 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	31.5-31.8 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149
31.8-32	FIXED 5.547A RADIONAVIGATION SPACE RESEARCH (deep space) (space-to-Earth) 5.547 5.547B 5.548	
32-32.3	FIXED 5.547A RADIONAVIGATION SPACE RESEARCH (deep space) (space-to-Earth) 5.547 5.547C 5.548	
32.3-33	FIXED 5.547A INTER-SATELLITE RADIONAVIGATION 5.547 5.547D 5.548	
33-33.4	FIXED 5.547A RADIONAVIGATION 5.547 5.547E	
33.4-34.2	RADIOLOCATION 5.549	

National Frequency Allocation Table

GHz 29.9 - 34.2 NATIONAL ALLOCATION	
INDIA	REMARKS
29.9 - 30 FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.539 MOBILE-SATELLITE (Earth-to-Space) Earth exploration-satellite (Earth-to-space) 5.541 5.543 Fixed Mobile 5.525 5.526 5.527 5.538 5.540	IND 77
30 - 31 FIXED-SATELLITE (Earth-to-space) 5.338A MOBILE-SATELLITE (Earth-to-Space) Standard Frequency and Time Signal-Satellite (space-to-Earth) Fixed Mobile	IND 77
31 - 31.3 FIXED 5.338A 5.543A MOBILE Standard Frequency and Time Signal-Satellite (space-to-Earth) Space Research 5.544 5.149	
31.3 - 31.5 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	
31.5 - 31.8 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149	
31.8 - 32 FIXED 5.547A RADIONAVIGATION SPACE RESEARCH (deep space) (space-to-Earth) 5.547 5.548	IND80
32 - 32.3 FIXED 5.547A RADIONAVIGATION SPACE RESEARCH (deep space) (space-to-Earth) 5.547 5.548	IND80
32.3 - 33 FIXED 5.547A INTER-SATELLITE RADIONAVIGATION 5.547 5.548	IND80
33 - 33.4 FIXED 5.547A RADIONAVIGATION 5.547	IND80
33.4 - 34.2 RADIOLOCATION	

International Frequency Allocation Table
34.2-40 GHz

Allocation to services		
Region 1	Region 2	Region 3
34.2-34.7	RADIOLOCATION SPACE RESEARCH (deep space) (Earth-to-space) 5.549	
34.7-35.2	RADIOLOCATION Space research 5.550 5.549	
35.2-35.5	METEOROLOGICAL AIDS RADIOLOCATION 5.549	
35.5-36	METEOROLOGICAL AIDS EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) 5.549 5.549A	
36-37	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 5.149 5.550A	
37-37.5	FIXED MOBILE SPACE RESEARCH (space-to-Earth) 5.547	
37.5-38	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE SPACE RESEARCH (space-to-Earth) Earth exploration-satellite (space-to-Earth) 5.547	
38-39.5	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Earth exploration-satellite (space-to-Earth) 5.547	
39.5-40	FIXED FIXED-SATELLITE (space-to-Earth) 5.516B MOBILE MOBILE-SATELLITE (space-to-Earth) Earth exploration-satellite (space-to-Earth) 5.547	

National Frequency Allocation Table

GHz 34.2 - 40 NATIONAL ALLOCATION	
INDIA	REMARKS
34.2 - 34.7 RADIOLOCATION SPACE RESEARCH (deep space) (Earth-to-space)	
34.7 - 35.2 RADIOLOCATION Space Research	-
35.2 - 35.5 METEOROLOGICAL AIDS RADIOLOCATION	
35.5 - 36 METEOROLOGICAL AIDS EARTH EXPLORATION-SATELLITE (Active) RADIOLOCATION SPACE RESEARCH(active) 5.549A	
36 - 37 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 5.149 5.550A	
37 - 37.5 FIXED MOBILE SPACE RESEARCH (space-to-Earth) 5.547	IND80
37.5 - 38 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE SPACE RESEARCH (space-to-Earth) Earth exploration-satellite (space-to-Earth) 5.547	IND80
38 - 39.5 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Earth exploration-satellite (space-to-Earth) 5.547	IND80
39.5 - 40 FIXED FIXED-SATELLITE (space-to-Earth) 5.516B MOBILE MOBILE-SATELLITE (space-to-Earth) Earth exploration-satellite (space-to-Earth) 5.547	IND80

International Frequency Allocation Table
40-47.5 GHz

Allocation to services		
Region 1	Region 2	Region 3
40-40.5	EARTH EXPLORATION-SATELLITE (Earth-to-space) FIXED FIXED-SATELLITE (space-to-Earth) 5.516B MOBILE MOBILE-SATELLITE (space-to-Earth) SPACE RESEARCH (Earth-to-space) Earth exploration-satellite (space-to-Earth)	
40.5-41 FIXED FIXED-SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Mobile 5.547	40.5-41 FIXED FIXED-SATELLITE (space-to-Earth) 5.516B BROADCASTING BROADCASTING-SATELLITE Mobile Mobile-satellite (space-to-Earth) 5.547	40.5-41 FIXED FIXED-SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Mobile 5.547
41-42.5	FIXED FIXED-SATELLITE (space-to-Earth) 5.516B BROADCASTING BROADCASTING-SATELLITE Mobile 5.547 5.551F 5.551H 5.551I	
42.5-43.5	FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE except aeronautical mobile RADIO ASTRONOMY 5.149 5.547	
43.5-47	MOBILE 5.553 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.554	
47-47.2	AMATEUR AMATEUR-SATELLITE	
47.2-47.5	FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE 5.552A	

National Frequency Allocation Table

GHz 40.0 – 47.5 NATIONAL ALLOCATION	
INDIA	REMARKS
40 - 40.5 EARTH EXPLORATION-SATELLITE (Earth-to-space) FIXED FIXED-SATELLITE (space-to-Earth) 5. 516B MOBILE MOBILE-SATELLITE (space-to-Earth) SPACE RESEARCH (Earth-to-space) Earth exploration-satellite (space-to-Earth)	
40.5 - 42.5 FIXED FIXED SATELLITE (space-to-Earth) 5.516B BROADCASTING BROADCASTING-SATELLITE Mobile 5. 547 5.551H 5.551I	IND80
42.5 - 43.5 FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE except aeronautical mobile RADIO ASTRONOMY 5.149 5.547	
43.5 - 47 MOBILE 5.553 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.554	
47 - 47.2 AMATEUR AMATEUR-SATELLITE	
47.2 – 47.5 FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE 5.552A	

International Frequency Allocation Table

47.5-51.4 GHz(A20)

Allocation to services		
Region 1	Region 2	Region 3
47.5-47.9 FIXED FIXED-SATELLITE (Earth-to-space) 5.552 (space-to-Earth) 5.516B 5.554A MOBILE	47.5-47.9 FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE	
47.9-48.2	FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE 5.552A	
48.2-48.54 FIXED FIXED-SATELLITE (Earth-to-space) 5.552 (space-to-Earth) 5.516B 5.554A 5.555B MOBILE	48.2-50.2 FIXED FIXED-SATELLITE (Earth-to-space) 5.516B 5.338A 5.552 MOBILE	
48.54-49.44 FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE 5.149 5.340 5.555		
49.44-50.2 FIXED FIXED-SATELLITE (Earth-to-space) 5.338A 5.552 (space-to-Earth) 5.516B 5.554A 5.555B MOBILE		
50.2-50.4	EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 5.340	
50.4-51.4	FIXED FIXED-SATELLITE (Earth-to-space) 5.338A MOBILE Mobile-satellite (Earth-to-space)	

National Frequency Allocation Table

GHz 47.5 – 51.4 NATIONAL ALLOCATION	
INDIA	REMARKS
47.5-47.9 FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE	
47.9-48.2 FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE 5.552A	
48.2-50.2 FIXED FIXED-SATELLITE (Earth-to-space) 5.516B 5.338A 5.552 MOBILE 5.149 5.340 5.555	
50.2 - 50.4 EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 5.340	
50.4 – 51.4 FIXED FIXED-SATELLITE (Earth-to-space) 5.338A MOBILE Mobile-satellite (Earth-to-space)	

International Frequency Allocation Table
51.4-55.78 GHz

Allocation to services		
Region 1	Region 2	Region 3
51.4-52.6	FIXED 5.338A MOBILE 5.547 5.556	
52.6-54.25	EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 5.340 5.556	
54.25-55.78	EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.556A SPACE RESEARCH (passive) 5.556B	

National Frequency Allocation Table

GHz 51.4 – 55.78 NATIONAL ALLOCATION	
INDIA	REMARKS
51.4 – 52.6 FIXED 5.338A MOBILE 5.547 5.556	
52.6 – 54.25 EARTH EXPLORATION SATELITTE (passive) SPACE RESEARCH (Passive) 5.340 5.556	
54.25 – 55.78 EARTH EXPLORATION SATELITTE (passive) INTERSATELLITE 5.556A SPACE RESEARCH (passive) 5.556B	

International Frequency Allocation Table

55.78-66 GHz

Allocation to services		
Region 1	Region 2	Region 3
55.78-56.9	EARTH EXPLORATION-SATELLITE (passive) FIXED 5.557A INTER-SATELLITE 5.556A MOBILE 5.558 SPACE RESEARCH (passive) 5.547 5.557	
56.9-57	EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.558A MOBILE 5.558 SPACE RESEARCH (passive) 5.547 5.557	
57-58.2	EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.556A MOBILE 5.558 SPACE RESEARCH (passive) 5.547 5.557	
58.2-59	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 5.547 5.556	
59-59.3	EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.556A MOBILE 5.558 RADIOLOCATION 5.559 SPACE RESEARCH (passive)	
59.3-64	FIXED INTER-SATELLITE MOBILE 5.558 RADIOLOCATION 5.559 5.138	
64-65	FIXED INTER-SATELLITE MOBILE except aeronautical mobile 5.547 5.556	
65-66	EARTH EXPLORATION-SATELLITE FIXED INTER-SATELLITE MOBILE except aeronautical mobile SPACE RESEARCH 5.547	

National Frequency Allocation Table

GHz 55.78 – 66 NATIONAL ALLOCATION	
INDIA	REMARKS
55.78 - 56.9 EARTH EXPLORATION-SATELLITE (passive) FIXED 5.557A INTER-SATELLITE 5.556A MOBILE 5.558 SPACE RESEARCH (passive) 5.547	
56.9 -57 EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.558A MOBILE 5.558 SPACE RESEARCH (passive) 5.547	
57 - 58.2 EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.556A MOBILE 5.558 SPACE RESEARCH (passive) 5.547	IND 80
58.2 – 59 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 5.547 5.556	IND 80
59 - 59.3 EARTH EXPLORATION SATELLITE (passive) FIXED INTER-SATELLITE 5.556A MOBILE 5.558 RADIO LOCATION 5.559 SPACE RESEARCH (passive)	
59.3 - 64 FIXED INTER-SATELLITE MOBILE 5.558 RADIO LOCATION 5.559 5.138	
64 - 65 FIXED INTER-SATELLITE MOBILE except aeronautical mobile 5.547 5.556	IND 80
65 - 66 EARTH EXPLORATION-SATELLITE FIXED INTER-SATELLITE MOBILE except aeronautical mobile SPACE RESEARCH 5.547	IND 80

International Frequency Allocation Table

66-81 GHz

Allocation to services		
Region 1	Region 2	Region 3
66-71	INTER-SATELLITE MOBILE 5.553 5.558 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.554	
71-74	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth)	
74-76	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE BROADCASTING BROADCASTING-SATELLITE Space research (space-to-Earth) 5.561	
76-77.5	RADIO ASTRONOMY RADIOLOCATION Amateur Amateur-satellite Space research (space-to-Earth) 5.149	
77.5-78	AMATEUR AMATEUR-SATELLITE Radio astronomy Space research (space-to-Earth) 5.149	
78-79	RADIOLOCATION Amateur Amateur-satellite Radio astronomy Space research (space-to-Earth) 5.149 5.560	
79-81	RADIO ASTRONOMY RADIOLOCATION Amateur Amateur-satellite Space research (space-to-Earth) 5.149	

National Frequency Allocation Table

GHz 66 - 81 NATIONAL ALLOCATION	
INDIA	REMARKS
66 - 71 INTER-SATELLITE MOBILE 5.553 5.558 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.554	
71 - 74 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth)	IND 81
74 - 76 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE BROADCASTING BROADCASTING-SATELLITE Space Research (space-to-Earth) 5.561	IND 81
76-77.5 RADIO ASTRONOMY RADIOLOCATION Amateur Amateur- Satellite Space Research (space-to-Earth) 5.149	
77.5 - 78 AMATEUR AMATEUR SATELLITE Radio Astronomy Space Research (space-to-Earth) 5.149	
78-79 RADIOLOCATION Amateur Amateur Satellite Radio Astronomy Space Research (space-to-Earth) 5.149 5.560	
79-81 RADIO ASTRONOMY RADIOLOCATION Amateur Amateur Satellite Space Research (space-to-Earth) 5.149	

International Frequency Allocation Table
81-86 GHz

Allocation to services		
Region 1	Region 2	Region 3
81-84	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY Space research (space-to-Earth) 5.149 5.561A	
84-86	FIXED FIXED-SATELLITE (Earth-to-space) 5.561B MOBILE RADIO ASTRONOMY 5.149	

National Frequency Allocation Table

GHz 81 - 86 NATIONAL ALLOCATION	
INDIA	REMARKS
81 - 84 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY Space Research (space-to-Earth) 5.149 5.561A	IND 81
84 - 86 FIXED FIXED-SATELLITE (Earth-to-space) 5.561 MOBILE RADIO ASTRONOMY 5.149	IND 81

International Frequency Allocation Table
86-111.8 GHz

Allocation to services		
Region 1	Region 2	Region 3
86-92	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	
92-94	FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION 5.149	
94-94.1	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) Radio astronomy 5.562 5.562A	
94.1-95	FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION 5.149	
95-100	FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.149 5.554	
100-102	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341	
102-105	FIXED MOBILE RADIO ASTRONOMY 5.149 5.341	
105-109.5	FIXED MOBILE RADIO ASTRONOMY SPACE RESEARCH (passive) 5.562B 5.149 5.341	
109.5-111.8	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341	

National Frequency Allocation Table

GHz 86 – 111.8 NATIONAL ALLOCATION	
INDIA	REMARKS
86 - 92 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	
92 - 94 FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION 5.149	
94 - 94.1 EARTH EXPLORATION SATELLITE (active) RADIO LOCATION SPACE RESEARCH (active) Radio Astronomy 5.562 5.562A	
94.1-95 FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION 5.149	
95 - 100 FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.149 5.554	
100 - 102 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341	
102 - 105 FIXED MOBILE RADIO ASTRONOMY 5.149 5.341	
105-109.5 FIXED MOBILE RADIO ASTRONOMY SPACE RESEARCH (passive) 5.562B 5.149 5.341	
109.5-111.8 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341	

International Frequency Allocation Table**111.8-119.98 GHz**

Allocation to services		
Region 1	Region 2	Region 3
111.8-114.25	FIXED MOBILE RADIO ASTRONOMY SPACE RESEARCH (passive) 5.562B 5.149 5.341	
114.25-116	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341	
116-119.98	EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.562C SPACE RESEARCH (passive) 5.341	

National Frequency Allocation Table

GHz 111.8 – 119.98 NATIONAL ALLOCATION	
INDIA	REMARKS
111.8 – 114.25 FIXED MOBILE RADIO ASTRONOMY SPACE RESEARCH (passive) 5.562B 5.149 5.341	
114.25 - 116 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5 340 5.341	
116 - 119.98 EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.562C SPACE RESEARCH (passive) 5.341	

International Frequency Allocation Table

119.98-151.5 GHz

Allocation to services		
Region 1	Region 2	Region 3
119.98-122.25	EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.562C SPACE RESEARCH (passive) 5.138 5.341	
122.25-123	FIXED INTER-SATELLITE MOBILE 5.558 Amateur 5.138	
123-130	FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) RADIONAVIGATION RADIONAVIGATION-SATELLITE Radio astronomy 5.562D 5.149 5.554	
130-134	EARTH EXPLORATION-SATELLITE (active) 5.562E FIXED INTER-SATELLITE MOBILE 5.558 RADIO ASTRONOMY 5.149 5.562A	
134-136	AMATEUR AMATEUR-SATELLITE Radio astronomy	
136-141	RADIO ASTRONOMY RADIOLOCATION Amateur Amateur-satellite 5.149	
141-148.5	FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION 5.149	
148.5-151.5	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	

International Frequency Allocation Table

GHz 119.98 – 151.5 NATIONAL ALLOCATION	
INDIA	REMARKS
119.98-122.25 EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.562C SPACE RESEARCH (passive) 5.138 5.341	
122.25 - 123 FIXED INTER-SATELLITE MOBILE 5.558 Amateur 5.138	
123 - 130 FIXED-SATELLITE (space-to-Earth) MOBILE –SATELLITE (space-to-Earth) RADIONAVIGATION RADIONAVIGATION-SATELLITE Radio astronomy 5.562D 5.149 5.554	
130-134 EARTH EXPLORATION-SATELLITE (active) 5.562E FIXED MOBILE 5.558 INTER-SATELLITE RADIO ASTRONOMY 5.149 5.562A	
134-136 AMATEUR AMATEUR-SATELLITE Radio Astronomy	
136- 141 RADIO ASTRONOMY RADIOLOCATION Amateur Amateur –satellite 5.149	
141-148.5 FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION 5.149	
148.5 – 151.5 EARTH EXPLORATION SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	

International Frequency Allocation Table
151.5-158.5 GHz

Allocation to services		
Region 1	Region 2	Region 3
151.5-155.5	FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION 5.149	
155.5-158.5	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE RADIO ASTRONOMY SPACE RESEARCH (passive) 5.562B 5.149 5.562F 5.562G	

National Frequency Allocation Table

GHz 151.5 – 158.5 NATIONAL ALLOCATION	
INDIA	REMARKS
151.5 – 155.5 FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION 5.149	
155 – 158.5 EARTH EXPLORATION-SATELLITE (passive) 5.562F FIXED MOBILE RADIO ASTRONOMY SPACE RESEARCH (passive) 5.562B 5.149 5.562F 5.562G	

International Frequency Allocation Table
158.5-202 GHz

Allocation to services		
Region 1	Region 2	Region 3
158.5-164	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth)	
164-167	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	
167-174.5	FIXED FIXED-SATELLITE (space-to-Earth) INTER-SATELLITE MOBILE 5.558 5.149 5.562D	
174.5-174.8	FIXED INTER-SATELLITE MOBILE 5.558	
174.8-182	EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.562H SPACE RESEARCH (passive)	
182-185	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	
185-190	EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.562H SPACE RESEARCH (passive)	
190-191.8	EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 5.340	
191.8-200	FIXED INTER-SATELLITE MOBILE 5.558 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.149 5.341 5.554	
200-202	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341 5.563A	

National Frequency Allocation Table

GHz 158.5 - 202 NATIONAL ALLOCATION	
INDIA	REMARKS
158.5 - 164 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE SATELLITE (space –to-Earth)	
164 - 167 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	
167 – 174.5 FIXED FIXED-SATELLITE (space-to-Earth) INTER-SATELLITE MOBILE 5.558 5.149 5.562D	
174.5-174.8 FIXED INTER-SATELLITE MOBILE 5.558	
174.8 - 182 EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE SPACE RESEARCH (passive)	
182 - 185 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	
185 - 190 EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.562H SPACE REASERCH (passive)	
190-191.8 EARTH EXPLORATION-SATELLITE (passive) SPACE REASERCH (passive) 5.340	
191.8 – 200 FIXED INTER-SATELLITE MOBILE 5.558 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.149 5.341 5.554	
200 - 202 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341 5.563A	

International Frequency Allocation Table

202-248 GHz

Allocation to services		
Region 1	Region 2	Region 3
202-209	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341 5.563A	
209-217	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY 5.149 5.341	
217-226	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY SPACE RESEARCH (passive) 5.562B 5.149 5.341	
226-231.5	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	
231.5-232	FIXED MOBILE Radiolocation	
232-235	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Radiolocation	
235-238	EARTH EXPLORATION-SATELLITE (passive) FIXED-SATELLITE (space-to-Earth) SPACE RESEARCH (passive) 5.563A 5.563B	
238-240	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE RADIOLOCATION RADIONAVIGATION RADIONAVIGATION-SATELLITE	
240-241	FIXED MOBILE RADIOLOCATION	
241-248	RADIO ASTRONOMY RADIOLOCATION Amateur Amateur-satellite 5.138 5.149	

National Frequency Allocation Table

GHz 202 - 248 NATIONAL ALLOCATION	
INDIA	REMARKS
202 - 209 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341 5.563A	
209-217 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY 5.149 5.341	
217 - 226 FIXED FIXED-SATELLITE (Earth –to-space) MOBILE RADIO ASTRONOMY SPACE RESEARCH (passive) 5.562B 5.149 5.341	
226-231.5 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	
231.5 - 232 FIXED MOBILE Radiolocation	
232 - 235 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Radiolocation	
235-238 EARTH EXPLORATION-SATELLITE (passive) FIXED-SATELLITE (space-to-Earth) SPACE RESEARCH (passive) 5.563A 5.563B	
238 - 240 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE RADIOLOCATION RADIONAVIGATION RADIONAVIGATION SATELLITE	
240-241 FIXED MOBILE RADIOLOCATION	
241 - 248 RADIO ASTRONOMY RADIOLOCATION Amateur Amateur-Satellite 5.138 5.149	

International Frequency Allocation Table
248-1 000 GHz

Allocation to services		
Region 1	Region 2	Region 3
248-250	AMATEUR AMATEUR-SATELLITE Radio astronomy 5.149	
250-252	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.563A	
252-265	FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.149 5.554	
265-275	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY 5.149 5.563A	
275-1 000	(Not allocated) 5.565	

National Frequency Allocation Table

GHz 248 - 1000 NATIONAL ALLOCATION	
INDIA	REMARKS
248 – 250 AMATEUR AMATEUR-SATELLITE Radio Astronomy 5.149	
250 – 252 EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) RADIO ASTRONOMY 5. 340 5.563A	
252 – 265 FIXED MOBILE MOBILE-SATELLITE (Earth-to space) RADIO ASTRONOMY RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.149 5.554	
265 – 275 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY 5.149 5.563A	
275 – 1000 (Not allocated) 5.565	

Heinrich Rudolph Hertz

1857-1894



Professor Hermann Von Helmholtz constructed the world's first radio transmitter and radio receiver for the purpose, generating radio waves. Prior to this no one had heard about it. Hertz's equipment later laid the foundation for invention of the modern radio

Heinrich Rudolph Hertz

**FOOTNOTES
TO
INTERNATIONAL FREQUENCY ALLOCATION TABLE**

Footnotes to International Frequency Allocation Table

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

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

5.55 *Additional allocation:* in Armenia, Azerbaijan, the Russian Federation, Georgia, Kyrgyzstan, Tajikistan and Turkmenistan, the band 14-17 kHz is also allocated to the radionavigation service on a primary basis. (WRC-07)

5.56 The stations of services to which the bands 14-19.95 kHz and 20.05-70 kHz and in Region 1 also the bands 72-84 kHz and 86-90 kHz are allocated may transmit standard frequency and time signals. Such stations shall be afforded protection from harmful interference. In Armenia, Azerbaijan, Belarus, Bulgaria, the Russian Federation, Georgia, Kazakhstan, Mongolia, Kyrgyzstan, Slovakia, Tajikistan and Turkmenistan, the frequencies 25 kHz and 50 kHz will be used for this purpose under the same conditions. (WRC-07)

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.

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

Footnotes to International Frequency Allocation Table

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 Mongolia, Kyrgyzstan and Turkmenistan, the band 130-148.5 kHz is also allocated to the radionavigation service on a secondary basis. Within and between these countries this service shall have an equal right to operate. (WRC-07)

5.67A *Stations in the amateur service using frequencies in the band 135.7-137.8 kHz shall not exceed a maximum radiated power of 1 W (e.i.r.p.) and shall not cause harmful interference to stations of the radionavigation service operating in countries listed in No. 5.67.* (WRC-07)

5.67B *The use of the band 135.7-137.8 kHz in Algeria, Egypt, Iran (Islamic Republic of), Iraq, Libyan Arab Jamahiriya, Lebanon, Syrian Arab Republic, Sudan and Tunisia is limited to the fixed and maritime mobile services. The amateur service shall not be used in the above-mentioned countries in the band 135.7-137.8 kHz, and this should be taken into account by the countries authorizing such use.* (WRC-07)

5.68 *Alternative allocation:* in Angola, Burundi, Congo (Rep. of the), Malawi, the Dem. Rep. of the Congo, Rwanda and South Africa, the band 160-200 kHz is allocated to the fixed service on a primary basis. (WRC-03)

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

5.70 *Alternative allocation:* in Angola, Botswana, Burundi, the Central African Rep., Congo (Rep. of the), Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Nigeria, Oman, the Dem. Rep. of the Congo, Rwanda, South Africa, Swaziland, Tanzania, Chad, Zambia and Zimbabwe, the band 200-283.5 kHz is allocated to the aeronautical radionavigation service on a primary basis. (WRC-07)

5.71 *Alternative allocation:* in Tunisia, the band 255-283.5 kHz is allocated to the broadcasting service on a primary basis.

5.72 Norwegian stations of the fixed service situated in northern areas (north of 60° N) subject to auroral disturbances are allowed to continue operation on four frequencies in the bands 283.5-490 kHz and 510-526.5 kHz.

Footnotes to International Frequency Allocation Table

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, India, Iran (Islamic Republic of), Japan, Pakistan, Papua New Guinea and Sri Lanka, the allocation of the band 415-495 kHz to the aeronautical radionavigation service is on a primary basis. Administrations in these countries shall take all practical steps necessary to ensure that aeronautical radionavigation stations in the band 435-495 kHz do not cause interference to reception by coast stations of ship stations transmitting on frequencies designated for ship stations on a worldwide basis (see No. 52.39). (WRC-07)

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

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.

Footnotes to International Frequency Allocation Table

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 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. (WRC-07)

5.82A The use of the band 495-505 KHz is limited to radiotelegraphy

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)

5.83 SUP

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, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland and Zimbabwe, the band 526.5-535 kHz is also allocated to the mobile service on a secondary basis. (WRC-03)

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

Footnotes to International Frequency Allocation Table

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 Angola, Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Hungary, Kazakhstan, Latvia, Lithuania, Moldova, Mongolia, Nigeria, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., Tajikistan, Chad, Turkmenistan and Ukraine, the 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-07)

5.94 and **5.95** Not used.

5.96 In Germany, Armenia, Austria, Azerbaijan, Belarus, Denmark, Estonia, the Russian Federation, Finland, Georgia, Hungary, Ireland, Iceland, Israel, Kazakhstan, Latvia, Liechtenstein, Lithuania, Malta, Moldova, Norway, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., the United Kingdom, Sweden, Switzerland, Tajikistan, Turkmenistan and Ukraine, administrations may allocate up to 200 kHz to their amateur service in the bands 1 715-1 800 kHz and 1 850-2 000 kHz. However, when allocating the 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-03)

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 Angola, Armenia, Azerbaijan, Belarus, Belgium, Cameroon, Congo (Rep. of the), Denmark, Egypt, Eritrea, Spain, Ethiopia, the Russian Federation, Georgia, Greece, Italy, Kazakhstan, Lebanon, Lithuania, Moldova, the Syrian Arab Republic, Kyrgyzstan, Somalia, Tajikistan, Tunisia, Turkmenistan, Turkey and Ukraine, the band 1 810-1 830 kHz is

Footnotes to International Frequency Allocation Table

allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-07)

5.99 **Additional allocation:** in Saudi Arabia, Austria, Iraq, the Libyan Arab Jamahiriya, 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-07)

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 *Alternative allocation:* in Burundi and Lesotho, the band 1 810-1 850 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

5.102 **Alternative allocation:** in Bolivia, Chile, Mexico, Paraguay, Peru and Uruguay, the band 1 850-2 000 kHz is allocated to the fixed, mobile except aeronautical mobile, radiolocation and radionavigation services on a primary basis. (WRC-07)

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.

Footnotes to International Frequency Allocation Table

5.107 *Additional allocation:* in Saudi Arabia, Eritrea, Ethiopia, Iraq, the Libyan Arab Jamahiriya, Lesotho, Somalia and Swaziland, the 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-03)

5.108 The carrier frequency 2 182 kHz is an international distress and calling frequency for radiotelephony. The conditions for the use of the band 2 173.5-2 190.5 kHz are prescribed in Articles 31 and 52. (WRC-07)

5.109 The frequencies 2 187.5 kHz, 4 207.5 kHz, 6 312 kHz, 8 414.5 kHz, 12 577 kHz and 16 804.5 kHz are international distress frequencies for digital selective calling. The conditions for the use of these frequencies are prescribed in Article **31**.

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

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

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

5.112 *Alternative allocation:* in Denmark, Malta, Serbia and Sri Lanka, the band 2 194-2 300 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-07)

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 Denmark, Iraq, Malta, and Serbia, the band 2 502-2 625 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-07)

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

Footnotes to International Frequency Allocation Table

devices may be assigned by administrations in the bands between 3 155 kHz and 3 400 kHz to suit local needs.

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

5.117 *Alternative allocation:* in Côte d'Ivoire, Denmark, Egypt, Liberia, Malta, Serbia, Sri Lanka and Togo, the band 3 155-3 200 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-07)

5.118 *Additional allocation:* in the United States, Mexico, Peru and Uruguay, the band 3 230-3 400 kHz is also allocated to the radiolocation service on a secondary basis. (WRC-03)

5.119 *Additional allocation:* in Honduras, Mexico and Peru, the band 3 500-3 750 kHz is also allocated to the fixed and mobile services on a primary basis. (WRC-07)

5.120 (SUP - WRC-2000)

5.121 Not used.

5.122 *Alternative allocation:* in Bolivia, Chile, Ecuador, Paraguay, Peru and Uruguay, the band 3 750-4 000 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-07)

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

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.

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

Footnotes to International Frequency Allocation Table

harmful interference is not caused to the maritime mobile service. In addition, in Afghanistan, Argentina, Armenia, Azerbaijan, Belarus, Botswana, Burkina Faso, the Central African Rep., China, the Russian Federation, Georgia, India, Kazakhstan, Mali, Niger, Kyrgyzstan, Tajikistan, Chad, Turkmenistan and Ukraine, in the bands 4 063-4 123 kHz, 4 130-4 133 kHz and 4 408-4 438 kHz, stations 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-07)

5.129 SUP

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).

5.133 Different category of service: in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Latvia, Lithuania, 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-07)

5.134 The use of the 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 bands to facilitate the introduction of digitally modulated emissions in accordance with the provisions of Resolution 517 (Rev.WRC-07). (WRC-07)

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

Footnotes to International Frequency Allocation Table

mean power not exceeding 50 W. At the time of notification of these frequencies, the attention of the Bureau will be drawn to the above conditions.

5.138 The following bands:

6 765-6 795 kHz	(centre frequency 6 780 kHz),
433.05-434.79 MHz	(centre frequency 433.92 MHz) in Region 1 except in the countries mentioned in No. 5.280 ,
61-61.5 GHz	(centre frequency 61.25 GHz),
122-123 GHz	(centre frequency 122.5 GHz), and
244-246 GHz	(centre frequency 245 GHz)

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

5.138A Until 29 March 2009, the band 6 765-7 000 kHz is allocated to the fixed service on a primary basis and to the land mobile service on a secondary basis. After this date, this band is allocated to the fixed and the mobile except aeronautical mobile (R) services on a primary basis. (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, Kenya, Rwanda, Somalia and Togo, the band 7 000-7 050 kHz is also allocated to the fixed service on a primary basis. (WRC-03)

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

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)

5.141B *Additional allocation:* after 29 March 2009, in Algeria, Saudi Arabia, Australia, Bahrain, Botswana, Brunei Darussalam, China, Comoros, Korea (Rep. of), Diego Garcia, Djibouti, Egypt, United Arab Emirates, Eritrea, Indonesia, Iran (Islamic Republic of), Japan, Jordan, Kuwait, the Libyan Arab Jamahiriya, Morocco, Mauritania, New Zealand, Oman, Papua New Guinea, Qatar, the Syrian Arab Republic, Singapore, Sudan, Tunisia, Viet Nam and Yemen, the 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-03)

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)

Footnotes to International Frequency Allocation Table

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), the Libyan Arab Jamahiriya, Jordan, Kuwait, Morocco, Mauritania, Oman, Qatar, the Syrian Arab Republic, 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-03)

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

Footnotes to International Frequency Allocation Table

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)

5.146 Additional allocation: Frequencies in the bands 9 400-9 500 kHz, 11 600-11 650 kHz, 12 050-12 100 kHz, 15 600-15 800 kHz, 17 480-17 550 kHz and 18 900-19 020 kHz may be used by stations in the fixed service, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies in the fixed service, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations. (WRC-07)

5.147 On condition that harmful interference is not caused to the broadcasting service, frequencies in the bands 9 775-9 900 kHz, 11 650-11 700 kHz and 11 975-12 050 kHz may be used by stations in the fixed service communicating only within the boundary of the country in which they are located, each station using a total radiated power not exceeding 24 dBW.

5.148 (SUP - WRC-97)

Footnotes to International Frequency Allocation Table

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

13 360-13 410 kHz,	23.07-23.12 GHz,
25 550-25 670 kHz,	31.2-31.3 GHz,
37.5-38.25 MHz,	31.5-31.8 GHz in Regions 1 and 3,
73-74.6 MHz in Regions 1 and 3,	36.43-36.5 GHz,
150.05-153 MHz in Region 1,	42.5-43.5 GHz,
322-328.6 MHz,	48.94-49.04 GHz,
406.1-410 MHz,	76-86 GHz,
608-614 MHz in Regions 1 and 3,	92-94 GHz,
1 330-1 400 MHz,	94.1-100 GHz,
1 610.6-1 613.8 MHz,	102-109.5 GHz,
1 660-1 670 MHz,	111.8-114.25 GHz,
1 718.8-1 722.2 MHz,	128.33-128.59 GHz,
2 655-2 690 MHz,	129.23-129.49 GHz,
3 260-3 267 MHz,	130-134 GHz,
3 332-3 339 MHz,	136-148.5 GHz,
3 345.8-3 352.5 MHz,	151.5-158.5 GHz,
4 825-4 835 MHz,	168.59-168.93 GHz,
4 950-4 990 MHz,	171.11-171.45 GHz,
4 990-5 000 MHz,	172.31-172.65 GHz,
6 650-6 675.2 MHz,	173.52-173.85 GHz,
10.6-10.68 GHz,	195.75-196.15 GHz,
14.47-14.5 GHz,	209-226 GHz,
22.01-22.21 GHz,	241-250 GHz,
22.21-22.5 GHz,	252-275 GHz
22.81-22.86 GHz,	

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

Footnotes to International Frequency Allocation Table

5.150 The following bands:

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

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

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

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

Footnotes to International Frequency Allocation Table

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 and **5.159** Not used.

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

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

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

5.162A *Additional allocation: in Germany, Austria, Belgium, Bosnia and Herzegovina, China, Vatican, Denmark, Spain, Estonia, the Russian Federation, Finland, France, Ireland, Iceland, Italy, Latvia, The Former Yugoslav Republic of Macedonia, Liechtenstein, Lithuania, Luxembourg, Monaco, Montenegro, Norway, the Netherlands, Poland, Portugal, Slovakia, the Czech Rep., the United Kingdom, Serbia, Slovenia, Sweden and Switzerland the band 46-68 MHz is also allocated to the radiolocation*

Footnotes to International Frequency Allocation Table

service on a secondary basis. This use is limited to the operation of wind profiler radars in accordance with Resolution 217 (WRC-97). (WRC-07)

5.163 *Additional allocation: in Armenia, Belarus, the Russian Federation, Georgia, Hungary, Kazakhstan, Latvia, Lithuania, Moldova, Uzbekistan, Kyrgyzstan, Slovakia, the Czech Rep., 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-07)*

5.164 Additional allocation: in Albania, Germany, Austria, Belgium, Bosnia and Herzegovina, Botswana, Bulgaria, Côte d'Ivoire, Denmark, Spain, Estonia, Finland, France, Gabon, Greece, Ireland, Israel, Italy, the Libyan Arab Jamahiriya, Jordan, Lebanon, Liechtenstein, Luxembourg, Madagascar, Mali, Malta, Morocco, Mauritania, Monaco, Montenegro, Nigeria, Norway, the Netherlands, Poland, Syrian Arab Republic, Romania, the United Kingdom, Serbia, Slovenia, Sweden, Switzerland, Swaziland, Chad, Togo, Tunisia and Turkey, the band 47-68 MHz, in South Africa the band 47-50 MHz, in the Czech Rep. the band 66-68 MHz, and in Latvia and Lithuania the band 48.5-56.5 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 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 band. (WRC-07)

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

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

5.167 Alternative allocation: in Bangladesh, Brunei Darussalam, India, Iran (Islamic Republic of), Pakistan, Singapore and Thailand, the band 50-54 MHz is allocated to the fixed, mobile and broadcasting services on a primary basis. (WRC-07)

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.*

Footnotes to International Frequency Allocation Table

5.169 *Alternative allocation:* in Botswana, Burundi, Lesotho, Malawi, Namibia, the Dem. Rep. of the Congo, Rwanda, South Africa, Swaziland, Zambia and Zimbabwe, the band 50-54 MHz is allocated to the amateur service on a primary basis.

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

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

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

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

5.174 *SUP*

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

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

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

Footnotes to International Frequency Allocation Table

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

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*

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

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.

Footnotes to International Frequency Allocation Table

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.

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 Azerbaijan, Kyrgyzstan, Somalia and Turkmenistan, the band 104-108 MHz is also allocated to the mobile, except aeronautical mobile (R), service on a secondary basis. (WRC-07)

5.195 and **5.196** Not used.

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

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

5.198 SUP

5.199 SUP

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 Angola, Armenia, Azerbaijan, Belarus, Bulgaria, Estonia, the Russian Federation, Georgia, Hungary, Iran (Islamic Republic of), Iraq, Japan, Kazakhstan, Latvia, Moldova, Mongolia, Mozambique, Uzbekistan, Papua New Guinea, Poland, Kyrgyzstan, Slovakia, the Czech Rep., Romania, Tajikistan, Turkmenistan and Ukraine, the band 132-136 MHz is also allocated to the aeronautical

Footnotes to International Frequency Allocation Table

mobile (OR) service on a primary basis. In assigning frequencies to stations of the aeronautical mobile (OR) service, the administration shall take account of the frequencies assigned to stations in the aeronautical mobile (R) service. (WRC-97)

5.202 *Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Belarus, Bulgaria, the United Arab Emirates, the Russian Federation, Georgia, Iran (Islamic Republic of), Jordan, Latvia, Moldova, Oman, Uzbekistan, Poland, the Syrian Arab Republic, Kyrgyzstan, Slovakia, the Czech Rep., Romania, Tajikistan, Turkmenistan and Ukraine, the band 136-137 MHz is also allocated to the aeronautical mobile (OR) service on a primary basis. In assigning frequencies to stations of the aeronautical mobile (OR) service, the administration shall take account of the frequencies assigned to stations in the aeronautical mobile (R) service. (WRC-2000)

5.203 SUP

5.203A SUP

5.203B SUP

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, Serbia, Singapore, Thailand and Yemen, the band 137-138 MHz is allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis (see No. 5.33). (WRC-07)

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.

Footnotes to International Frequency Allocation Table

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)

5.208B In the bands:

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

Resolution **739 (WRC-07)** applies. (WRC-07)

5.208A In making assignments to space stations in the mobile-satellite service in the bands 137-138 MHz, 387-390 MHz and 400.15-401 MHz, administrations shall take all practicable steps to protect the radio astronomy service in the bands 150.05-153 MHz, 322-328.6 MHz, 406.1-410 MHz and 608-614 MHz from harmful interference from unwanted emissions. The threshold levels of interference detrimental to the radio astronomy service are shown in the relevant ITU-R Recommendation. (WRC-07)

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)

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, Ireland, Israel, Kenya, Kuwait, The Former Yugoslav Republic of Macedonia, Lebanon, Liechtenstein, Luxembourg, Mali, Malta, Montenegro, Norway, the Netherlands, Qatar, the United Kingdom, Serbia, Slovenia, Somalia, Sweden, Switzerland, Tanzania, Tunisia and Turkey, the band 138-144 MHz is also allocated to the maritime mobile and land mobile services on a primary basis. (WRC-07)

5.212 Alternative allocation: in Angola, Botswana, Burundi, Cameroon, the Central African Rep., Congo (Rep. of the), Gabon, Gambia, Ghana, Guinea, Iraq, Libyan Arab Jamahiriya, Jordan, Lesotho, Liberia, Malawi, Mozambique, Namibia, Oman, Uganda, Syrian Arab Republic, the Dem. Rep. of the Congo, Rwanda, Sierra Leone, South Africa, Swaziland, Chad, Togo, Zambia and Zimbabwe, the band 138-144 MHz is allocated to the fixed and mobile services on a primary basis. (WRC-07)

Footnotes to International Frequency Allocation Table

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, The Former Yugoslav Republic of Macedonia, Malta, Montenegro, Serbia, Somalia, Sudan and Tanzania, the band 138-144 MHz is also allocated to the fixed service on a primary basis. (WRC-07)

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.

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

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

5.221 Stations of the mobile-satellite service in the band 148-149.9 MHz shall not cause harmful interference to, or claim protection from, stations of the fixed or mobile services operating in accordance with the Table of Frequency Allocations in the following countries: Albania, Algeria, Germany, Saudi Arabia, Australia, Austria, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Benin, Bosnia and Herzegovina, Botswana, Brunei Darussalam, Bulgaria, Cameroon, China, Cyprus, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Croatia, Cuba, Denmark, Egypt, the United Arab Emirates, Eritrea, Spain, Estonia, Ethiopia, the Russian Federation, Finland, France, Gabon, Ghana, Greece, Guinea, Guinea Bissau, Hungary, India, Iran (Islamic Republic of), Ireland, Iceland, Israel, Italy, the Libyan Arab Jamahiriya, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kuwait, The Former Yugoslav Republic of Macedonia, Lesotho, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malaysia, Mali, Malta,

Footnotes to International Frequency Allocation Table

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, Sri Lanka, South Africa, Sweden, Switzerland, Swaziland, Tanzania, Chad, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Ukraine, Viet Nam, Yemen, Zambia, and Zimbabwe. (WRC-07)

5.222 Emissions of the radionavigation-satellite service in the bands 149.9-150.05 MHz and 399.9-400.05 MHz may also be used by receiving earth stations of the space research service.

5.223 Recognizing that the use of the band 149.9-150.05 MHz by the fixed and mobile services may cause harmful interference to the radionavigation-satellite service, administrations are urged not to authorize such use in application of No. 4.4.

5.224 (SUP - WRC-97)

5.224A The use of the bands 149.9-150.05 MHz and 399.9-400.05 MHz by the mobile-satellite service (Earth-to-space) is limited to the land mobile-satellite service (Earth-to-space) until 1 January 2015. (WRC-97)

5.224B The allocation of the bands 149.9-150.05 MHz and 399.9-400.05 MHz to the radionavigation-satellite service shall be effective until 1 January 2015. (WRC-97)

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

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

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.

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).

Footnotes to International Frequency Allocation Table

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

However, the frequencies 156.8 MHz and 156.525 MHz and the frequency bands in which priority is given to the maritime mobile service may be used for radiocommunications on inland waterways subject to agreement between interested and affected administrations and taking into account current frequency usage and existing agreements. (WRC-07)

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

5.227A Additional allocation: the bands 161.9625-161.9875 MHz and 162.0125-162.0375 MHz are also allocated to the mobile-satellite service (Earth-to-space) on a secondary basis for the reception of automatic identification system (AIS) emissions from stations operating in the maritime-mobile service (see Appendix 18). (WRC-07)

5.228 Not used.

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

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

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

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

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.

Footnotes to International Frequency Allocation Table

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

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.

5.236 Not used.

5.237 *Additional allocation:* in Congo (Rep. of the), Eritrea, Ethiopia, Gambia, Guinea, the Libyan Arab Jamahiriya, Malawi, 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-07)

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, the band 216-220 MHz is also allocated to the land mobile service on a primary basis.

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)

Footnotes to International Frequency Allocation Table

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

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**.

Footnotes to International Frequency Allocation Table

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

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, Israel 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-07)

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

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, Costa Rica, Cuba, Egypt, the United Arab Emirates, Ecuador, the Russian Federation, Georgia, Hungary, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kazakhstan, Kuwait, Liberia, Malaysia, Moldova, Uzbekistan, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, Kyrgyzstan, Romania, Singapore,

Footnotes to International Frequency Allocation Table

Somalia, Tajikistan, Turkmenistan and Ukraine, the band 400.05-401 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-07)

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.

5.265 Not used.

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

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

5.268 Use of the band 410-420 MHz by the space research service is limited to communications within 5 km of an orbiting, manned space vehicle. The power flux-density at the surface of the Earth produced by emissions from extra-vehicular activities shall not exceed $-153 \text{ dB(W/m}^2\text{)}$ for $0^\circ \leq \delta \leq 5^\circ$, $-153 + 0.077 (\delta - 5) \text{ dB(W/m}^2\text{)}$ for $5^\circ \leq \delta \leq 70^\circ$ and $-148 \text{ dB(W/m}^2\text{)}$ for $70^\circ \leq \delta \leq 90^\circ$, where δ is the angle of arrival of the radio-frequency wave and the reference bandwidth is 4 kHz. No. **4.10** does not apply to extra-vehicular activities. In this frequency band the space research (space-to-space) service shall not claim protection from, nor constrain the use and development of, stations of the fixed and mobile services. (WRC-97)

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

Footnotes to International Frequency Allocation Table

5.272 *Different category of service:* in France, the allocation of the band 430-434 MHz to the amateur service is on a secondary basis (see No. **5.32**).

5.273 *Different category of service:* in the Libyan Arab Jamahiriya, the allocation of the bands 430-432 MHz and 438-440 MHz to the radiolocation service is on a secondary basis (see No. **5.32**). (WRC-03)

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

5.275 *Additional allocation:* in Croatia, Estonia, Finland, Libyan Arab Jamahiriya, The Former Yugoslav Republic of Macedonia, Montenegro, Serbia and Slovenia, the 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-07)

5.276 *Additional allocation:* in Afghanistan, Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Burkina Faso, Burundi, Egypt, the United Arab Emirates, Ecuador, Eritrea, Ethiopia, Greece, Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Italy, Libyan Arab Jamahiriya, Jordan, Kenya, Kuwait, Lebanon, Malaysia, Malta, Nigeria, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Somalia, Switzerland, Tanzania, Thailand, Togo, Turkey and Yemen, the band 430-440 MHz is also allocated to the fixed service on a primary basis and the bands 430-435 MHz and 438-440 MHz are also allocated to the mobile, except aeronautical mobile, service on a primary basis. (WRC-07)

5.277 *Additional allocation:* in Angola, Armenia, Azerbaijan, Belarus, Cameroon, Congo (Rep. of the), Djibouti, the Russian Federation, Georgia, Hungary, Israel, Kazakhstan, Mali, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Slovakia, Romania, Rwanda, Tajikistan, Chad, Turkmenistan and Ukraine, the band 430-440 MHz is also allocated to the fixed service on a primary basis. (WRC-07)

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

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

5.279A The use of this band by sensors in the Earth exploration-satellite service (active) shall be in accordance with Recommendation ITU-R SA.1260-1. Additionally, the Earth exploration-satellite service (active) in the band 432-438 MHz shall not cause harmful interference to the aeronautical radionavigation service in China. The provisions of this footnote in no way diminish the obligation of the Earth exploration-satellite

Footnotes to International Frequency Allocation Table

service (active) to operate as a secondary service in accordance with Nos. **5.29** and **5.30**. (WRC-03)

5.280 In Germany, Austria, Bosnia and Herzegovina, Croatia, The Former Yugoslav Republic of Macedonia, Liechtenstein, Montenegro, Portugal, Serbia, Slovenia and Switzerland, the 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 band must accept harmful interference which may be caused by these applications. ISM equipment operating in this band is subject to the provisions of No. **15.13**. (WRC-07)

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

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

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

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

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

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**.

Footnotes to International Frequency Allocation Table

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 band 450-470 MHz is identified for use by administrations wishing to implement International Mobile Telecommunications (IMT). See Resolution **224 (Rev.WRC-07)**. This identification does not preclude the use of this band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations.

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 not constrain 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 In the maritime mobile service, the frequencies 457.525 MHz, 457.550 MHz, 457.575 MHz, 467.525 MHz, 467.550 MHz and 467.575 MHz may be used by on-board communication stations. Where needed, equipment designed for 12.5 kHz channel spacing using also the additional frequencies 457.5375 MHz, 457.5625 MHz, 467.5375 MHz and 467.5625 MHz may be introduced for on-board communications. The use of these frequencies in territorial waters may be subject to the national regulations of the administration concerned. The characteristics of the equipment used shall conform to those specified in Recommendation ITU-R M.1174-2 (WRC-07)

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.1174-1. (WRC-03)

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

Footnotes to International Frequency Allocation Table

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, Mongolia, Kyrgyzstan, Slovakia, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 460-470 MHz to the meteorological-satellite service (space-to-Earth) is on a primary basis (see No. 5.33), subject to agreement obtained under No. 9.21. (WRC-07)

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

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

5.292 *Different category of service:* in Mexico, the allocation of the band 470-512 MHz to the fixed and mobile services, and in Argentina, Uruguay and Venezuela to the mobile service, is on a primary basis (see No. 5.33), subject to agreement obtained under No. 9.21. (WRC-07)

5.293 *Different category of service:* in Canada, Chile, Colombia, Cuba, the United States, Guyana, Honduras, Jamaica, Mexico, Panama and Peru, the allocation of the bands 470-512 MHz and 614-806 MHz to the fixed service is on a primary basis (see No. 5.33), subject to agreement obtained under No. 9.21. In Canada, Chile, Colombia, Cuba, the United States, Guyana, Honduras, Jamaica, Mexico, Panama and Peru, the allocation of the bands 470-512 MHz and 614-698 MHz to the mobile service is on a primary basis (see No. 5.33), subject to agreement obtained under No. 9.21. In Argentina and Ecuador, the allocation of the band 470-512 MHz to the fixed and mobile services is on a primary basis (see No. 5.33), subject to agreement obtained under No. 9.21. (WRC-07)

5.294 *Additional allocation:* in Saudi Arabia, Burundi, Cameroon, Côte d'Ivoire, Egypt, Ethiopia, Israel, the Libyan Arab Jamahiriya, Kenya, Malawi, the Syrian Arab Republic, Sudan, Chad and Yemen, the band 470-582 MHz is also allocated to the fixed service on a secondary basis. (WRC-07)

5.295 Not used.

5.296 *Additional allocation:* in Germany, Saudi Arabia, Austria, Belgium, Côte d'Ivoire, Denmark, Egypt, Spain, Finland, France, Ireland, Israel, Italy, the Libyan Arab Jamahiriya, Jordan, Lithuania, Malta, Morocco, Monaco, Norway, Oman, the Netherlands, Portugal, the Syrian Arab Republic, the United Kingdom, Sweden, Switzerland, Swaziland and Tunisia, the band 470-790 MHz is also allocated on a secondary basis to the land mobile service, intended for applications ancillary to broadcasting. 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-07)

5.297 *Additional allocation:* in Canada, Costa Rica, Cuba, El Salvador, the United States, Guatemala, Guyana, Honduras, Jamaica and Mexico, the band 512-608 MHz is also allocated to the fixed and mobile services on a primary basis, subject to agreement obtained under No. 9.21. (WRC-07)

Footnotes to International Frequency Allocation Table

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, Egypt, Israel, the Libyan Arab Jamahiriya, Jordan, Oman, the Syrian Arab Republic and Sudan, the band 582-790 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis. (WRC-07)

5.301 Not used.

5.302 *Additional allocation:* in the United Kingdom, the band 590-598 MHz is also allocated to the aeronautical radionavigation service on a primary basis. All new assignments to stations in the aeronautical radionavigation service, including those transferred from the adjacent bands, shall be subject to coordination with the Administrations of the following countries: Germany, Belgium, Denmark, Spain, France, Ireland, Luxembourg, Morocco, Norway and the Netherlands.

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 Not used.

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

Footnotes to International Frequency Allocation Table

5.310 (SUP - WRC-97)

5.311 SUP

5.311A For the frequency band 620-790 MHz, see also Resolution **549 (WRC-07)**

5.312 *Additional allocation:* in Armenia, Azerbaijan, Belarus, Bulgaria, the Russian Federation, Georgia, Hungary, Kazakhstan, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., Romania, Tajikistan, Turkmenistan and Ukraine, the band 645-862 MHz is also allocated to the aeronautical radionavigation service on a primary basis. (WRC-03)

5.313 (SUP - WRC-97)

5.313A The band, or portions of the band 698-790 MHz, in Bangladesh, China, Korea (Rep. Of), India, Japan, New Zealand, Papua New Guinea, Philippines and Singapore are identified for use by these Administrations wishing to implement International Mobile Telecommunication (IMT). This identification does not preclude the use of these bands by any application of service to which they are allocated and does not establish priority in Radio Regulations. In China, the use of IMT in this band will not start until 2015. (ERC-07)

5.313B Different Category of Service : In Brazil, the allocation of band 698-806 MHz to the mobile service is on secondary basis (WRC-07)

5.314 *Additional allocation:* in Austria, Italy, Moldova, Uzbekistan, Kyrgyzstan, the United Kingdom and Swaziland, the band 790-862 MHz is also allocated to the land mobile service on a secondary basis. (WRC-07)

5.315 *Alternative allocation:* in Greece, Italy and Tunisia, the band 790-838 MHz is allocated to the broadcasting service on a primary basis. (WRC-2000)

5.316 *Additional allocation:* in Germany, Saudi Arabia, Bosnia and Herzegovina, Burkina Faso, Cameroon, Côte d'Ivoire, Croatia, Denmark, Egypt, Finland, Greece, Israel, the Libyan Arab Jamahiriya, Jordan, Kenya, The Former Yugoslav Republic of Macedonia, Liechtenstein, Mali, Monaco, Montenegro, Norway, the Netherlands, Portugal, the United Kingdom, the Syrian Arab Republic, Serbia, Sweden and Switzerland, the band 790-830 MHz, and in these same countries and in Spain, France, Gabon and Malta, the band 830-862 MHz, are also allocated to the mobile, except aeronautical mobile, service on a primary basis. However, stations of the mobile service in the countries mentioned in connection with each band referred to in this footnote shall not cause harmful interference to, or claim protection from, stations of services operating in accordance with the Table in countries other than those mentioned in connection with the band. This allocation is effective until 16 June 2015. (WRC-07)

Footnotes to International Frequency Allocation Table

5.316A Additional allocation: in Spain, France, Gabon and Malta and in Lithuania in the band 790-830 MHz, in Angola, Bahrain, Benin, Botswana, Congo (Rep. of the), French Overseas Departments and Communities of Region 1, Gambia, Ghana, Guinea, Kuwait, Lesotho, Lebanon, Malawi, Morocco, Mauritania, Mozambique, Namibia, Niger, Oman, Uganda, Poland, Qatar, Rwanda, Senegal, Sudan, South Africa, Swaziland, Tanzania, Chad, Togo, Yemen, Zambia and Zimbabwe, the band 790-862 MHz, Georgia the band 806-862 MHz and in Lithuania, the band 830-862 MHz is also allocated to the mobile service except the aeronautical mobile, service on a primary basis subject to the agreement by the administrations concerned obtained under No. **9.21** and under the Geneva-06 Agreement, as appropriate, including those administrations mentioned in No. **5.312** where appropriate. However, stations of the mobile service in the countries mentioned in connection with each band referred to in this footnote shall not cause unacceptable interference to, nor claim protection from, stations of services operating in accordance with the Table in countries other than those mentioned in connection with the band. Frequency assignment to the mobile service under this allocation in Lithuania and Poland shall not be used without the agreement of the Russian Federation and Belarus. This allocation is effective until 16 June 2015. (WRC-07)

5.316B In Region 1, the allocation to the mobile, except aeronautical mobile, service on a primary basis in the frequency band 790-862 MHz shall come into effect from 17 June 2015 and shall be 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. Resolution **224 (Rev.WRC-07)** and 749 (**Rev.WRC-07**) shall apply. (WRC-07)

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

5.317A Those parts of the band 698-960 MHz in Region 2 and the band 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 Resolution **224 (Rev.WRC-07)** and Resolution **[COM4/13] (WRC-07)**. This identification does not preclude the use of these bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. (WRC-07)

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.

Footnotes to International Frequency Allocation Table

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*

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, Egypt, Spain, the Libyan Arab Jamahiriya, Morocco, Namibia, Nigeria, South Africa, Tanzania, Zimbabwe and Zambia, subject to agreement obtained under No. **9.21**. (WRC-2000)

5.323 *Additional allocation:* in Armenia, Azerbaijan, Belarus, Bulgaria, the Russian Federation, Hungary, Kazakhstan, Moldova, Uzbekistan, Poland, Kyrgyzstan, Romania, Tajikistan, Turkmenistan and Ukraine, the band 862-960 MHz is 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-07)

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 Cuba, the allocation of the band 902-915 MHz to the land mobile service is on a primary basis. (WRC-2000)

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**.

Footnotes to International Frequency Allocation Table

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**).

5.327A The use of the 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 (WRC-07)**. (WRC-07)

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)

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

5.329 Use of the radionavigation-satellite service in the band 1 215-1 300 MHz shall be subject to the condition that no harmful interference is caused to, and no protection is claimed from, the radionavigation service authorized under No. **5.331**. Furthermore, the use of the radionavigation-satellite service in the band 1 215-1 300 MHz shall be subject to the condition that no harmful interference is caused to the radiolocation service. No. **5.43** shall not apply in respect of the radiolocation service. Resolution **608 (WRC-03)** shall apply. (WRC-03)

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)

Footnotes to International Frequency Allocation Table

5.330 *Additional allocation:* in Angola, Saudi Arabia, Bahrain, Bangladesh, Cameroon, China, the United Arab Emirates, Eritrea, Ethiopia, Guyana, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, the Libyan Arab Jamahiriya, Japan, Jordan, Kuwait, Lebanon, Mozambique, Nepal, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, Somalia, Sudan, Chad, Togo and Yemen, the band 1 215-1 300 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-03)

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, The Former Yugoslav Republic of Macedonia, Lesotho, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Madagascar, Mali, Mauritania, Montenegro, Nigeria, Norway, Oman, the Netherlands, Poland, Portugal, Qatar, the Syrian Arab Republic, Dem. People's Rep. of Korea, Slovakia, the United Kingdom, Serbia, Slovenia, Somalia, Sudan, Sri Lanka, South Africa, Sweden, Switzerland, Thailand, Togo, Turkey, Venezuela and Viet Nam, the band 1 215-1 300 MHz is also allocated to the radionavigation service on a primary basis. In Canada and the United States, the band 1 240-1 300 MHz is also allocated to the radionavigation service, and use of the radionavigation service shall be limited to the aeronautical radionavigation service. (WRC-07)

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

Footnotes to International Frequency Allocation Table

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 Mongolia, Kyrgyzstan, Slovakia, the Czech Rep. and Turkmenistan, existing installations of the radionavigation service may continue to operate in the band 1 350-1 400 MHz. (WRC-07)

5.338A In the bands 1350-1400 MHz, 1427-1452 MHz, 22.55-23.55 GHz, 30-31.3 GHz, 49.7-50.2 GHz, 50.4-50.9 GHz and 51.4-52.6 GHz, Resolution **750 (WRC-07)** applies

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

5.339A *SUP*

5.340 All emissions are prohibited in the following bands:

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

Footnotes to International Frequency Allocation Table

50.2-50.4 GHz²,
52.6-54.25 GHz,
86-92 GHz,
100-102 GHz,
109.5-111.8 GHz,
114.25-116 GHz,
148.5-151.5 GHz,
164-167 GHz,
182-185 GHz,
190-191.8 GHz,
200-209 GHz,
226-231.5 GHz,
250-252 GHz. (WRC-03)

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.

5.342 *Additional allocation:* in Armenia, Azerbaijan, Belarus, Bulgaria, the Russian Federation, Uzbekistan, Kyrgystan and Ukraine, the 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 band 1 452-1 492 MHz is subject to agreement between the administrations concerned. (WRC-2000)

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

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)

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

Footnotes to International Frequency Allocation Table

5.346 Not used.

5.347 *SUP*

5.347A *SUP*

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 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)

5.348C For the use of the bands 1 518-1 525 MHz and 1 668-1 675 MHz by the mobile-satellite service, see Resolution **225 (Rev.WRC-03)**. (WRC-03)

5.349 *Different category of service:* in Saudi Arabia, Azerbaijan, Bahrain, Cameroon, Egypt, France, Iran (Islamic Republic of), Iraq, Israel, Kazakhstan, Kuwait, The Former Yugoslav Republic of Macedonia, Lebanon, Morocco, Qatar, Syrian Arab Republic, Kyrgyzstan, Turkmenistan and Yemen, the allocation of the band 1 525-1 530 MHz to the mobile, except aeronautical mobile, service is on a primary basis (see No. **5.33**). (WRC-07)

5.350 *Additional allocation:* in Azerbaijan, Kyrgyzstan and Turkmenistan, the band 1 525-1 530 MHz is also allocated to the aeronautical mobile service on a primary basis. (WRC-2000)

5.351A For the use of the bands 1 518-1 544 MHz, 1 545-1 559 MHz, 1 610-1 626.5 MHz, 1 626.5-1 645.5 MHz, 1 646.5-1 660.5 MHz, 1 668-1 675 MHz, 1 980-2 010 MHz, 2 170-2 200 MHz, 2 483.5-2 500 MHz, 2 500-2 520 MHz and 2 670-

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2 690 MHz by the mobile-satellite service, see Resolutions **212 (Rev.WRC-07)** and **225 (Rev.WRC-07)**. (WRC-07)

5.351A For the use of the bands 1 525-1 544 MHz, 1 545-1 559 MHz, 1 610-1 626.5 MHz, 1 626.5-1 645.5 MHz, 1 646.5-1 660.5 MHz, 1 980-2 010 MHz, 2 170-2 200 MHz, 2 483.5-2 500 MHz, 2 500-2 520 MHz and 2 670-2 690 MHz by the mobile-satellite service, see Resolutions **212 (Rev.WRC-97)** and **225 (WRC-2000)***. (WRC-2000)

5.352 (SUP - WRC-97)

5.352A In the 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 France and French overseas territories in Region 3, Algeria, Saudi Arabia, Egypt, Guinea, India, Israel, Italy, Jordan, Kuwait, Mali, Malta, Morocco, Mauritania, Nigeria, Oman, Pakistan, the Philippines, Qatar, Syrian Arab Republic, Tanzania, Viet Nam and Yemen notified prior to 1 April 1998. (WRC-97)

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

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

Footnotes to International Frequency Allocation Table

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. (The provisions of Resolution **222 (WRC-2000)** shall apply.) (WRC-2000)

5.358 (SUP - WRC-97)

5.359 *Additional allocation:* in Germany, Saudi Arabia, Armenia, Austria, Azerbaijan, Belarus, Benin, Bulgaria, Cameroon, Spain, the Russian Federation, France, Gabon, Georgia, Greece, Guinea, Guinea-Bissau, the Libyan Arab Jamahiriya, Jordan, Kazakhstan, Kuwait, Lebanon, Lithuania, Mauritania, Moldova, Uganda, Uzbekistan, Pakistan, Poland, the Syrian Arab Republic, Kyrgyzstan, the Dem. People's Rep. of Korea, Romania, Swaziland, Tajikistan, Tanzania, Tunisia, Turkmenistan and Ukraine, the bands 1 550-1 559 MHz, 1 610-1 645.5 MHz and 1 646.5-1 660 MHz are also allocated to the fixed service on a primary basis. Administrations are urged to make all practicable efforts to avoid the implementation of new fixed-service stations in these bands. (WRC-07)

5.360 to 5.362 (SUP - WRC-97)

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

Footnotes to International Frequency Allocation Table

priority of safety-related communications in the other mobile-satellite services. (WRC-97)

5.362B *Additional allocation:* The band 1 559-1 610 MHz is also allocated to the fixed service on a primary basis until 1 January 2010 in Algeria, Saudi Arabia, Cameroon, Libyan Arab Jamahiriya, Jordan, Mali, Mauritania, Syrian Arab Republic and Tunisia. After this date, the fixed service may continue to operate on a secondary basis until 1 January 2015, at which time this allocation shall no longer be valid. The band 1 559-1 610 MHz is also allocated to the fixed service on a secondary basis in Algeria, Germany, Armenia, Azerbaijan, Belarus, Benin, Bulgaria, Spain, Russian Federation, France, Gabon, Georgia, Guinea, Guinea-Bissau, Kazakhstan, Lithuania, Moldova, Nigeria, Uganda, Uzbekistan, Pakistan, Poland, Kyrgyzstan, Dem. People's Rep. of Korea, Romania, Senegal, Swaziland, Tajikistan, Tanzania, Turkmenistan and Ukraine until 1 January 2015, at which time this allocation shall no longer be valid. Administrations are urged to take all practicable steps to protect the radionavigation-satellite service and the aeronautical radionavigation service and not authorize new frequency assignments to fixed-service systems in this band. (WRC-07)

5.362C *Additional allocation:* in Congo (Rep. of the), Egypt, Eritrea, Iraq, Israel, Jordan, Malta, Qatar, the Syrian Arab Republic, Somalia, Sudan, Chad, Togo and Yemen, the band 1 559-1 610 MHz is also allocated to the fixed service on a secondary basis until 1 January 2015, at which time this allocation shall no longer be valid. Administrations are urged to take all practicable steps to protect the radionavigation-satellite service and not authorize new frequency assignments to fixed-service systems in this band. (WRC-07)

5.363 SUP

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

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

Footnotes to International Frequency Allocation Table

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 bands 1 610-1 626.5 MHz and 5 000-5 150 MHz are also allocated to the aeronautical mobile-satellite (R) service on a primary basis, subject to agreement obtained under No. **9.21**.

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

5.369 *Different category of service:* in Angola, Australia, Burundi, China, Eritrea, Ethiopia, India, Iran (Islamic Republic of), Israel, the Libyan Arab Jamahiriya, Lebanon, Liberia, Madagascar, Mali, Pakistan, Papua New Guinea, Syrian Arab Republic, the Dem. Rep. of the Congo, Sudan, Swaziland, 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-03)

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) and 2 483.5-2 500 MHz (space-to-Earth) are also allocated to the radiodetermination-satellite service on a secondary basis, subject to agreement obtained under No. **9.21**.

5.372 Harmful interference shall not be caused to stations of the radio astronomy service using the band 1 610.6-1 613.8 MHz by stations of the radiodetermination-satellite and mobile-satellite services (No. **29.13** applies).

5.373 Not used.

5.373A (SUP - WRC-97)

Footnotes to International Frequency Allocation Table

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)

5.377 (SUP - WRC-03)

5.378 Not used.

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 [**COM5/1**] (**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 $-181 \text{ dB(W/m}^2\text{)}$ in 10 MHz and $-194 \text{ dB(W/m}^2\text{)}$ 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)

Footnotes to International Frequency Allocation Table

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)

5.380 SUP

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, Costa Rica, 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-03)

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, the Former Yugoslav Republic of Macedonia, Lebanon, Mauritania, Moldova, Mongolia, Oman, Uzbekistan, Poland, Qatar, the Syrian Arab Republic, Kyrgyzstan, Serbia, Somalia, Tajikistan, Tanzania, Turkmenistan, Ukraine and Yemen, the allocation of the 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 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-07)

5.383 Not used.

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 bands, or portions of the bands, 1 710-1 885 MHz, 2 300-2 400 MHz and 2 500-2 690 MHz, are identified for use by administrations wishing to implement International Mobile Telecommunications (IMT) in accordance with Resolution **223 (Rev.WRC-07)**. This identification does not preclude the use of these bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. (WRC-07).

Footnotes to International Frequency Allocation Table

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

5.387 *Additional allocation:* in Belarus, Georgia, Kazakhstan, Mongolia, Kyrgyzstan, Slovakia, Romania, Tajikistan and Turkmenistan, the band 1 770-1 790 MHz is also allocated to the meteorological-satellite service on a primary basis, subject to agreement obtained under No. **9.21**. (WRC-07)

5.388 The bands 1 885-2 025 MHz and 2 110-2 200 MHz are intended for use, on a worldwide basis, by administrations wishing to implement International Mobile Telecommunications-2000 (IMT-2000). Such use does not preclude the use of these bands by other services to which they are allocated. The bands should be made available for IMT-2000 in accordance with Resolution **212 (Rev.WRC-97)**. (See also Resolution **223 (WRC-2000)**.) (WRC-2000)

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)

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, the Libyan Arab Jamahiriya, Jordan, Kenya, Kuwait, Mali, Morocco, Mauritania, Nigeria, Oman, Uganda, Qatar, the Syrian Arab Republic, Senegal, Singapore, Sudan, Tanzania, Chad, Togo, Tunisia, Yemen, Zambia and Zimbabwe, for the purpose of protecting fixed and mobile services, including IMT-2000 mobile stations, in their territories from co-channel interference, a high altitude platform station (HAPS) operating as an IMT-2000 base station in neighbouring countries, in the bands referred to in No. **5.388A**, shall not exceed a co-channel power flux-density of $-127 \text{ dB(W/(m}^2 \cdot \text{MHz))}$ at the Earth's surface outside a country's borders unless explicit agreement of the affected administration is provided at the time of the notification of HAPS. (WRC-03)

Footnotes to International Frequency Allocation Table

5.389 Not used.

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

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)

5.389D (SUP - WRC-03)

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

5.390 SUP

5.391 In making assignments to the mobile service in the bands 2 025-2 110 MHz and 2 200-2 290 MHz, administrations shall not introduce high-density mobile systems, as described in Recommendation ITU-R SA.1154, and shall take that Recommendation into account for the introduction of any other type of mobile system. (WRC-97)

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.

Footnotes to International Frequency Allocation Table

5.392A SUP

5.393 *Additional allocation:* in Canada, the United States, India and Mexico, the band 2 310-2 360 MHz is also allocated to the broadcasting-satellite service (sound) and complementary terrestrial sound broadcasting service on a primary basis. Such use is limited to digital audio broadcasting and is subject to the provisions of Resolution **528 (Rev.WRC-03)**, with the exception of *resolves* 3 in regard to the limitation on broadcasting-satellite systems in the upper 25 MHz. (WRC-07)

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 Space stations of the broadcasting-satellite service in the band 2 310-2 360 MHz operating in accordance with No. **5.393** that may affect the services to which this band is allocated in other countries shall be coordinated and notified in accordance with Resolution **33 (Rev.WRC-97)***. Complementary terrestrial broadcasting stations shall be subject to bilateral coordination with neighbouring countries prior to their bringing into use.

5.397 *Different category of service:* in France, the band 2 450-2 500 MHz is allocated on a primary basis to the radiolocation service (see No. **5.33**). Such use is subject to agreement with administrations having services operating or planned to operate in accordance with the Table of Frequency Allocations which may be affected.

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.

5.399 In Region 1, in countries other than those listed in No. **5.400**, harmful interference shall not be caused to, or protection shall not be claimed from, stations of the radiolocation service by stations of the radiodetermination satellite service.

5.400 *Different category of service:* in Angola, Australia, Bangladesh, Burundi, China, Eritrea, Ethiopia, India, Iran (Islamic Republic of), the Libyan Arab Jamahiriya, Lebanon, Liberia, Madagascar, Mali, Pakistan, Papua New Guinea, the Dem. Rep. of the Congo, the Syrian Arab Republic, Sudan, Swaziland, Togo and Zambia, the allocation of the band 2 483.5-2 500 MHz to the radiodetermination-satellite service (space-to-Earth)

Footnotes to International Frequency Allocation Table

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-03)

5.401 Not used.

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

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

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

5.405 *Additional allocation:* in France, the band 2 500-2 550 MHz is also allocated to the radiolocation service on a primary basis. Such use is subject to agreement with the administrations having services operating or planned to operate in accordance with the Table which may be affected.

5.406 Not used.

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 $-152 \text{ dB(W/(m}^2 \cdot 4 \text{ kHz))}$ in Argentina, unless otherwise agreed by the administrations concerned.

5.408 (SUP - WRC-2000)

5.409 SUP

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**. 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

Footnotes to International Frequency Allocation Table

measures shall be taken to avoid directing the antennas of these links towards the geostationary-satellite orbit. (WRC-07)

5.411 SUP

5.412 *Alternative allocation:* in Azerbaijan, 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-07)

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

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

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

$-136 \text{ dB(W/(m}^2 \cdot \text{MHz))}$	for $0^\circ \leq \theta \leq 5^\circ$
$-136 + 0.55 (\theta - 5) \text{ dB(W/(m}^2 \cdot \text{MHz))}$	for $5^\circ < \theta \leq 25^\circ$
$-125 \text{ dB(W/(m}^2 \cdot \text{MHz))}$	for $25^\circ < \theta \leq 90^\circ$

where θ is the angle of arrival of the incident wave above the horizontal plane, in degrees. Outside this area Table **21-4** of Article **21** shall apply. Furthermore, the coordination thresholds in Table 5-2 of Annex 1 to Appendix **5** of the Radio Regulations (edition of 2004), in conjunction with the applicable provisions of Articles **9** and **11** associated with No. **9.11A**, shall apply to systems for which complete notification information has been received by the Radiocommunication 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)

Footnotes to International Frequency Allocation Table

5.415A *Additional allocation:* in India and Japan, subject to agreement obtained under No. **9.21**, the band 2 515-2 535 MHz may also be used for the aeronautical mobile-satellite service (space-to-Earth) for operation limited to within their national boundaries. (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 - WRC-2000)

5.417A In applying provision No. **5.418**, in Korea (Rep. of) and Japan, *resolves* 3 of Resolution **528 (Rev.WRC-03)** is relaxed to allow the broadcasting-satellite service (sound) and the complementary terrestrial broadcasting service to additionally operate on a primary basis in the band 2 605-2 630 MHz. This use is limited to systems intended for national coverage. An administration listed in this provision shall not have simultaneously two overlapping frequency assignments, one under this provision and the other under No. **5.416**. The provisions of No. **5.416** and Table **21-4** of Article **21** do not apply. Use of non-geostationary-satellite systems in the broadcasting-satellite service (sound) in the band 2 605-2 630 MHz is subject to the provisions of Resolution **539 (Rev.WRC-03)**. The power flux-density at the Earth's surface produced by emissions from a geostationary broadcasting-satellite service (sound) space station operating in the band 2 605-2 630 MHz for which complete Appendix **4** coordination information, or notification information, has been received after 4 July 2003, for all conditions and for all methods of modulation, shall not exceed the following limits:

$$\begin{aligned} -130 \quad \text{dB(W/(m}^2 \cdot \text{MHz))} & \quad \text{for } 0^\circ \leq \theta \leq 5^\circ \\ -130 + 0.4 (\theta - 5) \quad \text{dB(W/(m}^2 \cdot \text{MHz))} & \quad \text{for } 5^\circ < \theta \leq 25^\circ \\ -122 \quad \text{dB(W/(m}^2 \cdot \text{MHz))} & \quad \text{for } 25^\circ < \theta \leq 90^\circ \end{aligned}$$

where θ is the angle of arrival of the incident wave above the horizontal plane, in degrees. These limits may be exceeded on the territory of any country whose administration has so agreed. In the case of the broadcasting-satellite service (sound) networks of Korea (Rep. of), as an exception to the limits above, the power flux-density value of $-122 \text{ dB(W/(m}^2 \cdot \text{MHz))}$ shall be used as a threshold for coordination under No. **9.11** in an area of 1 000 km around the territory of the administration notifying the broadcasting-satellite service (sound) system, for angles of arrival greater than 35° . (WRC-03)

5.417B In Korea (Rep. of) and Japan, use of the band 2 605-2 630 MHz by non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. **5.417A**, for which complete Appendix **4** coordination information, or notification

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information, has been received after 4 July 2003, is subject to the application of the provisions of No. **9.12A**, in respect of geostationary-satellite networks for which complete Appendix 4 coordination information, or notification information, is considered to have been received after 4 July 2003, and No. **22.2** does not apply. No. **22.2** shall continue to apply with respect to geostationary-satellite networks for which complete Appendix 4 coordination information, or notification information, is considered to have been received before 5 July 2003. (WRC-03)

5.417C Use of the band 2 605-2 630 MHz by non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. **5.417A**, for which complete Appendix 4 coordination information, or notification information, has been received after 4 July 2003, is subject to the application of the provisions of No. **9.12**. (WRC-03)

5.417D Use of the band 2 605-2 630 MHz by geostationary-satellite networks for which complete Appendix 4 coordination information, or notification information, has been received after 4 July 2003 is subject to the application of the provisions of No. **9.13** with respect to non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. **5.417A**, and No. **22.2** does not apply. (WRC-03)

5.418 *Additional allocation:* in Korea (Rep. of), India, Japan, Pakistan and Thailand, the band 2 535-2 655 MHz is also allocated to the broadcasting-satellite service (sound) and complementary terrestrial broadcasting service on a primary basis. Such use is limited to digital audio broadcasting and is subject to the provisions of Resolution **528 (Rev.WRC-03)**. The provisions of No. **5.416** and Table **21-4** of Article **21**, do not apply to this additional allocation. Use of non-geostationary-satellite systems in the broadcasting-satellite service (sound) is subject to Resolution **539 (Rev.WRC-03)**. Geostationary broadcasting-satellite service (sound) systems for which complete Appendix 4 coordination information has been received after 1 June 2005 are limited to systems intended for national coverage. The power flux-density at the Earth's surface produced by emissions from a geostationary broadcasting-satellite service (sound) space station operating in the band 2 630-2 655 MHz, and for which complete Appendix 4 coordination information has been received after 1 June 2005, shall not exceed the following limits, for all conditions and for all methods of modulation:

$$\begin{array}{ll} -130 \text{ dB(W/(m}^2 \cdot \text{MHz))} & \text{for } 0^\circ \leq \theta \leq 5^\circ \\ -130 + 0.4 (\theta - 5) \text{ dB(W/(m}^2 \cdot \text{MHz))} & \text{for } 5^\circ < \theta \leq 25^\circ \\ -122 \text{ dB(W/(m}^2 \cdot \text{MHz))} & \text{for } 25^\circ < \theta \leq 90^\circ \end{array}$$

where θ is the angle of arrival of the incident wave above the horizontal plane, in degrees. These limits may be exceeded on the territory of any country whose administration has so agreed. As an exception to the limits above, the pfd value of $-122 \text{ dB(W/(m}^2 \cdot \text{MHz))}$ shall be used as a threshold for coordination under No. **9.11** in an area

Footnotes to International Frequency Allocation Table

of 1 500 km around the territory of the administration notifying the broadcasting-satellite service (sound) system.

In addition, an administration listed in this provision shall not have simultaneously two overlapping frequency assignments, one under this provision and the other under No. **5.416** for systems for which complete Appendix **4** coordination information has been received after 1 June 2005. (WRC-07)

5.418A In certain Region 3 countries listed in No. **5.418**, use of the band 2 630-2 655 MHz by non-geostationary-satellite systems in the broadcasting-satellite service (sound) for which complete Appendix **4** coordination information, or notification information, has been received after 2 June 2000, is subject to the application of the provisions of No. **9.12A**, in respect of geostationary-satellite networks for which complete Appendix **4** coordination information, or notification information, is considered to have been received after 2 June 2000, and No. **22.2** does not apply. No. **22.2** shall continue to apply with respect to geostationary-satellite networks for which complete Appendix **4** coordination information, or notification information, is considered to have been received before 3 June 2000. (WRC-03)

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)

5.420A *SUP*

5.421 (SUP - WRC-03)

Footnotes to International Frequency Allocation Table

5.422 *Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Brunei Darussalam, Congo (Rep. of the), Côte d'Ivoire, Cuba, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Gabon, Georgia, Guinea, Guinea-Bissau, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kuwait, Lebanon, Mauritania, Moldova, 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-07)

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.

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 Azerbaijan, Mongolia, Kyrgyzstan, Romania and Turkmenistan, the band 3 100-3 300 MHz is also allocated to the radionavigation service on a primary basis. (WRC-07)

5.429 *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, China, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, the United Arab Emirates, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, the Libyan Arab Jamahiriya, Japan, Jordan, Kenya, Kuwait, Lebanon, Malaysia, Oman, Uganda, Pakistan,

Footnotes to International Frequency Allocation Table

Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea and Yemen, the band 3 300-3 400 MHz is also allocated to the fixed and mobile services on a primary basis. The countries bordering the Mediterranean shall not claim protection for their fixed and mobile services from the radiolocation service. (WRC-07)

5.430 *Additional allocation:* in Azerbaijan, Mongolia, Kyrgyzstan, Romania and Turkmenistan, the band 3 300-3 400 MHz is also allocated to the radionavigation service on a primary basis. (WRC-07)

5.430A *Different category of service:* in Albania, Algeria, Germany, Andorra, Saudi Arabia, Austria, Azerbaijan, Bahrain, Belgium, Benin, Bosnia and Herzegovina, Botswana, Bulgaria, Burkina Faso, Cameroon, Cyprus, Vatican, Côte d'Ivoire, Croatia, Denmark, French Overseas Departments and Communities in Region 1, Egypt, Spain, Estonia, Finland, France, Gabon, Georgia, Greece, Guinea, Hungary, Ireland, Iceland, Israel, Italy, Jordan, Kuwait, Lesotho, Latvia, Macedonia, Liechtenstein, Lithuania, Malawi, Malta, Morocco, Mauritania, Moldova, Monaco, Mongolia, Montenegro, Mozambique, Namibia, Niger, Norway, Oman, Netherlands, Poland, Portugal, Qatar, Syria, Congo, Slovakia, Czech Rep., Romania, United Kingdom, San Marino, Senegal, Serbia, Sierra Leone, Slovenia, South Africa, Sweden, Switzerland, Swaziland, Togo, Chad, Tunisia, Turkey, Ukraine, Zambia and Zimbabwe, the band 3 400-3 600 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 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 band it shall ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed $-154.5 \text{ dBW}/(\text{m}^2 \cdot 4 \text{ kHz})$ for more than 20 per cent 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 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). This allocation is effective from 17 November 2010. (WRC-07)

5.431 *Additional allocation:* in Germany, Israel and the United Kingdom, the band 3 400-3 475 MHz is also allocated to the amateur service on a secondary basis. (WRC-03)

Footnotes to International Frequency Allocation Table

5.431A *Different category of service:* in Argentina, Brazil, Chile, Costa Rica, Cuba, Dominican Republic, El Salvador, Guatemala, Mexico, Paraguay, Suriname, Uruguay, Venezuela and French Overseas Departments and Communities in Region 2, the 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**. Stations of the mobile service in the 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-07)

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

5.432A In Korea (Rep. of), Japan and Pakistan, the band 3 400-3 500 MHz is identified for International Mobile Telecommunications (IMT). This identification does not preclude the use of this band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. 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 band it shall ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed $-154.5 \text{ dBW}/(\text{m}^2 \cdot 4 \text{ kHz})$ for more than 20 per cent 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 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-07)

5.432B *Different category of service:* in Bangladesh, China, India, Iran (Islamic Republic of), New Zealand, Singapore and French Overseas Communities in Region 3, the 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 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 station of the mobile service in this band it shall ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed $-154.5 \text{ dBW}/(\text{m}^2 \cdot 4 \text{ kHz})$ for more than 20 per cent 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

Footnotes to International Frequency Allocation Table

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 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 (2004 edition). (WRC-07)

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 Bangladesh, China, Korea (Rep. of), India, Iran (Islamic Republic of), Japan, New Zealand, Pakistan and French Overseas Communities in Region 3, the band 3 500-3 600 MHz is identified for International Mobile Telecommunications (IMT). This identification does not preclude the use of this band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. At the stage of coordination the provisions of Nos. **9.17** and **9.18** also apply. Before an administration brings into use a station of the mobile service in this band it shall ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed $-154.5 \text{ dBW}/(\text{m}^2 \cdot 4 \text{ kHz})$ for more than 20 per cent 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 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-07)

5.434 (SUP - WRC-97)

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

5.436 Not used.

Footnotes to International Frequency Allocation Table

5.437 (SUP - WRC-2000)

5.438 Use of the band 4 200-4 400 MHz by the aeronautical radionavigation service is reserved exclusively for radio altimeters installed on board aircraft and for the associated transponders on the ground. However, passive sensing in the Earth exploration-satellite and space research services may be authorized in this band on a secondary basis (no protection is provided by the radio altimeters).

5.439 *Additional allocation:* in Iran (Islamic Republic of) and Libyan Arab Jamahiriya, the band 4 200-4 400 MHz is also allocated to the fixed service on a secondary basis. (WRC-2000)

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** and shall not cause harmful interference to, nor claim protection from, the fixed-satellite and fixed services. Any such use does not preclude the use of these bands by other mobile service applications or by other services to which these bands are allocated on a co-primary basis and does not establish priority in the Radio Regulations. (WRC-07)

5.441 The use of the bands 4 500-4 800 MHz (space-to-Earth), 6 725-7 025 MHz (Earth-to-space) by the fixed-satellite service shall be in accordance with the provisions of Appendix **30B**. The use of the bands 10.7-10.95 GHz (space-to-Earth), 11.2-11.45 GHz (space-to-Earth) and 12.75-13.25 GHz (Earth-to-space) by geostationary-satellite systems in the fixed-satellite service shall be in accordance with the provisions of Appendix **30B**. The use of the bands 10.7-10.95 GHz (space-to-Earth), 11.2-11.45 GHz (space-to-Earth) and 12.75-13.25 GHz (Earth-to-space) by a non-geostationary-satellite system in the fixed-satellite service is subject to application of the provisions of No. **9.12** for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the fixed-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and No. **5.43A** does not apply. Non-geostationary-satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated. (WRC-2000)

Footnotes to International Frequency Allocation Table

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

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-03)

5.443B In order not to cause harmful interference to the microwave landing system operating above 5 030 MHz, the aggregate power flux-density produced at the Earth's surface in the band 5 030-5 150 MHz by all the space stations within any radionavigation-satellite service system (space-to-Earth) operating in the band 5 010-5 030 MHz shall not exceed $-124.5 \text{ dB(W/m}^2\text{)}$ in a 150 kHz band. In order not to cause harmful interference to the radio astronomy service in the band 4 990-5 000 MHz, radionavigation-satellite service systems operating in the band 5 010-5 030 MHz shall comply with the limits in the band 4 990-5 000 MHz defined in Resolution **741 (WRC-03)**. (WRC-03)

5.444 The 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 band 5 030-5 091 MHz, the requirements of this system shall take precedence over other uses of this band. For the use of the band 5 091-5 150 MHz, No. **5.444A** and Resolution **114 (Rev.WRC-03)** apply. (WRC-07)

5.444A *Additional allocation:* the band 5 091-5 150 MHz is also allocated to the fixed-satellite service (Earth-to-space) on a primary basis. This allocation is limited to feeder links of non-geostationary mobile-satellite systems in the mobile-satellite service and is subject to coordination under No. **9.11A**.

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

- prior to 1 January 2018, the use of the band 5 091-5 150 MHz by feeder links of non-geostationary-satellite systems in the mobile-satellite service shall be made in accordance with Resolution **114 (Rev.WRC-03)**;
- after 1 January 2012, no new assignments shall be made to earth stations providing feeder links of non-geostationary mobile-satellite systems;

Footnotes to International Frequency Allocation Table

- after 1 January 2018, the fixed-satellite service will become secondary to the aeronautical radionavigation service. (WRC-07)

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

- systems operating in the aeronautical mobile (R) service and in accordance with international aeronautical standards, limited to surface applications at airports. Such use shall be in accordance with Resolution [COM4/4] (WRC-07);
- aeronautical telemetry transmissions from aircraft stations (see No. **1.83**) in accordance with Resolution [COM4/7] (WRC-07);
- aeronautical security transmissions. Such use shall be in accordance with Resolution [COM4/8] (WRC-07). (WRC-07)

5.445 Not used.

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

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** (WRC-03). (WRC-07)

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, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Syrian Arab Republic, Sudan and Tunisia) and 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 [COM4/7] (WRC-07). These stations shall not claim protection from other stations operating in accordance with Article 5. No. **5.43A** does not apply. (WRC-07)

Footnotes to International Frequency Allocation Table

5.447 *Additional allocation:* in Côte d'Ivoire, Israel, Lebanon, Pakistan, the Syrian Arab Republic and Tunisia, the band 5 150-5 250 MHz is also allocated to the mobile service, on a primary basis, subject to agreement obtained under No. **9.21**. In this case, the provisions of Resolution **229 (WRC-03)** do not apply. (WRC-07)

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

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

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

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

5.447E *Additional allocation:* The band 5 250-5 350 MHz is also allocated to the fixed service on a primary basis in the following countries in Region 3: Australia, Korea (Rep. of), India, Indonesia, Iran (Islamic Republic of), Japan, Malaysia, Papua New Guinea, the Philippines, Dem. People's Rep. of Korea, Sri Lanka, Thailand and Viet Nam. The use of this band by the fixed service is intended for the implementation of fixed wireless access systems and shall comply with Recommendation ITU-R F.1613. 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-07)

Footnotes to International Frequency Allocation Table

5.447F In the band 5 250-5 350 MHz, stations in the mobile service shall not claim protection from the radiolocation service, the Earth exploration-satellite service (active) and the space research service (active). These services shall not impose on the mobile service more stringent protection criteria, based on system characteristics and interference criteria, than those stated in Recommendations ITU-R M.1638 and ITU-R SA.1632. (WRC-03)

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

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)

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), Mongolia, 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-03)

5.450A In the band 5 470-5 725 MHz, stations in the mobile service shall not claim protection from radiodetermination services. Radiodetermination services shall not impose on the mobile service more stringent protection criteria, based on system characteristics and interference criteria, than those stated in Recommendation ITU-R M.1638. (WRC-03)

Footnotes to International Frequency Allocation Table

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

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

5.453 *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Egypt, the United Arab Emirates, Gabon, Guinea, Equatorial Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, the Libyan Arab Jamahiriya, Japan, Jordan, Kenya, Kuwait, Lebanon, Madagascar, Malaysia, Nigeria, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Sri Lanka, Swaziland, Tanzania, Chad, Thailand, Togo, Viet Nam and Yemen, the band 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 (WRC-03)** do not apply. (WRC-03)

5.454 *Different category of service:* in Azerbaijan, the Russian Federation, Georgia, Mongolia, 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-07)

5.455 *Additional allocation:* in Armenia, Azerbaijan, Belarus, Cuba, the Russian Federation, Georgia, Hungary, Kazakhstan, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 5 670-5 850 MHz is also allocated to the fixed service on a primary basis. (WRC-07)

5.456 *Additional allocation:* in Cameroon, the band 5 755-5 850 MHz is also allocated to the fixed service on a primary basis. (WRC-03)

5.457 Not used.

5.457A In the bands 5 925-6 425 MHz and 14-14.5 GHz, earth stations located on board vessels may communicate with space stations of the fixed-satellite service. Such use shall be in accordance with Resolution **902 (WRC-03)**. (WRC-03)

Footnotes to International Frequency Allocation Table

5.457B In the bands 5 925-6 425 MHz and 14-14.5 GHz, earth stations located on board vessels may operate with the characteristics and under the conditions contained in Resolution **902 (WRC-03)** in Algeria, Saudi Arabia, Bahrain, Comoros, Djibouti, Egypt, United Arab Emirates, the Libyan Arab Jamahiriya, Jordan, Kuwait, Morocco, Mauritania, Oman, Qatar, the Syrian Arab Republic, Sudan, Tunisia and Yemen, in the maritime mobile-satellite service on a secondary basis. Such use shall be in accordance with Resolution **902 (WRC-03)**. (WRC-03)

5.457C In Region 2 (except Brazil, Cuba, French Overseas Departments and Communities, Guatemala, Paraguay, Uruguay and Venezuela), the band 5 925-6 700 MHz may be used for aeronautical mobile telemetry for flight testing by aircraft stations (see No. **1.83**). Such use shall be in accordance with Resolution [COM4/2] **(WRC-07)** and shall not cause harmful interference to, nor claim protection from, the fixed-satellite and fixed services. Any such use does not preclude the use of these bands by other mobile service applications or by other services to which these bands are allocated on a co-primary basis and does not establish priority in the Radio Regulations.
(WRC-07)

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

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

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

5.458C Administrations making submissions in the band 7 025-7 075 MHz (Earth-to-space) for geostationary-satellite systems in the fixed-satellite service after 17 November 1995 shall consult on the basis of relevant ITU-R Recommendations with the administrations that have notified and brought into use non-geostationary-satellite systems in this frequency band before 18 November 1995 upon request of the latter administrations. This consultation shall be with a view to facilitating shared operation of both geostationary-satellite systems in the fixed-satellite service and non-geostationary-satellite systems in this band.

Footnotes to International Frequency Allocation Table

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**. (WRC-97)

5.460 The use of the band 7 145-7 190 MHz by the space research service (Earth-to-space) is restricted to deep space; no emissions to deep space shall be effected in the band 7 190-7 235 MHz. Geostationary satellites in the space research service operating in the band 7 190-7 235 MHz shall not claim protection from existing and future stations of the fixed and mobile services and No. **5.43A** does not apply. (WRC-03)

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)

5.461B The use of the band 7 750-7 850 MHz by the meteorological-satellite service (space-to-Earth) is limited to non-geostationary satellite systems. (WRC-97)

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:

$-174 \text{ dB(W/m}^2\text{)}$ in a 4 kHz band	for	$0^\circ \leq \theta < 5^\circ$
$-174 + 0.5 (\theta - 5) \text{ dB(W/m}^2\text{)}$ in a 4 kHz band	for	$5^\circ \leq \theta < 25^\circ$
$-164 \text{ dB(W/m}^2\text{)}$ in a 4 kHz band	for	$25^\circ \leq \theta \leq 90^\circ$

These values are subject to study under Resolution **124 (WRC-97)***. (WRC-97)

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

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

Footnotes to International Frequency Allocation Table

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

5.467 (SUP - WRC-03)

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

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

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), the Libyan Arab Jamahiriya, the Netherlands, Qatar and Sudan, the bands 8 825-8 850 MHz and 9 000-9 200 MHz are also allocated to the maritime radionavigation service, on a primary basis, for use by shore-based radars only. (WRC-07)

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.

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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)

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

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

5.475A In the band 9 000-9 200 MHz, stations operating in the radiolocation service shall not cause harmful interference to, nor claim protection from, systems identified in No. 5.337 operating in the aeronautical radionavigation service, or radar systems in the maritime radionavigation service operating in this band on a primary basis in the countries listed in No. 5.471. (WRC-07)

5.475B 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

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, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Guyana, India, Indonesia, Iran (Islamic Republic of), Iraq, Jamaica, Japan, Jordan, Kuwait, Lebanon, Liberia, Malaysia, Nigeria, Oman, Pakistan, Qatar, Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, Trinidad and

Footnotes to International Frequency Allocation Table

Tobago, and Yemen, the allocation of the band 9 800-10 000 MHz to the fixed service is on a primary basis (see No. **5.33**). (WRC-07)

5.478 *Additional allocation:* in Azerbaijan, Mongolia, Kyrgyzstan, Romania, Turkmenistan and Ukraine, the band 9 800-10 000 MHz is also allocated to the radionavigation service on a primary basis. (WRC-07)

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.

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.

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, Costa Rica, Cuba, El Salvador, Ecuador, Guatemala, Honduras, Mexico, Paraguay, the Netherlands Antilles, Peru and Uruguay, the band 10-10.45 GHz is also allocated to the fixed and mobile services on a primary basis. In Venezuela, the band 10-10.45 GHz is also allocated to the fixed service on a primary basis. (WRC-07)

5.481 *Additional allocation:* in Germany, Angola, Brazil, China, Costa Rica, Côte d'Ivoire, El Salvador, Ecuador, Spain, Guatemala, Hungary, Japan, Kenya, Morocco, Nigeria, Oman, Uzbekistan, Paraguay, Peru, the Dem. People's Rep. of Korea, Romania, Tanzania, Thailand and Uruguay, the band 10.45-10.5 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-07)

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)

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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), Costa Rica, 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, Romania, Tajikistan, Turkmenistan and Yemen, the 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-07)

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

5.484A The use of the bands 10.95-11.2 GHz (space-to-Earth), 11.45-11.7 GHz (space-to-Earth), 11.7-12.2 GHz (space-to-Earth) in Region 2, 12.2-12.75 GHz (space-to-Earth) in Region 3, 12.5-12.75 GHz (space-to-Earth) in Region 1, 13.75-14.5 GHz (Earth-to-space), 17.8-18.6 GHz (space-to-Earth), 19.7-20.2 GHz (space-to-Earth), 27.5-28.6 GHz (Earth-to-space), 29.5-30 GHz (Earth-to-space) by a non-geostationary-satellite system in the fixed-satellite service is subject to application of the provisions of No. **9.12** for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the fixed-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and No. **5.43A** does not apply. Non-geostationary-satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated. (WRC-2000)

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

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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 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.

5.491 (SUP - WRC-03)

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

Footnotes to International Frequency Allocation Table

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 $-111 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))}$ for all conditions and for all methods of modulation at the edge of the service area. (WRC-97)

5.494 *Additional allocation:* in Algeria, Angola, Saudi Arabia, Bahrain, Cameroon, the Central African Rep., Congo (Rep. of the), Côte d'Ivoire, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Gabon, Ghana, Guinea, Iraq, Israel, the Libyan Arab Jamahiriya, Jordan, Kuwait, Lebanon, Madagascar, Mali, Morocco, Mongolia, Nigeria, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, Somalia, Sudan, Chad, Togo and Yemen, the band 12.5-12.75 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-03)

5.495 *Additional allocation:* in Bosnia and Herzegovina, France, Greece, Liechtenstein, Monaco, Montenegro, Uganda, Romania, Serbia, Switzerland, Tanzania and Tunisia, the band 12.5-12.75 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis. (WRC-07)

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, India and Pakistan, the band 13.25-14 GHz is also allocated to the fixed service on a primary basis.

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

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-07)

5.501A The allocation of the band 13.4-13.75 GHz to the space research service on a primary basis is limited to active spaceborne sensors. Other uses of the band by the space research service are on a secondary basis. (WRC-97)

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

- –115 dB(W/(m² · 10 MHz)) for more than 1% of the time produced at 36 m above sea level at the low water mark, as officially recognized by the coastal State;
- –115 dB(W/(m² · 10 MHz)) for more than 1% of the time produced 3 m above ground at the border of the territory of an administration deploying or planning to deploy land mobile radars in this band, unless prior agreement has been obtained.

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

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operate on a secondary basis. Until those geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 cease to operate in this band:

- in the band 13.77-13.78 GHz, the e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in geostationary-satellite orbit shall not exceed:
 - i) $4.7D + 28 \text{ dB(W/40 kHz)}$, where D is the fixed-satellite service earth station antenna diameter (m) for antenna diameters equal to or greater than 1.2 m and less than 4.5 m;
 - ii) $49.2 + 20 \log(D/4.5) \text{ dB(W/40 kHz)}$, where D is the fixed-satellite service earth station antenna diameter (m) for antenna diameters equal to or greater than 4.5 m and less than 31.9 m;
 - iii) $66.2 \text{ dB(W/40 kHz)}$ for any fixed-satellite service earth station for antenna diameters (m) equal to or greater than 31.9 m;
 - iv) 56.2 dB(W/4 kHz) for narrow-band (less than 40 kHz of necessary bandwidth) fixed-satellite service earth station emissions from any fixed-satellite service earth station having an antenna diameter of 4.5 m or greater;
- the e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in non-geostationary-satellite orbit shall not exceed 51 dBW in the 6 MHz band from 13.772 to 13.778 GHz.

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

5.503A (SUP - 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 band 14-14.5 GHz shall comply with the provisions of Annex 1, Part C of Recommendation ITU-R M.1643, with respect to any radio astronomy station performing

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observations in the 14.47-14.5 GHz band located on the territory of Spain, France, India, Italy, the United Kingdom and South Africa. (WRC-03)

5.504C In the band 14-14.25 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, Botswana, Côte d'Ivoire, Egypt, Guinea, India, Iran (Islamic Republic of), Kuwait, Lesotho, Nigeria, Oman, the Syrian Arab Republic and Tunisia by any aircraft earth station in the aeronautical mobile-satellite service shall not exceed the limits given in Annex 1, Part B of Recommendation ITU-R M.1643, unless otherwise specifically agreed by the affected administration(s). The provisions of this footnote in no way derogate the obligations of the aeronautical mobile-satellite service to operate as a secondary service in accordance with No. **5.29**. (WRC-03)

5.505 *Additional allocation:* in Algeria, Angola, Saudi Arabia, Bahrain, Botswana, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Korea (Rep. of), Egypt, the United Arab Emirates, Gabon, Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lesotho, Lebanon, Malaysia, Mali, Morocco, Mauritania, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, Swaziland, Tanzania, Chad, Viet Nam and Yemen, the band 14-14.3 GHz is also allocated to the fixed service on a primary basis. (WRC-07)

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, Greece and Malta, within the minimum distance given in Resolution **902 (WRC-03)** from these countries. (WRC-03)

5.507 Not used.

5.508 *Additional allocation:* in Germany, Bosnia and Herzegovina, France, Italy, Libyan Arab Jamahiriya, The Former Yugoslav Rep. of Macedonia and the United

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Kingdom, the band 14.25-14.3 GHz is also allocated to the fixed service on a primary basis. (WRC-07)

5.508A In the band 14.25-14.3 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, Botswana, China, Côte d'Ivoire, Egypt, France, Guinea, India, Iran (Islamic Republic of), Italy, Kuwait, Lesotho, Nigeria, Oman, the Syrian Arab Republic, the United Kingdom and Tunisia by any aircraft earth station in the aeronautical mobile-satellite service shall not exceed the limits given in Annex 1, Part B of Recommendation ITU-R M.1643, unless otherwise specifically agreed by the affected administration(s). The provisions of this footnote in no way derogate the obligations of the aeronautical mobile-satellite service to operate as a secondary service in accordance with No. **5.29**. (WRC-03)

5.509 *SUP*

5.509A In the band 14.3-14.5 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, Botswana, Cameroon, China, Côte d'Ivoire, Egypt, France, Gabon, Guinea, India, Iran (Islamic Republic of), Italy, Kuwait, Lesotho, Morocco, Nigeria, Oman, the Syrian Arab Republic, the United Kingdom, Sri Lanka, Tunisia and Viet Nam by any aircraft earth station in the aeronautical mobile-satellite service shall not exceed the limits given in Annex 1, Part B of Recommendation ITU-R M.1643, unless otherwise specifically agreed by the affected administration(s). The provisions of this footnote in no way derogate the obligations of the aeronautical mobile-satellite service to operate as a secondary service in accordance with No. **5.29**. (WRC-03)

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

5.511 *Additional allocation:* in Saudi Arabia, Bahrain, Bosnia and Herzegovina, Cameroon, Egypt, the United Arab Emirates, Guinea, Iran (Islamic Republic of), Iraq, Israel, the Libyan Arab Jamahiriya, Kuwait, Lebanon, Pakistan, Qatar, the Syrian Arab Republic and Somalia, the band 15.35-15.4 GHz is also allocated to the fixed and mobile services on a secondary basis. (WRC-07)

5.511A The band 15.43-15.63 GHz is also allocated to the fixed-satellite service (space-to-Earth) on a primary basis. Use of the band 15.43-15.63 GHz by the fixed-satellite service (space-to-Earth and Earth-to-space) is limited to feeder links of non-geostationary systems in the mobile-satellite service, subject to coordination under No. **9.11A**. The use of the frequency band 15.43-15.63 GHz by the fixed-satellite service (space-to-Earth) is limited to feeder links of non-geostationary systems in the mobile-satellite service for which advance publication information has been received by the Bureau prior to 2 June 2000. In the space-to-Earth direction, the minimum earth station elevation angle above and gain towards the local horizontal plane and the minimum

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coordination distances to protect an earth station from harmful interference shall be in accordance with Recommendation ITU-R S.1341. In order to protect the radio astronomy service in the band 15.35-15.4 GHz, the aggregate power flux-density radiated in the 15.35-15.4 GHz band by all the space stations within any feeder-link of a non-geostationary system in the mobile-satellite service (space-to-Earth) operating in the 15.43-15.63 GHz band shall not exceed the level of $-156 \text{ dB(W/m}^2\text{)}$ in a 50 MHz bandwidth, into any radio astronomy observatory site for more than 2% of the time. (WRC-2000)

5.511B (SUP - WRC-97)

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

5.511D Fixed-satellite service systems for which complete information for advance publication has been received by the Bureau by 21 November 1997 may operate in the bands 15.4-15.43 GHz and 15.63-15.7 GHz in the space-to-Earth direction and 15.63-15.65 GHz in the Earth-to-space direction. In the bands 15.4-15.43 GHz and 15.65-15.7 GHz, emissions from a non-geostationary space station shall not exceed the power flux-density limits at the Earth's surface of $-146 \text{ dB(W/(m}^2 \cdot \text{MHz))}$ for any angle of arrival. In the band 15.63-15.65 GHz, where an administration plans emissions from a non-geostationary space station that exceed $-146 \text{ dB(W/(m}^2 \cdot \text{MHz))}$ for any angle of arrival, it shall coordinate under No. **9.11A** with the affected administrations. Stations in the fixed-satellite service operating in the band 15.63-15.65 GHz in the Earth-to-space direction shall not cause harmful interference to stations in the aeronautical radionavigation service (No. **4.10** applies). (WRC-97)

5.512 *Additional allocation:* in Algeria, Angola, Saudi Arabia, Austria, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, Congo (Rep. of the), Costa Rica, Egypt, El Salvador, the United Arab Emirates, Eritrea, Finland, Guatemala, India, Indonesia, Iran (Islamic Republic of), the Libyan Arab Jamahiriya, Jordan, Kenya, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Montenegro, Mozambique, Nepal, Nicaragua, Oman, Pakistan, Qatar, Syrian Arab Republic, Serbia, Singapore, Somalia, Sudan, Swaziland, Tanzania, Chad, Togo and Yemen, the band 15.7-17.3 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-07)

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

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protection from or cause harmful interference to services operating in accordance with the Table in countries other than those included in No. **5.512**.

5.513A Spaceborne active sensors operating in the band 17.2-17.3 GHz shall not cause harmful interference to, or constrain the development of, the radiolocation and other services allocated on a primary basis. (WRC-97)

5.514 *Additional allocation:* in Algeria, Angola, Saudi Arabia, Bahrain, Bangladesh, Cameroon, Costa Rica, El Salvador, the United Arab Emirates, Guatemala, India, Iran (Islamic Republic of), Iraq, Israel, Italy, the Libyan Arab Jamahiriya, Japan, Jordan, Kuwait, Lithuania, Nepal, Nicaragua, Nigeria, Oman, Uzbekistan, Pakistan, Qatar, Kyrgyzstan and Sudan, the band 17.3-17.7 GHz is also allocated to the fixed and mobile services on a secondary basis. The power limits given in Nos. **21.3** and **21.5** shall apply. (WRC-07)

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)

Footnotes to International Frequency Allocation Table

5.516B The following bands are identified for use by high-density applications in the fixed-satellite service:

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

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

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)

Footnotes to International Frequency Allocation Table

5.518 *SUP*

5.519 *Additional allocation:* the bands 18.0-18.3 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 Germany, Denmark, the United Arab Emirates and Greece, the band 18.1-18.4 GHz is allocated to the fixed, fixed-satellite (space-to-Earth) and mobile services on a primary basis (see No. **5.33**). The provisions of No. **5.519** also apply. (WRC-03)

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)

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

Footnotes to International Frequency Allocation Table

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, Angola, 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, Tanzania, Chad, Togo and Tunisia, the band 19.7-21.2 GHz is also allocated to the fixed and mobile services on a primary basis. This additional use shall not impose any limitation on the power flux-density of space stations in the fixed-satellite service in the band 19.7-21.2 GHz and of space stations in the mobile-satellite service in the band 19.7-20.2 GHz where the allocation to the mobile-satellite service is on a primary basis in the latter band. (WRC-07)

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

Footnotes to International Frequency Allocation Table

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.

5.528 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 In Regions 1 and 3, the use of the band 21.4-22 GHz by the broadcasting-satellite service is subject to the provisions of Resolution **525 (Rev.WRC-07)**. (WRC-07)

5.531 *Additional allocation:* in Japan, the band 21.4-22 GHz is also allocated to the broadcasting service on a primary basis.

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

5.533 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)

5.535 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.

Footnotes to International Frequency Allocation Table

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.

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 Recommendations ITU-R SA.1278 and ITU-R SA.1625, respectively. (WRC-03)

5.536B In Germany, Saudi Arabia, Austria, Belgium, Brazil, Bulgaria, China, Korea (Rep. of), Denmark, Egypt, United Arab Emirates, Spain, Estonia, Finland, France, Hungary, India, Iran (Islamic Republic of), Ireland, Israel, Italy, the Libyan Arab Jamahiriya, Jordan, Kenya, Kuwait, Lebanon, Liechtenstein, Lithuania, Moldova, Norway, Oman, Uganda, Pakistan, the Philippines, Poland, Portugal, the Syrian Arab Republic, Dem. People's Rep. of Korea, Slovakia, the Czech Rep., Romania, the United Kingdom, Singapore, Sweden, Switzerland, Tanzania, Turkey, Viet Nam and Zimbabwe, earth stations operating in the Earth exploration-satellite service in the band 25.5-27 GHz shall not claim protection from, or constrain the use and deployment of, stations of the fixed and mobile services. (WRC-07)

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, Tanzania, Tunisia, Uruguay, Zambia and Zimbabwe, earth stations operating in the space research service in the band 25.5-27 GHz shall not claim protection from, or constrain the use and deployment of, stations of the fixed and mobile services. (WRC-03)

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**.

Footnotes to International Frequency Allocation Table

5.537A In Bhutan, Cameroon, Korea (Rep. of), the Russian Federation, India, Indonesia, Iran (Islamic Republic of), Japan, Kazakhstan, Lesotho, Malaysia, Maldives, Mongolia, Myanmar, Uzbekistan, Pakistan, the Philippines, Kyrgyzstan, the Dem. People's Rep. of Korea, Sri Lanka, Thailand and Viet Nam, the allocation to the fixed service in the band 27.9-28.2 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-07)**. (WRC-07)

5.538 *Additional allocation:* the bands 27.500-27.501 GHz and 29.999-30.000 GHz are also allocated to the fixed-satellite service (space-to-Earth) on a primary basis for the beacon transmissions intended for up-link power control. Such space-to-Earth transmissions shall not exceed an equivalent isotropically radiated power (e.i.r.p.) of +10 dBW in the direction of adjacent satellites on the geostationary-satellite orbit. (WRC-07)

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

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

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

5.541A Feeder links of non-geostationary networks in the mobile-satellite service and geostationary networks in the fixed-satellite service operating in the band 29.1-29.5 GHz (Earth-to-space) shall employ uplink adaptive power control or other methods of fade compensation, such that the earth station transmissions shall be conducted at the power level required to meet the desired link performance while reducing the level of mutual interference between both networks. These methods shall apply to networks for which Appendix 4 coordination information is considered as having been received by the Bureau after 17 May 1996 and until they are changed by a future competent world radiocommunication conference. Administrations submitting Appendix 4 information for coordination before this date are encouraged to utilize these techniques to the extent practicable. (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,

Footnotes to International Frequency Allocation Table

Malaysia, Mali, Morocco, Mauritania, Nepal, Pakistan, Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Somalia, Sudan, Sri Lanka and Chad, the band 29.5-31 GHz is also allocated to the fixed and mobile services on a secondary basis. The power limits specified in Nos. **21.3** and **21.5** shall apply. (WRC-07)

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 In Bhutan, Cameroon, Korea (Rep. of), the Russian Federation, India, Indonesia, Iran (Islamic Republic of), Japan, Kazakhstan, Lesotho, Malaysia, Maldives, Mongolia, Myanmar, Uzbekistan, Pakistan, the Philippines, Kyrgyzstan, the Dem. People's Rep. of Korea, Sri Lanka, Thailand and Viet Nam, the allocation to the fixed service in the band 31-31.3 GHz may also be used by systems using high altitude platform stations (HAPS) in the ground-to-HAPS direction. The use of the band 31-31.3 GHz by systems using HAPS is limited to the territory of the countries listed above and shall not cause harmful interference to, nor claim protection from, other types of fixed-service systems, systems in the mobile service and systems operated under No. **5.545**. Furthermore, the development of these services shall not be constrained by HAPS. Systems using HAPS in the band 31-31.3 GHz shall not cause harmful interference to the radio astronomy service having a primary allocation in the band 31.3-31.8 GHz, taking into account the protection criterion as given in Recommendation ITU-R RA.769. In order to ensure the protection of satellite passive services, the level of unwanted power density into a HAPS ground station antenna in the band 31.3-31.8 GHz shall be limited to -106 dB(W/MHz) under clear-sky conditions, and may be increased up to -100 dB(W/MHz) under rainy conditions to mitigate fading due to rain, provided the effective impact on the passive satellite does not exceed the impact under clear-sky conditions. See Resolution **145 (Rev.WRC-07)**. (WRC-07)

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, Belarus, Egypt, the United Arab Emirates, Spain, Estonia, the Russian Federation, Georgia, Hungary, Iran (Islamic Republic of), Israel, Jordan, Lebanon, Moldova, Mongolia, Uzbekistan, Poland, the Syrian Arab Republic, Kyrgyzstan, Romania, the United Kingdom, South Africa, Tajikistan, Turkmenistan and Turkey, the allocation of the 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-07)

Footnotes to International Frequency Allocation Table

5.547 The bands 31.8-33.4 GHz, 37-40 GHz, 40.5-43.5 GHz, 51.4-52.6 GHz, 55.78-59 GHz and 64-66 GHz are available for high-density applications in the fixed service (see Resolution **75 (WRC-2000)**). Administrations should take this into account when considering regulatory provisions in relation to these bands. Because of the potential deployment of high-density applications in the fixed-satellite service in the bands 39.5-40 GHz and 40.5-42 GHz (see No. **5.516B**), administrations should further take into account potential constraints to high-density applications in the fixed service, as appropriate. (WRC-07)

5.547A Administrations should take practical measures to minimize the potential interference between stations in the fixed service and airborne stations in the radionavigation service in the 31.8-33.4 GHz band, taking into account the operational needs of the airborne radar systems. (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, the Libyan Arab Jamahiriya, Jordan, Kuwait, Lebanon, Malaysia, Mali, Malta, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, Singapore, Somalia, Sudan, Sri Lanka, Togo, Tunisia and Yemen, the band 33.4-36 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-03)

Footnotes to International Frequency Allocation Table

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 $-73.3 \text{ dB(W/m}^2\text{)}$ in this band. (WRC-03)

5.550 *Different category of service:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Mongolia, 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-07)

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)

5.551 (SUP - WRC-97)

5.551A (SUP - WRC-03)

5.551AA (SUP - WRC-03)

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

$-230 \text{ dB(W/m}^2\text{)}$ in 1 GHz and $-246 \text{ dB(W/m}^2\text{)}$ 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

Footnotes to International Frequency Allocation Table

–209 dB(W/m²) in any 500 kHz of the 42.5-43.5 GHz band at the site of any radio astronomy station registered as a very long baseline interferometry station.

These epfd values shall be evaluated using the methodology given in Recommendation ITU-R S.1586-1 and the reference antenna pattern and the maximum gain of an antenna in the radio astronomy service given in Recommendation ITU-R RA.1631 and shall apply over the whole sky and for elevation angles higher than the minimum operating angle θ_{min} of the radiotelescope (for which a default value of 5° should be adopted in the absence of notified information).

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

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

Other radio astronomy stations notified after these dates may seek an agreement with administrations that have authorized the space stations. In Region 2, Resolution **743 (WRC-03)** shall apply. The limits in this footnote may be exceeded at the site of a radio astronomy station of any country whose administration so agreed. (WRC-07)

5.551I The power flux-density in the band 42.5-43.5 GHz produced by any geostationary space station in the fixed-satellite service (space-to-Earth), or the broadcasting-satellite service (space-to-Earth) operating in the 42-42.5 GHz band, shall not exceed the following values at the site of any radio astronomy station:

–137 dB(W/m²) in 1 GHz and –153 dB(W/m²) in any 500 kHz of the 42.5-43.5 GHz band at the site of any radio astronomy station registered as a single-dish telescope; and

–116 dB(W/m²) in any 500 kHz of the 42.5-43.5 GHz band at the site of any radio astronomy station registered as a very long baseline interferometry station.

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

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

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

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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 bands 47.2-47.5 GHz and 47.9-48.2 GHz is designated for use by high altitude platform stations. The use of the bands 47.2-47.5 GHz and 47.9-48.2 GHz is subject to the provisions of Resolution **122 (Rev.WRC-07)**. (WRC-07)

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)

5.554 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 $-151.8 \text{ dB(W/m}^2\text{)}$ in any 500 kHz band at the site of any radio astronomy station. (WRC-03)

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)

Footnotes to International Frequency Allocation Table

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 $-147 \text{ dB(W/(m}^2 \cdot 100 \text{ MHz))}$ 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 $-147 \text{ dB(W/(m}^2 \cdot 100 \text{ MHz))}$ 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 The band 75.5-76 GHz is also allocated to the amateur and amateur-satellite services on a primary basis until the year 2006. (WRC-2000)

5.560 In the band 78-79 GHz radars located on space stations may be operated on a primary basis in the Earth exploration-satellite service and in the space research service.

5.561 In the band 74-76 GHz, stations in the fixed, mobile and broadcasting services shall not cause harmful interference to stations of the fixed-satellite service or stations of the broadcasting-satellite service operating in accordance with the decisions of

Footnotes to International Frequency Allocation Table

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, 155.5-158.5 GHz and 217-226 GHz, the use of this allocation is limited to space-based radio astronomy only. (WRC-2000)

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 $-148 \text{ dB(W/(m}^2 \cdot \text{MHz))}$ for all angles of arrival. (WRC-2000)

5.562D *Additional allocation:* In Korea (Rep. of), the bands 128-130 GHz, 171-171.6 GHz, 172.2-172.8 GHz and 173.3-174 GHz are also allocated to the radio astronomy service on a primary basis until 2015. (WRC-2000)

5.562E The allocation to the Earth exploration-satellite service (active) is limited to the band 133.5-134 GHz. (WRC-2000)

5.562F In the band 155.5-158.5 GHz, the allocation to the Earth exploration-satellite (passive) and space research (passive) services shall terminate on 1 January 2018. (WRC-2000)

5.562G The date of entry into force of the allocation to the fixed and mobile services in the band 155.5-158.5 GHz shall be 1 January 2018. (WRC-2000)

Footnotes to International Frequency Allocation Table

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 $-144 \text{ dB(W/(m}^2 \cdot \text{MHz))}$ 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)

5.565 The frequency band 275-1 000 GHz may be used by administrations for experimentation with, and development of, various active and passive services. In this band a need has been identified for the following spectral line measurements for passive services:

- radio astronomy service: 275-323 GHz, 327-371 GHz, 388-424 GHz, 426-442 GHz, 453-510 GHz, 623-711 GHz, 795-909 GHz and 926-945 GHz;
- Earth exploration-satellite service (passive) and space research service (passive): 275-277 GHz, 294-306 GHz, 316-334 GHz, 342-349 GHz, 363-365 GHz, 371-389 GHz, 416-434 GHz, 442-444 GHz, 496-506 GHz, 546-568 GHz, 624-629 GHz, 634-654 GHz, 659-661 GHz, 684-692 GHz, 730-732 GHz, 851-853 GHz and 951-956 GHz.

Future research in this largely unexplored spectral region may yield additional spectral lines and continuum bands of interest to the passive services. Administrations are urged to take all practicable steps to protect these passive services from harmful interference until the date when the allocation Table is established in the above-mentioned frequency band. (WRC-2000)

Acharya Sir Jagadish Chandra Bose

1858-1937



He pioneered the investigation of radio and microwave optics. IEEE named him one of the fathers of radio science. Over hundred years ago, He presented his research carried out in Calcutta at millimeter wavelengths. He used waveguides, horn antennas, dielectric lenses, various polarizers and even semiconductors at frequencies as high as 60 GHz.

**INDIA REMARKS
IN THE
NATIONAL FREQUENCY ALLOCATION TABLE**

India Remarks in the National Frequency Allocation Table

- IND01 Use of very low power devices, in frequency band 50-200 kHz on non interference, non protection and non exclusive basis has been exempted from licensing requirement. (see also GSR 90(E) dated 10.02.2009)
- IND02 Use of very low power devices, like tyre pressure indicator systems for use by airlines during all phases of flight, vehicle security system other low power devices, in frequency band 125-135 kHz on non interference, non protection and non exclusive basis has been exempted from licensing requirement. (see also GSR 90(E) dated 10.02.2009).
- IND03 Freq. spots 101.4, 121.6, and 145.7 kHz have been earmarked for cable locator systems
- IND04 The following frequencies are earmarked for Cordless Telephones:
Base unit: 1610, 1640, 1675, 1690 kHz, 43.720, 43.740, 43.820, 43.840, 43.920, 43.960, 44.120, 44.160, 44.180, 44.200, 44.320, 44.360, 44.400, 44.460, 44.480, 46.610, 46.630, 46.670, 46.675, 46.710, 46.725, 46.730, 46.770, 46.775, 46.825, 46.830, 46.870, 46.930 and 46.970 MHz.

Remote Unit: 26.375, 26.475, 26.575, 26.625, 48.760, 48.840, 48.860, 48.920, 49.020, 49.080, 49.100, 49.160, 49.200, 49.240, 49.280, 49.360, 49.400, 49.460, 49.500, 49.670, 49.770, 49.830, 49.845, 49.850, 49.860, 49.875, 49.890, 49.930, 49.970, 49.90, 150.350, 150.750, 150.850 and 150.950 MHz.
- IND05 Amateur Service is permitted in the following bands:
1820-1860 kHz
3500-3700 kHz
3890-3900 kHz
7000-7200 kHz
14000-14350 kHz
18068-18168 kHz
21000-21450 kHz
24890-24990 kHz
28000-29700 kHz
50-54 MHz
144-146 MHz
434-438 MHz
- IND06 The frequency spots 2010.4 kHz and 2025 kHz are earmarked for Fishing vessels.
- IND07 The frequency spots 3213, 5218, 13862.4 kHz, 73.675, 79.025, 159.55, 436.525 MHz are earmarked for demonstration of equipments on non interference, non protection and non exclusive basis. In addition, appropriate channels for short-term demonstration of equipment in other frequency bands may be considered on case-by-case basis, on non interference, non protection basis.
- IND08 The frequency spots 3698 and 5883 kHz are earmarked for shipping industry.

India Remarks in the National Frequency Allocation Table

IND09	The frequency spots 8268 & 12361.4 kHz, 156.375, 156.475, 156.575, 156.675 & 156.850 MHz are earmarked for port operations (from shore to ship).
IND 9A	Use of very low power radio frequency devices for indoor applications in the frequency band 13553 -13567 kHz has been exempted from licensing requirements on non interference, non protection and non exclusive basis. (See also GSR No. 884(E) dated 4.10.2008)
IND10	Use of wireless equipments in the frequency band 26.957-27.283 MHz, with a maximum Effective Radiated Power (ERP) of 5 Watts on interference. non protection and non exclusive basis has been exempted from licensing requirements. (see also GSR no 533 (E)dated 12.08.2005 and GSR no 35 (E)dated 10.01.2007
IND11	The frequency spots 36.5, 36.7, 37.1, 37.9, 160.9 & 161.8 MHz are earmarked for Radio microphones.
IND12	The requirement of Fixed/Mobile services in the band 54-68 MHz may be considered on case-by-case basis.
IND13	The requirement of FM broadcasting will be considered in the frequency band 87-91.5 MHz and 95-100 MHz on case-by-case basis.
IND14	The frequency band 91.5-95 MHz is earmarked for FM broadcasting.
IND15	Frequency spots in the frequency bands 88-100 MHz and 103.8-108 MHz for private FM broadcasting have been specifically identified.
IND16	The frequency spots 143.950, 150.175 & 150.9 MHz are earmarked for Car rallies/Sports activities.
IND17	The requirement of wide area radio paging systems will be considered in the frequency band 146.45-147.95, 151.5-153, 164.5-166.5 and 171-173 MHz. The frequency spots 146.5625, 146.6125, 146.6375, 151.6125, 151.6625, 151.6875, 165.3625 (Delhi only), 165.4625, 165.6625, 166.1125 166.1625 (except Delhi), 166.2375 & 166.2875 (Mumbai only), 166.3125, 166.3625, 166.3875, 166.4375, 172.8635, 172.8875 and 172.9375 MHz are earmarked for wide area radio paging only. The use of frequencies in the frequency band 151.5-153 MHz including the frequencies earmarked above in this band have appropriate geographical restrictions of operation around Giant Meter Radio telescope (GMRT), Pune.
IND18	Following frequencies are earmarked for construction and allied industries including remote control of EOT: 148.5, 148.575, 166.875, 167.725 MHz with a channel bandwidth of 10 KHz. The maximum RF transmitter power for EOT cranes is 1 mW.
IND19	Use of low power equipments for the remote control of cranes using frequencies 335.7125, 335.7375, 335.7625, 335.7875, 335.8125 and 335.8375 MHz, with a channel bandwidth of 10 KHz and maximum transmit power of 1 mW has been exempted from licensing requirement. (see also GSR 34(E) dated

India Remarks in the National Frequency Allocation Table

10.1.2007 and GSR 532 (E) dated 12.8.2005

- IND20 The requirement of onsite radio paging systems and talkback facility will be considered in the frequency band 150.05-151.5 MHz. The frequency spots 150.3, 150.9 and 151.07 MHz are earmarked for onsite paging and 151.15, 151.55 and 150.6 MHz for talkback facility for such systems.
- IND21 The frequency spots 150.525, 151.250 and 166.950 MHz are earmarked for purposes such as O.B. Vans & film shooting.
- IND22 Requirement of fixed and mobile services including those of wireless telemetry seismic systems will be considered in the frequency band 174-230 MHz on a case-by-case basis. Specific requirement of wind profiler radars in the frequency band 200-220 MHz may also be coordinated on a case-by-case basis.
- IND23 Digital Audio Broadcasting (DAB) may be considered in the frequency band 174-230 MHz initially in the four Metro cities and further introduction of DAB could be considered on a case-by-case basis taking into account interference potentiality aspects.
- IND24 Protection requirements of radio astronomy service in the frequency band 230-235 MHz within the appropriate coordination zone around GMRT, Pune may be borne in mind while considering spot frequencies for other services.
- IND25 The requirement for wide area Radio Paging systems, two way radio systems including voice paging systems may be considered in the frequency band 276-280 MHz with talk back in the frequency band 917-921 MHz up to a maximum of 1 MHz in each band.
- IND26 The requirement of short-range radio may be considered in the frequency band 350-351 MHz.
The frequency spots 350.1625, 350.1750, 350.1875, 350.2000, 350.2125, 350.2250, 350.2375, 350.2500, 350.2625, 350.2750, 350.2875, 350.3000, 350.3125, 350.3250, 350.3375, 350.3500, 350.3625, 350.3750, 350.3875, 350.4000, 350.4125, 350.4250, 350.4375, 350.45, 350.4625, 350.4750, 350.4875, 350.5000, 350.5125, 350.5250 and 350.5375 MHz are earmarked for this purpose
- IND27 Requirements of public mobile radio trunked systems (PMRTS) and Captive mobile radio trunked systems will be considered in the frequency band 338-340 MHz paired with 348-350 MHz and its additional requirements may be considered in the frequency bands 336-338 MHz paired with 346-348 MHz on a case-by-case basis.
- IND28 The requirement of digital radio trunked service for captive networks will also be considered in the frequency band 351-356 MHz paired with 361-366 MHz and 356-358 MHz paired with 366-368 MHz on case-by-case basis.
- IND29 Requirements for digital radio trunked systems may be considered in the frequency bands 380-389.9 MHz paired with 390-399.9 MHz as also in 410-430

India Remarks in the National Frequency Allocation Table

	MHz on a case-by-case basis.
IND30	Requirement of rural communications may be considered for coordination in the frequency band 368-380 MHz on case-by-case basis.
IND31	Use of very low power remote cardiac monitoring RF wireless medical devices, medical implant communication/ telemetry systems and other such medical RF wireless devices in frequency band 402-405 MHz using a maximum radiated power of 25 micro watt or less with channel emission band width with in 300 kHz has been exempted from licensing requirement. (See also GSR no 673 (E) dated 23.9.2008)
IND32	Requirements of digital seismic telemetry upto 1.5 MHz bandwidth may be met in the frequency band 406.1-450 MHz on case-by-case basis.
IND33	Low power short range devices may be considered in the frequency band 433-434 MHz with a power output of 10 mW with a channel bandwidth of 10 kHz on non-interference, non protection and non- exclusive basis.
IND34	The frequency spots 441.6 and 466.8 MHz may be considered for Anti Collision Device (ACD) applications on case-by-case basis.
IND35	The requirement of IMT applications in the frequency band 450.5-457.5 MHz paired with 460.5-467.5 MHz may be considered for coordination on a case-by-case basis subject to its availability.
IND36	Requirements of fixed and mobile services will be considered in the frequency band 470-520 MHz and 520-585 MHz on case-by-case basis.
IND37	The requirement of Digital Broadcasting Services including Mobile TV may be considered in the frequency band 585-698 MHz subject to coordination on case-by-case basis.
IND38	The requirement for IMT and Broadband Wireless Access may be considered in the frequency band 698-806 MHz subject to coordination on a case-by-case basis.
IND39	Requirements of broadcasting and mobile satellite services except aeronautical mobile satellite(R) service in the frequency band 806-890 MHz may be considered for co-ordination on case-by-case basis.
IND40	Frequency band 806-811 MHz paired with 851-856 MHz has been earmarked for mobile trunked radio system to be used predominantly for captive networks. The requirements for public mobile radio trunked systems (PMRTS), which cannot be met in other bands, may also be considered in this band.
IND41	Frequency bands 811-814 MHz paired with 856-859 MHz has been earmarked for spectrum efficient digital public mobile radio trunked systems (PMRTS) and captive mobile radio trunked systems.
IND42	Frequency band 814-819 MHz paired with 859-864 MHz has been earmarked

India Remarks in the National Frequency Allocation Table

for mobile radio trunked systems to be used predominantly for public mobile radio trunked systems (PMRTS).

- IND43 Requirement of public mobile radio trunked systems (PMRTS) and captive mobile radio trunked systems may also be considered, as appropriate, in the frequency bands 819-824 MHz paired with 864-869 MHz.
- IND44 Use of low power RFID equipments or any other low power wireless devices or equipments in the frequency band 865-867 MHz with a maximum transmitter power of 1 Watt (4 Watts Effective Radiated Power) with 200 kHz carrier band width has been exempted from licensing requirement. (see also GSR 564 (E) dated 30 July 2008)
- IND45 Frequency spots 849.0125/933.0125, 849.0250/933.0250, 849.0375/933.0375, 849.0500/933.0500, 849.0625/933.0625, 849.0750/933.0750, 849.0875/933.0875, 849.1000/933.1000, 849.1125/933.1125, 849.1250/933.1250 MHz have been earmarked for supervisory control and data acquisition system (SCADA) except in a few specific locations.
- IND46 Frequency band 824-844 MHz paired with 869-889 MHz has been earmarked for cellular telecommunication systems, including WLL
- IND47 Frequency band 890-902.5MHz paired with 935-947.5MHz has been earmarked for cellular telecom systems.
- IND48 Additional requirements for cellular telecom systems in the frequency band 902.5-915 MHz paired with 947.5-960 MHz may be coordinated on case-by-case basis.
- IND49 Certain frequency spots in the frequency bands 902.5-915 MHz and 947.5-960 MHz may be considered for train control & mobile train radio systems for specific locations on a case-by-case basis.
- IND 50 Requirements for Micro cellular low powered, telecommunication systems with maximum EIRP up to 4 Watts, FDD access techniques may be considered at specific locations for indigenously developed systems and technology, in a small chunk, in the frequency band 900 MHz presently used by existing wireless users of captive systems subject to co-ordination on case-by-case basis.
- IND51 In relation to specific problem of harmful interference from wireless access systems (fixed/mobile) for telecommunication services into cellular based networks, appropriate measures of incorporating filters in the wireless access systems (fixed/mobile) for telecommunication services shall be taken. Appropriate measures of incorporating filters in cellular based networks for blocking signals leaking through the extended cellular frequency bands shall also be taken.

India Remarks in the National Frequency Allocation Table

- IND52 Certain frequency spots in the frequency band 926 – 926.5 MHz may be considered for very low power cordless telephone systems. The use of this band for such purpose is on the basis of non-interference, non-protection and non-exclusiveness.
- IND53 The requirement of spectrum in the frequency band 1427 – 1535 MHz may be considered for experimental/ trial/ pilot-study purposes for indigenously developed technologies for point-to-point backhaul and point-to-multipoint access systems subject to coordination on case-to-case basis.
- IND54 The requirements of cellular telecom systems in the frequency band 1700-2000 MHz, appropriate amount of spectrum in the frequency band 1710-1785 MHz paired with 1805-1880 may be coordinated on a case-by-case basis.
- IND55 Requirements for Micro cellular low powered telecommunication systems with maximum EIRP up to 4 Watts, FDD access techniques may be considered at specific locations for indigenously developed systems and technology, in a small chunk, in the frequency band 1800 MHz presently used by existing wireless users of captive systems subject to co-ordination on case-by-case basis.
- IND56 The requirement of cellular telecommunication systems in the frequency band 1785-1805 MHz may be considered for coordination on a case-by-case basis subject to availability of spectrum in the band and after ensuring compatibility for coexistence with the systems in the frequency bands 1710-1785 MHz paired with 1805-1880 MHz
- IND57 Requirements of micro cellular wireless access systems (fixed/mobile) based on TDD access techniques, especially indigenously developed technologies and low power digital cordless telephones systems and devices with maximum transmit power of 250 mW, capable of coexistence with multiple operators may be considered in the frequency band 1880-1900 MHz may be considered subject to coordination on a case-by-case basis.
- IND58 The frequency band 1900-1910 MHz paired with 1980-1990 MHz may be considered for cellular telecom systems for coordination on a case-by-case basis subject to availability of spectrum in these bands and after ensuring compatibility for coexistence with the systems operating in the frequency bands 1920-1980 MHz paired with 2110-2170 MHz.
- IND59 Requirements of IMT (3G) applications in the frequency bands 1920-1980 MHz paired with 2110-2170 MHz (FDD mode) and 2010-2025 MHz (TDD mode) may be coordinated with existing users depending upon the availability, as far as possible.
- IND60 Requirement of Deep Space Research operations in the frequency bands 2110 - 2120 MHz (uplink) and 2290-2300 MHz (downlink) may be considered at few

India Remarks in the National Frequency Allocation Table

locations.

- IND61 The requirement of IMT applications including Broadband Wireless Access (BWA) in the frequency band 2300-2400 MHz may be considered for coordination on a case-by-case basis
- IND62 Use of low power equipments in the frequency band 2.4-2.4835 GHz using a maximum transmitter output power of 1 Watt (4 Watts Effective Radiated Power) with spectrum spread of 10 MHz or higher has been exempted from licensing requirement (see also GSR 45E dated 28.1.2005)
- IND63 INSAT system uses the frequency band 2535-2655 MHz for Broadcasting Satellite Service (BSS) downlink providing applications like Radio Networking, Cyclone Warning Dissemination, Meteorological Data Dissemination, Satellite Time and Frequency Dissemination and is planned to provide advanced application like Digital Multimedia. Requirements of IMT applications including Broadband Wireless Access (BWA) may be considered for coordination on a case-by-case basis in this band.
- IND64 Requirements for Microwave Multipoint Distribution System (MMDS) including broadband applications in the frequency band 2.7-2.9 GHz may be considered on case-by-case basis, while ensuring protection to Aeronautical Radio navigation service and Radio location service. International recognition for such purpose is not affordable.
- IND65 Requirements of Broadband Wireless Access (BWA) applications may be considered in the frequency band 3.3 – 3.4 GHz on a case-by-case basis.
- IND66 The requirement of IMT including Broadband Wireless Access (BWA) in the frequency band 3400-3600 MHz may be considered for coordination on a case-by-case basis subject to availability of spectrum in this band and appropriate protection from out of band emission to the networks in the FSS in the frequency band 3600- 4200 MHz.
- IND 67 Use of low power equipments for wireless access systems including Radio Local Area Networks, in the frequency band 5.150-5.350 GHz and 5.725 – 5.875 GHz using a maximum mean Effective Isotropic Radiated Power of 200 mW and a maximum mean Effective Isotropic Radiated Power density of 10 mW/MHz in any 1 MHz bandwidth, for the indoor applications has been exempted from licensing requirement. (See also GSR No 46E dated 28.1.2005)
- IND68 Use of low power equipments for Wireless Access Systems including Radio Local Area Networks (RLAN), in the frequency band 5.150-5.250 GHz using a maximum mean Effective Isotropic Radiated Power of 200 mW and a maximum mean Effective Isotropic Radiated Power density of 10 mW/MHz in any 1 MHz bandwidth may be considered for outdoor applications also.
- IND69 Requirement of indoor and outdoor Wireless Access Systems including RLAN may be considered in the frequency band 5570-5725 MHz, with a maximum

India Remarks in the National Frequency Allocation Table

- mean eirp of 1W and a maximum mean eirp density of 50 mW/ MHz in any 1MHz band on a case-by-case basis.
- IND70 The requirement of very low power radio gadgets, radio toys, etc with maximum power of 100 Microwatts may be considered in the frequency band 5725-5875 MHz. Such use will be on the basis of non-interference, non-protection and non-exclusiveness.
- IND71 Use of low power Wireless Access Systems including RLAN and Dedicated Short Range Communications (DSRC) for Intelligent Transport Networks may be considered in the frequency band 5.725 to 5.825 GHz using a maximum transmitter output power of 1 Watt (4 Watts Effective Radiated Power) with spectrum spread of 10 MHz or higher on non interference non protection and non exclusive basis.
- IND72 Use of low power equipments in the frequency band 5.825 to 5.875 GHz using a maximum transmitter output power of 1 Watt (4 Watts Effective Radiated Power) with spectrum spread of 10 MHz or higher has been exempted from licensing requirements. (See also GSR no 38E dated 19.1.2007)
- IND73 The use of Ultra Wide Band (UWB) equipment may be considered in the frequency band 6.0-7.25 GHz with maximum mean EIRP density of -41 dBm/MHz in any 1 MHz bandwidth with bandwidth of 500 MHz on non exclusive and non protection basis
- IND74 The requirement for LMDS may be considered in the frequency band 10.15-10.65 GHz on case-by-case basis. The technical parameters of terrestrial systems in the band 10.6-10.68 GHz should be in conformity with the Resolution 751(WRC 2007) of Radio Regulations of ITU.
- IND75 Frequency bands 10.95-11.2 GHz, 11.45-11.7 GHz and 12.2-12.75 GHz may be predominantly used for fixed satellite service (down links).
- IND76 It may be borne in mind that the frequency band 18.6-18.8 GHz is being used for Earth Exploration Satellite (EES) in IRS Satellite.
- IND77 The frequency bands 19.7-21.2 GHz and 29.5-31.0GHz may be considered predominantly for the use of FSS.
- IND78 Use of low power telecom systems and devices including Radio Local Area Networks (RLAN) and traffic safety applications in the frequency band 24.0 – 24.25 GHz using a maximum Effective Isotropic Radiated Power of 2Watts with spectrum spread of 50 MHz or higher may be considered on non-interference, non protection and non- exclusive basis.
- IND79 Requirements of LMDS and MMDS may be considered in the frequency bands 24.5 -26.5 GHz and 27.5-29.5 GHz on a case-by-case basis. Requirements of EESS Earth Station downlink operation in 25.5.-27.0 GHz at few locations may

India Remarks in the National Frequency Allocation Table

also be considered on a case-by-case basis appropriately.

- IND80 Requirements of high capacity dense network may be considered in the frequency bands 31.8-33.4, 37-40 GHz, 40.5-43.5, 51.4-52.6 GHz, 55.78-59 GHz and 64-66 GHz. Requirements of Deep Space Research (Space-to-Earth) in the band 31.8-32.3 GHz and protection of the same may be considered at a few locations. Requirements of inter-satellite link in the band 32.3-33.0 GHz may be considered.
- IND81 Use of high capacity dense network may be considered in the frequency bands 71-76 GHz and 81-86 GHz on FDD and TDD basis subject to their co-existence.
- IND82 Requirement of public protection and disaster relief (PPDR) communications including Broadband Wireless Access may be considered, as far as possible, in the frequency bands 380-400 MHz, 406.1-430 MHz, 440-470 MHz, 746-806 MHz, 806-824/851-869 MHz, 4940-4990 MHz and 5850-5925 MHz on a case-by-case basis depending on specific need and equipments availability

Guglielmo Marconi

1874-1937



Guglielmo Marconi

Guglielmo Marconi, known for his development of Marconi's law and a radio telegraph system, which served as the foundation for the establishment of numerous affiliated companies worldwide. He shared the 1909 Nobel Prize in Physics with Karl Ferdinand Braun "in recognition of their contributions to the development of wireless telegraphy

CHANNELING PLAN

(Plan No - 1)

Channeling plan in the frequency band 146-147, 151-152, 165-166 and 171-172 MHz.

F [1]- Group of Frequencies

[1009]=146.6625 MHz / [2009]= 151.7125 MHz
[1010]=146.6875 MHz / [2010]= 151.7375 MHz
[1011]=146.7125 MHz / [2011]= 151.7625 MHz
[1012]=146.7375 MHz / [2012]= 151.7875 MHz
[1061]=164.5125 MHz / [2061]= 171.0125 MHz
[1062]=164.5375 MHz / [2062]= 171.0375 MHz
[1063]=164.5625 MHz / [2063]= 171.0625 MHz
[1064]=164.5875 MHz / [2064]= 171.0875 MHz
[1065]=164.6125 MHz / [2065]= 171.1125 MHz
.....

F [2]- Group of Frequencies

[1013]=146.7625 MHz / [2013]= 151.8125 MHz
[1014]=146.7875 MHz / [2014]= 151.8375 MHz
[1015]=146.8125 MHz / [2015]= 151.8625 MHz
[1016]=146.8375 MHz / [2016]= 151.8875 MHz
[1066]=164.7375 MHz / [2066]= 171.1375 MHz *
[1067]=164.6625 MHz / [2067]= 171.1625 MHz
[1068]=164.6875 MHz / [2068]= 171.1875 MHz
[1069]=164.7125 MHz / [2069]= 171.2125 MHz
[1070]=164.7375 MHz / [2070]= 171.2375 MHz
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F [3]- Group of Frequencies

[1017]=146.8625 MHz / [2017]= 151.9125 MHz
[1018]=146.8875 MHz / [2018]= 151.9375 MHz
[1019]=146.9125 MHz / [2019]= 151.9625 MHz
[1020]=146.9375 MHz / [2020]= 151.9875 MHz
[1071]=164.7675 MHz / [2071]= 171.2625 MHz
[1072]=164.7875 MHz / [2072]= 171.2875 MHz

Channeling Plans

[1073]=164.8125 MHz / [2073]= 171.3125 MHz
[1074]=164.8375 MHz / [2074]= 171.3375 MHz
[1075]=164.8625 MHz / [2075]= 171.3625 MHz

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F [4]- Group of Frequencies

[1021]=146.9625 MHz / [2021]= 152.0125 MHz **
[1022]=146.9875 MHz / [2022]= 152.0375 MHz **
[1023]=147.0125 MHz / [2023]= 152.0625 MHz **
[1024]=147.0375 MHz / [2024]= 152.0875 MHz **
[1076]=164.8875 MHz / [2076]= 171.3875 MHz
[1077]=164.9125 MHz / [2077]= 171.4125 MHz
[1078]=164.9375 MHz / [2078]= 171.4375 MHz
[1079]=164.9625 MHz / [2079]= 171.4625 MHz
[1080]=164.9875 MHz / [2080]= 172.4875 MHz

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F [5]- Group of Frequencies

[1025]=147.0625 MHz / [2025]= 152.1125 MHz **
[1026]=147.0875 MHz / [2026]= 152.1375 MHz **
[1027]=147.1125 MHz / [2027]= 152.1625 MHz **
[1028]=147.1375 MHz / [2028]= 152.1875 MHz **
[1081]=165.0125 MHz / [2081]= 171.5125 MHz
[1082]=165.0375 MHz / [2082]= 171.5375 MHz
[1083]=165.0625 MHz / [2083]= 171.5625 MHz
[1084]=165.0875 MHz / [2084]= 171.5875 MHz
[1085]=165.1125 MHz / [2085]= 171.6125 MHz

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F [6]- Group of Frequencies

[1029]=147.1625 MHz / [2029]= 152.2125 MHz **
[1030]=147.1875 MHz / [2030]= 152.2375 MHz **
[1031]=147.2125 MHz / [2031]= 152.2625 MHz **
[1032]=147.2375 MHz / [2032]= 152.2875 MHz **
[1086]=165.1375 MHz / [2086]= 171.6375 MHz
[1087]=165.1625 MHz / [2087]= 171.6625 MHz
[1088]=165.1875 MHz / [2088]= 171.6875 MHz
[1089]=165.2125 MHz / [2089]= 171.7125 MHz

Channeling Plans

[1030]=165.2375 MHz / [2090]= 171.7375 MHz

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F [7]- Group of Frequencies

[1033]=147.2625 MHz / [2033]= 152.3125 MHz **

[1034]=147.2875 MHz / [2034]= 152.3375 MHz **

[1035]=147.3125 MHz / [2035]= 152.3625 MHz **

[1036]=147.3375 MHz / [2036]= 152.3875 MHz **

[1091]=165.2825 MHz / [2091]= 171.7625 MHz

[1092]=165.2825 MHz / [2092]= 171.7875 MHz

[1093]=165.3125 MHz / [2093]= 171.8125 MHz

[1094]=165.3375 MHz / [2094]= 171.8375 MHz

[1095]=165.3625 MHz / [2095]= 171.8625 MHz

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F [8]- Group of Frequencies

[1037]=147.3625 MHz / [2037]= 152.4125 MHz **

[1038]=147.3875 MHz / [2038]= 152.4375 MHz **

[1039]=147.4125 MHz / [2039]= 152.4625 MHz **

[1040]=147.4375 MHz / [2040]= 152.4875 MHz **

[1096]=165.3875 MHz / [2096]= 171.8875 MHz

[1097]=165.4125 MHz / [2097]= 171.9125 MHz

[1098]=165.4375 MHz / [2098]= 171.9375 MHz

[1099]=165.4625 MHz / [2099]= 171.9625 MHz

[1100]=165.4875 MHz / [2100]= 171.9875 MHz

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F [5]- Group of Frequencies

[1041]=147.4625 MHz / [2041]= 152.5125 MHz **

[1042]=147.4875 MHz / [2042]= 152.5375 MHz **

[1043]=147.5125 MHz / [2043]= 152.5625 MHz **

[1044]=147.5375 MHz / [2044]= 152.5875 MHz **

[1101]=165.5125 MHz / [2101]= 172.0125 MHz

[1102]=165.5375 MHz / [2102]= 172.0375 MHz

[1103]=165.5625 MHz / [2103]= 172.0625 MHz

[1104]=165.5875 MHz / [2104]= 172.0875 MHz

[1105]=165.6125 MHz / [2105]= 172.1125 MHz

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Channeling Plans

F [10]- Group of Frequencies

[1045]=147.5625 MHz / [2045]= 152.6125 MHz **
[1046]=147.5875 MHz / [2046]= 152.6375 MHz **
[1047]=147.6125 MHz / [2047]= 152.6625 MHz **
[1048]=147.6375 MHz / [2048]= 152.6875 MHz **
[1106]=165.6375 MHz / [2106]= 172.1375 MHz
[1107]=165.6625 MHz / [2107]= 172.1625 MHz
[1108]=165.6875 MHz / [2108]= 172.1875 MHz
[1109]=165.7125 MHz / [2109]= 172.2112 MHz
[1110]=165.7375 MHz / [2110]= 172.2375 MHz

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F [11]- Group of Frequencies

[1049]=147.6625 MHz / [2049]= 152.7125 MHz **
[1050]=147.6875 MHz / [2050]= 152.7375 MHz **
[1051]=147.7125 MHz / [2051]= 152.7625 MHz **
[1052]=147.7375 MHz / [2052]= 152.7875 MHz **
[1111]=165.7625 MHz / [2111]= 172.2625 MHz
[1112]=165.7875 MHz / [2112]= 172.2875 MHz
[1113]=165.8125 MHz / [2113]= 172.3125 MHz
[1114]=165.8375 MHz / [2114]= 172.3375 MHz
[1115]=165.8625 MHz / [2115]= 172.3625 MHz

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F [12]- Group of Frequencies

[1053]=147.7625 MHz / [2053]= 152.8125 MHz **
[1054]=147.7875 MHz / [2054]= 152.8375 MHz **
[1055]=147.8125 MHz / [2055]= 152.8625 MHz **
[1056]=147.8375 MHz / [2056]= 152.8875 MHz **
[1116]=165.8875 MHz / [2116]= 172.3875 MHz
[1117]=165.9125 MHz / [2117]= 172.4125 MHz
[1118]=165.9375 MHz / [2118]= 172.4375 MHz
[1119]=165.9625 MHz / [2119]= 172.4625 MHz
[1120]=165.9875 MHz / [2120]= 172.4875 MHz

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Channeling Plans

F [13]- Group of Frequencies

[1057]=147.8625 MHz / [2057]= 152.9125 MHz **
[1058]=147.8875 MHz / [2058]= 152.9375 MHz **
[1059]=147.9125 MHz / [2059]= 152.9625 MHz **
[1060]=147.9375 MHz / [2060]= 152.9875 MHz **
[1121]=166.0125 MHz / [2121]= 172.5125 MHz
[1122]=166.0375 MHz / [2122]= 172.5375 MHz
[1123]=166.0625 MHz / [2123]= 172.5625 MHz
[1124]=166.0875 MHz / [2124]= 172.5875 MHz
[1125]=166.1125 MHz / [2125]= 172.6125 MHz

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Spare Frequencies

[1001]=146.4625 MHz / [2001]= 151.5125 MHz
[1002]=146.4875 MHz / [2002]= 151.5375 MHz
[1003]=146.5125 MHz / [2003]= 151.5625 MHz
[1004]=146.5375 MHz / [2004]= 151.5875 MHz
[1005]=146.5625 MHz / [2005]= 151.6125 MHz
[1006]=146.5875 MHz / [2006]= 151.6375 MHz
[1007]=146.6125 MHz / [2007]= 151.6625 MHz
[1008]=146.6375 MHz / [2008]= 151.6875 MHz
[1126]=166.1375 MHz / [2126]= 172.6375 MHz
[1127]=166.1625 MHz / [2127]= 172.6625 MHz
[1128]=166.1875 MHz / [2128]= 172.6875 MHz
[1129]=166.2125 MHz / [2129]= 172.7125 MHz
[1130]=166.2375 MHz / [2130]= 172.7375 MHz
[1131]=166.2625 MHz / [2131]= 172.7625 MHz
[1132]=166.2875 MHz / [2132]= 172.7875 MHz
[1133]=166.3125 MHz / [2133]= 172.8125 MHz
[1134]=166.3375 MHz / [2134]= 172.8375 MHz
[1135]=166.3625 MHz / [2135]= 172.8625 MHz
[1136]=166.3875 MHz / [2136]= 172.8875 MHz
[1137]=166.4125 MHz / [2137]= 172.9125 MHz
[1138]=166.4375 MHz / [2138]= 172.9375 MHz
[1139]=166.4625 MHz / [2139]= 172.9725 MHz
[1140]=166.4875 MHz / [2140]= 172.9875 MHz

LEGEND

- ** Means frequency not to be used within a radius of 400 Kms from Narayan-Gaon, Pune
TIFR-GMRT coordination for 152.0-153.0 MHz
- * Means frequency not to be used near Bombay in 50 Km radius from the Paging Transmitter.

Channeling Plans

(Plan No - 2)

R.F. CHANNEL ARRANGEMENT FOR MOBILE RADIO TRUNKING SERVICE FOR THE FREQUENCY BAND 338 - 340 MHz AND 348 - 350 MHz.

<u>Block No.</u>	<u>Channel - Arrangement (338 - 340 MHz /348-350 MHz)</u>				
1	1	33	65	97	129 ----- 1A
	9	41	73	105	137 ----- 1C
	17	49	81	113	145 ----- 1B
	25	57	89	121	153 ----- 1D
2	2	34	66	98	130 ----- 2A
	10	42	74	106	138 ----- 2C
	18	50	82	114	146 ----- 2B
	26	58	90	122	154 ----- 2D
3	3	35	67	99	131 ----- 3A
	11	43	75	107	139 ----- 3C
	19	51	83	115	147 ----- 3B
	27	59	91	123	155 ----- 3D
4	4	36	68	100	132 ----- 4A
	12	44	76	108	140 ----- 4C
	20	52	84	116	148 ----- 4B
	28	60	92	124	156 ----- 3D
5	5	37	69	101	133 ----- 5A
	13	45	77	109	141 ----- 5C
	21	53	85	117	149 ----- 5B
	29	61	93	125	157 ----- 5D
6	6	38	70	102	134 ----- 6A
	14	46	78	110	142 ----- 6C
	22	54	86	118	150 ----- 6B
	30	62	94	126	158 ----- 6D
7	7	39	71	103	135 ----- 7A
	15	47	79	111	143 ----- 7C
	23	55	87	119	151 ----- 7B
	31	63	95	127	159 ----- 7D
8	8	40	72	104	136 ----- 8A
	16	48	80	112	114 ----- 8C
	24	56	88	120	152 ----- 8B
	32	64	96	128	160 ----- 8D

Note: Each set of 5 frequency pairs shall be assigned in the Order of A then B then C then D.

Channeling Plans

R.F. CHANNELS (12.5 kHz Plan with 10 MHz Duplex Separation)

CHL. PAIR No.	BASE TRANSMIT (Frq. in kHz)	BASE RECEIVE (Frq. in kHz)
1	338006.25	348006.25
2	338018.75	348018.75
3	338031.25	348031.25
4	338043.75	348043.75
5	338056.25	348056.25
6	338068.75	348068.75
7	338081.25	348081.25
8	338093.75	348093.75
9	338106.25	348106.25
10	338118.75	348118.75
11	338131.25	348131.25
12	338143.75	348143.75
13	338156.25	348156.25
14	338168.75	348168.75
15	338181.25	348181.25
16	338193.75	348193.75
17	338206.25	348206.25
18	338218.75	348218.75
19	338231.25	348231.25
20	338243.75	348243.75
21	338256.25	348256.25
22	338268.75	348268.75
23	338281.25	348281.25
24	338293.75	348293.75
25	338306.25	348306.25
26	338318.75	348318.75
27	338331.25	348331.25
28	338343.75	348343.75
29	338356.25	348356.25
30	338368.75	348368.75
31	338381.25	348381.25
32	338393.75	348393.75
33	338406.25	348406.25
34	338418.75	348418.75
35	338431.25	348431.25
36	338443.75	348443.75
37	338456.25	348456.25
38	338468.75	348468.75
39	338481.25	348481.25
40	338493.75	348493.75
41	338506.25	348506.25
42	338518.75	348518.75
43	338531.25	348531.25
44	338543.75	348543.75
45	338556.25	348556.25
46	338568.75	348568.75
47	338581.25	348581.25
48	338593.75	348593.75
49	338606.25	348606.25
50	338618.75	348618.75
51	338631.25	348631.25
52	338643.75	348643.75
53	338656.25	348656.25
54	338668.75	348668.75
55	338681.25	348681.25
56	338693.75	348693.75
57	338706.25	348706.25
58	338718.75	348718.75
59	338731.25	348731.25
60	338743.75	348743.75
61	338756.25	348756.25
62	338768.75	348768.75
63	338781.25	348781.25
64	338793.75	348793.75

Channeling Plans

CHL.PAIR No.	BASE TRANSMIT (Frq. in kHz)	BASE RECEIVE (Frq. in kHz)
65	338806.25	348806.25
66	338818.75	348818.75
67	338831.25	348831.25
68	338843.75	348843.75
69	338856.25	348856.25
70	338868.75	348868.75
71	338881.25	348881.25
72	338893.75	348893.75
73	338906.25	348906.25
74	338918.75	348918.75
75	338931.25	348931.25
76	338943.75	348943.75
77	338956.25	348956.25
78	338968.75	348968.75
79	338981.25	348981.25
80	338993.75	348993.75
81	339006.25	349006.25
82	339018.75	349018.75
83	339031.25	349031.25
84	339043.75	349043.75
85	339056.25	349056.25
86	339068.75	349068.75
87	339081.25	349081.25
88	339093.75	349093.75
89	339106.25	349106.25
90	339118.75	349118.75
91	339131.25	349131.25
92	339143.75	349143.75
93	339156.25	349156.25
94	339168.75	349168.75
95	339181.25	349181.25
96	339193.75	349193.75
97	339206.25	349206.25
98	339218.75	349218.75
99	339231.25	349231.25
100	339243.75	349243.75
101	339256.25	349256.25
102	339268.75	349268.75
103	339281.25	349281.25
104	339293.75	349293.75
105	339306.25	349306.25
106	339318.75	349318.75
107	339331.25	349331.25
108	339343.75	349343.75
109	339356.25	349356.25
110	339368.75	349368.75
111	339381.25	349381.25
112	339393.75	349393.75
113	339406.25	349406.25
114	339418.75	349418.75
115	339431.25	349431.25
116	339443.75	349443.75
117	339456.25	349456.25
118	339468.75	349468.75
119	339481.25	349481.25
120	339493.75	349493.75
121	339506.25	349506.25
122	339518.75	349518.75
123	339531.25	349531.25
124	339543.75	349543.75
125	339556.25	349556.25
126	339568.75	349568.75
127	339581.25	349581.25
128	339593.75	349593.75
129	339606.25	349606.25
130	339618.75	349618.75
131	339631.25	349631.25
132	339643.75	349643.75

Channeling Plans

CHL.PAIR No.	BASE TRANSMIT (Frq. in kHz)	BASE RECEIVE (Frq. in kHz)
133	339656.25	349656.25
134	339668.75	349668.75
135	339681.25	349681.25
136	339693.75	349693.75
137	339706.25	349706.25
138	339718.75	349718.75
139	339731.25	349731.25
140	339743.75	349743.75
141	339756.25	349756.25
142	339768.75	349768.75
143	339781.25	349781.25
144	339793.75	349793.75
145	339806.25	349806.25
146	339818.75	349818.75
147	339831.25	349831.25
148	339843.75	349843.75
149	339856.25	349856.25
150	339868.75	349868.75
151	339881.25	349881.25
152	339893.75	349893.75
153	339906.25	349906.25
154	339918.75	349918.75
155	339931.25	349931.25
156	339943.75	349943.75
157	339956.25	349956.25
158	339968.75	349968.75
159	339981.25	349981.25
160	339993.75	349993.75

Channeling Plans

(Plan No - 3)

CHANNELING PLAN IN THE FREQUENCY BAND 367- 400 MHZ

[1]	368.65 MHz	[1']	385.15 MHz
[2]	371.95 MHz	[2']	388.45 MHz
[3]	375.25 MHz	[3']	391.75 MHz
[4]	378.55 MHz	[4']	395.05 MHz
[5]	381.85 MHz	[5']	398.35 MHz

Note:- New plans to be developed in the frequency bands 367-380 MHz and 380-400 MHz in view of remark IND24 in the National Frequency Allocation Table.

Channeling Plans

(Plan No - 4)

CHANNELING PLAN IN THE FREQUENCY BANDS 420-436.5 MHz AND 445-461.5 MHz

[1]	421.65 MHz	[1']	446.65 MHz
[2]	424.95 MHz	[2']	449.95 MHz
[3]	428.25 MHz	[3']	453.25 MHz
[4]	431.55 MHz	[4']	456.55 MHz
[5]	434.85 MHz	[5']	459.85 MHz

Channeling Plans

(Plan No - 5)

CHANNELING PLAN IN THE FREQUENCY BAND 622-712 MHz

FREQUENCY			PAIRS		CHANNEL CAPACITY		
					10 CHL	30 CHL	120CHL
F[1]	=622.5	/	F[1']	=667.5	*	--	--
F[2]	=623.5	/	F[2']	=668.5	*	*	--
F[3]	=624.5	/	F[3']	=669.5	*	--	--
F[4]	=625.5	/	F[4']	=670.5	*	--	--
F[5]	=626.5	/	F[5']	=671.5	*	*	*
F[6]	=627.5	/	F[6']	=672.5	*	--	--
F[7]	=628.5	/	F[7']	=673.5	*	--	--
F[8]	=629.5	/	F[8']	=674.5	*	*	--
F[9]	=630.5	/	F[9']	=675.5	*	--	--
F[10]	=631.5	/	F[10']	=676.5	*	--	--
F[11]	=632.5	/	[F11']	=677.5	*	*	--
F[12]	=633.5	/	F[12']	=678.5	*	--	--
F[13]	=634.5	/	F[13']	=679.5	*	--	--
F[14]	=635.5	/	F[14']	=680.5	*	*	*
F[15]	=636.5	/	F[15']	=681.5	*	--	--
F[16]	=639.5	/	F[16']	=682.5	*	--	--
F[17]	=640.5	/	F[17']	=683.5	*	*	--
F[18]	=641.5	/	F[18']	=684.5	*	--	--
F[19]	=642.5	/	F[19']	=685.5	*	--	--
F[20]	=643.5	/	F[20']	=686.5	*	*	--
F[21]	=642.5	/	F[21']	=687.5	*	--	--
F[22]	=643.5	/	F[22']	=688.5	*	--	--
F[23]	=644.5	/	F[23']	=689.5	*	*	*
F[24]	=645.5	/	F[24']	=690.5	*	--	--
F[25]	=646.5	/	F[25']	=691.5	*	--	--
F[26]	=647.5	/	F[26']	=692.5	*	*	--
F[27]	=648.5	/	F[27']	=693.5	*	--	--
F[28]	=649.5	/	F[28']	=694.5	*	--	--
F[29]	=650.5	/	F[29']	=695.5	*	*	--
F[30]	=651.5	/	F[30']	=696.5	*	--	--
F[31]	=652.5	/	F[31']	=697.5	*	--	--
F[32]	=653.5	/	F[32']	=698.5	*	*	*

Channeling Plans

F[33]	=654.5	/	F[33']	=699.5	*	--	--
F[34]	=655.5	/	F[34']	=700.5	*	--	--
F[35]	=656.5	/	F[35']	=701.5	*	*	--
F[36]	=657.5	/	F[36']	=702.5	*	--	--
F[37]	=658.5	/	F[37']	=703.5	*	--	--
F[38]	=659.5	/	F[38']	=704.5	*	*	--
F[39]	=660.5	/	F[39']	=705.5	*	--	--
F[40]	=661.5	/	F[40']	=706.5	*	--	--
F[41]	=662.5	/	F[41']	=707.5	*	*	*
F[42]	=663.5	/	F[42']	=708.5	*	--	--
F[43]	=664.5	/	F[43']	=709.5	*	--	--
F[44]	=665.5	/	F[44']	=710.5	*	*	--
F[45]	=666.5	/	F[45']	=711.5	*	--	--

Adjacent Channel Separation = 1 MHz
TX - RX Separation = 45 MHz

* Indicates Frequency Pairs that can be assigned to respective channel capacity systems against which it is shown.

Channeling Plans

(Plan No - 6)

R.F. CHANNEL ARRANGEMENT FOR MOBILE RADIO TRUNKING SERVICE FOR THE FREQUENCY OF 814-819 MHz AND 859-864 MHz

<u>S.No.</u>	<u>Channel Arrangement</u>						<u>Block No.</u>
1.	1	41	81	121	161	.....	1A
	21	61	101	141	181	.....	1B
	11	51	91	131	171	.....	1C
	31	71	111	151	191	.....	1D
2.	2	42	82	122	162	.....	2A
	22	62	102	142	182	.....	2B
	12	52	92	132	172	.....	2C
	32	72	112	152	192	.....	2D
3.	3	43	83	123	163	.....	3A
	23	63	103	143	183	.....	3B
	13	53	93	133	173	.....	3C
	33	73	113	153	193	.....	3D
4.	4	44	84	124	164	.....	4A
	24	64	104	144	184	.....	4B
	14	54	94	134	174	.....	4C
	34	74	114	154	194	.....	4D
5.	5	45	85	125	165	.....	5A
	25	65	105	145	185	.....	5B
	15	55	95	135	175	.....	5C
	35	75	115	155	195	.....	5D
6.	6	46	86	126	166	.....	6A
	26	66	106	146	186	.....	6B
	16	56	96	136	176	.....	6C
	36	76	116	156	196	.....	6D
7.	7	47	87	127	167	.....	7A
	27	67	107	147	187	.....	7B
	17	57	97	137	177	.....	7C
	37	77	117	157	197	.....	7D
8.	8	48	88	128	168	.....	8A
	28	68	108	148	188	.....	8B
	18	58	98	138	178	.....	8C
	38	78	118	158	198	.....	8D
9.	9	49	89	129	169	.....	9A
	29	69	109	149	189	.....	9B
	19	59	99	139	179	.....	9C
	39	79	119	159	199	.....	9D
10.	10	50	90	130	170	.....	10A
	30	70	110	140	190	.....	10B
	20	60	100	140	180	.....	10C
	40	80	120	160	200	.....	10D

Note:- Each set of 5 frequency pairs shall be assigned in the order of A then B then C and then D

Channeling Plans

R.F. CHANNEL ARRANGEMENT FOR MOBILE RADIO TRUNKING SERVICE FOR THE FREQUENCY OF 814-819 MHz AND 859-864 MHz

25 KHz PLAN WITH 45 MHz DUPLEX SEPERATION

CHL.PAIR NO.	BASE TRANSMIT (KHz)	BASE RECEIVE (KHz)
200	814012.5	859012.5
199	814037.5	859037.5
198	814062.5	859062.5
197	814087.5	859087.5
196	814112.5	859112.5
195	814137.5	859137.5
194	814162.5	859162.5
193	814187.5	859187.5
192	814212.5	859212.5
191	814237.5	859237.5
190	814262.5	859262.5
189	814287.5	859287.5
188	814312.5	859312.5
187	814337.5	859337.5
186	814362.5	859362.5
185	814387.5	859387.5
184	814412.5	859412.5
183	814437.5	859437.5
182	814462.5	859462.5
181	814487.5	859487.5
180	814512.5	859512.5
179	814537.5	859537.5
178	814562.5	862537.5
177	814587.5	859587.5
176	814612.5	859612.5
175	814637.5	859637.5
174	814662.5	859662.5
173	814687.5	859687.5
172	814712.5	859712.5
171	814737.5	859737.5
170	814762.5	859762.5
169	814787.5	859787.5
168	814812.5	859812.5
167	814837.5	859837.5
166	814862.5	859862.5
165	814887.5	859887.5
164	814912.5	859912.5
163	814937.5	859937.5
162	814962.5	859962.5
161	814987.5	859987.5
160	815012.5	860012.5
159	815037.5	860037.5
158	815062.5	860062.5
157	815087.5	860087.5
156	815112.5	860112.5
155	815137.5	860137.5
154	815162.5	860162.5
153	815187.5	860187.5
152	815212.5	860212.5
151	815237.5	860237.5
150	815262.5	860212.5
149	815287.5	860287.5

Channeling Plans

CHL.PAIR NO.	BASE TRANSMIT (KHz)	BASE RECEIVE (KHz)
148	815312.5	860312.5
147	815337.5	860337.5
146	815362.5	860362.5
145	815387.5	860387.5
144	815412.5	860412.5
143	815437.5	860437.5
142	815462.5	860462.5
141	815487.5	860487.5
140	815512.5	860512.5
139	815537.5	860537.5
138	815562.5	860562.5
137	815587.5	860687.5
136	815612.5	860612.5
135	815637.5	860637.5
134	815662.5	860662.5
133	815687.5	860687.5
132	815712.5	860712.5
131	815737.5	860737.5
130	815762.5	860762.5
129	815787.5	860787.5
128	815812.5	860812.5
127	815837.5	860837.5
126	815862.5	860862.5
125	815887.5	860887.5
124	815912.5	860912.5
123	815937.5	860937.5
122	815962.5	860962.5
121	815987.5	860987.5
120	816012.5	861012.5
119	816037.5	861037.5
118	816062.5	861062.5
117	816087.5	861087.5
116	816112.5	861112.5
115	816137.5	861137.5
114	816162.5	861162.5
113	816187.5	861187.5
112	816212.5	861212.5
111	816237.5	861237.5
110	816262.5	861262.5
109	816287.5	861287.5
108	816312.5	861312.5
107	816337.5	861337.5
106	816362.5	861362.5
105	816387.5	861387.5
104	816412.5	861412.5
103	816437.5	861437.5
102	816462.5	861462.5
101	816487.5	861487.5
100	816512.5	861512.5
99	816537.5	861537.5
98	816562.5	861562.5
97	816587.5	861587.5
96	816612.5	861612.5
95	816637.5	861637.5
94	816662.5	861662.5
93	816687.5	861687.5
92	816712.5	861712.5
91	816737.5	861737.5
90	816762.5	861762.5

Channeling Plans

CHL.PAIR NO.	BASE TRANSMIT (KHz)	BASE RECEIVE (KHz)
89	816787.5	861787.5
88	816812.5	861812.5
87	816837.5	861837.5
86	816862.5	861862.5
85	816887.5	861887.5
84	816912.5	861912.5
83	816937.5	861937.5
82	816962.5	861962.5
81	816987.5	861987.5
80	817012.5	862012.5
79	817037.5	862037.5
78	817062.5	862062.5
77	817087.5	862087.5
76	817112.5	862112.5
75	817137.5	862137.5
74	817162.5	862162.5
73	817187.5	862187.5
72	817212.5	862212.5
71	817237.5	862237.5
70	817262.5	862262.5
69	817287.5	862287.5
68	817312.5	862312.5
67	817337.5	862337.5
66	817362.5	862362.5
65	817387.5	862387.5
64	817412.5	862412.5
63	817437.5	862437.5
62	817462.5	862462.5
61	817487.5	862487.5
60	817512.5	862512.5
59	817537.5	862537.5
58	817562.5	862562.5
57	817587.5	862587.5
56	817612.5	862612.5
55	817637.5	862637.5
54	817662.5	862662.5
53	817687.5	862687.5
52	817712.5	862712.5
51	817737.5	862737.5
50	817762.5	862762.5
49	817787.5	862787.5
48	817812.5	862812.5
47	817837.5	862837.5
46	817862.5	862862.5
45	817887.5	862887.5
44	817912.5	862912.5
43	817937.5	862937.5
42	817962.5	862962.5
41	817987.5	862987.5
40	818012.5	863012.5
39	818037.5	863037.5
38	818062.5	863062.5
37	818087.5	863087.5
36	818112.5	863112.5
35	818137.5	863137.5
34	818162.5	863162.5
33	818187.5	863187.5
32	818212.5	863212.5
31	818237.5	863237.5

Channeling Plans

CHL.PAIR NO.	BASE TRANSMIT (KHz)	BASE RECEIVE (KHz)
30	818262.5	863262.5
29	818287.5	863287.5
28	818312.5	863312.5
27	818337.5	863337.5
26	818362.5	863362.5
25	818387.5	863387.5
24	818412.5	863412.5
23	818437.5	863437.5
22	818462.5	863462.5
21	818487.5	863487.5
20	818512.5	863512.5
19	818537.5	863537.5
18	818562.5	863562.5
17	818587.5	863587.5
16	818612.5	863612.5
15	818637.5	863637.5
14	818662.5	863662.5
13	818687.5	863687.5
12	818712.5	863712.5
11	818737.5	863737.5
10	818762.5	863762.5
9	818787.5	863787.5
8	818812.5	863812.5
7	818837.5	863837.5
6	818862.5	862862.5
5	818887.5	863887.5
4	818912.5	863912.5
3	818937.5	863937.5
2	818962.5	863962.5
1	818987.5	863987.5

Channeling Plans

(Plan No - 7)

CHANNELING PLAN IN THE FREQUENCY BAND 1427 - 1525 MHz

1. TX - RX Separation = 49 MHz

CHANNEL CAPACITY	MODULATION METHOD	BIT RATE (MAX) Kb/s	RF CHN SEPRAT- ION(MHz)	NO. OF RF CHNL	CHANNEL NOS.
12	FM/FDM	-	0.5	93	1,2,3,4....
24	FM/FDM	-	1.0	24	1,3,5,7....
24	PCM(2PSK)	1544	2.0	24	1,5,9,13...
24	PCM(4PSK)	1544	1.5	30	1,4,7,10....
30	PCM(4PSK)	2048	2.0	31	1,5,9,13....
60	PCM(QPSK)	4096 (4 Mb/s)	3.0	15	3,9,15,21...
120	PCM(QPSK)	8000 (8 Mb/s)	5.0	6	8,24,40,56.

$$F1 = FO-X+0.5X = 1476 - 48+0.5 N$$

$$F2 = FO+X0.5X = 1476 + 1+0.5 N$$

	F1		F2
1	1428.50	-	1477.50
2	1429.00	-	1478.00
3	1429.50	-	1478.50
4	1430.00	-	1479.00
5	1430.50	-	1479.50
6	1431.00	-	1480.00
7	1431.50	-	1480.50
8	1432.00	-	1481.00
9	1432.50	-	1481.50
10	1433.00	-	1482.00
11	1433.50	-	1482.50

Channeling Plans

12	1434.00	-	1483.00
13	1434.50	-	1483.50
14	1435.00	-	1484.00
15	1435.50	-	1484.50
16	1436.00	-	1485.00
17	1436.50	-	1485.50
18	1437.00	-	1486.00
19	1437.50	-	1486.50
20	1438.00	-	1487.00
21	1438.50	-	1487.50
22	1439.00	-	1488.00
23	1439.50	-	1488.50
24	1440.00	-	1489.00
25	1440.50	-	1489.50
26	1441.00	-	1490.00
27	1441.50	-	1490.50
28	1442.00	-	1491.00
29	1442.50	-	1491.50
30	1443.00	-	1492.00
31	1443.50	-	1492.50
32	1444.00	-	1493.00
33	1444.50	-	1493.50
34	1445.00	-	1494.00
35	1445.50	-	1494.50
36	1446.00	-	1495.00
37	1446.50	-	1495.50
38	1447.00	-	1496.00
39	1447.50	-	1496.50
40	1448.00	-	1497.00
41	1448.50	-	1497.50
42	1449.00	-	1498.00
43	1449.50	-	1498.50
44	1450.00	-	1499.00
45	1450.50	-	1499.50
46	1451.00	-	1500.00
47	1451.50	-	1500.50
48	1452.00	-	1501.00
49	1452.50	-	1501.50
50	1453.00	-	1502.00
51	1453.50	-	1502.50
52	1454.00	-	1503.00
53	1454.50	-	1503.50
54	1455.00	-	1504.00

Channeling Plans

55	1455.50	-	1504.50
56	1456.00	-	1505.00
57	1456.50	-	1505.50
58	1457.00	-	1506.00
59	1457.50	-	1506.50
60	1458.00	-	1507.00
61	1458.50	-	1507.50
62	1459.00	-	1508.00
63	1459.50	-	1508.50
64	1460.00	-	1509.00
65	1460.50	-	1509.50
66	1461.00	-	1510.00
67	1461.50	-	1510.50
68	1462.00	-	1511.00
69	1462.50	-	1511.50
70	1463.00	-	1512.00
71	1463.50	-	1512.50
72	1464.00	-	1513.00
73	1464.50	-	1513.50
74	1465.00	-	1514.00
75	1465.50	-	1514.50
76	1466.00	-	1515.00
77	1466.50	-	1515.50
78	1467.00	-	1516.00
79	1467.50	-	1516.50
80	1468.00	-	1517.00
81	1468.50	-	1517.50
82	1469.00	-	1518.00
83	1469.50	-	1518.50
84	1470.00	-	1519.00
85	1470.50	-	1519.50
86	1471.00	-	1520.00
87	1471.50	-	1520.50
88	1472.00	-	1521.00
89	1472.50	-	1521.50
90	1473.00	-	1522.00
91	1473.50	-	1522.50
92	1474.00	-	1523.00
93	1474.50	-	1523.50

Channeling Plans

(Plan No - 8) **CHANNELING PLAN IN THE FREQUENCY BAND 2 - 2.3 GHz**

Adjacent Channel Separation		= 3.5 MHz
TX - RX Separation		=161 MHz
F[1]	=2003.0 /	F[1'] =2164.0
F[2]	=2006.5 /	F[2'] =2167.5 *
F[3]	=2010.0 /	F[3'] =2171.0
F[4]	=2013.5 /	F[4'] =2175.5 *
F[5]	=2017.0 /	F[5'] =2178.0
F[6]	=2020.5 /	F[6'] =2181.5 *
F[7]	=2024.0 /	F[7'] =2185.0
F[8]	=2027.5 /	F[8'] =2188.5 *
F[9]	=2031.0 /	F[9'] =2192.0
F[10]	=2034.5 /	F[10'] =2195.5 *
F[11]	=2038.0 /	F[11'] =2199.0
F[12]	=2041.5 /	F[12'] =2202.5 *
F[13]	=2044.5 /	F[13'] =2206.0
F[14]	=2048.5 /	F[14'] =2209.5*
F[15]	=2052.0 /	F[15'] =2213.0
F[16]	=2055.5 /	F[16'] =2116.5 *
F[17]	=2059.0 /	F[17'] =2220.0
F[18]	=2062.5 /	F[18'] =2223.5 *
F[19]	=2066.0 /	F[19'] =2227.0
F[20]	=2069.5 /	F[20'] =2230.5 *
F[21]	=2073.0 /	F[21'] =2234.0
F[22]	=2076.5 /	F[22] =2237.5 *

Channeling Plans

F[23]	=2080.0	/	F[23']	=2241.0
F[24]	=2083.5	/	F[24']	=2244.5 *
F[25]	=2087.0	/	F[25]	=2248.0
F[26]	=2090.5	/	F[26]	=2251.5 *
F[27]	=2094.0	/	F[27]	=2255.0
F[28]	=2097.5	/	F[28']	=2258.5 *
F[29]	=2101.0	/	F[29']	=2262.0
F[30]	=2104.5	/	F[30']	=2265.5 *
F[31]	=2108.0	/	F[31']	=2269.0
F[32]	=2111.5	/	F[32']	=2272.5 *
F[33]	=2115.0	/	F[33']	=2276.0
F[34]	=2118.5	/	F[34']	=2279.5 *
F[35]	=2122.0	/	F[35']	=2283.0
F[36]	=2125.5	/	F[36']	=2286.5 *
F[37]	=2129.0	/	F[37']	=2290.0
F[38]	=2132.5	/	F[38']	=2293.5 *
F[39]	=2136.0	/	F[39']	=2297.0

* 8 Mb/s 120 channel systems
 Adjacent channel Separation = 7.0 MHz
 Alternate channels to be on opposite polarisation.

Notes:-

- (I) Assignment of channels will need to take into account assignments for other services in the allocation table.

Channeling Plans

(Plan No - 9)

CHANNELING PLAN IN THE FREQUENCY BAND 3.8 - 4.2 GHz

29 MHz PLAN

$$f_n = f_0 - 208 + 29 \times n$$

$$f_{n'} = f_0 + 5 + 29 \times n$$

where $f_0 = 4003.5$ MHz

$$n = 1, 2, 3, \dots, 6$$

Adjacent Channel separation = 29 MHz

Trans-Receive frequency separation = 213 MHz

Frequency(MHz)	Frequency (MHz)
$f_1 = 3824.5$	$f_{1'} = 4037.5$
$f_2 = 3853.5$	$f_{2'} = 4066.5$
.	.
.	.
.	.
$f_6 = 3969.5$	$f_{6'} = 4182.5$

(Plan No - 10)

**CHANNELING PLAN IN THE FREQUENCY BAND 5925-6425 MHz and
6425-7111 MHz**

Plan for 5925-6425 MHz

TX-Rx separation = 252.04 MHz

Adjacent Channel Separation = 29.65 MHz

Frequency (MHz)	Frequency(MHz)
F1= 5945.20	F1'= 6197.24
F2= 5974.85	F2'= 6226.89
F3 = 6004.50	F3' = 6256.54
F4 = 6034.15	F4' = 6286.19
F5 = 6063.80	F5' = 6315.84
F6 = 6093.45	F6' = 6345.49
F7 = 6123.10	F7' = 6375.14
F8 = 6152.75	F8' = 6404.79

Plan for 6425 -7110 MHz

TX - RX Separation - 340 MHz

Adjacent Channel Separation - 40 MHz

Frequency(MHz)	Frequency(MHz)
F1 = 6460	F1' = 6800
F2 = 6500	F2' = 6840
F3 = 6540	F3' = 6880
F4 = 6580	F4' = 6920
F5 = 6620	F5' = 6960
F6 = 6660	F6' = 7000
F7 = 6700	F7' = 7040

Channeling Plans

$$F8 = 6740$$

$$F8' = 7080$$

Note:- 1st and 8th channel of the plan in the frequency band 6425-7110 MHz would not be available in future.

CHANNELING PLAN IN THE FREQUENCY BAND 7125-7425 MHz

Plan for 7125-7425 MHz

TX-Rx separation	=	161 MHz
Adjacent Channel Separation	=	28 MHz
Frequency (MHz)		Frequency(MHz)
F1= 7138.5		F1'= 7299.5
F2= 7166.5		F2'= 7327.5
F3 = 7194.5		F3' = 7355.5
F4 = 7222.5		F4' = 7383.5
F5 = 7250.5		F5' = 7411.5

(Plan No - 11)

CHANNELING PLAN IN THE FREQUENCY BAND 7425 - 7725 MHz

(1) 28 MHz PLAN

$$f_n = f_o - 161 + 28 \times n$$

$$f_n' = f_o - 7 + 28 \times n$$

Where $f_o = 7575$ MHz

$$n = 1, 2, 3, 4, 5$$

Adjacent Channel Separation = 28 MHz
Trans- Receive frequency Separation = 154 MHz

Frequency (MHz) Frequency (MHz)

$f_1 = 7442$	$f_1' = 7596$
$f_2 = 7470$	$f_2' = 7624$
$f_3 = 7498$	$f_3' = 7652$
$f_4 = 7526$	$f_4' = 7680$
$f_5 = 7554$	$f_5' = 7708$

(2) 7 MHz PLAN

$$f_n = f_o - 154 + 7 \times n$$

$$f_n' = f_o + 7 + 7 \times n$$

$f_o = 7575$ MHz

$n = 1, 2, 3, \dots, 20$

Adjacent Channel Separation = 7 MHz
Trans. - receive Frequency Separation = 161 MHz

Frequency (MHz) Frequency (MHz)

$f_1 = 7428$	$f_1' = 7589$
$f_2 = 7535$	$f_2' = 7596$
.	.
.	.
.	.
$f_{20} = 7561$	$f_{20}' = 7722$

Channeling Plans

(3) **28 MHz PLAN (For high capacity links e.g. 140 Mb/s)**

$$f_{nh} = f_{oh} - 168 + 28 \times n$$

$$f'_{nh} = f_{oh} + 28 \times n$$

where $n = 1, 2, 3, 4, 5$. & $f_{oh} = 7597$ MHz

Trans-Receive Separation = 168 MHz

Adjacent channel Separation = 28 MHz

Frequency(MHz)	Frequency(MHz)
----------------	----------------

$f_{1h} = 7457$	$f'_{1h} = 7625$
-----------------	------------------

$f_{2h} = 7485$	$f'_{2h} = 7653$
-----------------	------------------

$f_{3h} = 7513$	$f'_{3h} = 7681$
-----------------	------------------

$f_{4h} = 7541$	$f'_{4h} = 7709$
-----------------	------------------

Channeling Plans

(Plan No - 12)

CHANNELING PLAN IN THE FREQUENCY BAND 13 GHz
(12750 - 13250MHz)

Trans-Receive Separation = 266 MHz
Adjacent channel Separation = 28 MHz

[1]	12765 MHz	[1']	13031 MHz
[2]	12793 MHz	[2']	13059 MHz
[3]	12821 MHz	[3']	13087 MHz
[4]	12849 MHz	[4']	13115 MHz
[5]	12877 MHz	[5']	13143 MHz
[6]	12905 MHz	[6']	13171 MHz
[7]	12933 MHz	[7']	13199 MHz
[8]	12961 MHz	[8']	13227 MHz

(Plan No - 13)

CHANNELING PLAN IN THE FREQUENCY BAND 17.7-19.7 GHz

TX-RX Separation = 1010 MHz
Center Frequency = 18700 MHz
Adjacent Channel Spacing = 13.75 MHz

Ch. No.	TX (MHz)	RX (MHz)
1	17727.50	18737.50
2	17741.25	18751.25
3	17755.00	18765.00
4	17768.75	18778.75
5	17782.50	18792.50
6	17796.25	18806.25
7	17810.00	18820.00
8	17823.75	18833.75
9	17837.50	18847.50
10	17851.25	18861.25
11	17865.00	18875.00
12	17878.75	18888.75
13	17892.50	18902.50
14	17906.25	18916.25
15	17920.00	18930.00
16	17933.75	18943.75
17	17947.50	18957.50
18	17961.25	18971.25
19	17975.00	18985.00
20	17988.75	18998.75
21	18002.50	19012.50
22	18016.25	19026.25
23	18030.00	19040.00
24	18043.75	19053.75
25	18057.50	19067.50
26	18071.25	19081.25
27	18085.00	19095.00
28	18098.75	19108.75
29	18112.50	19122.50
30	18126.25	19136.25
31	18140.00	19150.00
32	18153.75	19163.75
33	18167.50	19177.50
34	18181.25	19191.25
35	18195.00	19205.00
36	18208.75	19218.75

Channeling Plans

37	18222.50	19232.50
38	18236.25	19246.25
39	18250.00	19260.00
40	18263.75	19273.75
41	18277.50	19287.50
42	18291.25	19301.25
43	18305.00	19315.00
44	18318.75	19328.75
45	18332.50	19342.50
46	18346.25	19356.25
47	18360.00	19370.00
48	18373.75	19383.75
49	18387.50	19397.50
50	18401.25	19411.25
51	18415.00	19425.00
52	18428.75	19438.75
53	18442.50	19452.50
54	18456.25	19466.25
55	18470.00	19480.00
56	18483.75	19493.75
57	18497.50	19507.50
58	18511.25	19521.25
59	18525.00	19535.00
60	18538.75	19548.75
61	18552.50	19562.50
62	18566.25	19576.25
63	18580.00	19590.00
64	18593.75	19603.75
65	18607.50	19617.50
66	18621.25	19631.25
67	18635.00	19645.00
68	18648.75	19658.75
69	18662.50	19672.50

Channeling Plans

(Plan No - 14)

CHANNELING PLAN IN THE FREQUENCY BAND 10.5- 10.68 GHz

Duplex Separation =91 MHz

7 MHz plan:

Channel No.	TX frequency(MHz)	RX frequency(MHz)
1	10504	10595
2	10511	10602
3	10518	10609
4	10525	10616
5	10532	10623
6	10539	10630
7	10546	10637
8	10553	10644
9	10560	10651
10	10567	10658
11	10574	10665
12	10581	10672

Channeling Plans

(Plan No - 15)

CHANNELING PLAN IN THE FREQUENCY BAND 10.7-11.7 GHz

TX-RX Separation = 490 MHz

Adjacent Channel Separation = 40 MHz

Channel No.	TX Frequency(MHz)	RX Frequency(MHz)
1	10735	11225
2	10775	11265
3	10815	11305
4	10855	11345
5	10895	11385
6	10935	11425
7	10975	11465
8	11015	11505
9	11055	11545
10	11095	11585
11	11135	11625
12	11175	11665

Channeling Plans

(Plan No - 16)

CHANNELING PLAN IN THE FREQUENCY BAND 14.5-15.5 GHz

Duplex Separation = 420 MHz

1. 28 MHz plan:

F1	14515 MHz	F1'	14935 MHz
F2	14543 MHz	F2'	14963 MHz
F3	14571 MHz	F3'	14991 MHz
-	-	-	-
-	-	-	-
-	-	-	-
F15	14907 MHz	F15'	15327 MHz

2. 14 MHz plan:

F1	14515 MHz	F2	14935 MHz
F2	14529 MHz	F2'	14949 MHz
-	-	-	-
-	-	-	-
-	-	-	-
F30	14921	F30'	15341 MHz

3. 07 MHz plan:

F1	14508 MHz	F1	14928 MHz
F2	14515 MHz	F2'	14935 MHz
-	-	-	-
-	-	-	-
-	-	-	-
F60	14921 MHz	F60'	15341 MHz

4. 3.5 MHz plan

F1	14504.5 MHz	F1'	14924.5 MHz
F2	14508	F2'	14928 MHz
-	-	-	-
-	-	-	-
F120	14921 MHz	F120'	15341 MHz

Channeling Plans

(Plan No - 17)

CHANNELING PLAN IN THE FREQUENCY BAND 21.2-23.6 GHz

Duplex Separation = 1232 MHz

1. 28 MHz plan:

F1	21238 MHz	F1'	22470 MHz
F2	21266 MHz	F2'	22498 MHz
-	-	-	-
-	-	-	-
-	-	-	-
F40	22330 MHz	F40'	23562 MHz

2. 14 MHz plan:

F1	21231 MHz	F1'	22463 MHz
F2	21245 MHz	F2'	22477 MHz
-	-	-	-
-	-	-	-
-	-	-	-
F80	22337 MHz	F80'	23569 MHz

3. 07 MHz plan:

F1	21227.5 MHz	F1'	22459.5 MHz
F2	21234.5 MHz	F2'	22466.5 MHz
-	-	-	-
-	-	-	-
-	-	-	-
F160	22340.5 MHz	F160'	23572.5 MHz

Electromagnetic Spectrum

