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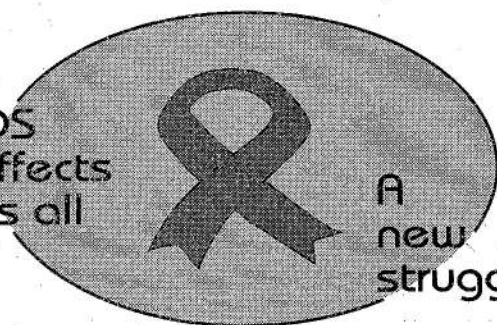
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No. 20634

**We all have the power to prevent AIDS**

AIDS  
affects  
us all



A  
new  
struggle

**Prevention is the cure**

**AIDS  
HELPLINE**

**0800 012 322**

DEPARTMENT OF HEALTH

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**GENERAL NOTICE**

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**NOTICE 2488 OF 1999****SOUTH AFRICAN TELECOMMUNICATIONS REGULATORY  
AUTHORITY**

**NOTICE IN TERMS OF SECTION 29 OF THE TELECOMMUNICATIONS ACT (ACT 103 OF 1996) INVITING REPRESENTATIONS WITH REGARD TO THE DRAFT SABRE-2 RADIO FREQUENCY BAND.**

**DRAFT RADIO FREQUENCY BAND PLAN FOR FREQUENCIES IN THE RANGE 3-70GHz**

1. The South African Telecommunications Regulatory Authority ("the Authority") hereby gives notice and invites representations on the Draft South African Band Re-planning Exercise ("SABRE-2") Radio Frequency Band.
2. This document is published in accordance with the second South African Band Re-planning Exercise (SABRE-2) process that was publicly announced in the Government Gazette No 18883, Notice 740 of 1998, dated 30 April 1998.
3. The purpose of this document is to seek views from interested parties on the draft radio frequency band plan covering the range 3 –70GHz contained in this document by 18<sup>th</sup> February 2000.
4. Persons making representations are further invited to indicate whether they are requesting an opportunity to make oral representations (and the estimated duration therefor, which duration shall not exceed one hour). The oral representations are scheduled for the 25th February 2000, 10H00 at SATRA Block B Auditorium, Pinmill Farm, 164 Katherine Street, Sandton,
5. Written comments will be made publicly available except where respondents indicate that their response or parts of it are confidential. Respondents are requested to separate any confidential material into a clearly marked confidential annex. Unconditional permission will be assumed unless the author expressly states otherwise.

6. It would be helpful if five copies of all comments could be submitted. An electronic version of your comments either on disk or e-mail must accompany your submission.
7. Written representations may be posted or hand delivered for attention:  
The Project Manager, SABRE-2, Private Bag X1, Marlboro, 2063  
or  
SATRA Block A, Pinmill Farm, 164 Katherine Street, Sandton, Gauteng Province
8. All comments and queries regarding this document should be addressed to Mr. Mandla Mchunu.

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Fax 011-321 8564  
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**MR HNL MAEPA, PrEng, PE**  
**CHAIRPERSON - SATRA**

# **South African Band Re-planning Exercise (SABRE - 2)**

**DRAFT**

## **Band Plan for the 3-70 Gigahertz Frequencies**

**August 1999**

**Revised: Nov 1999**

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## 1. Introduction

### 1.1 General

This document presents the draft band plan for the future use of the radio spectrum in South Africa between the 3 and 70 gigahertz (GHz) frequency range. The document has been produced by the South African Telecommunications Regulatory Authority (SATRA), with the assistance of IIT Research Institute (IITRI), LCC International and Thethani Universal Technologies, as part of the South African Band Replanning Exercise (SABRE-2).

### 1.2 Project SABRE

The need for Project SABRE 2 emerged from the requirement to establish a revitalized band plan in the 3 to 70 GHz range, in preparation for various new technologies and services to ensure a more competitive future environment. As a result of this requirement a new migration strategy for this area of the spectrum is also required to move from the existing band plan to the proposed new band plan. A further principle aim of this project is to produce a band plan for the future use of spectrum, which is agreed nationally, consistent with international trends, while maintaining the needs of South Africa.

The principle of the project included:

- a review of the spectrum utilization from 3 to 70 GHz
- the production of a "draft" band plan for presentation to public and private entities for comments and views

The project was broken down into a phased approach:

- Phase 1 - Analysis of current spectrum utilization
- Phase 2 - Identification of future spectrum requirements
- Phase 3 - Examination of International Technology Trends
- Phase 4 - Introduction of a "Draft Band Plan"
- Phase 5 - Refinement of the Band Plan (to be completed)

### 1.3 Methodology

The primary approach of the Working Group for the SABRE-2 band replanning has been the premise that, involving spectrum users, service providers, and equipment manufacturers a reasonably accurate and cost effective long-term spectrum band plan can be arrived at. Additionally, the following strategies were employed by the Working Group:

*"Spectrum Requirements Definition"*, in that all future national spectrum requirements for all radio services are analyzed.

*"Spectrum Availability Using ITU Allotment Plans"* were assessed with inputs from SATRA and ITU allotment lists. Current Radio Frequency Authorizations were also assessed.

*"Iterative Process"* with rapidly changing technology, our aim is to keep the spectrum plan as flexible and open with the ability for modification in the future. The planning process is therefore a continuous process of exploration and data analysis rather than a linear process.

*"The Administrative Body"* in this case SATRA, was also observed in the following areas:

- Detailed strategic policies
- Allocation of financial and human resources
- Strategic review of procedures
- Planning data used as a basis for frequency management

*Other Planning Criteria Included:*

*Regulatory and Legal factors:*

- ITU allotments
- Regional Management bodies
  - Europe - CEPT
  - Southern Africa - TRASA
- Neighboring administrations and their spectrum usage.
- Telecommunications infrastructures
- Industrial factors

*Economic Factors*

- User Mobility
- Globalization
- Overall economic development
- Market factors
- License fee structure

*Social Factors*

- Changes in demand as a result of changes in the social structure
- Security and public safety

*Ecological Factors*

- Electromagnetic pollution
- Public dislike of large antenna structures and proliferation of sites

*Technical Factors*

Basic technologies and equipment components

Coding and modulation techniques

Channel access techniques

Transmission modes such as time, space, frequency diversity and also spread spectrum techniques

**1.4 Evaluation**

Our evaluation process consisted of inquiries, interaction and analysis of trends both domestic and international. A thorough breakdown of user inputs pertaining to the comment round of the Replanning Exercise was undertaken. In addition, formal and informal meetings were held with both the public and private sector. Finally license trends in South Africa, international trends and technology developments were incorporated into the bandplan.

**1.5 TRANSITION TO LONG TERM OBJECTIVES**

The process also considered the maximum use of the radio spectrum by various technical and operational methodologies that are known or under development. In addition, the evaluation of current spectrum management processes was and is still under debate to include factors such as user exclusivity, band/block allocations and user fees. However, the transition from spectrum utilization to long-term objectives can only be achieved by the use of advanced spectrum engineering techniques and procedures. At the present time the lack of a comprehensive and centralized database is one of the detriments in the development of an updated long-term spectrum management strategy. The use of effective spectrum utilization can be achieved by the use of advanced engineering techniques to increase frequency re-use, reduce channel bandwidth, improve coding and modulation techniques, improve access strategies and band sharing, without interference and introduce new spectrum sharing criteria.

**1.6 SPECTRUM FLEXIBILITY**

A sound spectrum management program should permit flexibility of strategies and prioritization. The program should allow service flexibility by providing any band, to any service, subject to technical limitations of the frequency band concerned. It should also be technically flexible, allowing a myriad of technologies subject to interference limitations. Finally, it should allow for innovative policies and regulations tied to market forces, flexible enough to change with social, economical and technical needs.

## 2.0 KEY NATIONAL REQUIREMENTS UNDER SABRE 2

The requirement for educational and other broadcasting services, basic telephone services, rapid deployment of wireless local loop and the ever increasing need for safety and security needs have been catalysts for the plan. In addition, deregulation and competition in the Wireless Industry is upon us.

SATRA must take steps to encourage foreign investment while accelerating the Universal Service concept. It is certainly mandatory that for the good of the country, Spectrum Balance is needed that best meets the needs of all national interests without sacrificing one for the other due to financial or political interests.

Government Gazette notices which have been consolidated into the band plan are listed below with outlines of each:

### **Gazette Number 18883 (30 April 1998):**

#### **Microwave Multi-Point Distribution System**

##### **2.520 - 2.690 GHz**

- Reduction in access to 70% of the band in **urban** areas within 3 years on shared
- Co-primary basis for a finite period.
- Access to 100% of the band in **rural** areas on a shared co-primary basis for a Finite period
- No access to these bands after 10 years

#### **Time Division Multiple Access**

- Access to 70% of the band in urban areas on co-shared primary basis
- Access to 30% of the band in urban areas on primary basis within 3 years
- Access to 100% of the band in rural areas on a shared, co-primary basis
- TDMA sub-service will use CEPT recommendation T/R 13.01 allowing 3.5 MHz, 7 MHz and 14 MHz channel spacing

#### **Low Power Video Surveillance**

- Unlicensed usage within buildings in accordance with the telecom act
- Licensed and co-ordinate use in bands 10,025-10,081 GHz and 31,000-31,056 GHz.
- In all cases channel bandwidths of 14 MHz will be used.

**38 GHz High Density Fixed Services**

- It is anticipated that large mobile networks will be required.
- This band will be sub-divided into channel spacing to be determined.

**Gazette Number 1790 (17 November 1995)**

- Doppler-shift movement detectors (10.025-10.700 GHz)
- Microwave fences (13.4-14 GHz)

**Gazette Number 19183 (24 August 1998)****The principal aim of the re-planning is :**

- To introduce broadcasting services (DTH) within two sub-bands of the 10.7-11.7 GHz band.
- To protect current and future developments of FS/FSS throughout the band 10.7 – 11.7 GHz.

**Possible Consideration**

- i) Sharing between Broadcasting Satellite Services(BSS) and the FS/FSS in the bands allocated within Region 1 of the ITU as FS/FSS
- ii) Joint Liaison committee to monitor the angle of any potential future broadcasting satellite within this band
- iii) Primary allocation to be reserved for FS/FSS in the shared portion of the band
- iv) Secondary allocation to be reserved for BSS in the shared portion of the band.
- v) To revise band allocation in the 10.7 - 11.7 GHz to indicate sharing in the sub-bands 10.95 - 11.2GHz and 11.45 - 11.7 GHz with consideration of ( i ) – (iv).

**Gazette Number 19208 (31 August 1998)**

Whereas the entire band (10.7 – 11.7 GHz) is currently exclusively assigned to Telkom in terms of the Registrar of assignment SATRA now intends to change the status of the assignments made to Telkom in two sub-bands within the above band. The Sub-bands concerned are 10.95 – 11.25 GHz and 11.45 – 11.7 GHz.

### 3.0 Future band Plan

The following table presents the band plan for the future use of the radio spectrum in South Africa between 3 GHz and 70 GHz. The plan represents a target that the country should strive to achieve.

The table is divided into the following columns:

- Region One Band Allocations divided into frequency band into Primary and Secondary Services.
- South African Table of Allocations. The range of frequencies associated with the main allocations (in GHz) once again divided into Primary and Secondary Services.
- Primary Service. This column indicates the main services to which each band is to be allocated. The service types are defined by the ITU, and the allocations are in most cases consistent with the ITU Radio Regulations for Region 1. The service that will have most widespread utilization in the future is listed first and is in capital letters. However, bands listed as "SHARED" with multiple Primary services listed indicate that both services have equal occupancy rights to the spectrum. Secondary services are listed in lower case letters. Bands which are "RESERVED" for future use are clearly marked.

*Limitations of Secondary Services:* Secondary services are on a non-interference basis (NIB) to the primary services. 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 or to which frequencies may be assigned at a later date;
  - (b) cannot claim protection from harmful interference from stations of a primary service to which frequencies are already assigned or may be assigned at a later date;
  - (c) can claim protection, however, from harmful interference from stations of the same service(s) to which frequencies may be assigned at a later date.
- Application & Footnotes. This column indicates frequency utilization by applications associated with the primary service. It also indicates applications or systems which should be licensed in a particular band. The footnotes indicate specific channelization plans which are in place or anticipated for a specific band. The footnotes include:

International Radio Consultative Committee (CCIR)  
Recommendations (e.g. CCIR 852-6)

Federal Communications Commission Codes of Federal Regulations (e.g. FCC Part 15)

ITU Recommendations and Footnotes (e.g. ITU-R F1098 & S5.111)

- Future Requirements. This section contains footnotes relating to a compilation of comments reviewed; contained in Section 4.
- Actions. The action column indicates national or international processes which will affect a certain frequency band. It is also used as a general remarks section.

## **4 Supporting Notes**

### **4.1 General**

This section provides notes to support the future band plan presented in section 3 of this document. The notes relate to those frequency bands where changes may occur. In most cases the notes are concerned with the rationale behind proposed changes, or the strategy for migrating from an exclusive service to a shared band environment.

For convenience the notes are divided by frequency bands from 3 to 70 GHz.

### **4.2 Fundamental principles**

#### **4.2.1** This section describes some principles which have been key to the development of the band plan.

The following are fundamental long term aims of the "draft band plan":

Development of a draft band plan which is technology neutral, allowing spectrum utilization of mixed services based on approved engineering studies and recommendations.

The premise that bulk/band licensing practices by SATRA will eventually be abolished.

Protecting spectrum for sectors such as Government and safety and security concerns.

Increasing the amount of spectrum available for technology which is spectrum efficient.

### **4.3 Alignment with ITU Region 1**

South Africa is part of ITU Region 1, and thus the country has an obligation to base its frequency allocations on those specified for the Region, in the ITU Radio Regulations. Although the document contains existing band plans which have been adopted by the European community and are currently being utilized in South Africa, careful consideration must also be given to other regions.

The band plan reflects great flexibility in adjusting to market or technology factors dependent on channelization plans which will be adopted.

### **4.4 Migration of frequency bands**

Presently, the only forced migration issue deals with the 21.4 - 22.0 GHz bands. This band will revert from Fixed, Mobile and Broadcasting Satellite Services to the Broadcast Satellite Service application in the year 2007. Currently, there are very few licenses in the band according to SATRA records. In fact, the SABRE-2 Working Group has reserved a portion of this spectrum (21.8-22.0 GHz) due to non-utilization. Future migration for the existing few licenses can be accommodated in bands which have been "Reserved" for future use. This will be determined prior to the final band plan being presented.

Other migration issues include the "opening of the 38 GHz band." Prior to a channelization plan being adopted for this portion of the spectrum, it is recommended that a migration of 20-24 GHz Fixed Service assignments be established. The primary criteria for migration would be link distance associated with specific frequency assignments; once the band is released to the public.

Lastly, a common database is required for any future migration strategies. Currently, records are in incompatible formats and incomplete. Frequency authorizations must be developed in a common format to allow proper frequency coordination to avoid harmful interference. In addition, several bulk/band license users have not updated their records for some time, bringing the validity of the data base into question. In some instances, records have not been updated for years.

#### **4.5 Channelization Plans**

As noted in the band plan, (Footnotes Section) several channelization plans are in place. Some have been used for years and require a complete update. In order to proceed with this matter, a complete assignment review would be required. This would entail industry to update their records in a timely manner, analyzing assignments, and then adopting or maintaining the current channelization plan. On hand with the working group are complete channelization plans down to and including 2.5 MHz bandwidths plans to complete this endeavor. However, without SATRA's assistance, the working group has no authority to mandate a record update onto spectrum users.

#### **4.6 3 - 70 GHz Future Requirement Notes/ITU Footnotes and Comments by band.**

Future requirements, ITU Footnotes and amplifying information pertaining to each frequency band are contained in the supplemental note section.

**FUTURE REQUIREMENTS NOTES  
ITU FOOTNOTES  
COMMENTS**

**4.6.1      2.9 - 3.1 GHz Primary Allocation – Radionavigation**

- No additional Requirement

**S5.425**      In the band 2900-3100 MHz, the use of the shipborne interrogator-transponder system (SIT) shall be confined to the sub-band 2930-2950 MHz.

**S5.426**      The use of the band 2922-3100 MHz by the aeronautical radionavigation service is limited to ground-based radars.

**S5.427**      In the bands 2900-3100 MHz and 9300-9500 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.S4.9 .

**4.6.2      3.1 - 3.3 GHz Primary Allocation - Radiolocation**

- No additional Requirements

**S5.149**      In making assignments to stations of other services, 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. S4.5 and S4.6 and Article S29).

**4.6.3      3.3 - 3.4 GHz Primary Allocation - Radiolocation**

- No additional Requirements

**S5.149**      In making assignments to stations of other services, 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. S4.5 and S4.6 and Article S29).

**4.6.4      3.4 - 3.6 GHz Primary allocation - Fixed and Fixed Satellite**

- Fixed Satellite Service Down link/Fixed Outside Broadcasting
- Digital Multipoint
- Time Division Multiple Access/Wireless Local Loop
- PanAmSat-7

Comments: Recommend band be designated for shared use between services. WLL applications can be accommodated in bands currently allocated and underutilized.

**4.6.5      3.6 - 4.2 GHz Primary allocation - Fixed and Fixed Satellite**

- Down link/Fixed Outside Broadcasting(3.6 – 3.9GHz)
- Anticipated Expansion up to 4.2 GHz
- Expand PanAmSat-7 TO 3.7 GHz
- Down link/Expansion anticipated

Comments: Band sharing also recommended for this band. Anticipated expansion of satellite downlink is anticipated.

**4.6.6      4.2 - 4.4 GHz Primary allocation - Aeronautical Radionavigation**

- No additional Requirements

**S5.440** 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  $\pm 2$  MHz of these frequencies, subject to agreement obtained under No.S9.21.

**4.6.7      4.4 - 4.5 GHz Primary allocation - Fixed and mobile**

- No additional Requirements

**4.6.8      4.5 - 4.8 GHz Primary allocation - Fixed and Fixed Satellite**

- No additional Requirements

**S5.441** The use 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 **S30B**. 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 **S30B**. 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 non-geostationary-satellite systems in the fixed-satellite service shall be in accordance with the provisions of Resolution **130 (WRC-97)**.

**4.6.9      4.8 - 4.99 GHz Primary allocation - Fixed and Mobile**

- No additional Requirements

**S5.149** In making assignments to stations of other services, 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. **S4.5** and **S4.6** and Article **S29**).

**S5.339** 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.

**4.6.10      4.99-5000 GHz primary allocation – Fixed, Mobile (except aeronautical mobile) and Radio Astronomy**

- No additional requirement

**S5.149** In making assignments to stations of other services, 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. **S4.5** and **S4.6** and Article **S29**).

**4.6.11      5.000 - 5.250 GHz Primary allocation - Aeronautical Radionavigation**

- Feeder links
- Direct Sequence Spread Spectrum
- ISM operations

Comments: Industrial, scientific, and medical devices in this band will be licensed and type accepted in accordance with the Federal Communications Commission Part 15.401.

**S5.367** The bands 1 610-1 626.5 MHz and 5 000- 5150 are also allocated to the aeronautical mobile-satellite service ® on a primary basis, subject to the agreement obtained under No .S9.21.

**S5.444** The band 5 000-5150 MHz is to be used for the operation of the international standard system (Microwave landing system) for precision approach and landing. The requirement of this system shall take precedence over other uses of these band. For the use of this band, No. **S5.444A** and Resolution **114 (WRC-95)** apply.

**S5.444A** The band 5 000-5150 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 and is subject to coordination under No **S9.11A**. In the band 5 091-5 150 MHz, the following conditions also apply:

- prior to 1 January 2010, 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(WRC-95)**;
- prior to 1 January 2010, the requirements of existing and planned international standard systems for the aeronautical radionavigation service which cannot be met in the in the 5 000-5 091 MHz band, shall take precedence over uses of this band;
- after 1 January 2008, no new assignments shall be made to stations providing feeder links of the non-geostationary mobile- satellite systems;
- after 1 January 2010, the fixed-satellite service will become secondary to the aeronautical radionavigation service.

**S5.447A** The allocation to the fixed-satellite service (Earth-to-space) is limited to feeder links of non-geostationary-satellite service and is subject to provisions of No **S9.11A**.

**S5.447B** 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 operation in the space-to-Earth direction in the band 5 150-5 216 MHz shall in no case exceed – 164 dB(W/m<sup>2</sup>) in any 4kHz band for all angles of arrival.

**S5.447C** Administrations responsible for fixed-satellite service networks in the band 5 150-5 250 MHz operated under Nos. **S5.447A** and **S5.447B** shall coordinate on an equal basis in accordance with No **S9.11A** with administrations responsible for non-geostationary-satellite networks operated under No **S5.446** and brought into use to 17 November 1995. Satellite networks operated under No **S5.446** 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 **S5.447A** and **S5.447B**.

**4.6.12**      **5.250 - 5.255 GHz Primary allocation - Radiolocation**

- No additional Requirements

Comments: Industrial, scientific, and medical devices in this band will be licensed and type accepted in accordance with the Federal Communications Commission Part 15.401.

**S5.447D** The allocation of the band 5 250 – 5 255 MHz to the space research service on a primary basis is limited spaceborne sensors. Other uses of the band by the space research service are on a secondary basis.

**S5.448A** The use of the band 5 250-5 350 MHz the earth exploration-satellite (active) and space research (active) services shall not restrain the future development and deployment of the radiolocation service.

**4.6.13**      **5.255 - 5.350 GHz Primary allocation - Radiolocation**

- No additional Requirements

Comments: Industrial, scientific, and medical devices in this band will be licensed and type accepted in accordance with the Federal Communications Commission Part 15.401.

**S5.448A** The use of the band 5 250-5 350 MHz the earth exploration-satellite (active) and space research (active) services shall not constrain the future development and deployment of the radiolocation service.

**4.6.14      5.350 - 5.460 GHz Primary allocation - Aeronautical Radionavigation**

- No additional Requirements

**S5.448B**      The earth exploration-satellite (active) service operating in the band 5 350-5 460 MHz shall not cause harmful interference to, or constrain the future development of, the aeronautical radionavigation service.

**S5.449**      The use of the band 5 350-5 470 MHz by the aeronautical radionavigation service is limited to airborne radars and associated airborne beacons

**4.6.15      5.460 - 5.470 GHz Primary allocation - Radionavigation**

- No additional Requirements

**S5.449**      The use of the band 5 350-5 470 MHz by the aeronautical radionavigation service is limited to airborne radars and associated airborne beacons

**4.6.16      5.470 - 5.650 GHz Primary allocation - Maritime - Radiolocation**

- No additional Requirements

**S5.452**      Between 5 600 MHz and 5 650 MHz, ground-based radars used for meteorological purposes are authorized to operate on the basis of equality with stations of the maritime radionavigation service.

**4.6.17      5.650 - 5.725 GHz Primary allocation - Radiolocation**

- No additional Requirements

**S5.282**      In the bands 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.S5.43). Administrations authorizing such use shall ensure that any harmful interference caused by emissions from a station in the provisions of No S25.11. The use of the bands 1 260-1 270 MHz and 5 650-5 670 MHz by the amateur-satellite service is limited to Earth-to-space direction.

**4.6.18      5.725 - 5.850 GHz Primary allocation - Fixed Satellite and Radiolocation**

- No additional Requirements

**S5.150** The band 5 725-5 875 MHz is also designated for industrial scientific and medical (ISM) applications. Recommendation services operating within this band must accept harmful interference which may be caused by this application. ISM equipment operating in this band is subject to the provision of No **S15.13**.

**4.6.19      5.850 - 5.925 GHz Primary allocation - Fixed and Fixed Satellite**

- Point to Point Studio Broadcast

**S5.150** The band 5 725-5 875 MHz is also designated for industrial scientific and medical (ISM) applications. Recommendation services operating within this band must accept harmful interference which may be caused by this application. ISM equipment operating in this band is subject to the provision of No **S15.13**.

**4.6.20      5.925 - 7.075 GHz Primary allocation - Fixed Satellite, Mobile and Fixed**

- Satellite Uplinks
- Short range Intelligent Transport System
- Telemetry Tracking and Command
- Industrial Scientific and Medical
- Point to Point Studio Broadcast
- Licensed video surveillance
- Feeder links

Comments: Satellite uplink expansion is anticipated. In addition ISM operations are permitted in this band.

**S5.149** In making assignments to stations of other services, 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. **S4.5** and **S4.6** and **Article S29**).

**S5.440** The standard frequency and time signal-satellite service may be authorised 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 +/- 2MHz of these frequencies, subject to agreement obtained under No **S9.21**.

**S5.458** 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 measurement 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.

**S5.458A** In making assignments in the band 6 700-7 075 MHz to space station 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.

**S5.458B** 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 **S9.11A**. 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.**S22.2**.

**S5.458C** 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 the relevant ITU-R Recommendations with 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.

#### **4.6.21**      **7.075 - 7.250 GHz Primary allocation - Fixed, Fixed Satellite and Mobile**

- No additional Requirements

**S5.458** 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 measurement 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.

**S5.460** Additional allocation: the band 7 145 - 7 235 MHz is also allocated to the space research (Earth-to-space) service on a primary basis, subject to agreement obtained under No. **S9.21**. The use of the band 7 145 – 7 190 MHz is restricted to deep space ; no emissions to deep space shall be effected in the band 7 190 – 7 235 MHz.

**4.6.22      7.250 - 7.300 GHz Primary allocation - Fixed, Fixed Satellite and Mobile**

- Point to Point Studio Broadcast

**S5.461**      The bands 7 250-7 375 MHz (space-to-Earth) and 7 900-8 025 MHz (Earth-to-space) are allocated to mobile-satellite service on a primary basis, subject to agreement obtained under No. **S9.21**.

**4.6.23      7.300 - 7.450 GHz Primary allocation - Fixed, Fixed Satellite and Mobile**

- Point to Point Studio Broadcast

**S5.461**      The bands 7 250-7 375 MHz (space-to-Earth) and 7 900-8 025 MHz (Earth-to-space) are allocated to mobile-satellite service on a primary basis, subject to agreement obtained under No. **S9.21**.

**4.6.24      7.450 - 7.550 GHz Fixed, Fixed Satellite, Meteorological -Satellite and Mobile**

- Point to Point Studio Broadcast

**S5.461A**      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.

**4.6.25      7.550 - 7.750 GHz Primary allocation - Fixed, Fixed Satellite and Mobile**

- Point to Point Studio Broadcast

Comments: Shared Band. Coordination between services is a standard procedure at this time.

**4.6.26      7.750 - 7.900 GHz Primary allocation Fixed and Mobile**

- Point to Point Studio Broadcast

**S5.461B**      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.

**4.6.27     7.900 - 8.025 GHz Primary allocation - Fixed, Fixed Satellite and Mobile**

- Point to Point Studio Broadcast
- Telemetry Tracking and Command
- Direct Sequence Spread Spectrum

**S5.461**     The bands 7 250-7 375 MHz (space-to-Earth) and 7 900-8 025 MHz (Earth-to-space) are allocated to mobile-satellite service on a primary basis, subject to agreement obtained under No. S9.21.

**4.6.28     8.025 - 8.175 GHz Primary allocation - Fixed, Fixed Satellite, Mobile and Earth Exploration Satellite**

- No additional Requirements

**S5.462A**     In regions 1 and 3 (except Japan), in the bands 8 025-8 400 MHz, the earth exploration-satellite service geostationary satellite shall not produce a power flux density in excess of the following provisional values for angles of arrival ( $\theta$ ), without the consent of the affected administration:

-174 dB(W/m <sup>2</sup> ) in a 4 KHz band	for $0^\circ \leq \theta < 5^\circ$
-174 +0.5 ( $\theta - 5$ ) dB (W/m <sup>2</sup> ) in a 4 KHz band	for $5^\circ \leq \theta < 25^\circ$
-174dB (W/m <sup>2</sup> ) in a \$ KHz band	for $25^\circ \leq \theta \leq 90^\circ$

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

**S5.463**     Aircraft stations are not permitted to transmit in the band 8 025-8 400 MHz

**4.6.29     8.175 - 8.215 GHz Primary allocation - Fixed, Fixed Satellite, Meteorological Satellite and Mobile**

- Point to Point Studio Broadcast

**S5.462A**     In regions 1 and 3 (except Japan), in the bands 8 025-8 400 MHz, the earth exploration-satellite service geostationary satellite shall not produce a power flux density in excess of the following provisional values for angles of arrival ( $\theta$ ), without the consent of the affected administration:

-174 dB(W/m <sup>2</sup> ) in a 4 KHz band	for $0^\circ \leq \theta < 5^\circ$
-174 +0.5 ( $\theta - 5$ ) dB (W/m <sup>2</sup> ) in a 4 KHz band	for $5^\circ \leq \theta < 25^\circ$
-174dB (W/m <sup>2</sup> ) in a \$ KHz band	for $25^\circ \leq \theta \leq 90^\circ$

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

**S5.463** Aircraft stations are not permitted to transmit in the band 8 025-8 400 MHz

**4.6.30 8.215 - 8.400 GHz Primary allocation - Fixed, Fixed Satellite and Mobile**

- Point to Point Studio Broadcast

**S5.462A** In regions 1 and 3 (except Japan), in the bands 8 025-8 400 MHz, the earth exploration-satellite service geostationary satellite shall not produce a power flux density in excess of the following provisional values for angles of arrival ( $\theta$ ), without the consent of the affected administration:

-174 dB(W/m <sup>2</sup> ) in a 4 KHz band	for $0^\circ \leq \theta < 5^\circ$
-174 +0.5 ( $\theta - 5$ ) dB (W/m <sup>2</sup> ) in a 4 KHz band	for $5^\circ \leq \theta < 25^\circ$
-174dB (W/m <sup>2</sup> ) in a \$ KHz band	for $25^\circ \leq \theta \leq 90^\circ$

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

**S5.463** Aircraft stations are not permitted to transmit in the band 8 025-8 400 MHz

**4.6.31 8.400 - 8.500 GHz Primary allocation - Fixed and Mobile**

- Point to Point Studio Broadcast

**S5.465** In the space research service, the use of the band 8 400-8 450 MHz is limited to deep space.

**4.6.32 8.500 - 8.750 GHz Primary allocation - Radiolocation**

- No additional Requirements

**S 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.

**4.6.33 8.750 - 8.850 GHz Primary allocation - Radiolocation and Maritime Radiolocation**

- No additional Requirements

**S5.470** The use of the band 8 750-8 850 MHz by the aeronautical service is limited to airborne Doppler navigation aids on a centre frequency of 8 800 MHz.

**4.6.34      8.850 - 9.000 GHz Primary allocation - Radiolocation and Maritime Radiolocation**

- No additional Requirements

**S5.472**      In the bands 8 850-9 000 MHz, the maritime radionavigation service is limited to shore-based radars only.

**4.6.35      9.000- 9.200 GHz Primary allocation - Aeronautical Radionavigation**

- No additional Requirements

**S5.337**      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.

**4.6.36      9.200 – 9.300 GHz Primary allocation – Radiolocation & Maritime Radionavigation**

No additional Requirements

**S5.472**      In the bands 8 850-9 000 MHz, the maritime radionavigation service is limited to shore-based radars only.

**S5.474**      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 S31).

**4.6.37      9.300 - 9.500 GHz Primary allocation - Radionavigation**

- No additional Requirements

**S5.427**      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 (racons) and shall not cause interference to ship or aeronautical radars in the radionavigation service, having regard, however, to No.S4.9.

**S5.474**      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 S31).

**S5.475** 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 radars 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.

**S5.476** In the band 9 300-9 320 MHz in the radionavigation service, the use of shipborne radars, other than those existing on 1 January 1976, is not permitted until January 2001.

**4.6.38      9.500 - 9.800 GHz Primary allocation - Radiolocation and Radionavigation**

- No additional Requirements

**S5.476A** In the band 9 500-9 800 MHz, stations in the earth exploration-satellite service (active) shall not cause harmful interference to, or constrain the use and development of, stations of the radionavigation and radiolocation services.

**4.6.39      9.800 - 10.00 GHz Primary allocation - Radiolocation**

- No additional Requirements

**S5.479** The band 9 975-10 025 MHz is also allocated to the meteorological – satellite service on a secondary basis for use by weather radars.

**4.6.40      10.00 - 10.450 GHz Primary Allocation - Fixed, Mobile and Radiolocation**

- Request to develop wireless LAN's
- Digital Multipoint Broadcast

Comments: Low power video surveillance applications permitted.  
Other low power devices such as wireless LAN's can be accommodated.

**S5.479** The band 9 975-10 025 MHz is also allocated to the meteorological – satellite service on a secondary basis for use by weather radars.

**4.6.41      10.450 - 10.500 GHz Primary allocation - Radiolocation**

- No additional Requirements

**4.6.42      10.5 - 10.55 GHz Primary allocation - Fixed and Mobile**

- No additional Requirements

**4.6.43      10.55 - 10.6 GHz Primary allocation - Fixed and Mobile**

- No additional Requirements

**4.6.44      10.6 - 10.68 GHz Primary allocation - Earth Exploration Satellite, Fixed, Mobile, Radio Astronomy and Space Research**

- Request to develop
- Digital Multipoint Broadband
- Medium/Long haul links for video surveillance
- 10.25 – 10.7 Allocate to security on NIB (none interference basis)

**S5.149** In making assignments to stations of other services, 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. S4.5 and S4.6 and Article S29).

**S5.482** In the band 10.6-10.68 GHz, stations of the fixed and mobile, except aeronautical mobile services shall be limited to the maximum equivalent isotropically radiated power of 40dBW and the power delivered to the antenna shall not exceed –3 dBW. These limits may be exceeded subject to Agreement obtained under No.S.9.21.

**4.6.45      10.68 - 10.7 GHz Primary allocation - Earth Exploration Satellite, Radio Astronomy and Space Research**

- No additional Requirements

**S5.340** All emissions are prohibited in the following bands:

1 400-1 427 MHz,

2 690-2 700 MHz,

10.68-10.7 GHz,

except those provided for by Nos. S5.421 and S5.422,

except those provided for by No. S5.483,

15.35-15.4 GHz,	except those provided for by No. S5.483
23.6-24 GHz,	
31.3-31.5 GHz,	
31.5-31.8 GHz	in Region 2
48.94-49.04 GHz	from airborne stations,
50.2-50.4 GHz <sup>2</sup>	except those provided by No.S5.555A.
52.6-54.25 GHz,	
86-92 GHz,	
105-116 GHz,	
140.69-140.98 GHz,	from airborne stations and from space stations in
	the space-to-Earth direction,
182-185 GHz	except those provided for by No.S5.563,
217-231 GHz.	

#### 4.6.46 **10.7 - 11.7 GHz Primary allocation - Fixed, Fixed Satellite, and Mobile**

- Satellite Downlinks
- Telemetry Tracking and Command
- Shared between Broadcast Satellite Service and Fixed Satellite Service
- Panamsat-7
- Fixed Satellite Service/Direct to Home

Comments: Shared band. Satellite downlinks increasing

**S5.441** The use 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 **S30B**. 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 **S30B**. 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 non-geostationary-satellite systems in the fixed-satellite service shall be in accordance with the provisions of Resolution **130 (WRC-97)**.

**S5.484** In Region 1, the use of the band 10.7 – 11.7 GHz by fixed satellite service (Earth - to – space) is limited to feeder links for the broadcasting satellite services

**S5.484A** 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 non-geostationary and geostationary satellite systems in the fixed satellite systems is subject to the provisions of Resolution **130 (WRC –97)**. The use of the band 17.8 – 18.1 GHz (space – to – Earth) by non-geostationary fixed satellite service systems is also subject to the provisions of Resolution **538 (WRC-97)**.

**4.6.47      11.7 - 12.5 GHz Primary allocation - Fixed, Broadcasting, Broadcasting Satellite and Mobile**

- Satellite Downlinks
- Shared between Fixed Satellite Service and Broadcast Satellite Service
- Fixed Satellite Service/Direct to Home

Comments: Shared band between services.

**S5.487**      In the band 11.7 – 12.5 GHz in Region 1 and 3, the fixed , fixed-satellite, mobile, except aeronautical mobile, and broadcasting services, in accordance with their respect allocations shall not cause harmful interference to broadcasting-satellite stations operating in accordance with the provisions of Appendix **S30**.

**S5.487A**      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 the provisions of Resolution **538(WRC-97)**.

**S5.492**      Assignments to stations of the broadcasting – satellite service in conformity with the appropriate regional plan in Appendix **S30** may also be used for transmissions in the fixed satellite service(space-to-Earth), provided that such transmissions do not cause more interference or require more protection from interference than the broadcasting satellite service transmissions operating in conformity with this plan. With respect to space services , this band shall be used principally for the broadcasting satellite service. (WRC-97)

**4.6.48      12.5 - 12.75 GHz Primary allocation - Fixed Satellite**

- Satellite Downlinks
- Telemetry Tracking and Command
- Fixed Satellite Service /Direct to Home

**S5.496**      Additional allocation: in Austria, Azerbaijan, Kyrgyzstan, Turkmenistan and Ukraine, 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 service 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 service of the countries listed in this footnote. The power flux-density limit at the Earth's surface given in Article S21, Table S21-4, for the fixed-satellite service shall apply on the territory of the countries listed in this footnote. (WRC-97)

**4.6.49      12.75 - 13.25 GHz Primary allocation - Fixed, Fixed Satellite and Mobile**

- Telemetry Tracking and Command

Comments: Shared band.

**S5.441**      The use 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 S30B. 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 S30B. 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 non-geostationary-satellite systems in the fixed-satellite service shall be in accordance with the provisions of Resolution 130 (WRC-97).

**4.6.50      13.25 - 13.4 GHz Primary allocation - Aeronautical Radionavigation**

- No additional Requirements

**S5.497**      The use of the band 13.25 – 13.4 GHz by the aeronautical radionavigation service is limited to Doppler navigation aids.

**S5.498A**      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.

**4.6.51      13.4 - 13.75 GHz Primary allocation - Radiolocation**

- No additional Requirements

**S5.501A**      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.

**S5.501B** 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)

**4.6.52      13.75 - 14 GHz Primary allocation - Fixed Satellite and Radiolocation**

- Telemetry Tracking and Command
- Satellite Uplinks

**S5.484A** 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 non-geostationary and geostationary satellite systems in the fixed satellite systems is subject to the provisions of Resolution **130 (WRC –97)**. The use of the band 17.8 – 18.1 GHz (space – to – Earth) by non-geostationary fixed satellite service systems is also subject to the provisions of Resolution **538 (WRC-97)**.

**S5.502** In the band 13.75 – 14 GHz, the e.i.r.p. of any emission from earth station in the fixed satellite service shall be at least 68 dBW, and should not exceed 85 dBW, with 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 towards the geostationary satellite orbit shall not exceed 59 dBW.

**S5.503** In the band 13.75 – 14 GHz, geostationary space station in the space research service for which information for advanced 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 will operate on a secondary basis.. The e.i.r.p. density of emission from any earth station in the fixed satellite service shall not exceed 71 dBW in any 6 MHz band in the frequency range 13.772 – 13.778 GHz until those geostationary base stations in the space research service for which information for advance publication has been received by the Bureau prior to the 31 January 1992 cease to operate in this band. Automatic power control may be used to increase the e.i.r.p. density above 71 dBW in any 6 MHz band in these frequency range 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 the use of an e.i.r.p. of 71 dBW in any 6 MHz band in clear sky conditions.

**S5.503A** Until 1 January 2000, stations in the fixed satellite service shall not cause harmful interference to non-geostationary stations in the space research and earth exploration satellite service. After that date these non-geostationary space stations will operate on secondary basis in relation to the fixed satellite service. Additionally, when

planning earth station in the fixed satellite service to be brought in to service between 1 January 2000 and 1 January 2001, in order to accommodate the needs of spaceborne precipitation radars operating in the band 13.793 – 13.805 GHz, advantage should be taken of the consultation process and information given in Recommendation ITU-R SA.1071.

**4.6.53      14 - 14.25 GHz Primary allocation - Fixed Satellite, Radionavigation**

- Satellite Uplinks
- Broadcast Satellite Service feeder links
- Telemetry Tracking and Command

**S5.484A** 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 non-geostationary and geostationary satellite systems in the fixed satellite systems is subject to the provisions of Resolution **130 (WRC -97)**. The use of the band 17.8 – 18.1 GHz (space – to – Earth) by non-geostationary fixed satellite service systems is also subject to the provisions of Resolution **538 (WRC-97)**.

**S5.504** The use of the band 14 – 14.3 GHz by radionavigation service shall be such as to provide sufficient protection to space stations of fixed satellite service.

**S5.506** The band 14 – 14.5 GHz may be used, within fixed satellite service (Earth – to – space), for feeder links for 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.

**4.6.54      14.25 - 14.3 GHz Primary allocation - Fixed Satellite and Radionavigation**

- Satellite Uplinks
- Point to Point Studio Transmitter-links(14.2-15.3)GHz
- 13.75-14.8 GHz Telemetry Tracking and Command

**S5.484A** 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 non-geostationary and geostationary satellite systems in the fixed satellite systems is subject to the provisions of Resolution **130 (WRC –97)**. The use of the band 17.8 – 18.1 GHz (space – to – Earth) by non-geostationary fixed satellite service systems is also subject to the provisions of Resolution **538 (WRC-97)**.

**S5.504** The use of the band 14 – 14.3 GHz by radionavigation service shall be such as to provide sufficient protection to space stations of fixed satellite service.

**S5.506** The band 14 – 14.5 GHz may be used, within fixed satellite service (Earth – to – space), for feeder links for 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.

#### **4.6.55      14.3 - 14.4 GHz Primary allocation - Fixed, Fixed Satellite and Mobile**

- Point to Point Studio Transmitter-links(14.2-15.3)GHz
- 13.75-14.8 GHz Telemetry Tracking and Command

**S5.484A** 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 non-geostationary and geostationary satellite systems in the fixed satellite systems is subject to the provisions of Resolution **130 (WRC –97)**. The use of the band 17.8 – 18.1 GHz (space – to – Earth) by non-geostationary fixed satellite service systems is also subject to the provisions of Resolution **538 (WRC-97)**.

**S5.506** The band 14 – 14.5 GHz may be used, within fixed satellite service (Earth – to – space), for feeder links for 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.

**4.6.56      14.4 - 14.47 GHz Primary allocation - Fixed, Fixed Satellite and Mobile**

- Point to Point Studio Transmitter-links(14.2-15.3)GHz
- 13.75-14.8 GHz Telemetry Tracking and Command

**S5.484A** 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 non-geostationary and geostationary satellite systems in the fixed satellite systems is subject to the provisions of Resolution **130 (WRC –97)**. The use of the band 17.8 – 18.1 GHz (space – to – Earth) by non-geostationary fixed satellite service systems is also subject to the provisions of Resolution **538 (WRC-97)**.

**S5.506** The band 14 – 14.5 GHz may be used, within fixed satellite service (Earth – to – space), for feeder links for 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.

**4.6.57      14.47 - 14.5 GHz Primary allocation - Fixed, Fixed Satellite and Mobile**

- Point to Point Studio Transmitter-links

**S5.484A** 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 non-geostationary and geostationary satellite systems in the fixed satellite systems is subject to the provisions of Resolution **130 (WRC –97)**. The use of the band 17.8 – 18.1 GHz (space – to – Earth) by non-geostationary fixed satellite service systems is also subject to the provisions of Resolution **538 (WRC-97)**.

**S5.506** The band 14 – 14.5 GHz may be used, within fixed satellite service (Earth – to – space), for feeder links for 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.

**S5.149** In making assignments to stations of other services, 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. **S4.5** and **S4.6** and **Article S29**).

**4.6.58      14.5 - 14.8 GHz Primary allocation - Fixed, Fixed Satellite and Mobile**

- Point to Point Studio Transmitter-links
- Satellite Uplinks

**S5.510**      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.

**4.6.59      14.8 - 15.35 GHz Primary allocation - Fixed and Mobile**

- Point to Point Studio Transmitter-links
- High Density Fixed Service

**S5.339**      The band 15.20 – 15.35 GHz is also allocated to space research (passive) and earth exploration satellite (passive) services on a secondary basis.

**4.6.60      15.35 - 15.4 GHz Primary allocation - Earth Exploration Satellite, Radio Astronomy and Space Research**

- No additional Requirements

**S5.340**      All emissions are prohibited in the following bands:

1 400-1 427 MHz,	
2 690-2 700 MHz,	except those provided for by Nos. S5.421 and S5.422,
10.68-10.7 GHz,	except those provided for by No. S5.483,
15.35-15.4 GHz,	except those provided for by No. S5.483
23.6-24 GHz,	
31.3-31.5 GHz,	
31.5-31.8 GHz	in Region 2
48.94-49.04 GHz	from airborne stations,
50.2-50.4 GHz <sup>2</sup>	except those provided by No.S5.555A.
52.6-54.25 GHz,	
86-92 GHz,	
105-116 GHz,	
140.69-140.98 GHz,	from airborne stations and from space stations in the space-to-Earth direction,
182-185 GHz	except those provided for by No.S5.563,
217-231 GHz.	

**S5.516** 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 broadcasting satellite service. For the use of the band 17.3 – 17.8 GHz in Region 2 by feeder links for broadcasting satellite service in the band 12.2 – 12.7 GHz, see Article **S11**. The use of the band 17.3 – 18.1 GHz (Earth-to-space) in the Region 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 the provisions of Resolution **538 (WRC-97)**.

**4.6.68**      **18.1 - 18.4 GHz Primary allocation - Fixed and Fixed Satellite**

- Satellite Downlink
- Point to Point studio-transmitter links
- High Density Fixed Service
- Multichannel Multipoint Distribution Systems
- Telemetry Tracking and Command

Comments: Shared Band. Under Review.

**S5.484A** 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 non-geostationary and geostationary satellite systems in the fixed satellite systems is subject to the provisions of Resolution **130 (WRC –97)**. The use of the band 17.8 – 18.1 GHz (space – to – Earth) by non-geostationary fixed satellite service systems is also subject to the provisions of Resolution **538 (WRC-97)**.

**S5.519** Additional allocation: the band 18.1 – 18.3 GHz is also allocated to the meteorological-satellite service (space – to – Earth) on a primary basis. Its use is limited to geostationary satellite and shall be in accordance with the provisions of Article **S21**, Table **S21-4**

**S5.520** The use of the band 18.1 – 18.4 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links for the broadcasting-satellite service.

**4.6.69**      **18.4 - 18.6 GHz Primary allocation - Fixed, Fixed Satellite and Mobile**

- Satellite Downlink
- Geostationary Satellites
- Point to Point studio-transmitter links

Comments: Currently Shared Band. Under Review.

**S5.484A** 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 non-geostationary and geostationary satellite systems in the fixed satellite systems is subject to the provisions of Resolution **130 (WRC-97)**. The use of the band 17.8 – 18.1 GHz (space – to – Earth) by non-geostationary fixed satellite service systems is also subject to the provisions of Resolution **538 (WRC-97)**.

**4.6.70      18.6 – 18.8 GHz Primary allocation – Fixed and Fixed Satellite**

- Satellite Downlinks
- High Density Fixed Services
- Point to Point studio-transmitter links

Comments: Currently Shared Band. Under Review.

**S5.522** In making assignments to stations in the fixed and mobile services, administrations are invited to take account of passive sensors in the Earth-exploration satellite and space research service operating in the band 18.6 – 18.8 GHz. In this band, administration should endeavour to limit as far as possible both the power delivered by the transmitter to the antenna and the e.i.r.p. in order to reduce the risk of interference to passive sensors to the minimum.

**S5.523** In assigning frequencies to stations in the fixed satellite service in the direction space to earth, administrations are requested to limit as far as practicable the power flux-density at the Earth's surface in the band 18.6 – 18.8 GHz, in order to reduce the risk of interference to passive sensors in the earth exploration satellite and space research services.

**4.6.71      18.8 - 19.7 GHz Primary allocation - Fixed, Fixed Satellite and Mobile**

- Satellite Downlinks
- Non Geostationary Satellites
- Mobile Satellite Service
- Point to Point studio-transmitter links

Comments: Band under review.

**S5.523A** 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 provisions of No. S 9.11A and No. S22.2 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.

**S 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 parties concerned. Non-geostationary satellite service networks shall not cause unacceptable interference to geostationary fixed satellite service network for which complete Appendix S4 notification information is considered as having been received by the Bureau prior to 18 November 1995.

**S5.523B** 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. S 9.11A, and No. S 22.2 does not apply.

**S5.523C** No. S 22.2 of Radio Regulations shall continue to apply in the bands 19.3 – 19.6 GHz and 21.1 – 29.4 GHz, between feeder links of non-geostationary mobile satellite service networks and those fixed satellite service networks for which complete Appendix S4 coordination information, or notification information, is considered as having been received by the Bureau prior to 18 November 1995.

**S5.523D** 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. S 9.11A, but not subject to provisions of No. S22.2. The use of the band for other non-geostationary fixed satellite service systems, or for the cases indicated in the Nos. S 5.523C and S5.523E, is not subject to provisions of No. S 9.11A and shall continue to be subject to Article S9 (except No. S9.11A) and S11 procedures, and to the provisions of No. S22.2.

**S5.523E** No. S22.2 of the Radio Regulations 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 S4 coordination information, or notification information, is considered as having been received by the Bureau prior to 21 November 1997.

**4.6.72      19.7 - 20.1 GHz Primary allocation - Fixed Satellite**

- Satellite Downlinks
- Non Geostationary Satellites Orbit and Geostationary Satellites Fixed Satellite Satellite
- Point to Point studio-transmitter links

Comments: Band under review.

**S5.484A** 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 non-geostationary and geostationary satellite systems in the fixed satellite systems is subject to the provisions of Resolution **130 (WRC –97)**. The use of the band 17.8 – 18.1 GHz (space – to – Earth) by non-geostationary fixed satellite service systems is also subject to the provisions of Resolution **538 (WRC-97)**.

**4.6.73      20.1 - 20.2 GHz Primary allocation - Fixed Satellite, Mobile Satellite**

- Satellite Downlinks
- Point to Point studio-transmitter links

Comments: Band under review.

**S5.484A** 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 non-geostationary and geostationary satellite systems in the fixed satellite systems is subject to the provisions of Resolution **130 (WRC –97)**. The use of the band 17.8 – 18.1 GHz (space – to – Earth) by non-geostationary fixed satellite service systems is also subject to the provisions of Resolution **538 (WRC-97)**.

**S5.525** In order to facilitate interregional coordination between networks in the mobile satellite and fixed satellite services, carriers in the mobile in the mobile-satellite service that are most susceptible to interference shall, to the extent practicable, be located in the higher parts of the bands 19.7 – 20.2 GHz and 29.5 – 30 GHz.

**S5.526** In the 19.7-20.2 GHz and 29.5-30 GHz in Region2, and in the bands 20.1-20.2 GHz and 29.9-30 GHz in Region1 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.

**S5.527** In the bands 19.7-20.2 GHz and 29.5-30 GHz, the provisions of No.S4.10 do not apply with respect to the mobile-satellite service.

**S5.528** The allocation to the mobile-satellite service is intended for use by networks which use narrow sport 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 band for administrations operating fixed and mobile systems in accordance with the provisions of No. S 5.524.

**4.6.74      20.2 - 21.2 GHz Primary allocation - Fixed Satellite and Mobile Satellite**

- Closed Circuit Television Links
- Point to Point studio-transmitter links
- Satellite Downlinks

Comments: Primary service, Fixed Satellite

**4.6.75      21.2 - 21.4 GHz Primary allocation - Earth Exploration Satellite, Fixed, Mobile and Space Research**

- Closed Circuit Television Links
- Point to Point studio-transmitter links

**4.6.76      21.4 - 22 GHz Primary allocation - Fixed, Mobile and Broadcasting Satellite**

- Point to Point studio-transmitter links
- Broadcast Satellite Service Downlink
- Earmarked for Broadcast Satellite Service after 2007

**S5.530** All emissions are prohibited in the following bands:  
10.68-107 GHz (except those provided by No.**S5.483**).

**4.6.77** **22 - 22.21 GHz Primary allocation - Fixed and Mobile**

- Point to Point studio-transmitter links
- Video Surveillance

**S5.149** In making assignments to stations of other services, 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. **S4.5** and **S4.6** and **Article S29**).

**4.6.78** **22.21 - 22.5 GHz Primary allocation - Earth Exploration Satellite**

- Point to Point studio-transmitter links
- Video Surveillance
- High Definition Television
- Close Circuit Television Links

**S5.149** In making assignments to stations of other services, 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. **S4.5** and **S4.6** and **Article S29**).

**S5.532** 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, service.

**4.6.79** **22.5 – 22.55 GHz Primary allocation – Fixed, Mobile**

- No additional Requirements

**4.6.80      22.55 - 23 GHz Primary allocation - Fixed, Inter-Satellite and Mobile**

- Point to Point studio-transmitter links
- Video Surveillance
- High Definition Television
- Close Circuit Television Links

**S5.149** In making assignments to stations of other services, 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. S4.5 and S4.6 and Article S29).

**4.6.81      23 - 23.55 GHz Primary allocation - Fixed, Inter-satellite and Mobile**

- Point to Point studio-transmitter links
- Video Surveillance
- High Definition Television
- Close Circuit Television Links

**S5.149** In making assignments to stations of other services, 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. S4.5 and S4.6 and Article S29).

**4.6.82      23.55 - 23.6 GHz Primary allocation - Fixed and Mobile**

- Point to Point studio-transmitter links
- Video Surveillance
- High Definition Television
- Close Circuit Television Links

**4.6.83      23.6 - 24 GHz Primary allocation - Earth Exploration Satellite, Radio Astronomy and Space Research**

- No additional Requirements

- S5.340** All emissions are prohibited in the following bands:
- |                            |   |
|----------------------------|---|
| 1 400-1 427 MHz,           |   |
| 2 690-2 700 MHz,           | except those provided for by Nos. S5.421 and S5.422,                            |
| 10.68-10.7 GHz,            | except those provided for by No. S5.483,  |
| 15.35-15.4 GHz,            | except those provided for by No. S5.483   |
| 23.6-24 GHz,               |   |
| 31.3-31.5 GHz,             |   |
| 31.5-31.8 GHz              | in Region 2   |
| 48.94-49.04 GHz            | from airborne stations,   |
| 50.2-50.4 GHz <sup>2</sup> | except those provided by No.S5.555A.  |
| 52.6-54.25 GHz,            |   |
| 86-92 GHz,                 |   |
| 105-116 GHz,               |   |
| 140.69-140.98 GHz,         | from airborne stations and from space stations in the space-to-Earth direction, |
| 182-185 GHz                | except those provided for by No.S5.563,   |
| 217-231 GHz.               |   |

**4.6.84**      **24 - 24.05 GHz Primary allocation - Amateur and Amateur Satellite**

- Industrial Scientific and Medical
- Licensed video surveillance

**S5.150**      The band 5 725-5 875 MHz is also designated for industrial scientific and medical (ISM) applications. Recommendation services operating within this band must accept harmful interference which may be caused by this applications. ISM equipment operating in this band is subject to the provision of No S15.13.

**4.6.85**      **24.05 - 24.25 GHz Primary allocation - Radiolocation**

- Industrial Scientific and Medical
- Licensed video surveillance

**S5.150**      The band 24-24.25 GHz is also designated for industrial scientific and medical (ISM) applications. Recommendation services operating within this band must accept harmful interference which may be caused by this applications. ISM equipment operating in this band is subject to the provision of No S15.13.

**4.6.86      24.25 – 24.45 GHz Primary allocation - Fixed**

- Licensed video surveillance

**4.6.87      24.45 – 24.65 GHz Primary allocation Fixed and Inter Satellite**

- Digital Multipoint Broadband (24.5-26.5)

**4.6.88      24.65 - 24.75 GHz Primary allocation - Fixed and Inter Satellite**

- Digital Multipoint Broadband (24.5-26.5)

**4.6.89      24.75 - 25.25 GHz Primary allocation - Fixed**

- Digital Multipoint Broadband (24.5-26.5)

**4.6.90      25.25 - 25.5 GHz Primary allocation - Fixed, Inter Satellite and Mobile**

- Digital Multipoint Broadband (24.5-26.5)

**S5.536**      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.

**4.6.91      25.5 - 27.0 GHz Primary allocation - Fixed, Inter Satellite and Mobile**

- Digital Multipoint Broadband (24.5–26.5)

**S5.536**      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.

**S5.536A**      Administrations installing earth exploration-satellite earth stations cannot claim protection from fixed and mobile stations operated by neighbouring administrations. In addition, earth stations operating in the earth exploration-satellite service should take into account recommendation ITU-R SA.1278.

**4.6.92      27.0 - 27.5 GHz Primary allocation - Fixed, Fixed Satellite and Mobile**

- Telemetry Tracking and Command

**S5.536** 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.

**4.6.93      27.5 – 28.5 GHz Primary allocation - Fixed, Fixed Satellite and Mobile**

- Telemetry Tracking and Command
- Local Multipoint Distribution Services
- Broadcasting Satellite Services Uplinks

Comments: Band under review.

**S5.538** 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 and equivalent isotropically radiated power (e.i.r.p) of +10 dBW in the direction of adjacent satellites on the geostationary-satellite orbit. In the band 27 500 – 27 501 GHz, such space-to-Earth transmissions shall not produce a power flux-density in excess of the values specified in Article S21, Table S21-4 on the Earth's surface.

**S5.539** 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.

**S5.540** 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 transmission intended for up-link power control

**S5.484A** 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 non-geostationary and geostationary satellite systems in the fixed satellite systems is subject to the provisions of Resolution 130 (WRC –97). The use of the band 17.8 – 18.1 GHz (space – to – Earth) by non-geostationary fixed satellite service systems is also subject to the provisions of Resolution 538 (WRC-97).

**4.6.94      28.5 - 29.5 GHz Primary allocation - Fixed, Fixed satellite and Mobile**

- Local Multipoint Distribution Services
- Non Geostationary Satellite
- Geostationary Satellite Services Uplinks
- Telemetry Tracking and Command
- Broadcasting Satellite Services Uplinks
- Non-Geostationary Satellite Mobile satellite Service feeder links

Comments: Band under review.

**S5.523A** 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. S 9.11A and No. S 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. S 9.11A with non-geostationary-satellite networks for **which notification** information has been received by the Bureau prior to that date, with a view to reaching results acceptable to all the parties concerned. Non-geostationary-satellite networks shall not cause unacceptable interference to geostationary fixed-satellite service networks for which complete **Appendix S4** notification information is considered as having been received by the Bureau prior to 18 November 1995.

**S5.523C** No S 22.2 of the Radio Regulations 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 S4 coordination information, or notification information, is considered as having been received by the Bureau prior to 18 November 1995.

**S5.523E** No S 22.2 of the Radio Regulations 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 S4 coordination information, or notification information, is considered as having been received by the Bureau prior to 21 November 1997.

**S5.535A** 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 of non-geostationary mobile-satellite service. Such use is subject to the application of the provisions of No. S 9.11A, but not subject to provisions of S 22.2, except as indicated in Nos. S5.523C and S.523E where such use is not subject to the provisions of No. S9.11A and shall continue to be subject to Articles S9(except No.S9.11A) and S11 procedures, and to the provisions of No. S22.2.

**S5.539** The band 27.5 – 30 GHz may be used by the fixed satellite service (Earth-to-space) for the provisions of feeder links for the broadcasting satellite service.

**S5.540** 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.

**S5.541** 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 and passive sensors.

**S5.541A** 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. This methods shall apply to networks for which Appendix S4 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 S4 information for coordination before this date are encouraged to utilize these techniques to the extent practicable. These methods are also subject to review by ITU-R (see Resolution 121(Rev.WRC-97)).

**S5.484A** 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 non-geostationary and geostationary satellite systems in the fixed satellite systems is subject to the provisions of Resolution 130 (WRC –97). The use of the band 17.8 – 18.1 GHz (space – to – Earth) by non-geostationary fixed satellite service systems is also subject to the provisions of Resolution 538 (WRC-97).

#### **4.6.95      29.5 - 29.9 GHz Primary allocation - Fixed Satellite**

- Non-Geostationary Satellite Fixed satellite Services
- Geostationary Satellite Fixed Satellite Services
- Broadcasting Satellite Services Uplinks

Comments: Band under review.

**S5.539** The band 27.5 – 30 GHz may be used by the fixed satellite service (Earth-to-space) for the provisions of feeder links for the broadcasting satellite service.

**S5.540** 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.

**S5.541** 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 and passive sensors.

**S5.484A** 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 non-geostationary and geostationary satellite systems in the fixed satellite systems is subject to the provisions of Resolution **130 (WRC –97)**. The use of the band 17.8 – 18.1 GHz (space – to – Earth) by non-geostationary fixed satellite service systems is also subject to the provisions of Resolution **538 (WRC-97)**.

**4.6.96      29.9 - 30.0 GHz Primary allocation - Fixed Satellite and Mobile Satellite**

- Broadcasting Satellite Services Uplinks
- NonGeostationary Satellite Services Uplinks
- Geostationary Satellite Services Uplinks
- Telemetry Tracking and Command

Comments: Band under review.

**S5.538** 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 and equivalent isotropically radiated power (e.i.r.p) of +10 dBW in the direction of adjacent satellites on the geostationary-satellite orbit. In the band 27 500 – 27 501 GHz, such space-to-Earth transmissions shall not produce a power flux-density in excess of the values specified in Article **S21**, Table **S21-4** on the Earth's surface.

**S5.539** The band 27.5 – 30 GHz may be used by the fixed satellite service (Earth-to-space) for the provisions of feeder links for the broadcasting satellite service.

**S5.540** 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.

**S5.541** 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 and passive sensors.

**S5.484A** 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 non-geostationary and geostationary satellite systems in the fixed satellite systems is subject to the provisions of Resolution **130 (WRC -97)**. The use of the band 17.8 – 18.1 GHz (space – to – Earth) by non-geostationary fixed satellite service systems is also subject to the provisions of Resolution **538 (WRC-97)**.

**S5.543** 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.

**S5.525** In order to facilitate interregional coordination between networks in the mobile satellite and fixed satellite services carriers in the mobile-satellite service that are 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.

**S5.526** In the 19.7-20.2 GHz and 29.5-30 GHz in Region2, and in the bands 20.1-20.2 GHz and 29.9-30 GHz in Region1 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.

**S5.527** In the bands 19.7-20.2 GHz and 29.5-30 GHz, the provisions of No.S4.10 do not apply with respect to the mobile-satellite service.

**4.6.97      30.0 - 31.0 GHz Primary allocations - Fixed Satellite and Mobile Satellite**

- Local Multipoint Distribution Service
- Telemetry Tracking and Command
- Satellite Uplinks

**4.6.98      31.0 - 31.3 GHz Primary allocation - Fixed and Mobile**

- Low Power Video Surveillance

**S5.149** In making assignments to stations of other services, 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. S4.5 and S4.6 and Article S29).

**S5.544** In the band 29.95-30 GHz the power flux-density limits specified in Article S21, Table S21-4 shall apply to the space research service.

**4.6.99      31.3 - 31.5 GHz Primary allocation - Earth Exploration Satellite, Radio - Astronomy and Space Research**

- No additional Requirements

**S5.340** All emissions are prohibited in the following bands:

1 400-1 427 MHz,

2 690-2 700 MHz,

10.68-10.7 GHz,

15.35-15.4 GHz,

23.6-24 GHz,

31.3-31.5 GHz,

31.5-31.8 GHz

48.94-49.04 GHz

50.2-50.4 GHz<sup>2</sup>

52.6-54.25 GHz,

86-92 GHz,

105-116 GHz,

except those provided for by Nos. S5.421 and S5.422,

except those provided for by No. S5.483,

except those provided for by No. S5.483

in Region 2

from airborne stations,

except those provided by No. S5.555A.

140.69-140.98 GHz, from airborne stations and from space stations in the space-to-Earth direction,  
182-185 GHz except those provided for by No.S5.563,  
217-231 GHz.

**4.6.100     31.5 - 31.8 GHz Primary allocation - Earth Exploration Satellite, Radio Astronomy and Space Research**

- Licensed Video Surveillance

**S5.149** In making assignments to stations of other services, 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. S4.5 and S4.6 and Article S29).

**4.6.101     31.8 - 32.0 GHz Primary allocation - Radiolocation and Space Research**

- No additional Requirements

**S5.547A** The use the band 31.8 – 33.4 GHz by the fixed service shall be in accordance with Resolution 126 of (WRC-97).

**S5.547** The band 31.8 – 33.4 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 726 (WRC – 97)).

**S5.547B** 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) service on a primary basis

**S5.548** In designing systems for the inter-satellited and radionavigation services 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 radionavigation service ( see Recommendation 707).

**4.6.102     32.0 - 32.3 GHz Primary allocation - InterSatellite, Radionavigation and Space Research**

- High Density Fixed Services

**S5.547** The band 31.8 – 33.4 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 726 (WRC – 97)).

**S5.547A** The use the band 31.8 – 33.4 GHz by the fixed service shall be in accordance with Resolution 126 of (WRC-97).

**S5.548** In designing systems in for the inter-satellite and radionavigation services 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 radionavigation service (see Recommendation 707)

**4.6.103     32.3 - 33.0 GHz Primary allocation - Inter satellite and Radionavigation**

- High Density Fixed Services

**S5.547** The band 31.8 – 33.4 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 726 (WRC – 97)).

**S5.547A** The use the band 31.8 – 33.4 GHz by the fixed service shall be in accordance with Resolution 126 of (WRC-97).

**S5.548** In designing systems in for the inter-satellite and radionavigation services 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 radionavigation service (see Recommendation 707)

**4.6.104     33.0 - 33.4 GHz Primary allocation -Radiolocation**

- High Density Fixed Services

**S5.547** The band 31.8 – 33.4 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 726 (WRC – 97)).

**S5.547A** The use the band 31.8 – 33.4 GHz by the fixed service shall be in accordance with Resolution 126 of (WRC-97).

**4.6.105      33.4-34.2 GHz Primary allocation Radiolocation**

- High Density Fixed Services

**4.6.106      34.2 - 34.7 GHz Primary Allocation - Radiolocation, Space Research(deep space)(Earth-to-space)**

- No additional requirements

**4.6.107      34.7 - 35.2 GHz Primary Allocation - Radiolocation, Space Research**

- No additional requirements

**4.6.108      35.2 - 36.0 GHz Primary Allocation - Meteorological Aids, Radiolocation**

- No additional requirements

**S5.551A** In the bands 35.5-36.0 GHz, 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 meteorological aids service and other services allocated on a primary basis.

**4.6.109      36.0 - 37.0 GHz Primary Allocation - Earth Exploration Satellite(passive),Fixed, Mobile, Space Research(passive)**

- No additional requirements

**S5.149** In making assignments to stations of other services, 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. S4.5 and S4.6 and Article S29).

**4.6.110     37.0 - 37.5 GHz Primary Allocation - Fixed, Mobile, Space Research (space-to-earth)**

- Fixed Services

**4.6.111     37.5 - 38.0 GHz Primary Allocation - Fixed, Fixed Satellite, Space Research (space to Earth)**

- Non-Geostationary Fixed Satellite Services Downlink
- Fixed Services
- High Density Fixed Services

**4.6.112     38.0 - 39.5 GHz Primary Allocation - Fixed, Fixed Satellite (space-to-Earth), Mobile**

- Non-Geostationary Fixed Satellite Services Downlink
- Fixed Services
- High Density Fixed Services
- Point to Point Services

**4.6.113     39.5 - 40.00 Primary Allocation - Fixed, Fixed Satellite (space-to-Earth), Mobile, Mobile satellite**

- Non-Geostationary Fixed Satellite Services Downlink

**4.6.114     40 - 40.5 GHz Primary Allocation - Earth Exploration Satellite(Earth-to-space), Fixed, Fixed Satellite (space-to-Earth), Mobile, Mobile Satellite, Space Research (Earth-to-space)**

- Local Multipoint Distribution System
- Non-Geostationary Fixed Satellite Services Downlink
- Broadcasting Satellite Services

**4.6.115     40.5 - 42.5 GHz Primary Allocation - Broadcasting Satellite, Broadcasting**

- Local Multipoint Distribution Systems
- Broadcasting Satellite Services

**S5.551B** The use of the band 41.5-42.5 GHz by the fixed-satellite service (space-to-earth) is subject to Resolution 128 (WRC-97).

**4.6.116** **42.5 - 43.5 GHz Primary Allocation - Fixed, Fixed -Satellite(Earth-to-space), Mobile except aeronautical mobile**

- Broadcasting Satellite Feeder Links
- Telemetry Tracking and Command
- Extend Broadcasting Satellite Services

**S5.149** In making assignments to stations of other services, 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. S4.5 and S4.6 and Article S29).

**S5.552** 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 transmissions is greater than that in the band 37.5-39.5 GHz for space-to-Earth transmissions 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 the broadcasting-satellite service operating in the band 40.5-42.4 GHz

**4.6.117** **43.5 - 47.0 GHz Primary Allocation - Mobile, Mobile Satellite, Radionavigation, Radionavigation-Satellite**

- No additional requirements

**S5.553** In the bands 43.5-47 GHz, 66-71 GHz, 95-100 GHz, 134-142 GHz, 190-200 GHz and 252-265 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. S5.43).

**S5.554** In the bands 43.5 -47 GHz, 66-71 GHz, 95-100 GHz, 134-142 GHz, 190-200 GHz and 252-265 GHz, satellite links connecting land stations at specified fixed points are also authorised when used in conjunction with the mobile-satellite service or the radionavigation-satellite service.

**4.6.118** **47.0 - 47.2 GHz Primary Allocation - Amateur, Amateur-Satellite**

- No additional requirements

**4.6.119      47.2 - 50.2 GHz Primary Allocation - Fixed, Fixed Satellite (Earth-to-space), Mobile**

- Non-Geostationary Fixed Satellite Services Uplinks
- Telemetry Tracking and Command
- Broadcasting Satellite Services Feeder Links

**S5.149** In making assignments to stations of other services, 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. S4.5 and S4.6 and Article S29).

**S5.340** All emissions are prohibited in the following bands:

1 400-1 427 MHz,	
2 690-2 700 MHz,	except those provided for by Nos. S5.421 and S5.422,
10.68-10.7 GHz,	except those provided for by No. S5.483,
15.35-15.4 GHz,	except those provided for by No. S5.483
23.6-24 GHz,	
31.3-31.5 GHz,	
31.5-31.8 GHz	in Region 2
48.94-49.04 GHz	from airborne stations,
50.2-50.4 GHz <sup>2</sup>	except those provided by No. S5.555A.
52.6-54.25 GHz,	
86-92 GHz,	
105-116 GHz,	
140.69-140.98 GHz,	from airborne stations and from space stations in the space-to-Earth direction,
182-185 GHz	except those provided for by No. S5.563,
217-231 GHz.	

**S5.552** 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 transmissions is greater than that in the band 37.5-39.5 GHz for space-to-Earth transmissions 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 the broadcasting-satellite service operating in the band 40.5-424 GHz

**S5.552A** The allocation of the fixed service in the bands 47.2-47.5 GHz and 47.9-48.2 GHz is designated for use by high altitude platforms 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 (WRC-97).

**S5.555** Additional allocation; the band 48.94-49.04 GHz is allocated to the radio astronomy service on a primary basis.

**4.6.120** **50.2 - 50.4 GHz Primary Allocation - Earth Exploration Satellite (passive), Fixed, Mobile, Space Research(passive)**

- No additional requirements

**S5.340** All emissions are prohibited in the following bands:

- |                            |   |
|----------------------------|---|
| 1 400-1 427 MHz,           |   |
| 2 690-2 700 MHz,           | except those provided for by Nos. S5.421 and S5.422,                            |
| 10.68-10.7 GHz,            | except those provided for by No. S5.483,  |
| 15.35-15.4 GHz,            | except those provided for by No. S5.483   |
| 23.6-24 GHz,               |   |
| 31.3-31.5 GHz,             |   |
| 31.5-31.8 GHz              | in Region 2   |
| 48.94-49.04 GHz            | from airborne stations,   |
| 50.2-50.4 GHz <sup>2</sup> | except those provided by No.S5.555A.  |
| 52.6-54.25 GHz,            |   |
| 86-92 GHz,                 |   |
| 105-116 GHz,               |   |
| 140.69-140.98 GHz,         | from airborne stations and from space stations in the space-to-Earth direction, |
| 182-185 GHz                | except those provided for by No.S5.563,   |
| 217-231 GHz.               |   |

**S5.555A** The band 50.20-50.4 GHz is also allocated, on a primary basis, to the fixed and mobile services until 1 July 2000.

**4.6.121** **50.4 - 51.4 GHz Primary Allocation - Fixed, Fixed Satellite(Earth-to-space) and Mobile**

- Telemetry Tracking and Command

**4.6.122** **51.4 - 54.25 GHz Primary allocation - Earth Exploration Satellite(passive), Space Research(passive)**

- High Density Fixed Services

**S5.547** The band 31.8 – 33.4 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 726 (WRC – 97).

**S5.556** In the bands 51.4-54.25 GHz, 58.2-59 GHz, 64-65 GHz, 72.77-72.91 GHz and 93.07-93.27 GHz, radio astronomy observations may be carried out under national arrangements.

**S5.340** All emissions are prohibited in the following bands:

1 400-1 427 MHz,	
2 690-2 700 MHz,	except those provided for by Nos. S5.421 and S5.422,
10.68-10.7 GHz,	except those provided for by No. S5.483,
15.35-15.4 GHz,	except those provided for by No. S5.483
23.6-24 GHz,	
31.3-31.5 GHz,	
31.5-31.8 GHz	in Region 2
48.94-49.04 GHz	from airborne stations,
50.2-50.4 GHz <sup>2</sup>	except those provided by No. S5.555A.
52.6-54.25 GHz,	
86-92 GHz,	
105-116 GHz,	
140.69-140.98 GHz,	from airborne stations and from space stations in the space-to-Earth direction,
182-185 GHz	except those provided for by No. S5.563,
217-231 GHz.	

**4.6.123** **54.25 - 58.2 GHz Primary Allocation - Earth Exploration Satellite(passive), Fixed, Inter Satellite, Mobile, Space Research(passive)**

- Closed Circuit television
- High Density Fixed Services
- Licensed Video Surveillance

**S5.556A** 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 altitude from 0 Km to 1 000 Km above the Earth's surface produced by a station in the inter-satellite service, for all conditions and for all methods of modulation, shall not exceed -147 dB(W/m<sup>2</sup>/100 MHz) for all angles of arrival.

**S5.558** In the bands 55.78-58.2GHz, 59-64 GHz and 66-71 GHz, stations in the aeronautical-mobile service may be operated subject to not causing harmful interference to the inter-satellite (see No. S5.43).

**S5.547** The band 31.8 – 33.4 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 726 (WRC – 97).

**S5.558A** Use of the bands 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 -147dB(W/m<sup>2</sup>/100 MHz) for all angles of arrival.

**4.6.124** **58.2 - 59.0 GHz Primary Allocation - Earth Exploration Satellite(passive), Space Research(passive)**

- No additional requirements

**S5.547** The band 31.8 – 33.4 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 726 (WRC – 97).

**S5.556** In the bands 51.4-54.25 GHz, 58.2-59 GHz, 64-65 GHz, 72.77-72.91 GHz and 93.07-93.27 GHz, radio astronomy observations may be carried out under national arrangements.

**4.6.125** **59.0 - 64.0 GHz Primary Allocation - Fixed, Inter Satellite, Mobile, Radiolocation**

- Road Transport and Traffic Telemetry
- Video Surveillance

**S5.138** The following bands:

6 765-6 795 KHz	(centre frequency 6 780KHz) MHz
433.05-434.79 MHz	(centre frequency 433.92 MHz) in Region 1 except in the countries mentioned in No S5.280
61-61.5 GHz	(centre frequency 61.25 GHz),and 244-246 GHz
GHz	(centre frequency 245 GHz)

**S5.556A** 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 altitude from 0 Km to 1 000 Km above the Earth's surface produced by a station in the inter-satellite service, for all conditions and for all methods of modulation, shall not exceed -147 dB(W/m<sup>2</sup>/100 MHz) for all angles of arrival.

**S5.558** In the bands 55.78-58.2GHz, 59-64 GHz and 66-71 GHz, stations in the aeronautical-mobile service may be operated subject to not causing harmful interference to the inter-satellite (see No. S5.43).

**S5.559** In the bands 59-64 GHz and 126-134 GHz, airborne radars in the radiolocation service may be operated subject to not causing harmful interference to the inter-satellite service (see No S5.43)

**4.6.126** **64 - 65.0 GHz Primary Allocation - Earth Exploration Satellite(passive), Space Research (passive)**

- High Density Fixed Services

**S5.547** The band 31.8 – 33.4 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 726 (WRC – 97).

**S5.556** In the bands 51.4-54.25 GHz, 58.2-59 GHz, 64-65 GHz, 72.77-72.91 GHz and 93.07-93.27 GHz, radio astronomy observations may be carried out under national arrangements.

**4.6.127** **65.0 - 66.0 GHz Primary Allocation - Earth Exploration Satellite(passive), Space Research (passive)**

- High Density Fixed Service

**S5.547** The band 31.8 – 33.4 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 726 (WRC – 97).

**4.6.128** **66.0 - 71.0 GHz Primary Allocation - Mobile, Mobile Satellite, Radionavigation, Radionavigation -Satellite**

- No additional Requirements

**S5.553** In the bands 43.5-47 GHz, 66-71 GHz, 95-100 GHz, 134-142 GHz, 190-200 GHz and 252-265 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. **S5.43**).

**S5.554** In the bands 43.5 -47 GHz, 66-71 GHz, 95-100 GHz, 134-142 GHz, 190-200 GHz and 252-265 GHz, satellite links connecting land stations at specified fixed points are also authorised when used in conjunction with the mobile-satellite service or the radionavigation-satellite service.

**S5.558** In the bands 55.78-58.2GHz, 59-64 GHz and 66-71 GHz, stations in the aeronautical-mobile service may be operated subject to not causing harmful interference to the inter-satellite (see No. **S5.43**).

ITU Radio Regulations		Primary Service	APPLICATIONS/FOOTNOTES	Future Requirements	Actions
Region 1	S.A. Table of Allocations				
2.9 – 3.1 GHz RADIONAVIGATION Radiolocation	2.9 – 3.1 GHz RADIONAVIGATION Radiolocation	RADIONAVIGATION	CIVIL AIRPORTS/DEFENCE AERONAUTICAL INTERROGATORS (S5.425 & S5.427)	FRN 4.6.1	
3.1 – 3.3 GHz RADIOLOCATION	3.1 – 3.3 GHz RADIOLOCATION	RADIOLOCATION	GOVERNMENT RADIOLOCATION SPACEBORNE DEVICES (S5.149)	FRN 4.6.2	
3.3 – 3.4 GHz RADIOLOCATION	3.3 – 3.4 GHz RADIOLOCATION	RADIOLOCATION	GOVERNMENT RADIOLOCATION  (S5.149)	FRN 4.6.3	
3.4 – 3.6 GHz FIXED FIXED SATELLITE (Space-to-Earth) Mobile Radiolocation	3.4 – 3.6 GHz FIXED FIXED SATELLITE - (Space-to-Earth) Mobile Radiolocation	<b>SHARED BAND</b> FIXED FIXED SATELLITE	WIRELESS LOCAL LOOP SATELLITE DOWNLINKS  <i>ITU-R F.382</i> <i>ITU-R F.635</i>	FRN 4.6.4	3.4-3.6 GHz dedicated for WLL Gov't Gazette 17982, 6 May 1997
3.6 – 4.2 GHz FIXED FIXED-SATELLITE (Space-to-Earth) Mobile	3.6 – 4.2 GHz FIXED FIXED SATELLITE SERVICE Mobile except aeronautical mobile	<b>SHARED BAND</b> FIXED FIXED-SATELLITE Mobile	POINT TO POINT LINKS VSAT/SATELLITE LINKS  Low, medium and high capacity systems  <i>CCIR 382-4</i>	FRN 4.6.5	
4.2 – 4.4 GHz AERONAUTICAL- RADIONAVIGATION	4.2 – 4.4 GHz AERONAUTICAL- RADIONAVIGATION	RADIONAVIGATION	RADIO ALTIMETERS (S5.440)	FRN 4.6.6	
4.4 – 4.5 GHz FIXED MOBILE	4.4 – 4.5 GHz FIXED MOBILE	<b>RESERVED</b>		FRN 4.6.7	
4.5 – 4.8 GHz FIXED FIXED-SATELLITE (Space-to-Earth) MOBILE	4.5 – 4.8 GHz FIXED FIXED-SATELLITE (Space-to-Earth) MOBILE	FIXED FIXED SATELLITE MOBILE	GOVERNMENT UTILIZATION  (S5.441)	FRN 4.6.8	
4.8 – 4.99 GHz FIXED MOBILE Radio Astronomy	4.8 – 4.99 GHz FIXED MOBILE Radio Astronomy	FIXED MOBILE Radio Astronomy	GOVERNMENT UTILIZATION (S5.339, S5.149 AND S5.442) Radio Astronomy (4825-4835 & 4950-4990)	FRN 4.6.9	
4.990-5.000 GHz FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY Space Research (passive)	4.990-5.000 GHz FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY Space Research (passive)	FIXED MOBILE RADIO ASTRONOMY	GOVERNMENT UTILIZATION  RADIO ASTRONOMY (4990-5000) (S5.149)	FRN 4.6.10	

ITU Radio Regulations		Primary Service	APPLICATIONS/FOOTNOTES	Future Requirements	Actions
Region 1	S.A. Table of Allocations				
5 000-5 250 GHz AERONAUTICAL- RADIONAVIGATION	5 000-5 250 GHz AERONAUTICAL- RADIONAVIGATION	Radiodetermination Satellite Service ISM (5.15 - 5.35)	(S5.44A & S5.446) FCC Part 15 Licensing - NIB	MICROWAVE LANDING SYSTEMS FRN 4.6.11	
5 250 - 5 255 RADIOLOCATION Space Research	5 250 - 5 255 RADIOLOCATION Space Research	NO CHANGE	(S5.447D)	FRN 4.6.12	
5 255 - 5 350 GHz RADIOLOCATION	5 255 - 5 350 GHz RADIOLOCATION	NO CHANGE	(S5.448A)	FRN 4.6.13	
5 350 - 5 460 GHz AERONAUTICAL- RADIONAVIGATION Radiolocation	5 350 - 5 460 GHz AERONAUTICAL- RADIONAVIGATION Radiolocation	NO CHANGE	(S5.448B & S5.449)	FRN 4.6.14	
5 460 - 5 470 GHz RADIONAVIGATION Radiolocation	5 460 - 5 470 GHz RADIONAVIGATION Radiolocation	NO CHANGE	(S5.449)	FRN 4.6.15	
5 470 - 5 650 GHz MARITIME- RADIONAVIGATION Radiolocation	5 470 - 5 650 GHz MARITIME- RADIONAVIGATION Radiolocation	RADIONAVIGATION	SHIPBORNE AND ASSOCIATED RADARS (S5.452)	FRN 4.6.16	
5 650 - 5 725 GHz RADIOLOCATION Amateur Space Research(deepspace)	5 650 - 5 725 GHz RADIOLOCATION Amateur Space Research(deepspace)	NO CHANGE	(S5.282)	FRN 4.6.17	
5 725 - 5 850 GHz FIXED SATELLITE (Earth-to-space) RADIOLOCATION Amateur	5 725 - 5 850 GHz FIXED SATELLITE (Earth-to-space) RADIOLOCATION Amateur	FIXED SATELLITE	TELEMETRY, TRACKING & COMMAND (TT & C)  ISM (5725-5850)-OPERATION PERMITTED ON A NON-INTERFERENCE BASIS (S5.150)	FRN 4.6.18	
5 850 - 5 925 GHz FIXED FIXED SATELLITE (Earth-to-space) MOBILE	5 850 - 5 925 GHz FIXED FIXED SATELLITE (Earth-to-space) MOBILE	FIXED FIXED SATELLITE	TT & C/SATELLITE LINKS  ISM(5850-5875)-OPERATION PERMITTED ON A NON-INTERFERENCE BASIS (S5.150)	FRN 4.6.19	
5 925 - 7 075 GHz FIXED FIXED SATELLITE (Earth-to-space) MOBILE	5 925 - 7 075 GHz FIXED FIXED SATELLITE (Earth-to-space) MOBILE	SHARED FIXED FIXED SATELLITE	POINT TO POINT LINKS SATELLITE LINKS(TT & C) CCIR 383-3 & CCIR 384 ITU-R F.383 & F.384 (S5.458)	FRN 4.6.20	OFFSET CHANNEL PLAN REQUIRED
7 075 - 7 25 GHz FIXED MOBILE	7 075 - 7 25 GHz FIXED MOBILE	FIXED	POINT TO POINT LINKS CCIR 934 ITU-R F.384 ITU-R F.385 (S5.458)	FRN 4.6.21	

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## SOUTH AFRICAN ALLOCATIONS

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ITU Radio Regulations		Primary Service	APPLICATIONS/FOOTNOTES	Future Requirements	Actions
Region 1	S.A. Table of Allocations				
7.250 – 7.300 GHz FIXED FIXED SATELLITE (space-to-Earth) MOBILE	7.250 – 7.300 GHz FIXED FIXED SATELLITE (space-to-Earth) MOBILE	FIXED  MOBILE	FIXED & TEMPORARY POINT TO POINT LINKS  <i>ITU-R F.385</i> (S5.461)	  FRN 4.6.22	
7.300 – 7.450 GHz FIXED FIXED SATELLITE (space-to-Earth) MOBILE except aeronautical mobile	7.300 – 7.450 GHz FIXED FIXED SATELLITE (space-to-Earth) MOBILE except aeronautical mobile	FIXED  MOBILE	FIXED & TEMPORARY POINT TO POINT LINKS  <i>ITU-R F.386</i> (S5.461)	  FRN 4.6.23	
7.450 – 7.550 GHz FIXED FIXED SATELLITE (Space-to-earth) METEOROLOGICAL- SATELLITE (space-earth) MOBILE except aeronautical mobile	7.450 – 7.550 GHz FIXED FIXED SATELLITE (Space-to-earth) METEOROLOGICAL- SATELLITE (space-earth) MOBILE except aeronautical mobile	FIXED  MOBILE	FIXED & TEMPORARY POINT TO POINT LINKS <i>CYR 934</i>  (S5.461A)	  FRN 4.6.24	
7.550 – 7.750 GHz FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile	7.550 – 7.750 GHz FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile	<b>SHARED BAND</b> FIXED FIXED SATELLITE	FIXED & TEMPORARY POINT TO POINT LINKS SATELLITE LINKS	  FRN 4.6.25	
7.750 – 7.900 GHz FIXED MOBILE except aeronautical mobile	7.750 – 7.900 GHz FIXED MOBILE except aeronautical mobile	FIXED	POINT TO POINT LINKS <i>ITU-R F.386</i> (S5.461B)	METSAT FRN 4.6.26	
7.900 – 8.025 GHz FIXED FIXED-SATELLITE (Earth-to-space) MOBILE	7.900 – 8.025 GHz FIXED FIXED-SATELLITE (Earth-to-space) MOBILE	<b>SHARED BAND</b> FIXED FIXED SATELLITE	POINT TO POINT LINKS SATELLITE UPLINKS/(TT & C) <i>ITU-R F.386</i> (S5.461)	 FRN 4.6.27	
8.025 – 8.175 GHz FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Earth Exploration- Satellite (space-to-Earth)	8.025 – 8.175 GHz FIXED FIXED-SATELLITE(Earth-to-space) MOBILE EARTH EXPLORATION - SATELLITE (space-to-Earth)	FIXED FIXED SATELLITE MOBILE	POINT TO POINT LINKS SATELLITE UPLINKS/(TT & C)  <i>ITU-R F.386</i> (S5.462A & S5.463)	  FRN 4.6.28	
8.175 – 8.215 GHz FIXED FIXED-SATELLITE (Earth-to-space) METEOROLOGICAL- SATELLITE(Earth-to-space) MOBILE Earth Exploration- Satellite (space-to-earth)	8.175 – 8.215 GHz FIXED FIXED-SATELLITE (Earth-to-space) METEOROLOGICAL- SATELLITE(Earth-to-space) MOBILE Earth Exploration- Satellite(space-to-earth)	FIXED FIXED SATELLITE	POINT TO POINT LINKS SATELLITE UPLINKS  <i>ITU-R F.386</i> (S5.462A)	  FRN 4.6.29	

ITU Radio Regulations		Primary Service	APPLICATIONS/FOOTNOTES	Future Requirements	Actions
Region 1	S.A. Table of Allocations				
8.215 – 8.400 GHz FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Earth Exploration- Satellite(space-to-earth)	8.215 – 8.400 GHz FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Earth Exploration- Satellite(space-to-earth)	FIXED	POINT TO POINT LINKS  ITU-R F.386 (S5.462A & S5.463)	FRN 4.6.30	
8.400 – 8.500 GHz FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-earth)	8.400 – 8.500 GHz FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-earth)	FIXED	POINT TO POINT LINKS  (S5.465)	FRN 4.6.31	
8.500 – 8.750 GHz RADIOLOCATION	8.500 – 8.750 GHz RADIOLOCATION	RADIOLOCATION	SPACE RESEARCH (S5.469A)	FRN 4.6.32	
8.750 – 8.850 GHz RADIOLOCATION AERONAUTICAL- RADIONAVIGATION	8.750 – 8.850 GHz RADIOLOCATION AERONAUTICAL- RADIONAVIGATION	NO CHANGE	(S5.471)	FRN 4.6.33	
8.850 – 9.000 GHz RADIOLOCATION MARITIME- RADIONAVIGATION	8.850 – 9.000 GHz RADIOLOCATION MARITIME- RADIONAVIGATION	NO CHANGE	(S5.472)	FRN 4.6.34	
9.00 – 9.200 GHz AERONAUTICAL- RADIONAVIGATION Radiolocation	9.00 – 9.200 GHz AERONAUTICAL- RADIONAVIGATION Radiolocation	AERONAUTICAL	APPROACH RADARS (S5.337)	FRN 4.6.35	
9.200 – 9.300 GHz RADIOLOCATION MARITIME- RADIONAVIGATION	9.200 – 9.300 GHz RADIOLOCATION MARITIME- RADIONAVIGATION	NO CHANGE	HARBOR RADARS (S5.472 & S5.474)	FRN 4.6.36	
9.300 – 9.500 GHz RADIONAVIGATION Radiolocation	9.300 – 9.500 GHz RADIONAVIGATION Radiolocation	NO CHANGE	RADARS (S5.427, S5.474 & S5.475)	FRN 4.6.37	
9.500 – 9.800 GHz RADIOLOCATION RADIONAVIGATION	9.500 – 9.800 GHz RADIOLOCATION RADIONAVIGATION	NO CHANGE	MOVEMENT DETECTION RADARS (S5.476A)	FRN 4.6.38	
9.800 – 10.000 GHz RADIOLOCATION Fixed	9.800 – 10.000 GHz RADIOLOCATION Fixed	NO CHANGE	MOVEMENT DETECTION/LOW POWER (S5.479)	FRN 4.6.39	
10.00 – 10.45 GHz FIXED MOBILE RADIOLOCATION Amateur	10.00 – 10.45 GHz FIXED MOBILE RADIOLOCATION Amateur	FIXED MOBILE RESERVED 10.1-10.45 GHz	LPVS (10.025-10.081) Motion Sensors (10.025-10.7 NIB) (S5.479)	PTMP SYSTEMS  FRN 4.6.40	10.025-10.081 GHz (LPVS) per Gov't Gazette Article 15 Jan 1999 Gazette Article 17 Nov 1995
10.45 – 10.50 GHz RADIOLOCATION Amateur Amateur - Satellite	10.45 – 10.50 GHz RADIOLOCATION Amateur Amateur - Satellite		LPVS (10.025-10.081) Motion Sensors (10.025-10.7 NIB)	FRN 4.6.41	
10.50 – 10.55 GHz FIXED MOBILE Radiolocation	10.50 – 10.55 GHz FIXED MOBILE RADIOLOCATION	RESERVED	PTMP SYSTEMS Motion Sensors (10.025-10.7 NIB)	FRN 4.6.42	Gazette Article 15 Jan 1999 Gazette Article 17 Nov 1995

ITU Radio Regulations		Primary Service	APPLICATIONS/FOOTNOTES	Future Requirements	Actions
Region 1	S.A. Table of Allocations				
10.55 – 10.60 GHz FIXED MOBILE except aeronautical mobile Radiolocation	10.55 – 10.60 GHz FIXED MOBILE except aeronautical mobile Radiolocation	RESERVED	PTMP SYSTEMS Motion Sensors (10.025-10.7 NIB)	FRN 4.6.43	Gazette Article 17 Nov 1995
10.6 – 10.68GHz EARTH EXPLORATION- SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive) Radiolocation	10.6 – 10.68GHz EARTH EXPLORATION- SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive) Radiolocation	FIXED MOBILE	LOW POWER WIRELESS LAN APPLICATIONS (NON INTERFERENCE BASIS) Motion Sensors (10.025-10.7 NIB) (S5.149 & S5.482)	FRN 4.6.44	Gazette Article 17 Nov 1995
10.68 – 10.7 GHz EARTH EXPLORATION- SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	10.68 – 10.7 GHz EARTH EXPLORATION- SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	EMISSIONS ARE PROHIBITED IN THIS BAND ACCORDING TO ITU FOOTNOTES 340 & 483	Motion Sensors (10.025-10.7 NIB)	FRN 4.6.45	Gazette Article 17 Nov 1995
10.7 – 11.7 GHz FIXED FIXED-SATELLITE (Earth-to-space) (Space-to Earth) MOBILE except aeronautical mobile	10.7 – 11.7 GHz FIXED FIXED-SATELLITE (Earth-to-Space) (Space-to Earth) MOBILE except aeronautical mobile	SHARED BAND FIXED FIXED SATELLITE	POINT TO POINT LINKS SATELLITE UP/DOWN LINKS (TT & C) - (DTH) CCIR 387-4 ITU-R F.387 (S5.441)	FRN 4.6.46	
11.7 – 12.5 GHz FIXED BROADCASTING BROADCASTING-SATELLITE Mobile except aeronautical mobile	11.7 – 12.5 GHz FIXED BROADCASTING BROADCASTING-SATELLITE Mobile except aeronautical mobile	SHARED BAND FIXED BROADCASTING BROADCASTING-SATELLITE	DTH UTILIZATION SATELLITE DOWNLINKS (S5.487, S5.487A & S5.492)	FRN 4.6.47	
12.5 – 12.75 GHz FIXED-SATELLITE (Space-to-Earth) (Earth-to-Space)	12.5 – 12.75 GHz FIXED-SATELLITE (Space-to-Earth) (Earth-to-Space)	FIXED SATELLITE	SATELLITE UP/DOWNLINKS (DTH) (S5.484A & S5.496)	FRN 4.6.48	
12.75 – 13.25 GHz FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Space Research (deep space) (space-to-Earth)	12.75 – 13.25 GHz FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Space Research (deep space) (space-to-Earth)	SHARED BAND FIXED FIXED-SATELLITE  MOBILE	FIXED POINT TO POINT LINKS SATELLITE DOWNLINKS (TT & C)  CCIR 497-2 ITU-R F.497 (S5.441)	FRN 4.6.49	

ITU Radio Regulations		Primary Service	APPLICATIONS/FOOTNOTES	Future Requirements	Actions
Region 1	S.A. Table of Allocations				
13.25 - 13.4 GHz/ AERONAUTICAL- RADIONAVIGATION	13.25 - 13.4 GHz/ AERONAUTICAL- RADIONAVIGATION	NO CHANGE	(S5.497)	FRN 4.6.50	
13.4 - 13.75 GHz/ RADIOLOCATION Standard Frequency and- Time Signal-Satellite (Earth-to-space) Space Research	13.4 - 13.75 GHz/ RADIOLOCATION Standard Frequency and- Time Signal-Satellite (Earth-to-space) Space Research		(Low Power MW Fences 13.4-14 GHz-NIB) (S5.501B)	FRN 4.6.51	Gazette Article 17 Nov 1995
13.75 - 14 GHz/ FIXED-SATELLITE (Earth-to-space) RADIOLOCATION Standard Frequency and- Time Signal-Satellite (Earth-to-space) Space Research	13.75 - 14 GHz/ FIXED-SATELLITE (Earth-to-space) RADIOLOCATION Standard Frequency and- Time Signal-Satellite (Earth-to-space) Space Research	RESERVED	SATELLITE DOWNLINKS (TT & C)  (Low Power MW Fences 13.4-14 GHz-NIB) (S5.484A, S5.502, S5.503 & S5.503A)	FRN 4.6.52	Gazette Article 17 Nov 1995
14 - 14.25 GHz/ FIXED-SATELLITE (Earth-to-space) RADIONAVIGATION Space Research	14 - 14.25 GHz/ FIXED-SATELLITE (Earth-to-space) RADIONAVIGATION Space Research	FIXED-SATELLITE  RADIONAVIGATION	SATELLITE UP/DOWNLINKS  (S5.504 & S5.506)	FRN 4.6.53	
14.25 - 14.3 GHz/ FIXED-SATELLITE (Earth-to-space) RADIONAVIGATION Space Research	14.25 - 14.3 GHz/ FIXED-SATELLITE (Earth-to-space) RADIONAVIGATION Space Research	FIXED-SATELLITE  RADIONAVIGATION	SATELLITE UP/DOWNLINKS  (S5.484A & S5.504)	FRN 4.6.54	
14.3 - 14.4 GHz/ FIXED FIXED-SATELLITE (Earth-to-space) MOBILE except aeronautical mobile Radionavigation-Satellite	14.3 - 14.4 GHz/ FIXED FIXED-SATELLITE (Earth-to-space) MOBILE except aeronautical mobile Radionavigation-Satellite	FIXED-SATELLITE  <b>RESERVED 14328-14385</b> MOBILE	SATELLITE UP/DOWNLINKS/TT & C  (S5.484A & S5.506)	FRN 4.6.55	
14.4 - 14.47 GHz/ FIXED FIXED-SATELLITE (Earth-to-space) MOBILE except aeronautical mobile Space Research (space-to-Earth)	14.4 - 14.47 GHz/ FIXED FIXED-SATELLITE (Earth-to-space) MOBILE except aeronautical mobile Space Research (space-to-Earth)	FIXED-SATELLITE	SATELLITE UP/DOWNLINKS/TT & C <i>CCIR 636-1</i>  (S5.484A & S5.506)	FRN 4.6.56	
14.47 - 14.5 GHz/ FIXED FIXED-SATELLITE (Earth-to-space) MOBILE except aeronautical- mobile Radio Astronomy	14.47 - 14.5 GHz/ FIXED FIXED-SATELLITE (Earth-to-space) MOBILE except aeronautical- mobile Radio Astronomy	FIXED-SATELLITE  <b>RESERVED 14496-14500</b> MOBILE	SATELLITE UP/DOWNLINKS/TT & C <i>CCIR 636-1</i>  (S5.149, S5.484A & S5.506)	FRN 4.6.57	

III. Radio Regulations		Primary Service	APPLICATIONS/FOOTNOTES	Future Requirements	Actions
Region 1	S.A. Table of Allocations				
14.5 - 14.8 GHz FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Space Research	14.5 - 14.8 GHz FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Space Research	FIXED FIXED-SATELLITE  RESERVED 14500-14627 RESERVED 14648-14800	POINT TO POINT LINKS SATELLITE UPLINKS (TT & C) CCIR 636-1 (S5.510)	FRN 4.6.58	
14.8 - 15.35 GHz FIXED MOBILE Space Research	14.8 - 15.35 GHz FIXED MOBILE Space Research	FIXED RESERVED 14800-15117	POINT TO POINT LINKS CCIR 636-1 ITU-R F.636 (S5.339)	FRN 4.6.59	
15.35 - 15.4 GHz EARTH EXPLORATION- SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	15.35 - 15.4 GHz EARTH EXPLORATION- SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	NO CHANGE	VILBIRA OBSERVATIONS CCIR 636-1 (S5.340)	FRN 4.6.60	
15.4 - 15.7 GHz AERONAUTICAL- RADIO NAVIGATION	15.4 - 15.7 GHz AERONAUTICAL- RADIO NAVIGATION	NO CHANGE	RADIO ALTIMETERS/RADARS	FRN 4.6.61	
15.7 - 16.6 GHz RADIOLOCATION	15.7 - 16.6 GHz RADIOLOCATION	NO CHANGE	ALTIMETERS DISTANCE MEASURING EQUIPMENT (S5.511D)	FRN 4.6.62	
16.6 - 17.1 GHz RADIOLOCATION Space Research (deep space) (Earth-to-space)	16.6 - 17.1 GHz RADIOLOCATION Space Research (deep space) (Earth-to-space)	NO CHANGE	LOW POWER LANS	FRN 4.6.63	
17.1 - 17.2 GHz RADIOLOCATION	17.1 - 17.2 GHz RADIOLOCATION	NO CHANGE	LOW POWER LANS	FRN 4.6.64	
17.2 - 17.3 GHz RADIOLOCATION Earth Exploration-Satellite (active) Space Research (active)	17.2 - 17.3 GHz RADIOLOCATION Earth Exploration-Satellite (active) Space Research (active)	NO CHANGE	LOW POWER LANS	FRN 4.6.65	
17.3 - 17.7 GHz FIXED-SATELLITE (Earth-to-space) Radiolocation	17.3 - 17.7 GHz FIXED-SATELLITE (Earth-to-space) Radiolocation	FIXED-SATELLITE	SATELLITE UP/DOWNLINKS (TT & C) CCIR 636-1	FRN 4.6.66	
17.7 - 18.1 GHz FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) MOBILE	17.7 - 18.1 GHz FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) MOBILE	SHARED BAND FIXED FIXED-SATELLITE  MOBILE	POINT TO POINT LINKS BSS FEEDER LINKS CCIR 636-1 ITU-R F.595 (S5.516)	FRN 4.6.67	

ITU - Radio Regulations		Primary Service	APPLICATIONS/FOOTNOTES	Future Requirements	Actions
Region 1	S.A. Table of Allocations				
18.1 - 18.4 GHz/ FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) MOBILE	18.1 - 18.4 GHz/ FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) MOBILE	<b>SHARED BAND</b> FIXED FIXED-SATELLITE	POINT TO POINT LINKS BSS FEEDER LINKS (18.1-18.3) GSO/FSS (18.3-18.4) CCIR 636-1 (S5.484A & S5.520)	FRN 4.6.68	
18.4 - 18.6 GHz/ FIXED FIXED-SATELLITE (space-to-Earth) MOBILE	18.4 - 18.6 GHz/ FIXED FIXED-SATELLITE (space-to-Earth) MOBILE	<b>SHARED BAND</b> FIXED FIXED-SATELLITE MOBILE	POINT TO POINT LINKS SATELLITE DOWNLINKS GSO/FSS 18.4-18.55 CCIR 636-1 (S5.484A)	FRN 4.6.69	
18.6 - 18.8 GHz/ FIXED FIXED-SATELLITE (Space-to-Earth) MOBILE except aeronautical mobile Earth Exploration-Satellite (passive) Space Research (passive)	18.6 - 18.8 GHz/ FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile Earth Exploration-Satellite (passive) (Space Research (passive)	<b>SHARED BAND</b> FIXED FIXED SATELLITE MOBILE	HIGH DENSITY FIXED SERVICES SATELLITE DOWNLINKS GSO/FSS  CCIR 636-1 (S5.522 & S5.523)	FRN 4.6.70	
18.8 - 19.7 GHz/ FIXED FIXED-SATELLITE (Space-to-Earth) MOBILE	18.8 - 19.7 GHz/ FIXED FIXED-SATELLITE (Space-to-Earth) MOBILE	FIXED-SATELLITE MOBILE	SATELLITE DOWNLINKS NGSO/FSS (18.8-19.3) MSS (19.3-19.7)  CCIR 636-1 (S5.484A & S5.523A)	FRN 4.6.71	
19.7 - 20.1 GHz/ FIXED-SATELLITE (Space-to-Earth) Mobile-Satellite (space-to-Earth)	19.7 - 20.1 GHz/ FIXED-SATELLITE (Space-to-Earth) MOBILE-SATELLITE (Space-to-Earth)	NO CHANGE	SATELLITE DOWNLINKS GSO/FSS (S5.484A)	FRN 4.6.72	
20.1 - 20.2 GHz/ FIXED-SATELLITE (Space-to-Earth) MOBILE-SATELLITE (Space-to-Earth)	20.1 - 20.2 GHz/ FIXED-SATELLITE (Space-to-Earth) MOBILE-SATELLITE (Space-to-Earth)	NO CHANGE	SATELLITE DOWNLINKS GSO/FSS (S5.525, S5.526 & S5.528)	FRN 4.6.73	
20.2 - 21.2 GHz/ FIXED-SATELLITE (space- to-Earth) MOBILE-SATELLITE (space-to-Earth)Standard Frequency and Time Signal (space-to-Earth)	20.2 - 21.2 GHz/ FIXED-SATELLITE (space- to-Earth) MOBILE-SATELLITE (space-to-Earth)Standard Frequency and Time Signal (space-to-Earth)	NO CHANGE	SATELLITE DOWNLINKS	Surveillance Point to Point Links  FRN 4.6.74	

ITU Radio Regulations		Primary Service	APPLICATIONS/FOOTNOTES	Future Requirements	Actions
Region 1	S.A. Table of Allocations				
21.2 - 21.4 GHz/ EARTH EXPLORATION- SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive)	21.2 - 21.4 GHz/ EARTH EXPLORATION- SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive)	FIXED	POINT TO POINT LINKS	FRN 4.6.75	
21.4 - 22 GHz/ FIXED MOBILE BROADCASTING- SATELLITE	21.4 - 22 GHz/ FIXED MOBILE BROADCASTING- SATELLITE	<b>SHARED BAND</b> FIXED  BROADCASTING-SATELLITE <b>RESERVED 21.8-22.0</b>	POINT TO POINT LINKS  (S5.530)	<b>FIXED UNTIL 2007</b>  BSS APPLICATIONS AFTER 2007  FRN 4.6.76	
22 - 22.21 GHz/ FIXED MOBILE except aeronautical mobile	22 - 22.21 GHz/ FIXED MOBILE except aeronautical mobile	FIXED	POINT TO POINT LINKS  (S5.149)	FRN 4.6.77	
22.21 - 22.5 GHz/ EARTH EXPLORATION- SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive)	22.21 - 22.5 GHz/ EARTH EXPLORATION- SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive)	SATELLITE FIXED	POINT TO POINT LINKS  (S5.532)	FRN 4.6.78	
22.5 - 22.55 GHz/ FIXED MOBILE	22.5 - 22.55 GHz/ FIXED MOBILE	FIXED	POINT TO POINT LINKS   <i>ITU-R F.637</i>	FRN 4.6.79	
22.55 - 23 GHz/ FIXED INTER-SATELLITE MOBILE	22.55 - 23 GHz/ FIXED INTER-SATELLITE MOBILE	FIXED  MOBILE	FIXED LINKS POINT TO POINT/POINT TO MULTIPOINT ENG/OB LINKS  <i>ITU-R F.637</i> (S5.149)	FRN 4.6.80	

ITU Radio Regulations		Primary Service	APPLICATIONS/FOOTNOTES	Future Requirements	Actions
Region 1	S.A. Table of Allocations				
23 - 23.55 GHz FIXED INTER-SATELLITE MOBILE	23 - 23.55 GHz FIXED INTER-SATELLITE MOBILE	FIXED	POINT TO POINT LINKS  ITU-R F.637	FRN 4.6.81	
23.55 - 23.6 GHz FIXED MOBILE	23.55 - 23.6 GHz FIXED MOBILE	FIXED	POINT TO POINT LINKS	FRN 4.6.82	
23.6 - 24 GHz EARTH EXPLORATION- SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	23.6 - 24 GHz EARTH EXPLORATION- SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	PASSIVE BAND ALL EMISSIONS PROHIBITED		FRN 4.6.83	
24 - 24.05 GHz AMATEUR AMATEUR-SATELLITE	24 - 24.05 GHz AMATEUR AMATEUR-SATELLITE	NO CHANGE	ISM PERMITTED ON A NON INTERFERENCE BASIS (S5.150)	FRN 4.6.84	
24.05 - 24.25 GHz RADIOLOCATION Amateur Earth Exploration-Satellite (active)	24.05 - 24.25 GHz RADIOLOCATION Amateur Earth Exploration-Satellite (active)	RADIOLOCATION Amateur Earth Exploration	AMATEUR & ISM OPERATIONS PERMITTED ON A NON INTERFERENCE BASIS  (S5.150)	FRN 4.6.85	
24.25 - 24.45 GHz FIXED	24.25 - 24.45 GHz FIXED	RESERVED FIXED	ENG/OB	Licensed video surveillance  FRN 4.6.86	
24.45 - 24.65 GHz FIXED INTER-SATELLITE	24.45 - 24.65 GHz FIXED INTER-SATELLITE	RESERVED FIXED	POINT TO MULTIPOINT SYSTEMS  ITU-R F.748	Digital Multipoint Broadband  FRN 4.6.87	
24.65 - 24.75 GHz FIXED INTER-SATELLITE	24.65 - 24.75 GHz FIXED INTER-SATELLITE	RESERVED FIXED	POINT TO MULTIPOINT SYSTEMS  ITU-R F.748	Digital Multipoint Broadband  FRN 4.6.88	
24.75 - 25.25 GHz FIXED	24.75 - 25.25 GHz FIXED	RESERVED FIXED	POINT TO MULTIPOINT SYSTEMS  ITU-R F.748	Digital Multipoint Broadband  FRN 4.6.89	

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ITU Radio Regulations		Primary Service	APPLICATIONS/FOOTNOTES	Future Requirements	Actions
Region 1	S.A. Table of Allocations				
25.25 - 25.5 GHz/ FIXED INTER-SATELLITE MOBILE Standard Frequency and Time Signal-Satellite (Earth-to-space)	25.25 - 25.5 GHz/ FIXED INTER-SATELLITE MOBILE Standard Frequency and Time Signal-Satellite (Earth-to-space)	RESERVED FIXED	POINT TO MULTIPOINT SYSTEMS  <i>ITU-R F.748</i> (S5.536)	Digital Multipoint Broadband  <b>FRN 4.6.90</b>	
25.5 - 27.0 GHz/ FIXED INTER-SATELLITE MOBILE Earth Exploration- Satellite (space-to-Earth) Standard Frequency and Time Signal- Satellite (Earth-to-space)	25.5 - 27.0 GHz/ FIXED INTER-SATELLITE MOBILE Earth Exploration- Satellite (space-to-Earth) Standard Frequency and Time Signal- Satellite (Earth-to-space)	RESERVED FIXED  MOBILE	POINT TO MULTIPOINT SYSTEMS   <i>ITU-R F.748</i> (S5.536 & S5.536A)	Digital Multipoint Broadband   <b>FRN 4.6.91</b>	
27 - 27.5 GHz/ FIXED INTER-SATELLITE MOBILE	27 - 27.5 GHz/ FIXED MOBILE INTER-SATELLITE	RESERVED FIXED	POINT TO MULTIPOINT SYSTEMS   <i>ITU-R F.748</i> (S5.536)	Digital Multipoint Broadband   <b>FRN 4.6.92</b>	
27.5 - 28.5 GHz/ FIXED FIXED-SATELLITE (Earth-to-space) MOBILE	27.5 - 28.5 GHz/ FIXED Fixed-Satellite (Earth-to-space) MOBILE	FIXED Fixed-Satellite	LMDS (27.5-28.35) SATELLITE UPLINKS (28.35-28.5)   (S5.539)	    <b>FRN 4.6.93</b>	
28.5 - 29.5 GHz/ FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Earth Exploration-Satellite (Earth-to-space)	28.5 - 29.5 GHz/ Fixed FIXED-SATELLITE (Earth-to-space) MOBILE Earth Exploration-Satellite (Earth-to-space)	RESERVED 29.1-29.5 Fixed FIXED-SATELLITE (28.6-29.1)	LMDS (29.1-29.25) SATELLITE LINKS GSO/FSS (28.5-28.6) NGSO/FSS (28.6-29.1) MSS & GSO/FSS (29.25-29.5)   (S5.484A, S5.539, S5.541 & S5.541A)	      <b>FRN 4.6.94</b>	

ITU Radio Regulations		Primary Service	APPLICATIONS/FOOTNOTES	Future Requirements	Actions
Region 1	S.A. Table of Allocations				
29.5 - 29.9 GHz FIXED-SATELLITE (Earth-to-space) Earth Exploration-Satellite (Earth-to-space) Mobile-Satellite (Earth-to-space)	29.5 - 29.9 GHz FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Earth Exploration-Satellite (Earth-to-space)	FIXED SATELLITE	SATELLITE UPLINKS GSO/FSS (29.5-29.9)  (S\$ 484A, S\$ 526, S\$ 539 & S\$ 541)	FRN 4.6.95	
29.9 - 30 GHz FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Earth Exploration-Satellite (Earth-to-space)	29.9 - 30 GHz FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Earth Exploration-Satellite (Earth-to-space)	FIXED SATELLITE	SATELLITE UPLINKS GSO/FSS (29.9-30)  (S\$ 484A, S\$ 525, S\$ 526, S\$ 527, S\$ 538, S\$ 539 S\$ 540, S\$ 541 & S\$ 543)	FRN 4.6.96	
30.0-31.0 FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Standard Frequency and Time signal- Satellite (space-to-Earth)	30.0-31.0 FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Standard Frequency and Time signal- Satellite (space-to-Earth)	FIXED SATELLITE	SATELLITE UP/DOWN LINKS	FRN 4.6.97	
31 - 31.3 GHz FIXED MOBILE Standard Frequency and Time Signal-Satellite (space-to-Earth) Space Research	31 - 31.3 GHz FIXED MOBILE Standard Frequency and Time Signal-Satellite (space-to-Earth) Space Research	FIXED	LOW POWER VIDEO SURVEILLANCE (LPVS) 31.0-31.056 LPVS HIGH POWER VIDEO SURVEILLANCE (HPVS) 31.1-31.3 GHz (S\$ 149 & S\$ 544)	(31.056 - 31.3 FUTURE LPVS EXPANSION)  FRN 4.6.98	Gov't Gazette 15 Jan 99 applies
31.3 - 31.5 GHz EARTH EXPLORATION- SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	31.3 - 31.5 GHz EARTH EXPLORATION- SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	PASSIVE BAND ALL EMISSIONS PROHIBITED	(S\$ 340)	FRN 4.6.99	
31.5 - 31.8 GHz EARTH EXPLORATION- SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile	31.5 - 31.8 GHz EARTH EXPLORATION- SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	RESERVED	(TT & C)  (S\$ 149)	Licensed Low Power Systems  FRN 4.6.100	
31.8 - 32.0 GHz RADIONAVIGATION SPACE RESEARCH- (deep space)(space-to-Earth)	31.8 - 32.0 GHz RADIONAVIGATION SPACE RESEARCH- (deep space)(space-to-Earth)	RESERVED FIXED	HDFS (S\$ 548)	SHARING STUDIES REQUIRED WITH EXISTING SERVICES  FRN 4.6.101	

SATRA

## SOUTH AFRICAN ALLOCATIONS

SABRE-2

ITU Radio Regulations		Primary Service	APPLICATIONS/FOOTNOTES	Future Requirements	Actions
Region 1	S.A. Table of Allocations				
32.0 - 32.3 GHz INTER-SATELLITE RADIONAVIGATION SPACE RESEARCH (deep space)(space-to-Earth)	32.0 - 32.3 GHz INTER-SATELLITE RADIONAVIGATION SPACE RESEARCH (deep space)(space-to-Earth)	RESERVED FIXED	HDFS  (S5.547 & S5.547A)	SHARING STUDIES REQUIRED WITH EXISTING SERVICES  FRN 4.6.102	
32.3 - 33.0 GHz INTER-SATELLITE RADIONAVIGATION	32.3 - 33.0 GHz INTER-SATELLITE RADIONAVIGATION	RESERVED FIXED	HDFS	SHARING STUDIES REQUIRED WITH EXISTING SERVICES FRN 4.6.103	
33.0 - 33.4 GHz RADIONAVIGATION	33.0 - 33.4 GHz RADIONAVIGATION	RESERVED FIXED	HDFS (S5.547 & S5.547A)	SHARING STUDIES REQUIRED WITH EXISTING SERVICES-FRN 4.6.104	
33.4 - 34.2 GHz RADIOLOCATION	33.4 - 34.2 GHz RADIOLOCATION	RESERVED		FRN 4.6.105	
34.2-34.7 GHz RADIOLOCATION SPACE RESEARCH (deep space) (Earth-to-space)	34.2-34.7 GHz RADIOLOCATION SPACE RESEARCH (deep space) (Earth-to-space)	NO CHANGE		FRN 4.6.106	
34.7 - 35.2 GHz RADIOLOCATION Space Research	34.7 - 35.2 GHz RADIOLOCATION Space Research	NO CHANGE		FRN 4.6.107	
35.2 - 36.0 GHz METEOROLOGICAL AIDS RADIOLOCATION	35.2 - 36.0 GHz METEOROLOGICAL AIDS RADIOLOCATION	NO CHANGE		FRN 4.6.108	
36.0 - 37.0 GHz EARTH EXPLORATION - SATELLITE(passive) FIXED MOBILE SPACE RESEARCH (passive)	36.0 - 37.0 GHz EARTH EXPLORATION - SATELLITE(passive) FIXED MOBILE SPACE RESEARCH (passive)	RESERVED RADIO ASTRONOMY (36.43 - 36.5)  FIXED MOBILE	   (S5.149)	   FRN 4.6.109	
37.0 - 37.5 GHz FIXED MOBILE SPACE RESEARCH (space-to-earth)	37.0 - 37.5 GHz FIXED MOBILE SPACE RESEARCH (space-to-earth)	FIXED SERVICES MOBILE		FRN 4.6.110	In accordance with ITU-R F.749-1 this sub-band is allocated to Fixed Services Gazette Article 24 July 1998

ITU Radio Regulations		Primary Service	APPLICATIONS/FOOTNOTES	Future Requirements	Actions
Region 1	S.A. Table of Allocations				
37.5-38 GHz FIXED FIXED - SATELLITE SPACE RESEARCH (space-to-Earth) MOBILE Earth Exploration - Satellite(space-to-Earth)	37.5-38 GHz FIXED FIXED - SATELLITE SPACE RESEARCH (space-to-Earth) MOBILE Earth Exploration - Satellite(space-to-Earth)	SHARED BAND FIXED SERVICE FIXED SATELLITE	(ITU-R 749-1 APPLIES)-PENDING SATELLITE DOWNLINKS	FRN 4.6.111	Channel plans not adopted to date. SA WRC recommendation to allocate band solely to fixed services. Gazette Article 24 July 1998
38.0-39.5 GHz FIXED FIXED - SATELLITE (space-to-Earth) MOBILE Earth Exploration Satellite(space- to-Earth)	38.0-39.5 GHz FIXED FIXED - SATELLITE (space-to-Earth) MOBILE Earth Exploration Satellite(space- to-Earth)	SHARED BAND FIXED SERVICE FIXED SATELLITE	(ITU-R 749-1 APPLIES)-PENDING SATELLITE DOWNLINKS	FRN 4.6.112	Channel plans not adopted to date. SA WRC recommendation to allocate band solely to fixed services. Gazette Article 24 July 1998
39.5 - 40.0 GHz FIXED FIXED - SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth) Earth Exploration Satellite(space- to-Earth)	39.5 - 40.0 GHz FIXED FIXED - SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth) Earth Exploration Satellite(space- to-Earth)	SHARED BAND FIXED SERVICE FIXED SATELLITE	POINT TO MULTIPOINT FIXED SERVICES SATELLITE DOWNLINKS	FRN 4.6.113	
40-40.5 GHz EARTH EXPLORATION SATELLITE(Earth-to- space) FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth) SPACE RESEARCH (Earth-to-space) Earth Exploration Satellite (space-to-Earth)	40-40.5 GHz EARTH EXPLORATION SATELLITE(Earth-to- space) FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth) SPACE RESEARCH (Earth-to-space) Earth Exploration Satellite (space-to-Earth)	FIXED SATELLITE	SATELLITE DOWNLINKS	FRN 4.6.114	
40.5-42.5 GHz BROADCASTING-SATELLITE /BROADCASTING/ Fixed Mobile	40.5-42.5 GHz BROADCASTING-SATELLITE /BROADCASTING/ FIXED Mobile	BROADCASTING  FIXED	POINT TO POINT/MULTIPOINT (55 551B)	LMDS/MVDS FRN 4.6.115	

ITU Radio Regulations		Primary Service	APPLICATIONS/FOOTNOTES	Future Requirements	Actions
Region 1	S.A. Table of Allocations				
42.5 - 43.5 GHz FIXED FIXED-SATELLITE (Earth-to-space) MOBILE except aeronautical mobile RADIO- ASTRONOMY	42.5 - 43.5 GHz FIXED FIXED-SATELLITE (Earth-to-space) MOBILE except aeronautical mobile RADIO- ASTRONOMY	RESERVED FIXED FIXED-SATELLITE  RADIO ASTRONOMY (42.77 - 42.87, 43.07 - 43.17, 43.37 - 43.47)	MVDS   (S5.149 & S5.552)	TT&C BSS feeder links BS and BSS-extend  FRN 4.6.116	
43.5 - 47.0 GHz MOBILE MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION- SATELLITE	43.5 - 47.0 GHz MOBILE MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION- SATELLITE	RESERVED	   (S5.553 & S5.554)	   FRN 4.6.117	
47.0 - 47.2 GHz AMATEUR AMATEUR - SATELLITE	47.0 - 47.2 GHz AMATEUR AMATEUR - SATELLITE	NO CHANGE		  FRN 4.6.118	
47.2-50.2 GHz FIXED FIXED-SATELLITE (Earth-to-space) MOBILE	47.2-50.2 GHz FIXED FIXED-SATELLITE (Earth-to-space) MOBILE	FIXED FIXED SATELLITE  MOBILE RADIO ASTRONOMY (48.94 - 49.04)  RESERVED (49.8-50.2)	TT&C (47.6-47.8) SATELLITE UPLINKS (48.5-49.8)  (S5.149, S5.340, S5.552A & S5.555)	HIGH ALTITUDE LONG ENDURANCE PLATFORMS (47.2-47.5 & 47.9-48.2)  FRN 4.6.119	
50.2-50.4 GHz EARTH EXPLORATION- SATELLITE(passive) FIXED MOBILE SPACE RESEARCH (passive)	50.2-50.4 GHz EARTH EXPLORATION- SATELLITE(passive) FIXED MOBILE SPACE RESEARCH (passive)	NO CHANGE	   (S5.340 & S5.555A)	   FRN 4.6.120	
50.4 - 51.4 GHz FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Mobile-Satellite (Earth-to-space)	50.4 - 51.4 GHz FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Mobile-Satellite (Earth-to-space)	FIXED SATELLITE	SATELLITE UPLINKS (TT & C)	   FRN 4.6.121	
51.4 - 54.25 GHz EARTH EXPLORATION- SATELLITE(passive) SPACE RESEARCH (passive)	51.4 - 54.25 GHz FIXED	RESERVED FIXED NO EMISSIONS IN THE BAND 52.6 - 54.26	   (S5.340, S5.547 & S5.556)	HIGH DENSITY FIXED SYSTEMS  FRN 4.6.122	

ITU Radio Regulations		Primary Service	APPLICATIONS/FOOTNOTES	Future Requirements	Actions
Region 1	S.A. Table of Allocations				
54.25 – 58.2 GHz EARTH EXPLORATION- SATELLITE(passive) FIXED INTER-SATELLITE MOBILE SPACE RESEARCH (passive)	54.25 – 58.2 GHz EARTH EXPLORATION- SATELLITE(passive) FIXED INTER-SATELLITE MOBILE SPACE RESEARCH (passive)	EARTH EXPLORATION SATELLITE (passive) (54.25 - 55.2)  FIXED  RESERVED 55.2 - 55.78	   LICENSED VIDEO SYSTEMS (57.2 - 58.2)  (S5.547, S5.556A, S5.558 & S5.558A)	   HIGH DENSITY FIXED SYSTEMS (55.78 - 56.9)  FRN 4.6.123	
58.2 – 59.0 GHz EARTH EXPLORATION SATELLITE (passive) SPACE RESEARCH (passive)	58.2 – 59.0 GHz EARTH EXPLORATION SATELLITE (passive) SPACE RESEARCH (passive)	RESERVED	  (S5.547 & S5.556)	HIGH DENSITY FIXED SYSTEMS  FRN 4.6.124	
59.0 – 64.0 GHz FIXED INTER-SATELLITE MOBILE RADIOLOCATION	59.0 – 64.0 GHz FIXED INTER-SATELLITE MOBILE RADIOLOCATION	Fixed ISM (61.0 - 61.5) MOBILE	BROADBAND COMMUNICATIONS NETWORKS  INTELLIGNET TRANSPORTATION APPLICATIONS (S5.138, S5.556A, S5.558 & S5.559)	   FRN 4.6.125	
64.0 – 65.0 GHz EARTH EXPLORATION- SATELLITE(passive) SPACE RESEARCH (passive)	64.0 – 65.0 GHz EARTH EXPLORATION- SATELLITE(passive) SPACE RESEARCH (passive)	TO BE DETERMINED	  (S5.547 & S5.556)	  FRN 4.6.126	
65.0 – 66.0 GHz EARTH EXPLORATION- SATELLITE SPACE RESEARCH Fixed Mobile	65.0 – 66.0 GHz EARTH EXPLORATION- SATELLITE SPACE RESEARCH Fixed Mobile	RESERVED   FIXED	   BROADBAND COMMUNICATIONS NETWORKS (S5.547)	   FRN 4.6.127	
66.0 – 71.0 GHz MOBILE MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION- SATELLITE	66.0 – 71.0 GHz MOBILE MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION- SATELLITE	TO BE DETERMINED	  (S5.553, S5.554 & S5.558)	  FRN 4.6.128	

**Appendix A****LIST OF ACRONYMS**

A/D	Analog to Digital
AM	Amplitude Modulation
AMPS	Advanced Mobile Phone Service
AMSS	Aeronautical Mobile Satellite Service
ATM	Asynchronous Transfer Mode
ATS	Air Traffic Services
BMS	Broadband Mobile System
BPSK	Binary Phase Shift Keying
BRAN	Broadband Radio Access Network
BSS	Broadcast Satellite Services
C- band	3.4 – 4.2 GHz
CD	Compact Disc
CDMA	Code Division Multiple Access
CEPT	European Conference of Postal and Telecommunications
CITEL	Inter-American Commission for Telecommunications
CPE	Customer Premise equipment
CSMA	Carrier Synchronized Multiple Access
DAVIC	Digital, Audio, Visual Council
DBS	Digital Broadcast Satellite
DECT	Digital European Cordless Telephone
DME	Distance Measuring Equipment
DSP	Digital Signal Processing
DSB	Double Sideband Modulation
DSSS	Direct Sequence Spread Spectrum
DTH	Direct to Home
E1	2,048 Mbit/s
EDM	Electronic Distance Measurement
EMC	Electromagnetic Compatibility
ENG	Electronic News Gathering
EOS	Earth Observation Satellite
ERC	European Regional Commission
ERO	European Radiocommunications office
ETSI	European Telecommunication Standard Institute
ESMR	Enhanced Specialized Mobile Radio
FCC	Federal Communication Commission (USA)
FDMA	Frequency Division Multiple Access
FM	Frequency Modulation
FS	Fixed Services
FSS	Fixed Satellite Services
GPS	Global Satellite Positioning System,
GHz	Gigahertz
GMPCS	Global Mobile Personal Communications system
GSM	Global System for Mobile Communications
GSO	Geo-Stationary Orbit

HALE	High Altitude Long Endurance
HDTV	High Definition Television
HF	High Frequency
Hz	Hertz
IBA	Independent Broadcasting Authority
IBCN	Integrated Broadband Communications Network
ICAO	International Civil Aviation Organization
IP	Internet Protocol
IS	Intelsat
ISDN	Integrated Services Digital Network
ISL	Inter Satellite links
ISM	Industrial, Scientific and Medical Apparatus
ISO	International Organization for Standardization
ITS	Intelligent Transport System
ITU	International Telecommunications Union
Ka Band	18 – 31 GHz
Ku Band	10.9 – 17 GHz
kHz	Kilohertz
LAN	Local Area Network
LEO	Low Earth Orbit
LMDS	Local Multipoint Distribution services
LMS	Location and Monitoring Services
LMSS	Land Mobile Satellite Services
MDS	Multipoint Distribution System
MHz	Megahertz
MIR	Micropower Impulse Radar
MLS	Microwave Landing System
MMDS	Multichannel Multipoint Distribution System
MS	Mobile Services
MPT	Multipoint
MSS	Mobile Satellite Services
MVDS	Multipoint Video Distribution System
NATO	North Atlantic Treaty Organization
NB	Narrow Band
NIB	Non Interference Basis
NGSO	Non-Geostationary Orbit
OB	Outside Broadcasting
OSI	Open Systems Interconnection
PAS	PanAmSat
PC	Personal Computer
PCM	Pulse Coded Modulation
PCS	Personal Communication System
PDH	Plesiochronous Digital Hierachy
PMP	Point to Multipoint
PN	Pseudo Noise
POTS	Plain Old Telephone Service
PSD	Power Spectral Density
PSK	Phased Shift Keying
PSTN	Public Switched Telephone Network
PTMP	Point to Multipoint

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PTP	Point to Point
QoS	Quality of Service
QAM	Quadrature Amplitude Modulation
RBW	Reverse Band Working
REC	Recommendation
RF	Radio Frequency
RFB	Request for Bid
RFI	Radio Frequency Interference
RPE-LPC	Regular Pulse Excited – Linear Predictive Coder
RPU	Remote Pickup Links
RTT	Road Tracking and Transport
SABRE	South Africa Band replanning Exercise
SAB	Services Ancillary to Broadcasting
SABS	South African Bureau of Standards
SADC	Southern African Development Community
SANDF	South African National Defense Force
SAPS	South African Police Services
SATRA	South African Telecommunications Regulatory Authority
S-DAB	Satellite Digital Audio Broadcasting
SDH	Synchronous Digital Hierarchy
SDMA	Space Division Multiple Access
SHF	Super High Frequency
SMO	Spectrum Management Organization
SMR	Specialized Mobile Radio
SNG	Satellite News Gathering
SRD	Short Range Devices
SS	Spread Spectrum
STL	Studio to Transmitter Links
STM	Synchronous Transport Module
TASI	Time Assignment Speech Interpolation
TDMA	Time Division Multiple Access
TETRA	Terrestrial Trunked Radio
TT&C	Telemetry Tracking and Command
TV	Television
UHF	Ultra High Frequency
U-NII	Unlicensed National Information Infrastructure
VDL	Video Distribution Link
VHF	Very High Frequency
VOD	Video on Demand
VSAT	Very Small Aperture Terminal
WLL	Wireless Local Loop
WAN	Wired-area network
WB	Wideband
WRC	World Radio Conference
WTO	World Trade Organization
XPIC	Cross - polarization Interference Canceller

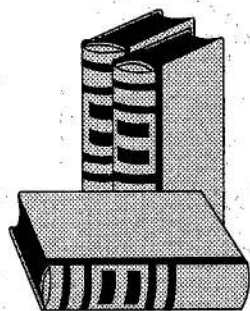
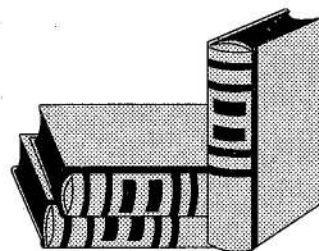
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*Where is the largest amount of meteorological information in the whole of South Africa available?*



*Waar is die meeste weerkundige inligting in die hele Suid-Afrika beskikbaar?*

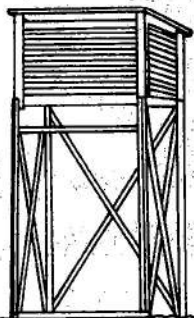
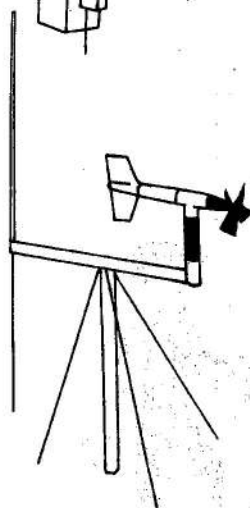
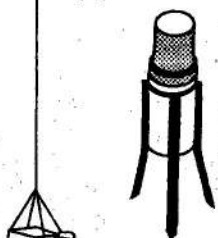
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# Wetlands are wonderlands!

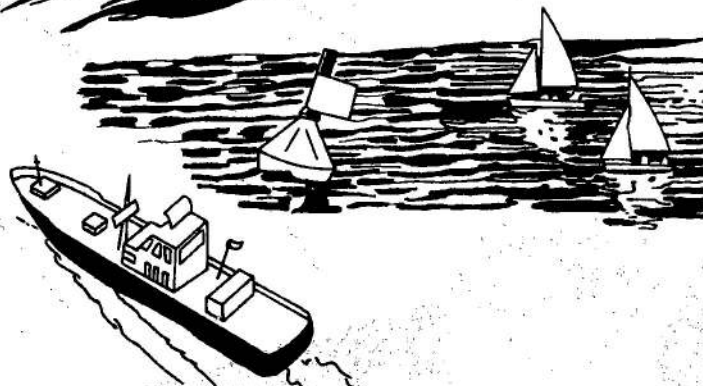
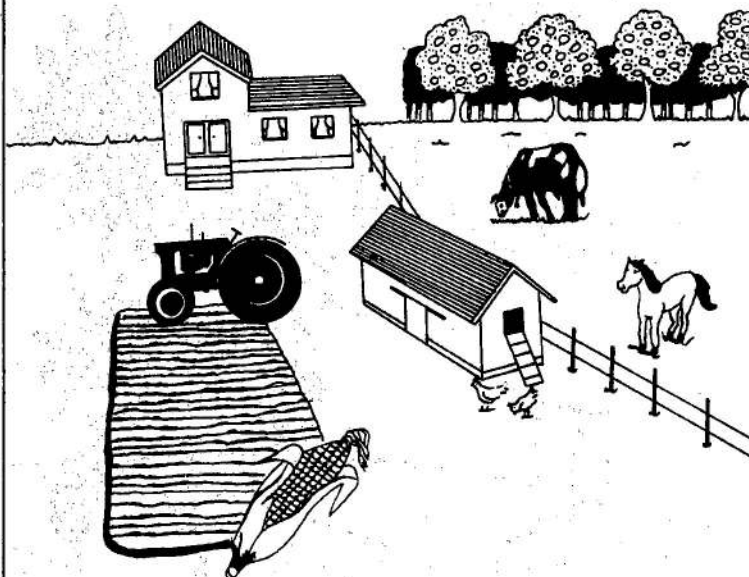
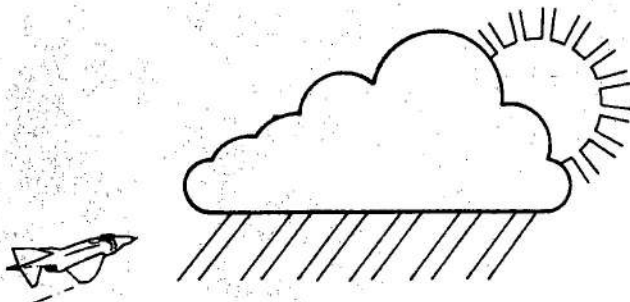


Department of Environmental Affairs and Tourism

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