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GOVERNMENT NOTICES • GOEWERMENTSKENNISGEWINGS

**INDEPENDENT COMMUNICATIONS AUTHORITY OF SOUTH AFRICA**

**NO. 4559** **27 March 2024**

## THE DRAFT RADIO FREQUENCY MIGRATION PLAN

1. The Independent Communications Authority of South Africa ("ICASA" or "the Authority") in terms of section 4 (1) read with sections 31 (4), 34 (7) (c) (iii), 34 (8) and 34 (16) of the Electronic Communications Act (Act No. 36 of 2005) hereby gives notice of the Draft Radio Frequency Migration Plan to the extent reflected in the Schedule.

2. A copy of the Draft Radio Frequency Migration Plan ("the Migration Plan") will be made available on the Authority's website at https://www.icasa.org.za or can be sent via email upon request by any individual or can be collected from ICASA Library at the following address: 350 Witch-Hazel Avenue, Eco Point Office Park, Eco Park, Centurion between 09h00 and 16h00, Monday to Friday.

3. Interested persons are hereby invited to submit written representations on the Draft Migration Plan by no later than 16h00 on Friday 31 May 2024 by post, hand or electronically (in MS Word and pdf format) for the attention of: Mr Manyaapelo Richard Makgotlho.

4. Delivery address: Block C, 350 Witch-Hazel Avenue, Eco Point Office Park, Centurion; or by email at rmakgotlho@icasa.org.za and copy jdikgale@icasa.org.za.

5. Telephonic enquiries should be directed to Mr Manyaapelo Richard Makgotlho at 012 568 3367 between 08h30 and 16h30, from Monday to Friday. Written representations received by the Authority pursuant to this notice, will be made available for inspection by interested persons at the Authority's library and/or the ICASA website.

6. Persons making representations are further invited to indicate whether they require an opportunity to make oral representations.

7. When a person submits information to the Authority, such person may request that specific information be treated as confidential information in terms of section 4D of the Independent Communications Act of South Africa Act, 2000 (Act No.13 of 2000) ("ICASA Act"). The request for confidentiality must be accompanied by a written statement explaining why the specific information should be treated as confidential, in accordance with ICASA Guidelines for Confidentiality Request published in Government Gazette No. 41839 (Notice No. 849) of 17 August 2018.

8. The Authority may determine that such specific information or any portion thereof is to be treated as confidential in terms of section 4D of the ICASA Act. Where the request for confidentiality is refused, the person who made the request will be granted an opportunity to withdraw such representations or portion(s) thereof.

**YOLISA KEDAMA**
**ACTING CHAIRPERSON**
**DATE: 25 /03/2024**

# Draft Radio Frequency Migration Plan

**PART 1**

**The Draft Radio Frequency Migration Plan Overview**

**1. Definitions**

In this Radio Frequency Migration Plan, unless the context indicates otherwise, a word or expression to which a meaning has been assigned in the Act or the ICASA Act, 2000 (Act No. 13 of 2000), as amended, has the meaning so assigned, and the following words and expressions shall have the meaning set out below:

**"Act"** means the Electronic Communications Act, 2005 (Act No. 36 of 2005) as amended;

**"AfriSAP"** means African Spectrum Allocation Plan, frequency range from 8.3 kHz to 3000 GHz.

**"User"** means a licensed or licence exempt user of the radio frequency spectrum; and

**2. Principles**

(1) Radio frequency spectrum migration must be in accordance with the Radio Frequency Migration Plan.

(2) Radio frequency spectrum migration must be consistent with the NRFP-21.

(3) The National Radio Frequency Plan itself must be consistent with the International Telecommunications Union (ITU) Radio-regulations as updated by WRC, the African Telecommunications Union (ATU) African Spectrum Allocation Plan and with the SADC FAP, to the extent possible.

(4) Systems and equipment of existing users within a radio frequency band, which have been identified for migration, will be migrated to the same or a different frequency band.

(5) The users to be migrated are not entitled to be compensated by the Authority for the costs of the migration.

(6) To the extent that it is possible, the cost of migration should be minimised by considering, amongst other things, the duration of the licence and the economic lifetime of the equipment.

(7) Frequency Migration may be required in the core and central astronomy advantage areas in terms of section 22(2) (c) of the Astronomy Geographical Advantage Act, 2007 (Act No. 21 of 2007).

**3. Process for Radio Frequency Migration**

The Authority will initiate a process of radio frequency migration in the following circumstances:

(a) As specified in the Frequency Migration Plan;

(b) Where a change in the use of a radio frequency band is required to bring the South African National Radio Frequency Plan in line with the final acts of the latest WRC and in turn, the latest ITU Radio-Regulations Edition;

(c) Where a change in the use of a radio frequency band is required to ensure harmonisation of the latest published South African National Radio Frequency Plan with the latest approved SADC FAP, read with ATU African Spectrum Allocation Plan;

(d) Where the Authority has determined that a change in use of the frequency is necessary for efficient utilisation of the radio frequency spectrum and to otherwise meet the objectives of the Act, more especially section 2(e) with respect to the efficient use of the radio frequency spectrum;

(e) Where the Authority has determined that a change in a radio frequency spectrum licence holder's assignment within a radio frequency band is required to enable more efficient use of the radio frequency spectrum (in-band migration); and

(f) Where a South Africa specific requirement must be accommodated such as that arising from protecting radio frequency spectrum for radio astronomy purposes in core and central astronomy advantage areas in terms of the Astronomy Geographical Advantage Act (Act No. 21 of 2007).

**4. Preparation of a Radio Frequency Spectrum Assignment Plan**

(1) A change in the use of a radio frequency band(s) will be initiated by the Authority through a Radio Frequency Spectrum Assignment Plan for the radio frequency spectrum bands in the manner specified in the latest Radio Frequency Spectrum Regulations in force.

(2) With respect to the radio frequency migration process, a Radio Frequency Assignment Plan may include:

(a) The process for migrating existing users and usages from their existing spectrum location, specifying the bands to which the users and uses will be migrated; including in-band migration where applicable.

(b) The time scale for the reallocation of the radio frequency band in question, specifying the date at which the users to be migrated should cease transmission.

(3) A Radio Frequency Spectrum Assignment Plan will be subject to a public consultation process.

(a) The Authority shall publish the Radio Frequency Spectrum Assignment Plan in the Government Gazette, inviting interested persons to submit written representations as specified by the notice in the Gazette; and

(b) The Authority may, after any defined period for lodging comments by interested persons has passed, hold a public hearing in respect of the application.

**5. Amendment of a Radio Frequency Spectrum Licence**

(1) Upon completion of the Radio Frequency Spectrum Assignment Plan, the Authority will issue a notice to users to be migrated.

(2) The notice of amendment may include the following:

(a) The date at which the licensee must cease transmitting within the frequency range of his existing assignment;

(b) The date at which the licensee may commence transmitting within the new assignment; and

(c) The date within which the licensee must collect their updated radio frequency spectrum licence which contains the new terms and conditions of the new assignment, including technical parameters and whether the assignment is exclusive or shared.

**6. Short title and commencement**

The plan is called the Radiocommunication Frequency Migration Plan and will be implemented by the Authority upon publication in the Government Gazette.

**PART 2**

**The Draft Radio Frequency Migration Plan**

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# 1 Introduction

## 1.1 Purpose

To develop a Radio Frequency Migration Plan with the aim of managing spectrum efficiently to the benefit of all South Africans in terms of section 2 (e) of the Electronic Communications Act, 2005 (Act No. 36 of 2005) as amended ("the Act").

The plan provides for:

- Background and basis of the Radio Frequency Migration Plan.
- How the Radio Frequency Migration Plan was developed?
- Identification of the radio frequency bands where migration may be required and makes proposals regarding such frequency migration as may be required.
- Identification of radio frequency bands which are subject to a feasibility study.
- The frequency bands where Radio Frequency Spectrum Assignment Plans have been developed.
- The impact of the Frequency Migration Plan.

## 1.2 Definitions

To avoid terminological confusion, it is useful to discuss exactly what is meant by the various terms that are used in spectrum management.

Full definitions are given in Appendix A.

### 1.2.1 ITU Definitions

The standard definitions for spectrum management in the International Telecommunication Union (ITU) Radio regulations (Article 1) are as follows:

***allocation*** (of a frequency band): Entry in the Table of Frequency Allocations of a given frequency band for the purpose of its use by one or more terrestrial or space *radiocommunication services* or the *radio astronomy service* under specified conditions. This term shall also be applied to the frequency band concerned. (1.16)

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

administrations for a terrestrial or space *Radiocommunication service* in one or more identified countries or geographical areas and under specified conditions. (1.17).

***assignment*** (of a radio frequency or radio frequency channel): Authorization given by an administration for a radio station to use a radio frequency or radio frequency channel under specified conditions. (1.18).

**refarming** (of frequency spectrum) "Spectrum redeployment (spectrum refarming) is a combination of administrative, financial, and technical measures aimed at removing users or equipment of the existing frequency assignments either completely or partially from a particular frequency band. The frequency band may then be allocated to the same or different service(s). These measures may be implemented in short, medium, or long timescales;" reference Recommendation. ITU-R SM.1603 (See Appendix H).

### 1.2.2 Defining Spectrum Migration

It is important to define exactly what is meant by spectrum migration as this defines the scope of the plan and regulation.

In the Act, the reference to spectrum migration is clearly the migration of users of radio frequency spectrum to other radio frequency bands in accordance with the radio frequency plan. The main focus of the FMP is on migrating existing users. "User" means licensed or licence exempt user of the radio frequency spectrum.

Since certain issues of spectrum migration involve usage as opposed to users, it is necessary to expand the definition of migration to include uses[1]. Under the circumstances, the term "uses encompasses re-farming of spectrum within assigned bands to other technologies and in-band migration such as the digitalisation of TV broadcast.

***"Radio Frequency Spectrum Migration"*** *means the movement of users or uses of radio frequency spectrum from their existing radio frequency spectrum location to another.*

[1] This allows spectrum migration to encompass re-farming of spectrum within assigned bands to other technologies and in-band migration such as the digitalisation of TV broadcast.

### 1.2.3 Spectrum re-farming

The term spectrum re-farming is widely used, but like spectrum migration it does not have a universal definition and can mean slightly different things in different jurisdictions.

The ICT Regulation Toolkit[2] notes the following regarding spectrum re-farming definition:

*Generally speaking, re-farming may be seen as process constituting any basic change in conditions of frequency usage in a given part of radio spectrum. Such basic changes might be:*

1. *Change of technical conditions for frequency assignments;*
2. *Change of application (particular Radiocommunication system using the band); or*
3. *Change of allocation to a different Radiocommunication service.*

The term re-farming is used to describe:

- the process where a GSM operator changes the use of all or part of the spectrum used for GSM to UMTS / LTE; especially where the spectrum licence has specified the technology (as GSM), and the operator licence has to be changed[3] .
- The situation where the individual assignments within a band are changed to allow more efficient use to be made of the frequency band (usually due to a change in technology).
- The process of reallocating and reassigning frequency bands where the licence period has expired, this is happening in Europe where the original GSM licences are expiring[4].
- Further examples of Spectrum Re-Farming case Studies including in Africa are contained in **ATU-R Recommendation 003-0[5],** relating to Spectrum Evolution for Mobile/Broadband Systems, published in March 2021.

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[2] The ICT Regulation Toolkit, produced by the Information for Development Program (infoDev) and the International Telecommunication Union (ITU), is a practical, web-based tool intended for ICT policymakers and regulators around the world.

[3] Even where the licences are not technologically specific and it could be argued that the change in use from GSM to LTE does not require a regulator to get involved, in order to make efficient use of the spectrum it may be necessary to modify the individual assignments within the band.

[4] An example of where this is happening is in Ireland in respect to the refarming process. "Multi-band Spectrum Release: Release of the 800 MHz, 900 MHz, and 1800 MHz Radio Spectrum Bands' – various consultations by ComReg 2012.

[5] https://www.google.com/search?q=ATU-R+Recommendation+003-0&rlz=1C1CHZN_enZA996ZA996&oq=ATU-R+Recommendation+003-0&gs_lcrp=EgZjaHJvbWUyBggAEEUYOTIGCAEQRRg70gEIMTczN2owajSoAgCwAgA&sourceid=chrome&ie=UTF-8

For the purposes of the plan therefore, radio frequency spectrum re-farming may be defined as follows:

*"Radio Frequency Spectrum Re-farming" means the process by which the use of a Radio Frequency Spectrum band is changed following a change in assignment or application, this may include change in the specified technology and does not necessarily mean that the licensed user has to vacate the frequency.*

#### 1.2.4 Other definitions

Where the user of a radio frequency has a change of assignment within the same band, usually to allow greater efficiency in the use of the spectrum, this may be termed **in-band migration**.

In some cases, a radio spectrum user may not only have the assignment changed in the same frequency band, but have a new spectrum assigned to a different frequency band. This has occurred with respect to the balancing of spectrum assignments in the IMT2000 to IMT advance through to IMT2020 bands and may well become a feature of mobile broadband assignments in the future.

## 2 Review of Legislation and Regulations

### 2.1 Electronic Communications Act, 2005 (Act No. 36 of 2005)

#### 2.1.1 Section 34 - Radio Frequency Plan

Section 34 of the Act deals with the National Radio Frequency Plan and as part of this, radio frequency migration.

Subsection (2) essentially contains the key statement:

*...national radio frequency plan developed by the Authority, which must set out the specific frequency bands designated for use by particular types of services...*

Referring specifically to matter of migration:

- Section 34 (7) (c) (iii), states that the Authority must:

  *Co-ordinate a plan for migration of existing users, as applicable, to make available radio frequency spectrum to satisfy the requirements of subsection (2) and the objects of this Act and of the related legislation.*

- Section 34 (16) states that:

  *The Authority may, where the national radio frequency plan identifies radio frequency spectrum that is occupied and requires the migration of the users of such radio frequency spectrum to other radio frequency bands, migrate the users to such other radio frequency bands in accordance with the national radio frequency plan, except where such migration involves governmental entities or organisations, in which case the Authority—*

  *(a) must refer the matter to the Minister; and*

  *(b) may migrate the users after consultation with the Minister*

It is clear that ICASA has the obligation and authority to plan and implement the migration of users, subject to the approval of the Minister with respect to government entities.

#### 2.1.2 Section 31 - Radio Frequency Spectrum Licence

Section 31 of the Act deals with the radio frequency spectrum licences.

- Section 31 (4) states that:

  *(4) The Authority may amend a radio frequency spectrum licence—*

  *(a) to implement a change in the radio frequency plan;*

  *(b) in the interest of orderly radio frequency spectrum management;*

  *(c) to effect the migration of licensees in accordance with a revised radio frequency plan or the transition from analogue to digital broadcasting;*

*(d) if requested by the licensee concerned to the extent that the request is fair and does not prejudice other licensees; or*

*(e) with the agreement of the licensee.*

This section clearly establishes that the ICASA has the right to amend a radio frequency licence to cater for instances listed in section 31(4) (a)-(e) of the Act.

#### 2.1.3 Chapter 3 – Licensing Framework

Chapter 3 of the Act which in principle deals with the award of licences for individual and class licences for the provision of services. It also refers to the use of the radio frequency spectrum. This is consistent with the provisions of Section 31(1) and (2) of the Act dealing with the radio frequency spectrum licence in that a person cannot provide services, in terms of chapter 3, which requires the use of the radio frequency spectrum without a radio frequency spectrum licence.

#### 2.1.4 Spectrum Licence Duration

The process of migrating users will not have an impact on the duration of their radio frequency spectrum licences, however the licence will be amended accordingly to effect the migration.

### 2.2 Radio Regulations

#### 2.2.1 Radio Frequency Spectrum Regulations, 2015

The Radio Frequency Spectrum Regulations, 2015 published in Government *Gazette* No. 38641 (Notice 279 of 2015) of 30 March 2015 (as amended) do not prescribe a regulatory process for radio frequency spectrum migration nor do they prescribe a procedure to amend a radio frequency spectrum licence initiated by the Authority.

Regulation 17 deals with the duration of a radio frequency spectrum licence

- Regulation 17 (1) stipulates that*; The granting of a radio frequency spectrum licence must not be construed as conferring upon the holder a monopoly for the use of or a right of continued tenure of the radio frequency spectrum;*
- Regulation 17 (2) stipulates that*, unless otherwise specified in a radio frequency spectrum licence, a radio frequency spectrum licence shall run parallel to and not exceed the duration of a service licence contemplated in Chapter 3 of the Act, issued to the person in possession of a radio frequency spectrum licence*.
- Regulation 17 (3) stipulates that*, the duration of a radio frequency spectrum licence, without a corresponding service licence contemplated in Chapter 3 of the Act, except those mentioned in sub regulation (4), is a year (i.e. from 1 April until 31 March) and such a licence will expire on the due date of the then current licence year.*

- Regulation 17 (4) stipulates that, *where a radio frequency spectrum licence is issued in the Amateur Radio, Aeronautical Band, Marine Band, Citizen Band Radio for Ski Boats, the licence shall remain valid from 1 April of the year in which it was issued and is thereafter renewable by payment of the prescribed licence fee before or on the due date in the year it is set to expire*.

### 2.3 Overview of rights and responsibilities

#### 2.3.1 Radio frequency spectrum rights

Neither in the Act nor in the regulations are there any rights on the parts of users to retain spectrum. The spectrum licence is currently valid as specified in a radio frequency spectrum licence and a spectrum assignment can be revoked at any time. This is not unique to South Africa and many administrations retain the ultimate right to decide on the use of the spectrum at any time, notwithstanding the procedures for withdrawal, amendment, or suspension of a licence.

The process for spectrum migration will include the following:

- a consultation process,
- consideration of the economic lifetime of the equipment,
- the identification of alternative frequencies for users who have to be migrated out of a frequency band,
- advance planning along with an adequate time frame,
- consideration of the duration of the radio frequency spectrum licence,
- consideration of the duration of a broadcast licence.

#### 2.3.2 Responsibilities

The Authority is the responsible body for frequency migration planning.

The Authority has the obligation to consult with the Minister[6] on various issues, notably where migration involves government entities and organisations.

[6] Section 34 (16) of the Act.

## 3 Principles Governing Frequency Migration

### 3.1 Identification of Bands are subject to Frequency Migration

Bands are identified for radio frequency migration according to the following hierarchy.

- First Level – where the ITU radio regulations / decision of a World Radiocommunication Conference (WRC) require a change in national allocation that will require existing users to be migrated.
- Second Level - where a Regional Radio Conference require a change in national allocation that will require existing users to be migrated.
- Third Level – where the SADC Frequency Allocation Plan (FAP) requires a change of use and in turn a change in national allocation that will require existing users to be migrated.
- Fourth Level – a decision is taken to change the use of a frequency band at national level, and this requires the migration of existing users.

### 3.2 Process

The process of frequency migration is carried out in a manner consistent with the radio frequency spectrum regulations and the generic process is described in the frequency migration regulation. The key processes are:

- Preparation of a Radio Frequency Spectrum Assignment Plan
- Amendment of a Radio Frequency Spectrum Licence

When it has been established that migration is required, then the critical issue is to determine the time frame in a manner consistent with sound radio frequency spectrum management.

### 3.3 Time Frame for Migration

In principle, the Authority can migrate a user to another frequency band or frequency location as part of sound radio frequency spectrum management. However, an appropriate time frame should be applied as a matter of standard practice.

In determining the time frame, the following factors should be taken into account:

- the duration of the spectrum licence;
- the time frame to migrate existing customers (end users);
- the economic life of the equipment installed;
- adequate forward planning.

### 3.3.1 Duration of the radio frequency spectrum licence

The radio frequency spectrum licences in South Africa are in principle granted for a one-year period. "*The duration of a radio frequency spectrum licence, without a corresponding service licence contemplated in Chapter 3 of the Act, except those mentioned in sub regulation (4), is a year (i.e. from 1 April until 31 March) and such a licence will expire on the due date of the then current licence year.*

*Unless otherwise specified in a radio frequency spectrum licence, a radio frequency spectrum licence shall run parallel to and not exceed the duration of a service licence contemplated in Chapter 3 of the Act, issued to the person in possession of a radio frequency spectrum licence"*[7].

The multi-year licences will be restricted so that any migration will not fall within the period of a multi-year licence.

### 3.3.2 Time Frame to migrate existing end users.

The issue of the migration of existing users is a key determinant of a spectrum migration time frame. The issue arose in the past with cessation of the analogue mobile phone systems and the migration to GSM and is currently an issue with respect to broadcasting. In Europe, the main controversy is with regard to proposed plans to terminate VHF FM and possibly Medium Wave broadcasting and as a result of this opposition; the termination of FM does not seem likely in the short term. There has been less opposition to the cessation of analogue television broadcasts.

The critical area in South Africa is the digitalisation of TV where end users have to obtain an - analogue to digital-set-top box to accommodate digital signals to their existing televisions before analogue switch off.

Potential areas that may arise in the future include:

- Conversion of existing Mobile International Mobile Telecommunication frequencies to IMT2020, IMT2030 and beyond.

Because of the large number of GSM customers with voice / text only phones and the availability of other bands for mobile broadband, there is a need to provide for a sunset timeline to shut off legacy systems by mobile operators, taking into consideration the lifespan of their Equipment and the evolution of Technology. This phenomenon is enabled by the Technology Neutral licensing of spectrum in South Africa that allows Mobile operators to re-farm or repurpose the spectrum

[7] Government Gazette No. 38641 (Notice 279 of 2015).

already assigned in order to keep pace with technology evolution. A switch over from 3G / HSPA to LTE, including the new Generations of Technologies – if this ever occurs would involve a time frame of 3-5 years to accommodate the life cycle of the end-terminal equipment.

- Switch off of analogue radio. This is unlikely to occur within the time frame envisaged by this spectrum migration strategy.

#### 3.3.3 Economic life of the equipment installed.

It should not be automatically assumed that a change in frequencies will require new transmission equipment; it is entirely possible that the equipment can be retuned at relatively low cost.

In terms of the economic lifetime of the equipment, SABRE 2 which was gazetted in August 2001, planned for switchover deadline of December 2005 for the services subject to migration which was a time frame of just under 5 years. This was at a time when the technological life cycle was longer than it is today.

#### 3.3.4 Adequate Forward Planning

Probably the most important factor for a frequency migration is the allowance of sufficient time for adequate forward planning. In terms of the overall process this may include:

- Proper time for consultation.
- Band planning.
- Adequate time for existing users of the spectrum to migrate out.
- Adequate time required for dual illumination during a switchover period subject to no interference.

In terms of the time frame, the critical determinant is the earliest time in which new users can begin transmitting as this will be the final date at which existing users cease transmitting. In principle, there is little to be achieved by shutting down existing transmission before new licensees are ready to start transmitting.

#### 3.3.5 Conclusions regarding time frame

It has been established that the forward-looking time frame for a process of spectrum migration should be between 3 to 5 years from the moment of announcement, unless otherwise specified.

To ensure that there is no confusion, where there are multi-year radio frequency spectrum licences, these should generally not exceed 5 years. Where there is a spectrum migration planned for a particular frequency band, there is nothing to stop a licence being issued for the period up to the date at which transmission should cease if the licensee is able to 'live with' this.

## 4 Development of the Radio Frequency Migration Plan

### 4.1 Background

The figure below illustrates the chronology of events or activities that informed the creation of this Radio Frequency Migration Plan.

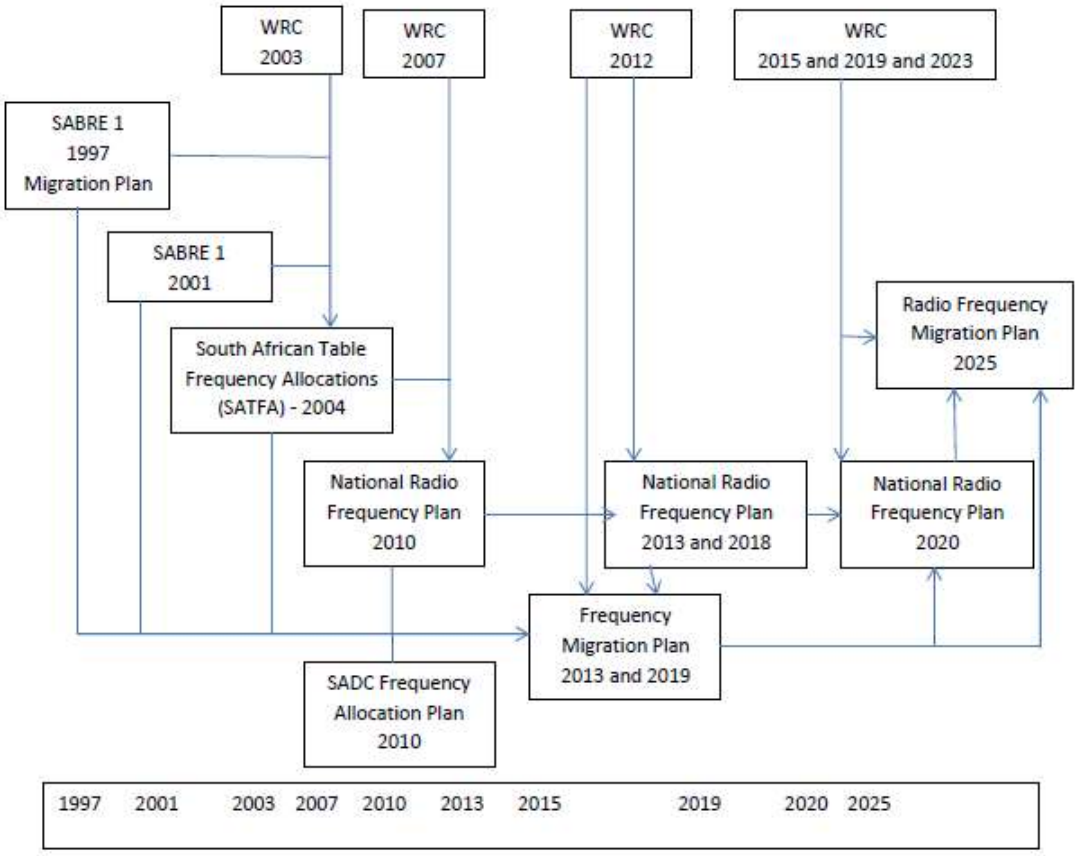



**Figure 1 Time Frame and events informing Frequency Migration Plan**

The radio Frequency Migration Plan reflects all relevant activities to date and comments on potential long-term migration issues.

### 4.2 International Context

The use of the Radio Frequency Spectrum is fundamentally determined through the ITU Radio Regulations which are established by treaty and modified by treaty in the form of the Resolutions and decisions of the World Radiocommunication Conferences in which South Africa has participated since 1994. South Africa fundamentally follows the allocations in the Radio Frequency

Plan for Region 1 in the ITU Radio Regulations and the primary driver for a change in use is a change in allocation stemming from a World Radiocommunication Conference Resolutions.

As Region 1 also includes Europe, it is common for South Africa to harmonise the way it uses and manages frequency bands with Europe on the grounds that this facilitates coordination and allows South Africa to benefit from potential economies of scale with regard to equipment as well being able to capitalize on existing development work.

South Africa also participates in the African Telecommunications Union and again seeks to harmonise its frequency allocations with other African countries, in order to realise economies of scale in respect of applications and devices, thus making these affordable to its Citizens. The African Telecommunications Union, in August 2021, published the First Edition of the African Spectrum Allocation Plan (AfriSAP) from 8.3 kHz to 3000 GHz, based on the ITU Radio Regulations Edition 2020. This, with a view, to foster ahead the African Union's (AU) Vision, and that is: *"An integrated, prosperous and peaceful Africa, driven by its own citizens and representing a dynamic force in the global arena"*. ATU being a specialised institution of the AU in the field of telecommunications/ICTs, developed the plan as a contribution towards to realization of the above AU vision.

For Southern Africa, South Africa is part of SADC, the Southern African Development Community. South Africa has actively participated in the preparation of the SADC Frequency Allocation Plan (SADC FAP) and to keep the National Radio Frequency Plan as harmonised as possible with the latest version of the SADC FAP is necessary to maintain international co-ordination with neighbouring countries.

### 4.3 Approach to development of FMP.

The Radio Frequency Migration Plan is drawn up using the latest National Radio Frequency Plan (NRFP 2021), the Final Acts[8] of the World Radiocommunications Conference 2023 (WRC-23) and in turn the International Telecommunications Union's (ITU) Radio Regulations, as a baseline.

[8] The minutes of the Fifteen and last Plenary Meeting of the World Radiocommunications Conference 2023 confirm that "Upon completion of the signing procedure, the Chair announced that 151 Member States had signed the Final Acts".

The first step was to check progress made concerning the frequency migrations proposed in SABRE[9] (see below) with respect to the following:

- Whether the migration as proposed (both from and to other bands) has been carried out; and
- If certain services still continue to occupy the original band, whether these services should still be migrated or whether migration is irrelevant).

The first step was carried out by:

- Evaluating the current utilisation of these bands by the incumbent.
- Determining whether these bands could be put to better use.

The next step was, the provisions made in the ATU Afrisap 2020, as well as the SADC Frequency Allocation Plan 2020 (SADC FAP 2020) are considered for relevancy in the Republic of South Africa. In terms of relevancy, points under consideration are:

- Whether the frequency bands considered for alternate use by ATU Afrisap, including the SADC are being currently utilized (by whom and to what extent).
- If there is a global trend and perceived economic benefit in migrating the current users to accommodate new services.

The third step involves looking at the resolutions adopted at the World Radiocommunication Conference (WRC) 2007, 2012, 2015, 2019 as well as the Final Acts of WRC 23 applicable to Region 1 and determine applicability for South Africa. Similar criteria as used to evaluate ATU Afrisap and SADC FAP provisions would be applied here.

The fourth step involves identifying South Africa specific migration issues. In this manner, all matters of significance from global, regional, and national context along with the historical activities around migration are awarded due consideration in drafting the frequency migration plan.

[9] The Revision of South African Frequency Allocation Plans (Band Plans) and Migration Strategies – Notice 759 of 1997 – which covered 20MHz to 3 GHz (SABRE-1) and 3.4GHz to 3.6 GHz (SABRE 2).

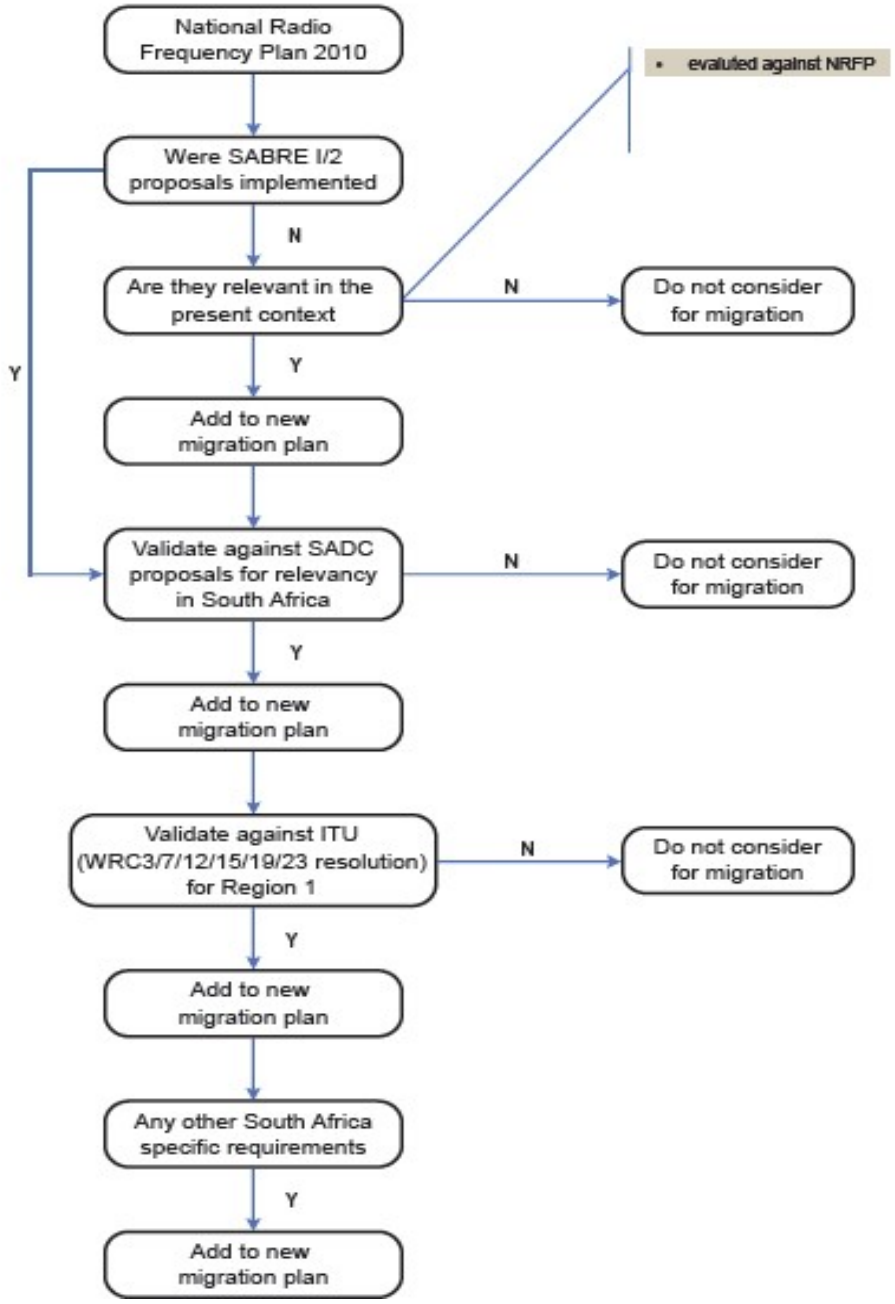



**Figure 2 Process for Development of Frequency Migration Plan**

### 4.4 SABRE 1 and SABRE 2

There were two South African Band Re-Planning Exercises (SABRE) carried out in 1997 and 2001. SABRE 1 has been the most comprehensive spectrum migration exercise to date.

- SABRE I – in 1997 addressing the radio frequency spectrum between 20MHz and 3 GHz, and between 3.4 – 3.6 GHz.
- SABRE II – in 2001 addressing radio frequency spectrum in the range between 3 GHz and 70GHz with the exception of those bands already addressed in SABRE I.

#### 4.4.1 SABRE 1 – 1997

SABRE 1[10] was a significant programme to re-plan the radio frequency in line with the ITU Region 1 frequency allocation plan from 20 MHz to 3 GHz and to migrate users that either did not accord with the existing allocation plan or prevented efficient use of the spectrum. A prime example of this was the drive to migrate fixed links to above 3 GHz. SABRE 1 was extended to cover 3.4 – 3.6 GHz.

The primary services which were targeted for this exercise were:

- Fixed links – plan to migrate the fixed links (wherever possible) to higher frequencies above 3 GHz. The primary rationale was that the frequency below 3 GHz was prime estate for mobile communications and should be reserved for that purpose.
- Mobile services in VHF High Band – plan for migrating existing services such as paging, alarms, municipal and governmental authorities into bands reserved for their use. Migrate in mobile services into the cleared band.
- Paging services – consolidate paging services into bands specifically allocated for that purpose. This would include low power paging, amateur, regional, and other paging system.
- Burglar Alarms – consolidate alarm systems into specific bands.

#### 4.4.2 SABRE 2 – 2001

SABRE 2[11] was a programme to re-plan the radio frequency spectrum from 3 GHz to 70 GHz (with the exception of 3.4 – 3.6 GHz which was part of SABRE 1), partly driven by the need to in-migrate fixed-links from below 3 GHz.

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[10] The Revision of Sou

th African Frequency Allocation Plans (Band Plans) and Migration Strategies – Notice 759 of 1997 – which covered 20MHz to 3 GHz (SABRE-1) and 3.4GHz to 3.6 GHz.

[11] Radio frequency spectrum band plan covering the range 3 GHz to 70 GHz – (SABRE-2) Notice 1920 of 2001

Extracts from SABRE 2 are given in the appendix (6.1Appendix C).

#### 4.4.3 Analysis of SABRE

The analysis conducted showed that the following migration of services out of specified bands as proposed under SABRE (1 and 2) was taken into consideration in developing the Radio Frequency Migration Plan 2019.

**Table 1 SABRE planned allocations that have been taken into consideration in the Frequency Migration Plan 2019**

| Frequency Band (MHz) | Planned allocation under SABRE | Current allocation in NRFP 2021 |
|---|---|---|
| **53.025 – 53.225** | Low power paging | Wireless Microphones (53 -54 MHz) |
| **(81 – 81.625 BTX) paired with (86.375 - 87 MTX)** | Dual frequency alarms/ Mobile | Mobile 7 BTX only |
| **141 – 142** | None | Remote controlled industrial apparatus (should be in the ISM band) |
| **150.05 – 151** | Wide area paging | Wildlife telemetry tracking 148-152 MHz |
| **(165.55 – 167.4875) paired with (172.05 – 173.9875)** | BTX-DF (165.55 – 167.4875 MHz)<br>MTX-DF (172.05 – 173.9875 MHz) | MTX-DF (165.55 – 167.4875 MHz)<br>BTX-DF (172.05 – 173.9875 MHz) |
| **240 – 246** | DAB | International distress (239 MHz) |
| **278 - 286** | FLEX outbound paging services | SF Mobile |
| **406.1 – 410** | SF links only | Fixed links (406.1 – 407.625 MHz) paired with (416.1 – 417.625 MHz)<br>Fixed links (407.625 – 410 MHz) paired with (417.625 – 420 MHz)<br>Refer to: Government Gazette No. 45690 (Notice 739 of 2021) |
| **426.1 – 427.625** | Public trunking | SF links (426.1 – 430 MHz) |

| Frequency Band (MHz) | Planned allocation under SABRE | Current allocation in NRFP 2021 |
|---|---|---|
| **427.625 – 430** | urban–government and public safety<br>rural – SF links | SF links (426.1 – 430 MHz) only |
| **(454.425 – 460) paired with (464.425 – 470)** | Mobile trunking<br>MTX (454.425 – 460 MHz)<br>BTX (464.425 – 470 MHz) | Mobile trunking<br>BTX (454.425 – 460 MHz)<br>MTX (464.425 – 470 MHz) |
| **463 – 463.975** | SF Mobile out of the band | SF Mobile |
| **876 – 880** | Digital trunking | Mobile Wireless Access (824 – 849 MHz paired with 869 - 894 MHz)<br>Refer to Government Gazette No. 45690 (Notice 739 of 2021) |
| **925 – 925.4** | Two-way paging (FLEX inbound) | No allocation |
| **1885 – 1980** | FPLMTS (satellite) | No allocation |
| **1980 – 2010/ 2170 - 2200** | Mobile – Satellite (earth – to – space) | Fixed links 1980 – 2010 MHz paired with 2170 – 2200 MHz |
| **21400 – 22000** | Broadcasting satellite service | Fixed links |

### 4.5 National Radio Frequency Plans

After SABRE, there have been five (5) national radio frequency plans, SATFA, NRFP 2010, NRFP 2013, NRFP 2018 and NRFP 2021.

#### 4.5.1 The South African Table of Frequency Allocations 2004

SATFA: The South African Table of Frequency Allocations 2004[12] consolidated SABRE 1 and SABRE 2 into one plan covering the range 20MHz to 70 GHz.

[12] The South African Table of Frequency Allocations (SATFA) – Notice 1442 of 2004.

This plan is discussed in the 6.1Appendix D with respect to frequency migration.

#### 4.5.2 National Radio Frequency Plan 2010

The National Radio Frequency Plan 2010[13] updated SATFA 2004[14] and extended the frequency range covered (now 9 kHz – 3000 GHz). Its stated aim was to incorporate the decisions taken by WRC 07 and include updates on the Table of Frequency Allocations extending up to 3000 GHz.

This plan is discussed in the Appendix E with respect to frequency migration.

#### 4.5.3 National Radio Frequency Plan 2013

The National Radio Frequency Plan 2013[15] updated National Radio Frequency Plan 2010, its stated aim was to incorporate the decisions taken by WRC 2012 and include updates on the Table of Frequency Allocations extending up to 3000 GHz.

This plan is discussed in the 6.1Appendix E with respect to frequency migration.

#### 4.5.4 National Radio Frequency Plan 2018

The National Radio Frequency Plan 2018 updated National Radio Frequency Plan 2013 and extended the frequency range covered (now 8.3 kHz – 3000 GHz). Its stated aim was to incorporate the decisions taken by WRC 15 and include updates on the Table of Frequency Allocations extending up to 3000 GHz.

#### 4.5.5 National Radio Frequency Plan 2021

The project has been initiated to review and update the National Radio Frequency Plan (NRFP); the last version of the National Radio Frequency Plan contained in Government Gazette Number 41650 (Notice 266 of 2018) published 25 May 2018.

[13] The National Radio Frequency Plan – Notice 727 of 2010

[14] The main reason for the name change is that the term 'National Radio Frequency Plan' is used in the ECA.

[15] The National Radio Frequency Plan – Government Gazette 36336 (Notice 354 of 2013)

The ITU Radiocommunication Sector (ITU-R) holds a World Radiocommunication Conference (WRC) every three to four years. The WRC review and, if necessary, revise the Radio Regulations. The WRC-19 was held at Sharm el-Sheikh, Egypt, 28 October 2019 to 22 November 2019.

The Authority initiated the process to review and update the National Radio Frequency Plan (NRFP), taking a long-term spectrum outlook for spectrum planning. The National Radio Frequency Plan review is performed in line with the provisions of section 34 of the Electronic Communications Act (Act 36 of 2005).

The review ensures that the NRFP is up to date, consistent with the AfriSAP, Southern African Development Community Frequency Allocation Plan (SADC FAP), reflects the final acts of the latest World Radio Conference of 2019 (WRC 2019) and the ITU Radio Regulations Edition 2020. The review was aimed at identifying all the necessary frequency changes which have taken place to ensure alignment with international and national developments.

The NRFP-21 allocates the Radio Frequency Spectrum to Radio Services in the Frequency Bands between 8.3 kHz and 3000 GHz. This NRFP-21 incorporates the decisions taken by 2019 World Radiocommunication Conference (WRC-19). The revision reflects the 2020 version of the ITU Radio Regulations edition, including the frequency allocations relevant to Region 1 and its associated footnotes. It also includes updates on the Table of Frequency Allocations extending up to 3000 GHz and South African National Footnotes

#### 4.5.6 The upcoming National Radio Frequency Plan 2025

The Authority is to develop the National Radio Frequency Plan during the 2024/2025 based on the Final Acts of WRC 23 and in turn the Latest Edition of the ITU Radio Regulations in order to keep the plan up to date and in accordance with section 34 of ECA.

The review and development of the Radio Frequency Migration Plan, is to be carried out in tandem with the upcoming National Radio Frequency Plan taking into consideration the previous Frequency Migration Plan(s) (FMP) and programs which were aimed at addressing the frequency migrations identified during the evolution of the earlier national radio frequency plans starting with SABRE 1 of 1997. The development of the Radio Frequency Migration Plan is to ensure that the requirements, subsequent to the ITU's World Radio Conferences including the latest Final acts of the World Radio Conference of 2023 (WRC 2023) are met.

This, taking into consideration the long-term plan associated with Spectrum planning with a view to ensure that spectrum is made available for the highest use and to those who value it the most, thus ensuring efficient use.

### 4.6 AFRICAN TELECOMMUNICATIONS UNION's African Spectrum Allocation Plan (AfriSAP)

The Africa Telecommunications Union developed and published the AfriSAP in 2020, covering the frequency range 8.3 kHz – 3000 GHz, based on edition 2020 of ITU Radio Regulations with respect to ITU Region 1.

The AfriSAP document includes table of common Spectrum Allocations and Applications, basic conditions necessary to guide Regulators, relevant applicable footnotes, typical applications, and additional information where applicable. The table of Spectrum Allocations and Applications was based on ITU Region 1 allocations.

This initiative is one key tool towards promoting the harmonized usage of spectrum across a given region on a common spectrum allocation plan which acts as a reference for sub-regional plans as well as national plans.

### 4.7 SADC Frequency Allocation Plan (FAP)

The Southern African Development Community (SADC) agreed to the development of a regional Frequency Allocation Plan (FAP) that provides for a harmonised framework on the allocation of the radio frequency spectrum in the SADC.

The SADC Frequency Allocation Plan revised in 2016 with the frequency range 8.3 kHz – 3000 GHz and guides the use of frequency in the SADC countries as spectrum coordination is required between SADC members.

This edition of the SADC FAP seeks to align to the changes made by WRC 15 and also reflect all other spectrum usage needs of the SADC region.

The allocations of the SADC FAP are largely consistent with those for South Africa and the SADC FAP is used as a reference in the preparation of the FMP.

### 4.8 Terrestrial Broadcasting Frequency Plan

The Terrestrial Broadcasting Frequency Plan published in Government Gazette 36321 (Notice 298 of 2 April 2013) and the Update to the Terrestrial Broadcasting Frequency Plan in Government Gazette 38005 (Notice 801 of 2014) deals with the re-planning of the broadcast bands in South Africa including the Digital Terrestrial Television Migration programme and the vacation of broadcast channels.

This was developed taking into consideration the International Telecommunications Union (ITU) Radio Regulations (RR), Provision Number 5.1.2 of the Geneva 2006 (GE06) Agreement, and the World Radiocommunication Conference (WRC) Resolution 224, Resolution 232 (WRC-12) and the results of activities undertaken within ITU Region 1 (African Region). The migration of Broadcasting service in the 790 to 862 MHz frequency band following the 2006 Regional Radio Conference in Geneva (GE06).

This plan reflected the WRC-07 and WRC-12 resolutions with respect to the migration of broadcast channels from the 694 to 790 MHz and 790 to 862 MHz bands respectively.

The plan took into consideration "The end of the transition period" to digital broadcasting set forth by the GE06 Agreement**,** that is, the Regional Agreement, Geneva 2006 for the planning of the digital terrestrial broadcasting service in parts of ITU Regions 1 and 3, in the frequency bands 174-230 MHz and 470-862 MHz, set forth as 17 June 2017, and notified through Administrative Circular CR/375.

The Multiplexes in the latest updated version of the Terrestrial Broadcasting Plan 2013 has been coordinated in terms of the GE06 Agreement and meets the conformance requirements of the Plan. The frequencies on this version have been successfully notified to the ITU-R Bureau and have been included in the Master International Frequency Register.

This plan essentially deals with the conversion of analogue to digital Television and the subsequent migration of the existing TV channels to a new spectrum location that is 470 to 694 MHz.

The Broadcasting Spectrum Assignments for the frequency band above 694 MHz, in the affected areas as stipulated in the Terrestrial Broadcasting Frequency Plan (Notice No. 298 of 2013 in Government Gazette No. 36321 and Notice No. 801 of 2014 in Government Gazette 38005 or the latest version), are to be used subject to meeting the conformance requirements in line with the GE06 Plan and are to be phased out during the performance period.

The key issues of interest are that there is a period during which broadcasts continue simultaneously in analogue and digital until the analogue channels are switched off. The dual illumination for the remaining assignments in the frequency band 470 to 694 MHz has been set to 31 December 2024 by the Minister, in terms of the Digital Migration Policy 2012 as amended.

### 4.9 World Radiocommunication Conference 2015

For WRC 15, South Africa joined together with other SADC countries to adopt a common position on 30 agenda items related to frequency allocation and frequency sharing for the efficient use of spectrum and orbital resources.

Key issues with potential implications for spectrum migration as a result of WRC 15 includes the following amongst others:

#### 4.9.1 Mobile broadband communications

Following the growing demand for spectrum for mobile broadband services, WRC-15 identified frequency bands in the L-band (1427-1518 MHz) and in the lower part of the C-band (3.3 -3.4 GHz).
WRC-15 achieved agreement on some additional portions in other bands that were also allocated to mobile broadband services in order to be used in regions where there was no interference with other services.

Furthermore, WRC-15 took a key decision that will provide enhanced capacity for mobile broadband in the 694 - 790 MHz frequency band in ITU Region-1 (Europe, Africa, the Middle East, and Central Asia) and a globally harmonized solution for the implementation of the digital dividend. In taking this decision WRC 15 ensured the full protection is given to television broadcasting between 470 and 694 MHz, as well as to the aeronautical radionavigation systems operating in this frequency band for countries listed in RR No.5.312 [16].

#### 4.9.2 Amateur radio service gets new allocation.

WRC-15 made new allocation for amateur radio service in the frequency band 5351.5 - 5366.5 kHz will maintain stable communications over various distances, especially for use when providing communications in disaster situations and for relief operations.

#### 4.9.3 Emergency communications and disaster relief

WRC-15 identified spectrum in the 694-894 MHz frequency band to facilitate mobile broadband communications for robust and reliable mission critical emergency services in public protection and disaster relief (PPDR), such as police, fire, ambulances, and disaster response teams.

#### 4.9.4 Search and rescue.

WRC-15 reinforced protection to Search and Rescue beacons that transmit in the 406-406.1 MHz frequency band signals to uplink to search and rescue satellites, such as the Cospas-Sarsat system. Resolution 205 was modified to ensure that frequency drift characteristics of radiosondes are taken into account when operating above 405 MHz to avoid drifting close to 406 MHz.

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[16] 5.312 Additional allocation: in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the frequency band 645-862 MHz, in Bulgaria the frequency bands 646-686 MHz, 726-758 MHz, 766-814 MHz, and 822-862 MHz, and in Poland the frequency band 860-862 MHz until 31 December 2017, are also allocated to the aeronautical radionavigation service on a primary. basis. (WRC-15)

Administrations were requested to avoid making new frequency assignments for the mobile and fixed services within the adjacent frequency bands to prevent interference in the frequency band 406-406.1MHz. As of December 2013, the Cospas-Sarsat System has provided assistance in rescuing over 37,000 persons in over 10,300 incidents worldwide.

#### 4.9.5 Earth observation satellites for environmental monitoring

WRC-15 resolved on a new allocation in the 7-8 GHz frequency range needed to uplink large amounts of data for operations plans and dynamic spacecraft software modifications that will eventually lead to simplified on-board architecture and operational concepts for future missions of earth-exploration satellite services (EESS).

Allocations of spectrum in the 9-10 GHz frequency range leads to the development of modern broadband sensing technologies and space-borne radars on active sensing EESS. Scientific and geo-information applications will provide high quality measurements in all weather conditions with enhanced applications for disaster relief and humanitarian aid, land use and large-area coastal surveillance.

#### 4.9.6 Unmanned aircraft and wireless avionics systems

WRC-15 opened the way for the development by the International Civil Aviation Organisation (ICAO) of worldwide standards for unmanned aircraft systems (UAS) and identified the regulatory conditions that may be applied to such systems internationally. WRC-15 also agreed on spectrum for wireless avionics intra-communications (WAIC) to allow for the heavy and expensive wiring used in aircraft to be replaced by wireless systems.

#### 4.9.7 Global flight tracking for civil aviation.

Agreement was reached on the allocation of radio-frequency spectrum for global flight tracking in civil aviation for improved safety. The frequency band 1087.7-1092.3 MHz has been allocated to the aeronautical mobile-satellite service (Earth-to-space) for reception by space stations of Automatic Dependent Surveillance-Broadcast (ADS-B) emissions from aircraft transmitters. This will facilitate reporting the position of aircraft equipped with ADS-B anywhere in the world, including oceanic, polar, and other remote areas. The International Civil Aviation Organization (ICAO) will address the performance criteria for satellite reception of ADS-B signals according to established standards and recommended practices (SARP).

#### 4.9.8 Enhanced maritime communications systems.

WRC-15 considered regulatory provisions and frequency allocations to enable new Automatic Identification System (AIS) applications and other possible new applications to improve maritime

Radiocommunication. New applications for data exchange, using AIS technology, are intended to improve the safety of navigation. New allocations were made in the bands 161.9375 - 161.9625 MHz and 161.9875 -162.0125 MHz to the maritime mobile-satellite service. Studies will continue on the compatibility between maritime mobile-satellite service (MMSS) in the downlink in the band 161.7875 -161.9375 MHz and incumbent services in the same and adjacent frequency bands.

#### 4.9.9 Road Safety

Radio-frequency spectrum needed for the operation of short-range high-resolution automotive radar was allocated in the 79 GHz frequency band. This will provide a globally harmonized regulatory framework for automotive radar to prevent collisions and improve vehicular safety by reducing traffic accidents. According to the United Nations (UN) data, more than 1.25 million fatalities occur each year on the roads around the world.

#### 4.9.10 Operation of broadband satellite systems: Earth Stations in Motion

WRC-15 agreed to facilitate the global deployment of Earth Stations in Motion (ESIM) in the 19.7-20.2 and 29.5-30.0 GHz frequency bands in the fixed-satellite service (FSS), paving the way for satellite systems to provide global broadband connectivity for the transportation community. Earth stations on-board moving platforms, such as ships, trains, and aircraft, will be able to communicate with high power multiple spot beam satellites, allowing transmission rates in the order of 10-50 Mbits/s.

#### 4.9.11 Universal Time

WRC-15 decided that further studies regarding current and potential future reference timescales are required, including the modification of coordinated universal time (UTC) and suppressing the so-called "leap second". A report will be considered by the World Radiocommunication Conference in 2023. Until then, UTC shall continue to be applied as described in Recommendation ITU-R TF.460-6 and as maintained by the International Bureau of Weights and Measures (BIPM).

#### 4.9.12 Conclusion on WRC 15 Resolutions

The National Radio Frequency Plan 2018 takes into consideration these resolutions taken by the World Radiocommunication Conference of 2015 (WRC 15). National Footnotes have been updated to make provision for transitional arrangements where migration of services and use are to be taken care off.

### 4.10 ITU World Radiocommunication Conference resolutions

The following resolutions from the World Radiocommunication Conferences have been taken into consideration – see Table 4 (WRC Resolutions). The primary focus is on WRC15, however 4 resolutions from WRC07 have also been analysed. WRC15 is discussed in the Appendix F

### 4.11 Key issues with respect to migration

The following explains the approach to key issues regarding the frequency migration plan:

*Broadcasting Service*

- DTT – Digital Terrestrial Television. The process of moving TV services from analogue to digital (and corresponding in-band migration) is in progress. The plans were updated following the WRC 12 along with the allocation of the 700 MHz band to IMT and the corresponding need to consolidate UHF TV broadcasting to the 470-694 MHz UHF band in line with the original Broadcasting Digital Migration Framework (Government Gazette number 31490). The freed spectrum that has been allocated to the Mobile Radiocommunication Services and identified for IMT in the band 790 to 862 MHz (WRC07) and 694 to 790 MHz band is a major spectrum resource for mobile broadband.
- Studio-to-Transmitter Links – These are point-to-point links connecting broadcast studios to transmitters that have been part of the broadcast frequency bands, especially the 800MHz band. With the allocation to the Mobile, of the 700MHz and 800 MHz frequency bands and the subsequent identification to IMT, the studio links had to be migrated out in line with the Frequency Migration Plan 2013. These have been given assignments in the destination bands allocated for Fixed Point to Point links.
- Self Help Stations – These are repeater stations rebroadcasting television channels to limited areas on a low power basis[17]. These stations are to be switched off, in accordance with the Digital Terrestrial Television Migration Rollout Plan in accordance with the Terrestrial Broadcasting Plan 2013 as updated.

*Mobile Service*

- Mobile broadband. 'Mobile' broadband is an important use of radio frequency spectrum at the current time and there is a large demand for spectrum in several bands for this purpose. As such, mobile broadband systems will most likely require the migration of other services to accommodate its spectrum needs. The allocation of spectrum for mobile broadband / IMT has already been done via WRC resolutions for ITU region 1 as well as per SADC proposed common

[17] Refer to 'Review of Self-Help Stations' – ICASA Position Paper February 2006 and 'Inquiry into Self Help Stations' – ICASA Discussion document of December 2004.

sub-allocation/ utilization. This ensures that equipment is readily available, and a harmonized service can be provided both across the Southern African region as well as other countries in Region 1.

- Paging – Paging was considered to be a major service at the time of SABRE; however (due mainly to GSM) the use of paging services is declining to the point where it will only be used in certain niche areas such as hospitals. SABRE aimed to consolidate paging channels and planned specific migration to achieve this; however, this is probably no longer relevant. It is expected that the remaining principal use will continue to be in medical environments where current allocations for low-power paging services would be more than adequate to meet the demand. Accordingly, the SABRE plans for paging can be discounted. The Frequency Migration Plan 2013 identified destination bands for these Radiocommunication Services and the Radio Frequency Spectrum Assignment Plans in order to implement the migration process.
- Alarms – The migration plan identified that there are large number of assignments in the bands allocated for alarms and the bands are generally highly utilised. The migration plan identified two options to satisfy the present trend of demand for new assignments:
  - Direct users to convert to a newer technology that is more spectrally efficient and can be accommodated in the existing spectrum allocation; or
  - Allocate more spectrum for Alarms in adjacent bands.

The Frequency Migration Plan 2013 identified destination frequency bands for some of the Buglar Alarm Assignments. The Radio Frequency Spectrum Assignment Plans have been developed in order to ensure the implementation of these Radiocommunication Services.

- Public Safety: The Frequency Migration 2013 identified that:

All public safety services should be consolidated in the same radio frequency band (380 – 400 MHz) and that where possible public safety users should adopt a common standard. This would have multiple benefits including economic benefits borne out of infrastructure sharing as well as increased effectiveness due to interoperability between users using a common equipment base.

The Frequency Migration Plan 2013 identified the destination bands. The Radio Frequency Assignment Plans have been developed in order to implement the migration process.

### 4.12 Commentary on frequency bands with respect to Frequency Migration Plan 2019 and the Implementation thereof.

This section focusses on the migration issues as listed in the Frequency Migration Plan 2019 and the actions taken to address the migration issues.

#### 4.12.1 75.2 – 87.5 MHz

The band is primarily used by Repeaters (Private, Communal) in several applications such as mining, farming, and other small businesses. SABRE 1 had proposed migration of the dual-

frequency alarms into this band. The Draft Radio Frequency Spectrum Assignment Plan was published for public consultation in Government Gazette Number 41164 (Notice 781 of 2017).

The Radio Frequency Spectrum Assignment Plan for the frequency band 75.2 to 87.5 MHz was published Government Gazette Number 42286 (Notice 124 of 2019) in terms of Regulation 3 of the Radio Frequency Spectrum Regulations 2015, as amended, read with the Frequency Migration Plan 2013.

#### 4.12.2 138 – 144 MHz

The band is primarily used by Repeaters (Private, Communal) in several applications such as mining, farming, and other small businesses along with SF alarms. In addition, there is an assignment for remote controlled industrial apparatus (ISM Licence exempt band 141 – 142)[18].

The Draft Radio Frequency Spectrum Assignment Plan was published for public consultation in Government Gazette Number 41512 (Notice 146 of 2018).

A feasibility study was performed to establish the destination frequency band for Transnet operation in this frequency band. In the interim Transnet's license was to be amended to co-exist with the alarms and to operate until 31 March 2020.

This feasibility study conducted in 2021 concerning the 138-144 MHz frequency band was mandated by the Radio was Frequency Migration Plan 2019[19]. The Radio Frequency Migration Plan 2019[20] stated that a feasibility study will also be performed to establish the destination band for some of Transnet and Eskom's operations in another band.

The Authority conducted a feasibility study and published a notice regarding the findings of its inquiry (Government Gazette no. 45247 of 30 September 2021), the authority's position and the draft implementation of the radio frequency migration plan and the international mobile telecommunications roadmap in terms of section 34(16) of the electronic communications act (ECA)[21].

[18] Government Gazette No. 31290, Notice No. 926 of 2008 as amended.

[19] Final Radio Frequency Migration Plan 2019, Government Gazette Number. 42337, 29 MARCH 2019

[20] Final Radio Frequency Migration Plan 2019, Government Gazette Number. 42337, 29 MARCH 2019

[21] Government Gazette No. 45690 (Notice 739 of 2021).

The Authority indicated that 138-144 MHz might be a destination band for Eskom's UHF Repeaters in 407/417 MHz and for Transnet's locomotive radios.

Transnet is yet to migrate from this frequency band. Transnet is encouraged to comment on this process.

The Radio Frequency Spectrum Assignment Plan for the frequency band 138 MHz to 144 MHz, was published in Government Gazette Number 49079 (Notice 3761 of 2023), in terms of regulation 3 of the Radio Frequency Spectrum Regulations, 2015, read with the Radio Frequency Migration Regulation 2013, the 2013 and 2019 Radio Frequency Migration Plan.

#### 4.12.3 150.05 – 153 MHz

The current users may continue to operate in this band in line with the rules contained in the Final Radio Frequency Spectrum Assignment Plan that was published in Government Gazette Number 41512 (Notice 149 of 2018).

#### 4.12.4 156.4875 – 156.5625 MHz

Although SF Mobile may continue to operate within 156.375 – 156.7625 MHz on a non-interference basis and non-protection basis to Maritime mobile services in inland areas, there are many occasions where these are situated in proximity (50 km or less to water-bodies). "*The conditions for the use of this frequency and the band 156.4875-156.5625 MHz are contained in Articles 31 and 52 of the ITU Radio Regulations, and in Appendix 18*, in line with ITU RR 5.226. Refer to:

- Appendix F; and
- Radio Frequency Spectrum Assignment Plan that was published for public consultation in Government Gazette Number 41350 (Notice 971 of 2017).

  RFSAP to be developed.

#### 4.12.5 156.875 - 174 MHz

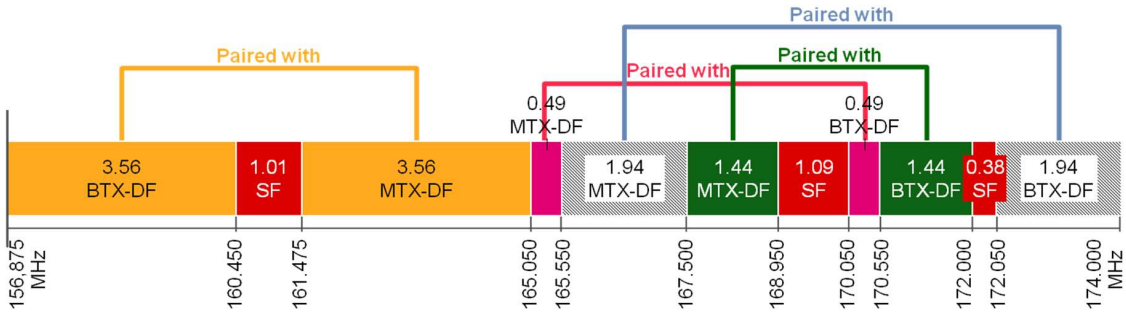


**Figure 3 Proposed Allocation 156.875 MHz – 174 MHz**

The planned frequency assignment as per the NRFP in this band is as shown in Figure 3

However, at present the MTX-DF (165.55 – 167.5 MHz) and BTX-DF (172.05 – 174 MHz) are interchanged as indicated in Figure 4.

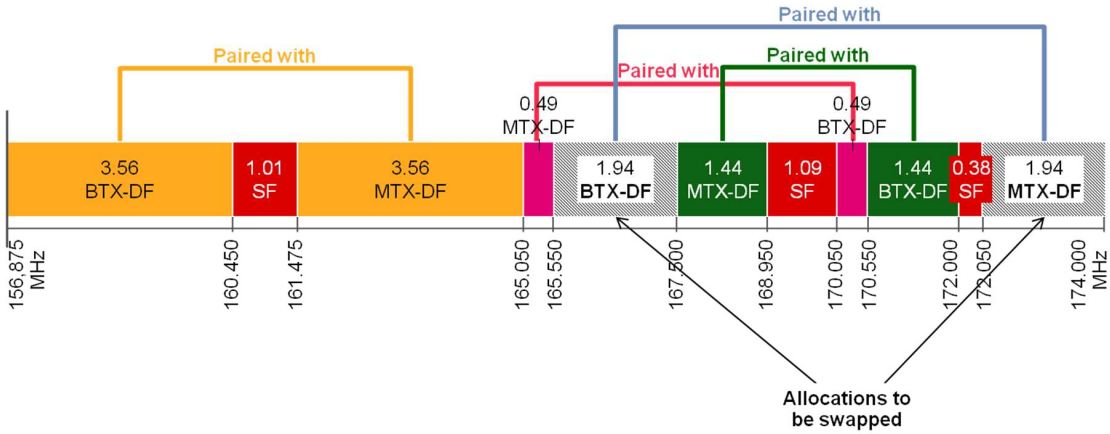



**Figure 4 Current situation 156.875 MHz – 174 MHz**

This has resulted in the situation that the BTX lies within the MTX assignment and *vice-versa*, leading to interference and other challenges during assignment.

It is therefore planned to:

- First step: ensure that the appropriate nesting of the spectrum is carried out by swapping the MTX and BTX;
- Second step: - Conduct technical feasibility study into simplex frequencies (FDMA or TDMA) with different channel spacing – including coexistence of multiple technologies, bandwidth etc. Depending upon the outcome, the band would need to be re-planned (year 2 + after studies have been completed) – need for studies stemming from the submissions; and
- Third step: Develop Radio Frequency Spectrum Assignment Plan for the band.

The Final Radio Frequency Spectrum Assignment Plan for the frequency band 156.8375 MHz to 174 MHz has been published in Government Gazette Number 49079 (Notice 3762 of 2023), in terms of regulation 3 of the Radio Frequency Spectrum Regulations, 2015, read with the Radio Frequency Migration Regulation 2013, the 2013 and 2019 Radio Frequency Migration Plans.

#### 4.12.6 174 – 223 MHz

The current analogue Television Services operating in this band is being migrated to DTT since February 2016 in accordance with the Terrestrial Broadcast Frequency Plan 2013. The new

assignment could be carried out in line with SADC FAP proposed common sub-assignment / utilisation including the SADC guidelines on Digital Sound Broadcasting.

Refer to the Radio Frequency Migration Plan 2013 published in Government Gazette No. 36334 (Notice no. 352 of 2013) and the Terrestrial Broadcasting Frequency Plan GG 36321 (Notice 298 of 2013).

#### 4.12.7 214 - 230 MHz T-DAB.

The Radio Frequency Spectrum Assignment Plans is to be optimised to increase T-DAB multiplexes on a national and regional basis.

#### 4.12.8 223 – 230 & 230 – 238 MHz

The process is underway for the use of the band for T-DAB. Refer to the Radio Frequency Migration Plan 2013, published in Government Gazette No 36334 (Notice no. 352 of 2013), the Terrestrial Broadcasting Frequency Plan GG 36321 (Notice 298 of 2013). (Refer to section 4.12.6)

#### 4.12.9 238 – 267 MHz

This band is currently partially being occupied by Analogue TV. Consequent to the planned migration in line with GE-06, the band can be used for the following purposes as per SADC proposed sub-allocation / utilisation:

- 230 – 238 MHz to form a complete 8 MHz DVB-T2 Channel;
- 238 – 242.95 MHz PMR including public trunking (national trunking);
- 242.95 – 243.05 MHz International Distress;
- 243.05 – 246 MHz Low power devices ancillary to broadcasting services;
- 246– 254 MHz TV Broadcast (Channel 13) to form a complete 8 MHz DVB-T2 Channel. This is DTT VHF spectrum in addition to the UHF spectrum in the Terrestrial Broadcasting Frequency Plan GG 36321 (Notice 298 of 2013);
- 254 – 267 MHz PMR and/ or PAMR including public trunking (national trunking)
- Radio Frequency Spectrum Assignment Plans are to be developed to implement the all the above applications in the frequency range 238 to 267 MHz.

#### 4.12.10 335.4 - 380 MHz

Spectrum in this band could be freed up for rural broadband if equipment for BFWA in this band is available in the market. The current players have shown indications that they may relinquish this spectrum due to spectrum fees imposed.

Planned feasibility study on the use of this band as per SADC FAP proposed sub-allocation/ utilization including BFWA and UAV's:

- 335.4-336 MHz PMR and / or PAMR.

- 366.0-380.0 MHz PMR and / or PAMR.
- 336-346 MHz paired with 356-366 MHz for Fixed Wireless Access/ PTP/PTMP rural system.

The Final Radio Frequency Spectrum Assignment Plan for the frequency band 335.4 MHz to 380 MHz was published in Government Gazette Number 49079 (Notice 3763 of 2023), in terms of regulation 3 of the Radio Frequency Spectrum Regulations, 2015, read with the Radio Frequency Migration Regulation 2013, the 2013 and 2019 Radio Frequency Migration Plans.

#### 4.12.11 380 - 387 & 387 – 390 & 390 – 399.9 MHz

This band will be assigned as a continuous block for Public Protection and Disaster Relief (PPDR) as well as Public Safety with users including SAPS, SANDF, the Ambulance Service, Metro Police and Fire-Fighting Services. All other users will migrate out of this frequency band. The frequency band is exclusively reserved for digital public safety PPDR, PAMR and PMR and all relevant non-digital usage/users (e.g., SAPS etc.) will migrate into this band. This assignment recognizes the importance of having a band dedicated for Public Safety and free of any other potential sources of interference. In ideal circumstances these users could make use of a common digital public trunking network which could also promote interoperability between such users in periods of emergency.

The Authority is of the view that private establishments who serve private health care should work alongside public institutions since they are all responsible for Public Safety operating within this band. This is to allow interoperability with other Public Safety/ Emergency Service users.

The planned assignment of this band would be as per SADC proposed sub-allocation utilization.

The Draft Radio Frequency Spectrum Assignments Plan was published for public consultation in Government Gazette Number 41164 (Notice 787 of 2017). The Radio Frequency Spectrum Assignment Plan, 2018 was subsequently published in GG No. 41512 (Notice 418 of 2018) dealing with the band 380 – 400 MHz.
The Radio Frequency Spectrum Assignment Plan, 2023 for the frequency band 380 MHz to 399.9 MHz, was published in Government Gazette Number 49079 (Notice 3764 of 2023), in terms of regulation 3 of the Radio Frequency Spectrum Regulations, 2015, read with the Radio Frequency Migration Regulation 2013, the 2013 and 2019 Radio Frequency Migration Plans.

#### 4.12.12 406.1 – 410 MHz

The Radio Frequency Spectrum Assignment Plan, 2023 for the frequency band 406.1 MHz to 410 MHz, was published in Government Gazette Number 49079 (Notice 3765 of 2023) in terms of regulation 3 of the Radio Frequency Spectrum Regulations, 2015, read with the Radio Frequency Migration Regulation 2013, the 2013 and 2019 Radio Frequency Migration Plans.
This frequency band has co-primary allocations for Fixed, Mobile (except for aeronautical mobile) and Radio astronomy services. This band is likely to be used for PMR (like in parts of Europe), fixed trunking (like in the USA) or Radio Astronomy (like on Europe)

The Authority, in its "Findings of its inquiry (government gazette no. 45247 of 30 September 2021), the authority's position and the draft implementation of the radio frequency migration plan and the international mobile telecommunications roadmap in terms of section 34(16) of the electronic communications act (ECA)[22]" concluded that the plan is for the use of digital mobile radio and fixed services operating in this frequency band along with radio astronomy service.
The summary proposals arriving out of feasibility study is that the Authority plans the use of digital mobile radio and fixed services operate in this band along with radio astronomy service. The Authority therefore is to develop the Radio Frequency Spectrum Assignment Plan to implement this outcome.

#### 4.12.13 410 – 420 & 420-430 MHz

The frequency band 410 to 430 MHz is exclusively allocated for Digital Public Trunking. A feasibility study within the frequency band 410 – 430 MHz was performed and the Radio Frequency Spectrum Assignment Plan for the frequency band 410 MHz to 430 MHz was developed and published in Government Gazette Number 49079 (Notice 3766 of 2023), in terms of regulation 3 of the Radio Frequency Spectrum Regulations, 2015, read with the Radio Frequency Migration Regulation 2013, the 2013 and 2019 Radio Frequency Migration Plans.

#### 4.12.14 440 - 450 MHz

This band is allocated for Short Range Business Radio (440 – 440.1 MHz) while the remaining portion is allocated for PMR (both UHF repeaters and DMR). The Short-Range Business Radio has wide application in South Africa and is type approved (unlicensed). It is important to ensure that this sub-band is maintained for Short Range Business Radio purposes. There is no migration planned in the PMR446 sub-band which is license exempted.

It is hence resolved that:

- 440 – 440.1 MHz (paired with 445 to 445,1 MHz be allocated to Short-range Business radio.
- 440 – 441 MHz (paired with 445 – 446 MHz) be used for temporary assignments within PMR band.

  Radio Frequency Spectrum Assignment Plan for the frequency band 440 to 441 MHz was published in Government Gazette Number 42230 (Notice 74 of 2019), in terms of Regulation

[22] Government Gazette No. 45690 (Notice 739 of 2021)

3 of the Radio Frequency Spectrum Regulations 2015, as amended, read with the Frequency Migration Plan 2013.

- A feasibility study into the possibility to use the band 440 – 450 MHz for PPDR is to be performed and the conclusion was that a Radio Frequency Assignment Plan is to be developed.
- All other users migrate out of the band. The band 441.1 to 445 MHz is paired with 446.1 to 450.
- The rest of the users in this band can stay as-is.

The Radio Frequency Spectrum Assignment Plan for the frequency band 440 MHz to 450 MHz was published in Government Gazette Number 49079 (Notice 3767 of 2023, in terms of regulation 3 of the Radio Frequency Spectrum Regulations, 2015, read with the Radio Frequency Migration Regulation 2013, the 2013 and 2019 Radio Frequency Migration Plans.

#### 4.12.15 450 – 455 & 455 – 456 & 456 – 459 & 459 – 460 & 460 - 470 MHz

This band is currently used amongst others for Trunked Mobile with several users including the Railways (Transnet, previously referred to as Transtel as well in various publications) and mines (Figure 5). The SADC FAP proposed common sub-allocation/ utilization seeks to allocate this spectrum for Mobile IMT. This is important to note that several adjacent countries (e.g. Mozambique) are moving to implement this proposal. Although the band has a large number of assignments, a recently concluded spectrum audit indicates that the spectrum usage is quite low – indicating inefficient spectrum use.

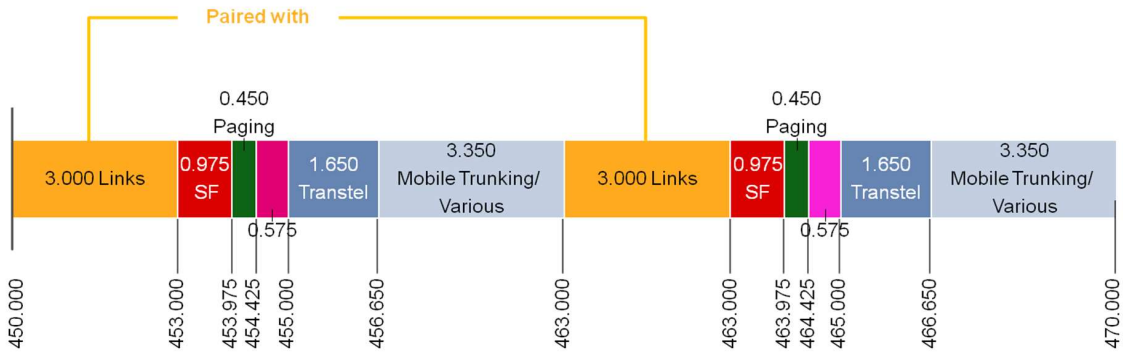



**Figure 5 Current assignment 450 – 470 MHz.**

Note that the numbers in Figure 5 above refer to MHz and the total MHz available for the specific service.

In view of the other spectrum that has been identified for IMT, it was decided therefore:

- To assign this frequency band to Mobile (IMT) as per Res. 224 revision WRC-15;

- Update the Radio Frequency Spectrum Assignment Plan for 450 – 470 MHz frequency band in accordance with Recommendation ITU-R.M1036-5
- The IMT450 Radio Frequency Spectrum Assignment Plan is to be updated in line with the updated Recommendation ITU-R.M1036-5, published in Government Gazette Number 38640 (Notice 270 of 2015, in accordance with the Frequency Migration Plan published in government Gazette Number 2013 GG 36334 (Notice 352 and 353 of 2013) and the Final International Mobile Telecommunications Roadmap 2014, published in Government Gazette Number 38146 (Notice 1009 of 2014), and
- To develop the Final Radio Frequency Spectrum Assignment Plan: Frequency Band 450 to 470 MHz.

This decision is based on the fact that Transnet was given the option of vacating this frequency band or shifting in this frequency band, if Transnet can proof the co-existence without interference with other telecommunication operators/providers within the band. Transnet has performed trials in the IMT450 in 2018.
The Final Radio Frequency Spectrum Assignment Plan for the frequency band 450 MHz to 470 MHz was published in Government Gazette Number 48353 (Notice 3246 of 2023), in terms of Regulation 3 of the Radio Frequency Spectrum Regulations, 2015, read with Regulation 5 of the Radio Frequency Migration Regulations, 2013, and the International Mobile Telecommunications (IMT) Roadmap 2014 and 2019.

#### 4.12.16 694 - 790 MHz

- Migration in this band is implemented in accordance with the Terrestrial Broadcasting Frequency Plan, published in Government Gazette 36321 (Notice 298 of 2013) and the ongoing efforts within the 700 MHz Band as defined in Government Gazette Number 40145 (Notice Number 438 of 2016).
- The Minister, in terms of the Broadcasting Digital Migration Policy published a Notice in Government Gazette Number 48793 (Notice 3554 of 2023) setting the date of 31 July 2023 for switching off all analogue Broadcasting Services above 694 MHz and that all remaining Broadcasting Services to be accommodated below the frequency band 694 MHz. That all Digital Broadcasting Services should be accommodated below the frequency band 694 MHz. The Minister set 31 December 2024 as the end of Dual Illumination and the date to switch-off all Analogue Broadcasting Services below the frequency band 694 MHz.

The Final Radio Frequency Spectrum Assignment Plan for the frequency band 703 to 733 MHz and 758 to 788 MHz was published in Government Gazette Number 47788 (Notice 2886 of 2022) in terms of regulation 3 of the Radio Frequency Spectrum Regulations, 2015 and the International Mobile Telecommunication Roadmap 2019.

#### 4.12.17 733 – 758 MHz

- The Minister, in terms of the Broadcasting Digital Migration Policy published a Notice in Government Gazette Number 48793 (Notice 3554 of 2023) setting the date of 31 July 2023 for switching off all analogue Broadcasting Services above 694 MHz and that all remaining Broadcasting Services to be accommodated below the frequency band 694 MHz. That all Digital Broadcasting Services should be accommodated below the frequency band 694 MHz. The Minister set 31 December 2024 as the end of Dual Illumination and the date to switch-off all Analogue Broadcasting Services below the frequency band 694 MHz.
- The Final Radio Frequency Spectrum Assignment Plan for the frequency band 733 MHz to 758 MHz was published in Government Gazette Number 47788 (Notice 2887 of 2022), in terms of regulation 3 of the Radio Frequency Spectrum Regulations 2015 and the International Mobile Telecommunication Roadmap 2019.

#### 4.12.18 790 - 862 MHz

This frequency band has been allocated for IMT (Terrestrial) for ITU Region 1 countries at WRC-07) and is often termed as Digital Dividend 1. Currently this band is occupied by UHF TV. Migration is currently underway.

It is proposed that:

- The migration plan is aligned with the on-going efforts within the 800 MHz band as defined in Government Gazette 40145[23].
- With respect to the small number of Studio to Transmitter Links (STL's) in this band; these must be migrated out and given point to point fixed assignments.
- Self Help stations must be switched off with all other analogue services at the end of television dual illumination. Refer to Terrestrial Broadcasting Frequency Plan, published in Government Gazette 36321 (Notice 298 of 2013)
- Migration in this band is to be implemented in accordance with the Terrestrial Broadcasting Frequency Plan, published in Government Gazette 36321 (Notice 298 of 2013).
- The Minister, in terms of the Broadcasting Digital Migration Policy published a Notice in Government Gazette Number 48793 (Notice 3554 of 2023) setting the date of 31 July 2023 for switching off all analogue Broadcasting Services above 694 MHz and that all remaining Broadcasting Services to be accommodated below the frequency band 694 MHz. That all

[23] Government Gazette 40145 (Notice Number 438 of 2016): Invitation to apply for a radio frequency spectrum licence to provide mobile broadband wireless access services for urban and rural areas using the complimentary bands, 700 MHz, 800 MHz and 2.6GHz

Digital Broadcasting Services should be accommodated below the frequency band 694 MHz. The Minister set 31 December 2024 as the end of Dual Illumination and the date to switch-off all Analogue Broadcasting Services below the frequency band 694 MHz.

The Final Radio Frequency Spectrum Assignment Plan for the frequency band 791 to 821 MHz and 832 to 862 MHz was published in Government Gazette Number 47788 (Notice 2888 of 2022), in terms of regulation 3 of the Radio Frequency Spectrum Regulations 2015 and the International Mobile Telecommunication Roadmap 2019.

#### 4.12.19 862 - 890 MHz

This band currently has several users including:

- Wireless audio (863-865 MHz).
- Fixed links (856 – 864.1 MHz paired with 868.1–876 MHz).
- RFID (865 – 868 MHz), RFID (869.4- 869.65 MHz).
- Alarms operate amongst others in 860.25 – 869.3 MHz).
- Wireless Access Services (872.775 – 877.695 MHz paired with 827.775 – 832.695 MHz).
- Mobile (880-890 MHz paired with 925-935 MHz) – currently assigned to Cell-C.
- 864.1 – 868.1 MHz assigned to Telkom for FWA

- The use of the band by non-specific SRDs, GSM-R and CT2 cordless telephones

It is essential to note that alarms were not part of the SABRE proposed allocations and may need to be consolidated within designated alarm bands. It is proposed to:

- Align re-planning efforts within the 800 MHz band as defined in Government Gazette Number40145 (Notice Number 438 of 2016)[24].
- Remove the assignment for Wireless Access Services in this band.
- Re-plan the entire band to accommodate IMT (terrestrial) as per SADC FAP proposed common sub-allocation/ utilization.
- Migrate existing users out of this band.

[24] Government Gazette 40145 (Notice Number 438 of 2016): Invitation to apply for a radio frequency spectrum licence to provide mobile broadband wireless access services for urban and rural areas using the complimentary bands, 700 MHz, 800 MHz and 2.6GHz.

Refer to IMT 850 consultation in Government Gazette number 38640 (notice no. 274 of 2015), Government Gazette number 41082 (Notice 678 of 2017) and Government Gazette number 41082 (Notice no. 648 of 2017).

Consideration is to be made for the use by the Railway Systems of the GSM-R MTX (877.695 – 880 MHz) Paired with 921 – 925 MHz frequency band. The National Radio Frequency Plan 2021 provides for the use of the frequency band 876 - 880 paired with 921 - 925 MHz through National Footnote 10.

**NOTE: The migration plan as contained in Government Gazette number 36334 (Notices Number (352 and 353 of 2013) were implemented through the following notices:**

a) Radio Frequency Assignment Plan for the Band 825 to 830 MHz and 870 to 875 MHz was published in Government Gazette Number 38640 (Notice 274 of 2015) and

b) Government Gazette Number 41082 (Notice 648 of 2017) for public consultation in accordance with the Frequency Migration Plan published in Government Gazette Number 36334 (Notice 352 and 353 of 2013) and

c) the Final International Mobile Telecommunications Roadmap 2014 published in Government Gazette Number 38146 (Notice 1009 of 2014.

d) The Final Radio Frequency Spectrum Assignment Plan for the frequency band 825 MHz to 830 MHz and 870 MHz to 875 MHz was published in Government Gazette Number 48353 (Notice 3245 of 2023), in terms of Regulation 3 of the Radio Frequency Spectrum Regulations, 2015, read with Regulation 5 of the Radio Frequency Migration Regulations, 2013, and the International Mobile Telecommunications (IMT) Roadmap 2014 and 2019.

e) Feasibility Study completed on part of the frequency band 876-960 MHz, and this also needs to be reviewed.

f) And the RFSAP to be updated.

#### 4.12.20 890 - 942 MHz

This band was implemented through a notice in the Government Gazette;

- RFSAP was developed and is contained in Government Gazette number 38640 (Notice Number 275 of 2015)
- The Final Radio Frequency Spectrum Assignment Plan for the frequency band 880 MHz to 915 MHz and 925 MHz to 960 MHz was published in Government Gazette Number 47788 (Notice 2889 of 2022), in terms of sections 2 (d) and (e), 30, 31(4) and 33 of the Electronic Communications Act (Act No. 36 of 2005), read with read with regulation 3 of the Radio

Frequency Spectrum Regulations 2015 and the International Mobile Telecommunication Roadmap 2019.

The Notice to amend various radio frequency spectrum licences in the frequency bands 880 MHz to 915 MHz and 925 MHz to 960 MHz, was published in Government Gazette Number 49556 (Notice 4000 of 2023), in order to implement the final Radio Frequency Spectrum Assignment Plan for the frequency band 825 MHz to 830 MHz and 870 MHz to 875 MHz published in Government Gazette No 48353 (Notice 3245 of 2023), concurrently with the Radio Frequency Spectrum Assignment Plan for the frequency band 880 MHz to 915 MHz and 925 MHz to 960 MHz published in Government Gazette No 47788 (Notice 2889 of 2022), in accordance with section 31 (4) (c) of the Electronic Communications Act, 2005 (Act No 36 of 2005), and regulation 6 of the Radio Frequency Migration Regulations 2013.

#### 4.12.21 942 - 960 MHz

This frequency band was implemented through a notice in Government Gazette number 38640 (Notice Number 275 of 2015).

RFSAP to be considered for review and updating based on the results of the feasibility study.

#### 4.12.22 1350 - 1375 MHz paired with1492- 1518 and 1375 – 1400 MHz paired with 1427 – 1452 MHz

This frequency band is currently allocated to low capacity PTP / DF links. Spectrum is available on a radio coordinated basis. Based upon availability of equipment as well as user demand, the Authority proposes that:

- Maintain existing links where required (too expensive to migrate etc.).
- Allocation to rural broadband (BFWA) due to good propagation characteristics.
- Feasibility Study to be performed considering the WRC-15 decision (enabling harmonization, equipment availability etc.).
- Radio Frequency Spectrum Assignment Plan to be developed in line with the study results conducted within ITU-R WP 5D and in accordance with the latest version of Recommendation 1036-7 in respect of L-Band.
- Radio Frequency Spectrum Assignment Plan to be developed for the frequency band 1350 – 1375 MHz paired with 1492 – 1517 MHz and align the Channel Arrangements with ITU-R F.1242

#### 4.12.23 1452 - 1492 MHz

This band is currently allocated to T-DAB and S-DAB due to the current South African allocations of BROADCASTING and BROADCASTING-SATELLITE. Given the allocation of DAB+ in the VHF band (from 214 – 230 MHz) it is important to determine whether the frequency allocation is sufficient or additional spectrum in the L-band needs to be allocated for the purpose. Consideration of this depends upon:

- Whether there is sufficient and adequate demand for DAB services to require assignment in two bands.
- Whether equipment is readily available encompassing both bands.

Under the present and forecasted situation, it is believed that the DAB+ allocation in the VHF band is sufficient to meet the requirements of T-DAB. This would also result in lower equipment costs since any receiver would have to be designed to cover only a single band rather than two distinct bands. In addition, S-DAB may have only very limited potential within South Africa and this spectrum may be better utilized for other purposes. It is there proposed by ICASA to:

- Modify the allocation in this band and align it with the ITU Region 1 to include FIXED, MOBILE except aeronautical mobile, BROADCASTING and BROADCASTING-SATELLITE.
- Consider developments and outcome of WP5D (i.e. sharing and compatibility studies and the development of a channelling plan).
- Allocate this band to PTP/ PMP/ BFWA depending upon the availability of equipment. Communal/ private repeaters could also operate in this band.
- Consider the band for Public Mobile and Emergency and Temporary transmissions.

Radio Frequency Spectrum Assignment Plan to be developed in line with the study results conducted within ITU-R WP 5D and in accordance with the latest version of Recommendation 1036 in respect of L-Band.
The Final Radio Frequency Spectrum Assignment Plan for the frequency band 1427 MHz to 1518 MHz in Government Gazette Number 48353 (Notice 3244 of 2023) in terms of Regulation 3 of the Radio Frequency Spectrum Regulations, 2015, read with Regulation 5 of the Radio Frequency Migration Regulations, 2013, and the International Mobile Telecommunications (IMT) Roadmap 2014 and 2019.

#### 4.12.24 1518 - 1525 MHz

The band was allocated for both SF links as well as the IMT satellite component. However, this band remains unoccupied and there are views that the IMT (satellite) will have limited usage within South Africa.

Due to these factors, ICASA proposes to:

- Assign this frequency band for repeater links for land-mobile radio (LMR) and migrate such links into this band.
- Assign for outside-broadcasting links currently operating in 2300 – 2450 MHz.
- The Draft Radio Frequency Spectrum Assignment Plan was published for public consultation in Government Gazette Number 41164 (Notice 784 of 2017)

The Final Radio Frequency Spectrum Assignment Plan for the frequency band 1518 MHz to 1525 MHz, in Government Gazette Number 49079 (Notice 3768 of 2023), in terms of regulation 3 of the Radio Frequency Spectrum Regulations, 2015, read with the Radio Frequency Migration Regulation 2013, the 2013 and 2019 Radio Frequency Migration Plans.
This follows the feasibility study concerning the 1518 - 1525 MHz frequency band, as mandated by the Frequency Band Migration Regulation and Plan contained in the IMT Roadmap 20142 and IMT Roadmap 2019.

The use of the band is limited for both SF links as well as the IMT satellite component. The use of the band 1518 - 1525 MHz by the mobile-satellite service is subject to coordination performed by the Authority during the process of assignment.

#### 4.12.25 1525 – 1530 & 1530 – 1535 & 1535 – 1559 MHz

The band has been allocated to the Satellite Services and identified for Satellite Component of IMT (satellite); Res. 225 (WRC applies). In the band 1530 – 1544 MHz priority for maritime mobile distress, urgency, and safety communication (GMDSS); Res. 222 applies. The band is currently being used by INMARSAT.

The Radio Frequency Spectrum Assignment Plan to be developed.

#### 4.12.26 1668 – 1675MHz

The frequency band has been identified for the satellite component of IMT; Res 225 applies. However, the use of IMT (Satellite) within South Africa is limited and it is unclear whether this application would ever become significant for broadband with the strong growth of IMT (Terrestrial).

It was therefore decided to:

- Change the current allocation to be in line with ITU Region 1 allocations of:

1668 – 1668.4 MHz:

  - MOBILE-SATELLITE (earth-to-space)
  - RADIO ASTRONOMY
  - SPACE RESEARCH (passive)
  - Fixed

- Mobile except aeronautical mobile

1668.4 – 1670 MHz:

- METEOROLOGICAL AIDS
- FIXED
- MOBILE except aeronautical mobile
- MOBILE-SATELLITE (earth-to-space)
- RADIO ASTRONOMY

1670 – 1675 MHz:

- METEOROLOGICAL AIDS
- METEOROLOGICAL SATELLITE (space-to-earth)
- MOBILE
- MOBILE-SATELLITE (earth-to-space)

- This change in allocation, in line with ITU Region 1 would open up the possibilities of introducing fixed links (PTP, PMP) into this frequency band.
- No Migration at this stage.

FIXED service allocations are currently not included in Government Gazette Number 41650 (Notice 266 of 2018)

#### 4.12.27 1880 - 1900 MHz

The frequency band was allocated for cordless DECT by SABRE proposed allocation. This is being currently in use by Telkom to provide Wireless Local Loop (WLL) services. Depending upon the current utilization of this band, as per SADC FAP proposed common sub-allocation/ utilization, the Authority decided to:

- Allocate this band to BFWA, and
- To have no Migration.

#### 4.12.28 1980-2010/ 2170-2200 MHz

The frequency band has been identified for the satellite component of IMT; Res 225 applies. However, the use of IMT (Satellite) within South Africa is limited and it is unclear whether this application would ever become significant for broadband with the strong growth of IMT (Terrestrial). The band is also allocated for Fixed Links, but currently lies unused in the lower frequency band and utilized by SANDF, amongst other users in the upper band; this is however under-utilized.

The implementation of satellite component of IMT in the frequency bands 1885 – 2025 MHz and 2110 – 2200 MHz was addressed at WRC-19 under agenda item 9.1.1. Any further decisions regarding the use of the frequency bands 1980 – 2010 MHz and 2170 – 2200 MHz will be taken during the update to the National Radio Frequency Plan.

The Authority has therefore decided to:

- Allocate for Fixed links and migrate in fixed links from other frequency bands into this frequency band.
- Allocate for BFWA depending upon availability of equipment in these bands (New ICASA proposal for the future).
- Have no Migration at this stage.

#### 4.12.29 2025 – 2110 paired with 2200 - 2285 MHz

The frequency band is currently allocated for fixed links – but is under-utilized. SABRE proposed use of 2075 - 2110 MHz for WLL was never implemented.

It is decided to:

- Assign BFWA depending upon availability of equipment in these frequency bands.

Develop a Radio Frequency Spectrum Assignment Plan, which was published for public consultation in Government Gazette Number 41164 (Notice 782 of 2017) for public consultation. The Final Radio Frequency Spectrum Assignment Plan for the frequency band 2025 to 2110 MHz paired with 2200 to 2285 MHz was published in Government Gazette Number 42230 (Notice 75 of 2019), in terms of Regulation 3 of the Radio Frequency Spectrum Regulations 2015, as amended, read with the Frequency Migration Plan 2013.

#### 4.12.30 2290 – 2300 MHz

This frequency band is currently unused. In line with SADC proposed common sub-allocation/ utilization, ICASA proposes to:

- Assign this frequency band to BFWA.
- Develop a Radio Frequency Spectrum Assignment Plan which was published for public consultation in Government Gazette Number 41164 (Notice 783 of 2017) for public consultation.
- Final Radio Frequency Spectrum Assignment Plan was published in GG No. 41512 (Notice 145 of 2018).

#### 4.12.31 2300 - 2483.5 MHz

The frequency band is currently in use for several services including:

- Fixed links – 2307 – 2387 MHz paired with 2401 – 2481 MHz.

- Outside broadcasting links (28 MHz) – primary basis at (2377, 2471 MHz), secondary basis at (2321, 2349 MHz, 2415, 2443 MHz).
- ISM – 2400 – 2483.5 MHz

As per SADC FAP proposed common sub-allocation/ utilization, it is proposed to:

- Allocate 2300 – 2400 MHz for IMT (Terrestrial).
- Continue to retain allocation of 2400 – 2483.5 MHz for ISM.
- Existing Fixed links could be migrated above 3 GHz.
- Migrate outside-broadcasting links in line with the DTT migration (potentially to 1518 – 1559 MHz frequency band).

The Authority decided that;

A feasibility study[25] was conducted and the following scenario plans consistent with the Final Radio Frequency Migration Plan 2019 for the frequency band was considered by the Authority:

- Allocate 2300 – 2400 MHz for IMT (Terrestrial) TDD abiding by ITU frequency band arrangement.
- Continue to retain allocation of 2400 – 2483.5 MHz for ISM.
- Existing Fixed links should be migrated above 3 GHz.
- Migrate outside-broadcasting links in line with the DTT migration (potentially to 1518 – 1559 MHz frequency band).

The Final Radio Frequency Spectrum Assignment Plan for the frequency band 2300 MHz to 2400 MHz was published in Government Gazette Number 47788 (Notice 2890 of 2022), in terms of regulation 3 of the Radio Frequency Spectrum Regulations 2015 and the International Mobile Telecommunication Roadmap 2019.

The Authority is in the process of amending the Final Radio Frequency Spectrum Assignment Plan for the frequency band 2 300 to 2 400 MHz to provide for:

- Amendment of the implementation date to 31 March 2024;
- Provisions for arrangements governing spectrum sharing in the FAR147 area in sections 9 and 10 of the RFSAP.

[25] Government Gazette No. 45690 (Notice 739 of 2021)

#### 4.12.32 2500 - 2690 MHz

- The RFSAP was developed and published in Government Gazette number 38640 (Notice Number 277 of 2015)

  Centre gap (i.e. 2570 – 2620 MHz) is included with respect to migration only and this centre gap will be subject to a separate Radio Frequency Spectrum Assignment Plan which needs to be developed.

  An amendment to the Radio Frequency Spectrum Assignment Plan IMT2600 to be undertaken in order to change the channel arrangement from FDD to TDD to maximise the efficient use of spectrum.

The Radio Frequency Spectrum Assignment Plan for the frequency band 2500 to 2690 MHz was published in Government Gazette Number 43341 (Notice 285 of 2020, in terms of section 30, 31(4), and 33 of the Electronic Communications Act (Act No. 36 of 2005), as amended, read with regulation 3 of the Radio Frequency Spectrum Regulations, 2015 and the International Mobile Telecommunications (IMT) Roadmap 2014 and the IMT Roadmap 2019. This RFSAP is to be updated to include the harmonised calculation method for Africa, with respect to coordination arrangements.

#### 4.12.33 3300 - 3400 MHz

- The frequency band 3300 to 3400 has been identified for IMT through resolution 223 (Rev WRC-15)
- This can form a continuous block of IMT frequencies with the frequency band 3400 to 3600 MHz.
- Sharing and compatibility studies called for resolution 223 (Rev. WRC-15) are currently undertaken within ITU-R.
- Radio Frequency Spectrum Assignment Plan to be developed in line with the study results conducted within ITU-R WP 5D and in accordance with the latest version of Recommendation 1036-7.
- The Final Radio Frequency Spectrum Assignment Plan for the frequency band 3300 MHz to 3400 MHz, was published in Government Gazette Number 47788 (Notice 2891 of 2022), in terms regulation 3 of the Radio Frequency Spectrum Regulations 2015 and the International Mobile Telecommunication Roadmap 2019.

#### 4.12.34 3400 - 3600 MHz

- The RFSAP was developed and is contained in Government Gazette number 38640 (Notice Number 278 of 2015).
- The Final Radio Frequency Spectrum Assignment Plan for the frequency band 3400 MHz to 3600 MHz, was published in Government Gazette Number 47763 (Notice 2879 of 2022), in

terms of regulation 3 of the Radio Frequency Spectrum Regulations 2015 and the International Mobile Telecommunication Roadmap 2019

#### 4.12.35 3600 -3800 MHz

The sub-band 3 600-3 800 MHz was used for BFWA where frequency sharing with FS PTP and/or FSS is feasible. The channelling arrangement for PTP links in this band is based on ITU-R Recommendation F.635 **Annexure 1**. In the band 3 600-3 800 MHz, FS PTP and FSS applications have been operating on coordinated basis.

The World Radiocommunications Conference upgraded the frequency band 3 600-3 700 MHz from secondary to Primary Service except aeronautical mobile (Foot Notes ADD 5.A13A ADD 5.A13B ADD 5.A13C ADD 5.A13D) and Identified for International Mobile Telecommunications (IMT).

A feasibility study is to be conducted for clearing the frequency band for use by the Mobile Services on a Primary basis and for the deployment of International Mobile Telecommunications.

The Radio Frequency Spectrum Assignment Plan is to be developed for the deployment of International Mobile Telecommunications.

#### 4.12.36 3600 - 4200 MHz

This band (C-band) is currently being utilized for PTP links (terrestrial backhaul) and Satellite links including VSAT, Satellite downlink and tracking. The following allocation is proposed:

- (3600-4200 MHz) Fixed services (PTP).
- (3600-4200 MHz) Fixed-satellite (space-to-Earth) (PTP/VSAT/SNG).

The sub-band 3600-4200 is used for FSS. The sub-band 3 600-4 200 MHz is used for medium and high capacity PTP links and FSS.

#### 4.12.37 4800 – 4990 MHz

The World Radiocommunications Conference 2019 allocated the frequency band 4 800 to 4 990 MHz. Recommendation ITU-R M.1036-6 (International Mobile Telecommunications (IMT)) contains the channel arrangement for the frequency band 4 800 to 4 990 MHz. The National Radio Frequency Plan 2021 allocated the frequency band 4 800 to 4 990 MHz and Identified it for the deployment of International Mobile Telecommunications in South Africa.

The Radio Frequency Spectrum Assignment Plan is to be developed.

#### 4.12.38 5470 - 5725 MHz

As per as per SADC proposed common sub-allocation/ utilization, the band can be allocated for:

- Wireless Access Systems (WAS) / RLAN.
- No Migration at this stage.

#### 4.12.39 5725 - 5850 MHz

This frequency band is currently being used for ISM, amateur and SRD services. As per ITU footnote 5.453 the band can also be allocated for fixed and mobile services on a primary basis. SADC FAP footnote SADC18 allocates this frequency band for similar services in Swaziland and Tanzania. The NRFP can be updated to reflect the assignment if there is an interest within South Africa for this service in the frequency band.

- No Migration at this stage.

#### 4.12.40 5850 - 5925 MHz

The upper C-band is currently being used for terrestrial backhaul and satellite (uplink, VSAT). As per the SADC FAP proposed common sub-allocation/ utilization outside broadcasting links could also be potentially migrated into this band with the proposed allocation as follows:

- Fixed-satellite uplinks (PTP/VSAT/SNG) (5850-6425 MHz) – this could also be used for temporary outside-broadcast links.
- FIXED links (5850-5925 MHz).
- ISM (5725-5875 MHz).
- No Migration at this stage.

#### 4.12.41 5925 - 6700 MHz

As per the SADC proposed common sub-allocation/ utilization the current band would be allocated as follows:

- 5925 – 6425 MHz Fixed links (lower 6 GHz in accordance with ITU-R Rec. F.383).
- 5850 – 6425 Fixed-satellite uplinks (PTP, VSAT, SNG) and Radio Local Area Networks (RLANs).

The World Radiocommunications Conference 2023 allocated the frequency band 6 425-7 125 MHz to the Mobile on a Primary basis and Identified for the implementation of the terrestrial component of International Mobile Telecommunications (IMT). The Fixed links (upper 6 GHz in accordance with ITU-R Rec. F.384) in the frequency band 6425 – 7110 MHz are to be Migrated to a new destination band.

A Feasibility Study is to be conducted in order to clear the frequency band.

The Radio Frequency Spectrum Assignment Plan is to be developed for the implementation of the Terrestrial Component of International Mobile Telecommunications.

#### 4.12.42 10700 - 11700 MHz

This is the defined Ku band.

- No Migration at this stage.

#### 4.12.43 15400 – 15700 MHz

No Migration at this stage

#### 4.12.44 24.25 – 27.5 GHz

The World Radiocommunications Conference 2019 allocated the frequency band 24.25 to 27.5 GHz. Recommendation ITU-R M.1036-6 (International Mobile Telecommunications (IMT)) contains the channel arrangement for the frequency band 24.25 to 27.5 GHz. The National Radio Frequency Plan 2021 allocated the frequency band 24.25 to 27.5 GHz and Identified it for the deployment of International Mobile Telecommunications in South Africa.

The feasibility study is to be undertaken and the Radio Frequency Spectrum Assignment Plan is to be developed.

#### 4.12.45 40000 MHz and above

Although out-migration is not an issue above 40GHz, the following comment should be made:

- Frequency bands above 40 GHz are relatively under-utilized. Equipment is available off the shelf for high bandwidth PTP links over distances of up to 5km. It is proposed that in the spectrum above 40GHz, allocations are made for Fixed Services such as PTP links – which would be useful especially in metropolitan areas for line-of-sight (LoS) high-capacity data links.
- It is planned to carry out feasibility studies regarding the use of the high frequency band in accordance with the outcome of WRC 19 Agenda Item 1.13 (i.e. frequency bands for IMT 2020)

#### 4.12.46 37 – 43.5 GHz

The World Radiocommunications Conference 2019 allocated the frequency band 37 to 43.5 GHz. Recommendation ITU-R M.1036-6 (International Mobile Telecommunications (IMT)) contains the channel arrangement for the frequency band 37 to 43.5 GHz. The National Radio Frequency Plan 2021 allocated the frequency band 37 to 43.5 GHz and Identified it for the deployment of International Mobile Telecommunications in South Africa.

The feasibility study is to be undertaken and the Radio Frequency Spectrum Assignment Plan is to be developed.

#### 4.12.47 47.2 – 48.2 GHz

The World Radiocommunications Conference 2019 allocated the frequency band 47.2 to 48.2 GHz. Recommendation ITU-R M.1036-6 (International Mobile Telecommunications (IMT)) contains the channel arrangement for the frequency band 47.2 to 48.2 GHz. The National Radio Frequency Plan 2021 allocated the frequency band 47.2 to 48.2 GHz and Identified it for the deployment of International Mobile Telecommunications in South Africa.

The feasibility study is to be undertaken and the Radio Frequency Spectrum Assignment Plan is to be developed.

#### 4.12.48 66 – 71 GHz

The World Radiocommunications Conference 2019 allocated the frequency band 66 to 71 GHz. Recommendation ITU-R M.1036-6 (International Mobile Telecommunications (IMT)) contains the channel arrangement for the frequency band 66 to 71 GHz. The National Radio Frequency Plan 2021 allocated the frequency band 66 to 71 GHz and Identified it for the deployment of International Mobile Telecommunications in South Africa.

The feasibility study is to be undertaken and the Radio Frequency Spectrum Assignment Plan is to be developed.

### 4.13 Summary of the Authority's decision

The following table summarises the Authority's decision regarding frequency migration as extracted from the previous section. These decisions are additional to those proposals made by SABRE and migrations stemming from the WRC 2015 and the SADC FAP 2016.

**Table 2 Consolidated list of New ICASA proposals for migration.**

| Frequency Band (MHz) | Notes on migration/ usage |
|---|---|
| **141 – 141.5** | Migrate SF Mobile out of this band and allocate for SF alarms. |
| **141 – 142** | Migrate remote controlled industrial apparatus to ISM Band. |
| **380 – 400** | Allocated for public safety/ government services. Migrate all such users into this band. |
| **410 – 430** | Allocated for Digital Public Trunking. |
| **440 – 440.1 paired with 445 – 445.1** | Allocated for Short-range Business Radio; all other users migrate out of this band. |

| Frequency Band (MHz) | Notes on migration/ usage |
|---|---|
| **921 – 925 paired with 876 – 880** | Allocated for GSM-R; migrate other users out of this band.<br>Refer to Government Gazette No. 45690 (Notice 739 of 2021) |
| **1452 - 1492** | Use of the band for IMT.as identified by WRC-15<br>Use for BFWA/ PTP/ PMP depending upon availability of equipment. |
| **1518 – 1530** | Allocate for links for LMR repeaters; Migrate in outside-broadcasting links currently operating in 2300 – 2450 MHz |
| **1668 – 1675** | Change allocation in line with ITU Region 1 allocations to include FIXED and Mobile except aeronautical mobile within the allocations. |
| **1980 – 2010 paired with 2170-2200** | Migrate in Fixed links (DF) from other bands; allocate for BFWA; |
| **2025 – 2110 paired with 2200 - 2285** | Migrate in Fixed links (DF) from other bands; allocate for BFWA. |
| **2300 – 2450** | Migrate outside broadcasting links to the 1518 – 1525 MHz band. |

### 4.14 Commentary on Spectrum Re-farming

#### 4.14.1 Spectrum re-farming

This definition below is quoted directly in line with the Spectrum Re-Farming Definition in Recommendation ITU-R SM.1603, which reads as thus:

"Spectrum redeployment (spectrum refarming) is a combination of administrative, financial, and technical measures aimed at removing users or equipment of the existing frequency assignments either completely or partially from a particular frequency band. The frequency band may then be allocated to the same or different service(s). These measures may be implemented in short, medium, or long time-scales;"

For more see Appendix H to this document.

#### 4.14.2 Need for Re-farming in GSM / Mobile bands.

Frequency bands in the sub- GHz range are attractive to operators since it offers better propagation characteristics leading to better coverage at lower cost as well as indoor coverage in comparison to higher frequency bands.

At the same time mobile broadband subscriptions and traffic continue to grow at a rapid rate and is expected to reach over 5 billion devices by 2016, worldwide. This is mainly due to a shift towards mobile broadband enabled smart phones over voice centric phones in the mass market coupled with a rapid declining price for the same. However, in order to provide a good quality of mobile broadband service requires better network quality. This can be achieved either through:

- Enhancements in technology (MIMO, Adaptive techniques etc.) or.
- Additional spectrum dedicated to mobile broadband either via new carriers or new bands.
- Use existing frequency assignments for in-house re-farming i.e. IMT2000 to IMT advance through to IMT2020 frequency bands for a number of Generation services.

#### 4.14.3 Points of consideration for the frequencies allocated to the Mobile Bands and Identified for IMT.

- South Africa still retains a large number of its subscriber base for Voice with the current 2G IMT spectrum (900 MHz and 1800 MHz) being fully utilized by the current license holders. This subscriber base would to a large extent be represented by lower income groups and it would be important to maintain the voice service for their benefit.
- However, until such a stage is reached that the subscriber base using the existing 2G spectrum is reduced in size to a level where the existing 2G bands have spare capacity, the issue of spectrum re-farming should be given high priority. Efforts should be focused towards locating additional bands for IMT as per WRC and SADC proposed spectrum allocation/ utilization.
- It should be noted that in some cases, such spectrum re-farming may also be in the interest of the current licensee (e.g. the operator) since it allows them to change the resource allocations and technical conditions in order to better serve their customer base.
- The IMT 900 MHz and 1800 MHz frequencies are currently occupied by the incumbent mobile operators who have nationwide assignments. If there is a case to inject competition in this market, a re-farming and or in-band migration exercise would also need to consider ways and means to re-assign the spectrum resources between the incumbents and new entrant(s) so as to facilitate free and fair competition. Such an exercise could be carried out for both 900 and 1800 bands at the same time in conjunction with assignments in other bands allocated to IMT to allow existing operators to maintain their existing level of service.

## 5 Potential Impact of Spectrum Migration

### 5.1 Frequency Bands planned for IMT.

One of the critical issues under public debate in South Africa is the availability of spectrum for mobile broadband wireless access. The total of 649 MHz of spectrum is made available for IMT following SADC FAP 2015 proposed common sub-allocation and WRC 2015 resolutions. A total amount of 18 588 MHz of spectrum is made available for IMT following SADC FAP 2019 proposed common sub-allocation and WRC 2019 resolutions as indicated in the following tables.

**Table 3 Bands planned for IMT.**

| Frequency Band (MHz) | Bandwidth (MHz) | Current Allocation | Notes |
|---|---|---|---|
| 450 – 470 | 20 | FIXED, MOBILE 5.286AA NF9 | Enabled for IMT as per WRC-7, Res. 224 applies |
| 694 – 792 | 98 | MOBILE except aeronautical mobile 5.312A 5.317A NF9 BROADCASTING 5.300 5.311A 5.312 NF8A | Enabled for IMT as per WRC-12, Res. 232 – Digital Dividend 2 |
| 790 – 862 | 72 | FIXED MOBILE except aeronautical mobile 5.316B 5.317A NF9 BROADCASTING 5.312 5.319 NF8A | Enabled for IMT as per WRC-7, planned for 2015 – Digital Dividend 1 |
| 862 – 876 | 14 | FIXED MOBILE except aeronautical mobile 5.317A NF10 | Enabled for IMT as per SADC FAP proposed common sub-allocation/ utilization |

| | | | |
|---|---|---|---|
| 1880 – 1920 | 40 | FIXED<br>MOBILE 5.384A 5.388A NF9 | Enabled for IMT as per SADC FAP proposed common sub-allocation/ utilization |
| 2010 – 2025 | 15 | FIXED<br>MOBILE 5.388A NF9 | Enabled for IMT as per SADC FAP proposed common sub-allocation/ utilization |
| 2500 – 2690 | 190 | MOBILE except aeronautical mobile 5.384A NF9<br>Radio astronomy | Enabled for IMT as per SADC FAP proposed common sub-allocation/ utilization |
| 3400 – 3600 | 200 | FIXED<br>MOBILE 5.430A NF9 | Enabled for IMT as per WRC-07, effective Nov. 2010 |

This does not include the frequency already allocated and assigned to GSM / UMTS.

### 5.2 Table 4 Frequency Bands Identified for IMT.

| No. | Band | Amount of spectrum assigned for IMT usage | Amount of spectrum in actual use by IMT systems |
|---|---|---|---|
| 1 | 450. - 470 MHz | 20 MHz | 0 MHz |
| 2 | 694 - 790 MHz | 96 MHz | 60 MHz |
| 3 | 790 - 960 MHz | 72 MHz | 60 MHz |
| 4 | 1 427 - 1 452 MHz | 90 MHz | 0 MHZ |
| 5 | 1 452 - 1 492 MHz | | |
| 6 | 1 492 - 1 518 MHz | | |
| 7 | 1 710 - 1 885 MHz | 75 MHz | 75 MHz |

| | | | |
|---|---|---|---|
| **8** | 1 885 - 2 025 MHz | 100 MHz | 100 MHz |
| **9** | 2 010 - 2 025 MHz | 15 MHz | 15 MHz |
| **10** | 2 110 - 2 200 MHz | 90 MHz | 90 MHz |
| **11** | 2 300 - 2 400 MHz | 100 MHz | 60 MHz |
| **12** | 2 500 - 2 690 MHz | 190 MHz | 190 MHz |
| **13** | 3 300 - 3 400 MHz | 100 MHz | 0 MHz |
| **14** | 3 400 - 3 600 MHz | 200 MHz | 200 MHz |
| **15** | 4 800 - 4 990 MHz | 190 MHz | 0 MHz |
| **Total** | **Low and Mid Bands** | **1 338 MHz** | **850 MHz- Approximately 64% Assigned in AFS** |
| **16** | 24.25 - 27.5 GHz | 3250 MHz | 0 MHz |
| **17** | 37 - 43.5 GHz | 6500 MHz | 0 MHz |
| **18** | 45.5 - 47 GHz | 1500 MHz | 0 MHz |
| **19** | 47.2 - 48.2 GHz | 1000 MHz | 0 MHz |
| **20** | 66 - 71 GHz | 5000 MHz | 0 MHz |

### 5.3 Frequency Migration Resolutions resulting from WRC 15

The following Resolutions were considered to be included in the Frequency Migration Plan 2019.

**Table 5 Summary of migrations issues.**

| Frequency Band (MHz) | WRC | Res. / Rec. | Footnote | Resolution/ Footnote |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| **5.3515 - 5 3665** | 15 | | **5.133B** | 1. Stations in the amateur service using the frequency band 5 351.5-5 366.5 kHz shall not exceed a maximum radiated power of 15 W (e.i.r.p.). |
| **108 - 117.975** | 12 | 413 | | 2. Use by aeronautical mobile (R) service without interfering with existing ARNS systems |
| **450 – 470** | 7 | 224 | | 3. Frequency bands for the terrestrial component of International Mobile Telecommunications below 1 GHz |
| **694 – 790** | 12 | 232 | | 4. Use of the frequency band 694-790 MHz by the mobile, except aeronautical mobile, service in ITU Region 1 and related studies |
| **790 – 862** | 12 | 224 | | 5. Frequency bands for the terrestrial |

| | | | | |
|---|---|---|---|---|
| | | | | component of International Mobile Telecommunications below 1 GHz |
| **1 452-1 492** | 15 | 223, 750 & 761 | 5.346 | 6. Additional frequency bands identified for International Mobile Telecommunications<br>7. Compatibility between the Earth exploration-satellite service (passive) and relevant active services<br>8. Compatibility of International Mobile Telecommunications and broadcasting-satellite service (sound) in the frequency band 1 452-1 492 MHz in Regions 1 and 3 |
| **960 – 1164** | 12 | 417 | | 9. Use of 960 – 1164 MHz by aeronautical mobile (R) service meeting standard and |

| | | | | |
|---|---|---|---|---|
| | | | | recommended practice |
| **1518 - 1544**<br>**1545 - 1559**<br>**1610 - 1626.5**<br>**1626.5 - 1645.5**<br>**1646.5 - 1660.5**<br>**1668 - 1675**<br>**2483.5 - 2500** | 12 | 225 | | 10. Use of additional frequency bands for the satellite component of IMT |
| **1525 – 1559/ 1626.5 – 1660.5** | 12 | 222 | | 11. Use of 1525-1559 MHz and 1626.5-1660.5 MHz by the mobile-satellite service, and procedures to ensure long-term spectrum access for the aeronautical mobile-satellite (R) service |
| **161.9375 -161.9625** | 15 | | 5.228AA | 12. The use of the frequency bands 161.9375-161.9625 MHz and 161.9875-162.0125 MHz by the maritime mobile-satellite (Earth-to-space) service is limited to the systems which operate in accordance with Appendix **18**. (WRC-15) |

| | | | | |
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| **161.9875-162.0125 MHz** | 15 | | 5.228AA | 13. The use of the frequency bands 161.9375-161.9625 MHz and 161.9875-162.0125 MHz by the maritime mobile-satellite (Earth-to-space) service is limited to the systems which operate in accordance with Appendix **18**. (WRC-15) |
| **173.7 – 175.1** | | | NF5 | 14. This frequency band may be used for wireless microphones for services ancillary to Broadcasting (SAB) and services ancillary to programme (SAP) making. Use of wireless microphones must be co-ordinated and licensed. |
| 403-406 MHz | 15 | 205 | 5.265 | 15. Protection of the systems operating in the mobile satellite service in the frequency band 406-406.1 MHz |
| 406-406.1 | 15 | 205 | 5.265 | 16. Protection of the systems |

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| | | | | operating in the mobile satellite service in the frequency band 406-406.1 MHz |
| 406.1-410 MHz | 15 | 205 | 5.265 | 17. Protection of the systems operating in the mobile satellite service in the frequency band 406-406.1 MHz |
| 410-420 MHz | 15 | | 5.268 | 18. Use of the frequency band 410-420 MHz by the space research service is limited to space-to-space communication links with an orbiting, manned space vehicle. |
| 432-438 MHz | 15 | | 5.279A | 19. The use of the frequency band 432-438 MHz by sensors in the Earth exploration-satellite service (active) shall be in accordance with Recommendation ITU-R RS.1260-1 |
| 450-455 MHz | 15 | 224 | 5.286AA | 20. Frequency bands for the terrestrial |

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| | | | | component of International Mobile Telecommunications below 1 GHz |
| 455-456 MHz | 15 | 224 | 5.286AA | 21. Frequency bands for the terrestrial component of International Mobile Telecommunications below 1 GHz |
| 456-459 MHz | 15 | 224 | 5.286AA | 22. Frequency bands for the terrestrial component of International Mobile Telecommunications below 1 GHz |
| 456-459 MHz | 15 | 224 | 5.287 | 23. Use of the frequency bands 457.5125-457.5875 MHz and 467.5125-467.5875 MHz by the maritime mobile service is limited to on-board communication stations. |
| 459-460 MHz | 15 | 224 | 5.286AA | 24. Frequency bands for the terrestrial component of International Mobile Telecommunications below 1 GHz |

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| 460-470 MHz | 15 | 224 | 5.286AA | 25. Frequency bands for the terrestrial component of International Mobile Telecommunications below 1 GHz |
| | | | | *26.* |
| 470-694 MHz | 15 | 760 | 5.296 | *27. Additional allocation:* the frequency band 470-694 MHz is also allocated on a secondary basis to the land mobile service, intended for applications ancillary to broadcasting and programme-making. |
| 694 – 790 MHz | 15 | 224, 760 | 5.312A, 5.317A | 28. Provisions relating to the use of the frequency band 694-790 MHz in Region 1 by the mobile, except aeronautical mobile, service and by other services |
| 790 – 862 MHz | 15 | 224, 749 | 5.312A, 5.317A | 29. Use of the frequency band 790-862 MHz in countries of ITU Region 1 and the Islamic |

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| | | | | Republic of Iran by mobile applications and by other services |
| 862-890 MHz | 15 | 224, 760 & 749 | 5.317A | 30. The parts of the frequency band 698-960 MHz in Region 2 and the frequency bands 694-790 MHz in Region 1 and 790-960 MHz in Regions 1 and 3 which are allocated to the mobile service on a primary basis are identified for use by administrations wishing to implement International Mobile Telecommunications (IMT) |
| 960-1 164 MHz | 15 | 417 | 5.327A, 5.328 | 31. Use of the frequency band 960-1 164 MHz by the aeronautical mobile (R) service |
| 1 350-1 400 MHz | 15 | 750 | | 32. Compatibility between the Earth exploration-satellite service (passive) |

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| | | | | 33. and relevant active services |
| 1 427-1 429 MHz | 15 | 223 | 5,341A | 34. Additional frequency bands identified for International Mobile Telecommunications |
| 1 452-1 492 MHz | 15 | 223, 739, 761 | 5.346, 5.208B | 35. Additional frequency bands identified for International Mobile Telecommunications<br>36. Compatibility of International Mobile Telecommunications and broadcasting-satellite service (sound) in the frequency band 1 452-1 492 MHz in Regions 1 and 3 |
| 1 492-1 518 MHz | 15 | 223 | 5.341A | 37. Additional frequency bands identified for International Mobile Telecommunications |
| 1 525-1 530 MHz | 15 | 739 | 5.208B | 38. Compatibility between the radio astronomy service and the active space services in |

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| | | | | certain adjacent and nearby frequency bands |
| 1 530 -1 535 MHz | 15 | 739 | 5.208B | 39. Compatibility between the radio astronomy service and the active space services in certain adjacent and nearby frequency bands |
| 1 535-1 559 MHz | 15 | 739 | 5.208B | 40. Compatibility between the radio astronomy service and the active space services in certain adjacent and nearby frequency bands |
| 1 559-1 610 MHz | 15 | 739 | 5.208B | 41. Compatibility between the radio astronomy service and the active space services in certain adjacent and nearby frequency bands |
| 1 613.8-1 626.5 MHz | 15 | 739 | 5.208B | 42. Compatibility between the radio astronomy service and the active space services in certain adjacent and nearby frequency bands |
| 1 710-1 930 MHz | 15 | 223, 212 | 5.384A, 5.388 | 43. Additional frequency bands |

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| | | | | identified for International Mobile Telecommunications<br>44. Implementation of International Mobile Telecommunications in the frequency bands 1 885-2 025 MHz and 2 110-2 200 MHz |
| **1885 – 2025/ 2100 - 2200** | 07 | 212 | | 45. Implementation of International Mobile Telecommunications in the bands 1885-2025 MHz and 2110-2200 MHz |
| **1 930-1 970 MHz** | 15 | 223, 212 | 5.388 | 46. Additional frequency bands identified for International Mobile Telecommunications<br>47. Implementation of International Mobile Telecommunications in the frequency bands 1 885-2 025 MHz and 2 110-2 200 MHz |
| 1970-1980 MHz | 15 | 223, 212, | 5.388 | 48. Additional frequency bands identified for |

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| | | | | International Mobile Telecommunications<br>49. Implementation of International Mobile Telecommunications in the frequency bands 1 885-2 025 MHz and 2 110-2 200 MHz |
| 1980-2010 MHz | 15 | 223,212 | 5.388 | 50. Additional frequency bands identified for International Mobile Telecommunications<br>51. Implementation of International Mobile Telecommunications in the frequency bands 1 885-2 025 MHz and 2 110-2 200 MHz |
| 2010-2025 MHz | 15 | 223,212 | 5.388 | 52. Additional frequency bands identified for International Mobile Telecommunications<br>53. Implementation of International Mobile Telecommunications in the |

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| | | | | frequency bands 1 885-2 025 MHz and 2 110-2 200 MHz |
| 2110-2120 MHz | 15 | 223,212 | 5.388 | 54. Additional frequency bands identified for International Mobile Telecommunications<br>55. Implementation of International Mobile Telecommunications in the frequency bands 1 885-2 025 MHz and 2 110-2 200 MHz |
| 2120-2160 MHz | 15 | 223<br>212 | 5.388 | 56. Additional frequency bands identified for International Mobile Telecommunications<br>57. Implementation of International Mobile Telecommunications in the frequency bands 1 885-2 025 MHz and 2 110-2 200 MHz |
| 2160-2170 MHz | 15 | 223<br>212 | 5.388 | 58. Additional frequency bands identified for International Mobile |

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| | | | | Telecommunications<br>59. Implementation of International Mobile Telecommunications in the frequency bands 1 885-2 025 MHz and 2 110-2 200 MHz |
| 2170-2200 MHz | 15 | 223<br>212 | | 60. Additional frequency bands identified for International Mobile Telecommunications<br>61. Implementation of International Mobile Telecommunications in the frequency bands 1 885-2 025 MHz and 2 110-2 200 MHz |
| 2200-2290 MHz | 97 | 622 | 5.391 | 62. In making assignments to the mobile service in the frequency bands 2 025-2 110 MHz and 2 200-2 290 MHz, administrations shall not introduce high-density mobile systems |

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| **2300 – 2400** | 12 | 223 | | 63. Additional frequency bands identified for IMT |
| 3300-3400 MHz | 15 | 223 | 5.429A, 5.429B | 64. Additional frequency bands identified for International.<br>65. Mobile Telecommunications |
| 3400-3600 MHz | 2004 | | 5.430A | 66. The allocation of the frequency band 3 400-3 600 MHz to the mobile, except aeronautical mobile, service is subject to agreement obtained under No. **9.21**. |
| 4200-4400 MHz | 15 | 424 | 5.436, 5.437 | 67. Use of Wireless Avionics Intra-Communications in the frequency band 4 200-4 400 MHz |
| 5010-5030 MHz | 15 | 741 | 5.443B | 68. Protection of the radio astronomy service in the frequency ban 4 990-5 000 MHz from unwanted emissions of the radionavigation - satellite service (space-to-Earth) operating in the frequency band 5 010-5 030 MH |

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| 5030-5091 MHz | 15 | 114 | 5.444 | 69. Compatibility between the aeronautical radionavigation service and the fixed-satellite service (Earth-to-space) (limited to feeder links of the non-geostationary mobile-satellite systems in the mobile-satellite service in the frequency band 5 091-5 150 MHz |
| 5091-5150 MHz | 15 | 114 | 5.444A, 5.444 | 70. Compatibility between the aeronautical radionavigation service and the fixed-satellite service (Earth-to-space) (limited to feeder links of the non-geostationary mobile-satellite systems in the mobile-satellite service) in the frequency band 5 091-5 150 MHz |
| **5150 – 5250/ 5250 – 5350/ 5470 – 5725** | 12, Rev.15 | 229 | 5.446 | 71. Use of the bands 5150-5250 MHz, 5250-5350 MHz, |

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| | | | | and 5470-5725 MHz by the mobile service for the implementation of wireless access systems including radio local area networks |
| 5250-5255 MHz | | 229, | 5.447F | 72. Use of the bands 5150-5250 MHz, 5250-5350 MHz, and 5470-5725 MHz by the mobile service for the implementation of wireless access systems including radio local area networks |
| 5470-5570 MHz | 15 | 229 | 5.450A | 73. Use of the bands 5150-5250 MHz, 5250-5350 MHz, and 5470-5725 MHz by the mobile service for the implementation of wireless access systems including radio local area networks |
| 5 725-5 830 MHz | 15 | 762 | 5.150 | 74. Application of power flux-density criteria to assess the potential for |

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| | | | | harmful interference under No. 11.32A for fixed satellite and broadcasting-satellite service networks in the 6 GHz and 10/11/12/14 GHz frequency bands not subject to a Plan |
| 5925-6700 MHz | 03, rev.15 | 902 | 5.457A | 75. Provisions relating to earth stations located on board vessels which operate in fixed-satellite service networks in the uplink bands 5 925-6 425 MHz and 14-14.5 GHz |
| 7 300-7 375 MHz | 15 | | 5.461 | 76. *Additional allocation:* the bands 7 250-7 375 MHz (space-to-Earth) and 7 900-8 025 MHz (Earth-to space) are also allocated to the mobile-satellite service on a primary basis, subject to agreement obtained under No. **9.21**. |

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| 7 375-7 450 MHz | 15 | | 5.461AA<br>5.461AB | 77. The use of the frequency band 7 375-7 750 MHz by the maritime mobile satellite service is limited to geostationary-satellite networks. |
| 7 450-7 550 MHz | 15 | | 5.461AA<br>5.461AB | 78. The use of the frequency band 7 375-7 750 MHz by the maritime mobile satellite service is limited to geostationary-satellite networks. |
| 7 550-7 750 MHz | 15 | | 5.461AA<br>5.461AB | 79. The use of the frequency band 7 375-7 750 MHz by the maritime mobile satellite service is limited to geostationary-satellite networks. |
| 9 200-9 300 MHz | 15 | | 5.474A<br>5.474B<br>5.474C | 80. In the band 9 200-9 500 MHz, search, and rescue transponders (SART) may be used, having due regard to the appropriate ITU-R |

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| | | | | Recommendation |
| 9900-10 000 MHz | 15 | | 5.474A 5.474B 5.474C | 81. The use of the frequency bands 9 200-9 300 MHz and 9 900-10 400 MHz by the Earth exploration-satellite service (active) is limited to systems requiring necessary bandwidth greater than 600 MHz that cannot be fully accommodated within the frequency band 9 300-9 900 MHz |
| 10-10.4 GHz | 15 | | 5.474D 5.479 | 82. Stations in the Earth exploration-satellite service (active) shall not cause harmful interference to, or claim protection from, stations of the maritime radionavigation and radiolocation services in the frequency band 9 200-9 300 |

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| | | | | MHz, the radionavigation and radiolocation services in the frequency band 9 900-10 000 MHz and the radiolocation service in the frequency band 10.0-10.4 GHz. (WRC-15) |
| 10.7-10.95 GHz | 15 | | 5.441 | 83. The use of the bands10.7-10.95 GHz (space-to-Earth), 11.2-11.45 GHz (space-to-Earth) and 12.75-13.25 GHz (Earth-to-space) by a non-geostationary-satellite system in the fixed-satellite service is subject to application of the provisions of No. 9.12 for coordination with other non-geostationary-satellite systems in the fixed-satellite service. |
| 10.95-11.2 GHz | 15 | 155 | 5.484A 5.484B | 84. Regulatory provisions related to earth stations on |

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| | | | | board unmanned aircraft which operate with geostationary-satellite networks in the fixed-satellite service in certain frequency bands not subject to a Plan of Appendices 30, 30A and 30B for the control and non-payload communications of unmanned aircraft systems in non-segregated airspaces |
| 11.2-11.45 GHz | 15 | | 5.441 | 85. The use of the bands 10.7-10.95 GHz (space-to-Earth), 11.2-11.45 GHz (space-to-Earth) and 12.75-13.25 GHz (Earth-to-space) by a non-geostationary-satellite system in the fixed-satellite service is subject to application of the provisions of No. **9.12** for coordination |

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| | | | | with other non-geostationary-satellite systems in the fixed-satellite service. |
| 11.45-11.7 GHz | 15 | Rec.F387 | | 86. This band is used for Fixed links (11 GHz) (10.7-11.7 GHz). |
| 13.4-13.65 GHz | 15 | 902 | | 87. Standard frequency and time signal-satellite (Earth-to-space) |
| 14-14.25 GHz | 15 | 902 | | 88. Provisions relating to earth stations located on board vessels which operate in fixed-satellite service networks in the uplink bands 5 925-6 425 MHz and 14-14.5 GHz |
| 14.25-14.3 GHz | 15 | 902 | | 89. Provisions relating to earth stations located on board vessels which operate in fixed-satellite service networks in the uplink bands 5 925-6 425 MHz and 14-14.5 GHz |
| 14.47-14.5 GHz | 15 | 902 | | 90. Provisions relating to earth stations located on board vessels |

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| | | | | which operate in fixed-satellite service networks in the uplink bands 5 925-6 425 MHz and 14-14.5 GHz |
| 14.5-14.75 GHz | 15 | | 163, | 91. Deployment of earth stations in some Regions 1 and 2 countries in the frequency band 14.5-14.75 GHz in the fixed-satellite service (Earth-to-space) not for feeder links for the broadcasting-satellite service |
| **15400 – 15700** | 07 | 614 | | 92. Use of the band 15.4-15.7 GHz by the radiolocation service |
| 21.4-22 GHz | 15 | 739 | 5.208B, 5.530A | 93. Compatibility between the radio astronomy service and the active space services in certain adjacent and nearby frequency bands |
| **22.550 – 23.150 GHz** | 07 | 753 | | 94. Use of the band 22.55-23.15 GHz by the space research service |

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| 25.5-27 GHz | 15 | F.748 | 5.536B | 95. National Polar-Orbiting Operational Environment Satellite System (NPOESS) Fixed Links (26 GHz) (24.5 – 26.5 GHz) BFWA (24.5-26.5 GHz |
| 27.5-28.5 GHz | 07 | 143 | | 96. Guidelines for the implementation of high-density applications in the fixed satellite service in frequency bands identified for these applications |
| 29.1-29.5 GHz | 15 | 143 | | 97. Guidelines for the implementation of high-density applications in the fixed satellite service in frequency bands identified for these applications |
| 31-31.3 GHz | 15 | 07 | 5.149 | 98. In making assignments to stations of other services to which the band allocated, administrations are urged to take all |

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| | | | | practicable steps to protect the radio astronomy service from harmful. Interference. Emissions from space borne or airborne stations can be particularly serious sources of interference to the Radio astronomy service (see Nos. **4.5** and **4.6** and Article **29**). (WRC-07) |
| 42.5-43.5 GHz | 15 | S.1586-1<br>RA.1631-0 | 5.551H | 99. Calculation of unwanted emission levels produced by a non-geostationary fixed satellite service system at radio astronomy sites.<br>100. Reference radio astronomy antenna pattern to be used for compatibility analyses between non-GSO systems and radio astronomy service stations |

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| | | | | based on the epfd concept |

### 5.4 Other Migration issues

The table below summarises other migration issues that have been highlighted.

**Table 4 Summary of migration issues**

| Frequency Band (MHz) | Current Allocation | Proposed Allocation | Notes |
|---|---|---|---|
| **380 – 400** | Public Safety (SAPS, DoD etc.) | Public Safety only | Consolidate all public safety related services in this band; move other users out of the band |
| **410 – 430** | Government services, Mobile Data and Trunking | Digital Trunking only | Reserve for Digital Trunking use only; migrate mobile data, ESKOM, SAPS out of the band |
| **440 – 450** | Short range business radio/ PMR/ other links | Short Range Business Radio, PMR only | Should be cleared of all other users; Communal repeaters can be allocated in this band |
| **450 – 470** | FIXED, MOBILE | IMT | Should be cleared of all other users |
| **694 – 790 & 790-862** | BROADCAST | IMT | Studio Links need to be migrated out to enable efficient allocation for IMT. Self Help stations need to migrate to below 694 MHz.<br><br>Frequency band 694 to 862 MHz to be cleared from analogue and digital broadcast services for implementation of IMT |
| **921 – 925 paired with 876 - 880** | | GSM-R | Originally allocated by SABRE 1 for digital trunking – currently unused |

| | | | |
|---|---|---|---|
| **1350 – 1375 paired with 1492 – 1517** | Shared duplex band | BFWA | Could be a consideration for rural BFWA |
| **1375 – 1400 paired with 1427 – 1452** | Shared duplex band | BFWA | Could be a consideration for rural BFWA |
| **2025 – 2110 paired with 2200 – 2285** | Fixed links (DF) | BFWA | Fixed links currently underutilized |
| **3600 – 4200** | Satellite (VSAT, downlink), Terrestrial backhaul | 3600 – 3800 MHz BFWA<br><br>3600 – 4200 MHz PTP and FSS | Sharing Criteria to be developed between BFWA and FS PTP and/or FSS where feasible. |
| **5850 – 6425** | Fixed/ Satellite uplinks | Fixed/ Satellite uplink/ Outside Broadcast links | Migrate outside-broadcast from 2300 – 2450 MHz into upper C band |
| **40000 and above** | | Allocate for PTP links | For local high-speed PTP data links (up to 5 km) |

## 6 Frequency Migration Plan

### 6.1 Progress Update on the Radio Frequency Migration Plan 2019

The Radio Frequency Migration Plan 2019 was compiled from unresolved issues from the Migration Frequency Plan 2013. WRC 2015, SADC FAP, and revisions, NRFP 2018 and ICASA Council resolutions and other information included in this document. The following table deals with all bands where there is a potential frequency migration issue. The motivation for a migration is either that it is an original SABRE proposal, stems from WRC resolutions, SADC FAP, or the Authority's decision. The content of the Migration Frequency Plan 2019 needs to be viewed in conjunction with the NRFP 2018 published in Government Gazette Number 41650 Notice 266 of 2018. Section 4.10 contains more information on the frequency bands included in the Frequency Migration Plan.

Column 1 indicates the frequency range.

Column 2 states the existing allocation in the National Radio Frequency Plan 2018 and any applications that are mentioned in the NRFP. As is the standard practice for frequency plans, primary allocations are in UPPER CASE, secondary allocations are in Lower Case. Applications are (within brackets).

Column 3 indicates the proposals for new allocations and utilization. The proposed allocation is indicated along with the source of the proposal (SABRE, WRC, SADC FAP, New ICASA proposals or any other cross reference provided).

Column 4 contains notes on any migration issues.

This table only includes those bands where frequency migration is under consideration.

**Table 5 Proposed migration plan**

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | Notes on migration/ usage |
|---|---|---|---|
| **75.2 – 87.5** | MOBILE except aeronautical mobile<br><br>(Private and communal repeaters) | Radio Frequency Migration Plan Government Gazette Number. 36334 (Notice No. 352 & 353 of 2013)<br><br>– | For the Draft Radio Frequency Spectrum Assignment Plan Refer to: Government Gazette Number. 41164 (Notice No. 781 of 2017).<br><br>The Radio Frequency Spectrum Assignment Plan for the frequency band 75.2 to 87.5 MHz was published Government Gazette Number 42286 (Notice 124 of 2019) in terms of Regulation 3 of the Radio Frequency Spectrum Regulations 2015, as amended, read with the Frequency |

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| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | | | Migration Plan 2013. |
| **138 – 144** | | FIXED<br>MOBILE<br>(SF alarms, SF Mobile, MTX-BTX paired links, Remote controlled industrial apparatus) | Radio Frequency Migration Plan Government Gazette Number. 36334 (Notice No. 352 & 353 of 2013)<br>) | Final Radio Frequency Spectrum Assignment Plan Refer to: Government Gazette Number.41512 (Notice No. 146 of 2018)<br>A feasibility study was performed to establish the destination band for Transnet operation in this band. In the interim Transnet's license will be amended to co-exist with the alarms and to operate until 31 March 2020.<br>The feasibility study was conclusive regarding the migration of Transnet. Further |

| **Frequency Band (MHz)** | **Existing Allocation in NRFP 2021 (Applications)** | **Proposed Allocation/ (Utilization)** | | **Notes on migration/ usage** |
|---|---|---|---|---|
| | | | | representations are invited in this respect.<br><br>The Final Radio Frequency Spectrum Assignment Plan for the frequency band 138 MHz to 144 MHz, in Government Gazette Number 49079 (Notice 3761 of 2023), in terms of regulation 3 of the Radio Frequency Spectrum Regulations, 2015, read with the Radio Frequency Migration Regulation 2013, the 2013 and 2019 Radio Frequency Migration Plans. |
| **150.05 – 153** | | FIXED | Radio Frequency | Final Radio Frequency |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | MOBILE except aeronautical mobile<br>RADIO ASTRONOMY<br>(Alarms, telemetry, SF Mobile and paging[26]) | Migration Plan Government Gazette Number. 36334 (Notice No. 352 & 353 of 2013) | Spectrum Assignment Plan Refer to: Government Gazette Number.41512 (Notice No. 149 of 2018)<br>The current users may continue to operate in this band in line with the rules contained in the Final Radio Frequency Spectrum Assignment Plan that was published in Government Gazette Number 41512 (Notice 149 of 2018). |
| **156.4875 – 156.5625** | | MARITIME MOBILE (distress | Radio Frequency Migration | Draft Radio Frequency Spectrum |

[26] Alarms, SF Mobile. In-house paging and load shedding (148.95 – 151 MHz); SF Alarms (152.05 – 152.55 MHz); Government Service Wildlife Telemetry Tracking (148 – 152 MHz); SF Mobile (152.55 – 153.05 MHz)

| **Frequency Band (MHz)** | **Existing Allocation in NRFP 2021 (Applications)** | **Proposed Allocation/ (Utilization)** | | **Notes on migration/ usage** |
|---|---|---|---|---|
| | | and calling via DSC)<br>FIXED<br>LAND MOBILE<br>(Maritime Radio-navigation and location (radar), SF mobile in inland areas) | Plan Government Gazette Number. 36334 (Notice No. 352 & 353 of 2013) | Assignment Plan Refer to: Government Gazette Number.41350 (Notice No. 971 of 2017)<br>There were submissions specific to this frequency band to the regarding the "inquiry for the Implementation of the Radio Frequency Migration Plan and the IMT Road Map" published in Government Gazette Number 45247 (Notice 580 of 2021).<br>The RFSAP is to be finalised. |
| **162.0375 – 174** | | MOBILE except aeronautical mobile (R) NF4 (Mobile 1 MTX-DF (161.475 – | Radio Frequency Migration Plan Government Gazette Number. 36334 | Develop Radio Frequency Spectrum Assignment Plan Refer to: Feasibility Study to be performed. |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | 165.0375 MHz)<br><br>Mobile 2 MTX-DF (165.05 – 165.5375 MHz)<br><br>Single Frequency Mobile (168.95 – 170.05 MHz)<br>Mobile 3 MTX-DF (165.55 – 167.4875 MHz)<br><br>Single Frequency Mobile (172 –172.0375 MHz)<br><br>Mobile 4 MTX-DF (167.5 – 168.9375 MHz) | (Notice No. 352 & 353 of 2013) | See section 4.10.5.<br><br>Summary proposals arriving out of feasibility study[27]<br><br>The Authority concludes that its thinking on this band at this stage is the following:<br><br>• The MTX DF and BTX DF swap shown in Figure 18 may be desirable but not very feasible;<br><br>• It may be feasible, but it would require significant stakeholder<br><br>galvanisation on the part of the Authority with a likely |

[27] Government Gazette No. 45690 (Notice 739 of 2021)

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | Meter Reading (169.4 – 169.475 MHz)<br><br>Non-specific SRD's – Telecommand only (173.2125 – 173.2375 MHz)<br><br>Non-specific SRDs (173.2375 – 173.2875 MHz)<br><br>Wireless microphones and assistive listening devices (173.7 – 175.1 MHz)) | | low probability of success.<br><br>Stakeholders are requested to provide any further information in this context to the Authority to assist in this matter relating to the swap. |
| **174 - 223** | | BROADCASTING<br><br>Television Broadcasting | Radio Frequency Migration Plan Government Gazette | Refer to Terrestrial Broadcasting Frequency Plan Government |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | T-DAB | Number. 36334 (Notice No. 352 & 353 of 2013) | Gazette Number 36321 (Notice No. 298 of 2013)<br>The Radio Frequency Spectrum Assignment Plans is to be optimised and additional T-DAB multiplexes developed on a national and regional basis.<br>Also refer to the Digital Sound broadcasting discussion document published in Government Gazette, No. 41534 (Notice No 161 of 2018). (refer to 4.12.6) |
| **223 – 230 & 230 - 238** | | BROADCASTING<br>(Television Broadcasting)<br>T-DAB | Radio Frequency Migration Plan Government Gazette Number. | Refer to Terrestrial Broadcasting Frequency Plan Government Gazette |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | | 36334 (Notice No. 352 & 353 of 2013) | Number 36321 (Notice No. 298 of 2013)<br>The Radio Frequency Spectrum Assignment Plans is to be optimised and additional T-DAB multiplexes developed on a national and regional basis.<br>Also refer to the Digital Sound broadcasting discussion document published in Government Gazette, No. 41534 (Notice No 161 of 2018). (refer to 4.12.6) |
| **238 – 246 & 246 - 254** | | BROADCASTING (246 – 254) (Television Broadcasting) | Radio Frequency Migration Plan Government Gazette Number. 36334 | Refer to Terrestrial Broadcasting Frequency Plan Government Gazette Number |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | MOBILE (238 – 246) (238-242.95 MHz<br>PMR and/or PAMR International Distress Frequency at 243 MHz (242.95 – 243.05 MHz)<br>243.05-246.00 MHz Low-power devices) | (Notice No. 352 & 353 of 2013) | 36321 (Notice No. 298 of 2013) Radio Frequency Spectrum Assignment Plan to be developed for VHF Digital Television. |
| **335.4 - 380** | | FIXED NF6 (FWA (336 – 346 MHz) FWA (356 – 366 MHz) 366-380 MHz (Govt.) Digital Trunking (Emergency) 335.4-336 MHz<br>PMR and/or PAMR)<br>MOBILE NF7 | Radio Frequency Migration Plan Government Gazette Number. 36334 (Notice No. 352 & 353 of 2013)<br>335.4-336 MHz/ / 366.0-380.0 MHz PMR and/or PAMR | Migrate existing fixed links to above 3 GHz as per SADC proposed common sub-allocation/ utilization.<br>(refer to 4.12.10)<br>There are 1362 Licenses issued in this band. Perform feasibility study on the use of this band as per |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | (336-346 MHz Fixed Wireless Access 336-346 Unmanned Aerial Vehicle (UAV) 356.0-366.0 MHz Fixed Wireless Access 366.0-380.0 MHz PMR and/or PAMR) | 336-346 MHz paired with 356-366 MHz Fixed Wireless Access/ PTP/PTMP rural system. (as per SADC FAP proposed common sub-allocation/ utilization) | SADC FAP proposed sub-allocation/ utilization including BFWA and UAV'. s: |
| **380-387 & 387– 390 & 390 – 399.9** | | FIXED NF6 & MOBILE NF7 MOBILE NF7 & Mobile-satellite (space-to-Earth) – (**387-390 MHz)** MOBILE NF7 – (**390-399.9 MHz)** | Radio Frequency Migration Plan Government Gazette Number. 36334 (Notice No. 352 & 353 of 2013) | The Radio Frequency Spectrum Assignment Plan published in GG No. 41512 (Notice 418 of 2018). This band will be assigned as a continuous block for Public Protection and Disaster Relief (PPDR) as well as Public |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | (Public safety, SAPS, DOD, Army etc.) | | Safety with users including SAPS, SANDF, the Ambulance Service, Metro Police and Fire-Fighting Services. All other users will migrate out of this band.<br>Refer to Government Gazette No. 45690 (Notice 739 of 2021<br>Further, Refer to: Government Gazette Number 49079 (Notice 3764 of 2023), |
| **403 - 406** | | METEOROLOGICAL AIDS Mobile except aeronautical mobile (Radiosonde | WRC15 | Develop Radio Frequency Spectrum Assignment Plan |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | Medical implants (402 – 405 MHz)<br>Various SRD's (402 – 406 MHz)) | | |
| **406 - 410** | | MOBILE-SATELLITE (Earth-to-space) (406 – 406.1 MHz) (COSPAS – SARSAT: Emergency Position Indicating Radio Beacon (EPIRB) Low power satellite EPIRBs<br>(distress and safety purposes))<br>(Mobile MTX (407.625 – 410 MHz). Government Use for Public Safety) | WRC15 | Develop Radio Frequency Spectrum Assignment Plan |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | FIXED & Mobile except & aeronautical mobile RADIO ASTRONOMY (406.1 – 410 MHz) (Mobile MTX (407.625 – 410 MHz) Government use for public safety Fixed Links (406.1 – 407.625 MHz) Fixed Links (407.625 – 410 MHz) Mobile MTX (406.1 – 407.625 MHz) Mobile MTX (407.625 – 410 MHz) PMR and/or PAMR PPDR) | | |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| **410 - 420** | | FIXED<br>MOBILE except aeronautical mobile<br>(Mobile MTX (410 – 413 MHz). Government Use for Public Safety)<br>SPACE RESEARCH (space-to-space)<br>(Mobile MTX (410 – 413 MHz) Government Services Mobile MTX (410 – 413 MHz) Mobile MTX Digital Trunking<br>(410 – 413 MHz) Mobile Data MTX (413-413.7625 MHz) Digital Trunking | SADC FAP proposed common sub-allocation/ utilization.<br>Public digital trunking only (New ICASA proposal) | Develop Radio Frequency Spectrum Assignment Plan.<br>Band reserved for Public Digital Trunking (New ICASA proposal)<br>Migrate government services (especially SAPS) to public safety band 380 – 400 MHz,<br>Mobile Data - Migrate Mobile Data users out of this band.<br>(Refer to section 4.10.11 |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | MTX (413.7625 – 416.1 MHz) Mobile BTX (416.1 – 417.625 MHz) PMR and/or PAMR<br>PPDR) | | |
| **420 – 430** | | FIXED<br>Mobile except aeronautical mobile<br>Radiolocation<br>(Government services, Mobile Data, and public trunking Single Frequency Links (426.1 – 430 MHz) Digital Trunked Mobile BTX (420 – 423 MHz) Mobile Data BTX (423 – | SADC FAP proposed common sub-allocation/ utilization.<br>Public digital trunking only (New ICASA proposal) | Develop Radio Frequency Spectrum Assignment Plan.<br>Band reserved for Public Digital Trunking (New ICASA proposal)<br>Migrate government services (especially SAPS) to public safety band 380 – 400 MHz,<br>Mobile Data - Migrate Mobile Data users out of this band. |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | 423.7625 MHz) Digital Trunking BTX (423.7625 – 426.1 MHz) PMR and/or PAMR<br>PPDR) | | (refer to section 4.10.11) |
| **440 – 450** | | FIXED<br>MOBILE except aeronautical mobile<br>(Short range business radio and PMR<br>Channels 440 to 440.1 and 445 to 445.1 are used for simplex. Telemetry / Data BTX (440 – 441<br>MHz) Telemetry / Data MTX (445 – 446 MHz) | New ICASA proposal | Refer to Radio Frequency Migration Plan Government Gazette Number 36334 (Notice no. 352 of 2013)<br>Perform a feasibility study into the possibility to use the band 440 – 450 MHz for PPDR is to be performed.<br>A Radio Frequency Spectrum Assignment Plan is to be developed. |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | Single Frequency Mobile (441 – 441.1 MHz) Mobile BTX (441.1 – 445 MHz) PMR 446 (446 – 446.1 MHz) Mobile 446.1 – 450 MHz PMR and/or PAMR PPDR FIXED (telemetry, dual frequency alarm systems)) | | |
| **450 – 470** **(450 – 455 & 455 – 456 & 456 – 459 & 459 – 460 & 460 – 470)** | | FIXED MOBILE (Fixed links (450 – 453 MHz) Single Frequency Mobile (453 – 454 MHz) Governmen t Services | Radio Frequency Migration Plan 2013 Governme nt Gazette Number. 36334 (Notice No. 352 & 353 of 2013) | Spectrum identified for IMT. as per Res. 224 revision WRC-15; Radio Frequency Spectrum Assignment Plan Government |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | Paging (454 – 454.425 MHz)<br>Trunked Mobile BTX (454.425 – 460 MHz)<br>IMT450 (450 – 470 MHz)<br>Fixed links (PTP)<br>IMT (450-470 MHz)<br>PMR and/or PAMR<br>Trunked mobile BTX (454.425 – 460 MHz)<br>IMT450 (450 – 470 MHz)<br>Fixed Links (460 – 463 MHz)<br>Single Frequency Mobile (463.025 – 463.975 MHz)<br>Low Power Mobile Radio | | Gazette 38640 (Notice 270 of 2015)<br>The IMT450 Radio Frequency Spectrum Assignment Plan is to be updated in line with the updated Recommendation ITU-R.M1036-5, published in Government Gazette Number 38640 (Notice 270 of 2015, in accordance with the Frequency Migration Plan published in government Gazette Number 2013 GG 36334 (Notice 352 and 353 of 2013) and the Final International Mobile Telecommunic |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | (463.975 MHz, 464.125 MHz, 464.175 MHz, 464.325 MHz, 464.375 MHz) Single Frequency Mobile (464.375 – 464.425 MHz) Trunked Mobile MTX (464.425 – 470 MHz) IMT450 (450 – 470 MHz) Security Systems (464.5375 MHz) Non-specific SRDs (464.5 – 464.5875 MHz) Government Services) | | ations Roadmap 2014, published in Government Gazette Number 38146 (Notice 1009 of 2014) To develop the Final Radio Frequency Spectrum Assignment Plan: Frequency Band 450 to 470 MHz Also see section 4.10.13. |
| **694 – 790** | | MOBILE except | IMT 700 (Terrestria | Digital Dividend 2; |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | aeronautical mobile 5.312A 5.317A NF9 BROADCASTING 5.300 5.311A 5.312<br>NF8AIMT700 | l) (WRC-12) | DTT bands between 694 – 790 MHz<br>Planned migration of television out of this band started in 2016.<br>Refer to.<br>1) Radio Frequency Migration Plan Government Gazette Number 36334 (Notice no. 352 of 2013)<br>2) Radio Frequency Spectrum Assignment Plan Government Gazette Number 38640 (Notice No. 271 & 272 of 2015),<br>3) Self Help stations must be switched off with all other analogue |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | | | services at the end of television dual illumination. Refer to Terrestrial Broadcasting Frequency Plan 2013 Government Gazette Number. 36321 (Notice 298 of 2013) and Government Gazette Number 38005 (Notice No. 801 of 2014) |
| **790 – 862** | | FIXED<br>BROADCASTING<br>MOBILE except aeronautical mobile<br>(TV Broadcast including fixed links (Secondary transmitter links) IMT800) | IMT800 (Terrestrial) (WRC-07). | Digital Dividend 1; DTT bands between 790 – 862 MHz<br>Planned migration of television out of this band started in 2016.<br>Refer to.<br>1) Radio Frequency Migration Plan |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | | | Government Gazette Number 36334 (Notice no. 352 of 2013)<br>2) Radio Frequency Spectrum Assignment Plan Government Gazette Number 38640 (Notice No. 273 & 274 of 2015),<br>3) Refer Second draft Radio Frequency Assignment Plan for the frequency band 825 to 830 MHz and 870 to 875 MHz for public consultation GG 41082 of 2017 (Notice No. 648 of 2017)<br>4) Self Help stations must be switched off with all |

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| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | | | other analogue services at the end of television dual illumination. Refer to Terrestrial Broadcasting Frequency Plan 2013 Government Gazette Number. 36321 (Notice 298 of 2013) and Government Gazette Number 38005 (Notice No. 801 of 2014)<br>5) With respect to the small number of Studio to Transmitter Links (STL's) in this band; these must be migrated out and given point to point fixed assignments |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | | | 6) Remove the assignment for Wireless Access Services in this band<br>. |
| **862 – 890** | | FIXED<br>MOBILE except aeronautical mobile<br>(Wireless audio (863-865 MHz),<br>Fixed links (856 – 864.1 MHz paired with 868.1–876 MHz),<br>RFID (865 – 868 MHz), RFID (869.4-869.65 MHz)<br>Alarms operate amongst others in 860.25 – 869.3 MHz, Wireless | WRC 15<br>Mobile (IMT800)<br>(as per SADC FAP proposed common sub-allocation/ utilization) | Migrate to IMT as per SADC FAP proposed common sub-allocation/ utilization to facilitate development of harmonized channelling arrangement.<br>Refer to:<br>1) Radio Frequency Migration Plan Government Gazette Number 36334 (Notice no. 352 of 2013)<br>2) Radio Frequency Spectrum Assignment Plan Government Gazette Number |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | Access Services (827.775-832.695 MHz paired with 872.775- 877.695 MHz) Mobile (880-890 MHz paired with 925-935 MHz))<br>FWA (864.1 – 868.1 MHz)<br>Other applications in the band include non-specific SRDs, GSM-R and CT2 cordless telephones. | | 38640 (Notice No. 273 & 274 of 2015),<br>3) Second draft Radio Frequency Assignment Plan for the frequency band 825 to 830 MHz and 870 to 875 MHz for public consultation GG 41082 of 2017 (Notice No. 648 of 2017)4) The Final International Mobile Telecommunications Roadmap 2014, published in Government Gazette Number 38146 |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | | | (Notice 1009 of 2014<br>5) Align re-planning efforts within the 800 MHz band as defined in Government Gazette Number40 145 (Notice Number 438 of 2016)[28].<br>6) Remove the assignment for Wireless Access Services in this band |

[28] Government Gazette 40145 (Notice Number 438 of 2016): Invitation to apply for a radio frequency spectrum licence to provide mobile broadband wireless access services for urban and rural areas using the complimentary bands, 700 MHz, 800 MHz and 2.6GHz.

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | | | 7) Migrate existing users out of this band |
| **890 – 942** | | MOBILE except aeronautical mobile (GSM-R (BTX) (921 - 925 MHz)<br><br>IMT900 MTX (880 – 915 MHz)<br>IMT900 BTX (925 – 960 MHz)<br>RFID (including, passive tags and vehicle location (915.1 – 921 MHz))<br><br>915-921 MHz<br>921-925 MHz<br><br>GSM-R 925-960 MHz<br><br>IMT) | Radio Frequency Migration Plan Government Gazette Number. 36334 (Notice No. 352 & 353 of 2013) | Refer to:<br><br>1) Radio Frequency Migration Plan Government Gazette Number 36334 (Notice no. 352 of 2013)<br><br>2) Radio Frequency Spectrum Assignment Plan Government Gazette Number 38640 (Notice No. 275 of 2015), |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| **942 – 960** | | MOBILE except aeronautical mobile 5.317A NF9<br>(IMT900 BTX (925 – 960 MHz)) | Radio Frequency Migration Plan Government Gazette Number. 36334 (Notice No. 352 & 353 of 2013)<br>IMT900 | Refer to:<br>1) Radio Frequency Migration Plan Government Gazette Number 36334 (Notice no. 352 of 2013)<br>2) Radio Frequency Spectrum Assignment Plan Government Gazette Number 38640 (Notice No. 275 of 2015),<br>For Feasibility Study, please refer to Government Gazette No. 45690 (Notice 739 of 2021) |
| **1350 – 1375 paired with 1492 – 1517 and**<br>**1375 – 1400 MHz paired with**<br>**1427 – 1429** | | (1350 – 1400 MHz) FIXED NF 14(1 350-1 375 MHz Fixed links (duplex) | (New ICASA proposal Rural BFWA) | Assign to rural BFWA; maintain existing links where required.<br>Feasibility Study to be |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | 1 375-1 400 MHz<br>Fixed links (duplex))<br>MOBILE RADIOLOCATION<br>Radio Astronomy<br>**1 400-1 427 MHz**<br>EARTH EXPLORATION SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br>(Passive sensing)<br>**1 427-1 429 MHz**<br>SPACE OPERATION (Earth-to-space)<br>FIXED NF14<br>MOBILE except aeronautical | | performed considering the WRC-15 decision (enabling harmonization, equipment availability etc.).<br><br>Develop a Radio Frequency Spectrum Assignment Plan to be developed in line with the study results conducted within ITU-R WP 5D and in accordance with the latest version of Recommendation 1036 in respect of L-Band. (refer to 4.12.22)<br>Refer to:<br>Radio Frequency Migration Plan Government Gazette |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | mobile 5,341A<br><br>(1 427-1 429 MHz)<br><br>(Fixed links duplex)<br>Refer also to Government Gazette No. 45690 (Notice 739 of 2021) | | Number 36334 (Notice no. 352 of 2013) |
| **1429 – 1452 MHz**<br>**FIXED**<br><br>**MOBILE except aeronautical mobile 5.341A**<br><br>**5.338A 5.341 5.342** | | FIXED<br><br>MOBILE except aeronautical mobile 5.341A<br>(Fixed links duplex)5.338A 5.341 | (New ICASA proposal Rural BFWA) | Paired with 1 375 – 1 400 MHz) In accordance with Recommendation ITU-R F.1242<br>See above.<br>Refer to:<br>Radio Frequency Migration Plan Government Gazette Number 36334 (Notice no. 352 of 2013)<br>Assign to Rural BFWA |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | | | Feasibility Study to be performed considering the WRC-15 decision (enabling harmonization, equipment availability etc.).<br><br>Radio Frequency Spectrum Assignment Plan to be developed in line with the study results conducted within ITU-R WP 5D and in accordance with the latest version of Recommendation 1036 in respect of L-Band. |
| | | | | |
| **1 452-1 492 MHz**<br><br>**FIXED**<br>**MOBILE except aeronautical mobile 5.346**<br>**BROADCASTING** | | FIXED NF14<br><br>MOBILE except aeronautica | FWBA/ PTP/ PMP/ New ICASA proposal | Feasibility studies to be performed. Resolution **761 (WRC-15)** on the |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| **BROADCASTING-SATELLITE 5.208B**<br>**5.341 5.342 5.345** | | l mobile 5.346<br>BROADCASTING<br>BROADCASTING-SATELLITE 5.208B<br>(Fixed low capacity PTP DF links)5.341 5.345 NF12 | | "Compatibility of International Mobile Telecommunications and broadcastions -satellite service and performé appropriate Regulatory and technical studies, with a view of ensuring the compatibility of IMT and BSS (Sound) are undertaken within the ITU-R Res. 223 (Rev.WRC-15)<br>Refer to:<br>Radio Frequency Migration Plan Government Gazette Number 36334 (Notice no. 352 of 2013)<br>Consider developments |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | | | and outcome of WP5D (i.e. sharing and compatibility studies and the development of a channelling plan).<br><br>Consider the band for Public Mobile and Emergency and Temporary transmissions.<br><br>Radio Frequency Spectrum Assignment Plan to be developed in line with the study results conducted within ITU-R WP 5D and in accordance with the latest version of Recommendation 1036 in respect of L-Band |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| **1518 – 1525** | | FIXED<br>MOBILE-SATELLITE (space-to-earth)<br>5.348<br>5.348A<br>5.351A<br>(IMT Satellite component) | Band is currently not occupied; potential application for LMR repeaters. | Refer to:<br>1) Radio Frequency Spectrum Assignment Plan Government Gazette 41164 (Notice 784 of 2017)<br>2) Radio Frequency Migration Plan Government Gazette Number 36334 (Notice no. 352 of 2013) |
| **1525 – 1530 & 1530 – 1535 & 1535 - 1559** | | (1525 – 1530 MHz)<br>SPACE OPERATION (space-to-earth)<br>FIXED<br>MOBILE-SATELLITE (space-to-earth)<br>Earth exploration satellite | Potential application for LMR repeaters<br>New ICASA proposal | Feasibility studies to be performed. Migrate in fixed links for LMR repeaters, band could also be used for outside-broadcasting links currently operating in 2300 – 2450 MHz (New ICASA |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | Mobile except aeronautical mobile (GMDSS Maritime satellite (1 525 – 1 544 MHz) Mobile satellite (1544 – 1545 MHz) Aeronautical Mobile satellite (1545 – 1555 MHz) Land Mobile satellite (1555 – 1559 MHz)) | | proposal) (refer to 4.12.25). Radio Frequency Migration Plan Government Gazette Number 36334 (Notice no. 352 of 2013) Develop a Radio Frequency Spectrum Assignment Plan. |
| | | (1530 – 1535 MHz) SPACE OPERATION (space-to-earth) MOBILE-SATELLITE (space-to-earth) | Radio Frequency Migration Plan Government Gazette Number. 36334 (Notice No. 352 & 353 of 2013) | No migration planned (refer to 4.12.25) |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | Earth exploration satellite<br>Mobile except aeronautical mobile<br>Fixed (GMDSS Maritime satellite (1 525 – 1 544 MHz)<br>Mobile satellite (1544 – 1545 MHz)<br>Aeronautical Mobile satellite (1545 – 1555 MHz)<br>Land Mobile satellite (1555 – 1559 MHz)) | | |
| | | (1535 – 1559 MHz)<br>MOBILE-SATELLITE (space-to-Earth) (GMDSS Maritime | Radio Frequency Migration Plan Government Gazette Number. 36334 | No migration planned (refer to 4.12.25) |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | satellite (1 525 – 1 544 MHz) Mobile satellite (1544 – 1545 MHz) Aeronautical Mobile satellite (1545 – 1555 MHz) Land Mobile satellite (1555 – 1559 MHz)) | (Notice No. 352 & 353 of 2013) | |
| **1668.1 – 1668.4 & 1668.4 – 1670 & 1670 - 1675** | | (1668.1 – 1668.4 MHz) MOBILE SATELLITE (earth-to-space) RADIO ASTRONOMY SPACE RESEARCH (passive) (IMT satellite component (1 668 – 1 675 MHz)) | (refer to 4.12.26) | Feasibility studies to be performed. Propose to align allocation with ITU Region 1 (New ICASA proposal) (refer to 4.12.26) |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | (1668.4 – 1670 MHz)<br>METEOROLOGICAL AIDS<br>MOBILE SATELLITE (earth-to-space)<br>MOBILE except aeronautical<br>mobile<br>RADIO ASTRONOMY<br>(Radiosonde (1 668 – 1 700 MHz)<br>IMT satellite component (1 668 – 1 675 MHz)) | (refer to 4.12.26) | Feasibility studies to be performed. Propose to align allocation with ITU Region 1 (New ICASA proposal)<br>(refer to 4.12.26) |
| | | (1670 – 1675 MHz)<br>METEOROLOGICAL AIDS<br>METEOROLOGICAL SATELLITE | (refer to 4.12.26) | Feasibility studies to be performed. Propose to align allocation with ITU Region 1 (New ICASA proposal) |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | (space-to-Earth)<br>MOBILE<br>MOBILE SATELLITE (Earth-to-space) (Radiosonde (1 668 – 1 700 MHz) IMT satellite component (1 668 – 1 675 MHz)) | | (refer to 4.12.26) |
| **1710 – 1785 paired with 1805-1880** | | FIXED<br>MOBILE<br>(IMT1800 band) | | Feasibility studies to be performed. Spectrum re-farming when deemed required may be carried out based upon defined process (refer to 4.14) |
| **1710-1930** | | FIXED<br>MOBILE FWA (1880 – 1900 MHz) | (SADC FAP proposed common sub-allocation/ utilization) | Feasibility studies to be performed.<br>Currently under use by Telkom in a WLL |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | FWA TDD (1900 – 1920 MHz) Fixed Broadband data applications (1 785 – 1 805 MHz) IMT1800 MTX (1710 – 1785 MHz) Cordless telephones (1880 – 1900 MHz) IMT1900 TDD (1900 – 1920 MHz) IMT2100 MTX (1920 – 1980 MHz) | IMT1800 FWA | configuration. Can be allocated for FWA (refer to 4.12.27) |
| **1710 –1930 &** **1 930-1 970 & 1970 – 1980 & 2110 – 2120 & 2120 – 2160 & 2160 - 2170** | | FIXED MOBILE (Current IMT1900 & IMT2100) (MT2100 MTX (1920 – 1980 MHz) | 1920 – 1980 paired with 2110 – 2170 WRC 07 & WRC15 | Feasibility studies to be performed. Spectrum re-farming when deemed required may be carried out based upon defined |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | IMT2100 MTX (1920 – 1980 MHz) Fixed links (1980 – 2010 MHz) CGC/ATC fixed systems (1980 – 2010 MHz) IMT-satellite IMT (satellite) (1980-2010 MHz) IMT TDD (2010 – 2025 MHz) Fixed Links (2025 – 2110 MHz) IMT2100 BTX (2110 – 2170 MHz) | | process (refer to 4.14) |
| **1980 – 2010 & 2170 - 2200** | | FIXED<br>MOBILE<br>MOBILE-SATELLITE (Earth-to-space) | IMT2100 (1980 – 2010 paired with 2170-2200 NRFP 2013) | Feasibility studies to be performed. Migrate in Fixed links (DF) from other bands; consider for BFWA (New |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | (Fixed Links (DF), IMT (Satellite)) (Fixed links (1980 – 2010 MHz) CGC/ATC fixed systems (1980 – 2010 MHz) IMT-satellite<br>IMT (satellite) (1980-2010 MHz)) | Fixed Links (DF), BFWA (New ICASA Proposal)<br>WRC07 & WRC15 | ICASA proposal) (refer to 4.12.28). Assign band to BFWA. |
| **2025 – 2110 & 2200 - 2290** | | SPACE OPERATION (space to Earth) (space to space)<br>FIXED<br>MOBILE (TT&C received from space Fixed Links (2025 – 2110 MHz paired with 2200 – 2285) | WRC15<br>Fixed Links (DF)<br>**(2025 – 2110 paired with 2200 – 2285)**<br>BFWA | Refer to:<br>1) Radio Frequency Migration Plan Government Gazette Number 36334 (Notice no. 352 of 2013)<br>2) Radio Frequency Spectrum Assignment Plan Government Gazette 41164 (Notice 782 of 2017). |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | Fixed Links (2200 – 2285 MHz)<br>BFWA (2 285-2 300 MHz)) | | |
| **2110 – 2120 & 2120 – 2160 & 2160 - 2170** | | FIXED<br>MOBILE<br>(Current 3G band) (IMT2100 BTX (2110 – 2170 MHz)) | WRC15<br>2110 – 2170 paired with 1920 – 1980 | Feasibility studies to be performed. Spectrum re-farming when deemed required may be carried out based upon defined process.<br>(refer to 4.14) |
| **2290 – 2300** | | FIXED<br>MOBILE except aeronautical mobile<br>SPACE RESEARCH (deep space) (space to Earth) (Fixed Links, BFWA (2 285-2 300 MHz) | BFWA (as per SADC FAP proposed common sub-allocation/ utilization) | Refer to:<br>Radio Frequency Migration Plan Government Gazette Number 36334 (Notice no. 352 of 2013)<br>Final Radio Frequency Spectrum Assignment Plan was published in |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | (Coordination is expected prior to the implementation of these services)) | | GG No. 41512 (Notice 145 of 2018). |
| **2300 – 2450** | | FIXED<br>MOBILE<br>Amateur<br>(Fixed links (2307 – 2387 MHz) paired with (2401 – 2481 MHz)<br>Several outside broadcasts links.<br>ISM band (2400 – 2483.5 MHz))<br>(FWA (PTP/PTMP) (2307-2387 MHz)<br>FWA (PTP/PTMP) (2401 – 2481 MHz)<br>IMT2300 TDD (2300 | IMT2300 (Terrestrial) 2300 – 2400 MHz as per SADC FAP proposed common sub-allocation/ utilization | Refer to:<br>1) Radio Frequency Migration Plan Government Gazette Number 36334 (Notice no. 352 of 2013)<br>2) Radio Frequency Spectrum Assignment Plan Government Gazette Number 38640 (Notice No. 276 of 2015), IMT 2300<br>3) Feasibility study be performed in accordance with section 4.10.28. |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | – 2400 MHz) WLAN, FDDA and model ctrl. (2400 – 2483.5 MHz) Non-Specific SRDs and low power video surveillance (2400 – 2483.5 MHz) RFID (2 400 – 2 483.5 MHz) ISM applications (2400 – 2483.5 MHz)) | | |
| **2500 – 2520 & 2520 – 2655 & 2655 – 2670 & 2670 - 2690** | | 2500-2655 MHz MOBILE except aeronautical mobile (IMT2600 MTX (2500 – 2570 MHz) IMT2600 TDD (2570 | BFWA Mobile IMT | Refer to: 1) Radio Frequency Migration Plan Government Gazette Number 36334 (Notice no. 352 of 2013) |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | – 2620MHz) IMT2600 BTX (2620 – 2690MHz) IMT (2500-2690 MHz)) | | 2) Radio Frequency Spectrum Assignment Plan Government Gazette Number 38640 (Notice No. 277 of 2015), IMT 2600 3) Radio Frequency Spectrum Assignment Plan needs to be updated. to include centre gap (i.e. 2570 – 2620 MHz) |
| | | 2655-2690 MHz MOBILE except aeronautical mobile Radio astronomy (IMT2600 BTX (2620 – 2690MHz); IMT (2500-2690 MHz)) | | |
| **3 300-3 400 MHz** **RADIOLOCATION** **5.149 5.429 5.429A 5.429B 5.430** | | 3 300-3 400 MHz RADIOLOCATION (Government Services | IMT Res. 223 (Rev.WRC-15) | Feasibility Study to be undertaken considering the outcome of the sharing and compatibility studies called for by Resolution 223 (WRC-15) currently |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | 5.149<br>5.429A<br>5.429B | | underway within the ITU-R, there might be a need to migrate Radars out of this band. This will be addressed through an update of the migration plan.<br><br>3) The band 3300 to 3400 has been identified for IMT through resolution 223 (Rev WRC-15)<br><br>4) This can form a continuous block of IMT frequencies with the band 3400 to 3600 MHz<br><br>5) Sharing and compatibility studies called for resolution 223 (Rev. WRC-15) are currently |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | | | undertaken within ITU-R.<br>6) Radio Frequency Spectrum Assignment Plan to be developed in line with the study results conducted within ITU-R WP 5D and in accordance with the latest version of Recommendation 1036 in respect of L-Band. |
| **3400 – 3600** | | FIXED<br>MOBILE<br>(MT3500 TDD (3400 – 3600 MHz)) | IMT Roadmap Government Gazette Number 38213 14 November 2014<br>BFWA<br>Mobile IMT | Refer to:<br>1) Radio Frequency Migration Plan Government Gazette Number 36334 (Notice no. 352 of 2013)<br>2) Radio Frequency Spectrum Assignment Plan Government |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | | | Gazette Number 38640 (Notice No. 278 of 2015), IMT 3500<br><br>3) An amendment to the Radio Frequency Spectrum Assignment Plan IMT2600 to be undertaken in order to change the channel arrangement from FDD to TDD.to maximise the efficient use of spectrum. |
| **3600 – 4200** | | FIXED<br><br>FIXED-SATELLITE (space-to-Earth)<br><br>(Satellite (VSAT, downlink), Terrestrial backhaul) (Fixed links (4 GHz) | (3600-4200 MHz) Fixed services (PTP)<br><br>(3600-4200 MHz) Fixed-satellite (space-to-Earth) (PTP/VSAT/SNG) | As per the NRFP 2018. The sub-band 3 600-3 800 MHz could be used for BFWA where frequency sharing with FS PTP and/or FSS is feasible. The channelling |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | (3600 – 4200 MHz)) | (3600-3800 MHz) Broadband Fixed Wireless Access (BFWA)<br>as per SADC FAP proposed common sub-allocation/ utilization | arrangement for PTP links in this band is based on ITU-R Recommendation F.635 Annex 1 (also refer to 4.12.35). |
| **5150 – 5250 & 5250 – 5255 & 5255 - 5350** | | (5150 – 5250 MHz)<br>AERONAUTICAL RADIONAVIGATION<br>FIXED-SATELLITE-SERVICE (Earth-to-space)<br>MOBILE except aeronautical mobile<br>(Wireless Access (short range))<br>(NGSO MSS feeder links | Wireless Access Systems / RLAN<br>As per SADC FAP proposed common sub-allocation/ utilization | Feasibility study to be performed. License exempt; Wireless Access Systems / Radio Local Access Network (WAS & RLAN) indoor use only. as per Notice 184 of 2011 Government Gazette 34172 *(previously Notice number 944 of 2008 in Government* |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | (5091 – 5150 MHz) WAS / RLAN (5150 – 5350 MHz) (indoor use only)) | | *Gazette 31321)*<br>No migration at this stage<br>Refer to section 4.10.33. |
| | | (5250 – 5255 MHz)<br>SPACE RESEARCH<br>MOBILE except aeronautical mobile<br>WAS / RLAN (5150 – 5350 MHz) (indoor use only) | | |
| | | (5255 – 5350 MHz)<br>EARTH EXPLORATION SATELLITE (active)<br>RADIOLOCATION<br>SPACE RESEARCH (active) | | |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | MOBILE except aeronautical mobile (WAS / RLAN (5150 – 5350 MHz) (indoor use only)) | | |
| **5470 – 5570 & 5570 – 5650 & 5650 - 5725** | | (5470 – 5570 MHz)<br>MARITME RADIONAVIGATION<br>MOBILE except aeronautical mobile<br>EARTH EXPLORATION SATELLITE (active)<br>SPACE RESEARCH (active)<br>RADIOLOCATION<br>(Maritime radionavigation (radar) and Wireless Access | Wireless Access Systems / RLAN<br>As per SADC FAP proposed common sub-allocation/ utilization | Feasibility study to be performed. No migration planned; as per as per Notice 184 of 2011 Government Gazette 34172 *(previously Notice number 944 of 2008 in Government Gazette 31321)*<br>(refer to 0)<br>No migration at this stage |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | (short range)) (WAS / RLAN (5150 – 5350 MHz) (indoor use only)) | | |
| | | (5570 – 5650 MHz)<br>MARITME RADIONAVIGATION<br>MOBILE except aeronautical mobile<br>RADIOLOCATION (Location Radar Ground based meteorological. radars (5600 – 5650 MHz) WAS / RLAN (5470 – 5725 MHz) Weather Radars (5600 – 5650 MHz)) | | |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | (5650 – 5725 MHz)<br>RADIOLOCATION<br>MOBILE except aeronautical mobile<br>Amateur<br>Space Research (deep space) (WAS / RLAN (5470 – 5725 MHz) (indoor use only)) | | |
| **5725 – 5850** | | **5725 – 5830**<br>FIXED-SATELLITE (Earth-to-space)<br>RADIOLOCATION<br>Amateur<br>Fixed<br>(ISM, Amateur, SRD) | WRC15 | Feasibility study to be performed. No migration for South Africa; maintain for ISM as per Notice 184 of 2011 Government Gazette 34172 *(previously Notice number 926 of 2008 in Government Gazette 31290).* |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | **5830 – 5850**<br>IXED-SATELLITE (Earth-to space)<br>RADIOLOCATION<br>Amateur<br>Amateur-satellite (space-to-Earth)<br>(Fixed links (5725 – 5850 MHz)<br>RTT data (5795 – 5815 MHz)<br>ISM applications (5725 – 5875 MHz)<br>BFWA (5725-5850 MHz)<br>ISM (5725-5875 MHz)<br>RTTT (Road Transport and Traffic Telematics) (5795-5815 MHz)<br>SRD applications (5 725- | | |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | 5 875 MHz) SRD - Transport and information control systems (5 805-5 815 MHz) | | |
| **5850 -5925** | | FIXED<br>FIXED-SATELLITE (Earth-to-space)<br>MOBILE (C-band uplink (VSAT/SNG /PTP links) ISM applications (5725 – 5875 MHz) Fixed-satellite uplinks. (PTP/VSAT/ SNG) (5850-6425 MHz) FIXED links (5850-5925 MHz) ISM (5725-5875 MHz)) | (5850-6425 MHz) Fixed-satellite uplinks (PTP/VSAT/SNG)/ temporary Outside broadcast links.<br>(5850-5925 MHz) FIXED links<br>(5725-5875 MHz) ISM<br>as per SADC FAP proposed common sub-allocation/ utilization | Feasibility study to be performed.<br>(refer to 4.12.40) |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| **5925 – 6700** | | FIXED<br>FIXED-SATELLITE (Earth-to-space)<br>(Fixed links/ VSAT, FSS, SNG feeder links)<br>(Fixed links - Lower 6 GHz (5925-6425 MHz) and Upper 6 GHz (6425-7110 MHz), BFWA Fixed-satellite uplinks. (PTP/VSAT/ SNG) (5850-6425 MHz) ESVs (5925 – 6425 MHz)) | 5925 – 6425 MHz Fixed links<br>6425 – 7110 MHz Fixed links<br>as per SADC FAP proposed common sub-allocation/ utilization | Feasibility study to be performed.<br>(refer to 4.12.41)<br>) |
| **10700 – 10950 & 10950 – 11200 & 11200 – 11450 & 11450 - 11700** | | FIXED<br>FIXED-SATELLITE (space-to-earth)/(ear | No change | All assignments remain as-is.<br>(refer to 0) |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| | | th-to-space)<br>MOBILE except aeronautical mobile<br>(Ku-band satellite)<br>(Fixed Links (11 GHz) (10.7 – 11.7 GHz) Ku-band downlink (VSAT/SNG /BSS feeder links<br>Fixed links - 11 GHz (10.7-11.7 GHz) Fixed-satellite downlinks (PTP/VSAT/ SNG)), | | |
| **15400 – 15430 & 15430 – 15630 & 15630 - 15700** | | RADIOLOCATION<br>AERONAUTICAL RADIONAVIGATION (Radio Altimeters<br>Radars) | Radio location service<br>as per WRC-07 Res. 614 | No Migration |

| Frequency Band (MHz) | Existing Allocation in NRFP 2021 (Applications) | Proposed Allocation/ (Utilization) | | Notes on migration/ usage |
|---|---|---|---|---|
| **40000 – above** | | | Allocate for high capacity PTP links | Feasibility studies to be performed.<br>(refer to 4.12.43)<br>Refer to:<br>Radio Frequency Migration Plan Government Gazette Number 36334 (Notice no. 352 of 2013) |

# Appendix A Glossary

| | |
|---|---|
| **Act** | means the Electronic Communications Act, 2005 (Act No. 36 of 2005); |
| **Authority** | means ICASA is the Independent Communications Authority of South Africa; |
| **3G** | means 3rd Generation of mobile telecommunications and a generation of standards for mobile phones and mobile telecommunication services fulfilling the International Mobile Telecommunications-2000 (IMT-2000) specifications by the ITU |
| **Amateur** | means a person who is interested in the radio technique solely for a private reason and not for financial gain and to whom the Authority has granted an amateur radio station licence and shall mean a natural person and shall not include a juristic person or an association: provided that an amateur radio station licence may be issued to a licensed radio amateur acting on behalf of a duly founded amateur radio association; |
| **Assignment** | means the authorization given by the authority to use a radio frequency or radio frequency channel under specified conditions; |
| **Base station** | means a land radio station in the land mobile service for a service with land mobile stations; |
| **BS** | means Broadcast Service |
| **BTX** | means Base Transceiver; |
| **Burglar alarm service** | means a land mobile service installed, maintained, and operated to monitor burglar alarm signals of clients by means of a signal forwarded from a radio transmitter to a central position; |
| **Burglar alarm transmitter** | means a transmission radio station in the land mobile service that is intended to transmit automatic alarm signals to a central position; |
| **CDMA** | means Code Division Multiple Access |
| **CEPT** | means Conference of European Posts and Telecommunications Authorities; |
| **Citizen-band radio service** | means a private, two-way, limited coverage speech communication service in the land mobile service to personal and business operations, which may also be used as a paging system; |
| **Communal radio repeater station service** | means a land mobile service installed, maintained, and operated via repeater stations that are available for communal use; |
| **Cordless Phone** | means a portable telephone with a wireless handset that communicates via radio waves with a base station connected to a fixed telephone line, within a limited range of its base station; |
| **DAB** | means Digital Audio Broadcasting is a digital radio technology for broadcasting radio stations |

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| **DECT** | means Digital Enhanced Cordless Telecommunications is a digital communication standard, which is primarily used for creating cordless phone systems |
| **DECT** | means Digitally Enhanced Cordless Telephone 1880 - 1900MHz; |
| **DF** | means Dual Frequency |
| **DTT** | means Digital Terrestrial Television |
| **DTT Mobile** | means Digital Terrestrial Television for Mobile services |
| **e.i.r.p** | means effective isotopically radiated power; |
| **e.r.p** | means effective radiated power, is the product of the power supplied to an antenna and its gain relative to a half wave dipole in a given direction; |
| **EBU** | means European Broadcasting Union |
| **ECA** | means Electronic Communications ACT of South Africa |
| **ECNS** | means Electronic Communications Network Services; |
| **ECS** | means Electronic Communications Services; |
| **EDGE** | means Enhanced Data rates for GSM Evolution is a digital mobile phone technology that allows improved data transmission rates as a backward-compatible extension of GSM |
| **EMC** | means Electromagnetic Compatibility; |
| **ETSI** | means European Telecommunications Standards Institute |
| **FDMA** | means Frequency Division Multiple Access |
| **FLEX** | means paging software originally developed for Motorola; |
| **FMP** | means Frequency Migration Plan |
| **FPLMTS** | means Future Public Land Mobile Telecommunications System also called IMT-2000 |
| **FTBFP 2008** | means Final Terrestrial Broadcast Frequency Plan of 2008 |
| **FWBA** | Fixed Wireless Broadband Access |
| **GHz** | means Gigahertz of Radio Frequency Spectrum; |
| **GE06** | means Digital Broadcast Conference held in Geneva, Switzerland in 2006. |
| **GMDSS** | means the Global Maritime Distress and Safety System is an internationally agreed-upon set of safety procedures, types of equipment, and communication protocols used to increase safety and make it easier to rescue distressed ships, boats, and aircraft. |
| **GSM** | means Global System for Mobile Communications, (originally Groupe Spécial Mobile), is a standard set developed by the European Telecommunications Standards Institute (ETSI) to describe technologies for second generation (2G) digital cellular networks |
| **GSM-R** | means GSM for Railways |
| **HF** | means High Frequency; |
| **IMT** | International Mobile Telecommunications |
| **IMT** | means International Mobile Telecommunications |

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|---|---|
| **Inductive Loop Systems** | means radio apparatus which operates by producing a controlled magnetic field within which a predetermined recognisable signal is formed; |
| **INMARSAT** | means International Maritime Satellite |
| **ISM** | means Industrial, Scientific, and Medical; |
| **ITU** | means International Telecommunications Union |
| **ITU RR** | means International Telecommunications Union Radio Regulations |
| **kHz** | means kilohertz of Radio Frequency Spectrum; |
| **Land mobile service** | means a mobile radio-communication service between fixed stations and mobile land stations, or between land mobile stations; |
| **LEO** | means Low Earth Orbit satellites |
| **LMR** | means Land Mobile Radio |
| **Low Power Radio** | means radio apparatus, normally hand-held radios used for short range two-way voice communications; |
| **LTE** | means Long Term Evolution is a standard for wireless communication of high-speed data for mobile phones and data terminals. It is based on the GSM/EDGE and UMTS/HSPA network technologies |
| **M2M** | means Machine to Machine |
| **MFN** | means Multiple Frequency Networks |
| **MHz** | means Megahertz of Radio Frequency Spectrum; |
| **MIMO** | means Multiple-Input and Multiple-Output is the use of multiple antennas at both the transmitter and receiver to improve communication performance |
| **Mobile station** | means a radio station that is intended to be operated while it is in motion or while it is stationary at an unspecified place; |
| **Model Control apparatus** | means radio apparatus used to control the movement of the model in the air, on land or over or under the water surface; |
| **MTX** | means Mobile Transceiver; |
| **Non-specific Short-Range Devices** | means radio apparatus used for general telemetry, telecommand, alarms and data applications with a present duty cycle (0.1%: S duty cycle< 100%); |
| **NRFP** | means the National Radio Frequency Plan 2010 for South Africa |
| **PAMR** | means Public Access Mobile Radio |
| **PMR** | means Private Mobile Radio or Professional Mobile Radio |
| **PMR** | means Public Mobile Radio is radio apparatus used for short range two-way voice communications; |
| **PPDR** | Public Protection and Disaster Relief for emergency and safety radio communications systems |
| **PTM** | means Point to Multipoint |
| **PTP** | means Point to Point |

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|---|---|
| **Radio trunking** | means a technique by means of which free channels out of a group of radio frequency channels allocated to a base station are automatically made available for the establishment of a connection between the stations of a user; |
| **Radio-beacon station** | means a radio station whose radiation is intended to enable a mobile station to fix its position or obtain its bearing with regard to the radio beacon; |
| **Radio-communication** | means all electronic communication by means of radio waves; |
| **Relay or repeater station** | means a land station in the land mobile service; |
| **RFID** | means Radio Frequency identification is a wireless system that uses radio frequency communication to automatically identify, track and manage objects, people, or animals. It consists of two main components viz, tag and a reader which are tuned to the same frequency; |
| **RLAN** | means Radio Local Access Network is the high data rate two way (duplex) wireless data communications network; |
| **SABRE** | means South African Band Re-Planning Exercise |
| **SADC** | means Southern African Development Community |
| **SADC FAP** | means Southern African Development Community Frequency Allocation Plan: |
| **SAPS** | means South African Police Service |
| **SATFA** | means South African Table of Frequency Allocations 2004 |
| **Self Helps** | means repeater stations rebroadcasting television channels to limited areas on a low power basis |
| **Service licence** | means a BS, ECS or ECNS licence; |
| **SF** | means Single Frequency |
| **SFN** | means Single Frequency Network |
| **Ship station** | means a mobile station in the maritime mobile service that has been erected |
| **SNG** | means Satellite News Gathering |
| **Spread spectrum** | means a form of wireless communications in which the frequency of the transmitted signal is deliberately varied, resulting in a much greater bandwidth than the signal would have if its frequency were not varied; |
| **SRD** | means Short Range Device is a piece of apparatus which includes a transmitter, and/or a receiver and or parts thereof, used in alarm, telecommand telemetry applications, etc., operating with analogue speech/music or data (analogue and/or digital) or with combined analogue speech/music and data, using any modulation type intended to operate over short distances; |

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|---|---|
| **Studio Links** | means point to point links in the broadcasting frequency bands used to connect studios to transmitters |
| **STB** | means Set Top Box for DVB-T2 reception |
| **T-DAB** | means Terrestrial Digital Audio Broadcasting |
| **TDMA** | means Time Division Multiple Access |
| **Telemetry** | means the transmission of remotely measured data; |
| **TETRA** | means Terrestrial Trunked Radio is a professional mobile radio [2] and two-way transceiver specification. TETRA was specifically designed for use by government agencies, emergency services, (police forces, fire departments, ambulance) for public safety networks, rail transportation staff for train radios, transport services and the military. TETRA is an ETSI standard. |
| **TPC** | means Transmitter Power Control is a technical mechanism used within some networking devices in order to prevent unwanted interference between wireless networks; |
| **UHF** | means Ultra High Frequency; |
| **UMTS** | means Universal Mobile Telecommunications System is a third-generation mobile cellular technology for networks based on the GSM standard |
| **VHF** | means Very High Frequency; |
| **Video Surveillance Equipment** | means radio apparatus used for security camera purposes to replace the cable between a camera and a monitor; |
| **VSAT** | means Very Small Aperture Terminal is a two-way satellite ground station that is smaller than 3 meters' diameter |
| **WAS** | means Wireless Access Systems is end-user radio connections to public or private core networks; |
| **Wideband Wireless Systems** | means radio apparatus that uses spread spectrum techniques and has high bit rate; |
| **WRC** | means the World Radiocommunication Conference. |
| **WRC 2007** | means World Radiocommunication Conference 2007 held in Geneva |
| **WRC 2012** | means World Radiocommunication Conference 2012 held in Geneva |
| **WRC 2015** | means World Radiocommunication Conference 2015 held in Geneva |
| **WRC 19** | means World Radiocommunication Conference 2019 held in Geneva |
| **WRC 23** | means World Radiocommunication Conference 2023 held in Geneva |

# Appendix B **ECA – Section 34**

*Radio frequency plan*

*34.*

*(1) The Minister, in the exercise of his or her functions, represents the Republic in international fora, including the ITU, in respect of—*

*(a) the international allotment of radio frequency spectrum; and*

*(b) the international coordination of radio frequency spectrum usage, in accordance with international treaties, multinational and bilateral agreements entered into by the Republic.*

*(2) The Minister must approve the national radio frequency plan developed by the Authority, which must set out the specific frequency bands designated for use by particular types of services, taking into account the radio frequency spectrum bands allocated to the security services.*

*(3) The Authority must assign radio frequencies consistent with the national radio frequency plan for the use of radio frequency spectrum by licence holders and other services that may be provided pursuant to a licence exemption.*

*(4) The Authority must, within 12 months of the coming into force of this Act, prepare the national radio frequency plan or make appropriate modification to any existing radio frequency plan to bring it into conformity with this Act.*

*(5) The national radio frequency plan must be updated and amended, when necessary, in order to keep the plan current. When updating and amending this plan due regard must be given to the current and future usage of the radio frequency spectrum.*

*(6) The national radio frequency plan must—*

*(a) designate the radio frequency bands to be used for particular types of services;*

*(b) ensure that the radio frequency spectrum is utilised and managed in an orderly, efficient, and effective manner;*

*(c) aim at reducing congestion in the use of the radio frequency spectrum;*

*(d) aim at protecting radio frequency spectrum licensees from harmful interference;*

*(e) provide for flexibility and the rapid and efficient introduction of new technologies;*

*(f) aim at providing opportunities for the introduction of the widest range of services and the maximum number of users thereof as is practically feasible.*

*(7) In preparing the national radio frequency plan as contemplated in subsection (4), the Authority must—*

*(a) take into account the ITU's international spectrum allotments for radio frequency spectrum use, in so far as ITU allocations have been adopted or agreed upon by the*

*Republic, and give due regard to the reports of experts in the field of spectrum or radio frequency planning and to internationally accepted methods for preparing such plans;*

*(b) take into account existing uses of the radio frequency spectrum and any radio frequency band plans in existence or in the course of preparation; and*

*(c) consult with the Minister to—*

*(i) incorporate the radio frequency spectrum allocated by the Minister for the exclusive use of the security services into the national radio frequency plan;*

*(ii) take account of the government's current and planned uses of the radio frequency spectrum, including but not limited to, civil aviation, aeronautical services, and scientific research; and*

*(iii) co-ordinate a plan for migration of existing users, as applicable, to make available radio frequency spectrum to satisfy the requirements of subsection (2) and the objects of this Act and of the related legislation.*

*(8) The Authority must give notice of its intention to prepare a national radio frequency plan in the Gazette and in such notice invite interested parties to submit their written representations to the Authority within such period as may be specified in such notice.*

*(9) The Authority may, after the period referred to in subsection (8) has passed, hold a hearing in respect of the proposed national radio frequency plan.*

*(10) After the hearing, if any, and after due consideration of any written representations received in response to the notice mentioned in subsection (8) or tendered at the hearing, the Authority must forward the national radio frequency plan to the Minister for approval.*

*(11) The Minister must, within 30 days of receipt of the national radio frequency plan, either approve the plan, at which time the plan must become effective, or notify the Authority that further consultation is required.*

*(12) Upon approval of the national radio frequency plan by the Minister, the Authority must publish the plan in the Gazette.*

*(13) Any radio frequency plan approved in terms of this section and all the comments, representations and other documents received in response to the notice contemplated in subsection (8) or tendered at the hearing must be—*

*(a) kept at the offices of the Authority; and*

*(b) open for public inspection by interested persons during the normal office hours of the Authority.*

*(14) The Authority must, at the request of any person and on payment of such fee as may be prescribed, furnish him or her with a copy of the radio frequency plan.*

*(15) The provisions of subsections (6) to (14) apply, with the necessary changes, in relation to any amendment made by the Authority to the radio frequency plan.*

*(16) The Authority may, where the national radio frequency plan identifies radio frequency spectrum that is occupied and requires the migration of the users of such radio frequency spectrum to other radio frequency bands, migrate the users to such other radio frequency bands in accordance with the national radio frequency plan, except where such migration involves governmental entities or organisations, in which case the Authority—*

*(a) must refer the matter to the Minister; and*

*(b) may migrate the users after consultation with the Minister*

# Appendix C SABRE 2 – 2001

SABRE 2[29] was a programme to re-plan the radio frequency spectrum from 3GHz to 70 MHz, partly driven by the need to in-migrate fixed-links from below 3Gz.

SABRE 2 made the following comment on migration issues above 3 GHz.

*Above 3 GHz the cost of backbone infrastructure equipment is borne by one or a few organisations. Band reallocation and spectrum use migration activities have to carefully consider industry's return on investment over pre-planned equipment life cycles. Ideally any additionally identified SABRE 2 band migrations will be voluntary and will occur within the constraints of the infrastructure life cycle.*

*A number of bands were identified during the SABRE 2 project that requires consideration due to anticipated future congestion and reallocation. Three types of migration are recommended; band, equipment, and channels. These migrations are viewed as voluntary because they are expected to occur as part of the natural system life cycle.*

| Band | Migration Objective | Target Date |
|---|---|---|
| 3600-4200 MHz | Analogue to digital terrestrial systems | 31 December 2005 |
| 5925-6425 MHz<br>6425-7110 MHz | Analogue to digital systems | 31 December 2005 |
| 7110-7425 MHz<br>7425-7750 MHz | Analogue to digital systems | 31 December 2005 |
| 7110-7425 MHz<br>7425 - 7750 MHz | Digital systems to channel plan | Not specified |
| 10.7- 11.7 GHz | Analogue to digital systems | 31 December 2005 |
| 21.4 22 GHz | FS reverts to secondary service 22-22.6 GHz // 23.0 23.6 GHz,<br>26 GHz and 38 GHz bands also available | 1 April 2007 |

*Operators are expected to identify all migration links, plan their migration, and coordinate their schedule with ICASA. at least three years before the deadline. The 2 1.4 - 22.0 GHz band will revert from Fixed, Mobile and Broadcasting Satellite Services to the Broadcast Satellite Service application in the year 2007. Currently, there is a limited set of licences in the band according to*

[29] Radio frequency spectrum band plan covering the range 3 GHz to 70 GHz – (SABRE-2) Notice 1920 of 2001

*ICASA records. Operators intending to maintain FS links in the 21.4-22 GHz band will be accommodated with no protection after 1 April 2007. Another migration issue is the "opening of the 38 GHz band." Prior to making assignments in this portion of the spectrum, it is recommended that a migration of 20-24 GHz FS 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.*

# Appendix D SATFA – 2004

The South African Table of Frequency Allocations 2004[30] consolidated SABRE 1 and SABRE 2 in one plan covering the range 20MHz to 70 GHz.

Regarding migration, the following points were made:

*The migration process has had its successes and failures. Some migration time-frames have been revised whilst others are maintained at their original deadlines. One can mention that the 2008 deadline for current public trunking operators has been reviewed at the request of the public trunking operators. The use of the band 406.1 - 407.625 // 416.1 - 417.625 MHz by the national electricity utility has been re-instated.*

The changes implemented in SATFA 2004 were listed as:

- *The Radio Frequency Identification systems (RFID) allocation in the 900 MHz band*
- *Pre-programmed low power PMR446 two-way radios.*
- *Allocation of Broadband FWA in the 2.6GHz band,*
- *Public Protection and Disaster relief (PPDR) bands which includes 380 -385//390-395MHz.*
- *Full allocation of 2x10MHz E-GSM spectrum. Previously the E-GSM allocation was 2 x 400 kHz short because of an allocation to a now defunct two-way paging service.*
- *Allocation of the 5GHz band to "mobile" so as to enable wireless LAN" Hotspots".*
- *Allocation of the band 14-14.5 GHz to aeronautical mobile to enable broadband internet access by aircraft passengers.*
- *At the WRC03 the South African delegation added the country name to an ITU Radio Regulation footnote which seeks to protect future radio astronomy activities in the 14GHz band.*

[30] The South African Table of Frequency Allocations (SATFA) – Notice 1442 of 2004.

# Appendix E **National Radio Frequency Plan – 2010 and 2013**

The National Radio Frequency Plan 2010[31] updated SATFA 2004[32] and extended the frequency range covered (now 9 kHz – 3000 GHz[33]). Its stated aim was to incorporate the decisions taken by WRC and include updates on the Table of Frequency Allocations extending up to 3000GHz. In 2013, the National Radio Frequency Plan 2013[34] was updated.

The fundamental objectives informing the National Radio Frequency Plan were to:

- *To effect.... policy directives published in Government Gazette No. 30308 of 17 September 2007 which states that the Authority should take into account the results of WRC 2007 when revising the national radio frequency plan.*
- *To update the table with changes made by WRC 97, WRC 2000, WRC03, and WRC07*
- *To allocate spectrum that was previously not allocated by extending the range to cover 9 kHz to 3000 GHz in line with the Act and ITU-R*
- *To make spectrum available for new radio interfaces such as WIMAX, which were included as the newest member of the IMT family of standards.*
- *To facilitate future identification of spectrum for very low power fixed links in the spectrum below 1 GHz in order to promote small medium and micro enterprises in the communications industry.*
- *To facilitate developments of the frequency migration strategies and to facilitate migration of high-capacity fixed links to higher frequency bands.*
- *To facilitate the development of a framework for usage of ISM frequency bands to support rural development objectives.*
- *To promote access to lower frequency bands for broadband wireless access to support rural development*

[31] The National Radio Frequency Plan – Notice 727 of 2010.

[32] The main reason for the name change is that the term National Radio Frequency Plan is used in the ECA.

[33] Although 1000 – 3000 GHz is not allocated.

[34] National Radio Frequency Plan 2013, Government Gazette 36336 (354 of 2013)

- *To promote access to frequency bands below 1 GHz such as the 790 – 862 MHz band which offers both coverage and capacity to help bridge the "digital gap" between sparsely-populated and densely-populated areas and to increase universal service and access in the country.*

The following changes were implemented:

- *Identification and allocation of spectrum for IMT - spectrum has been allocated in line with WRC 07 in the bands 790 - 862 MHz, 2300 – 2400 MHz, 2500 - 2690 MHz, 3400 - 3600 MHz, 1518 -1525 MHz and 1668-1675 MHz. Where there are existing services that need to be protected such provision has been made.*
- *Allocation of spectrum for amateur radio - spectrum has been allocated in line with WRC 07 and previous WRCs in the bands 135.7 - 137.8 kHz, 2300 - 2450 on secondary basis.*
- *Addition of a proposal to change DTH from secondary to primary status in the 10.7-11.7 GHz.*
- *National footnote NF 49 of SATFA 2004 has been replaced by national footnote NF 2 addressing the Astronomy Geographic Advantage Act, 2007 (Act No. 21 of 2007)*
- *Updated ISM frequency bands in line with Government Gazette Number 31321 Notice No. 944 of 08 August 2008*
- *Updated the 5725 - 5850 MHz band in line with Government Gazette Number 31290 Notice No.926 of 29 July 2008.*
- *Added allocations for inductive loop and RFID in line with Government Gazette Number 31290 Notice No. 926 of 29 July 2008*
- *Added new maritime, aeronautical allocations below 20 MHz and new satellite allocations above 70 GHz.*

The Plan did not specify any migration activities, although the plan includes the WRC mandated allocation of the 800 MHz to IMT (digital dividend 2).

# Appendix F **Appendix F National Radio Frequency Plan – 2018**

This National Radio Frequency Plan *2018* (NRFP-18) has been prepared under Section 34 of the Act.

The NRFP-17allocates the *Radio Frequency* Spectrum to Radio Services in the Frequency Bands between 8.3 kHz and 3000 GHz. All frequency assignments must be in accordance national radio frequency plan.

This revised *NRFP-18* incorporates the decisions taken by 2015 World Radiocommunication Conferences (WRC-15). The revision reflects the 2016 version of the ITU Radio Regulations, including the frequency allocations relevant to Region 1 and its associated footnotes. It also includes updates on the Table of Frequency Allocations extending up to 3000 GHz and South African National Footnotes. The revised NRFP-17 further reflects agreements taken at regional level including that of the African Telecommunication Union (ATU) and the Southern African Development Community (SADC)[35] *Frequency Allocation Plan (FAP)*[36]*. These aforementioned agreements do not supersede any regulations developed by the Authority.*

The Authority consulted with the *government Department that is responsible for approving the frequency band plan as prescribed in the Electronic Communications Act,* to incorporate the radio frequency spectrum allocated by the Minister for use by security services taking into account the Government's current and planned use of radio frequency spectrum, including but not limited to, civil aviation, and aeronautical services and scientific research. This updated version of the NRFP-17 incorporates the outcome of the public consultation as mandated by the EC Act.

[35] http://www.crasa.org/crasa-publication/cat/18/regulatory-guidelines/

[36] http://www.crasa.org/common_up/crasa-setup/10-11-2016_SADC%20FREQUENCY%20ALLOCATION%20PLAN%202016.pdf

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

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

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

**The following updates and amendments amongst others have been implemented in NRFP -18:**

- National footnotes have been revised.
- The resolutions and decisions taken by World Radiocommunication Conferences preceding WRC-15.
- The resolutions and decisions taken by the WRC-15, as ratified by the South Africa (Republic of), have been reflected.
- The Astronomy Geographic Advantage Act, 2007 (Act No. 21 of 2007) covered in a separate chapter in view of the award of the Square Kilometre Array (SKA) to South Africa. The commencement of the Astronomy Geographic Advantage Act, 2007 (Act No. 21 of 2007) In terms of section 53 of the Astronomy Geographic Advantage Act. 2007 (Act No. 21 of 2007), the 24 April 2009 has been determined as the date on which the said Act comes into operation.
- The Regulations apply to the Karoo Central Astronomy Advantage Areas declared for the purpose of radio astronomy and related scientific endeavours in terms of sections 9(1) and 9(2) of the Act.
- Incorporated references to the SADC Frequency Allocation Plan (FAP) and SADC Harmonised Guidelines

# Appendix G : Summary of the Impact of the Proposed Frequency Migrations from 2013 included in this document

## 1 Technical Investigation

The table below and subsequent sections include additional information on some frequency bands which were included in the study.

| Item | RFSAP | GG. No. | Notice |
|---|---|---|---|
| 1 | 75.2 to 87.5 MHz | 41164 | 781 of 2017 |
| 2 | 138 to 143.6 MHz | 41164 | 785 of 2017 |
| 3 | 150.5 to 153 MHz | 41164 | 786 of 2017 |
| 4 | 156.4785 to 156.5625 MHz | 41350 | 971 of 2017 |
| 5 | 380 to 400 MHz | 41164 | 787 of 2017 |
| 6 | 403 to 406 MHz | RFSAP to be developed | |
| 7 | 406 to 426 MHz | RFSAP to be developed (Destination band for Transnet) | |
| 8 | 410 to 413 MHz paired with 420 to 423 MHz | RFSAP to be developed (Destination band for Transnet) | |
| 9 | 426 to 430 | RFSAP to be developed | |
| 10 | 440 to 441 MHz | 41164 | 788 of 2017 |
| 11 | 440 to 450 MHz | RFSAP to be developed | |
| 12 | 450 to 470 MHz | | |
| 13 | 452.5 - 457.5 paired with 462.5 - 467.5 | Band 31 identified for trial by Transnet. Transnet successfully applied for trial license and tests were successful. | |
| 14 | 694 to 876 MHz | | |
| 15 | 876 to 880 MHz | | |
| 16 | 921 to 925 MHz | | |
| 17 | 880 to 960 MHz | | |
| 18 | 880 to 915 MHz | | |
| 19 | IMT850 | 41082 | 648 of 2017 |
| 20 | 925 to 960 MHz | | |

| | | | |
|---|---|---|---|
| 21 | 942 to 960 MHz | RFSAP to be developed | |
| 22 | 1350 to 1375 MHz paired with 1492 to 1517 MHz and 1375 to 1400 MHz paired 1427 to 1452 MHz | Feasibility studies to done after WRC 15. This band is currently allocated to low capacity PTP/DF links | |
| 23 | 1452 to 1492 MHz | Feasibility study to be done. Align the status of the channel arrangements in ITU-R.M1036 within Working party 5D | |
| 24 | 1518 to 1525 MHz | 41164 | 784 of 2017 |
| 25 | 1700 to 2290 MHz | | |
| 26 | 2025 to 2110 MHz | 41164 | 782 of 2017 |
| 27 | 2290 to 2300 MHz | RFSAP to be developed | |
| 28 | 2285 to 2300 MHz | 41164 | 783 of 2017 |
| 29 | 2300 to 2400 MHz | | |
| 30 | 2300 to 2450 MHz | Feasibility study to be considered and RFSAP to be developed | |
| 31 | 2500 to 2690 MHz | | |
| 32 | 3300 to 3400 MHz | Feasibility study to be done. Align the status of the channel arrangements in ITU-R.M1036 within Working party 5D | |
| 33 | 3400 to 3600 MHz | 38640 | 278 |

### 1.1 Applicable Frequency Allocation and Band information 69.25 MHz to 87.5 MHz

Frequency Band under investigation 69.25 MHz to 87.5 MHz

MOBILE except aeronautical mobile

Frequency Sub bands

Allocate following pairings.

Mobile 1 MTX 76.175 – 76.925 MHz paired with BTX 69.25 to 70 MHz

Mobile 2 MTX 75.2 – 76.175 MHz paired with BTX 70 to 70.975 MHz

Mobile 3 MTX 76.925 – 77.975 MHz paired with BTX 71.475 to 72.525 MHz

Mobile 4 MTX 78.625 – 80 MHz paired with BTX 73.425 to 74.8 MHz

Mobile 5 MTX 82.975 – 83.625 MHz paired with BTX 77.975 to 78.625 MHz

Mobile 6 MTX 87 – 87.5 MHz paired with BTX 80 to 80.5 MHz

Mobile 7 MTX 86.375 – 87 MHz paired with BTX 81 to 81.625 MHz

Mobile 8 MTX 85.025 – 86.375 MHz paired with BTX 81.625 to 82.975 MHz

Single Frequency Mobile Allocations

80.5 to 81 MHz

83.625 – 85.025 MHz

### 1.1.1 Channel Plans for the Frequency Allocation

(Mobile 2) MID-BAND DUPLEX FREQUENCIES

CHANNEL PLAN FOR 70-70.9625/75.2-76.1625MHz 2003 (12.5kHz)

| CHANNEL No. | BTX | MTX | REMARKS | S/GRADE |
|---|---|---|---|---|
| 1 | 70 | 75.2 | | |
| 2 | 70.0125 | 75.2125 | | |
| 3 | 70.025 | 75.225 | | |
| 4 | 70.0375 | 75.2375 | | |
| 5 | 70.05 | 75.25 | | |
| 6 | 70.0625 | 75.2625 | | |
| 7 | 70.075 | 75.275 | | |
| 8 | 70.0875 | 75.2875 | | |
| 9 | 70.1 | 75.3 | | |
| 10 | 70.1125 | 75.3125 | | |
| 11 | 70.125 | 75.325 | | |
| 12 | 70.1375 | 75.3375 | | |
| 13 | 70.15 | 75.35 | | |
| 14 | 70.1625 | 75.3625 | | |
| 15 | 70.175 | 75.375 | | |
| 16 | 70.1875 | 75.3875 | | |
| 17 | 70.2 | 75.4 | | |
| 18 | 70.2125 | 75.4125 | | |
| 19 | 70.225 | 75.425 | | |
| 20 | 70.2375 | 75.4375 | | |
| 21 | 70.25 | 75.45 | | |
| 22 | 70.2625 | 75.4625 | | |
| 23 | 70.275 | 75.475 | | |
| 24 | 70.2875 | 75.4875 | | |
| 25 | 70.3 | 75.5 | | |
| 26 | 70.3125 | 75.5125 | | |
| 27 | 70.325 | 75.525 | | |
| 28 | 70.3375 | 75.5375 | | |
| 29 | 70.35 | 75.55 | | |
| 30 | 70.3625 | 75.5625 | | |
| 31 | 70.375 | 75.575 | | |
| 32 | 70.3875 | 75.5875 | | |
| 33 | 70.4 | 75.6 | | |
| 34 | 70.4125 | 75.6125 | | |
| 35 | 70.425 | 75.625 | | |
| 36 | 70.4375 | 75.6375 | | |
| 37 | 70.45 | 75.65 | | |
| 38 | 70.4625 | 75.6625 | | |
| 39 | 70.475 | 75.675 | | |
| 40 | 70.4875 | 75.6875 | | |
| 41 | 70.5 | 75.7 | | |
| 42 | 70.5125 | 75.7125 | | |
| 43 | 70.525 | 75.725 | | |
| 44 | 70.5375 | 75.7375 | | |
| 45 | 70.55 | 75.75 | | |
| 46 | 70.5625 | 75.7625 | | |

| CHANNEL No. | BTX | MTX | REMARKS | S/GRADE |
|---|---|---|---|---|
| 47 | 70.575 | 75.775 | | |
| 48 | 70.5875 | 75.7875 | | |
| 49 | 70.6 | 75.8 | | |
| 50 | 70.6125 | 75.8125 | | |
| 51 | 70.625 | 75.825 | | |
| 52 | 70.6375 | 75.8375 | | |
| 53 | 70.65 | 75.85 | | |
| 54 | 70.6625 | 75.8625 | | |
| 55 | 70.675 | 75.875 | | |
| 56 | 70.6875 | 75.8875 | | |
| 57 | 70.7 | 75.9 | | |
| 58 | 70.7125 | 75.9125 | | |
| 59 | 70.725 | 75.925 | | |
| 60 | 70.7375 | 75.9375 | | |
| 61 | 70.75 | 75.95 | | |
| 62 | 70.7625 | 75.9625 | | |
| 63 | 70.775 | 75.975 | | |
| 64 | 70.7875 | 75.9875 | | |
| 65 | 70.8 | 76 | | |
| 66 | 70.8125 | 76.0125 | | |
| 67 | 70.825 | 76.025 | | |
| 68 | 70.8375 | 76.0375 | | |
| 69 | 70.85 | 76.05 | | |
| 70 | 70.8625 | 76.0625 | | |
| 71 | 70.875 | 76.075 | | |
| 72 | 70.8875 | 76.0875 | | |
| 73 | 70.9 | 76.1 | | |
| 74 | 70.9125 | 76.1125 | | |
| 75 | 70.925 | 76.125 | | |
| 76 | 70.9375 | 76.1375 | | |
| 77 | 70.95 | 76.15 | | |
| 78 | 70.9625 | 76.1625 | | |

## (Mobile 3) MID-BAND DUPLEX FREQUENCIES

CHANNEL PLAN FOR 71.475 - 72.5125/76.925 - 77.9625MHz 2003 (12.5 kHz)

| CHANNEL No. | BTX | MTX | REMARKS | S/GRADE |
|---|---|---|---|---|
| 1 | 71.475 | 76.925 | | |
| 2 | 71.4875 | 76.9375 | | |
| 3 | 71.5 | 76.95 | | |
| 4 | 71.5125 | 76.9625 | | |
| 5 | 71.525 | 76.975 | | |
| 6 | 71.5375 | 76.9875 | | |
| 7 | 71.55 | 77 | | |
| 8 | 71.5625 | 77.0125 | | |
| 9 | 71.575 | 77.025 | | |
| 10 | 71.5875 | 77.0375 | | |
| 11 | 71.6 | 77.05 | | |
| 12 | 71.6125 | 77.0625 | | |
| 13 | 71.625 | 77.075 | | |
| 14 | 71.6375 | 77.0875 | | |
| 15 | 71.65 | 77.1 | | |
| 16 | 71.6625 | 77.1125 | | |
| 17 | 71.675 | 77.125 | | |
| 18 | 71.6875 | 77.1375 | | |
| 19 | 71.7 | 77.15 | | |
| 20 | 71.7125 | 77.1625 | | |
| 21 | 71.725 | 77.175 | | |
| 22 | 71.7375 | 77.1875 | | |
| 23 | 71.75 | 77.2 | | |
| 24 | 71.7625 | 77.2125 | | |
| 25 | 71.775 | 77.225 | | |
| 26 | 71.7875 | 77.2375 | | |
| 27 | 71.8 | 77.25 | | |
| 28 | 71.8125 | 77.2625 | | |
| 29 | 71.825 | 77.275 | | |
| 30 | 71.8375 | 77.2875 | | |
| 31 | 71.85 | 77.3 | | |
| 32 | 71.8625 | 77.3125 | | |
| 33 | 71.875 | 77.325 | | |
| 34 | 71.8875 | 77.3375 | | |
| 35 | 71.9 | 77.35 | | |
| 36 | 71.9125 | 77.3625 | | |
| 37 | 71.925 | 77.375 | | |
| 38 | 71.9375 | 77.3875 | | |
| 39 | 71.95 | 77.4 | | |
| 40 | 71.9625 | 77.4125 | | |
| 41 | 71.975 | 77.425 | | |
| 42 | 71.9875 | 77.4375 | | |
| 43 | 72 | 77.45 | | |
| 44 | 72.0125 | 77.4625 | | |
| 45 | 72.025 | 77.475 | | |
| 46 | 72.0375 | 77.4875 | | |

| CHANNEL No. | BTX | MTX | REMARKS | S/GRADE |
|---|---|---|---|---|
| 47 | 72.05 | 77.5 | | |
| 48 | 72.0625 | 77.5125 | | |
| 49 | 72.075 | 77.525 | | |
| 50 | 72.0875 | 77.5375 | | |
| 51 | 72.1 | 77.55 | | |
| 52 | 72.1125 | 77.5625 | | |
| 53 | 72.125 | 77.575 | | |
| 54 | 72.1375 | 77.5875 | | |
| 55 | 72.15 | 77.6 | | |
| 56 | 72.1625 | 77.6125 | | |
| 57 | 72.175 | 77.625 | | |
| 58 | 72.1875 | 77.6375 | | |
| 59 | 72.2 | 77.65 | | |
| 60 | 72.2125 | 77.6625 | | |
| 61 | 72.225 | 77.675 | | |
| 62 | 72.2375 | 77.6875 | | |
| 63 | 72.25 | 77.7 | | |
| 64 | 72.2625 | 77.7125 | | |
| 65 | 72.275 | 77.725 | | |
| 66 | 72.2875 | 77.7375 | | |
| 67 | 72.3 | 77.75 | | |
| 68 | 72.3125 | 77.7625 | | |
| 69 | 72.325 | 77.775 | | |
| 70 | 72.3375 | 77.7875 | | |
| 71 | 72.35 | 77.8 | | |
| 72 | 72.3625 | 77.8125 | | |
| 73 | 72.375 | 77.825 | | |
| 74 | 72.3875 | 77.8375 | | |
| 75 | 72.4 | 77.85 | | |
| 76 | 72.4125 | 77.8625 | | |
| 77 | 72.425 | 77.875 | | |
| 78 | 72.4375 | 77.8875 | | |
| 79 | 72.45 | 77.9 | | |
| 80 | 72.4625 | 77.9125 | | |
| 81 | 72.475 | 77.925 | | |
| 82 | 72.4875 | 77.9375 | | |
| 83 | 72.5 | 77.95 | | |
| 84 | 72.5125 | 77.9625 | | |

## MID-BAND SIMPLEX FREQUENCIES

### CHANNEL PLAN FOR 72.525 - 73.425MHz 2003 (12.5 kHz)

| CHANNEL No. | BTX | | REMARKS | S/GRADE |
|---|---|---|---|---|
| 1 | 72.525 | | | |
| 2 | 72.5375 | | | |
| 3 | 72.55 | | | |
| 4 | 72.5625 | | | |
| 5 | 72.575 | | | |
| 6 | 72.5875 | | | |
| 7 | 72.6 | | | |
| 8 | 72.6125 | | | |
| 9 | 72.625 | | | |
| 10 | 72.6375 | | | |
| 11 | 72.65 | | | |
| 12 | 72.6625 | | | |
| 13 | 72.675 | | | |
| 14 | 72.6875 | | | |
| 15 | 72.7 | | | |
| 16 | 72.7125 | | | |
| 17 | 72.725 | | | |
| 18 | 72.7375 | | | |
| 19 | 72.75 | | | |
| 20 | 72.7625 | | | |
| 21 | 72.775 | | | |
| 22 | 72.7875 | | | |
| 23 | 72.8 | | | |
| 24 | 72.8125 | | | |
| 25 | 72.825 | | | |
| 26 | 72.8375 | | | |
| 27 | 72.85 | | | |
| 28 | 72.8625 | | | |
| 29 | 72.875 | | | |
| 30 | 72.8875 | | | |
| 31 | 72.9 | | | |
| 32 | 72.9125 | | | |
| 33 | 72.925 | | | |
| 34 | 72.9375 | | | |
| 35 | 72.95 | | | |
| 36 | 72.9625 | | | |
| 37 | 72.975 | | | |
| 38 | 72.9875 | | | |
| 39 | 73 | | | |
| 40 | 73.0125 | | | |
| 41 | 73.025 | | | |
| 42 | 73.0375 | | | |
| 43 | 73.05 | | | |
| 44 | 73.0625 | | | |
| 45 | 73.075 | | | |
| 46 | 73.0875 | | | |
| 47 | 73.1 | | | |
| 48 | 73.1125 | | | |
| 49 | 73.125 | | | |
| 50 | 73.1375 | | | |
| 51 | 73.15 | | | |
| 52 | 73.1625 | | | |
| 53 | 73.175 | | | |
| 54 | 73.1875 | | | |
| 55 | 73.2 | | | |
| 56 | 73.2125 | | | |
| 57 | 73.225 | | | |
| 58 | 73.2375 | | | |
| 59 | 73.25 | | | |
| 60 | 73.2625 | | | |
| 61 | 73.275 | | | |
| 62 | 73.2875 | | | |
| 63 | 73.3 | | | |
| 64 | 73.3125 | | | |
| 65 | 73.325 | | | |
| 66 | 73.3375 | | | |
| 67 | 73.35 | | | |
| 68 | 73.3625 | | | |
| 69 | 73.375 | | | |
| 70 | 73.3875 | | | |
| 71 | 73.4 | | | |
| 72 | 73.4125 | | | |

## (Mobile 4) MID-BAND DUPLEX FREQUENCIES

### CHANNEL PLAN FOR 73.425 - 74.8/78.625 - 80MHz 2003 (12.5kHz)

| CHANNEL No. | BTX | MTX | REMARKS | S/GRADE |
|---|---|---|---|---|
| 1 | 73.425 | 78.625 | | |
| 2 | 73.4375 | 78.6375 | | |
| 3 | 73.45 | 78.65 | | |
| 4 | 73.4625 | 78.6625 | | |
| 5 | 73.475 | 78.675 | | |
| 6 | 73.4875 | 78.6875 | | |
| 7 | 73.5 | 78.7 | | |
| 8 | 73.5125 | 78.7125 | | |
| 9 | 73.525 | 78.725 | | |
| 10 | 73.5375 | 78.7375 | | |
| 11 | 73.55 | 78.75 | | |
| 12 | 73.5625 | 78.7625 | | |
| 13 | 73.575 | 78.775 | | |
| 14 | 73.5875 | 78.7875 | | |
| 15 | 73.6 | 78.8 | | |
| 16 | 73.6125 | 78.8125 | | |
| 17 | 73.625 | 78.825 | | |
| 18 | 73.6375 | 78.8375 | | |
| 19 | 73.65 | 78.85 | | |
| 20 | 73.6625 | 78.8625 | | |
| 21 | 73.675 | 78.875 | | |
| 22 | 73.6875 | 78.8875 | | |
| 23 | 73.7 | 78.9 | | |
| 24 | 73.7125 | 78.9125 | | |
| 25 | 73.725 | 78.925 | | |
| 26 | 73.7375 | 78.9375 | | |
| 27 | 73.75 | 78.95 | | |
| 28 | 73.7625 | 78.9625 | | |
| 29 | 73.775 | 78.975 | | |
| 30 | 73.7875 | 78.9875 | | |
| 31 | 73.8 | 79 | | |
| 32 | 73.8125 | 79.0125 | | |
| 33 | 73.825 | 79.025 | | |
| 34 | 73.8375 | 79.0375 | | |
| 35 | 73.85 | 79.05 | | |
| 36 | 73.8625 | 79.0625 | | |
| 37 | 73.875 | 79.075 | | |
| 38 | 73.8875 | 79.0875 | | |
| 39 | 73.9 | 79.1 | | |
| 40 | 73.9125 | 79.1125 | | |
| 41 | 73.925 | 79.125 | | |
| 42 | 73.9375 | 79.1375 | | |
| 43 | 73.95 | 79.15 | | |
| 44 | 73.9625 | 79.1625 | | |
| 45 | 73.975 | 79.175 | | |
| 46 | 73.9875 | 79.1875 | | |

| CHANNEL No. | BTX | MTX | REMARKS | S/GRADE |
|---|---|---|---|---|
| 47 | 74 | 79.2 | | |
| 48 | 74.0125 | 79.2125 | | |
| 49 | 74.025 | 79.225 | | |
| 50 | 74.0375 | 79.2375 | | |
| 51 | 74.05 | 79.25 | | |
| 52 | 74.0625 | 79.2625 | | |
| 53 | 74.075 | 79.275 | | |
| 54 | 74.0875 | 79.2875 | | |
| 55 | 74.1 | 79.3 | | |
| 56 | 74.1125 | 79.3125 | | |
| 57 | 74.125 | 79.325 | | |
| 58 | 74.1375 | 79.3375 | | |
| 59 | 74.15 | 79.35 | | |
| 60 | 74.1625 | 79.3625 | | |
| 61 | 74.175 | 79.375 | | |
| 62 | 74.1875 | 79.3875 | | |
| 63 | 74.2 | 79.4 | | |
| 64 | 74.2125 | 79.4125 | | |
| 65 | 74.225 | 79.425 | | |
| 66 | 74.2375 | 79.4375 | | |
| 67 | 74.25 | 79.45 | | |
| 68 | 74.2625 | 79.4625 | | |
| 69 | 74.275 | 79.475 | | |
| 70 | 74.2875 | 79.4875 | | |
| 71 | 74.3 | 79.5 | | |
| 72 | 74.3125 | 79.5125 | | |
| 73 | 74.325 | 79.525 | | |
| 74 | 74.3375 | 79.5375 | | |
| 75 | 74.35 | 79.55 | | |
| 76 | 74.3625 | 79.5625 | | |
| 77 | 74.375 | 79.575 | | |
| 78 | 74.3875 | 79.5875 | | |
| 79 | 74.4 | 79.6 | | |
| 80 | 74.4125 | 79.6125 | | |
| 81 | 74.425 | 79.625 | | |
| 82 | 74.4375 | 79.6375 | | |
| 83 | 74.45 | 79.65 | | |
| 84 | 74.4625 | 79.6625 | | |
| 85 | 74.475 | 79.675 | | |
| 86 | 74.4875 | 79.6875 | | |
| 87 | 74.5 | 79.7 | | |
| 88 | 74.5125 | 79.7125 | | |
| 89 | 74.525 | 79.725 | | |
| 90 | 74.5375 | 79.7375 | | |
| 91 | 74.55 | 79.75 | | |
| 92 | 74.5625 | 79.7625 | | |
| 93 | 74.575 | 79.775 | | |
| 94 | 74.5875 | 79.7875 | | |
| 95 | 74.6 | 79.8 | | |
| | | | | |
| 96 | 74.6125 | 79.8125 | | |
| 97 | 74.625 | 79.825 | | |
| 98 | 74.6375 | 79.8375 | | |
| 99 | 74.65 | 79.85 | | |
| 100 | 74.6625 | 79.8625 | | |
| 101 | 74.675 | 79.875 | | |
| 102 | 74.6875 | 79.8875 | | |
| 103 | 74.7 | 79.9 | | |
| 104 | 74.7125 | 79.9125 | | |
| 105 | 74.725 | 79.925 | | |
| 106 | 74.7375 | 79.9375 | | |
| 107 | 74.75 | 79.95 | | |
| 108 | 74.7625 | 79.9625 | | |
| 109 | 74.775 | 79.975 | | |
| 110 | 74.7875 | 79.9875 | | |

## (Mobile 5) MID-BAND DUPLEX FREQUENCIES

### CHANNEL PLAN FOR 77.975 - 78.625/82.975 - 83.625MHz 2003 (12.5 kHz)

| CHANNEL No. | BTX | MTX | REMARKS | S/GRADE |
|---|---|---|---|---|
| 1 | 77.975 | 82.975 | | |
| 2 | 77.9875 | 82.9875 | | |
| 3 | 78 | 83 | | |
| 4 | 78.0125 | 83.0125 | | |
| 5 | 78.025 | 83.025 | | |
| 6 | 78.0375 | 83.0375 | | |
| 7 | 78.05 | 83.05 | | |
| 8 | 78.0625 | 83.0625 | | |
| 9 | 78.075 | 83.075 | | |
| 10 | 78.0875 | 83.0875 | | |
| 11 | 78.1 | 83.1 | | |
| 12 | 78.1125 | 83.1125 | | |
| 13 | 78.125 | 83.125 | | |
| 14 | 78.1375 | 83.1375 | | |
| 15 | 78.15 | 83.15 | | |
| 16 | 78.1625 | 83.1625 | | |
| 17 | 78.175 | 83.175 | | |
| 18 | 78.1875 | 83.1875 | | |
| 19 | 78.2 | 83.2 | | |
| 20 | 78.2125 | 83.2125 | | |
| 21 | 78.225 | 83.225 | | |
| 22 | 78.2375 | 83.2375 | | |
| 23 | 78.25 | 83.25 | | |
| 24 | 78.2625 | 83.2625 | | |
| 25 | 78.275 | 83.275 | | |
| 26 | 78.2875 | 83.2875 | | |
| 27 | 78.3 | 83.3 | | |
| 28 | 78.3125 | 83.3125 | | |
| 29 | 78.325 | 83.325 | | |
| 30 | 78.3375 | 83.3375 | | |
| 31 | 78.35 | 83.35 | | |
| 32 | 78.3625 | 83.3625 | | |
| 33 | 78.375 | 83.375 | | |
| 34 | 78.3875 | 83.3875 | | |
| 35 | 78.4 | 83.4 | | |
| 36 | 78.4125 | 83.4125 | | |
| 37 | 78.425 | 83.425 | | |
| 38 | 78.4375 | 83.4375 | | |
| 39 | 78.45 | 83.45 | | |
| 40 | 78.4625 | 83.4625 | | |
| 41 | 78.475 | 83.475 | | |
| 42 | 78.4875 | 83.4875 | | |
| 43 | 78.5 | 83.5 | | |
| 44 | 78.5125 | 83.5125 | | |
| 45 | 78.525 | 83.525 | | |
| 46 | 78.5375 | 83.5375 | | |

| CHANNEL No. | BTX | MTX | REMARKS | S/GRADE |
|---|---|---|---|---|
| 47 | 78.55 | 83.55 | | |
| 48 | 78.5625 | 83.5625 | | |
| 49 | 78.575 | 83.575 | | |
| 50 | 78.5875 | 83.5875 | | |
| 51 | 78.6 | 83.6 | | |
| 52 | 78.6125 | 83.6125 | | |

## MID-BAND SIMPLEX FREQUENCIES

### CHANNEL PLAN FOR 80.5 - 81MHz 2003 (12.5kHz)

| CHANNEL No. | BTX | | REMARKS | S/GRADE |
|---|---|---|---|---|
| | | | | |
| 1 | 80.5 | | | |
| 2 | 80.5125 | | | |
| 3 | 80.525 | | | |
| 4 | 80.5375 | | | |
| 5 | 80.55 | | | |
| 6 | 80.5625 | | | |
| 7 | 80.575 | | | |
| 8 | 80.5875 | | | |
| 9 | 80.6 | | | |
| 10 | 80.6125 | | | |
| 11 | 80.625 | | | |
| 12 | 80.6375 | | | |
| 13 | 80.65 | | | |
| 14 | 80.6625 | | | |
| 15 | 80.675 | | | |
| 16 | 80.6875 | | | |
| 17 | 80.7 | | | |
| 18 | 80.7125 | | | |
| 19 | 80.725 | | | |
| 20 | 80.7375 | | | |
| 21 | 80.75 | | | |
| 22 | 80.7625 | | | |
| 23 | 80.775 | | | |
| 24 | 80.7875 | | | |
| 25 | 80.8 | | | |
| 26 | 80.8125 | | | |
| 27 | 80.825 | | | |
| 28 | 80.8375 | | | |
| 29 | 80.85 | | | |
| 30 | 80.8625 | | | |
| 31 | 80.875 | | | |
| 32 | 80.8875 | | | |
| 33 | 80.9 | | | |
| 34 | 80.9125 | | | |
| 35 | 80.925 | | | |
| 36 | 80.9375 | | | |
| 37 | 80.95 | | | |
| 38 | 80.9625 | | | |
| 39 | 80.975 | | | |
| 40 | 80.9875 | | | |

## (Mobile 6) MID-BAND DUPLEX FREQUENCIES

### CHANNEL PLAN FOR 80-80.5/87-87.5MHz 2003 (12.5 kHz)

| CHANNEL No. | BTX | MTX | REMARKS | S/GRADE |
|---|---|---|---|---|
| 1 | 80 | 87 | | |
| 2 | 80.0125 | 87.0125 | | |
| 3 | 80.025 | 87.025 | | |
| 4 | 80.0375 | 87.0375 | | |
| 5 | 80.05 | 87.05 | | |
| 6 | 80.0625 | 87.0625 | | |
| 7 | 80.075 | 87.075 | | |
| 8 | 80.0875 | 87.0875 | | |
| 9 | 80.1 | 87.1 | | |
| 10 | 80.1125 | 87.1125 | | |
| 11 | 80.125 | 87.125 | | |
| 12 | 80.1375 | 87.1375 | | |
| 13 | 80.15 | 87.15 | | |
| 14 | 80.1625 | 87.1625 | | |
| 15 | 80.175 | 87.175 | | |
| 16 | 80.1875 | 87.1875 | | |
| 17 | 80.2 | 87.2 | | |
| 18 | 80.2125 | 87.2125 | | |
| 19 | 80.225 | 87.225 | | |
| 20 | 80.2375 | 87.2375 | | |
| 21 | 80.25 | 87.25 | | |
| 22 | 80.2625 | 87.2625 | | |
| 23 | 80.275 | 87.275 | | |
| 24 | 80.2875 | 87.2875 | | |
| 25 | 80.3 | 87.3 | | |
| 26 | 80.3125 | 87.3125 | | |
| 27 | 80.325 | 87.325 | | |
| 28 | 80.3375 | 87.3375 | | |
| 29 | 80.35 | 87.35 | | |
| 30 | 80.3625 | 87.3625 | | |
| 31 | 80.375 | 87.375 | | |
| 32 | 80.3875 | 87.3875 | | |
| 33 | 80.4 | 87.4 | | |
| 34 | 80.4125 | 87.4125 | | |
| 35 | 80.425 | 87.425 | | |
| 36 | 80.4375 | 87.4375 | | |
| 37 | 80.45 | 87.45 | | |
| 38 | 80.4625 | 87.4625 | | |
| 39 | 80.475 | 87.475 | | |
| 40 | 80.4875 | 87.4875 | | |

(Mobile 8) MID-BAND DUPLEX FREQUENCIES

CHANNEL PLAN FOR 81.625 - 82.975/85.025-86.375MHz 2004 (12.5kHz)

| CHANNEL No. | BTX | MTX | REMARKS | S/GRADE |
|---|---|---|---|---|
| 1 | 81.625 | 85.025 | | |
| 2 | 81.6375 | 85.0375 | | |
| 3 | 81.65 | 85.05 | | |
| 4 | 81.6625 | 85.0625 | | |
| 5 | 81.675 | 85.075 | | |
| 6 | 81.6875 | 85.0875 | | |
| 7 | 81.7 | 85.1 | | |
| 8 | 81.7125 | 85.1125 | | |
| 9 | 81.725 | 85.125 | | |
| 10 | 81.7375 | 85.1375 | | |
| 11 | 81.75 | 85.15 | | |
| 12 | 81.7625 | 85.1625 | | |
| 13 | 81.775 | 85.175 | | |
| 14 | 81.7875 | 85.1875 | | |
| 15 | 81.8 | 85.2 | | |
| 16 | 81.8125 | 85.2125 | | |
| 17 | 81.825 | 85.225 | | |
| 18 | 81.8375 | 85.2375 | | |
| 19 | 81.85 | 85.25 | | |
| 20 | 81.8625 | 85.2625 | | |
| 21 | 81.875 | 85.275 | | |
| 22 | 81.8875 | 85.2875 | | |
| 23 | 81.9 | 85.3 | | |
| 24 | 81.9125 | 85.3125 | | |
| 25 | 81.925 | 85.325 | | |
| 26 | 81.9375 | 85.3375 | | |
| 27 | 81.95 | 85.35 | | |
| 28 | 81.9625 | 85.3625 | | |
| 29 | 81.975 | 85.375 | | |
| 30 | 81.9875 | 85.3875 | | |
| 31 | 82 | 85.4 | | |
| 32 | 82.0125 | 85.4125 | | |
| 33 | 82.025 | 85.425 | | |
| 34 | 82.0375 | 85.4375 | | |
| 35 | 82.05 | 85.45 | | |
| 36 | 82.0625 | 85.4625 | | |
| 37 | 82.075 | 85.475 | | |
| 38 | 82.0875 | 85.4875 | | |
| 39 | 82.1 | 85.5 | | |
| 40 | 82.1125 | 85.5125 | | |
| 41 | 82.125 | 85.525 | | |
| 42 | 82.1375 | 85.5375 | | |
| 43 | 82.15 | 85.55 | | |
| 44 | 82.1625 | 85.5625 | | |

CHANNEL PLAN FOR 81.625 - 82.975/85.025-86.375MHz 2004

| CHANNEL No. | BTX | MTX | REMARKS | S/GRADE |
|---|---|---|---|---|
| 45 | 82.175 | 85.575 | | |
| 46 | 82.1875 | 85.5875 | | |
| 47 | 82.2 | 85.6 | | |
| 48 | 82.2125 | 85.6125 | | |
| 49 | 82.225 | 85.625 | | |
| 50 | 82.2375 | 85.6375 | | |
| 51 | 82.25 | 85.65 | | |
| 52 | 82.2625 | 85.6625 | | |
| 53 | 82.275 | 85.675 | | |
| 54 | 82.2875 | 85.6875 | | |
| 55 | 82.3 | 85.7 | | |
| 56 | 82.3125 | 85.7125 | | |
| 57 | 82.325 | 85.725 | | |
| 58 | 82.3375 | 85.7375 | | |
| 59 | 82.35 | 85.75 | | |
| 60 | 82.3625 | 85.7625 | | |
| 61 | 82.375 | 85.775 | | |
| 62 | 82.3875 | 85.7875 | | |
| 63 | 82.4 | 85.8 | | |
| 64 | 82.4125 | 85.8125 | | |
| 65 | 82.425 | 85.825 | | |
| 66 | 82.4375 | 85.8375 | | |
| 67 | 82.45 | 85.85 | | |
| 68 | 82.4625 | 85.8625 | | |
| 69 | 82.475 | 85.875 | | |
| 70 | 82.4875 | 85.8875 | | |
| 71 | 82.5 | 85.9 | | |
| 72 | 82.5125 | 85.9125 | | |
| 73 | 82.525 | 85.925 | | |
| 74 | 82.5375 | 85.9375 | | |
| 75 | 82.55 | 85.95 | | |
| 76 | 82.5625 | 85.9625 | | |
| 77 | 82.575 | 85.975 | | |
| 78 | 82.5875 | 85.9875 | | |
| 79 | 82.6 | 86 | | |
| 80 | 82.6125 | 86.0125 | | |
| 81 | 82.625 | 86.025 | | |
| 82 | 82.6375 | 86.0375 | | |
| 83 | 82.65 | 86.05 | | |
| 84 | 82.6625 | 86.0625 | | |
| 85 | 82.675 | 86.075 | | |
| 86 | 82.6875 | 86.0875 | | |
| 87 | 82.7 | 86.1 | | |
| 88 | 82.7125 | 86.1125 | | |
| 89 | 82.725 | 86.125 | | |
| 90 | 82.7375 | 86.1375 | | |

CHANNEL PLAN FOR 81.625 - 82.975/85.025-86.375MHz 2004

| CHANNEL No. | BTX | MTX | REMARKS | S/GRADE |
|---|---|---|---|---|
| 91 | 82.75 | 86.15 | | |
| 92 | 82.7625 | 86.1625 | | |
| 93 | 82.775 | 86.175 | | |
| 94 | 82.7875 | 86.1875 | | |
| 95 | 82.8 | 86.2 | | |
| 96 | 82.8125 | 86.2125 | | |
| 97 | 82.825 | 86.225 | | |
| 98 | 82.8375 | 86.2375 | | |
| 99 | 82.85 | 86.25 | | |
| 100 | 82.8625 | 86.2625 | | |
| 101 | 82.875 | 86.275 | | |
| 102 | 82.8875 | 86.2875 | | |
| 103 | 82.9 | 86.3 | | |
| 104 | 82.9125 | 86.3125 | | |
| 105 | 82.925 | 86.325 | | |
| 106 | 82.9375 | 86.3375 | | |
| 107 | 82.95 | 86.35 | | |
| 108 | 82.9625 | 86.3625 | | |

## (Mobile 7) MID-BAND DUPLEX FREQUENCIES

### CHANNEL PLAN FOR 81 - 8.62/86.375-87MHz 2003 (12.5 kHz)

| CHANNEL No. | BTX | MTX | REMARKS | S/GRADE |
|---|---|---|---|---|
| 1 | 81 | 86.375 | | |
| 2 | 81.0125 | 86.3875 | | |
| 3 | 81.025 | 86.4 | | |
| 4 | 81.0375 | 86.4125 | | |
| 5 | 81.05 | 86.425 | | |
| 6 | 81.0625 | 86.4375 | | |
| 7 | 81.075 | 86.45 | | |
| 8 | 81.0875 | 86.4625 | | |
| 9 | 81.1 | 86.475 | | |
| 10 | 81.1125 | 86.4875 | Livestock & Wildlife protection NARC RSA | |
| 11 | 81.125 | 86.5 | | |
| 12 | 81.1375 | 86.5125 | | |
| 13 | 81.15 | 86.525 | | |
| 14 | 81.1625 | 86.5375 | | |
| 15 | 81.175 | 86.55 | | |
| 16 | 81.1875 | 86.5625 | Livestock & Wildlife protection NARC RSA | |
| 17 | 81.2 | 86.575 | | |
| 18 | 81.2125 | 86.5875 | | |
| 19 | 81.225 | 86.6 | | |
| 20 | 81.2375 | 86.6125 | | |
| 21 | 81.25 | 86.625 | | |
| 22 | 81.2625 | 86.6375 | | |
| 23 | 81.275 | 86.65 | | |
| 24 | 81.2875 | 86.6625 | Livestock & Wildlife protection NARC RSA | |
| 25 | 81.3 | 86.675 | | |
| 26 | 81.3125 | 86.6875 | Livestock & Wildlife protection NARC RSA | |
| 27 | 81.325 | 86.7 | | |
| 28 | 81.3375 | 86.7125 | | |
| 29 | 81.35 | 86.725 | | |
| 30 | 81.3625 | 86.7375 | Livestock & Wildlife protection NARC RSA | |
| 31 | 81.375 | 86.75 | | |
| 32 | 81.3875 | 86.7625 | | |
| 33 | 81.4 | 86.775 | | |
| 34 | 81.4125 | 86.7875 | | |
| 35 | 81.425 | 86.8 | | |
| 36 | 81.4375 | 86.8125 | | |
| 37 | 81.45 | 86.825 | | |
| 38 | 81.4625 | 86.8375 | | |
| 39 | 81.475 | 86.85 | | |
| 40 | 81.4875 | 86.8625 | | |
| 41 | 81.5 | 86.875 | | |
| 42 | 81.5125 | 86.8875 | | |
| 43 | 81.525 | 86.9 | | |
| 44 | 81.5375 | 86.9125 | | |
| 45 | 81.55 | 86.925 | | |
| 46 | 81.5625 | 86.9375 | | |
| 47 | 81.575 | 86.95 | | |
| 48 | 81.5875 | 86.9625 | | |
| 49 | 81.6 | 86.975 | | |
| 50 | 81.6125 | 86.9875 | | |

## MID-BAND SIMPLEX FREQUENCIES

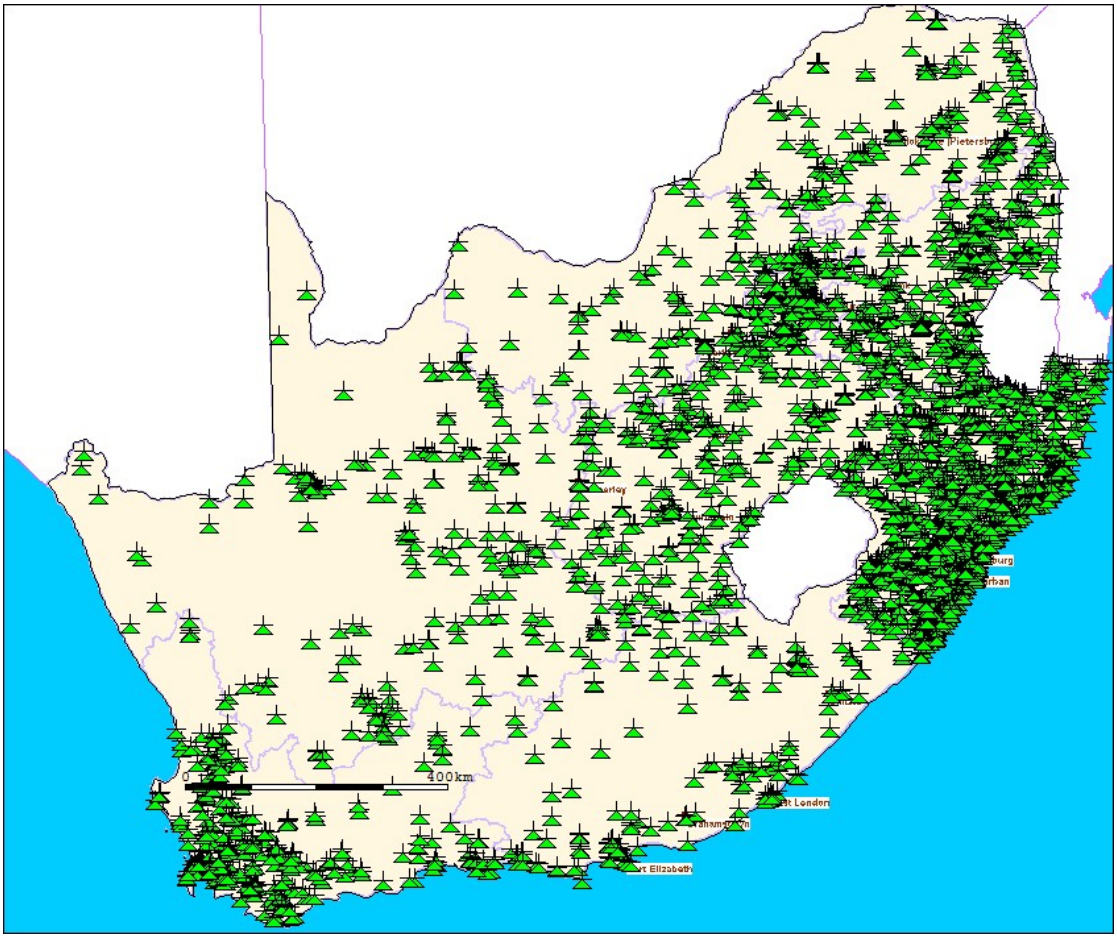
CHANNEL PLAN FOR 83.625 - 85.025MHz 2003 (12.5 kHz)

| CHANNEL No. | BTX | | REMARKS | S/GRADE |
|---|---|---|---|---|
| 1 | 83.625 | | | |
| 2 | 83.6375 | | | |
| 3 | 83.65 | | | |
| 4 | 83.6625 | | | |
| 5 | 83.675 | | | |
| 6 | 83.6875 | | | |
| 7 | 83.7 | | | |
| 8 | 83.7125 | | | |
| 9 | 83.725 | | | |
| 10 | 83.7375 | | | |
| 11 | 83.75 | | | |
| 12 | 83.7625 | | | |
| 13 | 83.775 | | | |
| 14 | 83.7875 | | | |
| 15 | 83.8 | | | |
| 16 | 83.8125 | | | |
| 17 | 83.825 | | | |
| 18 | 83.8375 | | | |
| 19 | 83.85 | | | |
| 20 | 83.8625 | | | |
| 21 | 83.875 | | | |
| 22 | 83.8875 | | | |
| 23 | 83.9 | | | |
| 24 | 83.9125 | | | |
| 25 | 83.925 | | | |
| 26 | 83.9375 | | | |
| 27 | 83.95 | | | |
| 28 | 83.9625 | | | |
| 29 | 83.975 | | | |
| 30 | 83.9875 | | | |
| 31 | 84 | | | |
| 32 | 84.0125 | | | |
| 33 | 84.025 | | | |
| 34 | 84.0375 | | | |
| 35 | 84.05 | | | |
| 36 | 84.0625 | | | |
| 37 | 84.075 | | | |
| 38 | 84.0875 | | | |
| 39 | 84.1 | | | |
| 40 | 84.1125 | | | |
| 41 | 84.125 | | | |
| 42 | 84.1375 | | | |
| 43 | 84.15 | | | |
| 44 | 84.1625 | | | |
| 45 | 84.175 | | | |
| 46 | 84.1875 | | | |
| CHANNEL No. | BTX | | REMARKS | S/GRADE |
| 47 | 84.2 | | | |
| 48 | 84.2125 | | | |
| 49 | 84.225 | | | |
| 50 | 84.2375 | | | |
| 51 | 84.25 | | | |
| 52 | 84.2625 | | | |
| 53 | 84.275 | | | |
| 54 | 84.2875 | | | |
| 55 | 84.3 | | | |
| 56 | 84.3125 | | | |
| 57 | 84.325 | | | |
| 58 | 84.3375 | | | |
| 59 | 84.35 | | | |
| 60 | 84.3625 | | | |
| 61 | 84.375 | | | |
| 62 | 84.3875 | | | |
| 63 | 84.4 | | | |
| 64 | 84.4125 | | | |
| 65 | 84.425 | | | |
| 66 | 84.4375 | | | |
| 67 | 84.45 | | | |
| 68 | 84.4625 | | | |
| 69 | 84.475 | | | |
| 70 | 84.4875 | | | |
| 71 | 84.5 | | | |
| 72 | 84.5125 | | | |
| 73 | 84.525 | | | |
| 74 | 84.5375 | | | |
| 75 | 84.55 | | | |
| 76 | 84.5625 | | | |
| 77 | 84.575 | | | |
| 78 | 84.5875 | | | |
| 79 | 84.6 | | | |
| 80 | 84.6125 | | | |
| 81 | 84.625 | | | |
| 82 | 84.6375 | | | |
| 83 | 84.65 | | | |
| 84 | 84.6625 | | | |
| 85 | 84.675 | | | |
| 86 | 84.6875 | | | |
| 87 | 84.7 | | | |
| 88 | 84.7125 | | | |
| 89 | 84.725 | | | |
| 90 | 84.7375 | | | |
| 91 | 84.75 | | | |
| 92 | 84.7625 | | | |
| 93 | 84.775 | | | |
| 94 | 84.7875 | | | |
| 95 | 84.8 | | | |
| 96 | 84.8125 | | | |
| CHANNEL No. | BTX | | REMARKS | S/GRADE |
| 97 | 84.825 | | | |
| 98 | 84.8375 | | | |
| 99 | 84.85 | | | |
| 100 | 84.8625 | | | |
| 101 | 84.875 | | | |
| 102 | 84.8875 | | | |
| 103 | 84.9 | | | |
| 104 | 84.9125 | | | |
| 105 | 84.925 | | | |
| 106 | 84.9375 | | | |
| 107 | 84.95 | | | |
| 108 | 84.9625 | | | |
| 109 | 84.975 | | | |
| 110 | 84.9875 | | | |
| 111 | 85 | | | |
| 112 | 85.0125 | | | |

### 1.1.2 Licensing information for the applicable frequency allocation

There are 11 777 Licenses issued in this band for both BTX and MTX as well as single frequency devices.

### 1.1.3 Areas where licensed frequencies are operational.




### 1.2 Applicable Frequency Allocation and Band information 138 MHz to 143.6 MHz

Frequency Band under investigation 138 MHz to 143.6 MHz

FIXED

MOBILE

Frequency Sub bands

Pairings

Mobile 1 MTX 138 – 140.5 MHz paired with BTX 141.5 to 144 MHz

Single Frequency Mobile Allocations

140.5 to 141 MHz

141 – 141.5 MHz

### 1.2.1 Channel Plan for the Frequency Allocation

SINGLE FREQUENCY MOBILE

CHANNEL PLAN FOR 141 - 141.5MHz 2002 (12.5kHz)

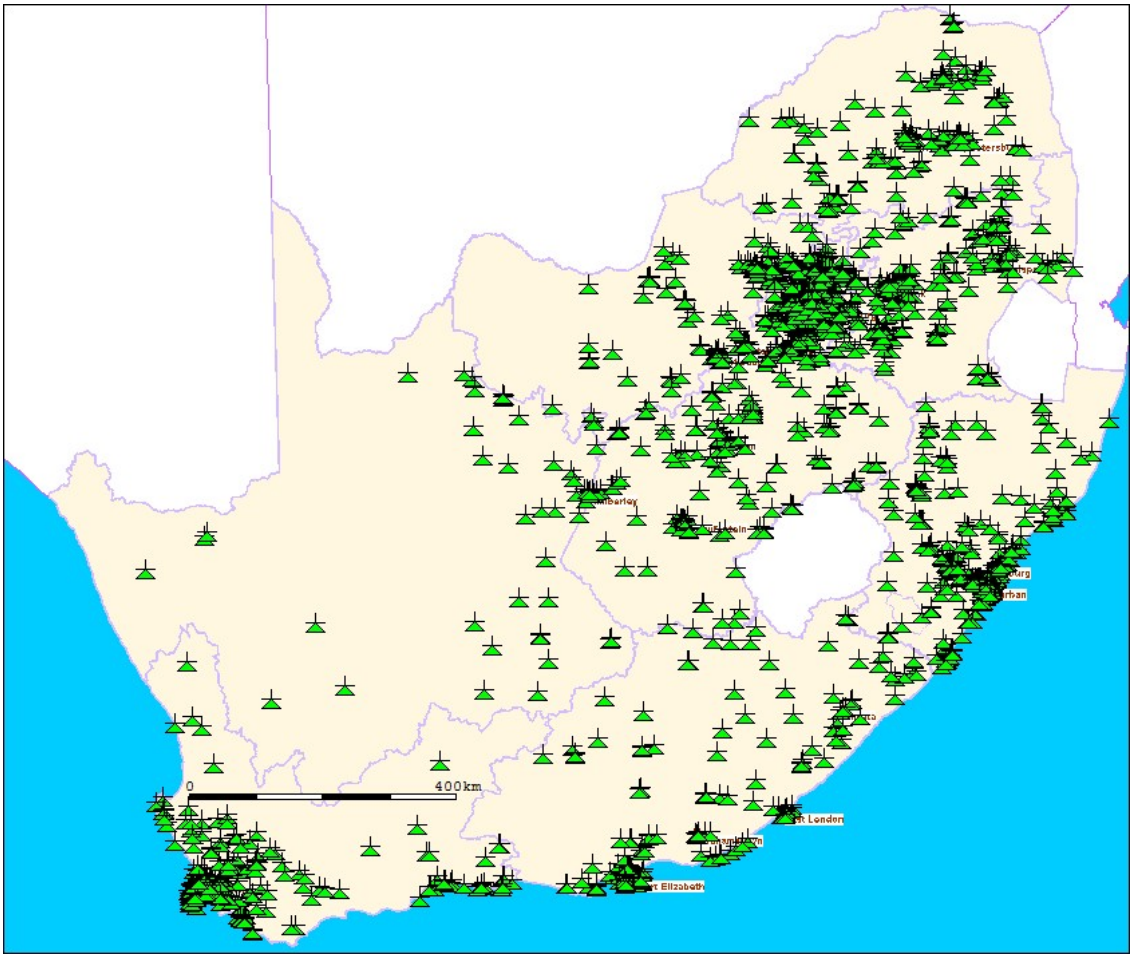
| CH. No. | SF | REMARKS | S/Gr. |
|---|---|---|---|
| 1 | 141 | NOT AVAILABLE | NON |
| 2 | 141.0125 | AVAILABLE | A |
| 3 | 141.025 | NOT AVAILABLE | NON |
| 4 | 141.0375 | AVAILABLE | C |
| 5 | 141.05 | NOT AVAILABLE | NON |
| 6 | 141.0625 | AVAILABLE | A |
| 7 | 141.075 | NOT AVAILABLE | NON |
| 8 | 141.0875 | AVAILABLE | C |
| 9 | 141.1 | NOT AVAILABLE | NON |
| 10 | 141.1125 | AVAILABLE | A |
| 11 | 141.125 | NOT AVAILABLE | NON |
| 12 | 141.1375 | AVAILABLE | C |
| 13 | 141.15 | NOT AVAILABLE | NON |
| 14 | 141.1625 | AVAILABLE | A |
| 15 | 141.175 | NOT AVAILABLE | NON |
| 16 | 141.1875 | AVAILABLE | C |
| 17 | 141.2 | NOT AVAILABLE | NON |
| 18 | 141.2125 | AVAILABLE | A |
| 19 | 141.225 | NOT AVAILABLE | NON |
| 20 | 141.2375 | AVAILABLE | C |
| 21 | 141.25 | NOT AVAILABLE | NON |
| 22 | 141.2625 | AVAILABLE | A |
| 23 | 141.275 | NOT AVAILABLE | NON |
| 24 | 141.2875 | AVAILABLE | C |
| 25 | 141.3 | NOT AVAILABLE | NON |
| 26 | 141.3125 | AVAILABLE | A |
| 27 | 141.325 | NOT AVAILABLE | NON |
| 28 | 141.3375 | AVAILABLE | C |
| 29 | 141.35 | NOT AVAILABLE | NON |
| 30 | 141.3625 | AVAILABLE | A |
| 31 | 141.375 | NOT AVAILABLE | NON |
| 32 | 141.3875 | AVAILABLE | C |
| 33 | 141.4 | NOT AVAILABLE | NON |
| 34 | 141.4125 | AVAILABLE | A |
| 35 | 141.425 | NOT AVAILABLE | NON |
| 36 | 141.4375 | AVAILABLE | C |
| 37 | 141.45 | NOT AVAILABLE | NON |
| 38 | 141.4625 | AVAILABLE | ROVING |
| 39 | 141.475 | NOT AVAILABLE | NON |
| 40 | 141.4875 | AVAILABLE | A/C |

Channel plan for SF 140.5 to 141 is similar to this channel plan.

### 1.2.2 Licensing information for the applicable frequency allocation

There are 2974 licenses issued in the SF band between 140.5 and 141.5 MHz.

### 1.2.3 Areas where licensed frequencies are operational.



### 1.3 Applicable Frequency Allocation and Band information 150.05 MHz to 153.05 MHz

Frequency Band under investigation 150.05 MHz to 153.05 MHz

FIXED

MOBILE except aeronautical mobile

RADIO ASTRONOMY

Frequency Sub bands

FIXED

Single Frequency Alarms Allocations

152.05 to 152.55 MHz

MOBILE except aeronautical mobile

Alarms, Single Frequency Mobile, and Load Shedding Allocations

148.950 – 151 MHz

PMR and PAMR

Paging

Government Services

Wildlife Telemetry Tracking

148-152 MHz

RADIO ASTRONOMY

### 1.3.1 Channel Plan for the Frequency Allocation

**VHF-HIGH BAND SIMPLEX FREQUENCIES**

CHANNEL PLAN FOR 148.95 - 151MHz 2004 (12.5kHz)

| CH. No. | SF | REMARKS | S/Gr. |
|---|---|---|---|
| 1 | 148.95 | | |
| 2 | 148.9625 | | |
| 3 | 148.975 | | |
| 4 | 148.9875 | | |
| 5 | 149 | | |
| 6 | 149.0125 | | |
| 7 | 149.025 | | |
| 8 | 149.0375 | | |
| 9 | 149.05 | | |
| 10 | 149.0625 | | |
| 11 | 149.075 | | |
| 12 | 149.0875 | | |
| 13 | 149.1 | | |
| 14 | 149.1125 | | |
| 15 | 149.125 | | |
| 16 | 149.1375 | | |
| 17 | 149.15 | | |
| 18 | 149.1625 | | |
| 19 | 149.175 | | |
| 20 | 149.1875 | | |
| 21 | 149.2 | | |
| 22 | 149.2125 | | |
| 23 | 149.225 | | |
| 24 | 149.2375 | | |
| 25 | 149.25 | | |
| 26 | 149.2625 | | |
| 27 | 149.275 | | |
| 28 | 149.2875 | | |
| 29 | 149.3 | | |
| 30 | 149.3125 | | |
| 31 | 149.325 | | |
| 32 | 149.3375 | | |
| 33 | 149.35 | | |
| 34 | 149.3625 | | |
| 35 | 149.375 | | |
| 36 | 149.3875 | | |
| 37 | 149.4 | | |
| 38 | 149.4125 | | |
| 39 | 149.425 | | |
| 40 | 149.4375 | | |
| 41 | 149.45 | | |
| 42 | 149.4625 | | |
| 43 | 149.475 | | |
| 44 | 149.4875 | | |
| 45 | 149.5 | | |
| 46 | 149.5125 | | |

CHANNEL PLAN FOR 148.95 - 151MHz 2004 (12.5kHz)

| CH. No. | SF | REMARKS | S/Gr. |
|---|---|---|---|
| 47 | 149.525 | | |
| 48 | 149.5375 | | |
| 49 | 149.55 | | |
| 50 | 149.5625 | | |
| 51 | 149.575 | | |
| 52 | 149.5875 | | |
| 53 | 149.6 | | |
| 54 | 149.6125 | | |
| 55 | 149.625 | | |
| 56 | 149.6375 | | |
| 57 | 149.65 | | |
| 58 | 149.6625 | | |
| 59 | 149.675 | | |
| 60 | 149.6875 | | |
| 61 | 149.7 | | |
| 62 | 149.7125 | | |
| 63 | 149.725 | | |
| 64 | 149.7375 | | |
| 65 | 149.75 | | |
| 66 | 149.7625 | | |
| 67 | 149.775 | | |
| 68 | 149.7875 | | |
| 69 | 149.8 | | |
| 70 | 149.8125 | | |
| 71 | 149.825 | | |
| 72 | 149.8375 | | |
| 73 | 149.85 | | |
| 74 | 149.8625 | | |
| 75 | 149.875 | | |
| 76 | 149.8875 | | |
| 77 | 149.9 | | |
| 78 | 149.9125 | | |
| 79 | 149.925 | | |
| 80 | 149.9375 | | |
| 81 | 149.95 | | |
| 82 | 149.9625 | | |
| 83 | 149.975 | | |
| 84 | 149.9875 | | |
| 85 | 150 | | |
| 86 | 150.0125 | | |
| 87 | 150.025 | | |
| 88 | 150.0375 | | |
| 89 | 150.05 | | |
| 90 | 150.0625 | | |
| 91 | 150.075 | | |
| 92 | 150.0875 | | |
| 93 | 150.1 | | |

## CHANNEL PLAN FOR 148.95 - 151MHz 2004

| CH. No. | SF | REMARKS | S/Gr. |
|---|---|---|---|
| 94 | 150.1125 | | |
| 95 | 150.125 | | |
| 96 | 150.1375 | | |
| 97 | 150.15 | | |
| 98 | 150.1625 | | |
| 99 | 150.175 | | |
| 100 | 150.1875 | | |
| 101 | 150.2 | | |
| 102 | 150.2125 | | |
| 103 | 150.225 | | |
| 104 | 150.2375 | | |
| 105 | 150.25 | | |
| 106 | 150.2625 | | |
| 107 | 150.275 | | |
| 108 | 150.2875 | | |
| 109 | 150.3 | | |
| 110 | 150.3125 | | |
| 111 | 150.325 | | |
| 112 | 150.3375 | | |
| 113 | 150.35 | | |
| 114 | 150.3625 | | |
| 115 | 150.375 | | |
| 116 | 150.3875 | | |
| 117 | 150.4 | | |
| 118 | 150.4125 | | |
| 119 | 150.425 | | |
| 120 | 150.4375 | | |
| 121 | 150.45 | | |
| 122 | 150.4625 | | |
| 123 | 150.475 | | |
| 124 | 150.4875 | | |
| 125 | 150.5 | | |
| 126 | 150.5125 | | |
| 127 | 150.525 | | |
| 128 | 150.5375 | | |
| 129 | 150.55 | | |
| 130 | 150.5625 | | |
| 131 | 150.575 | | |
| 132 | 150.5875 | | |
| 133 | 150.6 | | |
| 134 | 150.6125 | | |
| 135 | 150.625 | | |
| 136 | 150.6375 | | |
| 137 | 150.65 | | |
| 138 | 150.6625 | | |
| 139 | 150.675 | | |
| 140 | 150.6875 | | |
| 141 | 150.7 | | |
| | | | |

## CHANNEL PLAN FOR 148.95 - 151MHz 2004

| CH. No. | SF | REMARKS | S/Gr. |
|---|---|---|---|
| 142 | 150.7125 | | |
| 143 | 150.725 | | |
| 144 | 150.7375 | | |
| 145 | 150.75 | | |
| 146 | 150.7625 | | |
| 147 | 150.775 | | |
| 148 | 150.7875 | | |
| 149 | 150.8 | | |
| 150 | 150.8125 | | |
| 151 | 150.825 | | |
| 152 | 150.8375 | | |
| 153 | 150.85 | | |
| 154 | 150.8625 | | |
| 155 | 150.875 | | |
| 156 | 150.8875 | | |
| 157 | 150.9 | | |
| 158 | 150.9125 | | |
| 159 | 150.925 | | |
| 160 | 150.9375 | | |
| 161 | 150.95 | | |
| 162 | 150.9625 | | |
| 163 | 150.975 | | |
| 164 | 150.9875 | | |

## VHF-HIGH BAND SIMPLEX FREQUENCIES

CHANNEL PLAN FOR 151 - 152.05MHz 2007

| CH. No. | SF | REMARKS | S/Gr. |
|---|---|---|---|
| 1 | 151 | | |
| 2 | 151.0125 | | |
| 3 | 151.025 | | |
| 4 | 151.0375 | | |
| 5 | 151.05 | | |
| 6 | 151.0625 | | |
| 7 | 151.075 | | |
| 8 | 151.0875 | | |
| 9 | 151.1 | | |
| 10 | 151.1125 | | |
| 11 | 151.125 | | |
| 12 | 151.1375 | | |
| 13 | 151.15 | | |
| 14 | 151.1625 | | |
| 15 | 151.175 | | |
| 16 | 151.1875 | | |
| 17 | 151.2 | | |
| 18 | 151.2125 | | |
| 19 | 151.225 | | |
| 20 | 151.2375 | | |
| 21 | 151.25 | | |
| 22 | 151.2625 | | |
| 23 | 151.275 | | |
| 24 | 151.2875 | | |
| 25 | 151.3 | | |
| 26 | 151.3125 | | |
| 27 | 151.325 | | |
| 28 | 151.3375 | | |
| 29 | 151.35 | | |
| 30 | 151.3625 | | |
| 31 | 151.375 | | |
| 32 | 151.3875 | | |
| 33 | 151.4 | | |
| 34 | 151.4125 | | |
| 35 | 151.425 | | |
| 36 | 151.4375 | | |
| 37 | 151.45 | | |
| 38 | 151.4625 | | |
| 39 | 151.475 | | |
| 40 | 151.4875 | | |
| 41 | 151.5 | | |
| 42 | 151.5125 | | |
| 43 | 151.525 | | |
| 44 | 151.5375 | | |
| 45 | 151.55 | | |
| 46 | 151.5625 | | |

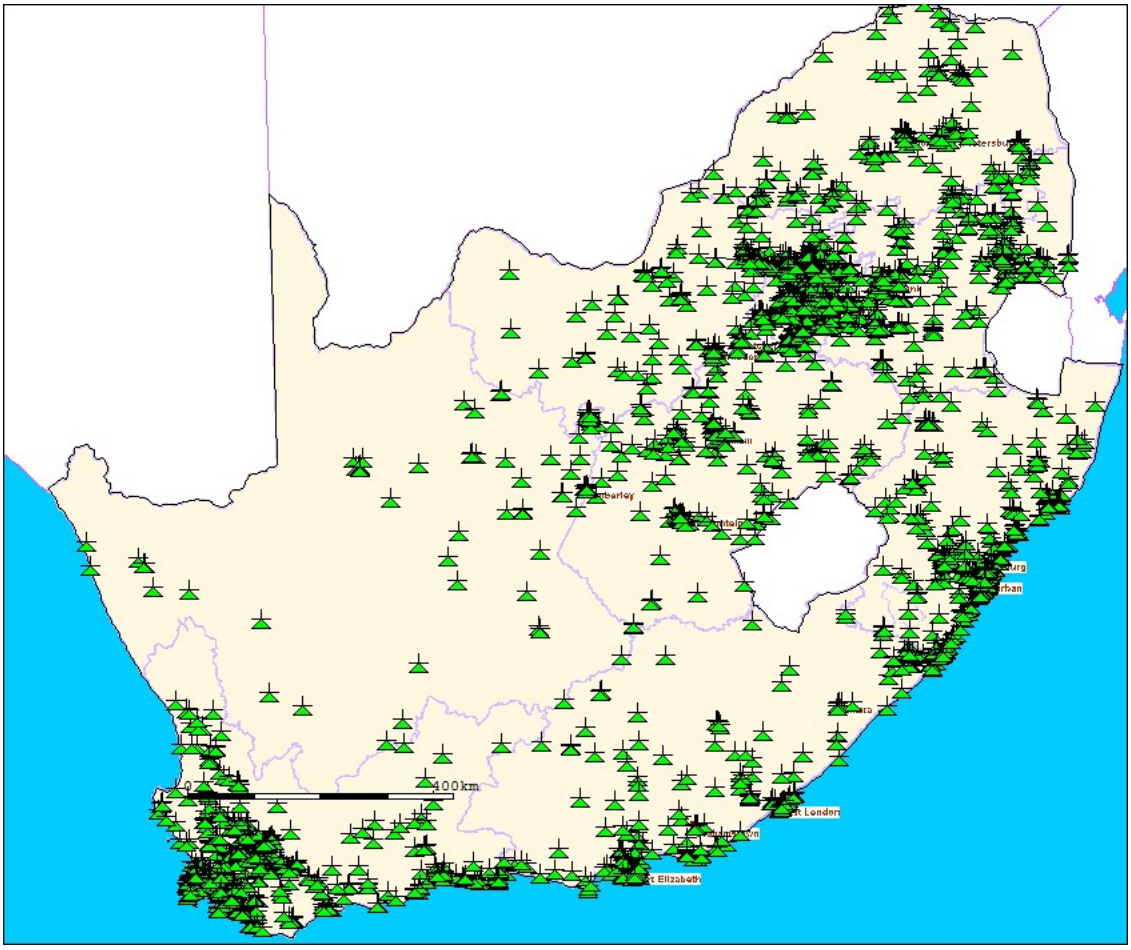
CHANNEL PLAN FOR 151 - 152.05MHz 2007

| CH. No. | SF | REMARKS | S/Gr. |
|---|---|---|---|
| 47 | 151.575 | | |
| 48 | 151.5875 | | |
| 49 | 151.6 | | |
| 50 | 151.6125 | | |
| 51 | 151.625 | | |
| 52 | 151.6375 | | |
| 53 | 151.65 | | |
| 54 | 151.6625 | | |
| 55 | 151.675 | | |
| 56 | 151.6875 | | |
| 57 | 151.7 | | |
| 58 | 151.7125 | | |
| 59 | 151.725 | | |
| 60 | 151.7375 | | |
| 61 | 151.75 | | |
| 62 | 151.7625 | | |
| 63 | 151.775 | | |
| 64 | 151.7875 | | |
| 65 | 151.8 | | |
| 66 | 151.8125 | | |
| 67 | 151.825 | | |
| 68 | 151.8375 | | |
| 69 | 151.85 | | |
| 70 | 151.8625 | | |
| 71 | 151.875 | | |
| 72 | 151.8875 | | |
| 73 | 151.9 | | |
| 74 | 151.9125 | | |
| 75 | 151.925 | | |
| 76 | 151.9375 | | |
| 77 | 151.95 | | |
| 78 | 151.9625 | | |
| 79 | 151.975 | | |
| 80 | 151.9875 | | |
| 81 | 152 | | |
| 82 | 152.0125 | | |
| 83 | 152.025 | | |
| 84 | 152.0375 | | |

### 1.3.2 Licensing information for the applicable frequency allocation

There are 5 516 Licenses issued in this band for different single frequency devices.

### 1.3.3 Areas where licensed frequencies are operational.



**1.4 Applicable Frequency Allocation and Band information 156.4785 to 156.5625 MHz**

156.4785 MHz to 156.5625 MHz

MARITIME MOBILE (distress and calling DCS)

FIXED

LAND MOBILE

Maritime mobile distress, safety and calling frequency 156.525 MHz for maritime mobile VHF radio telephone service using DSC.

The bands 156.4875 to 156.5125 MHz and 156.5375 to 156.5625 MHz may also be used for land mobile services while protecting the maritime mobile service. Single frequency mobile (156.375 to 156.7625)

### 1.4.1 Channel Plan for the Frequency Allocation

(Mobile 3) HIGH-BAND DUPLEX FREQUENCIES

CHANNEL PLAN FOR 156 - 156.875_160.6 - 160.975MHz 2007 (12.5kHz)

| CHANNEL No. | BTX | MTX | REMARKS | S/GRADE |
|---|---|---|---|---|
| 1 | 156 | 160.6 | MARITIME SEE ITU AP 18-3 | |
| 2 | 156.025 | 160.625 | MARITIME SEE ITU AP 18-3 | |
| 3 | 156.05 | 160.65 | MARITIME SEE ITU AP 18-3 | |
| 4 | 156.075 | 160.675 | MARITIME SEE ITU AP 18-3 | |
| 5 | 156.1 | 160.7 | MARITIME SEE ITU AP 18-3 | |
| 6 | 156.125 | 160.725 | MARITIME SEE ITU AP 18-3 | |
| 7 | 156.15 | 160.75 | MARITIME SEE ITU AP 18-3 | |
| 8 | 156.175 | 160.775 | MARITIME SEE ITU AP 18-3 | |
| 9 | 156.2 | 160.8 | MARITIME SEE ITU AP 18-3 | |
| 10 | 156.225 | 160.825 | MARITIME SEE ITU AP 18-3 | |
| 11 | 156.25 | 160.85 | MARITIME SEE ITU AP 18-3 | |
| 12 | 156.275 | 160.875 | MARITIME SEE ITU AP 18-3 | |
| 13 | 156.3 | 160.9 | MARITIME SEE ITU AP 18-3 | |
| 14 | 156.325 | 160.925 | MARITIME SEE ITU AP 18-3 | |
| 15 | 156.35 | 160.95 | MARITIME SEE ITU AP 18-3 | |
| 16 | 156.375 | | MARITIME SEE ITU AP 18-3 | |
| 17 | 156.4 | | MARITIME SEE ITU AP 18-3 | |
| 18 | 156.425 | | MARITIME SEE ITU AP 18-3 | |
| 19 | 156.45 | | MARITIME SEE ITU AP 18-3 | |
| 20 | 156.475 | | MARITIME SEE ITU AP 18-3 | |
| 21 | 156.5 | | MARITIME SEE ITU AP 18-3 | |
| 22 | 156.525 | | MARITIME SEE ITU AP 18-3 | |
| 23 | 156.55 | | MARITIME SEE ITU AP 18-3 | |
| 24 | 156.575 | | MARITIME SEE ITU AP 18-3 | |
| 25 | 156.6 | | MARITIME SEE ITU AP 18-3 | |
| 26 | 156.625 | | MARITIME SEE ITU AP 18-3 | |
| 27 | 156.65 | | MARITIME SEE ITU AP 18-3 | |
| 28 | 156.675 | | MARITIME SEE ITU AP 18-3 | |
| 29 | 156.7 | | MARITIME SEE ITU AP 18-3 | |
| 30 | 156.725 | | MARITIME SEE ITU AP 18-3 | |
| 31 | 156.75 | | MARITIME SEE ITU AP 18-3 | |
| 32 | 156.7625 | | MARITIME SEE ITU AP 18-3 | |
| 33 | 156.7875 | | MARITIME SEE ITU AP 18-3 | |
| 34 | 156.8 | | MARITIME SEE ITU AP 18-3 | |
| 35 | 156.825 | | MARITIME SEE ITU AP 18-3 | |
| 36 | 156.8375 | | MARITIME SEE ITU AP 18-3 | |
| 37 | 156.8625 | | MARITIME SEE ITU AP 18-3 | |

### 1.4.2 Licensing information for the applicable frequency allocation

There are 21 Licenses issued in this band for both BTX and MTX as well as single frequency devices.

### 1.4.3 Areas where licensed frequencies are operational.



### 1.5 Applicable Frequency Allocation and Band information 380 MHz to 400 MHz

Frequency Band under investigation 380 MHz to 400 MHz

**388 to 390 MHz**

MOBILE

Mobile-Satellite (space to Earth)

PMR and/or PAMR

Frequency Sub bands

Pairings

Mobile 1 MTX 380 – 387 MHz paired with BTX 390 to 397 MHz (Digital Trunking)

Mobile 2 MTX 387 – 390 MHz paired with BTX 397 to 399.9 MHz (PMR and/or PAMR)

**390 to 399.9 MHz**

MOBILE

Emergency: 390 to 397 MHz paired with 380 to 387 (PPDR)

Government Services – PMR and/or PAMR: 397 to 399.9 MHz paired with 387 to 390 MHz.

### 1.5.1 Channel Plan for the Frequency Allocation

**TETRA TRUNKING (EMERGENCY) WITH 25kHz.**

CH PLAN FOR 390-399.9875_380-389.9875MHz 2006

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 0 | 390 | 380 | |
| 1 | 390.025 | 380.025 | SAPS DMO 1 |
| 2 | 390.05 | 380.05 | |
| 3 | 390.075 | 380.075 | SAPS DMO 1 |
| 4 | 390.1 | 380.1 | |
| 5 | 390.125 | 380.125 | SAPS DMO 1 |
| 6 | 390.15 | 380.15 | |
| 7 | 390.175 | 380.175 | SAPS DMO 1 |
| 8 | 390.2 | 380.2 | |
| 9 | 390.225 | 380.225 | SAPS DMO 1 |
| 10 | 390.25 | 380.25 | |
| 11 | 390.275 | 380.275 | SAPS DMO 1 |
| 12 | 390.3 | 380.3 | |
| 13 | 390.325 | 380.325 | SAPS DMO 1 |
| 14 | 390.35 | 380.35 | |
| 15 | 390.375 | 380.375 | SAPS DMO 1 |
| 16 | 390.4 | 380.4 | |
| 17 | 390.425 | 380.425 | SAPS DMO 1 |
| 18 | 390.45 | 380.45 | |
| 19 | 390.475 | 380.475 | SAPS DMO 1 |
| 20 | 390.5 | 380.5 | TETRA SAPS |
| 21 | 390.525 | 380.525 | TETRA SAPS |
| 22 | 390.55 | 380.55 | TETRA SAPS |
| 23 | 390.575 | 380.575 | TETRA SAPS |
| 24 | 390.6 | 380.6 | TETRA SAPS |
| 25 | 390.625 | 380.625 | TETRA SAPS |
| 26 | 390.65 | 380.65 | TETRA SAPS |
| 27 | 390.675 | 380.675 | TETRA SAPS |
| 28 | 390.7 | 380.7 | TETRA SAPS |
| 29 | 390.725 | 380.725 | TETRA SAPS |
| 30 | 390.75 | 380.75 | TETRA SAPS |
| 31 | 390.775 | 380.775 | TETRA SAPS |
| 32 | 390.8 | 380.8 | TETRA SAPS |
| 33 | 390.825 | 380.825 | TETRA SAPS |
| 34 | 390.85 | 380.85 | TETRA SAPS |
| 35 | 390.875 | 380.875 | TETRA SAPS |
| 36 | 390.9 | 380.9 | TETRA SAPS |
| 37 | 390.925 | 380.925 | TETRA SAPS |
| 38 | 390.95 | 380.95 | TETRA SAPS |
| 39 | 390.975 | 380.975 | TETRA SAPS |
| 40 | 391 | 381 | TETRA SAPS |
| 41 | 391.025 | 381.025 | TETRA SAPS |
| 42 | 391.05 | 381.05 | TETRA SAPS |
| 43 | 391.075 | 381.075 | TETRA SAPS |
| | | | |
| CH. No. | BTX | MTX | REMARKS |

CH PLAN FOR 390-399.9875_380-389.9875MHz 2006

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 45 | 391.1 | 381.1 | TETRA SAPS |
| 46 | 391.125 | 381.125 | TETRA SAPS |
| 47 | 391.15 | 381.15 | TETRA SAPS |
| 48 | 391.175 | 381.175 | TETRA SAPS |
| 49 | 391.2 | 381.2 | TETRA SAPS |
| 50 | 391.225 | 381.225 | TETRA SAPS |
| 51 | 391.25 | 381.25 | TETRA SAPS |
| 52 | 391.275 | 381.275 | TETRA SAPS |
| 53 | 391.3 | 381.3 | TETRA SAPS |
| 54 | 391.325 | 381.325 | TETRA SAPS |
| 55 | 391.35 | 381.35 | TETRA SAPS |
| 56 | 391.375 | 381.375 | TETRA SAPS |
| 57 | 391.4 | 381.4 | TETRA SAPS |
| 58 | 391.425 | 381.425 | TETRA SAPS |
| 59 | 391.45 | 381.45 | TETRA SAPS |
| 60 | 391.475 | 381.475 | TETRA SAPS |
| 61 | 391.5 | 381.5 | TETRA SAPS |
| 62 | 391.525 | 381.525 | TETRA SAPS |
| 63 | 391.55 | 381.55 | TETRA SAPS |
| 64 | 391.575 | 381.575 | TETRA SAPS |
| 65 | 391.6 | 381.6 | TETRA SAPS |
| 66 | 391.625 | 381.625 | TETRA SAPS |
| 67 | 391.65 | 381.65 | TETRA SAPS |
| 68 | 391.675 | 381.675 | TETRA SAPS |
| 69 | 391.7 | 381.7 | TETRA SAPS |
| 70 | 391.725 | 381.725 | TETRA SAPS |
| 71 | 391.75 | 381.75 | TETRA SAPS |
| 72 | 391.775 | 381.775 | TETRA SAPS |
| 73 | 391.8 | 381.8 | TETRA SAPS |
| 74 | 391.825 | 381.825 | TETRA SAPS |
| 75 | 391.85 | 381.85 | TETRA SAPS |
| 76 | 391.875 | 381.875 | TETRA SAPS |
| 77 | 391.9 | 381.9 | TETRA SAPS |
| 78 | 391.925 | 381.925 | TETRA SAPS |
| 79 | 391.95 | 381.95 | TETRA SAPS |
| 80 | 391.975 | 381.975 | TETRA SAPS |
| 81 | 392 | 382 | TETRA SAPS |
| 82 | 392.025 | 382.025 | TETRA SAPS |
| 83 | 392.05 | 382.05 | TETRA SAPS |
| 84 | 392.075 | 382.075 | TETRA SAPS |
| 85 | 392.1 | 382.1 | TETRA SAPS |
| 86 | 392.125 | 382.125 | TETRA SAPS |
| 87 | 392.15 | 382.15 | TETRA SAPS |
| 88 | 392.175 | 382.175 | TETRA SAPS |
| 89 | 392.2 | 382.2 | TETRA SAPS |
| | | | |
| CH. No. | BTX | MTX | REMARKS |

CH PLAN FOR 390-399.9875_380-389.9875MHz 2006

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 90 | 392.225 | 382.225 | TETRA SAPS |
| 91 | 392.25 | 382.25 | TETRA SAPS |
| 92 | 392.275 | 382.275 | TETRA SAPS |
| 93 | 392.3 | 382.3 | TETRA SAPS |
| 94 | 392.325 | 382.325 | TETRA SAPS |
| 95 | 392.35 | 382.35 | TETRA SAPS |
| 96 | 392.375 | 382.375 | TETRA SAPS |
| 97 | 392.4 | 382.4 | TETRA SAPS |
| 98 | 392.425 | 382.425 | TETRA SAPS |
| 99 | 392.45 | 382.45 | TETRA SAPS |
| 100 | 392.475 | 382.475 | TETRA SAPS |
| 101 | 392.5 | 382.5 | TETRA SAPS |
| 102 | 392.525 | 382.525 | TETRA SAPS |
| 103 | 392.55 | 382.55 | TETRA SAPS |
| 104 | 392.575 | 382.575 | TETRA SAPS |
| 105 | 392.6 | 382.6 | TETRA SAPS |
| 106 | 392.625 | 382.625 | TETRA SAPS |
| 107 | 392.65 | 382.65 | TETRA SAPS |
| 108 | 392.675 | 382.675 | TETRA SAPS |
| 109 | 392.7 | 382.7 | TETRA SAPS |
| 110 | 392.725 | 382.725 | TETRA SAPS |
| 111 | 392.75 | 382.75 | TETRA SAPS |
| 112 | 392.775 | 382.775 | TETRA SAPS |
| 113 | 392.8 | 382.8 | TETRA SAPS |
| 114 | 392.825 | 382.825 | TETRA SAPS |
| 115 | 392.85 | 382.85 | TETRA SAPS |
| 116 | 392.875 | 382.875 | TETRA SAPS |
| 117 | 392.9 | 382.9 | TETRA SAPS |
| 118 | 392.925 | 382.925 | TETRA SAPS |
| 119 | 392.95 | 382.95 | TETRA SAPS |
| 120 | 392.975 | 382.975 | TETRA SAPS |
| 121 | 393 | 383 | TETRA SAPS |
| 122 | 393.025 | 383.025 | TETRA SAPS |
| 123 | 393.05 | 383.05 | TETRA SAPS |
| 124 | 393.075 | 383.075 | TETRA SAPS |
| 125 | 393.1 | 383.1 | TETRA SAPS |
| 126 | 393.125 | 383.125 | TETRA SAPS |
| 127 | 393.15 | 383.15 | TETRA SAPS |
| 128 | 393.175 | 383.175 | TETRA SAPS |
| 129 | 393.2 | 383.2 | TETRA SAPS |
| 130 | 393.225 | 383.225 | TETRA SAPS |
| 131 | 393.25 | 383.25 | TETRA SAPS |
| 132 | 393.275 | 383.275 | TETRA SAPS |
| 133 | 393.3 | 383.3 | TETRA SAPS |
| 134 | 393.325 | 383.325 | TETRA SAPS |
| 135 | 393.35 | 383.35 | TETRA SAPS |

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|

CH PLAN FOR 390-399.9875_380-389.9875MHz 2006

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 136 | 393.375 | 383.375 | TETRA SAPS |
| 137 | 393.4 | 383.4 | TETRA SAPS |
| 138 | 393.425 | 383.425 | TETRA SAPS |
| 139 | 393.45 | 383.45 | TETRA SAPS |
| 140 | 393.475 | 383.475 | TETRA SAPS |
| 141 | 393.5 | 383.5 | TETRA SAPS |
| 142 | 393.525 | 383.525 | TETRA SAPS |
| 143 | 393.55 | 383.55 | TETRA SAPS |
| 144 | 393.575 | 383.575 | TETRA SAPS |
| 145 | 393.6 | 383.6 | TETRA SAPS |
| 146 | 393.625 | 383.625 | TETRA SAPS |
| 147 | 393.65 | 383.65 | TETRA SAPS |
| 148 | 393.675 | 383.675 | TETRA SAPS |
| 149 | 393.7 | 383.7 | TETRA SAPS |
| 150 | 393.725 | 383.725 | TETRA SAPS |
| 151 | 393.75 | 383.75 | TETRA SAPS |
| 152 | 393.775 | 383.775 | TETRA SAPS |
| 153 | 393.8 | 383.8 | TETRA SAPS |
| 154 | 393.825 | 383.825 | TETRA SAPS |
| 155 | 393.85 | 383.85 | TETRA SAPS |
| 156 | 393.875 | 383.875 | TETRA SAPS |
| 157 | 393.9 | 383.9 | TETRA SAPS |
| 158 | 393.925 | 383.925 | TETRA SAPS |
| 159 | 393.95 | 383.95 | TETRA SAPS |
| 160 | 393.975 | 383.975 | TETRA SAPS |
| 161 | 394 | 384 | TETRA SAPS |
| 162 | 394.025 | 384.025 | TETRA SAPS |
| 163 | 394.05 | 384.05 | TETRA SAPS |
| 164 | 394.075 | 384.075 | TETRA SAPS |
| 165 | 394.1 | 384.1 | TETRA SAPS |
| 166 | 394.125 | 384.125 | TETRA SAPS |
| 167 | 394.15 | 384.15 | TETRA SAPS |
| 168 | 394.175 | 384.175 | TETRA SAPS |
| 169 | 394.2 | 384.2 | TETRA SAPS |
| 170 | 394.225 | 384.225 | TETRA SAPS |
| 171 | 394.25 | 384.25 | TETRA SAPS |
| 172 | 394.275 | 384.275 | TETRA SAPS |
| 173 | 394.3 | 384.3 | TETRA SAPS |
| 174 | 394.325 | 384.325 | TETRA SAPS |
| 175 | 394.35 | 384.35 | TETRA SAPS |
| 176 | 394.375 | 384.375 | TETRA SAPS |
| 177 | 394.4 | 384.4 | TETRA SAPS |
| 178 | 394.425 | 384.425 | TETRA SAPS |
| 179 | 394.45 | 384.45 | TETRA SAPS |
| 180 | 394.475 | 384.475 | TETRA SAPS |
| 181 | 394.5 | 384.5 | TETRA SAPS |

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|

CH PLAN FOR 390-399.9875_380-389.9875MHz 2006

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 182 | 394.525 | 384.525 | TETRA SAPS |
| 183 | 394.55 | 384.55 | TETRA SAPS |
| 184 | 394.575 | 384.575 | TETRA SAPS |
| 185 | 394.6 | 384.6 | TETRA SAPS |
| 186 | 394.625 | 384.625 | TETRA SAPS |
| 187 | 394.65 | 384.65 | TETRA SAPS |
| 188 | 394.675 | 384.675 | TETRA SAPS |
| 189 | 394.7 | 384.7 | TETRA SAPS |
| 190 | 394.725 | 384.725 | TETRA SAPS |
| 191 | 394.75 | 384.75 | TETRA SAPS |
| 192 | 394.775 | 384.775 | TETRA SAPS |
| 193 | 394.8 | 384.8 | TETRA SAPS |
| 194 | 394.825 | 384.825 | TETRA SAPS |
| 195 | 394.85 | 384.85 | TETRA SAPS |
| 196 | 394.875 | 384.875 | TETRA SAPS |
| 197 | 394.9 | 384.9 | TETRA SAPS |
| 198 | 394.925 | 384.925 | TETRA SAPS |
| 199 | 394.95 | 384.95 | TETRA SAPS |
| 200 | 394.975 | 384.975 | TETRA SAPS |
| 201 | 395 | 385 | TETRA SAPS |
| 202 | 395.025 | 385.025 | TETRA SAPS |
| 203 | 395.05 | 385.05 | TETRA SAPS |
| 204 | 395.075 | 385.075 | TETRA SAPS |
| 205 | 395.1 | 385.1 | TETRA SAPS |
| 206 | 395.125 | 385.125 | TETRA SAPS |
| 207 | 395.15 | 385.15 | TETRA SAPS |
| 208 | 395.175 | 385.175 | TETRA SAPS |
| 209 | 395.2 | 385.2 | TETRA SAPS |
| 210 | 395.225 | 385.225 | TETRA SAPS |
| 211 | 395.25 | 385.25 | TETRA SAPS |
| 212 | 395.275 | 385.275 | TETRA SAPS |
| 213 | 395.3 | 385.3 | TETRA SAPS |
| 214 | 395.325 | 385.325 | TETRA SAPS |
| 215 | 395.35 | 385.35 | TETRA SAPS |
| 216 | 395.375 | 385.375 | TETRA SAPS |
| 217 | 395.4 | 385.4 | TETRA SAPS |
| 218 | 395.425 | 385.425 | TETRA SAPS |
| 219 | 395.45 | 385.45 | TETRA SAPS |
| 220 | 395.475 | 385.475 | TETRA SAPS |
| 221 | 395.5 | 385.5 | TETRA SAPS |
| 222 | 395.525 | 385.525 | TETRA SAPS |
| 223 | 395.55 | 385.55 | TETRA SAPS |
| 224 | 395.575 | 385.575 | TETRA SAPS |
| 225 | 395.6 | 385.6 | TETRA SAPS |
| 226 | 395.625 | 385.625 | TETRA SAPS |
| 227 | 395.65 | 385.65 | TETRA SAPS |

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|

CH PLAN FOR 390-399.9875_380-389.9875MHz 2006

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 228 | 395.675 | 385.675 | TETRA SAPS |
| 229 | 395.7 | 385.7 | TETRA SAPS |
| 230 | 395.725 | 385.725 | TETRA SAPS |
| 231 | 395.75 | 385.75 | TETRA SAPS |
| 232 | 395.775 | 385.775 | TETRA SAPS |
| 233 | 395.8 | 385.8 | TETRA SAPS |
| 234 | 395.825 | 385.825 | TETRA SAPS |
| 235 | 395.85 | 385.85 | TETRA SAPS |
| 236 | 395.875 | 385.875 | TETRA SAPS |
| 237 | 395.9 | 385.9 | TETRA SAPS |
| 238 | 395.925 | 385.925 | TETRA SAPS |
| 239 | 395.95 | 385.95 | TETRA SAPS |
| 240 | 395.975 | 385.975 | TETRA SAPS |
| 241 | 396 | 386 | TETRA SAPS |
| 242 | 396.025 | 386.025 | TETRA SAPS |
| 243 | 396.05 | 386.05 | TETRA SAPS |
| 244 | 396.075 | 386.075 | TETRA SAPS |
| 245 | 396.1 | 386.1 | TETRA SAPS |
| 246 | 396.125 | 386.125 | TETRA SAPS |
| 247 | 396.15 | 386.15 | TETRA SAPS |
| 248 | 396.175 | 386.175 | TETRA SAPS |
| 249 | 396.2 | 386.2 | TETRA SAPS |
| 250 | 396.225 | 386.225 | TETRA SAPS |
| 251 | 396.25 | 386.25 | TETRA SAPS |
| 252 | 396.275 | 386.275 | TETRA SAPS |
| 253 | 396.3 | 386.3 | TETRA SAPS |
| 254 | 396.325 | 386.325 | TETRA SAPS |
| 255 | 396.35 | 386.35 | TETRA SAPS |
| 256 | 396.375 | 386.375 | TETRA SAPS |
| 257 | 396.4 | 386.4 | TETRA SAPS |
| 258 | 396.425 | 386.425 | TETRA SAPS |
| 259 | 396.45 | 386.45 | TETRA SAPS |
| 260 | 396.475 | 386.475 | TETRA SAPS |
| 261 | 396.5 | 386.5 | TETRA SAPS |
| 262 | 396.525 | 386.525 | TETRA SAPS |
| 263 | 396.55 | 386.55 | TETRA SAPS |
| 264 | 396.575 | 386.575 | TETRA SAPS |
| 265 | 396.6 | 386.6 | TETRA SAPS |
| 266 | 396.625 | 386.625 | TETRA SAPS |
| 267 | 396.65 | 386.65 | TETRA SAPS |
| 268 | 396.675 | 386.675 | TETRA SAPS |
| 269 | 396.7 | 386.7 | TETRA SAPS |
| 270 | 396.725 | 386.725 | TETRA SAPS |
| 271 | 396.75 | 386.75 | TETRA SAPS |
| 272 | 396.775 | 386.775 | TETRA SAPS |
| 273 | 396.8 | 386.8 | TETRA SAPS |

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|

CH PLAN FOR 390-399.9875_380-389.9875MHz 2006

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 274 | 396.825 | 386.825 | TETRA SAPS |
| 275 | 396.85 | 386.85 | TETRA SAPS |
| 276 | 396.875 | 386.875 | TETRA SAPS |
| 277 | 396.9 | 386.9 | TETRA SAPS |
| 278 | 396.925 | 386.925 | TETRA SAPS |
| 279 | 396.95 | 386.95 | TETRA SAPS |
| 280 | 396.975 | 386.975 | TETRA SAPS |
| 281 | 397 | 387 | DOD FORMER SANDF |
| 282 | 397.025 | 387.025 | DOD FORMER SANDF |
| 283 | 397.05 | 387.05 | DOD FORMER SANDF |
| 284 | 397.075 | 387.075 | DOD FORMER SANDF |
| 285 | 397.1 | 387.1 | DOD FORMER SANDF |
| 286 | 397.125 | 387.125 | DOD FORMER SANDF |
| 287 | 397.15 | 387.15 | DOD FORMER SANDF |
| 288 | 397.175 | 387.175 | DOD FORMER SANDF |
| 289 | 397.2 | 387.2 | DOD FORMER SANDF |
| 290 | 397.225 | 387.225 | DOD FORMER SANDF |
| 291 | 397.25 | 387.25 | DOD FORMER SANDF |
| 292 | 397.275 | 387.275 | DOD FORMER SANDF |
| 293 | 397.3 | 387.3 | DOD FORMER SANDF |
| 294 | 397.325 | 387.325 | DOD FORMER SANDF |
| 295 | 397.35 | 387.35 | DOD FORMER SANDF |
| 296 | 397.375 | 387.375 | DOD FORMER SANDF |
| 297 | 397.4 | 387.4 | DOD FORMER SANDF |
| 298 | 397.425 | 387.425 | DOD FORMER SANDF |
| 299 | 397.45 | 387.45 | DOD FORMER SANDF |
| 300 | 397.475 | 387.475 | DOD FORMER SANDF |
| 301 | 397.5 | 387.5 | DOD FORMER SANDF |
| 302 | 397.525 | 387.525 | DOD FORMER SANDF |
| 303 | 397.55 | 387.55 | DOD FORMER SANDF |
| 304 | 397.575 | 387.575 | DOD FORMER SANDF |
| 305 | 397.6 | 387.6 | DOD FORMER SANDF |
| 306 | 397.625 | 387.625 | DOD FORMER SANDF |
| 307 | 397.65 | 387.65 | DOD FORMER SANDF |
| 308 | 397.675 | 387.675 | DOD FORMER SANDF |
| 309 | 397.7 | 387.7 | DOD FORMER SANDF |
| 310 | 397.725 | 387.725 | DOD FORMER SANDF |
| 311 | 397.75 | 387.75 | DOD FORMER SANDF |
| 312 | 397.775 | 387.775 | DOD FORMER SANDF |
| 313 | 397.8 | 387.8 | DOD FORMER SANDF |
| 314 | 397.825 | 387.825 | DOD FORMER SANDF |
| 315 | 397.85 | 387.85 | DOD FORMER SANDF |
| 316 | 397.875 | 387.875 | DOD FORMER SANDF |
| 317 | 397.9 | 387.9 | DOD FORMER SANDF |
| 318 | 397.925 | 387.925 | DOD FORMER SANDF |
| 319 | 397.95 | 387.95 | DOD FORMER SANDF |
| | | | |
| CH. No. | BTX | MTX | REMARKS |

CH PLAN FOR 390-399.9875_380-389.9875MHz 2006

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 320 | 397.975 | 387.975 | DOD FORMER SANDF |
| 321 | 398 | 388 | DOD FORMER SANDF |
| 322 | 398.025 | 388.025 | DOD FORMER SANDF |
| 323 | 398.05 | 388.05 | DOD FORMER SANDF |
| 324 | 398.075 | 388.075 | DOD FORMER SANDF |
| 325 | 398.1 | 388.1 | DOD FORMER SANDF |
| 326 | 398.125 | 388.125 | DOD FORMER SANDF |
| 327 | 398.15 | 388.15 | DOD FORMER SANDF |
| 328 | 398.175 | 388.175 | DOD FORMER SANDF |
| 329 | 398.2 | 388.2 | DOD FORMER SANDF |
| 330 | 398.225 | 388.225 | DOD FORMER SANDF |
| 331 | 398.25 | 388.25 | DOD FORMER SANDF |
| 332 | 398.275 | 388.275 | DOD FORMER SANDF |
| 333 | 398.3 | 388.3 | DOD FORMER SANDF |
| 334 | 398.325 | 388.325 | DOD FORMER SANDF |
| 335 | 398.35 | 388.35 | DOD FORMER SANDF |
| 336 | 398.375 | 388.375 | DOD FORMER SANDF |
| 337 | 398.4 | 388.4 | DOD FORMER SANDF |
| 338 | 398.425 | 388.425 | DOD FORMER SANDF |
| 339 | 398.45 | 388.45 | DOD FORMER SANDF |
| 340 | 398.475 | 388.475 | DOD FORMER SANDF |
| 341 | 398.5 | 388.5 | DOD FORMER SANDF |
| 342 | 398.525 | 388.525 | DOD FORMER SANDF |
| 343 | 398.55 | 388.55 | DOD FORMER SANDF |
| 344 | 398.575 | 388.575 | DOD FORMER SANDF |
| 345 | 398.6 | 388.6 | DOD FORMER SANDF |
| 346 | 398.625 | 388.625 | DOD FORMER SANDF |
| 347 | 398.65 | 388.65 | DOD FORMER SANDF |
| 348 | 398.675 | 388.675 | DOD FORMER SANDF |
| 349 | 398.7 | 388.7 | DOD FORMER SANDF |
| 350 | 398.725 | 388.725 | DOD FORMER SANDF |
| 351 | 398.75 | 388.75 | DOD FORMER SANDF |
| 352 | 398.775 | 388.775 | DOD FORMER SANDF |
| 353 | 398.8 | 388.8 | DOD FORMER SANDF |
| 354 | 398.825 | 388.825 | DOD FORMER SANDF |
| 355 | 398.85 | 388.85 | DOD FORMER SANDF |
| 356 | 398.875 | 388.875 | DOD FORMER SANDF |
| 357 | 398.9 | 388.9 | DOD FORMER SANDF |
| 358 | 398.925 | 388.925 | DOD FORMER SANDF |
| 359 | 398.95 | 388.95 | DOD FORMER SANDF |
| 360 | 398.975 | 388.975 | DOD FORMER SANDF |
| 361 | 399 | 389 | DOD FORMER SANDF |
| 362 | 399.025 | 389.025 | DOD FORMER SANDF |
| 363 | 399.05 | 389.05 | DOD FORMER SANDF |
| 364 | 399.075 | 389.075 | DOD FORMER SANDF |
| 365 | 399.1 | 389.1 | DOD FORMER SANDF |
| | | | |
| CH. No. | BTX | MTX | REMARKS |

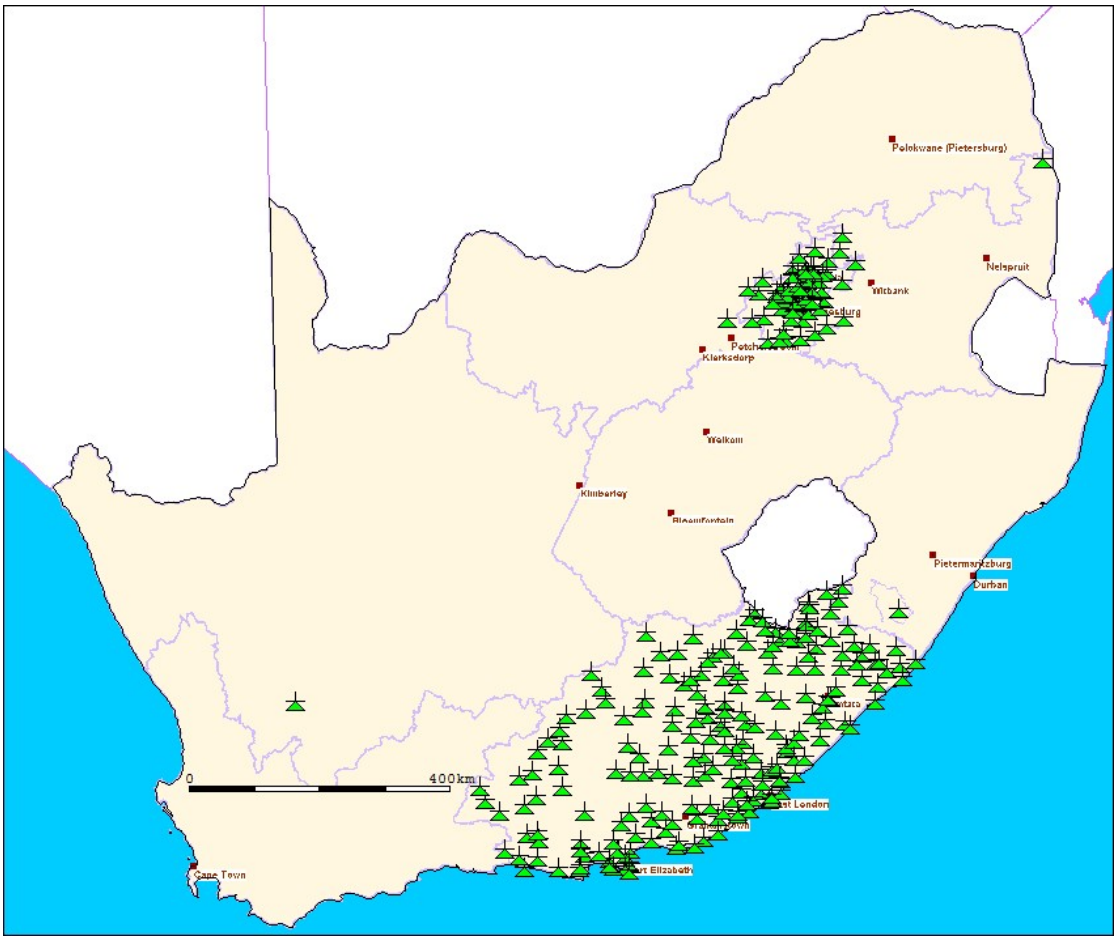
CH PLAN FOR 390-399.9875_380-389.9875MHz 2006

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 366 | 399.125 | 389.125 | DOD FORMER SANDF |
| 367 | 399.15 | 389.15 | DOD FORMER SANDF |
| 368 | 399.175 | 389.175 | DOD FORMER SANDF |
| 369 | 399.2 | 389.2 | DOD FORMER SANDF |
| 370 | 399.225 | 389.225 | DOD FORMER SANDF |
| 371 | 399.25 | 389.25 | DOD FORMER SANDF |
| 372 | 399.275 | 389.275 | DOD FORMER SANDF |
| 373 | 399.3 | 389.3 | DOD FORMER SANDF |
| 374 | 399.325 | 389.325 | DOD FORMER SANDF |
| 375 | 399.35 | 389.35 | DOD FORMER SANDF |
| 376 | 399.375 | 389.375 | DOD FORMER SANDF |
| 377 | 399.4 | 389.4 | DOD FORMER SANDF |
| 378 | 399.425 | 389.425 | DOD FORMER SANDF |
| 379 | 399.45 | 389.45 | DOD FORMER SANDF |
| 380 | 399.475 | 389.475 | DOD FORMER SANDF |
| 381 | 399.5 | 389.5 | DOD FORMER SANDF |
| 382 | 399.525 | 389.525 | DOD FORMER SANDF |
| 383 | 399.55 | 389.55 | DOD FORMER SANDF |
| 384 | 399.575 | 389.575 | DOD FORMER SANDF |
| 385 | 399.6 | 389.6 | DOD FORMER SANDF |
| 386 | 399.625 | 389.625 | DOD FORMER SANDF |
| 387 | 399.65 | 389.65 | DOD FORMER SANDF |
| 388 | 399.675 | 389.675 | DOD FORMER SANDF |
| 389 | 399.7 | 389.7 | DOD FORMER SANDF |
| 390 | 399.725 | 389.725 | DOD FORMER SANDF |
| 391 | 399.75 | 389.75 | DOD FORMER SANDF |
| 392 | 399.775 | 389.775 | DOD FORMER SANDF |
| 393 | 399.8 | 389.8 | DOD FORMER SANDF |
| 394 | 399.825 | 389.825 | DOD FORMER SANDF |
| 395 | 399.85 | 389.85 | DOD FORMER SANDF |
| 396 | 399.875 | 389.875 | DOD FORMER SANDF |
| 397 | 399.9 | 389.9 | DOD FORMER SANDF |
| 398 | 399.925 | 389.925 | DOD FORMER SANDF |
| 399 | 399.95 | 389.95 | DOD FORMER SANDF |
| 400 | 399.975 | 389.975 | DOD FORMER SANDF |

### 1.5.2 Licensing information for the applicable frequency allocation

There are 2 760 Licenses issued in this band for both BTX and MTX as well as single frequency devices.

### 1.5.3 Areas where licensed frequencies are operational.



### 1.6 Applicable Frequency Allocation and Band information 403 MHz to 406 MHz

Frequency Band under investigation 403 MHz to 406 MHz

METEOROLOGICAL AIDS

Mobile except aeronautical mobile

Frequency Sub bands

402 – 405 MHz – Medical Implants

402 – 406 MHz – Various SRD's

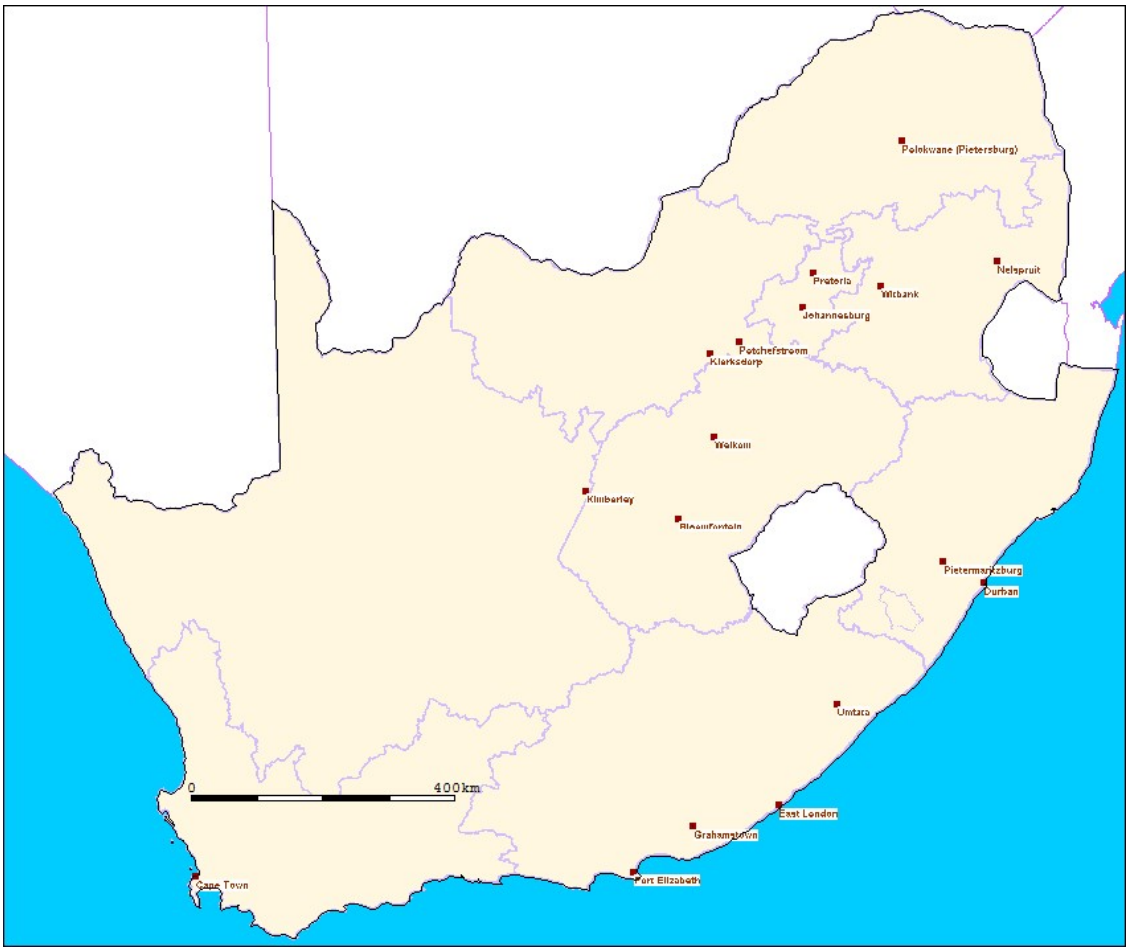
#### 1.6.1 Channel Plan for the Frequency Allocation

Not available, no channel spacing, 10 mW, 100% duty cycle.

#### 1.6.2 Licensing information for the applicable frequency allocation

There are 1573 Licenses issued in this band.

### 1.6.3 Areas where licensed frequencies are operational.



### 1.7 Applicable Frequency Allocation and Band information 406 MHz to 426 MHz

Use of this Band for PPDR to be studied.

Frequency Band under investigation 406 MHz to 426 MHz

Frequency Sub bands

**406 – 410 MHz**

FIXED

MOBILE except aeronautical mobile

RADIO ASTRONOMY

Pairings

Fixed Links MTX 406.1 – 407.625 MHz paired with BTX 416.625 to 417.625 MHz

Mobile MTX 406.1 – 407.625 MHz paired with BTX 416.625 to 417.625 MHz

Fixed Links MTX 407.625 – 410 MHz paired with BTX 417.625 to 420 MHz

Mobile MTX 407.625 – 410 MHz paired with BTX 417.625 to 420 MHz

**410 to 420 MHz & 420 to 430 MHz**

FIXED

MOBILE except aeronautical mobile

SPACE RESEARCH (space to space) in Band 410 to 420 MHz

Pairings

Mobile MTX 410 – 413 MHz paired with BTX 420 to 423 MHz

Mobile Data MTX 413 – 413.7625 MHz paired with BTX 423 to 423.7625 MHz

Digital Trunking MTX 413.7625 – 416.1 MHz paired with BTX 423.7625 to 426.1 MHz

Mobile BTX 416.1 – 417.625 MHz paired with MTX 406.1 to 407.625 MHz

FIXED Single Frequency Links 426.1 to 430 MHz

### 1.7.1 Channel Plan for the Frequency Allocation

**SOUTH AFRICAN POLICE SERVICES**

CH-PLAN FOR 417.5875_419.9875/407.5875_409.9875MHz 2006(12.5kH

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 1 | 417.5875 | 407.5875 | ADDITIONAL SAPS |
| 2 | 417.6 | 407.6 | ADDITIONAL SAPS |
| 3 | 417.6125 | 407.6125 | ADDITIONAL SAPS |
| 4 | 417.625 | 407.625 | SAPS |
| 5 | 417.6375 | 407.6375 | SAPS |
| 6 | 417.65 | 407.65 | SAPS |
| 7 | 417.6625 | 407.6625 | SAPS |
| 8 | 417.675 | 407.675 | SAPS |
| 9 | 417.6875 | 407.6875 | SAPS |
| 10 | 417.7 | 407.7 | SAPS |
| 11 | 417.7125 | 407.7125 | SAPS |
| 12 | 417.725 | 407.725 | SAPS |
| 13 | 417.7375 | 407.7375 | SAPS |
| 14 | 417.75 | 407.75 | SAPS |
| 15 | 417.7625 | 407.7625 | SAPS |
| 16 | 417.775 | 407.775 | SAPS |
| 17 | 417.7875 | 407.7875 | SAPS |
| 18 | 417.8 | 407.8 | SAPS |
| 19 | 417.8125 | 407.8125 | SAPS |
| 20 | 417.825 | 407.825 | SAPS |
| 21 | 417.8375 | 407.8375 | SAPS |
| 22 | 417.85 | 407.85 | SAPS |
| 23 | 417.8625 | 407.8625 | SAPS |
| 24 | 417.875 | 407.875 | SAPS |
| 25 | 417.8875 | 407.8875 | SAPS |
| 26 | 417.9 | 407.9 | SAPS |
| 27 | 417.9125 | 407.9125 | SAPS |
| 28 | 417.925 | 407.925 | SAPS |
| 29 | 417.9375 | 407.9375 | SAPS |
| 30 | 417.95 | 407.95 | SAPS |
| 31 | 417.9625 | 407.9625 | SAPS |
| 32 | 417.975 | 407.975 | SAPS |
| 33 | 417.9875 | 407.9875 | SAPS |
| 34 | 418 | 408 | SAPS |
| 35 | 418.0125 | 408.0125 | SAPS |
| 36 | 418.025 | 408.025 | SAPS |
| 37 | 418.0375 | 408.0375 | SAPS |
| 38 | 418.05 | 408.05 | SAPS |
| 39 | 418.0625 | 408.0625 | SAPS |
| 40 | 418.075 | 408.075 | SAPS |
| 41 | 418.0875 | 408.0875 | SAPS |
| 42 | 418.1 | 408.1 | SAPS |
| 43 | 418.1125 | 408.1125 | SAPS |
| 44 | 418.125 | 408.125 | SAPS |
| | | | |
| CH. No. | BTX | MTX | REMARKS |

CH-PLAN FOR 417.5875_419.9875/407.5875_409.9875MHz 2006(12.5kH

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 45 | 418.1375 | 408.1375 | SAPS |
| 46 | 418.15 | 408.15 | SAPS |
| 47 | 418.1625 | 408.1625 | SAPS |
| 48 | 418.175 | 408.175 | SAPS |
| 49 | 418.1875 | 408.1875 | SAPS |
| 50 | 418.2 | 408.2 | SAPS |
| 51 | 418.2125 | 408.2125 | SAPS |
| 52 | 418.225 | 408.225 | SAPS |
| 53 | 418.2375 | 408.2375 | SAPS |
| 54 | 418.25 | 408.25 | SAPS |
| 55 | 418.2625 | 408.2625 | SAPS |
| 56 | 418.275 | 408.275 | SAPS |
| 57 | 418.2875 | 408.2875 | SAPS |
| 58 | 418.3 | 408.3 | SAPS |
| 59 | 418.3125 | 408.3125 | SAPS |
| 60 | 418.325 | 408.325 | SAPS |
| 61 | 418.3375 | 408.3375 | SAPS |
| 62 | 418.35 | 408.35 | SAPS |
| 63 | 418.3625 | 408.3625 | SAPS |
| 64 | 418.375 | 408.375 | SAPS |
| 65 | 418.3875 | 408.3875 | SAPS |
| 66 | 418.4 | 408.4 | SAPS |
| 67 | 418.4125 | 408.4125 | SAPS |
| 68 | 418.425 | 408.425 | SAPS |
| 69 | 418.4375 | 408.4375 | SAPS |
| 70 | 418.45 | 408.45 | SAPS |
| 71 | 418.4625 | 408.4625 | SAPS |
| 72 | 418.475 | 408.475 | SAPS |
| 73 | 418.4875 | 408.4875 | SAPS |
| 74 | 418.5 | 408.5 | SAPS |
| 75 | 418.5125 | 408.5125 | SAPS |
| 76 | 418.525 | 408.525 | SAPS |
| 77 | 418.5375 | 408.5375 | SAPS |
| 78 | 418.55 | 408.55 | SAPS |
| 79 | 418.5625 | 408.5625 | SAPS |
| 80 | 418.575 | 408.575 | SAPS |
| 81 | 418.5875 | 408.5875 | SAPS |
| 82 | 418.6 | 408.6 | SAPS |
| 83 | 418.6125 | 408.6125 | SAPS |
| 84 | 418.625 | 408.625 | SAPS |
| 85 | 418.6375 | 408.6375 | SAPS |
| 86 | 418.65 | 408.65 | SAPS |
| 87 | 418.6625 | 408.6625 | SAPS |
| 88 | 418.675 | 408.675 | SAPS |
| 89 | 418.6875 | 408.6875 | SAPS |
| 90 | 418.7 | 408.7 | SAPS |
| 91 | 418.7125 | 408.7125 | SAPS |

CH-PLAN FOR 417.5875_419.9875/407.5875_409.9875MHz 2006(12.5kH

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 92 | 418.725 | 408.725 | SAPS |
| 93 | 418.7375 | 408.7375 | SAPS |
| 94 | 418.75 | 408.75 | SAPS |
| 95 | 418.7625 | 408.7625 | SAPS |
| 96 | 418.775 | 408.775 | SAPS |
| 97 | 418.7875 | 408.7875 | SAPS |
| 98 | 418.8 | 408.8 | SAPS |
| 99 | 418.8125 | 408.8125 | SAPS |
| 100 | 418.825 | 408.825 | SAPS |
| 101 | 418.8375 | 408.8375 | SAPS |
| 102 | 418.85 | 408.85 | SAPS |
| 103 | 418.8625 | 408.8625 | SAPS |
| 104 | 418.875 | 408.875 | SAPS |
| 105 | 418.8875 | 408.8875 | SAPS |
| 106 | 418.9 | 408.9 | SAPS |
| 107 | 418.9125 | 408.9125 | SAPS |
| 108 | 418.925 | 408.925 | SAPS |
| 109 | 418.9375 | 408.9375 | SAPS |
| 110 | 418.95 | 408.95 | SAPS |
| 111 | 418.9625 | 408.9625 | SAPS |
| 112 | 418.975 | 408.975 | SAPS |
| 113 | 418.9875 | 408.9875 | SAPS |
| 114 | 419 | 409 | SAPS |
| 115 | 419.0125 | 409.0125 | SAPS |
| 116 | 419.025 | 409.025 | SAPS |
| 117 | 419.0375 | 409.0375 | SAPS |
| 118 | 419.05 | 409.05 | SAPS |
| 119 | 419.0625 | 409.0625 | SAPS |
| 120 | 419.075 | 409.075 | SAPS |
| 121 | 419.0875 | 409.0875 | SAPS |
| 122 | 419.1 | 409.1 | SAPS |
| 123 | 419.1125 | 409.1125 | SAPS |
| 124 | 419.125 | 409.125 | SAPS |
| 125 | 419.1375 | 409.1375 | SAPS |
| 126 | 419.15 | 409.15 | SAPS |
| 127 | 419.1625 | 409.1625 | SAPS |
| 128 | 419.175 | 409.175 | SAPS |
| 129 | 419.1875 | 409.1875 | SAPS |
| 130 | 419.2 | 409.2 | SAPS |
| 131 | 419.2125 | 409.2125 | SAPS |
| 132 | 419.225 | 409.225 | SAPS |
| 133 | 419.2375 | 409.2375 | SAPS |
| 134 | 419.25 | 409.25 | SAPS |
| 135 | 419.2625 | 409.2625 | SAPS |
| 136 | 419.275 | 409.275 | SAPS |
| 137 | 419.2875 | 409.2875 | SAPS |
| 138 | 419.3 | 409.3 | SAPS |
| | | | |
| CH. No. | BTX | MTX | REMARKS |

CH-PLAN FOR 417.5875_419.9875/407.5875_409.9875MHz 2006(12.5kH

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 139 | 419.3125 | 409.3125 | SAPS |
| 140 | 419.325 | 409.325 | SAPS |
| 141 | 419.3375 | 409.3375 | SAPS |
| 142 | 419.35 | 409.35 | SAPS |
| 143 | 419.3625 | 409.3625 | SAPS |
| 144 | 419.375 | 409.375 | SAPS |
| 145 | 419.3875 | 409.3875 | SAPS |
| 146 | 419.4 | 409.4 | SAPS |
| 147 | 419.4125 | 409.4125 | SAPS |
| 148 | 419.425 | 409.425 | SAPS |
| 149 | 419.4375 | 409.4375 | SAPS |
| 150 | 419.45 | 409.45 | SAPS |
| 151 | 419.4625 | 409.4625 | SAPS |
| 152 | 419.475 | 409.475 | SAPS |
| 153 | 419.4875 | 409.4875 | SAPS |
| 154 | 419.5 | 409.5 | SAPS |
| 155 | 419.5125 | 409.5125 | SAPS |
| 156 | 419.525 | 409.525 | SAPS |
| 157 | 419.5375 | 409.5375 | SAPS |
| 158 | 419.55 | 409.55 | SAPS |
| 159 | 419.5625 | 409.5625 | SAPS |
| 160 | 419.575 | 409.575 | SAPS |
| 161 | 419.5875 | 409.5875 | SAPS |
| 162 | 419.6 | 409.6 | SAPS |
| 163 | 419.6125 | 409.6125 | SAPS |
| 164 | 419.625 | 409.625 | SAPS |
| 165 | 419.6375 | 409.6375 | SAPS |
| 166 | 419.65 | 409.65 | SAPS |
| 167 | 419.6625 | 409.6625 | SAPS |
| 168 | 419.675 | 409.675 | SAPS |
| 169 | 419.6875 | 409.6875 | SAPS |
| 170 | 419.7 | 409.7 | SAPS |
| 171 | 419.7125 | 409.7125 | SAPS |
| 172 | 419.725 | 409.725 | SAPS |
| 173 | 419.7375 | 409.7375 | SAPS |
| 174 | 419.75 | 409.75 | SAPS |
| 175 | 419.7625 | 409.7625 | SAPS |
| 176 | 419.775 | 409.775 | SAPS |
| 177 | 419.7875 | 409.7875 | SAPS |
| 178 | 419.8 | 409.8 | SAPS |
| 179 | 419.8125 | 409.8125 | SAPS |
| 180 | 419.825 | 409.825 | SAPS |
| 181 | 419.8375 | 409.8375 | SAPS |
| 182 | 419.85 | 409.85 | SAPS |
| 183 | 419.8625 | 409.8625 | SAPS |
| 184 | 419.875 | 409.875 | SAPS |
| 185 | 419.8875 | 409.8875 | SAPS |
| | | | |
| CH. No. | BTX | MTX | REMARKS |

CH-PLAN FOR 417.5875_419.9875/407.5875_409.9875MHz 2006(12.5kH

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 186 | 419.9 | 409.9 | ADDITIONAL SAPS |
| 187 | 419.9125 | 409.9125 | ADDITIONAL SAPS |
| 188 | 419.925 | 409.925 | ADDITIONAL SAPS |
| 189 | 419.9375 | 409.9375 | ADDITIONAL SAPS |
| 190 | 419.95 | 409.95 | ADDITIONAL SAPS |
| 191 | 419.9625 | 409.9625 | ADDITIONAL SAPS |
| 192 | 419.975 | 409.975 | ADDITIONAL SAPS |
| 193 | 419.9875 | 409.9875 | ADDITIONAL SAPS |

**DIGITAL TRUNKING (TETRA)**

CH-PLAN FOR 420_424.975/410_414.975MHz 2009 (25kHz)

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 1 | 420 | 410 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 2 | 420.025 | 410.025 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 3 | 420.05 | 410.05 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 4 | 420.075 | 410.075 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 5 | 420.1 | 410.1 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 6 | 420.125 | 410.125 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 7 | 420.15 | 410.15 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 8 | 420.175 | 410.175 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 9 | 420.2 | 410.2 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 10 | 420.225 | 410.225 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 11 | 420.25 | 410.25 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 12 | 420.275 | 410.275 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 13 | 420.3 | 410.3 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 14 | 420.325 | 410.325 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 15 | 420.35 | 410.35 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 16 | 420.375 | 410.375 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 17 | 420.4 | 410.4 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 18 | 420.425 | 410.425 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 19 | 420.45 | 410.45 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 20 | 420.475 | 410.475 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 21 | 420.5 | 410.5 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 22 | 420.525 | 410.525 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 23 | 420.55 | 410.55 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 24 | 420.575 | 410.575 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 25 | 420.6 | 410.6 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 26 | 420.625 | 410.625 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 27 | 420.65 | 410.65 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 28 | 420.675 | 410.675 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 29 | 420.7 | 410.7 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 30 | 420.725 | 410.725 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 31 | 420.75 | 410.75 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 32 | 420.775 | 410.775 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 33 | 420.8 | 410.8 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 34 | 420.825 | 410.825 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 35 | 420.85 | 410.85 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 36 | 420.875 | 410.875 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 37 | 420.9 | 410.9 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 38 | 420.925 | 410.925 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 39 | 420.95 | 410.95 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 40 | 420.975 | 410.975 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 41 | 421 | 411 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 42 | 421.025 | 411.025 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 43 | 421.05 | 411.05 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 44 | 421.075 | 411.075 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|

CH-PLAN FOR 420_424.975/410_414.975MHz 2009 (25kHz)

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 45 | 421.1 | 411.1 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 46 | 421.125 | 411.125 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 47 | 421.15 | 411.15 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 48 | 421.175 | 411.175 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 49 | 421.2 | 411.2 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 50 | 421.225 | 411.225 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 51 | 421.25 | 411.25 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 52 | 421.275 | 411.275 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 53 | 421.3 | 411.3 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 54 | 421.325 | 411.325 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 55 | 421.35 | 411.35 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 56 | 421.375 | 411.375 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 57 | 421.4 | 411.4 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 58 | 421.425 | 411.425 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 59 | 421.45 | 411.45 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 60 | 421.475 | 411.475 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 61 | 421.5 | 411.5 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 62 | 421.525 | 411.525 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 63 | 421.55 | 411.55 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 64 | 421.575 | 411.575 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 65 | 421.6 | 411.6 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 66 | 421.625 | 411.625 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 67 | 421.65 | 411.65 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 68 | 421.675 | 411.675 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 69 | 421.7 | 411.7 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 70 | 421.725 | 411.725 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 71 | 421.75 | 411.75 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 72 | 421.775 | 411.775 | TETRA - SECUNDA - RADIO ROOM 1. |
| 73 | 421.8 | 411.8 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 74 | 421.825 | 411.825 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 75 | 421.85 | 411.85 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 76 | 421.875 | 411.875 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 77 | 421.9 | 411.9 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 78 | 421.925 | 411.925 | TETRA - SECUNDA - RADIO ROOM 1. |
| 79 | 421.95 | 411.95 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 80 | 421.975 | 411.975 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 81 | 422 | 412 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 82 | 422.025 | 412.025 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 83 | 422.05 | 412.05 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 84 | 422.075 | 412.075 | TETRA - SECUNDA - RADIO ROOM 1. |
| 85 | 422.1 | 412.1 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 86 | 422.125 | 412.125 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 87 | 422.15 | 412.15 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 88 | 422.175 | 412.175 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 89 | 422.2 | 412.2 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 90 | 422.225 | 412.225 | TETRA - SECUNDA - RADIO ROOM 1. |
| 91 | 422.25 | 412.25 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |

CH-PLAN FOR 420_424.975/410_414.975MHz 2009 (25kHz)

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 92 | 422.275 | 412.275 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 93 | 422.3 | 412.3 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 94 | 422.325 | 412.325 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 95 | 422.35 | 412.35 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 96 | 422.375 | 412.375 | TETRA - SECUNDA - RADIO ROOM 1. |
| 97 | 422.4 | 412.4 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 98 | 422.425 | 412.425 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 99 | 422.45 | 412.45 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 100 | 422.475 | 412.475 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 101 | 422.5 | 412.5 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 102 | 422.525 | 412.525 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 103 | 422.55 | 412.55 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 104 | 422.575 | 412.575 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 105 | 422.6 | 412.6 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 106 | 422.625 | 412.625 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 107 | 422.65 | 412.65 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 108 | 422.675 | 412.675 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 109 | 422.7 | 412.7 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 110 | 422.725 | 412.725 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 111 | 422.75 | 412.75 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 112 | 422.775 | 412.775 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 113 | 422.8 | 412.8 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 114 | 422.825 | 412.825 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 115 | 422.85 | 412.85 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 116 | 422.875 | 412.875 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 117 | 422.9 | 412.9 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 118 | 422.925 | 412.925 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 119 | 422.95 | 412.95 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 120 | 422.975 | 412.975 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 121 | 423 | 413 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 122 | 423.025 | 413.025 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 123 | 423.05 | 413.05 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 124 | 423.075 | 413.075 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 125 | 423.1 | 413.1 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 126 | 423.125 | 413.125 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 127 | 423.15 | 413.15 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 128 | 423.175 | 413.175 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 129 | 423.2 | 413.2 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 130 | 423.225 | 413.225 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 131 | 423.25 | 413.25 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 132 | 423.275 | 413.275 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 133 | 423.3 | 413.3 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 134 | 423.325 | 413.325 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 135 | 423.35 | 413.35 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 136 | 423.375 | 413.375 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 137 | 423.4 | 413.4 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| 138 | 423.425 | 413.425 | TETRA - MUN-UTILITIES AND PUBLIC - COUNTRY WIDE |
| | | | |
| CH. No. | BTX | MTX | REMARKS |

CH-PLAN FOR 420_424.975/410_414.975MHz 2009 (25kHz)

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 139 | 423.45 | 413.45 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 140 | 423.475 | 413.475 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 141 | 423.5 | 413.5 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 142 | 423.525 | 413.525 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 143 | 423.55 | 413.55 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 144 | 423.575 | 413.575 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 145 | 423.6 | 413.6 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 146 | 423.625 | 413.625 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 147 | 423.65 | 413.65 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 148 | 423.675 | 413.675 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 149 | 423.7 | 413.7 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 150 | 423.725 | 413.725 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 151 | 423.75 | 413.75 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 152 | 423.775 | 413.775 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 153 | 423.8 | 413.8 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 154 | 423.825 | 413.825 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 155 | 423.85 | 413.85 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 156 | 423.875 | 413.875 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 157 | 423.9 | 413.9 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 158 | 423.925 | 413.925 | TETRA - SEE DATABASE. |
| 159 | 423.95 | 413.95 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 160 | 423.975 | 413.975 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 161 | 424 | 414 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 162 | 424.025 | 414.025 | TETRA - SEE DATABASE. |
| 163 | 424.05 | 414.05 | TETRA - SEE DATABASE. |
| 164 | 424.075 | 414.075 | TETRA - SEE DATABASE. |
| 165 | 424.1 | 414.1 | TETRA - SEE DATABASE. |
| 166 | 424.125 | 414.125 | TETRA - SEE DATABASE. |
| 167 | 424.15 | 414.15 | TETRA - SEE DATABASE. |
| 168 | 424.175 | 414.175 | TETRA - SEE DATABASE. |
| 169 | 424.2 | 414.2 | TETRA - SEE DATABASE. |
| 170 | 424.225 | 414.225 | TETRA - SEE DATABASE. |
| 171 | 424.25 | 414.25 | TETRA - SEE DATABASE. |
| 172 | 424.275 | 414.275 | TETRA - SEE DATABASE. |
| 173 | 424.3 | 414.3 | TETRA - SEE DATABASE. |
| 174 | 424.325 | 414.325 | TETRA - SEE DATABASE. |
| 175 | 424.35 | 414.35 | TETRA - SEE DATABASE. |
| 176 | 424.375 | 414.375 | TETRA - SEE DATABASE. |
| 177 | 424.4 | 414.4 | TETRA - SEE DATABASE. |
| 178 | 424.425 | 414.425 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 179 | 424.45 | 414.45 | TETRA - SEE DATABASE. |
| 180 | 424.475 | 414.475 | TETRA - SEE DATABASE. |
| 181 | 424.5 | 414.5 | TETRA - SEE DATABASE. |
| 182 | 424.525 | 414.525 | TETRA - SEE DATABASE. |
| 183 | 424.55 | 414.55 | TETRA - SEE DATABASE. |
| 184 | 424.575 | 414.575 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 185 | 424.6 | 414.6 | TETRA - SEE DATABASE. |
| | | | |
| CH. No. | BTX | MTX | REMARKS |

CH-PLAN FOR 420_424.975/410_414.975MHz 2009 (25kHz)

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 186 | 424.625 | 414.625 | TETRA - SEE DATABASE. |
| 187 | 424.65 | 414.65 | TETRA - SEE DATABASE. |
| 188 | 424.675 | 414.675 | TETRA - SEE DATABASE. |
| 189 | 424.7 | 414.7 | TETRA - SEE DATABASE. |
| 190 | 424.725 | 414.725 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 191 | 424.75 | 414.75 | TETRA - SEE DATABASE. |
| 192 | 424.775 | 414.775 | TETRA - SEE DATABASE. |
| 193 | 424.8 | 414.8 | TETRA - SEE DATABASE. |
| 194 | 424.825 | 414.825 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 195 | 424.85 | 414.85 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 196 | 424.875 | 414.875 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 197 | 424.9 | 414.9 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 198 | 424.925 | 414.925 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| 199 | 424.95 | 414.95 | TETRA - SEE DATABASE. |
| 200 | 424.975 | 414.975 | TETRA - MUN-UTILITIES - COUNTRY WIDE |
| | | | |
| CH. No. | BTX | MTX | REMARKS |

**MOBILE DATA**

CHANNEL PLAN FOR 423-423.7625/413-413.7625MHz 2003 (12.5kHz)

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 1 | 423 | 413 | WBS |
| 2 | 423.0125 | 413.0125 | WBS |
| 3 | 423.025 | 413.025 | WBS |
| 4 | 423.0375 | 413.0375 | WBS |
| 5 | 423.05 | 413.05 | WBS |
| 6 | 423.0625 | 413.0625 | WBS |
| 7 | 423.075 | 413.075 | WBS |
| 8 | 423.0875 | 413.0875 | WBS |
| 9 | 423.1 | 413.1 | WBS |
| 10 | 423.1125 | 413.1125 | WBS |
| 11 | 423.125 | 413.125 | WBS |
| 12 | 423.1375 | 413.1375 | WBS |
| 13 | 423.15 | 413.15 | WBS |
| 14 | 423.1625 | 413.1625 | WBS |
| 15 | 423.175 | 413.175 | WBS |
| 16 | 423.1875 | 413.1875 | WBS AVAILABLE |
| 17 | 423.2 | 413.2 | WBS MIGRATION X2 |
| 18 | 423.2125 | 413.2125 | WBS |
| 19 | 423.225 | 413.225 | WBS |
| 20 | 423.2375 | 413.2375 | WBS |
| 21 | 423.25 | 413.25 | WBS |
| 22 | 423.2625 | 413.2625 | WBS |
| 23 | 423.275 | 413.275 | SEE DATABASE. |
| 24 | 423.2875 | 413.2875 | SEE DATABASE. |
| 25 | 423.3 | 413.3 | SEE DATABASE. |
| 26 | 423.3125 | 413.3125 | SEE DATABASE. |
| 27 | 423.325 | 413.325 | SEE DATABASE. |
| 28 | 423.3375 | 413.3375 | SEE DATABASE. |
| 29 | 423.35 | 413.35 | SEE DATABASE. |
| 30 | 423.3625 | 413.3625 | SEE DATABASE. |
| 31 | 423.375 | 413.375 | SEE DATABASE. |
| 32 | 423.3875 | 413.3875 | SEE DATABASE. |
| 33 | 423.4 | 413.4 | SEE DATABASE. |
| 34 | 423.4125 | 413.4125 | SEE DATABASE. |
| 35 | 423.425 | 413.425 | SEE DATABASE. |
| 36 | 423.4375 | 413.4375 | SEE DATABASE. |
| 37 | 423.45 | 413.45 | SEE DATABASE. |
| 38 | 423.4625 | 413.4625 | SEE DATABASE. |
| 39 | 423.475 | 413.475 | SEE DATABASE. |
| 40 | 423.4875 | 413.4875 | SEE DATABASE. |
| 41 | 423.5 | 413.5 | SEE DATABASE. |
| 42 | 423.5125 | 413.5125 | SEE DATABASE. |
| 43 | 423.525 | 413.525 | SEE DATABASE. |
| 44 | 423.5375 | 413.5375 | SEE DATABASE. |

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|

CHANNEL PLAN FOR 423-423.7625/413-413.7625MHz 2003 (12.5kHz)

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 45 | 423.55 | 413.55 | SEE DATABASE. |
| 46 | 423.5625 | 413.5625 | SEE DATABASE. |
| 47 | 423.575 | 413.575 | SEE DATABASE. |
| 48 | 423.5875 | 413.5875 | SEE DATABASE. |
| 49 | 423.6 | 413.6 | SEE DATABASE. |
| 50 | 423.6125 | 413.6125 | SEE DATABASE. |
| 51 | 423.625 | 413.625 | SEE DATABASE. |
| 52 | 423.6375 | 413.6375 | SEE DATABASE. |
| 53 | 423.65 | 413.65 | SEE DATABASE. |
| 54 | 423.6625 | 413.6625 | SEE DATABASE. |
| 55 | 423.675 | 413.675 | SEE DATABASE. |
| 56 | 423.6875 | 413.6875 | SEE DATABASE. |
| 57 | 423.7 | 413.7 | SEE DATABASE. |
| 58 | 423.7125 | 413.7125 | SEE DATABASE. |
| 59 | 423.725 | 413.725 | SEE DATABASE. |
| 60 | 423.7375 | 413.7375 | SEE DATABASE. |
| 61 | 423.75 | 413.75 | SEE DATABASE. |

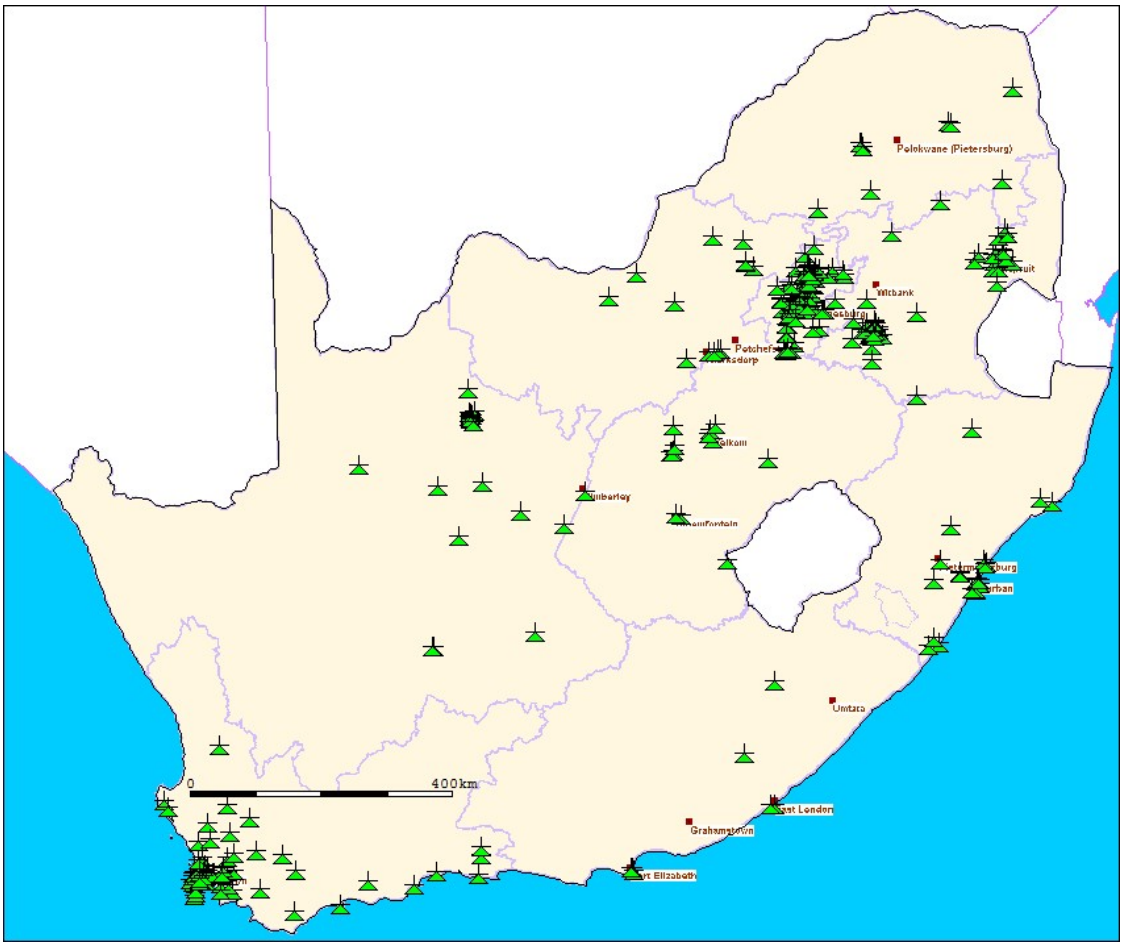
### 1.7.2 Licensing information for the applicable frequency allocation

406 to 410 MHz: There are 3326 Licenses issued in this band.

410 to 420 MHz: There are 681 Licenses issued in this band.

420 to 430 MHz: There are 1052 Licenses issued in this band.

### 1.7.3 Areas where licensed frequencies are operational.



### 1.8 Applicable Frequency Allocation and Band information 440 MHz to 450 MHz

Use of this band for PPDR to be studied.

Frequency Band under investigation 440 MHz to 450 MHz

FIXED

MOBILE except aeronautical mobile

Frequency Sub bands

Pairings

FIXED BTX: 440 to 441.1 MHz paired with MTX 445 to 446.1 MHz

Mobile BTX 441.1 – 445 MHz paired with MTX 446.1 to 450 MHz

Single Frequency Mobile Allocations

Channels 440.0125, 440.3625, 445.0125 and 445.3625 MHz are used for Agricultural Telemetry

Channels 440 to 440.1 and 445 to 445.1 are used for simplex.

Channels 440.275, 440.2875, 445.2750, 445.2875, 440.375 and 445.375 MHz are roving simplex channels.

### 1.8.1 Channel Plan for the Frequency Allocation

| CHANNEL PLAN FOR UHF TELEMETRY & ALARM BANDS | | | |
|---|---|---|---|
| 440-441 / 445-446 MHz | | | |
| CHANNEL NO | FREQUENCY A | FREQUENCY B | NOTE |
| 1 | 440 | 445 | SEE DATABASE. |
| 2 | 440.0125 | 445.0125 | SEE DATABASE. |
| 3 | 440.025 | 445.025 | SEE DATABASE. |
| 4 | 440.0375 | 445.0375 | SEE DATABASE. |
| 5 | 440.05 | 445.05 | SEE DATABASE. |
| 6 | 440.0625 | 445.0625 | SEE DATABASE. |
| 7 | 440.075 | 445.075 | SEE DATABASE. |
| 8 | 440.0875 | 445.0875 | SEE DATABASE. |
| 9 | 440.1 | 445.1 | SEE DATABASE. |
| 10 | 440.1125 | 445.1125 | SEE DATABASE. |
| 11 | 440.125 | 445.125 | SEE DATABASE. |
| 12 | 440.1375 | 445.1375 | SEE DATABASE. |
| 13 | 440.15 | 445.15 | SEE DATABASE. |
| 14 | 440.1625 | 445.1625 | SEE DATABASE. |
| 15 | 440.175 | 445.175 | SEE DATABASE. |
| 16 | 440.1875 | 445.1875 | SEE DATABASE. |
| 17 | 440.2 | 445.2 | SEE DATABASE. |
| 18 | 440.2125 | 445.2125 | SEE DATABASE. |
| 19 | 440.225 | 445.225 | SEE DATABASE. |
| 20 | 440.2375 | 445.2375 | SEE DATABASE. |
| 21 | 440.25 | 445.25 | SEE DATABASE. |
| 22 | 440.2625 | 445.2625 | SEE DATABASE. |
| 23 | 440.275 | 445.275 | SEE DATABASE. |
| 24 | 440.2875 | 445.2875 | SEE DATABASE. |
| 25 | 440.3 | 445.3 | SEE DATABASE. |
| 26 | 440.3125 | 445.3125 | SEE DATABASE. |
| 27 | 440.325 | 445.325 | SEE DATABASE. |
| 28 | 440.3375 | 445.3375 | SEE DATABASE. |
| 29 | 440.35 | 445.35 | SEE DATABASE. |
| 30 | 440.3625 | 445.3625 | SEE DATABASE. |
| 31 | 440.375 | 445.375 | SEE DATABASE. |
| 32 | 440.3875 | 445.3875 | SEE DATABASE. |
| 33 | 440.4 | 445.4 | SEE DATABASE. |
| 34 | 440.4125 | 445.4125 | SEE DATABASE. |
| 35 | 440.425 | 445.425 | SEE DATABASE. |
| 36 | 440.4375 | 445.4375 | SEE DATABASE. |
| 37 | 440.45 | 445.45 | SEE DATABASE. |
| 38 | 440.4625 | 445.4625 | SEE DATABASE. |
| 39 | 440.475 | 445.475 | SEE DATABASE. |
| 40 | 440.4875 | 445.4875 | SEE DATABASE. |
| 41 | 440.5 | 445.5 | SEE DATABASE. |
| 42 | 440.5125 | 445.5125 | SEE DATABASE. |
| 43 | 440.525 | 445.525 | SEE DATABASE. |
| 44 | 440.5375 | 445.5375 | SEE DATABASE. |
| 45 | 440.55 | 445.55 | SEE DATABASE. |
| 46 | 440.5625 | 445.5625 | SEE DATABASE. |
| 47 | 440.575 | 445.575 | SEE DATABASE. |
| 48 | 440.5875 | 445.5875 | SEE DATABASE. |
| 49 | 440.6 | 445.6 | SEE DATABASE. |
| 50 | 440.6125 | 445.6125 | SEE DATABASE. |
| 51 | 440.625 | 445.625 | SEE DATABASE. |
| 52 | 440.6375 | 445.6375 | SEE DATABASE. |
| 53 | 440.65 | 445.65 | SEE DATABASE. |
| 54 | 440.6625 | 445.6625 | SEE DATABASE. |
| 55 | 440.675 | 445.675 | SEE DATABASE. |
| 56 | 440.6875 | 445.6875 | SEE DATABASE. |
| 57 | 440.7 | 445.7 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |
| 58 | 440.7125 | 445.7125 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |
| 59 | 440.725 | 445.725 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |
| 60 | 440.7375 | 445.7375 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |
| 61 | 440.75 | 445.75 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |
| 62 | 440.7625 | 445.7625 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |
| 63 | 440.775 | 445.775 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |
| 64 | 440.7875 | 445.7875 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |
| 65 | 440.8 | 445.8 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |
| 66 | 440.8125 | 445.8125 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |
| 67 | 440.825 | 445.825 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |
| 68 | 440.8375 | 445.8375 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |
| 69 | 440.85 | 445.85 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |
| 70 | 440.8625 | 445.8625 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |
| 71 | 440.875 | 445.875 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |
| 72 | 440.8875 | 445.8875 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |
| 73 | 440.9 | 445.9 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |
| 74 | 440.9125 | 445.9125 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |
| 75 | 440.925 | 445.925 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |
| 76 | 440.9375 | 445.9375 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |
| 77 | 440.95 | 445.95 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |
| 78 | 440.9625 | 445.9625 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |
| 79 | 440.975 | 445.975 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |
| 80 | 440.9875 | 445.9875 | SWIFTNET MIGRATION - **NO ASSIGNMENTS** |

### 1.8.2 Licensing information for the applicable frequency allocation

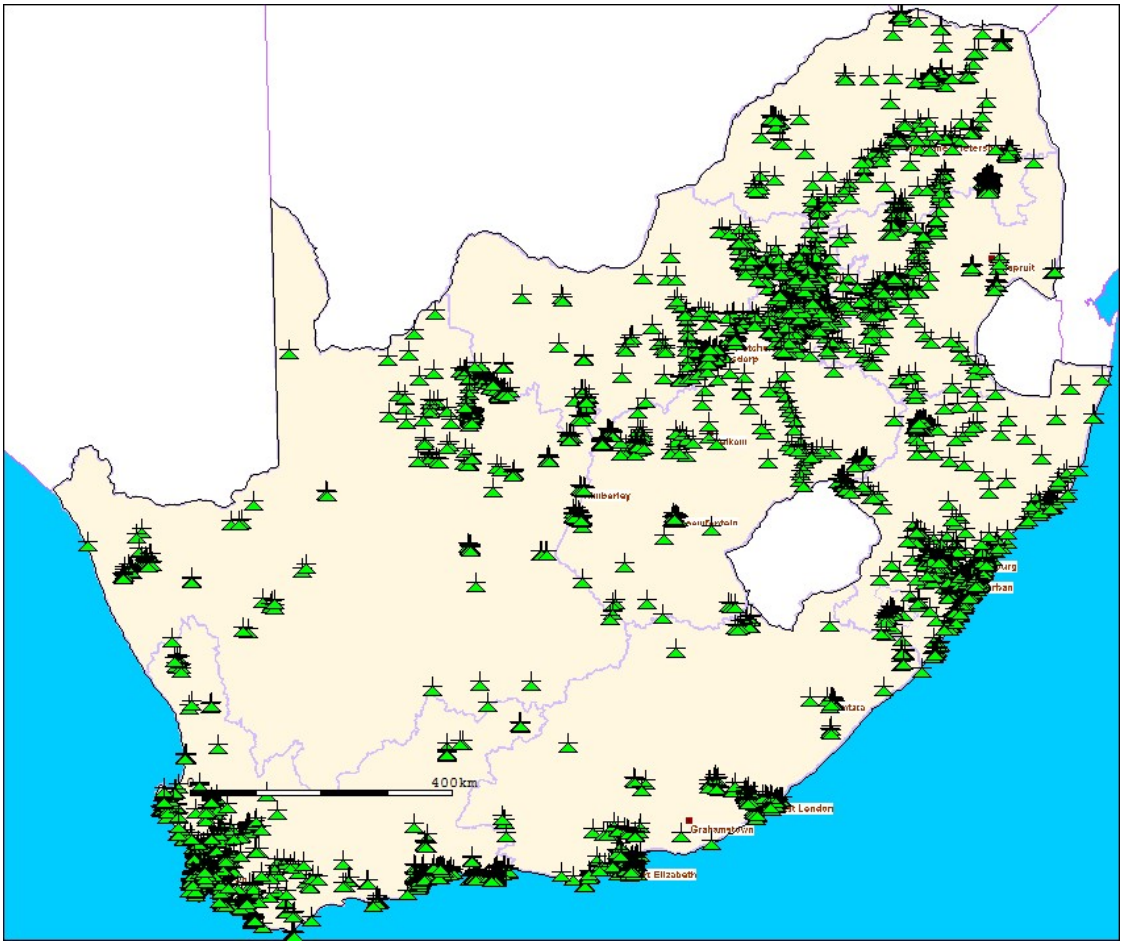
There are 3759 Licenses issued in this band 440 to 441 MHz.

There are 4243 Licenses issued in this band 445 to 446 MHz.

There are 1170 Licenses issued in this band 441.1 to 445 MHz.

There are 1486 Licenses issued in this band 446.1 to 450 MHz.

### 1.8.3 Areas where licensed frequencies are operational.



### 1.9 Applicable Frequency Allocation and Band information 450 MHz to 470 MHz

Band is identified for IMT (450)

Frequency Band under investigation 450 MHz to 470 MHz

FIXED

MOBILE

Frequency Sub bands

Pairings

FIXED 450 to 453 MHz paired with BTX 460 to 463 MHz

Trunked Mobile 3 MTX 454.425 to 460 MHz paired with BTX 464.425 to 470 MHz

Paging MTX 454 to 454.425 MHz

Low Power Mobile: 463.975, 464.125, 464.175, 464.325, 464.375 MHz

Security Systems: 464.5375 MHz

Non-Specified SRD's: 464.5 to 464.5875 MHz

Single Frequency Mobile Allocations

453 to 454 MHz

463.025 to 463.975 MHz

464.375 to 464.425

#### 1.9.1 Channel Plan for the Frequency Allocation

**FIXED LINKS**

CH-PLAN FOR 450_452.9875/460_462.9875MHz 2005 (12.5 kHz)

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 1 | 450 | 460 | SEE DATABASE |
| 2 | 450.0125 | 460.0125 | SEE DATABASE |
| 3 | 450.025 | 460.025 | SEE DATABASE |
| 4 | 450.0375 | 460.0375 | SEE DATABASE |
| 5 | 450.05 | 460.05 | SEE DATABASE |
| 6 | 450.0625 | 460.0625 | SEE DATABASE |
| 7 | 450.075 | 460.075 | SEE DATABASE |
| 8 | 450.0875 | 460.0875 | SEE DATABASE |
| 9 | 450.1 | 460.1 | SEE DATABASE |
| 10 | 450.1125 | 460.1125 | SEE DATABASE |
| 11 | 450.125 | 460.125 | SEE DATABASE |
| 12 | 450.1375 | 460.1375 | SEE DATABASE |
| 13 | 450.15 | 460.15 | SEE DATABASE |
| 14 | 450.1625 | 460.1625 | SEE DATABASE |
| 15 | 450.175 | 460.175 | SEE DATABASE |
| 16 | 450.1875 | 460.1875 | SEE DATABASE |
| 17 | 450.2 | 460.2 | SEE DATABASE |
| 18 | 450.2125 | 460.2125 | SEE DATABASE |
| 19 | 450.225 | 460.225 | SEE DATABASE |
| 20 | 450.2375 | 460.2375 | SEE DATABASE |
| 21 | 450.25 | 460.25 | SEE DATABASE |
| 22 | 450.2625 | 460.2625 | SEE DATABASE |
| 23 | 450.275 | 460.275 | SEE DATABASE |
| 24 | 450.2875 | 460.2875 | SEE DATABASE |
| 25 | 450.3 | 460.3 | SEE DATABASE |
| 26 | 450.3125 | 460.3125 | SEE DATABASE |
| 27 | 450.325 | 460.325 | SEE DATABASE |
| 28 | 450.3375 | 460.3375 | SEE DATABASE |
| 29 | 450.35 | 460.35 | SEE DATABASE |
| 30 | 450.3625 | 460.3625 | SEE DATABASE |
| 31 | 450.375 | 460.375 | SEE DATABASE |
| 32 | 450.3875 | 460.3875 | SEE DATABASE |
| 33 | 450.4 | 460.4 | SEE DATABASE |
| 34 | 450.4125 | 460.4125 | SEE DATABASE |
| 35 | 450.425 | 460.425 | SEE DATABASE |
| 36 | 450.4375 | 460.4375 | SEE DATABASE |
| 37 | 450.45 | 460.45 | SEE DATABASE |
| 38 | 450.4625 | 460.4625 | SEE DATABASE |
| 39 | 450.475 | 460.475 | SEE DATABASE |
| 40 | 450.4875 | 460.4875 | SEE DATABASE |
| 41 | 450.5 | 460.5 | SEE DATABASE |
| 42 | 450.5125 | 460.5125 | SEE DATABASE |
| 43 | 450.525 | 460.525 | SEE DATABASE |
| 44 | 450.5375 | 460.5375 | SEE DATABASE |
| | | | |
| CH. No. | BTX | MTX | REMARKS |
| | | | |

CH-PLAN FOR 450_452.9875/460_462.9875MHz 2005 (12.5 kHz)

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 45 | 450.55 | 460.55 | SEE DATABASE |
| 46 | 450.5625 | 460.5625 | SEE DATABASE |
| 47 | 450.575 | 460.575 | SEE DATABASE |
| 48 | 450.5875 | 460.5875 | SEE DATABASE |
| 49 | 450.6 | 460.6 | SEE DATABASE |
| 50 | 450.6125 | 460.6125 | SEE DATABASE |
| 51 | 450.625 | 460.625 | SEE DATABASE |
| 52 | 450.6375 | 460.6375 | SEE DATABASE |
| 53 | 450.65 | 460.65 | SEE DATABASE |
| 54 | 450.6625 | 460.6625 | SEE DATABASE |
| 55 | 450.675 | 460.675 | SEE DATABASE |
| 56 | 450.6875 | 460.6875 | SEE DATABASE |
| 57 | 450.7 | 460.7 | SEE DATABASE |
| 58 | 450.7125 | 460.7125 | SEE DATABASE |
| 59 | 450.725 | 460.725 | SEE DATABASE |
| 60 | 450.7375 | 460.7375 | SEE DATABASE |
| 61 | 450.75 | 460.75 | SEE DATABASE |
| 62 | 450.7625 | 460.7625 | SEE DATABASE |
| 63 | 450.775 | 460.775 | SEE DATABASE |
| 64 | 450.7875 | 460.7875 | SEE DATABASE |
| 65 | 450.8 | 460.8 | SEE DATABASE |
| 66 | 450.8125 | 460.8125 | SEE DATABASE |
| 67 | 450.825 | 460.825 | SEE DATABASE |
| 68 | 450.8375 | 460.8375 | SEE DATABASE |
| 69 | 450.85 | 460.85 | SEE DATABASE |
| 70 | 450.8625 | 460.8625 | SEE DATABASE |
| 71 | 450.875 | 460.875 | SEE DATABASE |
| 72 | 450.8875 | 460.8875 | SEE DATABASE |
| 73 | 450.9 | 460.9 | SEE DATABASE |
| 74 | 450.9125 | 460.9125 | SEE DATABASE |
| 75 | 450.925 | 460.925 | SEE DATABASE |
| 76 | 450.9375 | 460.9375 | SEE DATABASE |
| 77 | 450.95 | 460.95 | SEE DATABASE |
| 78 | 450.9625 | 460.9625 | SEE DATABASE |
| 79 | 450.975 | 460.975 | SEE DATABASE |
| 80 | 450.9875 | 460.9875 | SEE DATABASE |
| 81 | 451 | 461 | SEE DATABASE |
| 82 | 451.0125 | 461.0125 | SEE DATABASE |
| 83 | 451.025 | 461.025 | SEE DATABASE |
| 84 | 451.0375 | 461.0375 | SEE DATABASE |
| 85 | 451.05 | 461.05 | SEE DATABASE |
| 86 | 451.0625 | 461.0625 | SEE DATABASE |
| 87 | 451.075 | 461.075 | SEE DATABASE |
| 88 | 451.0875 | 461.0875 | SEE DATABASE |
| 89 | 451.1 | 461.1 | SEE DATABASE |
| 90 | 451.1125 | 461.1125 | SEE DATABASE |
| 91 | 451.125 | 461.125 | SEE DATABASE |

CH-PLAN FOR 450_452.9875/460_462.9875MHz 2005 (12.5 kHz)

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 92 | 451.1375 | 461.1375 | SEE DATABASE |
| 93 | 451.15 | 461.15 | SEE DATABASE |
| 94 | 451.1625 | 461.1625 | SEE DATABASE |
| 95 | 451.175 | 461.175 | SEE DATABASE |
| 96 | 451.1875 | 461.1875 | SEE DATABASE |
| 97 | 451.2 | 461.2 | SEE DATABASE |
| 98 | 451.2125 | 461.2125 | SEE DATABASE |
| 99 | 451.225 | 461.225 | SEE DATABASE |
| 100 | 451.2375 | 461.2375 | SEE DATABASE |
| 101 | 451.25 | 461.25 | SEE DATABASE |
| 102 | 451.2625 | 461.2625 | SEE DATABASE |
| 103 | 451.275 | 461.275 | SEE DATABASE |
| 104 | 451.2875 | 461.2875 | SEE DATABASE |
| 105 | 451.3 | 461.3 | SEE DATABASE |
| 106 | 451.3125 | 461.3125 | SEE DATABASE |
| 107 | 451.325 | 461.325 | SEE DATABASE |
| 108 | 451.3375 | 461.3375 | SEE DATABASE |
| 109 | 451.35 | 461.35 | SEE DATABASE |
| 110 | 451.3625 | 461.3625 | SEE DATABASE |
| 111 | 451.375 | 461.375 | SEE DATABASE |
| 112 | 451.3875 | 461.3875 | SEE DATABASE |
| 113 | 451.4 | 461.4 | SEE DATABASE |
| 114 | 451.4125 | 461.4125 | SEE DATABASE |
| 115 | 451.425 | 461.425 | SEE DATABASE |
| 116 | 451.4375 | 461.4375 | SEE DATABASE |
| 117 | 451.45 | 461.45 | SEE DATABASE |
| 118 | 451.4625 | 461.4625 | SEE DATABASE |
| 119 | 451.475 | 461.475 | SEE DATABASE |
| 120 | 451.4875 | 461.4875 | SEE DATABASE |
| 121 | 451.5 | 461.5 | SEE DATABASE |
| 122 | 451.5125 | 461.5125 | SEE DATABASE |
| 123 | 451.525 | 461.525 | SEE DATABASE |
| 124 | 451.5375 | 461.5375 | SEE DATABASE |
| 125 | 451.55 | 461.55 | SEE DATABASE |
| 126 | 451.5625 | 461.5625 | SEE DATABASE |
| 127 | 451.575 | 461.575 | SEE DATABASE |
| 128 | 451.5875 | 461.5875 | SEE DATABASE |
| 129 | 451.6 | 461.6 | SEE DATABASE |
| 130 | 451.6125 | 461.6125 | SEE DATABASE |
| 131 | 451.625 | 461.625 | SEE DATABASE |
| 132 | 451.6375 | 461.6375 | SEE DATABASE |
| 133 | 451.65 | 461.65 | SEE DATABASE |
| 134 | 451.6625 | 461.6625 | SEE DATABASE |
| 135 | 451.675 | 461.675 | SEE DATABASE |
| 136 | 451.6875 | 461.6875 | SEE DATABASE |
| 137 | 451.7 | 461.7 | SEE DATABASE |
| 138 | 451.7125 | 461.7125 | SEE DATABASE |

CH. No. BTX MTX REMARKS

CH-PLAN FOR 450_452.9875/460_462.9875MHz 2005 (12.5 kHz)

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 139 | 451.725 | 461.725 | SEE DATABASE |
| 140 | 451.7375 | 461.7375 | SEE DATABASE |
| 141 | 451.75 | 461.75 | SEE DATABASE |
| 142 | 451.7625 | 461.7625 | SEE DATABASE |
| 143 | 451.775 | 461.775 | SEE DATABASE |
| 144 | 451.7875 | 461.7875 | SEE DATABASE |
| 145 | 451.8 | 461.8 | SEE DATABASE |
| 146 | 451.8125 | 461.8125 | SEE DATABASE |
| 147 | 451.825 | 461.825 | SEE DATABASE |
| 148 | 451.8375 | 461.8375 | SEE DATABASE |
| 149 | 451.85 | 461.85 | SEE DATABASE |
| 150 | 451.8625 | 461.8625 | SEE DATABASE |
| 151 | 451.875 | 461.875 | SEE DATABASE |
| 152 | 451.8875 | 461.8875 | SEE DATABASE |
| 153 | 451.9 | 461.9 | SEE DATABASE |
| 154 | 451.9125 | 461.9125 | SEE DATABASE |
| 155 | 451.925 | 461.925 | SEE DATABASE |
| 156 | 451.9375 | 461.9375 | SEE DATABASE |
| 157 | 451.95 | 461.95 | SEE DATABASE |
| 158 | 451.9625 | 461.9625 | SEE DATABASE |
| 159 | 451.975 | 461.975 | SEE DATABASE |
| 160 | 451.9875 | 461.9875 | SEE DATABASE |
| 161 | 452 | 462 | SEE DATABASE |
| 162 | 452.0125 | 462.0125 | SEE DATABASE |
| 163 | 452.025 | 462.025 | SEE DATABASE |
| 164 | 452.0375 | 462.0375 | SEE DATABASE |
| 165 | 452.05 | 462.05 | SEE DATABASE |
| 166 | 452.0625 | 462.0625 | SEE DATABASE |
| 167 | 452.075 | 462.075 | SEE DATABASE |
| 168 | 452.0875 | 462.0875 | SEE DATABASE |
| 169 | 452.1 | 462.1 | SEE DATABASE |
| 170 | 452.1125 | 462.1125 | SEE DATABASE |
| 171 | 452.125 | 462.125 | SEE DATABASE |
| 172 | 452.1375 | 462.1375 | SEE DATABASE |
| 173 | 452.15 | 462.15 | SEE DATABASE |
| 174 | 452.1625 | 462.1625 | SEE DATABASE |
| 175 | 452.175 | 462.175 | SEE DATABASE |
| 176 | 452.1875 | 462.1875 | SEE DATABASE |
| 177 | 452.2 | 462.2 | SEE DATABASE |
| 178 | 452.2125 | 462.2125 | SEE DATABASE |
| 179 | 452.225 | 462.225 | SEE DATABASE |
| 180 | 452.2375 | 462.2375 | SEE DATABASE |
| 181 | 452.25 | 462.25 | SEE DATABASE |
| 182 | 452.2625 | 462.2625 | SEE DATABASE |
| 183 | 452.275 | 462.275 | SEE DATABASE |
| 184 | 452.2875 | 462.2875 | SEE DATABASE |
| 185 | 452.3 | 462.3 | SEE DATABASE |

CH-PLAN FOR 450_452.9875/460_462.9875MHz 2005 (12.5 kHz)

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 186 | 452.3125 | 462.3125 | SEE DATABASE |
| 187 | 452.325 | 462.325 | SEE DATABASE |
| 188 | 452.3375 | 462.3375 | SEE DATABASE |
| 189 | 452.35 | 462.35 | SEE DATABASE |
| 190 | 452.3625 | 462.3625 | SEE DATABASE |
| 191 | 452.375 | 462.375 | SEE DATABASE |
| 192 | 452.3875 | 462.3875 | SEE DATABASE |
| 193 | 452.4 | 462.4 | SEE DATABASE |
| 194 | 452.4125 | 462.4125 | SEE DATABASE |
| 195 | 452.425 | 462.425 | SEE DATABASE |
| 196 | 452.4375 | 462.4375 | SEE DATABASE |
| 197 | 452.45 | 462.45 | SEE DATABASE |
| 198 | 452.4625 | 462.4625 | SEE DATABASE |
| 199 | 452.475 | 462.475 | SEE DATABASE |
| 200 | 452.4875 | 462.4875 | SEE DATABASE |
| 201 | 452.5 | 462.5 | SEE DATABASE |
| 202 | 452.5125 | 462.5125 | SEE DATABASE |
| 203 | 452.525 | 462.525 | SEE DATABASE |
| 204 | 452.5375 | 462.5375 | SEE DATABASE |
| 205 | 452.55 | 462.55 | SEE DATABASE |
| 206 | 452.5625 | 462.5625 | SEE DATABASE |
| 207 | 452.575 | 462.575 | SEE DATABASE |
| 208 | 452.5875 | 462.5875 | SEE DATABASE |
| 209 | 452.6 | 462.6 | SEE DATABASE |
| 210 | 452.6125 | 462.6125 | SEE DATABASE |
| 211 | 452.625 | 462.625 | SEE DATABASE |
| 212 | 452.6375 | 462.6375 | SEE DATABASE |
| 213 | 452.65 | 462.65 | SEE DATABASE |
| 214 | 452.6625 | 462.6625 | SEE DATABASE |
| 215 | 452.675 | 462.675 | SEE DATABASE |
| 216 | 452.6875 | 462.6875 | SEE DATABASE |
| 217 | 452.7 | 462.7 | SEE DATABASE |
| 218 | 452.7125 | 462.7125 | SEE DATABASE |
| 219 | 452.725 | 462.725 | SEE DATABASE |
| 220 | 452.7375 | 462.7375 | SEE DATABASE |
| 221 | 452.75 | 462.75 | SEE DATABASE |
| 222 | 452.7625 | 462.7625 | SEE DATABASE |
| 223 | 452.775 | 462.775 | SEE DATABASE |
| 224 | 452.7875 | 462.7875 | SEE DATABASE |
| 225 | 452.8 | 462.8 | SEE DATABASE |
| 226 | 452.8125 | 462.8125 | SEE DATABASE |
| 227 | 452.825 | 462.825 | SEE DATABASE |
| 228 | 452.8375 | 462.8375 | SEE DATABASE |
| 229 | 452.85 | 462.85 | SEE DATABASE |
| 230 | 452.8625 | 462.8625 | SEE DATABASE |
| 231 | 452.875 | 462.875 | SEE DATABASE |
| 232 | 452.8875 | 462.8875 | SEE DATABASE |
| | | | |
| CH. No. | BTX | MTX | REMARKS |

CH-PLAN FOR 450_452.9875/460_462.9875MHz 2005 (12.5 kHz)

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 233 | 452.9 | 462.9 | SEE DATABASE |
| 234 | 452.9125 | 462.9125 | SEE DATABASE |
| 235 | 452.925 | 462.925 | SEE DATABASE |
| 236 | 452.9375 | 462.9375 | SEE DATABASE |
| 237 | 452.95 | 462.95 | SEE DATABASE |
| 238 | 452.9625 | 462.9625 | SEE DATABASE |
| 239 | 452.975 | 462.975 | SEE DATABASE |
| 240 | 452.9875 | 462.9875 | SEE DATABASE |

UHF SIMPLEX

CHANNEL PLAN FOR 453 - 453.9875MHz 2003 (12.5kHz)

| CH. No. | SF | REMARKS | S/Gr. |
|---|---|---|---|
| 1 | 453 | SEE DATABASE | |
| 2 | 453.0125 | SEE DATABASE | |
| 3 | 453.025 | SEE DATABASE | |
| 4 | 453.0375 | SEE DATABASE | |
| 5 | 453.05 | SEE DATABASE | |
| 6 | 453.0625 | SEE DATABASE | |
| 7 | 453.075 | SEE DATABASE | |
| 8 | 453.0875 | SEE DATABASE | |
| 9 | 453.1 | SEE DATABASE | |
| 10 | 453.1125 | SEE DATABASE | |
| 11 | 453.125 | SEE DATABASE | |
| 12 | 453.1375 | SEE DATABASE | |
| 13 | 453.15 | SEE DATABASE | |
| 14 | 453.1625 | SEE DATABASE | |
| 15 | 453.175 | SEE DATABASE | |
| 16 | 453.1875 | SEE DATABASE | |
| 17 | 453.2 | SEE DATABASE | |
| 18 | 453.2125 | SEE DATABASE | |
| 19 | 453.225 | SEE DATABASE | |
| 20 | 453.2375 | SEE DATABASE | |
| 21 | 453.25 | SEE DATABASE | |
| 22 | 453.2625 | SEE DATABASE | |
| 23 | 453.275 | SEE DATABASE | |
| 24 | 453.2875 | SEE DATABASE | |
| 25 | 453.3 | SEE DATABASE | |
| 26 | 453.3125 | SEE DATABASE | |
| 27 | 453.325 | SEE DATABASE | |
| 28 | 453.3375 | SEE DATABASE | |
| 29 | 453.35 | SEE DATABASE | |
| 30 | 453.3625 | SEE DATABASE | |
| 31 | 453.375 | SEE DATABASE | |
| 32 | 453.3875 | SEE DATABASE | |
| 33 | 453.4 | SEE DATABASE | |
| 34 | 453.4125 | SEE DATABASE | |
| 35 | 453.425 | SEE DATABASE | |
| 36 | 453.4375 | SEE DATABASE | |
| 37 | 453.45 | SEE DATABASE | |
| 38 | 453.4625 | SEE DATABASE | |
| 39 | 453.475 | SEE DATABASE | |
| 40 | 453.4875 | SEE DATABASE | |
| 41 | 453.5 | SEE DATABASE | |
| 42 | 453.5125 | SEE DATABASE | |
| 43 | 453.525 | SEE DATABASE | |
| 44 | 453.5375 | SEE DATABASE | |
| 45 | 453.55 | SEE DATABASE | |
| 46 | 453.5625 | SEE DATABASE | |
| 47 | 453.575 | SEE DATABASE | |

CHANNEL PLAN FOR 453 - 453.9875MHz 2003 (12.5kHz)

| | | | |
|---|---|---|---|
| 48 | 453.5875 | SEE DATABASE | |
| 49 | 453.6 | SEE DATABASE | |
| 50 | 453.6125 | SEE DATABASE | |
| 51 | 453.625 | SEE DATABASE | |
| 52 | 453.6375 | SEE DATABASE | |
| 53 | 453.65 | SEE DATABASE | |
| 54 | 453.6625 | SEE DATABASE | |
| 55 | 453.675 | SEE DATABASE | |
| 56 | 453.6875 | SEE DATABASE | |
| 57 | 453.7 | SEE DATABASE | |
| 58 | 453.7125 | SEE DATABASE | |
| 59 | 453.725 | SEE DATABASE | |
| 60 | 453.7375 | SEE DATABASE | |
| 61 | 453.75 | SEE DATABASE | |
| 62 | 453.7625 | SEE DATABASE | |
| 63 | 453.775 | SEE DATABASE | |
| 64 | 453.7875 | SEE DATABASE | |
| 65 | 453.8 | SEE DATABASE | |
| 66 | 453.8125 | SEE DATABASE | |
| 67 | 453.825 | SEE DATABASE | |
| 68 | 453.8375 | SEE DATABASE | |
| 69 | 453.85 | SEE DATABASE | |
| 70 | 453.8625 | SEE DATABASE | |
| 71 | 453.875 | SEE DATABASE | |
| 72 | 453.8875 | SEE DATABASE | |
| 73 | 453.9 | SEE DATABASE | |
| 74 | 453.9125 | SEE DATABASE | |
| 75 | 453.925 | SEE DATABASE | |
| 76 | 453.9375 | SEE DATABASE | |
| 77 | 453.95 | SEE DATABASE | |
| 78 | 453.9625 | SEE DATABASE | |
| 79 | 453.975 | SEE DATABASE | |
| 80 | 453.9875 | SEE DATABASE | |

**TRUNKED MOBILE**

CH-PLAN FOR 454.425_460/464.425_470MHz 2004 (12.5 kHz)

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 1 | 454.425 | 464.425 | VARIOUS ASSIGMENTS |
| 2 | 454.4375 | 464.4375 | VARIOUS ASSIGMENTS |
| 3 | 454.45 | 464.45 | VARIOUS ASSIGMENTS |
| 4 | 454.4625 | 464.4625 | VARIOUS ASSIGMENTS |
| 5 | 454.475 | 464.475 | VARIOUS ASSIGMENTS |
| 6 | 454.4875 | 464.4875 | VARIOUS ASSIGMENTS |
| 7 | 454.5 | 464.5 | VARIOUS ASSIGMENTS |
| 8 | 454.5125 | 464.5125 | VARIOUS ASSIGMENTS |
| 9 | 454.525 | 464.525 | VARIOUS ASSIGMENTS |
| 10 | 454.5375 | 464.5375 | VARIOUS ASSIGMENTS |
| 11 | 454.55 | 464.55 | VARIOUS ASSIGMENTS |
| 12 | 454.5625 | 464.5625 | VARIOUS ASSIGMENTS |
| 13 | 454.575 | 464.575 | VARIOUS ASSIGMENTS |
| 14 | 454.5875 | 464.5875 | VARIOUS ASSIGMENTS |
| 15 | 454.6 | 464.6 | VARIOUS ASSIGMENTS |
| 16 | 454.6125 | 464.6125 | VARIOUS ASSIGMENTS |
| 17 | 454.625 | 464.625 | VARIOUS ASSIGMENTS |
| 18 | 454.6375 | 464.6375 | VARIOUS ASSIGMENTS |
| 19 | 454.65 | 464.65 | VARIOUS ASSIGMENTS |
| 20 | 454.6625 | 464.6625 | VARIOUS ASSIGMENTS |
| 21 | 454.675 | 464.675 | VARIOUS ASSIGMENTS |
| 22 | 454.6875 | 464.6875 | VARIOUS ASSIGMENTS |
| 23 | 454.7 | 464.7 | VARIOUS ASSIGMENTS |
| 24 | 454.7125 | 464.7125 | VARIOUS ASSIGMENTS |
| 25 | 454.725 | 464.725 | VARIOUS ASSIGMENTS |
| 26 | 454.7375 | 464.7375 | VARIOUS ASSIGMENTS |
| 27 | 454.75 | 464.75 | VARIOUS ASSIGMENTS |
| 28 | 454.7625 | 464.7625 | VARIOUS ASSIGMENTS |
| 29 | 454.775 | 464.775 | VARIOUS ASSIGMENTS |
| 30 | 454.7875 | 464.7875 | VARIOUS ASSIGMENTS |
| 31 | 454.8 | 464.8 | VARIOUS ASSIGMENTS |
| 32 | 454.8125 | 464.8125 | VARIOUS ASSIGMENTS |
| 33 | 454.825 | 464.825 | VARIOUS ASSIGMENTS |
| 34 | 454.8375 | 464.8375 | VARIOUS ASSIGMENTS |
| 35 | 454.85 | 464.85 | VARIOUS ASSIGMENTS |
| 36 | 454.8625 | 464.8625 | VARIOUS ASSIGMENTS |
| 37 | 454.875 | 464.875 | VARIOUS ASSIGMENTS |
| 38 | 454.8875 | 464.8875 | VARIOUS ASSIGMENTS |
| 39 | 454.9 | 464.9 | VARIOUS ASSIGMENTS |
| 40 | 454.9125 | 464.9125 | VARIOUS ASSIGMENTS |
| 41 | 454.925 | 464.925 | VARIOUS ASSIGMENTS |
| 42 | 454.9375 | 464.9375 | VARIOUS ASSIGMENTS |
| 43 | 454.95 | 464.95 | VARIOUS ASSIGMENTS |
| 44 | 454.9625 | 464.9625 | VARIOUS ASSIGMENTS |
| | | | |
| CH. No. | BTX | MTX | REMARKS |
| | | | |

CH-PLAN FOR 454.425_460/464.425_470MHz 2004 (12.5 kHz)

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 45 | 454.975 | 464.975 | VARIOUS ASSIGMENTS |
| 46 | 454.9875 | 464.9875 | VARIOUS ASSIGMENTS |
| 47 | 455 | 465 | EXISTING TRANSTEL |
| 48 | 455.0125 | 465.0125 | EXISTING TRANSTEL |
| 49 | 455.025 | 465.025 | EXISTING TRANSTEL |
| 50 | 455.0375 | 465.0375 | EXISTING TRANSTEL |
| 51 | 455.05 | 465.05 | EXISTING TRANSTEL |
| 52 | 455.0625 | 465.0625 | EXISTING TRANSTEL |
| 53 | 455.075 | 465.075 | EXISTING TRANSTEL |
| 54 | 455.0875 | 465.0875 | EXISTING TRANSTEL |
| 55 | 455.1 | 465.1 | EXISTING TRANSTEL |
| 56 | 455.1125 | 465.1125 | EXISTING TRANSTEL |
| 57 | 455.125 | 465.125 | EXISTING TRANSTEL |
| 58 | 455.1375 | 465.1375 | EXISTING TRANSTEL |
| 59 | 455.15 | 465.15 | EXISTING TRANSTEL |
| 60 | 455.1625 | 465.1625 | EXISTING TRANSTEL |
| 61 | 455.175 | 465.175 | EXISTING TRANSTEL |
| 62 | 455.1875 | 465.1875 | EXISTING TRANSTEL |
| 63 | 455.2 | 465.2 | EXISTING TRANSTEL |
| 64 | 455.2125 | 465.2125 | EXISTING TRANSTEL |
| 65 | 455.225 | 465.225 | EXISTING TRANSTEL |
| 66 | 455.2375 | 465.2375 | EXISTING TRANSTEL |
| 67 | 455.25 | 465.25 | EXISTING TRANSTEL |
| 68 | 455.2625 | 465.2625 | EXISTING TRANSTEL |
| 69 | 455.275 | 465.275 | EXISTING TRANSTEL |
| 70 | 455.2875 | 465.2875 | EXISTING TRANSTEL |
| 71 | 455.3 | 465.3 | EXISTING TRANSTEL |
| 72 | 455.3125 | 465.3125 | EXISTING TRANSTEL |
| 73 | 455.325 | 465.325 | EXISTING TRANSTEL |
| 74 | 455.3375 | 465.3375 | EXISTING TRANSTEL |
| 75 | 455.35 | 465.35 | EXISTING TRANSTEL |
| 76 | 455.3625 | 465.3625 | EXISTING TRANSTEL |
| 77 | 455.375 | 465.375 | EXISTING TRANSTEL |
| 78 | 455.3875 | 465.3875 | EXISTING TRANSTEL |
| 79 | 455.4 | 465.4 | EXISTING TRANSTEL |
| 80 | 455.4125 | 465.4125 | EXISTING TRANSTEL |
| 81 | 455.425 | 465.425 | EXISTING TRANSTEL |
| 82 | 455.4375 | 465.4375 | EXISTING TRANSTEL |
| 83 | 455.45 | 465.45 | EXISTING TRANSTEL |
| 84 | 455.4625 | 465.4625 | EXISTING TRANSTEL |
| 85 | 455.475 | 465.475 | EXISTING TRANSTEL |
| 86 | 455.4875 | 465.4875 | EXISTING TRANSTEL |
| 87 | 455.5 | 465.5 | ADDITIONAL TRANSTEL (MIGRATION) |
| 88 | 455.5125 | 465.5125 | ADDITIONAL TRANSTEL (MIGRATION) |
| 89 | 455.525 | 465.525 | ADDITIONAL TRANSTEL (MIGRATION) |
| 90 | 455.5375 | 465.5375 | ADDITIONAL TRANSTEL (MIGRATION) |
| 91 | 455.55 | 465.55 | ADDITIONAL TRANSTEL (MIGRATION) |

CH-PLAN FOR 454.425_460/464.425_470MHz 2004 (12.5 kHz)

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 92 | 455.5625 | 465.5625 | ADDITIONAL TRANSTEL (MIGRATION) |
| 93 | 455.575 | 465.575 | ADDITIONAL TRANSTEL (MIGRATION) |
| 94 | 455.5875 | 465.5875 | ADDITIONAL TRANSTEL (MIGRATION) |
| 95 | 455.6 | 465.6 | ADDITIONAL TRANSTEL (MIGRATION) |
| 96 | 455.6125 | 465.6125 | ADDITIONAL TRANSTEL (MIGRATION) |
| 97 | 455.625 | 465.625 | ADDITIONAL TRANSTEL (MIGRATION) |
| 98 | 455.6375 | 465.6375 | ADDITIONAL TRANSTEL (MIGRATION) |
| 99 | 455.65 | 465.65 | ADDITIONAL TRANSTEL (MIGRATION) |
| 100 | 455.6625 | 465.6625 | ADDITIONAL TRANSTEL (MIGRATION) |
| 101 | 455.675 | 465.675 | ADDITIONAL TRANSTEL (MIGRATION) |
| 102 | 455.6875 | 465.6875 | ADDITIONAL TRANSTEL (MIGRATION) |
| 103 | 455.7 | 465.7 | ADDITIONAL TRANSTEL (MIGRATION) |
| 104 | 455.7125 | 465.7125 | ADDITIONAL TRANSTEL (MIGRATION) |
| 105 | 455.725 | 465.725 | ADDITIONAL TRANSTEL (MIGRATION) |
| 106 | 455.7375 | 465.7375 | ADDITIONAL TRANSTEL (MIGRATION) |
| 107 | 455.75 | 465.75 | ADDITIONAL TRANSTEL (MIGRATION) |
| 108 | 455.7625 | 465.7625 | ADDITIONAL TRANSTEL (MIGRATION) |
| 109 | 455.775 | 465.775 | ADDITIONAL TRANSTEL (MIGRATION) |
| 110 | 455.7875 | 465.7875 | ADDITIONAL TRANSTEL (MIGRATION) |
| 111 | 455.8 | 465.8 | ADDITIONAL TRANSTEL (MIGRATION) |
| 112 | 455.8125 | 465.8125 | ADDITIONAL TRANSTEL (MIGRATION) |
| 113 | 455.825 | 465.825 | ADDITIONAL TRANSTEL (MIGRATION) |
| 114 | 455.8375 | 465.8375 | ADDITIONAL TRANSTEL (MIGRATION) |
| 115 | 455.85 | 465.85 | ADDITIONAL TRANSTEL (MIGRATION) |
| 116 | 455.8625 | 465.8625 | ADDITIONAL TRANSTEL (MIGRATION) |
| 117 | 455.875 | 465.875 | ADDITIONAL TRANSTEL (MIGRATION) |
| 118 | 455.8875 | 465.8875 | ADDITIONAL TRANSTEL (MIGRATION) |
| 119 | 455.9 | 465.9 | ADDITIONAL TRANSTEL (MIGRATION) |
| 120 | 455.9125 | 465.9125 | ADDITIONAL TRANSTEL (MIGRATION) |
| 121 | 455.925 | 465.925 | ADDITIONAL TRANSTEL (MIGRATION) |
| 122 | 455.9375 | 465.9375 | ADDITIONAL TRANSTEL (MIGRATION) |
| 123 | 455.95 | 465.95 | ADDITIONAL TRANSTEL (MIGRATION) |
| 124 | 455.9625 | 465.9625 | ADDITIONAL TRANSTEL (MIGRATION) |
| 125 | 455.975 | 465.975 | ADDITIONAL TRANSTEL (MIGRATION) |
| 126 | 455.9875 | 465.9875 | ADDITIONAL TRANSTEL (MIGRATION) |
| 127 | 456 | 466 | ADDITIONAL TRANSTEL (MIGRATION) |
| 128 | 456.0125 | 466.0125 | ADDITIONAL TRANSTEL (MIGRATION) |
| 129 | 456.025 | 466.025 | ADDITIONAL TRANSTEL (MIGRATION) |
| 130 | 456.0375 | 466.0375 | ADDITIONAL TRANSTEL (MIGRATION) |
| 131 | 456.05 | 466.05 | ADDITIONAL TRANSTEL (MIGRATION) |
| 132 | 456.0625 | 466.0625 | ADDITIONAL TRANSTEL (MIGRATION) |
| 133 | 456.075 | 466.075 | ADDITIONAL TRANSTEL (MIGRATION) |
| 134 | 456.0875 | 466.0875 | ADDITIONAL TRANSTEL (MIGRATION) |
| 135 | 456.1 | 466.1 | ADDITIONAL TRANSTEL (MIGRATION) |
| 136 | 456.1125 | 466.1125 | ADDITIONAL TRANSTEL (MIGRATION) |
| 137 | 456.125 | 466.125 | ADDITIONAL TRANSTEL (MIGRATION) |
| 138 | 456.1375 | 466.1375 | ADDITIONAL TRANSTEL (MIGRATION) |
| | | | |
| CH. No. | BTX | MTX | REMARKS |

CH-PLAN FOR 454.425_460/464.425_470MHz 2004 (12.5 kHz)

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 139 | 456.15 | 466.15 | ADDITIONAL TRANSTEL (MIGRATION) |
| 140 | 456.1625 | 466.1625 | ADDITIONAL TRANSTEL (MIGRATION) |
| 141 | 456.175 | 466.175 | ADDITIONAL TRANSTEL (MIGRATION) |
| 142 | 456.1875 | 466.1875 | ADDITIONAL TRANSTEL (MIGRATION) |
| 143 | 456.2 | 466.2 | ADDITIONAL TRANSTEL (MIGRATION) |
| 144 | 456.2125 | 466.2125 | ADDITIONAL TRANSTEL (MIGRATION) |
| 145 | 456.225 | 466.225 | ADDITIONAL TRANSTEL (MIGRATION) |
| 146 | 456.2375 | 466.2375 | ADDITIONAL TRANSTEL (MIGRATION) |
| 147 | 456.25 | 466.25 | ADDITIONAL TRANSTEL (MIGRATION) |
| 148 | 456.2625 | 466.2625 | ADDITIONAL TRANSTEL (MIGRATION) |
| 149 | 456.275 | 466.275 | ADDITIONAL TRANSTEL (MIGRATION) |
| 150 | 456.2875 | 466.2875 | ADDITIONAL TRANSTEL (MIGRATION) |
| 151 | 456.3 | 466.3 | ADDITIONAL TRANSTEL (MIGRATION) |
| 152 | 456.3125 | 466.3125 | ADDITIONAL TRANSTEL (MIGRATION) |
| 153 | 456.325 | 466.325 | ADDITIONAL TRANSTEL (MIGRATION) |
| 154 | 456.3375 | 466.3375 | ADDITIONAL TRANSTEL (MIGRATION) |
| 155 | 456.35 | 466.35 | ADDITIONAL TRANSTEL (MIGRATION) |
| 156 | 456.3625 | 466.3625 | ADDITIONAL TRANSTEL (MIGRATION) |
| 157 | 456.375 | 466.375 | ADDITIONAL TRANSTEL (MIGRATION) |
| 158 | 456.3875 | 466.3875 | ADDITIONAL TRANSTEL (MIGRATION) |
| 159 | 456.4 | 466.4 | ADDITIONAL TRANSTEL (MIGRATION) |
| 160 | 456.4125 | 466.4125 | ADDITIONAL TRANSTEL (MIGRATION) |
| 161 | 456.425 | 466.425 | ADDITIONAL TRANSTEL (MIGRATION) |
| 162 | 456.4375 | 466.4375 | ADDITIONAL TRANSTEL (MIGRATION) |
| 163 | 456.45 | 466.45 | ADDITIONAL TRANSTEL (MIGRATION) |
| 164 | 456.4625 | 466.4625 | ADDITIONAL TRANSTEL (MIGRATION) |
| 165 | 456.475 | 466.475 | ADDITIONAL TRANSTEL (MIGRATION) |
| 166 | 456.4875 | 466.4875 | ADDITIONAL TRANSTEL (MIGRATION) |
| 167 | 456.5 | 466.5 | ADDITIONAL TRANSTEL (MIGRATION) |
| 168 | 456.5125 | 466.5125 | ADDITIONAL TRANSTEL (MIGRATION) |
| 169 | 456.525 | 466.525 | ADDITIONAL TRANSTEL (MIGRATION) |
| 170 | 456.5375 | 466.5375 | ADDITIONAL TRANSTEL (MIGRATION) |
| 171 | 456.55 | 466.55 | ADDITIONAL TRANSTEL (MIGRATION) |
| 172 | 456.5625 | 466.5625 | ADDITIONAL TRANSTEL (MIGRATION) |
| 173 | 456.575 | 466.575 | ADDITIONAL TRANSTEL (MIGRATION) |
| 174 | 456.5875 | 466.5875 | ADDITIONAL TRANSTEL (MIGRATION) |
| 175 | 456.6 | 466.6 | ADDITIONAL TRANSTEL (MIGRATION) |
| 176 | 456.6125 | 466.6125 | ADDITIONAL TRANSTEL (MIGRATION) |
| 177 | 456.625 | 466.625 | ADDITIONAL TRANSTEL (MIGRATION) |
| 178 | 456.6375 | 466.6375 | ADDITIONAL TRANSTEL (MIGRATION) |
| 179 | 456.65 | 466.65 | ADDITIONAL TRANSTEL (MIGRATION) |
| 180 | 456.6625 | 466.6625 | TRUNKED MOBILE |
| 181 | 456.675 | 466.675 | TRUNKED MOBILE |
| 182 | 456.6875 | 466.6875 | TRUNKED MOBILE |
| 183 | 456.7 | 466.7 | TRUNKED MOBILE |
| 184 | 456.7125 | 466.7125 | TRUNKED MOBILE |
| 185 | 456.725 | 466.725 | TRUNKED MOBILE |

CH-PLAN FOR 454.425_460/464.425_470MHz 2004 (12.5 kHz)

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 186 | 456.7375 | 466.7375 | TRUNKED MOBILE |
| 187 | 456.75 | 466.75 | TRUNKED MOBILE |
| 188 | 456.7625 | 466.7625 | TRUNKED MOBILE |
| 189 | 456.775 | 466.775 | TRUNKED MOBILE |
| 190 | 456.7875 | 466.7875 | TRUNKED MOBILE |
| 191 | 456.8 | 466.8 | TRUNKED MOBILE |
| 192 | 456.8125 | 466.8125 | TRUNKED MOBILE |
| 193 | 456.825 | 466.825 | TRUNKED MOBILE |
| 194 | 456.8375 | 466.8375 | TRUNKED MOBILE |
| 195 | 456.85 | 466.85 | TRUNKED MOBILE |
| 196 | 456.8625 | 466.8625 | TRUNKED MOBILE |
| 197 | 456.875 | 466.875 | TRUNKED MOBILE |
| 198 | 456.8875 | 466.8875 | TRUNKED MOBILE |
| 199 | 456.9 | 466.9 | TRUNKED MOBILE |
| 200 | 456.9125 | 466.9125 | TRUNKED MOBILE |
| 201 | 456.925 | 466.925 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 202 | 456.9375 | 466.9375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 203 | 456.95 | 466.95 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 204 | 456.9625 | 466.9625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 205 | 456.975 | 466.975 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 206 | 456.9875 | 466.9875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 207 | 457 | 467 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 208 | 457.0125 | 467.0125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 209 | 457.025 | 467.025 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 210 | 457.0375 | 467.0375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 211 | 457.05 | 467.05 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 212 | 457.0625 | 467.0625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 213 | 457.075 | 467.075 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 214 | 457.0875 | 467.0875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 215 | 457.1 | 467.1 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 216 | 457.1125 | 467.1125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 217 | 457.125 | 467.125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 218 | 457.1375 | 467.1375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 219 | 457.15 | 467.15 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 220 | 457.1625 | 467.1625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 221 | 457.175 | 467.175 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 222 | 457.1875 | 467.1875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 223 | 457.2 | 467.2 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 224 | 457.2125 | 467.2125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 225 | 457.225 | 467.225 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 226 | 457.2375 | 467.2375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 227 | 457.25 | 467.25 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 228 | 457.2625 | 467.2625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 229 | 457.275 | 467.275 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 230 | 457.2875 | 467.2875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 231 | 457.3 | 467.3 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 232 | 457.3125 | 467.3125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|

CH-PLAN FOR 454.425_460/464.425_470MHz 2004 (12.5 kHz)

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 233 | 457.325 | 467.325 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 234 | 457.3375 | 467.3375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 235 | 457.35 | 467.35 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 236 | 457.3625 | 467.3625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 237 | 457.375 | 467.375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 238 | 457.3875 | 467.3875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 239 | 457.4 | 467.4 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 240 | 457.4125 | 467.4125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 241 | 457.425 | 467.425 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 242 | 457.4375 | 467.4375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 243 | 457.45 | 467.45 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 244 | 457.4625 | 467.4625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 245 | 457.475 | 467.475 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 246 | 457.4875 | 467.4875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 247 | 457.5 | 467.5 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 248 | 457.5125 | 467.5125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 249 | 457.525 | 467.525 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 250 | 457.5375 | 467.5375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 251 | 457.55 | 467.55 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 252 | 457.5625 | 467.5625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 253 | 457.575 | 467.575 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 254 | 457.5875 | 467.5875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 255 | 457.6 | 467.6 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 256 | 457.6125 | 467.6125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 257 | 457.625 | 467.625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 258 | 457.6375 | 467.6375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 259 | 457.65 | 467.65 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 260 | 457.6625 | 467.6625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 261 | 457.675 | 467.675 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 262 | 457.6875 | 467.6875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 263 | 457.7 | 467.7 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 264 | 457.7125 | 467.7125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 265 | 457.725 | 467.725 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 266 | 457.7375 | 467.7375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 267 | 457.75 | 467.75 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 268 | 457.7625 | 467.7625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 269 | 457.775 | 467.775 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 270 | 457.7875 | 467.7875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 271 | 457.8 | 467.8 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 272 | 457.8125 | 467.8125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 273 | 457.825 | 467.825 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 274 | 457.8375 | 467.8375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 275 | 457.85 | 467.85 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 276 | 457.8625 | 467.8625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 277 | 457.875 | 467.875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 278 | 457.8875 | 467.8875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 279 | 457.9 | 467.9 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |

CH-PLAN FOR 454.425_460/464.425_470MHz 2004 (12.5 kHz)

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 280 | 457.9125 | 467.9125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 281 | 457.925 | 467.925 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 282 | 457.9375 | 467.9375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 283 | 457.95 | 467.95 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 284 | 457.9625 | 467.9625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 285 | 457.975 | 467.975 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 286 | 457.9875 | 467.9875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 287 | 458 | 468 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 288 | 458.0125 | 468.0125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 289 | 458.025 | 468.025 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 290 | 458.0375 | 468.0375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 291 | 458.05 | 468.05 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 292 | 458.0625 | 468.0625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 293 | 458.075 | 468.075 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 294 | 458.0875 | 468.0875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 295 | 458.1 | 468.1 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 296 | 458.1125 | 468.1125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 297 | 458.125 | 468.125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 298 | 458.1375 | 468.1375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 299 | 458.15 | 468.15 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 300 | 458.1625 | 468.1625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 301 | 458.175 | 468.175 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 302 | 458.1875 | 468.1875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 303 | 458.2 | 468.2 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 304 | 458.2125 | 468.2125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 305 | 458.225 | 468.225 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 306 | 458.2375 | 468.2375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 307 | 458.25 | 468.25 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 308 | 458.2625 | 468.2625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 309 | 458.275 | 468.275 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 310 | 458.2875 | 468.2875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 311 | 458.3 | 468.3 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 312 | 458.3125 | 468.3125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 313 | 458.325 | 468.325 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 314 | 458.3375 | 468.3375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 315 | 458.35 | 468.35 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 316 | 458.3625 | 468.3625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 317 | 458.375 | 468.375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 318 | 458.3875 | 468.3875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 319 | 458.4 | 468.4 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 320 | 458.4125 | 468.4125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 321 | 458.425 | 468.425 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 322 | 458.4375 | 468.4375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 323 | 458.45 | 468.45 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 324 | 458.4625 | 468.4625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 325 | 458.475 | 468.475 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| | | | |
| CH. No. | BTX | MTX | REMARKS |

CH-PLAN FOR 454.425_460/464.425_470MHz 2004 (12.5 kHz)

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 326 | 458.4875 | 468.4875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 327 | 458.5 | 468.5 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 328 | 458.5125 | 468.5125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 329 | 458.525 | 468.525 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 330 | 458.5375 | 468.5375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 331 | 458.55 | 468.55 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 332 | 458.5625 | 468.5625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 333 | 458.575 | 468.575 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 334 | 458.5875 | 468.5875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 335 | 458.6 | 468.6 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 336 | 458.6125 | 468.6125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 337 | 458.625 | 468.625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 338 | 458.6375 | 468.6375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 339 | 458.65 | 468.65 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 340 | 458.6625 | 468.6625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 341 | 458.675 | 468.675 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 342 | 458.6875 | 468.6875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 343 | 458.7 | 468.7 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 344 | 458.7125 | 468.7125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 345 | 458.725 | 468.725 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 346 | 458.7375 | 468.7375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 347 | 458.75 | 468.75 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 348 | 458.7625 | 468.7625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 349 | 458.775 | 468.775 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 350 | 458.7875 | 468.7875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 351 | 458.8 | 468.8 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 352 | 458.8125 | 468.8125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 353 | 458.825 | 468.825 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 354 | 458.8375 | 468.8375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 355 | 458.85 | 468.85 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 356 | 458.8625 | 468.8625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 357 | 458.875 | 468.875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 358 | 458.8875 | 468.8875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 359 | 458.9 | 468.9 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 360 | 458.9125 | 468.9125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 361 | 458.925 | 468.925 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 362 | 458.9375 | 468.9375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 363 | 458.95 | 468.95 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 364 | 458.9625 | 468.9625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 365 | 458.975 | 468.975 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 366 | 458.9875 | 468.9875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 367 | 459 | 469 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 368 | 459.0125 | 469.0125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 369 | 459.025 | 469.025 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 370 | 459.0375 | 469.0375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 371 | 459.05 | 469.05 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 372 | 459.0625 | 469.0625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 373 | 459.075 | 469.075 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 374 | 459.0875 | 469.0875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |

CH-PLAN FOR 454.425_460/464.425_470MHz 2004 (12.5 kHz)

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| 375 | 459.1 | 469.1 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 376 | 459.1125 | 469.1125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 377 | 459.125 | 469.125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 378 | 459.1375 | 469.1375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 379 | 459.15 | 469.15 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 380 | 459.1625 | 469.1625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 381 | 459.175 | 469.175 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 382 | 459.1875 | 469.1875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 383 | 459.2 | 469.2 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 384 | 459.2125 | 469.2125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 385 | 459.225 | 469.225 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 386 | 459.2375 | 469.2375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 387 | 459.25 | 469.25 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 388 | 459.2625 | 469.2625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 389 | 459.275 | 469.275 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 390 | 459.2875 | 469.2875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 391 | 459.3 | 469.3 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 392 | 459.3125 | 469.3125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 393 | 459.325 | 469.325 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 394 | 459.3375 | 469.3375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 395 | 459.35 | 469.35 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 396 | 459.3625 | 469.3625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 397 | 459.375 | 469.375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 398 | 459.3875 | 469.3875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 399 | 459.4 | 469.4 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 400 | 459.4125 | 469.4125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 401 | 459.425 | 469.425 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 402 | 459.4375 | 469.4375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 403 | 459.45 | 469.45 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 404 | 459.4625 | 469.4625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 405 | 459.475 | 469.475 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 406 | 459.4875 | 469.4875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 407 | 459.5 | 469.5 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 408 | 459.5125 | 469.5125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 409 | 459.525 | 469.525 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 410 | 459.5375 | 469.5375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 411 | 459.55 | 469.55 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 412 | 459.5625 | 469.5625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 413 | 459.575 | 469.575 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 414 | 459.5875 | 469.5875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 415 | 459.6 | 469.6 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 416 | 459.6125 | 469.6125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 417 | 459.625 | 469.625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 418 | 459.6375 | 469.6375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 419 | 459.65 | 469.65 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 420 | 459.6625 | 469.6625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 421 | 459.675 | 469.675 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 422 | 459.6875 | 469.6875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| CH. No. | BTX | MTX | REMARKS |

CH-PLAN FOR 454.425_460/464.425_470MHz 2004 (12.5 kHz)

| CH. No. | BTX | MTX | REMARKS |
|---|---|---|---|
| | | | |
| 423 | 459.7 | 469.7 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 424 | 459.7125 | 469.7125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 425 | 459.725 | 469.725 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 426 | 459.7375 | 469.7375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 427 | 459.75 | 469.75 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 428 | 459.7625 | 469.7625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 429 | 459.775 | 469.775 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 430 | 459.7875 | 469.7875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 431 | 459.8 | 469.8 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 432 | 459.8125 | 469.8125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 433 | 459.825 | 469.825 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 434 | 459.8375 | 469.8375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 435 | 459.85 | 469.85 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 436 | 459.8625 | 469.8625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 437 | 459.875 | 469.875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 438 | 459.8875 | 469.8875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 439 | 459.9 | 469.9 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 440 | 459.9125 | 469.9125 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 441 | 459.925 | 469.925 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 442 | 459.9375 | 469.9375 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 443 | 459.95 | 469.95 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 444 | 459.9625 | 469.9625 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 445 | 459.975 | 469.975 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |
| 446 | 459.9875 | 469.9875 | VAROIUS ASSIGNMENTS & TRUNKED MOBILE |

CHANNEL PLAN FOR 454 - 454.425MHz 2017 (12.5 kHz)

| CH. No. | SF | REMARKS | S/Gr. |
|---|---|---|---|
| 1 | 454 | SEE DATABASE | |
| 2 | 454.0125 | SEE DATABASE | |
| 3 | 454.025 | SEE DATABASE | |
| 4 | 454.0375 | SEE DATABASE | |
| 5 | 454.05 | SEE DATABASE | |
| 6 | 454.0625 | SEE DATABASE | |
| 7 | 454.075 | SEE DATABASE | |
| 8 | 454.0875 | SEE DATABASE | |
| 9 | 454.1 | SEE DATABASE | |
| 10 | 454.1125 | SEE DATABASE | |
| 11 | 454.125 | SEE DATABASE | |
| 12 | 454.1375 | SEE DATABASE | |
| 13 | 454.15 | SEE DATABASE | |
| 14 | 454.1625 | SEE DATABASE | |
| 15 | 454.175 | SEE DATABASE | |
| 16 | 454.1875 | SEE DATABASE | |
| 17 | 454.2 | SEE DATABASE | |
| 18 | 454.2125 | SEE DATABASE | |
| 19 | 454.225 | SEE DATABASE | |
| 20 | 454.2375 | SEE DATABASE | |
| 21 | 454.25 | SEE DATABASE | |
| 22 | 454.2625 | SEE DATABASE | |
| 23 | 454.275 | SEE DATABASE | |
| 24 | 454.2875 | SEE DATABASE | |
| 25 | 454.3 | SEE DATABASE | |
| 26 | 454.3125 | SEE DATABASE | |
| 27 | 454.325 | SEE DATABASE | |
| 28 | 454.3375 | SEE DATABASE | |
| 29 | 454.35 | SEE DATABASE | |
| 30 | 454.3625 | SEE DATABASE | |
| 31 | 454.375 | SEE DATABASE | |
| 32 | 454.3875 | SEE DATABASE | |
| 33 | 454.4 | SEE DATABASE | |
| 34 | 454.4125 | SEE DATABASE | |

CHANNEL PLAN FOR 464 - 464.425MHz 2017 (12.5 kHz)

| CH. No. | SF | REMARKS | S/Gr. |
|---|---|---|---|
| 1 | 464 | SEE DATABASE | |
| 2 | 464.0125 | SEE DATABASE | |
| 3 | 464.025 | SEE DATABASE | |
| 4 | 464.0375 | SEE DATABASE | |
| 5 | 464.05 | SEE DATABASE | |
| 6 | 464.0625 | SEE DATABASE | |
| 7 | 464.075 | SEE DATABASE | |
| 8 | 464.0875 | SEE DATABASE | |
| 9 | 464.1 | SEE DATABASE | |
| 10 | 464.1125 | SEE DATABASE | |
| 11 | 464.125 | SEE DATABASE | |
| 12 | 464.1375 | SEE DATABASE | |
| 13 | 464.15 | SEE DATABASE | |
| 14 | 464.1625 | SEE DATABASE | |
| 15 | 464.175 | SEE DATABASE | |
| 16 | 464.1875 | SEE DATABASE | |
| 17 | 464.2 | SEE DATABASE | |
| 18 | 464.2125 | SEE DATABASE | |
| 19 | 464.225 | SEE DATABASE | |
| 20 | 464.2375 | SEE DATABASE | |
| 21 | 464.25 | SEE DATABASE | |
| 22 | 464.2625 | SEE DATABASE | |
| 23 | 464.275 | SEE DATABASE | |
| 24 | 464.2875 | SEE DATABASE | |
| 25 | 464.3 | SEE DATABASE | |
| 26 | 464.3125 | SEE DATABASE | |
| 27 | 464.325 | SEE DATABASE | |
| 28 | 464.3375 | SEE DATABASE | |
| 29 | 464.35 | SEE DATABASE | |
| 30 | 464.3625 | SEE DATABASE | |
| 31 | 464.375 | SEE DATABASE | |
| 32 | 464.3875 | SEE DATABASE | |
| 33 | 464.4 | SEE DATABASE | |
| 34 | 464.4125 | SEE DATABASE | |

UHF SIMPLEX

CHANNEL PLAN FOR 463 - 463.9875MHz 2003 (12.5 kHz)

| CH. No. | SF | REMARKS | S/Gr. |
|---|---|---|---|
| 1 | 463 | SEE DATABASE | |
| 2 | 463.0125 | SEE DATABASE | |
| 3 | 463.025 | SEE DATABASE | |
| 4 | 463.0375 | SEE DATABASE | |
| 5 | 463.05 | SEE DATABASE | |
| 6 | 463.0625 | SEE DATABASE | |
| 7 | 463.075 | SEE DATABASE | |
| 8 | 463.0875 | SEE DATABASE | |
| 9 | 463.1 | SEE DATABASE | |
| 10 | 463.1125 | SEE DATABASE | |
| 11 | 463.125 | SEE DATABASE | |
| 12 | 463.1375 | SEE DATABASE | |
| 13 | 463.15 | SEE DATABASE | |
| 14 | 463.1625 | SEE DATABASE | |
| 15 | 463.175 | SEE DATABASE | |
| 16 | 463.1875 | SEE DATABASE | |
| 17 | 463.2 | SEE DATABASE | |
| 18 | 463.2125 | SEE DATABASE | |
| 19 | 463.225 | SEE DATABASE | |
| 20 | 463.2375 | SEE DATABASE | |
| 21 | 463.25 | SEE DATABASE | |
| 22 | 463.2625 | SEE DATABASE | |
| 23 | 463.275 | SEE DATABASE | |
| 24 | 463.2875 | SEE DATABASE | |
| 25 | 463.3 | SEE DATABASE | |
| 26 | 463.3125 | SEE DATABASE | |
| 27 | 463.325 | SEE DATABASE | |
| 28 | 463.3375 | SEE DATABASE | |
| 29 | 463.35 | SEE DATABASE | |
| 30 | 463.3625 | SEE DATABASE | |
| 31 | 463.375 | SEE DATABASE | |
| 32 | 463.3875 | SEE DATABASE | |
| 33 | 463.4 | SEE DATABASE | |
| 34 | 463.4125 | SEE DATABASE | |
| 35 | 463.425 | SEE DATABASE | |
| 36 | 463.4375 | SEE DATABASE | |
| 37 | 463.45 | SEE DATABASE | |
| 38 | 463.4625 | SEE DATABASE | |
| 39 | 463.475 | SEE DATABASE | |
| 40 | 463.4875 | SEE DATABASE | |
| 41 | 463.5 | SEE DATABASE | |
| 42 | 463.5125 | SEE DATABASE | |
| 43 | 463.525 | SEE DATABASE | |
| 44 | 463.5375 | SEE DATABASE | |
| 45 | 463.55 | SEE DATABASE | |
| 46 | 463.5625 | SEE DATABASE | |
| 47 | 463.575 | SEE DATABASE | |

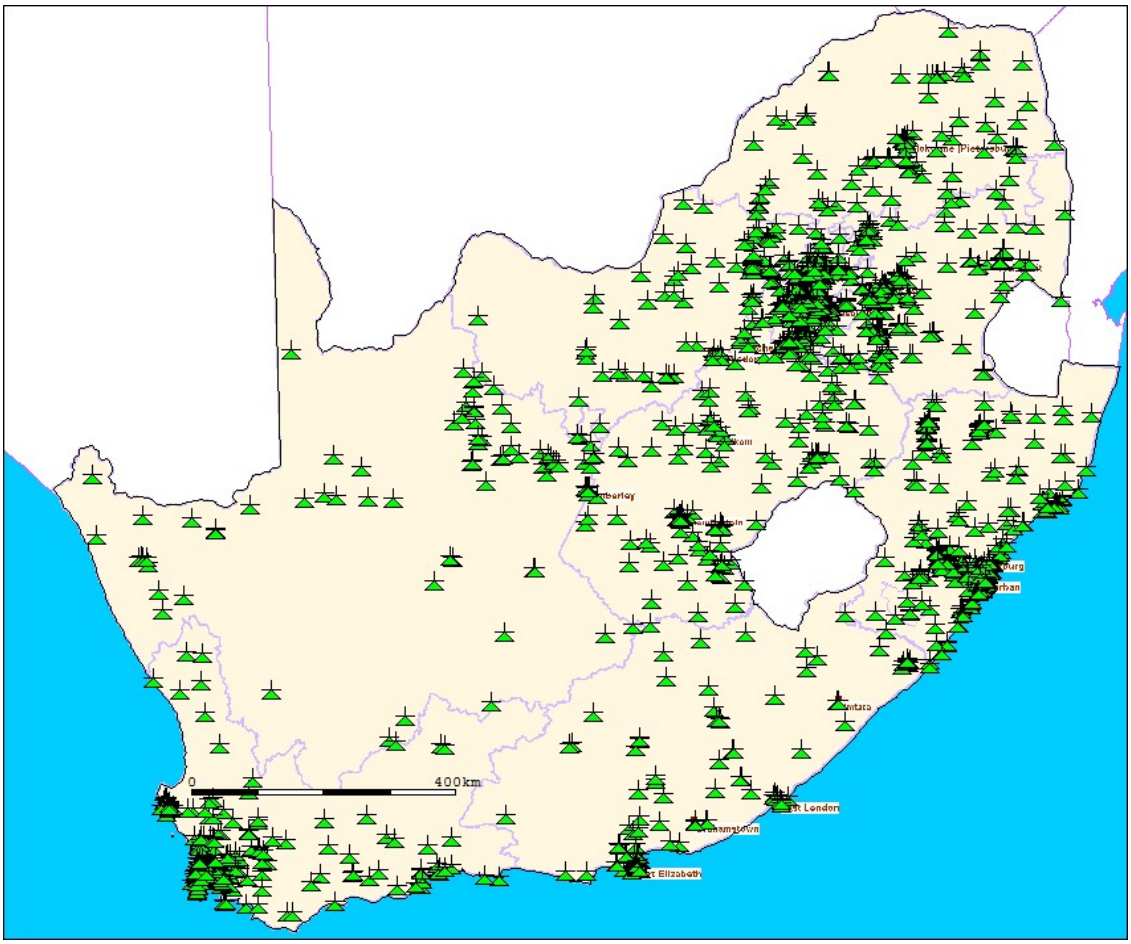
CHANNEL PLAN FOR 463 - 463.9875MHz 2003 (12.5 kHz)

| | | | |
|---|---|---|---|
| 48 | 463.5875 | SEE DATABASE | |
| 49 | 463.6 | SEE DATABASE | |
| 50 | 463.6125 | SEE DATABASE | |
| 51 | 463.625 | SEE DATABASE | |
| 52 | 463.6375 | SEE DATABASE | |
| 53 | 463.65 | SEE DATABASE | |
| 54 | 463.6625 | SEE DATABASE | |
| 55 | 463.675 | SEE DATABASE | |
| 56 | 463.6875 | SEE DATABASE | |
| 57 | 463.7 | SEE DATABASE | |
| 58 | 463.7125 | SEE DATABASE | |
| 59 | 463.725 | SEE DATABASE | |
| 60 | 463.7375 | SEE DATABASE | |
| 61 | 463.75 | SEE DATABASE | |
| 62 | 463.7625 | SEE DATABASE | |
| 63 | 463.775 | SEE DATABASE | |
| 64 | 463.7875 | SEE DATABASE | |
| 65 | 463.8 | SEE DATABASE | |
| 66 | 463.8125 | SEE DATABASE | |
| 67 | 463.825 | SEE DATABASE | |
| 68 | 463.8375 | SEE DATABASE | |
| 69 | 463.85 | SEE DATABASE | |
| 70 | 463.8625 | SEE DATABASE | |
| 71 | 463.875 | SEE DATABASE | |
| 72 | 463.8875 | SEE DATABASE | |
| 73 | 463.9 | SEE DATABASE | |
| 74 | 463.9125 | SEE DATABASE | |
| 75 | 463.925 | SEE DATABASE | |
| 76 | 463.9375 | SEE DATABASE | |
| 77 | 463.95 | SEE DATABASE | |
| 78 | 463.9625 | SEE DATABASE | |
| 79 | 463.975 | SEE DATABASE | |
| 80 | 463.9875 | SEE DATABASE | |

### 1.9.2 Licensing information for the applicable frequency allocation

There are 7857 Licenses issued in this band for both BTX and MTX as well as single frequency devices.

### 1.9.3 Areas where licensed frequencies are operational.




## 1.10 Applicable Frequency Allocation and Band information 452.5 MHz to 457.5 MHz and 462.5 MHz to 467.5 MHz

Band is identified for Transnet Trial License

Frequency Band under investigation 450 MHz to 470 MHz

MOBILE

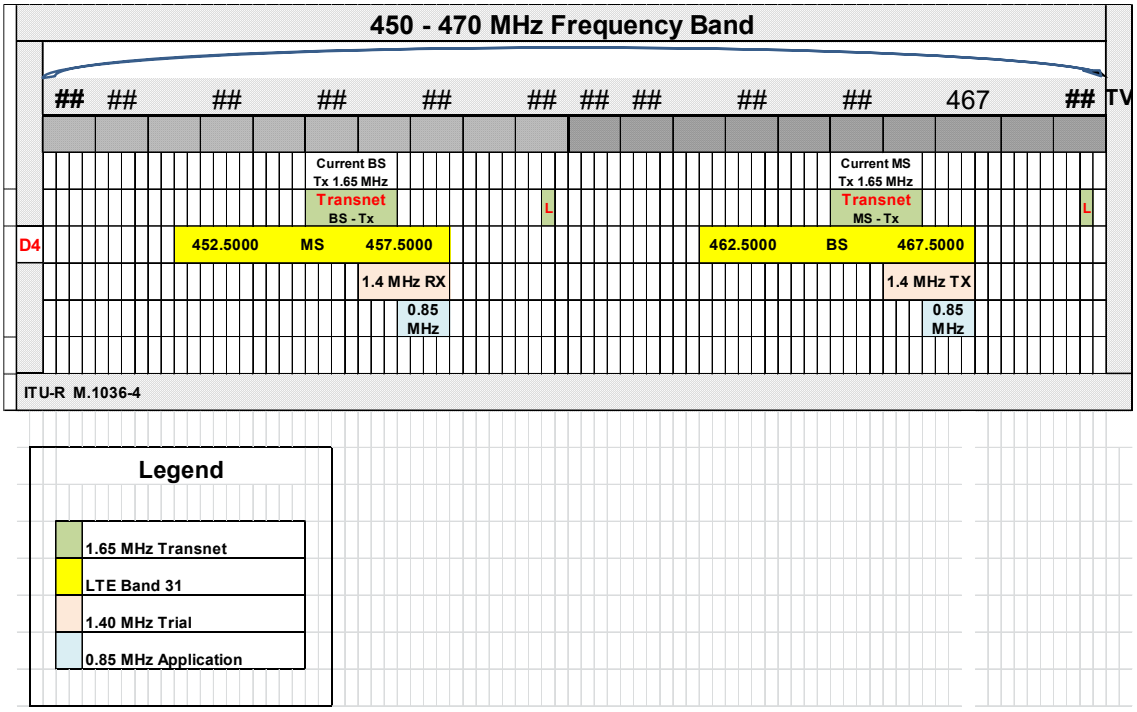
Frequency Sub bands

Pairings

MOBILE 452.5 to 457.5 MHz paired with BTX 462.5 to 467.5 MHz

See section 9 for more detail on existing licences.

### 1.10.1 Channel Plan for the Frequency Allocation

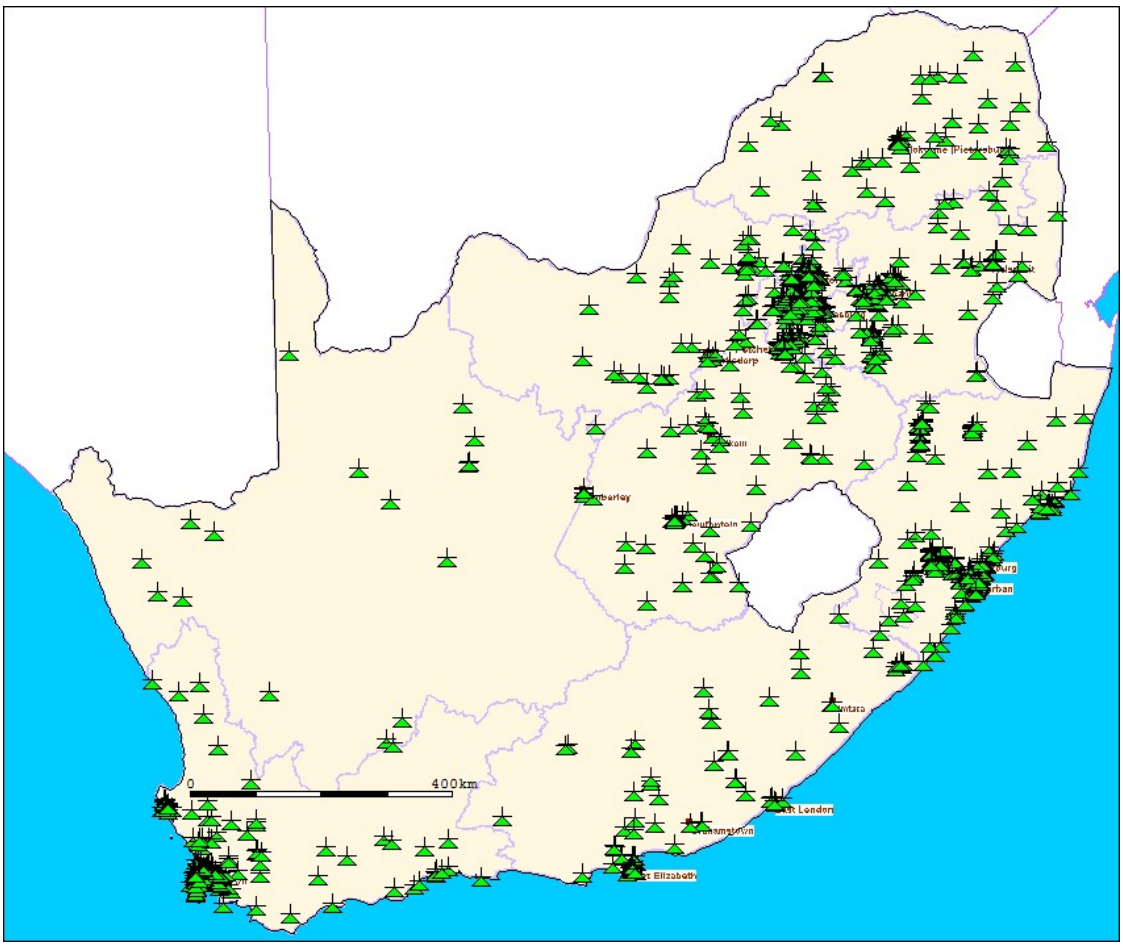



### 1.10.2 Licensing information for the applicable frequency allocation

There are 2207 Licenses issued in this band 452.5 to 457.5 MHz.

There are 2548 Licenses issued in this band 462.5 to 467.5 MHz.

**1.10.3 Areas where licensed frequencies are operational.**



### 1.11 Applicable Frequency Allocation and Band information 694 MHz to 960 MHz

Frequency Band under investigation 694 MHz to 960 MHz

MOBILE

BROADCASTING

FIXED (856 to 864.1 MHz)

Frequency Sub-bands

694 to 790 MHz & 790 to 862MHz & 862 to 890 & 890 to 942 & 942 to 960 MHz

Pairings

MOBILE UL 703 to 713 MHz paired with DL 758 to 768 MHz

MOBILE UL 713 to 723 MHz paired with DL 758 to 768 MHz

MOBILE UL 723 to 733 MHz paired with DL 758 to 768 MHz

MOBILE DL 791 to 801 MHz paired with UL 832 to 842 MHz

MOBILE DL 801 to 811 MHz paired with UL 842 to 852 MHz

MOBILE DL 811 to 821 MHz paired with UL 852 to 862 MHz

GSM-R (MTX) 877.695 to 880 MHz paired with (BTX) 921 to 925 MHz

IMT 900 (MTX) 880 to 915 MHz paired with (BTX) 925 to 960 MHz

FIXED Links 856 to 864.1 MHz paired with 868.1 to 876 MHz.

RFID (including, passive tags and vehicle location) 915.1 to 921 MHz.

Wireless Access 872.775 to 877.695 MHz paired with 827.775 to 832.695 MHz.

Wireless audio systems and wireless microphones 863 to 865 MHz

CT2 Cordless phones 864.1 to 868.1 MHz

FWA 864.1 to 868.1 MHz

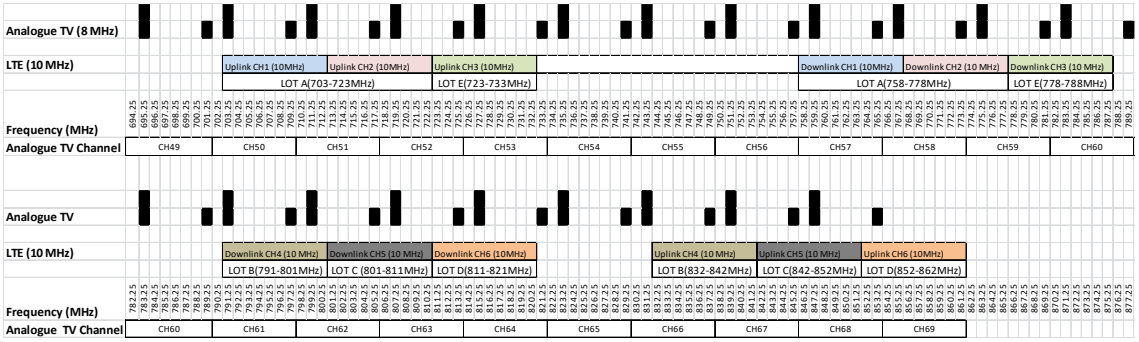
RFID 865 to 868 MHz

Non-specific SRD and RFID 869.4 to 869.65 MHz

Non-specific SRDs 868 to 868.6 MHz & 868.7 to 869.2 MHz

#### 1.11.1 Channel Plan for the Frequency Allocation

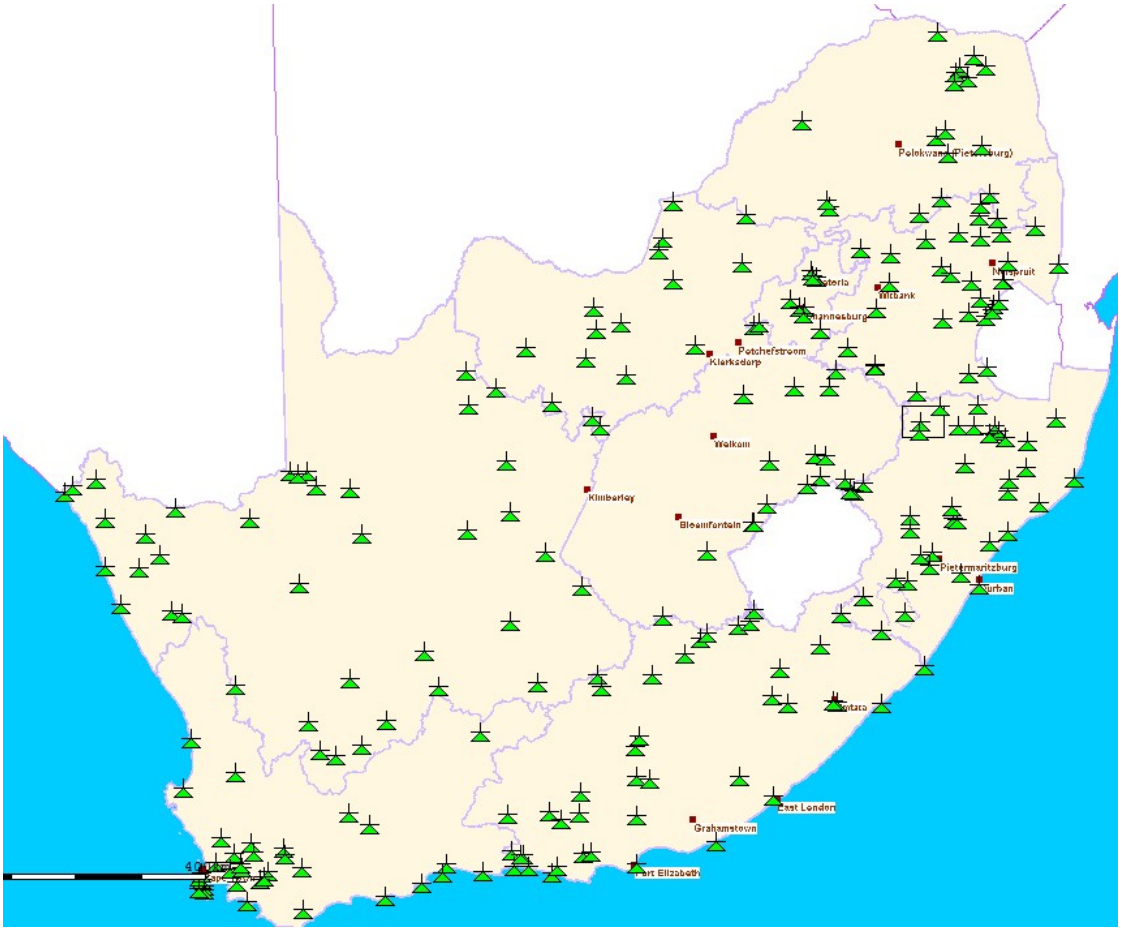
LTE Implementation Plan after Broadcast analogue Television switch-off


Analogue TV (8 MHz)
LTE (10 MHz)
Uplink CH1 (10MHz)
Uplink CH2 (10MHz)
Uplink CH3 (10MHz)
Downlink CH1 (10MHz)
Downlink CH2 (10 MHz)
Downlink CH3 (10 MHz)
LOT A(703-723MHz)
LOT E(723-733MHz)
LOT A(758-778MHz)
LOT E(778-788MHz)
Frequency (MHz)
Analogue TV Channel
CH49
CH50
CH51
CH52
CH53
CH54
CH55
CH56
CH57
CH58
CH59
CH60
Analogue TV
LTE (10 MHz)
Downlink CH4 (10 MHz)
Downlink CH5 (10 MHz)
Downlink CH6 (10MHz)
Uplink CH4 (10 MHz)
Uplink CH5 (10 MHz)
Uplink CH6 (10MHz)
LOT B(791-801MHz)
LOT C (801-811MHz)
LOT D(811-821MHz)
LOT B(832-842MHz)
LOT C(842-852MHz)
LOT D(852-862MHz)
Frequency (MHz)
Analogue TV Channel
CH60
CH61
CH62
CH63
CH64
CH65
CH66
CH67
CH68
CH69

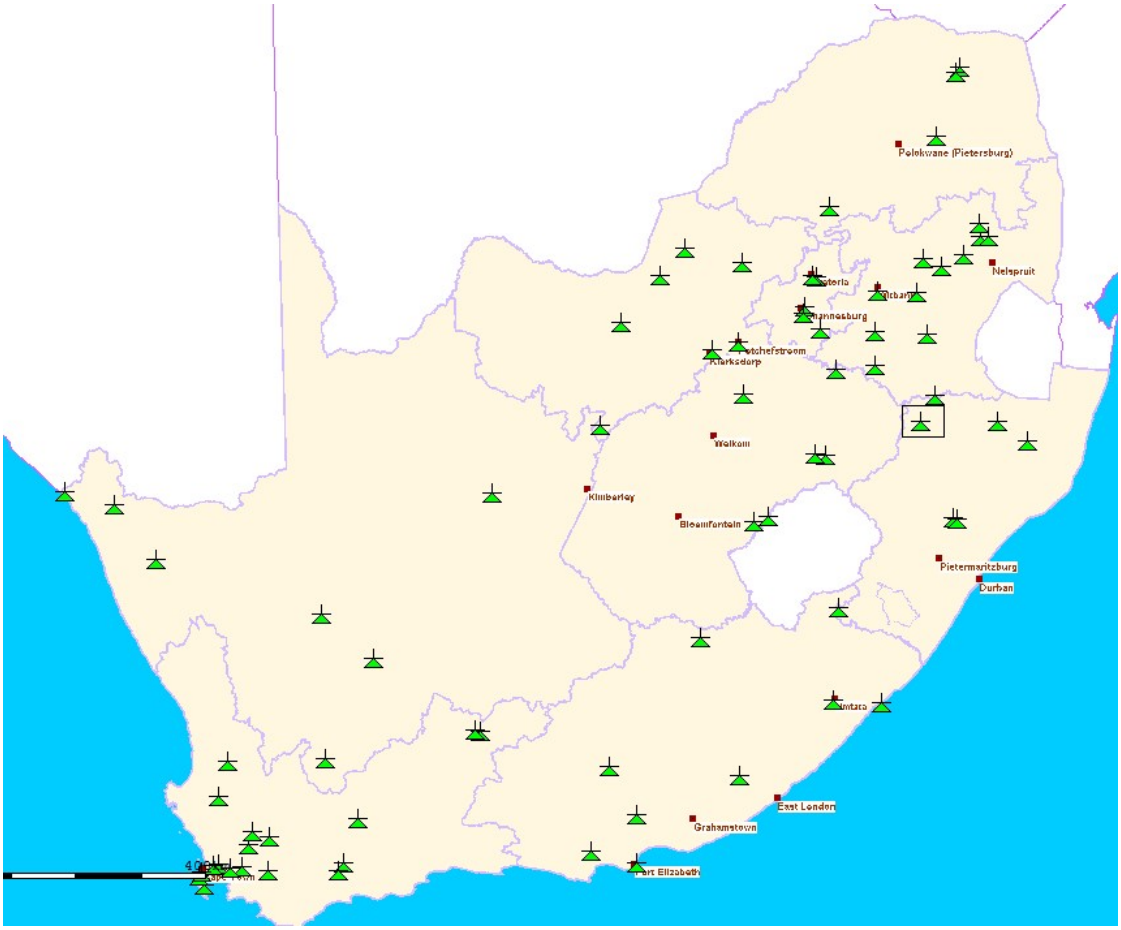
### 1.11.2 Areas where licensed frequencies are operational.

This does not include the low power self-help frequencies which are operational.

#### 1.11.2.1 Operational Analogue Broadcast Frequencies 694 MHz to 790 MHz



### 1.11.2.2 Operational Analogue Broadcast Frequencies 790 MHz to 854 MHz



### 1.12 Applicable Frequency Allocation and Band information 1350 MHz to 1375 MHz & 1492 MHz to 1517 MHz

FIXED NF 14

**Frequency Band under investigation 1350 to 1375 MHz**

FIXED

**Frequency Band under investigation 1492 to 1517 MHz**

FIXED

MOBILE except aeronautical mobile

Frequency Sub bands

Pairings

FIXED 1350 to 1375 MHz paired with 1492 to 1517 MHz.

Fixed link (duplex)

### 1.12.1 Channel Plan for the Frequency Allocation

#### 1.12.1.1 Annexure A

1.4 GHz channel plans TR13-01(A) ITU-R F.1242

Annex A (new plan)

| CEPT Band | TR13-01(A) 1.4 GHz (F.S) | | | | | CEPT Band | TR13-01(A) 1.4 GHz (F.S) | | | | | CEPT Band | TR13-01(A) 1.4 GHz (F.S) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ctr.Freq | 1433.5 MHz | | | | | Ctr.Freq | 1433.5 MHz | | | | | Ctr.Freq | 1433.5 MHz | | | |
| Ch.Width | 25 kHz | | | | | Ch.Width | 250 kHz | | | | | Ch.Width | 500 kHz | | | |
| Separ. | 142 MHz | | | | | Separ. | 142 MHz | | | | | Separ. | 142 MHz | | | |
| Ch.Spac. | 100x25 kHz | | | | | Ch.Spac. | 15x250 kHz | | | | | Ch.Spac. | 35x500 kHz | | | |
| Ctr.Gap | 117 MHz | | | | | Ctr.Gap | 117 MHz | | | | | Ctr.Gap | 117 MHz | | | Old plan |
| Ch. | Go | Return | | Go | Return | Ch. | Go | Return | Ch. | Go | Return | Ch. | Go | Return | | channel nu |
| 1 | 1350.5125 | 1492.5125 | 37 | 1351.4125 | 1493.4125 | 73 | 1352.3125 | 1494.3125 | 9 | 1355.1250 | 1497.1250 | 1 | 1357.2500 | 1499.2500 | | 109 |
| 2 | 1350.5375 | 1492.5375 | 38 | 1351.4375 | 1493.4375 | 74 | 1352.3375 | 1494.3375 | 10 | 1355.3750 | 1497.3750 | 2 | 1357.7500 | 1499.7500 | | 110 |
| 3 | 1350.5625 | 1492.5625 | 39 | 1351.4625 | 1493.4625 | 75 | 1352.3625 | 1494.3625 | 11 | 1355.6250 | 1497.6250 | 3 | 1358.2500 | 1500.2500 | | 111 |
| 4 | 1350.5875 | 1492.5875 | 40 | 1351.4875 | 1493.4875 | 76 | 1352.3875 | 1494.3875 | 12 | 1355.8750 | 1497.8750 | 4 | 1358.7500 | 1500.7500 | | 112 |
| 5 | 1350.6125 | 1492.6125 | 41 | 1351.5125 | 1493.5125 | 77 | 1352.4125 | 1494.4125 | 13 | 1356.1250 | 1498.1250 | 5 | 1359.2500 | 1501.2500 | | 113 |
| 6 | 1350.6375 | 1492.6375 | 42 | 1351.5375 | 1493.5375 | 78 | 1352.4375 | 1494.4375 | 14 | 1356.3750 | 1498.3750 | 6 | 1359.7500 | 1501.7500 | | 114 |
| 7 | 1350.6625 | 1492.6625 | 43 | 1351.5625 | 1493.5625 | 79 | 1352.4625 | 1494.4625 | 15 | 1356.6250 | 1498.6250 | 7 | 1360.2500 | 1502.2500 | | 115 |
| 8 | 1350.6875 | 1492.6875 | 44 | 1351.5875 | 1493.5875 | 80 | 1352.4875 | 1494.4875 | | | | 8 | 1360.7500 | 1502.7500 | | 116 |
| 9 | 1350.7125 | 1492.7125 | 45 | 1351.6125 | 1493.6125 | 81 | 1352.5125 | 1494.5125 | | | | 9 | 1361.2500 | 1503.2500 | | 117 |
| 10 | 1350.7375 | 1492.7375 | 46 | 1351.6375 | 1493.6375 | 82 | 1352.5375 | 1494.5375 | | | | 10 | 1361.7500 | 1503.7500 | | 118 |
| 11 | 1350.7625 | 1492.7625 | 47 | 1351.6625 | 1493.6625 | 83 | 1352.5625 | 1494.5625 | | | | 11 | 1362.2500 | 1504.2500 | | 119 |
| 12 | 1350.7875 | 1492.7875 | 48 | 1351.6875 | 1493.6875 | 84 | 1352.5875 | 1494.5875 | | | | 12 | 1362.7500 | 1504.7500 | | 120 |
| 13 | 1350.8125 | 1492.8125 | 49 | 1351.7125 | 1493.7125 | 85 | 1352.6125 | 1494.6125 | | | | 13 | 1363.2500 | 1505.2500 | | 121 |
| 14 | 1350.8375 | 1492.8375 | 50 | 1351.7375 | 1493.7375 | 86 | 1352.6375 | 1494.6375 | | | | 14 | 1363.7500 | 1505.7500 | | 122 |
| 15 | 1350.8625 | 1492.8625 | 51 | 1351.7625 | 1493.7625 | 87 | 1352.6625 | 1494.6625 | | | | 15 | 1364.2500 | 1506.2500 | | 123 |
| 16 | 1350.8875 | 1492.8875 | 52 | 1351.7875 | 1493.7875 | 88 | 1352.6875 | 1494.6875 | | | | 16 | 1364.7500 | 1506.7500 | | 124 |
| 17 | 1350.9125 | 1492.9125 | 53 | 1351.8125 | 1493.8125 | 89 | 1352.7125 | 1494.7125 | | | | 17 | 1365.2500 | 1507.2500 | | 125 |
| 18 | 1350.9375 | 1492.9375 | 54 | 1351.8375 | 1493.8375 | 90 | 1352.7375 | 1494.7375 | | | | 18 | 1365.7500 | 1507.7500 | | 126 |
| 19 | 1350.9625 | 1492.9625 | 55 | 1351.8625 | 1493.8625 | 91 | 1352.7625 | 1494.7625 | | | | 19 | 1366.2500 | 1508.2500 | | 127 |
| 20 | 1350.9875 | 1492.9875 | 56 | 1351.8875 | 1493.8875 | 92 | 1352.7875 | 1494.7875 | | | | 20 | 1366.7500 | 1508.7500 | | 128 |
| 21 | 1351.0125 | 1493.0125 | 57 | 1351.9125 | 1493.9125 | 93 | 1352.8125 | 1494.8125 | | | | 21 | 1367.2500 | 1509.2500 | | 129 |
| 22 | 1351.0375 | 1493.0375 | 58 | 1351.9375 | 1493.9375 | 94 | 1352.8375 | 1494.8375 | | | | 22 | 1367.7500 | 1509.7500 | | 130 |
| 23 | 1351.0625 | 1493.0625 | 59 | 1351.9625 | 1493.9625 | 95 | 1352.8625 | 1494.8625 | | | | 23 | 1368.2500 | 1510.2500 | | 131 |
| 24 | 1351.0875 | 1493.0875 | 60 | 1351.9875 | 1493.9875 | 96 | 1352.8875 | 1494.8875 | | | | 24 | 1368.7500 | 1510.7500 | | 132 |
| 25 | 1351.1125 | 1493.1125 | 61 | 1352.0125 | 1494.0125 | 97 | 1352.9125 | 1494.9125 | | | | 25 | 1369.2500 | 1511.2500 | | 133 ad hoc |
| 26 | 1351.1375 | 1493.1375 | 62 | 1352.0375 | 1494.0375 | 98 | 1352.9375 | 1494.9375 | | | | 26 | 1369.7500 | 1511.7500 | | 134 |
| 27 | 1351.1625 | 1493.1625 | 63 | 1352.0625 | 1494.0625 | 99 | 1352.9625 | 1494.9625 | | | | 27 | 1370.2500 | 1512.2500 | | 135 ad hoc |
| 28 | 1351.1875 | 1493.1875 | 64 | 1352.0875 | 1494.0875 | 100 | 1352.9875 | 1494.9875 | | | | 28 | 1370.7500 | 1512.7500 | | 136 |
| 29 | 1351.2125 | 1493.2125 | 65 | 1352.1125 | 1494.1125 | 1 | 1353.1250 | 1495.1250 | | | | 29 | 1371.2500 | 1513.2500 | | 137 ad hoc |
| 30 | 1351.2375 | 1493.2375 | 66 | 1352.1375 | 1494.1375 | 2 | 1353.3750 | 1495.3750 | | | | 30 | 1371.7500 | 1513.7500 | | 138 ad hoc |
| 31 | 1351.2625 | 1493.2625 | 67 | 1352.1625 | 1494.1625 | 3 | 1353.6250 | 1495.6250 | | | | 31 | 1372.2500 | 1514.2500 | | 139 |
| 32 | 1351.2875 | 1493.2875 | 68 | 1352.1875 | 1494.1875 | 4 | 1353.8750 | 1495.8750 | | | | 32 | 1372.7500 | 1514.7500 | | 140 ad hoc |
| 33 | 1351.3125 | 1493.3125 | 69 | 1352.2125 | 1494.2125 | 5 | 1354.1250 | 1496.1250 | | | | 33 | 1373.2500 | 1515.2500 | | 141 |
| 34 | 1351.3375 | 1493.3375 | 70 | 1352.2375 | 1494.2375 | 6 | 1354.3750 | 1496.3750 | | | | 34 | 1373.7500 | 1515.7500 | | 142 |
| 35 | 1351.3625 | 1493.3625 | 71 | 1352.2625 | 1494.2625 | 7 | 1354.6250 | 1496.6250 | | | | 35 | 1374.2500 | 1516.2500 | | 143 |
| 36 | 1351.3875 | 1493.3875 | 72 | 1352.2875 | 1494.2875 | 8 | 1354.8750 | 1496.8750 | | | | | | | | |
| | | 25 kHz shared | | | | | | 250 kHz shared | | | | | | 500 kHz shared | | |

continue Annex B on next sheet

Typical users

- Eskom
- Transnet
- SAPS
- SANDF
- Ekurhuleni
- National Research Foundation

### 1.12.1.2 Annexure B

| Annex B (new plan) | | | |
|---|---|---|---|
| | CEPT TR13-01(B) | | |
| | Band 1.4 GHz (F.S) | | |
| | Ctr.Freq 1413.5 MHz | | |
| | Ch.Width 500 kHz | | |
| | Separ. 52 MHz | | |
| | Ch.Spac. 48x500 kHz | | |
| | Ctr.Gap 27 MHz | | |
| Ch. | Go | Return | |
| 1 | 1375.7500 | 1427.7500 | |
| 2 | 1376.2500 | 1428.2500 | |
| 3 | 1376.7500 | 1428.7500 | |
| 4 | 1377.2500 | 1429.2500 | |
| 5 | 1377.7500 | 1429.7500 | |
| 6 | 1378.2500 | 1430.2500 | |
| 7 | 1378.7500 | 1430.7500 | |
| 8 | 1379.2500 | 1431.2500 | |
| 9 | 1379.7500 | 1431.7500 | |
| 10 | 1380.2500 | 1432.2500 | Telkom |
| 11 | 1380.7500 | 1432.7500 | |
| 12 | 1381.2500 | 1433.2500 | Telkom |
| 13 | 1381.7500 | 1433.7500 | |
| 14 | 1382.2500 | 1434.2500 | |
| 15 | 1382.7500 | 1434.7500 | |
| 16 | 1383.2500 | 1435.2500 | |
| 17 | 1383.7500 | 1435.7500 | |
| 18 | 1384.2500 | 1436.2500 | |
| 19 | 1384.7500 | 1436.7500 | |
| 20 | 1385.2500 | 1437.2500 | |
| 21 | 1385.7500 | 1437.7500 | |
| 22 | 1386.2500 | 1438.2500 | |
| 23 | 1386.7500 | 1438.7500 | |
| 24 | 1387.2500 | 1439.2500 | |
| 25 | 1387.7500 | 1439.7500 | |
| 26 | 1388.2500 | 1440.2500 | |
| 27 | 1388.7500 | 1440.7500 | |
| 28 | 1389.2500 | 1441.2500 | |
| 29 | 1389.7500 | 1441.7500 | |
| 30 | 1390.2500 | 1442.2500 | |
| 31 | 1390.7500 | 1442.7500 | |
| 32 | 1391.2500 | 1443.2500 | |
| 33 | 1391.7500 | 1443.7500 | |
| 34 | 1392.2500 | 1444.2500 | |
| 35 | 1392.7500 | 1444.7500 | |
| 36 | 1393.2500 | 1445.2500 | |
| 37 | 1393.7500 | 1445.7500 | |
| 38 | 1394.2500 | 1446.2500 | |
| 39 | 1394.7500 | 1446.7500 | Telkom |
| 40 | 1395.2500 | 1447.2500 | Telkom |
| 41 | 1395.7500 | 1447.7500 | Telkom |
| 42 | 1396.2500 | 1448.2500 | Telkom |
| 43 | 1396.7500 | 1448.7500 | Telkom |
| 44 | 1397.2500 | 1449.2500 | Telkom |
| 45 | 1397.7500 | 1449.7500 | Telkom |
| 46 | 1398.2500 | 1450.2500 | Telkom |
| 47 | 1398.7500 | 1450.7500 | Telkom |
| 48 | 1399.2500 | 1451.2500 | Telkom |

### 1.12.1.3 Simplex Channels

**Single (or simplex) frequency channels (shared) [Intended for migration of links < 1 GHz]**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ITU / CEPT | Based on REC ITU-R F.1242 | | | | | | | |
| | Band | 1.5 GHz (F.S) Simplex | | | | | | | |
| | Ctr.Freq | | - | | | | | | |
| | Ch.Width | 7x500 kHz | & 140x25 kHz | | | | | | |
| | Separ. | | - | | | | | | |
| | Ch.Spac. | 7x 500 kHz & 140x 25 kHz | | | | | | | |
| | Ctr.Gap | | - | | | | | | |
| Ch. | | Ch. | | Ch. | | Ch. | | Ch. | |
| 1(IMT) | 1517.75 | 37 | 1521.7375 | 73 | 1522.6375 | 109 | 1523.5375 | 145 | 1524.4375 |
| 2(IMT) | 1518.25 | 38 | 1521.7625 | 74 | 1522.6625 | 110 | 1523.5625 | 146 | 1524.4625 |
| 3 | 1518.75 | 39 | 1521.7875 | 75 | 1522.6875 | 111 | 1523.5875 | 147 | 1524.4875 |
| 4 | 1519.25 | 40 | 1521.8125 | 76 | 1522.7125 | 112 | 1523.6125 | | |
| 5 | 1519.75 | 41 | 1521.8375 | 77 | 1522.7375 | 113 | 1523.6375 | | |
| 6 | 1520.25 | 42 | 1521.8625 | 78 | 1522.7625 | 114 | 1523.6625 | | |
| 7 | 1520.75 | 43 | 1521.8875 | 79 | 1522.7875 | 115 | 1523.6875 | | |
| 8 | 1521.0125 | 44 | 1521.9125 | 80 | 1522.8125 | 116 | 1523.7125 | | |
| 9 | 1521.0375 | 45 | 1521.9375 | 81 | 1522.8375 | 117 | 1523.7375 | | |
| 10 | 1521.0625 | 46 | 1521.9625 | 82 | 1522.8625 | 118 | 1523.7625 | | |
| 11 | 1521.0875 | 47 | 1521.9875 | 83 | 1522.8875 | 119 | 1523.7875 | | |
| 12 | 1521.1125 | 48 | 1522.0125 | 84 | 1522.9125 | 120 | 1523.8125 | | |
| 13 | 1521.1375 | 49 | 1522.0375 | 85 | 1522.9375 | 121 | 1523.8375 | | |
| 14 | 1521.1625 | 50 | 1522.0625 | 86 | 1522.9625 | 122 | 1523.8625 | | |
| 15 | 1521.1875 | 51 | 1522.0875 | 87 | 1522.9875 | 123 | 1523.8875 | | |
| 16 | 1521.2125 | 52 | 1522.1125 | 88 | 1523.0125 | 124 | 1523.9125 | | |
| 17 | 1521.2375 | 53 | 1522.1375 | 89 | 1523.0375 | 125 | 1523.9375 | | |
| 18 | 1521.2625 | 54 | 1522.1625 | 90 | 1523.0625 | 126 | 1523.9625 | | |
| 19 | 1521.2875 | 55 | 1522.1875 | 91 | 1523.0875 | 127 | 1523.9875 | | |
| 20 | 1521.3125 | 56 | 1522.2125 | 92 | 1523.1125 | 128 | 1524.0125 | | |
| 21 | 1521.3375 | 57 | 1522.2375 | 93 | 1523.1375 | 129 | 1524.0375 | | |
| 22 | 1521.3625 | 58 | 1522.2625 | 94 | 1523.1625 | 130 | 1524.0625 | | |
| 23 | 1521.3875 | 59 | 1522.2875 | 95 | 1523.1875 | 131 | 1524.0875 | | |
| 24 | 1521.4125 | 60 | 1522.3125 | 96 | 1523.2125 | 132 | 1524.1125 | | |
| 25 | 1521.4375 | 61 | 1522.3375 | 97 | 1523.2375 | 133 | 1524.1375 | | |
| 26 | 1521.4625 | 62 | 1522.3625 | 98 | 1523.2625 | 134 | 1524.1625 | | |
| 27 | 1521.4875 | 63 | 1522.3875 | 99 | 1523.2875 | 135 | 1524.1875 | | |
| 28 | 1521.5125 | 64 | 1522.4125 | 100 | 1523.3125 | 136 | 1524.2125 | | |
| 29 | 1521.5375 | 65 | 1522.4375 | 101 | 1523.3375 | 137 | 1524.2375 | | |
| 30 | 1521.5625 | 66 | 1522.4625 | 102 | 1523.3625 | 138 | 1524.2625 | | |
| 31 | 1521.5875 | 67 | 1522.4875 | 103 | 1523.3875 | 139 | 1524.2875 | | |
| 32 | 1521.6125 | 68 | 1522.5125 | 104 | 1523.4125 | 140 | 1524.3125 | | |
| 33 | 1521.6375 | 69 | 1522.5375 | 105 | 1523.4375 | 141 | 1524.3375 | | |
| 34 | 1521.6625 | 70 | 1522.5625 | 106 | 1523.4625 | 142 | 1524.3625 | | |
| 35 | 1521.6875 | 71 | 1522.5875 | 107 | 1523.4875 | 143 | 1524.3875 | | |
| 36 | 1521.7125 | 72 | 1522.6125 | 108 | 1523.5125 | 144 | 1524.4125 | | |

## 1.13 Applicable Frequency Allocation and Band information 1518 MHz to 1525 MHz

FIXED

MOBILE-SATELLITE (space to Earth)

Frequency Band under investigation 1518 to 1525 MHz

This band is identified for IMT Satellite Components (Space to earth)

### 1.13.1 Channel Plan for the Frequency Allocation

See previous section for more details.

### 1.13.2 Licensing information for the applicable frequency allocation

See previous section for more details.

**1.14 Applicable Frequency Allocation and Band information 1700 MHz to 2450 MHz**

Frequency Band under investigation 1700 to 2450 MHz and sub band 2025 to 2110 MHz

**1700 to 1710 MHz**

METEOROLOGICAL SATELLITE (space to Earth)

Fixed Links (single frequency)

**1710 to 1980 MHz**

FIXED

MOBILE

FWA 1880 to 1900 MHz

FWA TDD 1900 to 1920 MHz

Fixed Broadband data applications: 1785 to 1805 MHz

IMT 1800 MTX: 1710 to 1785 MHz paired with BTX 1805 to 1880 MHz

Cordless Telephones: 1880 to 1900 MHz

IMT 1900 TDD: 1900 to 1920 MHz

IMT 2100 MTX: 1920 to 1980 MHz paired with BTX 2110 to 2170 MHz

The feasibility study is to be undertaken from the preceding the following;

- The Radio Frequency Spectrum Assignment Plan for the frequency band 1710 – 1785 MHz paired with 1805 – 1880 MHz is to be developed.
- Further, the Radio Frequency Spectrum Assignment Plan for the frequency band 1900 – 1920 MHz is to be developed.
- Furthermore, the Radio Frequency Spectrum Assignment Plan for the frequency band 1920 – 1980 MHz paired with 2110 – 2170 MHz is to be developed.

**1980 to 2010 MHz**

FIXED

MOBILE

MOBILE-SATELLITE

FIXED Links: 1980 to 2010 MHz paired with 2170 to 2200 MHz.

CGC/ATC fixed systems: 1980 to 2010 MHz

IMT satellite: 1980 to 2010 MHz

**2010 to 2025 MHz**

FIXED

MOBILE

IMT TDD: 2010 to 2025 MHz

**2025 to 2110 MHz**

FIXED

Fixed Links: 2025 to 2110 MHz paired with 2200 to 2285 MHz.

**2110 to 2170 MHz**

FIXED

MOBILE

IMT 2100 BTX 2110 to 2170 MHz paired with 1920 to 1980.

**2170 to 2200 MHz**

FIXED

MOBILE

MOBILE-SATELLITE (space to Earth)

Fixed Links 2170 to 2200 MHz paired with 1980 to 2010.

CGC/ATC fixed systems: 1980 to 2010 MHz

IMT satellite: 1980 to 2010 MHz

**2200 to 2300 MHz**

SPACE OPERATION (space to Earth) (space to space)

FIXED

MOBILE

Fixed Links 2025 to 2110 MHz paired with 2200 to 2285 MHz.

BFWA 2285 to 2300 MHz

ITU-R Rec F.1098 refers.

**2300 to 2450 MHz**

FIXED

MOBILE

Amateur

FWA (PTP/PTMP): 2307 to 2387 paired with 2401 to 2481 MHz.

FWA (PTP/PTMP): 2401 to 2481 paired with MHz 2307 to 2387

IMT 2300 TDD: 2300 to 2400 MHz

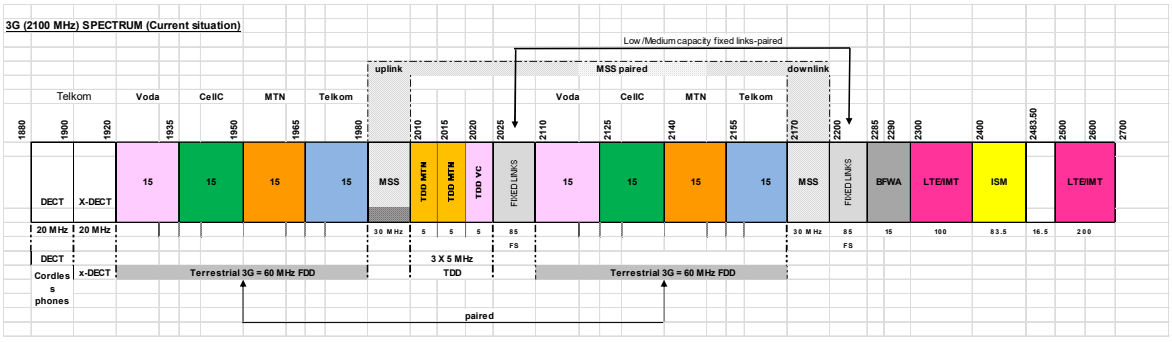
WLAN, FDDA and model ctrl: 2400 to 2483.5 MHz

Non-Specific SRDs and low power video surveillance: 2400 2483.5 MHz

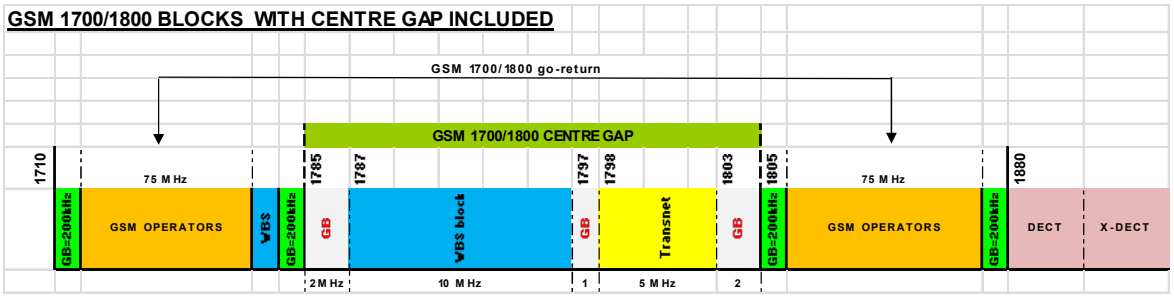
RFDI: 2400 2483.5 MHz

ISM applications: 2400 2483.5 MHz

### 1.14.1 Channel Plan for the Frequency Allocation



**GSM 1700/1800 BLOCKS WITH CENTRE GAP INCLUDED**



CONTINUES ON PAGE 258 OF BOOK 3

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AIDS HELPLINE: 0800-0123-22 Prevention is the cure

## GSM 1800

| GSM 1800 | | | | | |
|---|---|---|---|---|---|
| Ch. No. | ARFCN (Fl), MHz | ARFCN (Fu), MHz | Assignment/usage current | Comments | Final assignment |
| 512 | 1710.2 | 1805.2 | | | GB |
| 513 | 1710.4 | 1805.4 | | | Neotel |
| 514 | 1710.6 | 1805.6 | | | Neotel |
| 515 | 1710.8 | 1805.8 | | | Neotel |
| 516 | 1711 | 1806 | | | Neotel |
| 517 | 1711.2 | 1806.2 | | | Neotel |
| 518 | 1711.4 | 1806.4 | | | Neotel |
| 519 | 1711.6 | 1806.6 | | | Neotel |
| 520 | 1711.8 | 1806.8 | | | Neotel |
| 521 | 1712 | 1807 | | | Neotel |
| 522 | 1712.2 | 1807.2 | | | Neotel |
| 523 | 1712.4 | 1807.4 | | | Neotel |
| 524 | 1712.6 | 1807.6 | | | Neotel |
| 525 | 1712.8 | 1807.8 | | | Neotel |
| 526 | 1713 | 1808 | | | Neotel |
| 527 | 1713.2 | 1808.2 | | | Neotel |
| 528 | 1713.4 | 1808.4 | | | Neotel |
| 529 | 1713.6 | 1808.6 | | | Neotel |
| 530 | 1713.8 | 1808.8 | | | Neotel |
| 531 | 1714 | 1809 | | | Neotel |
| 532 | 1714.2 | 1809.2 | | | Neotel |
| 533 | 1714.4 | 1809.4 | | | Neotel |
| 534 | 1714.6 | 1809.6 | | | Neotel |
| 535 | 1714.8 | 1809.8 | | | Neotel |
| 536 | 1715 | 1810 | | | Neotel |
| 537 | 1715.2 | 1810.2 | | | Neotel |
| 538 | 1715.4 | 1810.4 | | | Neotel |
| 539 | 1715.6 | 1810.6 | | | Neotel |
| 540 | 1715.8 | 1810.8 | | | Neotel |
| 541 | 1716 | 1811 | | | Neotel |
| 542 | 1716.2 | 1811.2 | | | Neotel |
| 543 | 1716.4 | 1811.4 | | | Neotel |
| 544 | 1716.6 | 1811.6 | | | Neotel |
| 545 | 1716.8 | 1811.8 | | | Neotel |
| 546 | 1717 | 1812 | | | Neotel |
| 547 | 1717.2 | 1812.2 | | | Neotel |
| 548 | 1717.4 | 1812.4 | | | Neotel |
| 549 | 1717.6 | 1812.6 | | | Neotel |
| 550 | 1717.8 | 1812.8 | | | Neotel |
| 551 | 1718 | 1813 | | | Neotel |
| 552 | 1718.2 | 1813.2 | | | Neotel |
| 553 | 1718.4 | 1813.4 | | | Neotel |
| 554 | 1718.6 | 1813.6 | | | Neotel |
| 555 | 1718.8 | 1813.8 | | | Neotel |
| 556 | 1719 | 1814 | | | Neotel |
| 557 | 1719.2 | 1814.2 | | | Neotel |
| 558 | 1719.4 | 1814.4 | | | Neotel |
| 559 | 1719.6 | 1814.6 | | | Neotel |
| 560 | 1719.8 | 1814.8 | | | Neotel |
| 561 | 1720 | 1815 | | | Neotel |
| 562 | 1720.2 | 1815.2 | | | Neotel |
| 563 | 1720.4 | 1815.4 | | | Neotel |
| 564 | 1720.6 | 1815.6 | | | Neotel |
| 565 | 1720.8 | 1815.8 | | | Neotel |
| 566 | 1721 | 1816 | | | Neotel |
| 567 | 1721.2 | 1816.2 | | | Neotel |
| 568 | 1721.4 | 1816.4 | | | Neotel |
| 569 | 1721.6 | 1816.6 | | | Neotel |
| 570 | 1721.8 | 1816.8 | | | Neotel |
| 571 | 1722 | 1817 | | | Neotel |
| 572 | 1722.2 | 1817.2 | | | Neotel |

| | | | | | |
|---|---|---|---|---|---|
| 573 | 1722.4 | 1817.4 | | | GB |
| 574 | 1722.6 | 1817.6 | | | GB |
| 575 | 1722.8 | 1817.8 | | | MTN |
| 576 | 1723 | 1818 | | | MTN |
| 577 | 1723.2 | 1818.2 | | | MTN |
| 578 | 1723.4 | 1818.4 | | | MTN |
| 579 | 1723.6 | 1818.6 | | | MTN |
| 580 | 1723.8 | 1818.8 | | | MTN |
| 581 | 1724 | 1819 | | | MTN |
| 582 | 1724.2 | 1819.2 | | | MTN |
| 583 | 1724.4 | 1819.4 | | | MTN |
| 584 | 1724.6 | 1819.6 | | | MTN |
| 585 | 1724.8 | 1819.8 | | | MTN |
| 586 | 1725 | 1820 | | | MTN |
| 587 | 1725.2 | 1820.2 | | | MTN |
| 588 | 1725.4 | 1820.4 | | | MTN |
| 589 | 1725.6 | 1820.6 | | | MTN |
| 590 | 1725.8 | 1820.8 | | | MTN |
| 591 | 1726 | 1821 | | | MTN |
| 592 | 1726.2 | 1821.2 | | | MTN |
| 593 | 1726.4 | 1821.4 | | | MTN |
| 594 | 1726.6 | 1821.6 | | | MTN |
| 595 | 1726.8 | 1821.8 | | | MTN |
| 596 | 1727 | 1822 | | | MTN |
| 597 | 1727.2 | 1822.2 | | | MTN |
| 598 | 1727.4 | 1822.4 | | | MTN |
| 599 | 1727.6 | 1822.6 | | | MTN |
| 600 | 1727.8 | 1822.8 | | | MTN |
| 601 | 1728 | 1823 | | | MTN |
| 602 | 1728.2 | 1823.2 | | | MTN |
| 603 | 1728.4 | 1823.4 | | | MTN |
| 604 | 1728.6 | 1823.6 | | | MTN |
| 605 | 1728.8 | 1823.8 | | | MTN |
| 606 | 1729 | 1824 | | | MTN |
| 607 | 1729.2 | 1824.2 | | | MTN |
| 608 | 1729.4 | 1824.4 | | | MTN |
| 609 | 1729.6 | 1824.6 | | | MTN |
| 610 | 1729.8 | 1824.8 | | | MTN |
| 611 | 1730 | 1825 | | | MTN |
| 612 | 1730.2 | 1825.2 | | | MTN |
| 613 | 1730.4 | 1825.4 | | | MTN |
| 614 | 1730.6 | 1825.6 | | | MTN |
| 615 | 1730.8 | 1825.8 | | | MTN |
| 616 | 1731 | 1826 | | | MTN |
| 617 | 1731.2 | 1826.2 | | | MTN |
| 618 | 1731.4 | 1826.4 | | | MTN |
| 619 | 1731.6 | 1826.6 | | | MTN |
| 620 | 1731.8 | 1826.8 | | | MTN |
| 621 | 1732 | 1827 | | | MTN |
| 622 | 1732.2 | 1827.2 | | | MTN |
| 623 | 1732.4 | 1827.4 | | | MTN |
| 624 | 1732.6 | 1827.6 | | | MTN |
| 625 | 1732.8 | 1827.8 | | | MTN |
| 626 | 1733 | 1828 | | | MTN |
| 627 | 1733.2 | 1828.2 | | | MTN |
| 628 | 1733.4 | 1828.4 | | | MTN |
| 629 | 1733.6 | 1828.6 | | | MTN |
| 630 | 1733.8 | 1828.8 | | | MTN |
| 631 | 1734 | 1829 | | | MTN |
| 632 | 1734.2 | 1829.2 | | | MTN |
| 633 | 1734.4 | 1829.4 | | | MTN |
| 634 | 1734.6 | 1829.6 | | | MTN |
| 635 | 1734.8 | 1829.8 | | | GB |
| 636 | 1735 | 1830 | | | GB |

| | | | | | |
|---|---|---|---|---|---|
| 637 | 1735.2 | 1830.2 | | | Telkom |
| 638 | 1735.4 | 1830.4 | | | Telkom |
| 639 | 1735.6 | 1830.6 | | | Telkom |
| 640 | 1735.8 | 1830.8 | | | Telkom |
| 641 | 1736 | 1831 | | | Telkom |
| 642 | 1736.2 | 1831.2 | | | Telkom |
| 643 | 1736.4 | 1831.4 | | | Telkom |
| 644 | 1736.6 | 1831.6 | | | Telkom |
| 645 | 1736.8 | 1831.8 | | | Telkom |
| 646 | 1737 | 1832 | | | Telkom |
| 647 | 1737.2 | 1832.2 | | | Telkom |
| 648 | 1737.4 | 1832.4 | | | Telkom |
| 649 | 1737.6 | 1832.6 | | | Telkom |
| 650 | 1737.8 | 1832.8 | | | Telkom |
| 651 | 1738 | 1833 | | | Telkom |
| 652 | 1738.2 | 1833.2 | | | Telkom |
| 653 | 1738.4 | 1833.4 | | | Telkom |
| 654 | 1738.6 | 1833.6 | | | Telkom |
| 655 | 1738.8 | 1833.8 | | | Telkom |
| 656 | 1739 | 1834 | | | Telkom |
| 657 | 1739.2 | 1834.2 | | | Telkom |
| 658 | 1739.4 | 1834.4 | | | Telkom |
| 659 | 1739.6 | 1834.6 | | | Telkom |
| 660 | 1739.8 | 1834.8 | | | Telkom |
| 661 | 1740 | 1835 | | | Telkom |
| 662 | 1740.2 | 1835.2 | | | Telkom |
| 663 | 1740.4 | 1835.4 | | | Telkom |
| 664 | 1740.6 | 1835.6 | | | Telkom |
| 665 | 1740.8 | 1835.8 | | | Telkom |
| 666 | 1741 | 1836 | | | Telkom |
| 667 | 1741.2 | 1836.2 | | | Telkom |
| 668 | 1741.4 | 1836.4 | | | Telkom |
| 669 | 1741.6 | 1836.6 | | | Telkom |
| 670 | 1741.8 | 1836.8 | | | Telkom |
| 671 | 1742 | 1837 | | | Telkom |
| 672 | 1742.2 | 1837.2 | | | Telkom |
| 673 | 1742.4 | 1837.4 | | | Telkom |
| 674 | 1742.6 | 1837.6 | | | Telkom |
| 675 | 1742.8 | 1837.8 | | | Telkom |
| 676 | 1743 | 1838 | | | Telkom |
| 677 | 1743.2 | 1838.2 | | | Telkom |
| 678 | 1743.4 | 1838.4 | | | Telkom |
| 679 | 1743.6 | 1838.6 | | | Telkom |
| 680 | 1743.8 | 1838.8 | | | Telkom |
| 681 | 1744 | 1839 | | | Telkom |
| 682 | 1744.2 | 1839.2 | | | Telkom |
| 683 | 1744.4 | 1839.4 | | | Telkom |
| 684 | 1744.6 | 1839.6 | | | Telkom |
| 685 | 1744.8 | 1839.8 | | | Telkom |
| 686 | 1745 | 1840 | | | Telkom |
| 687 | 1745.2 | 1840.2 | | | Telkom |
| 688 | 1745.4 | 1840.4 | | | Telkom |
| 689 | 1745.6 | 1840.6 | | | Telkom |
| 690 | 1745.8 | 1840.8 | | | Telkom |
| 691 | 1746 | 1841 | | | Telkom |
| 692 | 1746.2 | 1841.2 | | | Telkom |
| 693 | 1746.4 | 1841.4 | | | Telkom |
| 694 | 1746.6 | 1841.6 | | | Telkom |
| 695 | 1746.8 | 1841.8 | | | Telkom |
| 696 | 1747 | 1842 | | | Telkom |
| 697 | 1747.2 | 1842.2 | | | GB |
| 698 | 1747.4 | 1842.4 | | | GB |
| 699 | 1747.6 | 1842.6 | | | GB |
| 700 | 1747.8 | 1842.8 | | | GB |

| | | | | | |
|---|---|---|---|---|---|
| 701 | 1748 | 1843 | | | Cell C |
| 702 | 1748.2 | 1843.2 | | | Cell C |
| 703 | 1748.4 | 1843.4 | | | Cell C |
| 704 | 1748.6 | 1843.6 | | | Cell C |
| 705 | 1748.8 | 1843.8 | | | Cell C |
| 706 | 1749 | 1844 | | | Cell C |
| 707 | 1749.2 | 1844.2 | | | Cell C |
| 708 | 1749.4 | 1844.4 | | | Cell C |
| 709 | 1749.6 | 1844.6 | | | Cell C |
| 710 | 1749.8 | 1844.8 | | | Cell C |
| 711 | 1750 | 1845 | | | Cell C |
| 712 | 1750.2 | 1845.2 | | | Cell C |
| 713 | 1750.4 | 1845.4 | | | Cell C |
| 714 | 1750.6 | 1845.6 | | | Cell C |
| 715 | 1750.8 | 1845.8 | | | Cell C |
| 716 | 1751 | 1846 | | | Cell C |
| 717 | 1751.2 | 1846.2 | | | Cell C |
| 718 | 1751.4 | 1846.4 | | | Cell C |
| 719 | 1751.6 | 1846.6 | | | Cell C |
| 720 | 1751.8 | 1846.8 | | | Cell C |
| 721 | 1752 | 1847 | | | Cell C |
| 722 | 1752.2 | 1847.2 | | | Cell C |
| 723 | 1752.4 | 1847.4 | | | Cell C |
| 724 | 1752.6 | 1847.6 | | | Cell C |
| 725 | 1752.8 | 1847.8 | | | Cell C |
| 726 | 1753 | 1848 | | | Cell C |
| 727 | 1753.2 | 1848.2 | | | Cell C |
| 728 | 1753.4 | 1848.4 | | | Cell C |
| 729 | 1753.6 | 1848.6 | | | Cell C |
| 730 | 1753.8 | 1848.8 | | | Cell C |
| 731 | 1754 | 1849 | | | Cell C |
| 732 | 1754.2 | 1849.2 | | | Cell C |
| 733 | 1754.4 | 1849.4 | | | Cell C |
| 734 | 1754.6 | 1849.6 | | | Cell C |
| 735 | 1754.8 | 1849.8 | | | Cell C |
| 736 | 1755 | 1850 | | | Cell C |
| 737 | 1755.2 | 1850.2 | | | Cell C |
| 738 | 1755.4 | 1850.4 | | | Cell C |
| 739 | 1755.6 | 1850.6 | | | Cell C |
| 740 | 1755.8 | 1850.8 | | | Cell C |
| 741 | 1756 | 1851 | | | Cell C |
| 742 | 1756.2 | 1851.2 | | | Cell C |
| 743 | 1756.4 | 1851.4 | | | Cell C |
| 744 | 1756.6 | 1851.6 | | | Cell C |
| 745 | 1756.8 | 1851.8 | | | Cell C |
| 746 | 1757 | 1852 | | | Cell C |
| 747 | 1757.2 | 1852.2 | | | Cell C |
| 748 | 1757.4 | 1852.4 | | | Cell C |
| 749 | 1757.6 | 1852.6 | | | Cell C |
| 750 | 1757.8 | 1852.8 | | | Cell C |
| 751 | 1758 | 1853 | | | Cell C |
| 752 | 1758.2 | 1853.2 | | | Cell C |
| 753 | 1758.4 | 1853.4 | | | Cell C |
| 754 | 1758.6 | 1853.6 | | | Cell C |
| 755 | 1758.8 | 1853.8 | | | Cell C |
| 756 | 1759 | 1854 | | | Cell C |
| 757 | 1759.2 | 1854.2 | | | Cell C |
| 758 | 1759.4 | 1854.4 | | | Cell C |
| 759 | 1759.6 | 1854.6 | | | Cell C |
| 760 | 1759.8 | 1854.8 | | | Cell C |
| 761 | 1760 | 1855 | | | GB |
| 762 | 1760.2 | 1855.2 | | | GB |

| | | | | | |
|---|---|---|---|---|---|
| 763 | 1760.4 | 1855.4 | | | Vodacom |
| 764 | 1760.6 | 1855.6 | | | Vodacom |
| 765 | 1760.8 | 1855.8 | | | Vodacom |
| 766 | 1761 | 1856 | | | Vodacom |
| 767 | 1761.2 | 1856.2 | | | Vodacom |
| 768 | 1761.4 | 1856.4 | | | Vodacom |
| 769 | 1761.6 | 1856.6 | | | Vodacom |
| 770 | 1761.8 | 1856.8 | | | Vodacom |
| 771 | 1762 | 1857 | | | Vodacom |
| 772 | 1762.2 | 1857.2 | | | Vodacom |
| 773 | 1762.4 | 1857.4 | | | Vodacom |
| 774 | 1762.6 | 1857.6 | | | Vodacom |
| 775 | 1762.8 | 1857.8 | | | Vodacom |
| 776 | 1763 | 1858 | | | Vodacom |
| 777 | 1763.2 | 1858.2 | | | Vodacom |
| 778 | 1763.4 | 1858.4 | | | Vodacom |
| 779 | 1763.6 | 1858.6 | | | Vodacom |
| 780 | 1763.8 | 1858.8 | | | Vodacom |
| 781 | 1764 | 1859 | | | Vodacom |
| 782 | 1764.2 | 1859.2 | | | Vodacom |
| 783 | 1764.4 | 1859.4 | | | Vodacom |
| 784 | 1764.6 | 1859.6 | | | Vodacom |
| 785 | 1764.8 | 1859.8 | | | Vodacom |
| 786 | 1765 | 1860 | | | Vodacom |
| 787 | 1765.2 | 1860.2 | | | Vodacom |
| 788 | 1765.4 | 1860.4 | | | Vodacom |
| 789 | 1765.6 | 1860.6 | | | Vodacom |
| 790 | 1765.8 | 1860.8 | | | Vodacom |
| 791 | 1766 | 1861 | | | Vodacom |
| 792 | 1766.2 | 1861.2 | | | Vodacom |
| 793 | 1766.4 | 1861.4 | | | Vodacom |
| 794 | 1766.6 | 1861.6 | | | Vodacom |
| 795 | 1766.8 | 1861.8 | | | Vodacom |
| 796 | 1767 | 1862 | | | Vodacom |
| 797 | 1767.2 | 1862.2 | | | Vodacom |
| 798 | 1767.4 | 1862.4 | | | Vodacom |
| 799 | 1767.6 | 1862.6 | | | Vodacom |
| 800 | 1767.8 | 1862.8 | | | Vodacom |
| 801 | 1768 | 1863 | | | Vodacom |
| 802 | 1768.2 | 1863.2 | | | Vodacom |
| 803 | 1768.4 | 1863.4 | | | Vodacom |
| 804 | 1768.6 | 1863.6 | | | Vodacom |
| 805 | 1768.8 | 1863.8 | | | Vodacom |
| 806 | 1769 | 1864 | | | Vodacom |
| 807 | 1769.2 | 1864.2 | | | Vodacom |
| 808 | 1769.4 | 1864.4 | | | Vodacom |
| 809 | 1769.6 | 1864.6 | | | Vodacom |
| 810 | 1769.8 | 1864.8 | | | Vodacom |
| 811 | 1770 | 1865 | | | Vodacom |
| 812 | 1770.2 | 1865.2 | | | Vodacom |
| 813 | 1770.4 | 1865.4 | | | Vodacom |
| 814 | 1770.6 | 1865.6 | | | Vodacom |
| 815 | 1770.8 | 1865.8 | | | Vodacom |
| 816 | 1771 | 1866 | | | Vodacom |
| 817 | 1771.2 | 1866.2 | | | Vodacom |
| 818 | 1771.4 | 1866.4 | | | Vodacom |
| 819 | 1771.6 | 1866.6 | | | Vodacom |
| 820 | 1771.8 | 1866.8 | | | Vodacom |
| 821 | 1772 | 1867 | | | Vodacom |
| 822 | 1772.2 | 1867.2 | | | Vodacom |
| 823 | 1772.4 | 1867.4 | | | GB |
| 824 | 1772.6 | 1867.6 | | | GB |

| | | | | | |
|---|---|---|---|---|---|
| 825 | 1772.8 | 1867.8 | | | WBS |
| 826 | 1773 | 1868 | | | WBS |
| 827 | 1773.2 | 1868.2 | | | WBS |
| 828 | 1773.4 | 1868.4 | | | WBS |
| 829 | 1773.6 | 1868.6 | | | WBS |
| 830 | 1773.8 | 1868.8 | | | WBS |
| 831 | 1774 | 1869 | | | WBS |
| 832 | 1774.2 | 1869.2 | | | WBS |
| 833 | 1774.4 | 1869.4 | | | WBS |
| 834 | 1774.6 | 1869.6 | | | WBS |
| 835 | 1774.8 | 1869.8 | | | WBS |
| 836 | 1775 | 1870 | | | WBS |
| 837 | 1775.2 | 1870.2 | | | WBS |
| 838 | 1775.4 | 1870.4 | | | WBS |
| 839 | 1775.6 | 1870.6 | | | WBS |
| 840 | 1775.8 | 1870.8 | | | WBS |
| 841 | 1776 | 1871 | | | WBS |
| 842 | 1776.2 | 1871.2 | | | WBS |
| 843 | 1776.4 | 1871.4 | | | WBS |
| 844 | 1776.6 | 1871.6 | | | WBS |
| 845 | 1776.8 | 1871.8 | | | WBS |
| 846 | 1777 | 1872 | | | WBS |
| 847 | 1777.2 | 1872.2 | | | WBS |
| 848 | 1777.4 | 1872.4 | | | WBS |
| 849 | 1777.6 | 1872.6 | | | WBS |
| 850 | 1777.8 | 1872.8 | | | WBS |
| 851 | 1778 | 1873 | | | WBS |
| 852 | 1778.2 | 1873.2 | | | WBS |
| 853 | 1778.4 | 1873.4 | | | WBS |
| 854 | 1778.6 | 1873.6 | | | WBS |
| 855 | 1778.8 | 1873.8 | | | WBS |
| 856 | 1779 | 1874 | | | WBS |
| 857 | 1779.2 | 1874.2 | | | WBS |
| 858 | 1779.4 | 1874.4 | | | WBS |
| 859 | 1779.6 | 1874.6 | | | WBS |
| 860 | 1779.8 | 1874.8 | | | WBS |
| 861 | 1780 | 1875 | | | WBS |
| 862 | 1780.2 | 1875.2 | | | WBS |
| 863 | 1780.4 | 1875.4 | | | WBS |
| 864 | 1780.6 | 1875.6 | | | WBS |
| 865 | 1780.8 | 1875.8 | | | WBS |
| 866 | 1781 | 1876 | | | WBS |
| 867 | 1781.2 | 1876.2 | | | WBS |
| 868 | 1781.4 | 1876.4 | | | WBS |
| 869 | 1781.6 | 1876.6 | | | WBS |
| 870 | 1781.8 | 1876.8 | | | WBS |
| 871 | 1782 | 1877 | | | WBS |
| 872 | 1782.2 | 1877.2 | | | WBS |
| 873 | 1782.4 | 1877.4 | | | WBS |
| 874 | 1782.6 | 1877.6 | | | WBS |
| 875 | 1782.8 | 1877.8 | | | WBS |
| 876 | 1783 | 1878 | | | WBS |
| 877 | 1783.2 | 1878.2 | | | WBS |
| 878 | 1783.4 | 1878.4 | | | WBS |
| 879 | 1783.6 | 1878.6 | | | WBS |
| 880 | 1783.8 | 1878.8 | | | WBS |
| 881 | 1784 | 1879 | | | WBS |
| 882 | 1784.2 | 1879.2 | | | WBS |
| 883 | 1784.4 | 1879.4 | | | WBS |
| 884 | 1784.6 | 1879.6 | | | WBS |
| 885 | 1784.8 | 1879.8 | | | GB |
| | | | | | |

**2 GHz Plan based on ITU F.10-98, Annex 1a)**

Frequency channels are assigned on a radio co-ordinated basis with other users, i.e. channels that are available on a "per link" basis

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Radiocommunication Study Group 9 made editorial amendments to this Recommendation in 2002 in accordance with Resolution ITU-R 44.

Correct channelisation

| f0=2155<br>Separation = 175 MHz<br>Centre gap = 90 MHz<br>Ch spacing = 14 MHz | | | f0=2155<br>Separation = 175 MHz<br>Centre gap = 90 MHz<br>Ch spacing = 7 MHz | | | f0=2155<br>Separation = 175 MHz<br>Centre gap = 90 MHz<br>Ch spacing = 3.5 MHz | | | f0=2155<br>Separation = 175 MHz<br>Centre gap = 90 MHz<br>Ch spacing = 1.75 MHz | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ch | Go | Return | Ch | Go | Return | Ch | Go | Return | Ch | Go | Return |
| 1 | 2032.5 | 2207.5 | 1 | 2029 | 2204 | 1 | 2027.25 | 2202.25 | 1 | 2026.375 | 2201.375 |
| 2 | 2046.5 | 2221.5 | 2 | 2036 | 2211 | 2 | 2030.75 | 2205.75 | 2 | 2028.125 | 2203.125 |
| 3 | 2060.5 | 2235.5 | 3 | 2043 | 2218 | 3 | 2034.25 | 2209.25 | 3 | 2029.875 | 2204.875 |
| 4 | 2074.5 | 2249.5 | 4 | 2050 | 2225 | 4 | 2037.75 | 2212.75 | 4 | 2031.625 | 2206.625 |
| 5 | 2088.5 | 2263.5 | 5 | 2057 | 2232 | 5 | 2041.25 | 2216.25 | 5 | 2033.375 | 2208.375 |
| 6 | 2102.5 | 2277.5 | 6 | 2064 | 2239 | 6 | 2044.75 | 2219.75 | 6 | 2035.125 | 2210.125 |
| | | | 7 | 2071 | 2246 | 7 | 2048.25 | 2223.25 | 7 | 2036.875 | 2211.875 |
| | | | 8 | 2078 | 2253 | 8 | 2051.75 | 2226.75 | 8 | 2038.625 | 2213.625 |
| | | | 9 | 2085 | 2260 | 9 | 2055.25 | 2230.25 | 9 | 2040.375 | 2215.375 |
| | | | 10 | 2092 | 2267 | 10 | 2058.75 | 2233.75 | 10 | 2042.125 | 2217.125 |
| | | | 11 | 2099 | 2274 | 11 | 2062.25 | 2237.25 | 11 | 2043.875 | 2218.875 |
| | | | 12 | 2106 | 2281 | 12 | 2065.75 | 2240.75 | 12 | 2045.625 | 2220.625 |
| | | | | | | 13 | 2069.25 | 2244.25 | 13 | 2047.375 | 2222.375 |
| | | | | | | 14 | 2072.75 | 2247.75 | 14 | 2049.125 | 2224.125 |
| Users: | | | | | | 15 | 2076.25 | 2251.25 | 15 | 2050.875 | 2225.875 |
| | Mbombela Local Municipality | | | | | 16 | 2079.75 | 2254.75 | 16 | 2052.625 | 2227.625 |
| | Richards Bay Titanium | | | | | 17 | 2083.25 | 2258.25 | 17 | 2054.375 | 2229.375 |
| | SANDF | ? | | | | 18 | 2086.75 | 2261.75 | 18 | 2056.125 | 2231.125 |
| | SAPS | ? | | | | 19 | 2090.25 | 2265.25 | 19 | 2057.875 | 2232.875 |
| | Sky Connect | | ? | | | 20 | 2093.75 | 2268.75 | 20 | 2059.625 | 2234.625 |
| | Telkom | | | | | 21 | 2097.25 | 2272.25 | 21 | 2061.375 | 2236.375 |
| | Transnet | | | | | 22 | 2100.75 | 2275.75 | 22 | 2063.125 | 2238.125 |
| | Kaltrade | ch 6 temporary | | ch1 Gauteng | | 23 | 2104.25 | 2279.25 | 23 | 2064.875 | 2239.875 |
| | SANSA | | | | | 24 | 2107.75 | 2282.75 | 24 | 2066.625 | 2241.625 |
| | | | | | | | | | 25 | 2068.375 | 2243.375 |
| | | | | | | | | | 26 | 2070.125 | 2245.125 |
| | | | | | | | | | 27 | 2071.875 | 2246.875 |
| | | | | | | | | | 28 | 2073.625 | 2248.625 |
| | | | | | | | | | 29 | 2075.375 | 2250.375 |
| | | | | | | | | | 30 | 2077.125 | 2252.125 |
| | | | | | | | | | 31 | 2078.875 | 2253.875 |
| | | | | | | | | | 32 | 2080.625 | 2255.625 |
| | | | | | | | | | 33 | 2082.375 | 2257.375 |
| | | | | | | | | | 34 | 2084.125 | 2259.125 |
| | | | | | | | | | 35 | 2085.875 | 2260.875 |
| | | | | | | | | | 36 | 2087.625 | 2262.625 |
| | | | | | | | | | 37 | 2089.375 | 2264.375 |
| | | | | | | | | | 38 | 2091.125 | 2266.125 |
| | | | | | | | | | 39 | 2092.875 | 2267.875 |
| | | | | | | | | | 40 | 2094.625 | 2269.625 |
| | | | | | | | | | 41 | 2096.375 | 2271.375 |
| | | | | | | | | | 42 | 2098.125 | 2273.125 |
| | | | | | | | | | 43 | 2099.875 | 2274.875 |
| | | | | | | | | | 44 | 2101.625 | 2276.625 |
| | | | | | | | | | 45 | 2103.375 | 2278.375 |
| | | | | | | | | | 46 | 2105.125 | 2280.125 |
| | | | | | | | | | 47 | 2106.875 | 2281.875 |
| | | | | | | | | | 48 | 2108.625 | 2283.625 |

### 1.14.2 Licensing information for the applicable frequency allocation

See above for license information on specific bands.

### 1.15 Applicable Frequency Allocation and Band information 2500 MHz to 2655 MHz

MOBILE except aeronautical mobile

**Frequency Band under investigation 2500 to 2655 MHz**

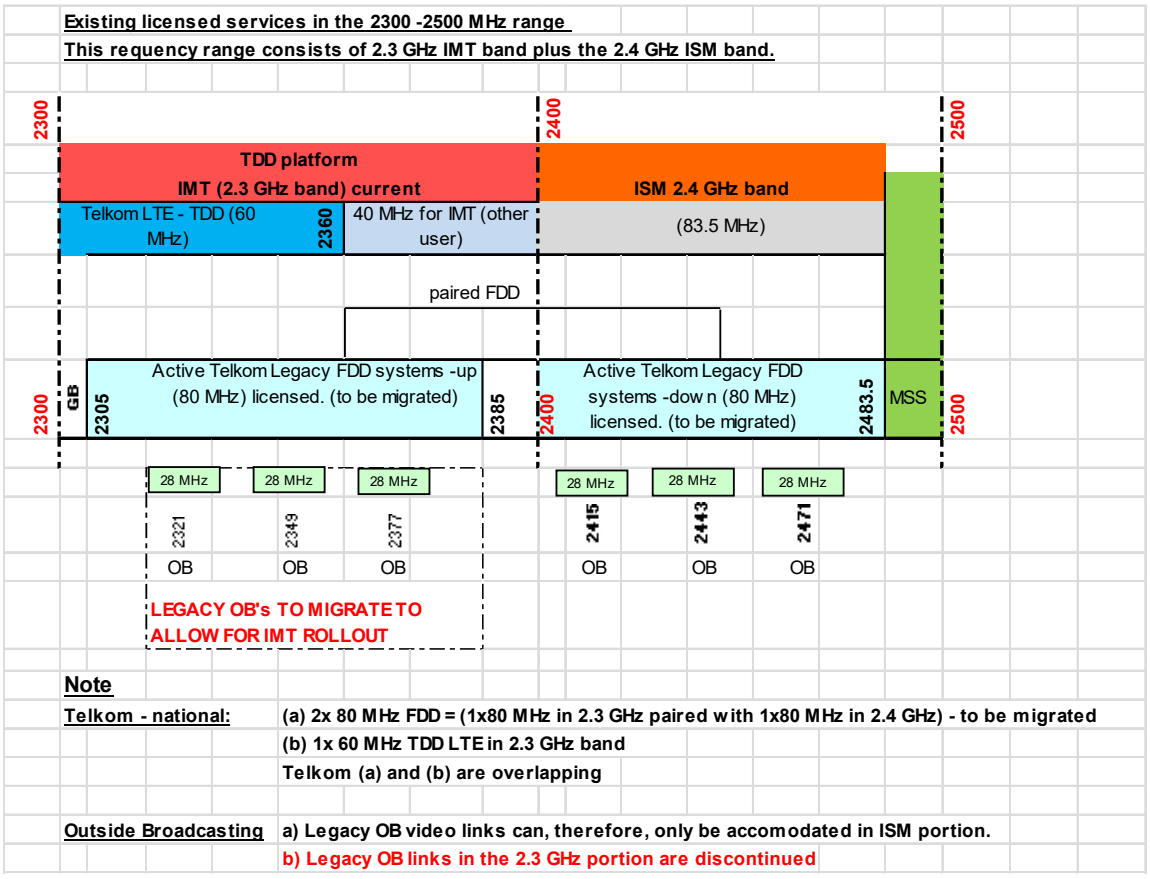
IMT 2600 MTX 2500 to 2570 MHz paired with BTX 2620 to 2690 MHz

IMT 2600 TDD: 2570 to 2620 MHz

IMT 2600 BTX 2620 to 2690 MHz paired with MTX 2500 to 2570 MHz

IMT 2500 to 2690 MHz

#### 1.15.1 Channel Plan for the Frequency Allocation



### 1.16 Applicable Frequency Allocation and Band information 2655 MHz to 2690 MHz

MOBILE except aeronautical mobile

Radio astronomy

**Frequency Band under investigation 2655 to 2690 MHz**

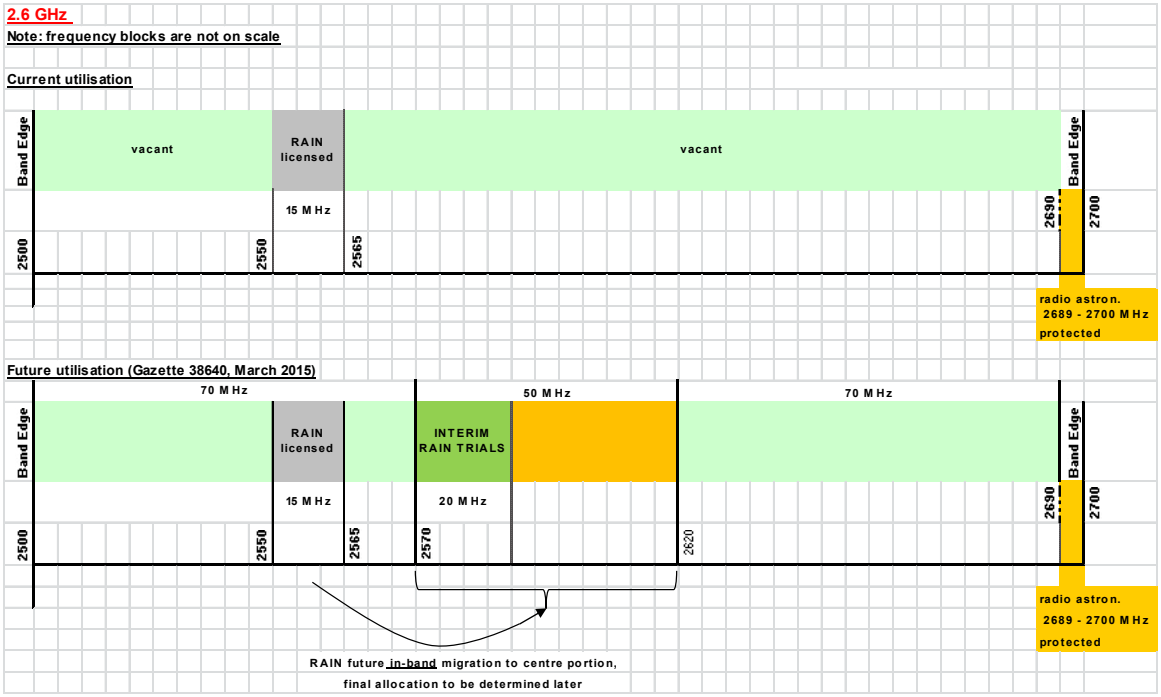
IMT 2600 BTX 2620 to 2690 MHz paired with MTX 2500 to 2570 MHz

IMT 2500 to 2690 MHz

IMT 2600 MTX 2500 to 2570 MHz paired with MTX 2620 to 2690 MHz

Telecommunication Roadmap GG No 38213 14 November 2014.

#### 1.16.1 Channel Plan for the Frequency Allocation




#### 1.16.2 Licensing information for the applicable frequency allocation

See above for more information.

### 1.17 Applicable Frequency Allocation and Band information 3300 MHz to 3600 MHz

Frequency Band under Investigation 3300 to 3400 MHz

RADIOLOCATION

Government Services

IMT Res. 223 (Rev WRC-15)

Subject to the outcome of the sharing and compatibility studies called for by Resolution 223 (WRC 15) currently underway within ITU-R, there might be a need to migrate Radars out of this band. This will be addressed through the update of the migration plan.

**Frequency Band under investigation 3400 to 3600 MHz**

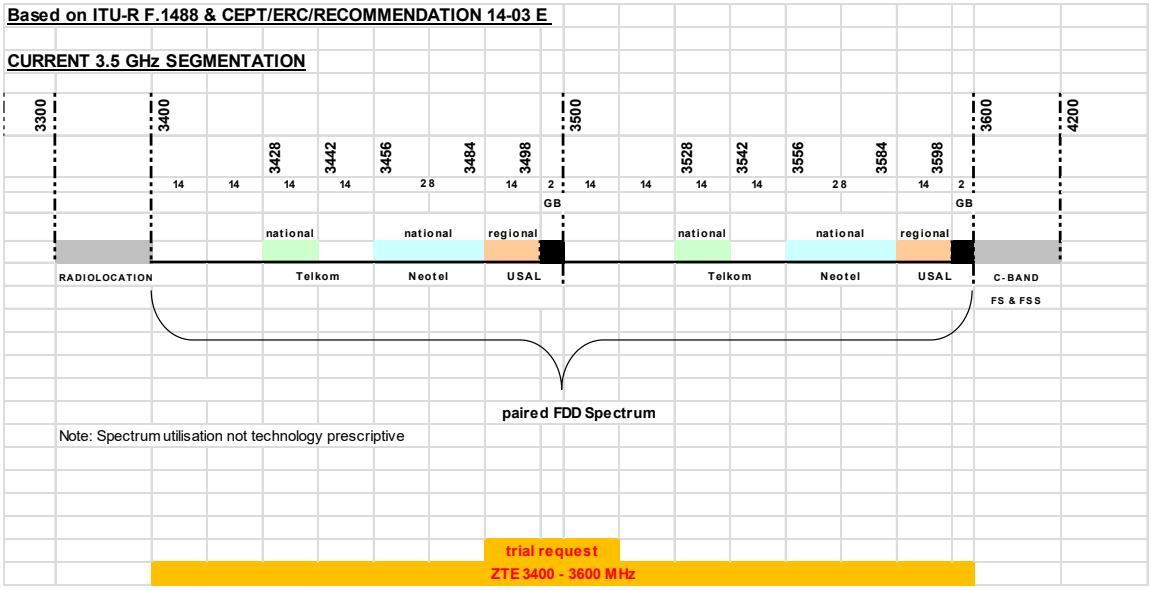
FIXED

MOBILE

IMT3500 TDD: 3400 to 3600 MHz

International Mobile Telecommunications Roadmap (Government Gazette Number38213) 14 November 2014. Radio Frequency Assignment Plan (GG No 38640) as amender 30 March 2015. Recommendation ITU-R M. 1036. The band 3400 to 3600 MHz is also used for BFWA in some SADC countries.

### 1.17.1 Channel Plan for the Frequency Allocation




### 1.17.2 Licensing information for the applicable frequency allocation

See above for more information.

# Appendix H

**Articles 31 and 52 of the ITU Radio Regulations and Rec. ITU-R SM.1603**

**ARTICLE 31 of the ITU Radio Regulations**

**Frequencies for the global maritime distress and safety system (GMDSS)**

**Section I – General**

**31.1** § 1 The frequencies to be used for the transmission of distress and safety information under the GMDSS are contained in Appendix **15**. In addition to the frequencies listed in Appendix **15**, ship stations and coast stations should use other appropriate frequencies for the transmission of safety messages and general radiocommunications to and from shore-based radio systems or networks. (WRC-07)

**31.2** § 2 Any emission causing harmful interference to distress and safety communications on any of the discrete frequencies identified in Appendix **15** is prohibited. (WRC-07)

**31.3** § 3 The number and duration of test transmissions shall be kept to a minimum on the frequencies identified in Appendix **15**; they should be coordinated with a competent authority, as necessary, and, wherever practicable, be carried out on artificial antennas or with reduced power. However, testing on the distress and safety calling frequencies should be avoided, but where this is unavoidable, it should be indicated that these are test transmissions. **31.4** § 4 Before transmitting for other than distress purposes on any of the frequencies identified in Appendix **15** for distress and safety, a station shall, where practicable, listen on the frequency concerned to make sure that no distress transmission is being sent. **31.5** Not used.

**Section II – Survival craft stations**

**31.6** § 5 1) Equipment for radiotelephony use in survival craft stations shall, if capable of operating on any frequency in the bands between 156 MHz and 174 MHz, be able to transmit and receive on 156.8 MHz and at least one other frequency in these bands.

**31.7** 2) Equipment for transmitting locating signals from survival craft stations shall be capable of operating in the 9 200-9 500 MHz band.

**31.8** 3) Equipment with digital selective calling facilities for use in survival craft shall, if capable of operating:

**31.9** *a)* in the bands between 1 606.5 kHz and 2 850 kHz, be able to transmit on 2 187.5 kHz; (WRC-03)

**31.10** *b)* in the bands between 4 000 kHz and 27 500 kHz, be able to transmit on 8 414.5 kHz;

**31.11** *c)* in the bands between 156 MHz and 174 MHz, be able to transmit on 156.525 MHz.

**RR31-2** CHAPTER VII ☐ Distress and safety communications.

**Section III – Watch keeping**

**31.12** *A – Coast stations*

**31.13** § 6 Those coast stations assuming a watch-keeping responsibility in the GMDSS shall maintain an automatic digital selective calling watch on frequencies and for periods of time as indicated in the information published in the List of Coast Stations and Special Service Stations (List IV). (WRC-07)

**31.14** *B – Coast earth stations*

**31.15** § 7 Those coast earth stations assuming a watch-keeping responsibility in the GMDSS shall maintain a continuous automatic watch for appropriate distress alerts relayed by space stations.

**31.16** *C – Ship stations*

**31.17** § 8 1) Ship stations, where so equipped, shall, while at sea, maintain an automatic digital selective calling watch on the appropriate distress and safety calling frequencies in the frequency bands in which they are operating. Ship stations, where so equipped, shall also maintain watch on the appropriate frequencies for the automatic reception of transmissions of meteorological and navigational warnings and other urgent information to ships. (WRC-07)

**31.18** 2) Ship stations complying with the provisions of this Chapter should, where practicable, maintain a watch on the frequency 156.8 MHz (VHF channel 16). (WRC-07)

**31.19** *D – Ship earth stations*

**31.20** § 9 Ship earth stations complying with the provisions of this Chapter shall, while at sea, maintain watch except when communicating on a working channel.

**ARTICLE 52 of the ITU Radio Regulations**

**Special rules relating to the use of frequencies.**

**Section I – General provisions**

**52.1** *A – Single-sideband radiotelegraph transmissions*

**52.2** § 1 1) Where these provisions specify A1A emission, class A1B or J2A emissions shall be considered equivalent.

**52.3** 2) Where these provisions specify class F1B emission, class J2B and J2D emissions shall be considered equivalent. However, class J2D emission shall not be used with the HF distress and safety frequencies listed in Appendix **15**.

**52.4** *B – Bands between 415 kHz and 535 kHz*

**52.5** (SUP - WRC-07)

**52.6** § 3 1) In the maritime mobile service, no assignments shall be made on the frequency 518 kHz other than for transmission by coast stations of meteorological and navigational warnings and urgent information to ships by means of automatic narrow-band direct-printing telegraphy (International NAVTEX System).

**52.7** 2) In the maritime mobile service, the frequency 490 kHz is used exclusively for the transmission by coast stations of meteorological and navigational warnings and urgent information to ships by means of narrow-band direct-printing telegraphy. (WRC-03)

**52.8** *C – Bands between 1 606.5 kHz and 4 000 kHz* (WRC-03)

**52.9** § 4 1) In Region 1, frequencies assigned to stations operating in the bands between

1 850 kHz and 3 800 kHz (see Article **5**) should, whenever possible, be in accordance with the following subdivision:

– 1 850-1 950 kHz: Coast stations, single-sideband radiotelephony.

– 1 950-2 045 kHz: Ship stations, single-sideband radiotelephony.

– 2 194-2 262.5 kHz: Ship stations, single-sideband radiotelephony.

– 2 262.5-2 498 kHz: Intership, single-sideband radiotelephony.

– 2 502-2 578 kHz: Ship stations, narrow-band direct-printing telegraphy.

**RR52-2** CHAPTER IX □ Maritime services.

– 2578-2 850 kHz: Coast stations, narrow-band direct-printing telegraphy and single-sideband radiotelephony.

– 3 155-3 200 kHz: Ship stations, narrow-band direct-printing telegraphy.

– 3 200-3 340 kHz: Ship stations, single-sideband radiotelephony.

– 3 340-3 400 kHz: Intership, single-sideband radiotelephony.

– 3 500-3 600 kHz: Intership, single-sideband radiotelephony.

– 3 600-3 800 kHz: Coast stations, single-sideband radiotelephony.

**52.10** 2) In Region 1, frequencies assigned to stations operating in the bands listed below shall be in accordance with the following subdivision:

– 1606.5-1 625 kHz: Coast stations, narrow-band direct-printing telegraphy, digital selective calling.

– 1 635-1 800 kHz: Coast stations, single-sideband radiotelephony.

– 2 045-2 141.5 kHz: Ship stations, single-sideband radiotelephony.

– 2141.5-2 160 kHz: Ship stations, narrow-band direct-printing telegraphy, digital selective calling.

**52.11** § 5 In Regions 2 and 3, the carrier frequencies 2 635 kHz (assigned frequency 2 636.4 kHz) and 2 638 kHz (assigned frequency 2 639.4 kHz) are used as single sideband intership radiotelephony working frequencies in addition to the frequencies prescribed for common use in certain services. The carrier frequencies 2 635 kHz and 2 638 kHz should be used with class J3E emissions only. In Region 3 these frequencies are protected by a guard band between 2 634 kHz and 2 642 kHz.

**52.12** *D – Bands between 4 000 kHz and 27 500 kHz*

**52.13** § 6 Bands exclusively allocated to the maritime mobile service between 4 000 kHz and 27 500 kHz (see Article **5**) are subdivided into categories and sub-bands as indicated in Appendix **17**.

**52.14** *E – Bands between 156 MHz and 174 MHz*

**52.15** § 7 The ship movement service should be operated only on frequencies allocated to

the maritime mobile service in the band 156-174 MHz.

**Section II –** (Number not used)

**52.16** to **52.93** (SUP - WRC-07)

CHAPTER IX ☐ Maritime services **RR52-3**

**Section III – Use of frequencies for narrow-band direct-printing telegraphy**

**52.94** *A – General*

**52.95** § 44 Frequencies assigned to coast stations for narrow-band direct-printing telegraphy shall be indicated in the List of Coast Stations and Special Service Stations (List IV). This List shall also indicate any other useful information concerning the service performed by each coast station. (WRC-07)

**52.96** *B – Bands between 415 kHz and 535 kHz*

**52.97** § 45 All ship stations equipped with narrow-band direct-printing apparatus to work in the authorized bands between 415 kHz and 535 kHz shall be able to send and receive class F1B emissions as specified in No. **51.44**. Additionally, ship stations complying with the provisions of Chapter **VII** shall be able to receive class F1B emissions on 518 kHz (see No. **51.45**).

**52.98** (SUP - WRC-03)

**52.99** *C – Bands between 1 606.5 kHz and 4 000 kHz* (WRC-03)

**52.100** § 46 1) All ship stations equipped with narrow-band direct-printing telegraph apparatus to work in the authorized bands between 1 606.5 kHz and 4 000 kHz shall be able to send and receive class F1B or J2B emissions on at least two working frequencies. (WRC-03)

**52.101** 2) Narrow-band direct-printing telegraphy is forbidden in the band 2 170-2 194 kHz, except as provided for in Appendix **15** and Resolution **354 (WRC-07)**. (WRC-07)

**52.102** *D – Bands between 4 000 kHz and 27 500 kHz*

**52.103** § 47 All ship stations equipped with narrow-band direct-printing telegraph apparatus to work in the authorized bands between 4 000 kHz and 27 500 kHz shall be able to send and receive class F1B emissions as specified in No. **51.49**. The assignable frequencies are indicated in Appendix **17**.

**52.104** § 48 Coast stations employing class F1B emissions and operating in the bands exclusively allocated to the maritime mobile service between 4 000 kHz and 27 500 kHz shall at no time use mean powers in excess of the following:

*Band Maximum*

*mean power*

4 MHz 5 kW

6 MHz 5 kW

8 MHz 10 kW

12 MHz 15 kW

16 MHz 15 kW

18/19 MHz 15 kW

22 MHz 15 kW

25/26 MHz 15 kW

**RR52-4** CHAPTER IX Maritime services.

**52.105** 1) In all bands, the working frequencies for ship stations using narrow-band direct-printing telegraphy at speeds not exceeding 100 Bd for FSK and 200 Bed for PSK, including those paired with the working frequencies assignable to coast stations (see Appendix **17**), are spaced

0.5 kHz apart. The frequencies assignable to ship stations which are paired with those used by coast stations are shown in Appendix **17**. The frequencies assignable to ship stations which are not paired with those used by coast stations are shown in Appendix **17**.

**52.106** (SUP - WRC-03)

**52.107** 2) Each administration shall, if necessary, assign to each ship station under its jurisdiction and employing non-paired narrow-band direct-printing telegraphy one or more frequencies reserved for this purpose and shown in Appendix **17**.

**52.108** *E – Bands between 156 MHz and 174 MHz*

**52.109** § 49 All ship stations equipped with direct-printing telegraph apparatus may work in the authorized bands between 156 MHz and 174 MHz and shall conform to the provisions of Appendix **18**.

**Section IV – Use of frequencies for digital selective-calling.**

**52.110** *A – General*

**52.111** § 50 The provisions described in this Section are applicable to calling and acknowledgement, when digital selective-calling techniques are used, except in cases of distress, urgency, and safety, to which the provisions of Chapter **VII** apply.

**52.112** § 51 The characteristics of the digital selective-calling equipment shall be in accordance with Recommendation ITU-R M.541-10 and should be in accordance with the most recent version of Recommendation ITU-R M.493. (WRC-15)

**52.113** § 52 The frequencies on which coast stations provide services using digital selective calling techniques shall be indicated in the List of Coast Stations and Special Service Stations (List IV), which shall also supply any other useful information concerning such services. (WRC-07)

**52.114** *B – Bands between 415 kHz and 526.5 kHz*

B1 – Mode of operation

**52.115** § 53 1) The class of emission to be used for digital selective-calling and acknowledgement in the authorized bands between 415 kHz and 526.5 kHz shall be F1B.

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**52.116** 2) When transmitting digital selective calls and acknowledgements in the bands between 415 kHz and 526.5 kHz, coast stations should use the minimum power necessary to cover their service area.

**52.117** § 54 Transmissions of digital selective calls and acknowledgements by ship stations shall be limited to a mean power of 400 W.

B2 – Call and acknowledgement

**52.118** § 55 For call and acknowledgement by digital selective-calling techniques, an appropriate channel shall be used.

**52.119** § 56 The international digital selective-calling frequency 455.5 kHz may be assigned to any coast station. In order to reduce interference on this frequency, it may be used as a general rule by coast stations to call ships of another nationality, or in cases where it is not known on which digital selective-calling frequencies within these bands the ship station is maintaining watch.

**52.120** § 57 The international digital selective-calling frequency 458.5 kHz may be used by any ship station. In order to reduce interference on this frequency, it shall only be used when calling cannot be made on national frequencies assigned to the coast station.

**52.121** § 58 The frequency to be used for transmission of an acknowledgement shall normally be the frequency paired with the calling frequency used.

B3 – Watch

**52.122** § 59 1) A coast station providing international public correspondence service using digital selective-calling techniques within the bands between 415 kHz and 526.5 kHz should, during its hours of service, maintain automatic digital selective-calling watch on appropriate national or international calling frequencies. The hours and frequencies shall be indicated in the List of Coast Stations and Special Service Stations (List IV). (WRC-07)

**52.123** 2) Ship stations equipped with apparatus for digital selective-calling to work in the authorized bands between 415 kHz and 526.5 kHz should, when within the coverage area of coast stations providing services using digital selective-calling techniques in these bands, maintain an automatic digital selective-calling watch on one or more appropriate digital selective-calling frequencies within these bands, taking into account the digital selective-calling frequencies operated by the coast stations.

**52.124** *C – Bands between 1 606.5 kHz and 4 000 kHz* (WRC-03)

C1 – Mode of operation

**52.125** § 60 1) The class of emission to be used for digital selective-calling and acknowledgement in the bands between 1 606.5 kHz and 4 000 kHz shall be F1B. (WRC-03)

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**52.126** 2) Coast stations should, when transmitting digital selective calls and acknowledgements in the bands between 1 606.5 kHz and 4 000 kHz, use the minimum power necessary to cover their service area. (WRC-03)

**52.127** 3) In Region 1, transmissions of digital selective calls and acknowledgements by ship stations shall be limited to a mean power of 400 W.

C2 – Call and acknowledgement

**52.128** § 61 1) When calling a coast station by digital selective-calling techniques, ship stations should use for the call, in order of preference:

**52.129** *a)* a national digital selective-calling channel on which the coast station is maintaining watch;

**52.130** *b)* subject to the provisions of No. **52.131**, the international digital selective-calling frequency 2 189.5 kHz.

**52.131** 2) The international digital selective-calling frequency 2 189.5 kHz may be assigned to any ship station. In order to reduce interference on this frequency, it may be used as a general rule by ship stations to call coast stations of another nationality.

**52.132** 3) A ship station calling another ship station by digital selective-calling techniques should use the frequency 2 177 kHz for the call. Acknowledgements of such calls should also be made on this frequency.

**52.133** § 62 1) When calling ship stations by digital selective-calling techniques, coast.

stations should use for the call, in the order of preference:

**52.134** *a)* a national digital selective-calling channel on which the coast station is.

maintaining watch;

**52.135** *b)* subject to the provisions of No. **52.136**, the international digital selective-calling.

frequency 2 177 kHz.

**52.136** 2) The international digital selective-calling frequency 2 177 kHz may be assigned to any coast station. In order to reduce interference on this frequency, it may be used as a general rule by coast stations to call ships of another nationality, or in cases where it is not known on which digital selective-calling frequencies within the bands between 1 606.5 kHz and 4 000 kHz the ship station is maintaining watch. (WRC-03)

**52.137** § 63 The frequency to be used for transmission of an acknowledgement shall normally be the frequency paired with the frequency used for the call received, as indicated in the List of Coast Stations and Special Service Stations (List IV) (see also No. **52.113**). (WRC-07)

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C3 – Watch

**52.138** § 64 1) The provisions detailed in this Sub-section are applicable to watch-keeping by digital selective-calling, except for distress, urgency, and safety purposes, to which the provisions of Section III of Article **31** apply.

**52.139** 2) A coast station providing international public correspondence service using.

digital selective-calling techniques within the bands between 1 606.5 kHz and 4 000 kHz should, during its hours of service, maintain automatic digital selective-calling watch on appropriate national or international calling frequencies. The hours and frequencies shall be indicated in the List of Coast Stations and Special Service Stations (List IV). (WRC-07)

**52.140** 3) Ship stations equipped with apparatus for digital selective-calling to work in the authorized bands between 1 606.5 kHz and 4 000 kHz should, when within the coverage area of coast stations providing services using digital selective-calling techniques in these bands, maintain an automatic digital selective-calling watch on one or more appropriate digital selective-calling frequencies within these bands, taking into account the digital selective-calling frequencies operated by the coast stations. (WRC-03)

**52.141** *D – Bands between 4 000 kHz and 27 500 kHz*

D1 – Mode of operation

**52.142** § 65 1) The class of emission to be used for digital selective-calling and acknowledgement in the authorized bands between 4 000 kHz and 27 500 kHz shall be F1B.

**52.143** 2) When transmitting digital selective calls and acknowledgements in the bands between 4 000 kHz and 27 500 kHz, coast stations shall at no time use a mean power in excess of the following values:

*Band Maximum*

*mean power*

4 MHz 5 kW

6 MHz 5 kW

8 MHz 10 kW

12 MHz 15 kW

16 MHz 15 kW

18/19 MHz 15 kW

22 MHz 15 kW

25/26 MHz 15 kW

**52.144** 3) Transmissions of digital selective calls and acknowledgements by ship stations in the bands between 4 000 kHz and 27 500 kHz shall be limited to a mean power of 1.5 kW.

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D2 – Call and acknowledgement

**52.145** § 66 A station calling another station by digital selective-calling techniques within the authorized bands between 4 000 kHz and 27 500 kHz should choose an appropriate digital selective calling frequency, taking into account propagation characteristics.

**52.146** § 67 1) When calling a coast station by digital selective-calling techniques on

frequencies within the authorized bands between 4 000 kHz and 27 500 kHz, ship stations should use for the call, in order of preference:

**52.147** *a)* a national digital selective-calling channel on which the coast station is maintaining watch;

**52.148** *b)* subject to the provisions of No. **52.149**, one of the international digital selective calling frequencies. (WRC-07)

**52.149** 2) The international digital selective-calling frequencies shall be as indicated in Recommendation ITU-R M.541-10 and may be used by any ship station. In order to reduce interference on these frequencies, they shall only be used when calling cannot be made on nationally assigned frequencies. (WRC-15)

**52.150** § 68 1) When calling ship stations by digital selective-calling techniques on frequencies within the bands between 4 000 kHz and 27 500 kHz coast stations should use for the call, in order of preference:

**52.151** *a)* a national digital selective-calling channel on which the coast station is maintaining watch;

**52.152** *b)* subject to the provisions of No. **52.153**, one of the international digital selective calling frequencies. (WRC-07)

**52.153** 2) The international digital selective-calling frequencies shall be as indicated in Recommendation ITU-R M.541-10 and may be assigned to any coast station. In order to reduce interference on these frequencies, they may be used as a general rule by coast stations to call ships of another nationality, or in cases where it is not known on which digital selective-calling frequencies within the frequency bands concerned the ship station is maintaining watch. (WRC-15)

D3 – Watch

**52.154** § 69 1) The provisions detailed in this Sub-section are applicable to watch-keeping by digital selective-calling, except for distress, urgency, and safety purposes, to which the provisions of Section III of Article **31** apply.

**52.155** 2) A coast station providing international public correspondence service using digital selective-calling techniques within the bands between 4 000 kHz and 27 500 kHz should, during its hours of service, maintain automatic digital selective-calling watch on the appropriate digital selective-calling frequencies as indicated in the List of Coast Stations and Special Service Stations (List IV). (WRC-07)

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**52.156** 3) Ship stations equipped with apparatus for digital selective-calling to work in the authorized bands between 4 000 kHz and 27 500 kHz should maintain automatic digital selective calling watch on appropriate digital selective-calling frequencies within these bands, taking into account propagation characteristics and the calling frequencies for coast stations providing service using digital selective-calling techniques.

**52.157** *E – Bands between 156 MHz and 174 MHz*

E1 – Mode of operation

**52.158** § 70 The class of emission to be used for digital selective-calling and acknowledgement in the authorized bands between 156 MHz and 174 MHz shall be G2B.

E2 – Call and acknowledgement

**52.159** § 71 1) The frequency 156.525 MHz is an international frequency in the maritime

mobile service used for distress, urgency, safety and calling by digital selective-calling techniques (see Nos. **33.8** and **33.31** and Appendix **15**). (WRC-07)

**52.160** 2) Calling by digital selective-calling techniques within the authorized bands between 156 MHz and 174 MHz, from ship to coast station, from coast station to ship and from ship to ship should, as a general rule, be made on the digital selective-calling frequency 156.525 MHz. E3 – Watch

**52.161** § 72 Information concerning watch-keeping by automatic digital selective-calling on the frequency 156.525 MHz by coast stations shall be given in the List of Coast Stations and Special Service Stations (List IV) (see also No. **31.13**). (WRC-07)

**52.162** § 73 Ship stations equipped with apparatus for digital selective-calling to work in the authorized bands between 156 MHz and 174 MHz should, while at sea, maintain an automatic digital selective-calling watch on the frequency 156.525 MHz (see also No. **31.17**).

**Section V – Use of frequencies for wide-band telegraphy, facsimile, special transmission systems and oceanographic data transmissions**

**52.163** *A– Wide-band telegraphy, facsimile, and special transmission systems*

**52.164** A1 – Bands between 1 606.5 kHz and 4 000 kHz (WRC-03)

**52.165** § 74 In Region 2, the frequencies in the band 2 068.5-2 078.5 kHz are assigned to ship stations using wide-band telegraphy, facsimile, and special transmission systems. The provisions of No. **52.171** apply.

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**52.166** A2 – Bands between 4 000 kHz and 27 500 kHz

**52.167** § 75 In all bands, the working frequencies for ship stations equipped to use wide-band telegraphy, facsimile and special transmission systems are spaced 4 kHz apart. The assignable frequencies are shown in Appendix **17**.

**52.168** § 76 1) Each administration shall assign to each ship station under its jurisdiction and employing wide-band telegraphy, facsimile, and special transmission systems one or more series of the working frequencies reserved for this purpose shown in Appendix **17**. The total number of series assigned to each ship station shall be determined by traffic requirements.

**52.169** 2) When ship stations employing wide-band telegraphy, facsimile and special transmission systems are assigned less than the total number of working frequencies in a band, the administration concerned shall assign working frequencies to such ships in accordance with an orderly system of rotation that will ensure approximately the same number of assignments on any one working frequency.

**52.170** 3) However, within the limits of the bands given in Appendix **17**, administrations may, to meet the needs of specific systems, assign frequencies in a different manner from that shown in Appendix **17**. Nevertheless, administrations shall take into account, as far as possible, the provisions of Appendix **17**, concerning channelling and the 4 kHz spacing.

**52.171** § 77 Ship stations equipped for wide-band telegraphy, facsimile and special transmission systems may, in the frequency bands reserved for such use, employ any class of emission provided that such emissions can be contained within the wide-band channels indicated in Appendix **17**. However, the use of A1A Morse telegraphy and telephony is excluded except for circuit alignment purposes.

**52.172** § 78 Coast radiotelegraph stations employing multichannel telegraph emissions and operating in the bands allocated exclusively to the maritime mobile service between 4 000 kHz and 27 500 kHz shall at no time use a mean power in excess of 2.5 kW per 500 Hz bandwidth.

**52.173** *B – Oceanographic data transmission systems*

**52.174** § 79 In all bands, the assignable frequencies for oceanographic data transmissions are spaced 0.3 kHz apart. The assignable frequencies are shown in Appendix **17**.

**52.175** § 80 The frequency bands for oceanographic data transmission systems (see Appendix **17**) may also be used by buoy stations for oceanographic data transmission and by stations interrogating these buoys.

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**Section VI – Use of frequencies for radiotelephony**

**52.176** *A – General*

**52.177** § 81 Except with regard to the provisions of Article **11** concerning notification and

recording of frequencies, when designating frequencies for single-sideband radiotelephony the carrier frequency is always to be designated. The assigned frequency shall be 1 400 Hz higher than the carrier frequency.

**52.178** § 82 Coast stations shall not occupy idle radiotelephone channels by emitting identification signals, such as those generated by call slips or tapes. Exceptionally, a coast station, when requested by a ship station for the purpose of establishing a radiotelephone call, may emit a receiver tuning signal of not more than 10 s duration.

**52.179** § 83 However, coast stations in automatic service in the UHF band may emit marking signals. The emission power of the signals shall however be limited to the minimum value

necessary for effective operation of the signalling. Such emissions shall not cause harmful interference to the maritime mobile service in other countries.

**52.180** § 84 The frequencies of transmission (and reception when these frequencies are in pairs as in the case of duplex radiotelephony) assigned to each coast station shall be indicated in the List of Coast Stations and Special Service Stations (List IV). This List shall also indicate any other useful information concerning the service performed by each coast station. (WRC-07)

**52.181** § 85 Single-sideband apparatus in radiotelephone stations of the maritime mobile service operating in the frequency bands allocated to this service between 1 606.5 kHz and 4 000 kHz and in the frequency, bands allocated exclusively to this service between 4 000 kHz and 27 500 kHz shall satisfy the technical and operational conditions specified in Recommendation ITU-R M.1173-1. (WRC-15)

**52.182** *B – Bands between 1 606.5 kHz and 4 000 kHz* (WRC-03)

B1 – Mode of operation of stations

**52.183** § 86 1) Unless otherwise specified in the Radio Regulations (see Nos. **51.53**, **52.188**, **52.189** and **52.199**), the class of emission to be used in the bands between 1 606.5 kHz and 4 000 kHz shall be J3E. (WRC-07)

**52.184** 2) The peak envelope power of coast radiotelephone stations operating in the authorized bands allocated between 1 606.5 kHz and 4 000 kHz shall not exceed: (WRC-03)

**52.185** – 5 kW for coast stations located north of latitude 32° N;

**52.186** – 10 kW for coast stations located south of latitude 32° N.

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**52.187** 3) The normal mode of operation for each coast station shall be indicated in the List of Coast Stations and Special Service Stations (List IV). (WRC-07)

**52.188** 4) Transmissions in the bands 2 170-2 173.5 kHz and 2 190.5-2 194 kHz with the carrier frequency 2 170.5 kHz and the carrier frequency 2 191 kHz, respectively, are limited to class J3E emissions and are limited to a peak envelope power of 400 W. (WRC-07) B2 – Call and reply.

**52.189** § 87 1) The frequency 2 182 kHz1 is an international distress frequency for radiotelephony (see Appendix **15** and Resolution **354 (WRC-07)**). (WRC-07)

**52.190** 2) The frequency 2 182 kHz may also be used:

**52.191** *a)* for call and reply in accordance with the provisions of Article **57**;

**52.192** *b)* by coast stations to announce the transmission, on another frequency, of traffic lists as specified in Recommendation ITU-R M.1171-0. (WRC-15)

**52.193** 3) In addition, an administration may assign to its station's other frequencies for call and reply.

**52.194** § 88 To facilitate use of the frequency 2 182 kHz for distress purposes, all transmissions on 2 182 kHz shall be kept to a minimum.

**52.195** § 89 1) Before transmitting on the carrier frequency 2 182 kHz, a station shall, in accordance with Recommendation ITU-R M.1171-0, listen on this frequency for a reasonable period to make sure that no distress traffic is being sent. (WRC-15)

**52.196** 2) The provisions of No. **52.195** do not apply to stations in distress.

B3 – Traffic

**52.197** § 90 1) Coast stations which use 2 182 kHz for calling shall be able to use at least one other frequency in the authorized bands between 1 606.5 kHz and 2 850 kHz. (WRC-03)

**52.198** 2) Coast stations authorized to use radiotelephony on one or more frequencies other than 2 182 kHz in the authorized bands between 1 606.5 kHz and 2 850 kHz shall use class J3E emissions on those frequencies (see also No. **52.188**). (WRC-03)

1 **52.189.1** Where administrations provide at their coast stations a watch on 2 182 kHz for receiving class J3E emissions as well as class A3E and H3E emissions, ship stations may call those coast stations for safety purposes using class H3E or J3E emissions.

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**1352.199** 3) Coast stations open to the public correspondence service on one or more frequencies between 1 606.5 kHz and 2 850 kHz shall also be capable of transmitting class H3E and J3E emissions with a carrier frequency of 2 182 kHz, and of receiving class A3E, H3E and J3E emissions with a carrier frequency of 2 182 kHz. (WRC-03)

**52.200** 4) One of the frequencies which coast stations are required to be able to use (see No. **52.197**) is printed in heavy type in the List of Coast Stations and Special Service Stations (List IV) to indicate that it is the normal working frequency of the stations. Supplementary frequencies, if assigned, are shown in ordinary type. (WRC-07)

**52.201** 5) Working frequencies of coast stations shall be chosen in such a manner as to avoid interference with other stations. B4 – Additional provisions applying to Region 1

**52.202** § 91 The peak envelope power of ship radiotelephone stations operating in the authorized bands between 1 606.5 kHz and 2 850 kHz shall not exceed 400 W. (WRC-03)

**52.203** § 92 1) All stations on ships making international voyages should be able to use:

**52.204** *a)* the following ship-to-shore working frequency, if required by their service:

**52.205** – carrier frequency 2 045 kHz (assigned frequency 2 046.4 kHz) for class

J3E emissions;

**52.206** *b)* the following intership frequency, if required by their service:

**52.207** – carrier frequency 2 048 kHz (assigned frequency 2 049.4 kHz) for class J3E emissions;

**52.208** This frequency may be used as an additional ship-to-shore frequency.

**52.209** (SUP - WRC-07)

**52.210** § 93 1) Ships frequently exchanging correspondence with a coast station of a

nationality other than their own may use the same frequencies as ships of the nationality of the coast station:

**52.211** – where mutually agreed by the administrations concerned; or

**52.212** – where the facility is open to ships of all nationalities by virtue of a note against each of the frequencies concerned in the List of Coast Stations and Special Service Stations (List IV). (WRC-07)

**RR52-14** CHAPTER IX Maritime services.

**52.213** 2) In exceptional circumstances, if frequency usage according to Nos. **52.203** to **52.208** or No. **52.210** is not possible, a ship station may use one of its own assigned national ship to-shore frequencies for communication with a coast station of another nationality, under the express condition that the coast station as well as the ship station shall take precautions, in accordance with Recommendation ITU-R M.1171-0, to ensure that the use of such a frequency will not cause harmful interference to the service for which the frequency in question is authorized. (WRC-15)

**52.214** § 94 The following ship-to-shore frequencies:

– carrier frequency 2 051 kHz (assigned frequency 2 052.4 kHz),

– carrier frequency 2 054 kHz (assigned frequency 2 055.4 kHz), and

– carrier frequency 2 057 kHz (assigned frequency 2 058.4 kHz),

may be assigned to coast stations as receiving frequencies. B5 – Additional provisions applying to Regions 2 and 3

**52.215** § 95 All stations on ships making international voyages should, if required by their service, be able to use the intership carrier frequencies:

2 635 kHz (assigned frequency 2 636.4 kHz) or

2 638 kHz (assigned frequency 2 639.4 kHz).

The conditions of use of these frequencies are specified in No. **52.11**.

**52.216** *C – Bands between 4 000 kHz and 27 500 kHz*

C1 – Mode of operation of stations

**52.217** § 96 1) The class of emission to be used for analogue radiotelephony in the bands

between 4 000 kHz and 26 175 kHz shall be J3E; for digital telecommunications in those bands, the class of emission shall be J2D. (WRC-03)

**52.218** 2) The normal mode of operation of each coast station is indicated in the List of Coast Stations and Special Service Stations (List IV). (WRC-07)

**52.219** 3) Coast stations employing class J3E or J2D emissions in accordance with No. **52.217** in the bands between 4 000 kHz and 27 500 kHz shall use the minimum power necessary to cover their service area and shall at no time use a peak envelope power in excess of 10 kW per channel.

**52.220** 4) Ship stations employing class J3E or J2D emissions in accordance with

No. **52.217** in the bands between 4 000 kHz and 27 500 kHz shall at no time use a peak envelope power in excess of 1.5 kW per channel.

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C2 – Call and reply

**52.220A** 5) Administrations should encourage the coast stations and ship stations under their jurisdiction to use digital selective calling techniques for call and reply. (WRC-2000)

**52.220B** § 96A When calling by radiotelephony is necessary, it should be done (in order of preference): (WRC-2000)

**52.220C** 1) on the working frequencies assigned to the coast stations; or (WRC-2000)

**52.220D** 2) when this is not possible, on the calling frequencies listed under No. **52.221**

or **52.221A** below. (WRC-2000)

**52.221** § 97 1) Ship stations may use the following carrier frequencies for calling in radiotelephony:

4 125 kHz2, 3, 4

6 215 kHz3, 4

8 255 kHz

8 291 kHz4 (see also No. **52.221A**)

12 290 kHz4 (see also No. **52.221A**)

16 420 kHz4 (see also No. **52.221A**)

18 795 kHz

22 060 kHz

25 097 kHz (WRC-15)

**52.221A** 2) The carrier frequency 8 291 kHz is authorized on a simplex basis for distress and safety traffic only (see also Appendix **15**). Calling on the carrier frequencies 12 290 kHz and 16 420 kHz shall be permitted only to and from rescue coordination centres (see No. **30.6.1**), subject to the safeguards of Resolution **352 (WRC-03)**. The alternative carrier frequencies 12 359 kHz

and 16 537 kHz may be used by ship stations and coast stations for calling on a simplex basis, provided that the peak envelope power does not exceed 1 kW. (WRC-15)

2 **52.221.1** In the United States, the carrier frequency 4 125 kHz is also authorized for common use by coast and ship stations for single-sideband radiotelephony on a simplex basis, provided the peak envelope power of such stations does not exceed 1 kW (see also No. **52.222.2**).

3 **52.221.2** The carrier frequencies 4 125 kHz and 6 215 kHz are also authorized for common use by coast and ship stations for single-sideband radiotelephony on a simplex basis for call and reply purposes, provided that the peak envelope power of such stations does not exceed 1 kW. The use of these frequencies for working purposes is not permitted (see also No. **52.221.1**). (WRC-07)

4 **52.221.3** The carrier frequencies 4 125 kHz, 6 215 kHz, 8 291 kHz, 12 290 kHz, and 16 420 kHz are also authorized for common use by coast and ship stations for single-sideband radiotelephony on a simplex basis for distress and safety traffic.

**RR52-16** CHAPTER IX Maritime services.

**52.222** 3) Coast stations may use the following carrier frequencies for calling in radiotelephony:

4 417 kHz5

6 516 kHz5

8 779 kHz

13 137 kHz (see No. **52.222A**)

17 302 kHz (see No. **52.222A**)

19 770 kHz

22 756 kHz

26 172 kHz (WRC-2000)

**52.222A** 4) The carrier frequencies 13 137 kHz and 17 302 kHz shall not be used as calling frequencies after 31 December 2003. The alternative carrier frequencies 12 359 kHz and 16 537 kHz may be used by ship stations and coast stations for calling on a simplex basis, provided that the peak envelope power does not exceed 1 kW. (WRC-2000)

**52.223** § 98 The hours of service of coast stations open to public correspondence and the frequency or frequencies on which watch is maintained shall be indicated in the List of Coast Stations and Special Service Stations (List IV). (WRC-07)

**52.224** § 99 1) Before transmitting on the carrier frequencies 4 125 kHz, 6 215 kHz, 8 291 kHz, 12 290 kHz, or 16 420 kHz a station shall, in accordance with Recommendation ITU-R M.1171-0, listen on the frequency for a reasonable period to make sure that no distress traffic is being sent (see No. **52.221A**). (WRC-15)

**52.225** 2) The provisions of No. **52.224** do not apply to stations in distress.

C3 – Traffic

**52.226** § 100 1) For the conduct of duplex telephony, the transmitting frequencies of the coast stations and of the corresponding ship stations shall be associated in pairs, as indicated in Appendix **17**, except temporarily in cases where working conditions prohibit the use of paired frequencies in order to meet operational needs.

**52.227** 2) The frequencies to be used for the conduct of simplex radiotelephony are shown in Appendix **17**, Section B. In these cases, the peak envelope power of the coast station transmitter shall not exceed 1 kW.

**52.222.1** (SUP - WRC-07)

5 **52.222.2** The carrier frequencies 4 417 kHz and 6 516 kHz are also authorized for common use by coast and ship stations for single-sideband radiotelephony on a simplex basis, provided that the peak envelope power of such stations does not exceed 1 kW. The use of 6 516 kHz for this purpose should be limited to daytime operation (see also No. **52.221.1**).

CHAPTER IX Maritime services **RR52-17**

**52.228** 3) The frequencies indicated in Appendix **17** for ship station transmissions may be used by ships of any category according to traffic requirements.

**52.229** 4) Transmitters used for radiotelephony in the frequency bands between 4 000 kHz and 27 500 kHz shall comply with technical characteristics specified in Recommendation ITU-R M.1173-1. (WRC-15)

**52.230** *D – Bands between 156 MHz and 174 MHz*

D1 – Call and reply

**52.231** § 101 1) The frequency 156.8 MHz is the international frequency for distress traffic and for calling by radiotelephony when using frequencies in the authorized bands between 156 MHz and 174 MHz. The class of emission to be used for radiotelephony on the frequency 156.8 MHz shall be G3E (as specified in Recommendation ITU-R M.489-2). (WRC-07)

**52.232** 2) The frequency 156.8 MHz may also be used:

**52.233** *a)* by coast and ship stations for call and reply in accordance with the provisions of

Articles **54** and **57**;

**52.234** *b)* by coast stations to announce the transmission on another frequency of traffic lists, in accordance with Recommendation ITU-R M.1171-0, and important maritime information. (WRC-15)

**52.235** (SUP - WRC-07)

**52.236** 3) Any one of the channels designated in Appendix **18** for public correspondence may be used as a calling channel if an administration so desires. Such use shall be indicated in the List of Coast Stations and Special Service Stations (List IV). (WRC-07)

**52.237** 5) Ship and coast stations in the public correspondence service may use a working frequency, for calling purposes, as provided in Articles **54** and **57**.

**52.238** 6) All emissions in the band 156.7625-156.8375 MHz capable of causing harmful interference to the authorized transmissions of stations of the maritime mobile service on 156.8 MHz are forbidden.

**52.239** 7) To facilitate the reception of distress calls and distress traffic, all transmissions on 156.8 MHz shall be kept to a minimum and shall not exceed one minute.

**52.240** 8) Before transmitting on the frequency 156.8 MHz, a station shall, in accordance with Recommendation ITU-R M.1171-0, listen on this frequency for a reasonable period to make sure that no distress traffic is being sent. (WRC-15)

**52.241** 9) The provisions of No. **52.240** do not apply to stations in distress.

**RR52-18** CHAPTER IX Maritime services.

**52.241A** 10) The frequency 156.525 MHz is the international distress, safety and calling frequency for the maritime mobile VHF radiotelephone service using digital selective calling (DSC) when using frequencies in the authorized bands between 156 MHz and 174 MHz. (WRC-07)

**52.241B** 11) All emissions in the band 156.4875-156.5625 MHz capable of causing harmful interference to the authorized transmissions of stations of the maritime mobile service on 156.525 MHz are forbidden. (WRC-07)

**52.241C** 12) To facilitate the reception of distress calls and distress traffic, all transmissions on 156.525 MHz shall be kept to a minimum. (WRC-07) D2 – Watch

**52.242** § 102 1) A coast station open to the international public correspondence service should, during its hours of service, maintain watch on its receiving frequency or frequencies indicated in the List of Coast Stations and Special Service Stations (List IV). (WRC-07)

**52.243** 2) The method of watch on a working frequency shall be no less efficient than

watch by an operator.

**52.244** 3) Ship stations should, where practicable, maintain watch on 156.8 MHz when within the service area of a coast station providing international maritime mobile radiotelephone service in the band 156-174 MHz. Ship stations fitted only with VHF radiotelephone equipment operating in the authorized bands between 156 MHz and 174 MHz should maintain watch on 156.8 MHz when at sea.

**52.245** 4) Ship stations, when in communication with a port station, may, on an exceptional basis and subject to the agreement of the administration concerned, continue to maintain watch

on the appropriate port operations frequency only, provided that watch on 156.8 MHz is being maintained by the port station.

**52.246** 5) Ship stations, when in communication with a coast station in the ship movement service and subject to the agreement of the administration concerned, may continue to maintain watch on the appropriate ship movement service frequency only, provided that watch on 156.8 MHz is being maintained by that coast station.

**52.247** § 103 A coast station in the port operations service in an area where 156.8 MHz is being used for distress, urgency or safety shall, during its working hours, keep an additional watch on 156.6 MHz or another port operations frequency indicated in heavy type in the List of Coast Stations and Special Service Stations (List IV). (WRC-07)

**52.248** § 104 A coast station in the ship movement service in an area where 156.8 MHz is being used for distress, urgency and safety shall, during its working hours, keep an additional watch on the ship movement frequencies indicated in heavy type in the List of Coast Stations and Special Service Stations (List IV). (WRC-07)

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D3 – Traffic

**52.249** § 105 1) Where practicable, coast stations open to the international public correspondence service shall be capable of working with ship stations equipped for duplex or semi duplex operation.

**52.250** 2) The method of working (single-frequency or two-frequency) specified in Appendix **18** for each channel should be used in the international services.

**52.251** § 106 Communications in the port operations service shall be restricted to those relating to operational handling, the movement, and the safety of ships and, in emergency, to the safety of persons. Messages of a public correspondence nature shall be excluded from this service.

**52.252** § 107 Communications in the ship movement service shall be restricted to those relating to the movement of ships. Messages of a public correspondence nature shall be excluded from this service.

**52.253** § 108 1) Coast stations which use 156.8 MHz for calling shall be able to use at least one other authorized channel in the international maritime mobile radiotelephone service in the band 156-174 MHz.

**52.254** 2) In the band 156-174 MHz administrations shall, where practicable, assign frequencies to coast and ship stations in accordance with the Table of transmitting frequencies given in Appendix **18** for such international services as administrations consider necessary.

**52.255** (SUP - WRC-03)

**52.256** 3) In assigning frequencies to their coast stations, administrations should collaborate in cases where harmful interference might occur.

**52.257** 4) Channels are designated by numbers in the Table of transmitting frequencies given in Appendix **18**.

**52.258** § 109 1) In assigning frequencies to stations of authorized services, other than maritime mobile, administrations shall avoid the possibility of interference to international maritime services in the bands between 156 MHz and 174 MHz.

**52.259** 2) The use of channels for maritime mobile purposes other than those indicated in the Table of transmitting frequencies given in Appendix **18** shall not cause harmful interference to services which operate in accordance with that table and shall not prejudice the future development of such services.

**52.260** § 110 The carrier power of ship station transmitters shall not exceed 25 W.

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**Section VII – Use of frequencies for data transmissions** (WRC-12)

**52.261** *A – General* (WRC-12)

**52.262** Frequencies assigned to coast stations for data transmissions shall be indicated in the List of Coast Stations and Special Service Stations (List IV). This List shall also indicate any other useful information concerning the service performed by each coast station. (WRC-12)

**52.263** *B – Bands between 4 000 kHz and 27 500 kHz* (WRC-12)

B1 – Mode of operation of stations (WRC-12)

**52.264** The class of emissions to be used for data transmissions in this section should be in accordance with the most recent version of Recommendation ITU-R M.1798. Coast stations as well as ship stations should use radio systems specified in the most recent version of

Recommendation ITU-R M.1798. (WRC-15)

**52.265** Coast stations employing the class of emissions in accordance with No. **52.264** in the frequency bands between 4 000 kHz and 27 500 kHz shall not exceed a peak envelope power of 10 kW. (WRC-12)

**52.266** Ship stations employing the class of emissions in accordance with No. **52.264** in

the frequency bands between 4 000 kHz and 27 500 kHz shall not exceed a peak envelope power of 1.5 kW. (WRC-12)

**Rec. ITU-R SM.1603**

**Spectrum redeployment* as a method of national spectrum management**

(Question ITU-R 216/1)

(2003-2012-2014)

**Scope**

This Recommendation gives guidelines for spectrum redeployment issues.

**Keywords**

Guidelines, national spectrum management, spectrum redeployment, spectrum refarming.

**Related ITU Recommendations, Reports**

Reports ITU-R SM.2015, ITU-R SM.2012 and ITU-R SM.2153.

NOTE – In every case the latest edition of the Recommendation/Report in force should be used.

The ITU Radiocommunication Assembly,

*considering*

*a)* that all administrations need to make spectrum available for new radio applications and for increased use of existing applications;

*b)* that as the use of the spectrum increases it may become progressively more difficult for administrations to find suitable spectrum for radio applications;

*c)* that making spectrum available for some new applications may require redeployment to other frequency bands or redeployment to innovative technologies (i.e. to decreased bandwidth or analogue to digital);

*d)* that redeploying licence-exempt bands will be complicated by lack of records of users;

*e)* the experiences of administrations in spectrum redeployment techniques would provide information on the practice;

* Also referred to as "refarming."

*f)* that frequency management and thus redeployment of spectrum is a national responsibility and there is a need for guidelines by collating the experiences of administrations in spectrum redeployment techniques,

*recommends*

**1** that the following definition for spectrum redeployment be recognized as:

"Spectrum redeployment (spectrum refarming) is a combination of administrative, financial, and technical measures aimed at removing users or equipment of the existing frequency assignments either completely or partially from a particular frequency band. The frequency band may then be allocated to the same or different service(s). These measures may be implemented in short, medium, or long time-scales.;"

**2** that Annex 1 should be used as a guide for national consideration of redeployment issues.

**Annex** **1**

**Redeployment issues**

## 1 Introduction

The radio spectrum is a finite, but reusable resource that can benefit each administration by providing a medium to assist communications and economic development. In order to maximize the benefits to an administration the radio spectrum needs to be efficiently and effectively managed. Part of efficient and effective spectrum management is planning the development of radio services in advance of their requirement; this may include extending the coverage of existing services, enhancing the performance of existing services and introducing new services. This type of spectrum planning is considered to be associated with the development of a national spectrum strategy and the strategy is normally expected to cover a period of 5 to 10 years. Report ITU-R SM.2015 – Methods for determining national long-term strategies for spectrum utilization provides details on the planning process, evaluation of scenarios and appropriate procedures for transition from present spectrum utilization to long-term objectives.

To improve existing services or introduce new services, it may be necessary to move existing users of the radio spectrum to more modern technologies or new frequency bands. This movement of existing spectrum users, or as it is otherwise known, spectrum redeployment, needs to be planned. Spectrum redeployment should be included in the administration's national spectrum strategy together with the mechanism identified to assist implementation of redeployment. It should be considered equally with all other options, i.e. sharing, removing restrictions, and not as a last resort.

Spectrum redeployment is not necessarily a simple task, and an administration may face a number of difficulties that can complicate, delay, and even disrupt the process. The administration is encouraged to use spectrum monitoring data to supplement other data when considering redeployment. The level of difficulty experienced and options of implementations available may subsequently influence an administration's approach to spectrum redeployment. The following text examines the process of spectrum redeployment and the various factors that are associated with its use.

## 2 The requirement for spectrum redeployment

All administrations have plans to introduce new radio services and for some this may include the need to move existing users of the radio spectrum to new technologies or new frequency bands. This requirement to move existing users of the spectrum can arise for a number of reasons, for example:

a) a spectrum allocation may have been in operation for a considerable period of time and currently no longer matches the demands of users, or the capabilities of modern systems;

b) an allocation within a specific range of frequencies is required for a new radio service and these frequencies are occupied by services with whom the new service cannot share;

c) a decision by a WRC to allocate a currently occupied frequency band to a different service on a regional or global basis.

If, as in the case of b) above, the spectrum allocation is not being used efficiently, there may be a requirement to re-engineer, the band to improve spectral efficiency and this can include the following options:

– increasing the level of spectrum sharing;

– reducing the channel bandwidth to increase the number of channels;

– changing to more efficient modulation techniques that permit greater sharing;

– reducing the frequency reuse distance.

Any of the above options may provide the requirement for starting a spectrum redeployment process in order to change existing users' current equipment and/or their frequency assignment, even though any change in frequency may be limited to the same frequency band. In some cases, the spectrum sharing criteria between services on a co-primary basis is detailed but the national requirements may be to assign these frequencies to one of the radio services and may require the redeployment of other radio services from the same band.

If an administration can move existing users to unused spectrum, then the spectrum redeployment process may not be difficult. However, resistance amongst radio users to changes in the type of equipment used, or to changes in frequency allocation, limits an administration's flexibility to make spectrum available for new users and services. In addition, in some countries, increasing spectrum congestion can make the identification and use of alternative frequency bands time-consuming and difficult. Delays in the introduction of new services are undesirable, as they can make a proposed solution obsolete before it is implemented and, in the case of a

proposed change affecting one or more frequency bands, a delay with one service[1] may impact on several other bands and services.

These delays, as studies have shown, are capable of causing a significant loss to a country's economy. If a solution is not achieved, this may lead in the long term to impairment in spectrum use and a reduction in radiocommunications development. Hence, it is important that once an administration has decided to use spectrum redeployment, any unnecessary delays in the process are avoided.

The extent to which an administration will need to use spectrum redeployment will depend on the size of the demand for spectrum and the level of spectrum congestion within the administration. For those administrations where the level of demand for spectrum has given rise to spectrum congestion and there is little usable spectrum available, the need for an effective spectrum redeployment policy is self-evident. However, there are benefits in identifying a suitable spectrum redeployment mechanism. Benefits can apply even to countries where spectrum congestion is not a problem, as the necessity to make spectrum available to take advantage of new services is an issue that faces all administrations, e.g. providing spectrum to take advantage of the global growth in mobile services.

[1] Whether delays occur will depend on the difficulty an administration has in getting users to agree to the change. Assessment of the difficulty experienced by administrations should be based on their ability to make all users, both public and private, large, and small release spectrum when it is required.

## 3 Spectrum redeployment

Spectrum redeployment is a national spectrum management tool and therefore, in theory, any frequency band and any system could be subjected to some form of spectrum redeployment. In practice, spectrum redeployment is more limited as it can only be applied in cases where an administration can change the use of the frequency band, and this may be limited by international agreements and sharing criteria.

The administration should derive benefits in terms of technical, economic, and social aspects from the process of redeployment of spectrum.

For example, the new use of a released band can make more efficient use of the spectrum and can provide services to improve quality of life and generate new business opportunities that can increase employment.

The issues associated with applying spectrum redeployment in bands where use is exempt from licences are more complex than for licensed use, as there is no record of users of the service. The ramifications of these issues are described in § 3.2.2.

### 3.1 Time-scales

The approach an administration takes to spectrum redeployment depends on the time-scale in which the spectrum needs to be made available. For some services, a change in spectrum use may be associated with a new international allocation. In this case, the period for planning the introduction for the particular service may take place over a 10 to 20-year time-scale and be subject to a long-term plan with quite detailed market predictions of the possible technology developments to justify the allocation process.

For services where the change in spectrum use is based on a change in the end user service, for example mobile data, the demand for spectrum access can arise more quickly due to the rapid change of market requirements and the availability of the technology. These services may require a more flexible system for the national designation of spectrum for a particular service and typically would be characterized by a shorter planning cycle (i.e. less than five years) where the spectrum would need to be made available over a much shorter time period.

A reasonable amount of advance notice of the proposed change should be given to enable existing or new users time to plan and implement any consequent changes. The spectrum manager should schedule the period of advance notice into plans for the process.

In all cases, redeployment decisions should be taken at an early stage to allow the maximum time for the migration of existing services and systems. An early decision on spectrum redeployment is desirable, although not always possible, as it provides a clear basis on which existing and new users can develop their implementation plans and for larger systems may include establishing the necessary financial backing. To avoid leaving spectrum unused for any lengthy period, it is also desirable to have a flexible transition period that only clears existing users from the spectrum when it is required by the new services. However, this approach may require a compromise on

technical decisions on the structure of the assignments in the frequency band and may not produce the most efficient use of the spectrum.

### 3.2 Voluntary and regulatory spectrum redeployment

Spectrum redeployment may be used in a number of different ways but there are only two basic types: voluntary spectrum redeployment and regulatory spectrum redeployment.

#### 3.2.1 Voluntary spectrum redeployment

This method of spectrum redeployment represents the case when an administration decides to implement spectrum redeployment and to use methods to encourage an existing spectrum user to voluntarily decide to return the frequencies used to the spectrum manager for re-assignment. This process tends to occur when an existing user recognizes the benefits, they are gaining from using the spectrum are less than the costs of continuing to use it. This method may not be suitable if the spectrum needs to be recovered quickly, as it is likely to take time. Typically, voluntary spectrum redeployment occurs when there may be more than one increase in licence fees or for an increase in licence fees to coincide with the existing equipment needing to be serviced or replaced, or a new technology appearing that provides a better service than the existing equipment, e.g. for taxi drivers, the greater range provided by cellular telephones compared to mobile radio.

The stimulus for an administration deciding to implement voluntary spectrum redeployment may arise for many reasons, including the monitoring of statistics on the use of a frequency band, e.g. if the number of users in a frequency band are decreasing nationally, or possibly regionally, or if there is a rapid turnover of users in the band. Such changes in the number of users may indicate that the existing service is either no longer desirable or there are problems of operation with that particular service. Noting that spectrum users may vacate a frequency band for a large number of reasons and that in some frequency bands there may be only a limited number of users (either due to a large operating bandwidth or individual users having access to multiple frequency assignments in the band), the decision by a single user to leave a band may create an opportunity for the administration to consider future usage. If a frequency band became vacant, without any action by the administration, good spectrum management practice should mean the automatic reconsideration of the frequency band's usage.

When this spectrum redeployment method is to be used as part of an identified administrative policy then it may need to be linked to a charging mechanism, e.g. licence fees. To provide the greatest flexibility the charging mechanism also needs to be flexible. Hence this spectrum redeployment method may be suitable for charging mechanisms like spectrum pricing, where the cost of the licence can be linked to a wide variety of factors, e.g. coverage area, extent of sharing, bandwidth, hours of operation.

#### 3.2.2 Regulatory spectrum redeployment

Regulatory spectrum redeployment is the approach most associated with an administrative policy to redeploy spectrum. This method basically consists of the administration either terminating the

licence or refusing to renew the licence. Early notification/publicity of the administration's plans for the frequency band is essential to ensure that those affected will have the maximum time to plan alternative arrangements.

#### 3.2.2.1Spectrum redeployment at the expiration of the current licence

This approach currently appears to be the most common way of achieving spectrum redeployment. The difficulty faced by the administration in applying the policy will depend on the length of the licence term and the speed with which the administration wishes to recover the frequency band. If the period of the licence is short (e.g. one or two years) or the administration knows sufficiently far in advance that it requires this spectrum, then recovering the spectrum may not be a problem. However, if the administration wants to recover the spectrum quickly, it may face claims for compensation depending on the terms and conditions of the licence, if:

– the existing licence period is long (e.g. 10-15 years); or

– the licensee has purchased radio equipment based on an understanding that, even though the licence period is short, the licence will be renewed automatically.

#### 3.2.2.2Spectrum redeployment at the end of the equipment's lifetime or before the expiration of the licence

This approach requires that the administration announce its intentions to redeploy the spectrum sufficiently far in advance of the date on which they propose to reclaim the frequency band. To minimize difficulties, the administration could wait until the end of the equipment's lifetime. However, the lifetime of equipment differs from service to service and for some systems, such as military equipment, updating technologies are used which further prolong the lifetime of equipment. For cases where the operational lifetime of the equipment is unacceptable, compared to the period the administration has set to recover the spectrum, it may be necessary for the administration to agree with the users a fixed lifetime for the equipment or impose a cut-off date; potentially giving rise to claims for compensation.

#### 3.2.2.3Redeployment of spectrum in licence-exempt bands

By definition there are no records of users and their application of services used in license-exempt bands. It would be impossible to contact all users to notify them of redeployment bands, and this prevents the band from being emptied of incumbent users.

Considerations for new assignments or allocations of license-exempt bands should take account of the legacy from assigning license-exempt services if the bands are later to be the subject of redeployment plans.

Most users of license-exempt devices for short-range radiocommunication devices (SRD) (refer to Report ITU-R SM.2153) are reluctant to pay any costs caused by spectrum policy change. However, it is difficult to establish the spectrum policy plan in the license-exempt bands because of lifetime of the products, which is between 3 and 10 years on the average depending on the product type.

In the case of redeployment of license-exempt bands, the administrations may review the potential infringement of people's property rights because most license-exempt users are unspecified. In order to judge the property infringement for existing users, it needs to consider the relationship between the government authority and the property loss.

| | **Government** | **User** | **Maker** |
|---|---|---|---|
| Role | – Permit licence-exempt bands | – Pay cost | – Type approval |
| Responsibility limits | – Support | – Guideline | – Type approval is a procedure of the public benefit protection from interference. |

For the protection of unspecified users' property rights in the license-exempt bands, the items to be considered for spectrum redeployment policy are as follows:

– public relation (advertising nationwide newspapers for 6 months etc.).

– compensation guideline for applying the product life cycle;

– replacement of parts (simple engineering technique, which may unintentionally increase the lifetime of the product).

– extension of grace period.

### 3.3 Cost of implementation

Redeployment can impact on the budgets of administrations and existing users of the spectrum. The administration could lose revenue from licence fees if the period allowed to move existing users out of a particular frequency band is too long. It is the existing users who initially incur the cost of implementing spectrum redeployment, as they will need to purchase new equipment in addition to the new licence fee. The level of costs incurred by users will depend on the amount of equipment used, how much time they have had to amortize its costs and how much of their existing equipment they can reuse. Taking three typical examples can provide an indication of the range of costs, and while the costs may be associated with regulatory redeployment they could equally apply to voluntary redeployment:

#### 3.3.1 Migration to frequency bands within the tuning range of the equipment used.

This option assumes that all the equipment associated with spectrum redeployment process can be re-tuned. In this case, the costs may be limited to those associated with the re-tuning and testing of the equipment. If the costs of operating in the new frequency band were lower (e.g. a lower licence fee), the cost of re-tuning would be offset by the reduced operating costs. This approach is reasonably simple and therefore suitable for short-term implementation.

### 3.3.2 Migration into other frequency bands outside the tuning range of the equipment used.

This option is potentially more technically and economically difficult to implement. For some services it may be impossible to move to other bands, e.g. science services using physically specific frequencies. For other services it may require a general change of the radio infrastructure, which could be costly. However, it should not be assumed that the costs are always high. If redeployment is part of a move to a new technology that is already available (e.g. a taxi company moving from two-way radio to a cellular phone) the cost to the end user may be low, providing they have had time to amortize the cost of their original equipment. In addition, the increased flexibility and performance could over a short period of time outweigh the costs. Depending on the extent of the operator's infrastructure, migration to a higher frequency band may require a long transition period, due to the consequences of shorter propagation paths, e.g. re-designed infrastructure, acquisition of new transmission sites and equipment; this does not necessarily fit with the general desire for rapid changes in the telecommunication environment.

It should be noted that the consequences of migration to a lower frequency band can also lead to a longer transition period, because a greater propagation range may require international coordination.

### 3.3.3 Migration to achieve greater spectral efficiency.

This option would almost certainly require the purchase of some new equipment (e.g. a move from equipment with a 12.5 kHz bandwidth to a 6.25 kHz bandwidth). However, it is unlikely that this option would require any change in the transmission/reception infrastructure (i.e. antennas and masts) and so again the costs would be limited. If the costs of operating in the new frequency band are lower (e.g. a lower licence fee), then the costs of new equipment would be offset by the reduced operating costs.

Administrations may consider the existing market situation in terms of number of users and number of equipment using a particular equipment specification set, availability of the new equipment from different manufacturers and then decide on the realistic time-scales with costs impact while mandating the reduction in channel bandwidth. In digital radios, enhanced data rate support requires higher channel bandwidths and even channel aggregation as compared to the legacy analogue 12.5 kHz channels. These digital radios offer higher spectral efficiency per communication path even though using higher bandwidth. The digital radios offer many more data and multimedia services than the voice-only service offered by the analogue radios.

## 3.4 Regional coordination for redeployment

Redeployment in certain frequency bands may require regional coordination. The implementation of GE06 Agreement involved digital switchover from analogue terrestrial broadcasting. To use the digital dividend for the mobile service, the analogue switch-off needed regional coordination because of the higher transmission powers of analogue terrestrial broadcasting.

### 3.5 Global/regional harmonization for redeployment

Redeployment in certain frequency bands may require regional harmonization to achieve economies of scale. This has been experienced by recent examples of redeployments undertaken for IMT in different bands. Significant costs are involved in deploying IMT networks. Availability of equipment, propagation, bandwidth, and harmonization across major markets are the key factors considered by service providers and therefore must be considered for spectrum redeployment.

## 4 Relationship between spectrum redeployment and spectrum pricing

From the above text, it can be seen that the effects of redeployment on existing spectrum users may vary from minimal, e.g. slight frequency adjustment in same band, to major, e.g. new transmission infrastructure. Incumbents that are subjected to the burden of major system changes may, in some cases, seek some form of compensation, based on certain administrative policies. Hence it is useful for the administration to have a range of spectrum management tools or mechanisms to encourage existing users to change frequency bands, particularly if the administration requires spectrum redeployment to be implemented quickly. Two mechanisms for encouraging spectrum users to vacate a frequency band are spectrum pricing and some form of compensation.

### 4.1 Spectrum pricing

As previously noted, spectrum pricing can be used to encourage spectrum users to voluntarily vacate a frequency band. The use of spectrum pricing to promote a more rapid migration in cases of spectrum redeployment, can take three to five years to be successful, and in many cases this time-frame could be acceptable to the administration. Spectrum pricing has the benefit that it is fully flexible and can be applied to a variety of situations, as it enables a pricing structure to be created that provides spectrum users with the financial inducement to change equipment or frequency bands. In addition, spectrum pricing can also be applied progressively to promote spectrum redeployment on an area-by-area basis. This aspect of spectrum pricing is particularly helpful for tackling local areas of spectrum congestion or cases where a new service or new operating condition (e.g. reduced bandwidth, reduced power) would be introduced.

However, spectrum pricing may have the undesirable consequence of increasing illegal spectrum use, i.e. users that are not prepared to pay for a licence and require that more resources have to be provided on spectrum monitoring and spectrum enforcement activities.

### 4.2 Compensation

The radio spectrum is an asset that belongs to the country and not to individual groups of spectrum users. Payment of compensation should not be *de facto* policy, but if it is to be provided it is advised that administrations have the appropriate policies for compensation and competition restrictions that comply with national legislation and international bodies like the World Trade Organization (WTO).

Determining whether some form of compensation is justified, the correct level of any compensation and how it should be provided can be a difficult task depending on:

- the spectrum rights provided by the administration when they issued the licence;
- the spectrum rights retained by the administration;
- the time-scales for completion of spectrum redeployment;
- the proposed method of compensation.

It should be noted that compensation does not only have to be given in the form of a direct financial payment; for example, it could take the form of licensing assistance (trial licences) or equipment subsidies.

The following subsections consider the potential sources of any compensation (see Report ITU-R SM.2012 for discussions on the issue of spectrum rights).

**4.2.1 The new entrant compensates existing spectrum users.**

This approach has been used in some countries, e.g. Bulgaria, Finland, France, Israel, Italy, Jordan, the United Kingdom, and the United States of America, where it was considered necessary to speed up the process of spectrum redeployment. Basically, it consists of the new entrant(s) compensating the existing spectrum users for early vacation of the frequency band.

The advantages of this approach are that the administration does not have to fund any compensation and, if properly managed, it can speed up the release of spectrum only when the new entrant requires it. However, there are several potential disadvantages; the new entrants may have to pay less or more than the market value for the spectrum or equipment/infrastructure unless a fund has been established through an auction mechanism or there is some form of spectrum trading, i.e. the user of the spectrum sells on the rights to use the spectrum. Furthermore, without a clear mechanism for trading or handling payments the process could raise issues of transparency. To avoid these concerns an administration may have to maintain strict oversight of the process, which may require considerable effort.

There are different ways this approach can be implemented:

- the spectrum may be suitable for some form of spectrum trading;
- a fund could be established against which each existing user either makes a claim or is given a set level of compensation;
- existing spectrum users are directly compensated by the new entrants.

An administration may provide legislation that allows payment of the expenses of relocating the incumbents' operations from one or more frequencies to another frequency or frequencies, including the costs of any modification, replacement, or re-issuance of equipment, facilities, operating manuals, or national regulations incurred, e.g. pre-auction notices.

Where spectrum is to be auctioned the administration should make known, before the auction, the marginal costs anticipated to be associated with such relocation or with modifications necessary to accommodate prospective licensees. The administration's procedures may include a process for resolving any differences that arise between the incumbent and new licensees regarding estimates of relocation or modification costs.

**4.2.2 Redeployment funds**

Some countries have introduced the concept of a redeployment fund to compensate spectrum users for having to hand back spectrum. This approach provides a number of possibilities for implementing redeployment in a shorter time-scale than waiting for the expiry of a licence.

Redeployment funds raise a number of issues that need careful consideration, not least the concern that the very existence of such a fund raises the idea that any user of the radio spectrum should receive compensation if required to change some aspect of their operation. Hence it is necessary to clearly identify the conditions under which any compensation may be paid and to establish a transparent mechanism that can be used to determine the level of compensation.

A redeployment fund can be funded from a number of different sources, for example:

- The new entrants could pay into the fund collectively.
- All licence holders could pay via part of the licence fee.
- Spectrum pricing fees could be transferred to the redeployment fund.
- Fees from auctioning of licences or frequency bands could be transferred to the redeployment fund.

While a redeployment fund can provide a convenient means to speed up the spectrum redeployment process, it is not a universal panacea. Redeployment funds may not be sufficiently strong to pay for redeployment in other than limited cases. The fund will need to be managed and there may be concerns over transparency, which is likely to increase the effort and costs. In addition, the existence of the fund, its size, the frequency with which compensation is paid and the levels of any payments, could lead to an assumption by spectrum users that payment of compensation is guaranteed, distorting the market value of the spectrum, and generating the type of negotiations that actually prolong the redeployment process rather than shorten it. In addition, in some countries, the concept that individuals or companies that do not use the radio spectrum, or the frequency band concerned, should compensate others may raise political or judicial issues.

**4.2.3 Compensation for loss by redeployment of licence-exempt band**

Since the frequency redeployed in the licence-exempt band is changing from dedicated form to sharing one to increase spectrum efficiency, government support by frequency redeployment needs to be considered.

Object of the compensation is applied to radio station with license of government such as permission, report, approval of use.

It is difficult to confer property right to licence-exempt devices because they are legally used without license and any right acquisition activities from the administration. Even though property right of the licence-exempt devices is recognized, it is difficult to compensate its loss, because it is not regarded as invasion of property right under the law.

It is necessary to protect user by, for example, through a government service centre for replacement of an existing device, remodeling, money support, etc.

## 5 Conclusions

Spectrum redeployment is a spectrum management tool, which can be used to satisfy new market demands, increase spectrum efficiency or to respond to changes in international frequency allocations. In many cases, spectrum redeployment is a natural process as existing users change their radio operations based on innovative technologies and changing operational requirements. The main problems relating to spectrum redeployment occur when insufficient time is available for introducing a change in spectrum use, and it is necessary to use a supporting mechanism to speed up the redeployment process. However, the use of such supporting mechanisms can lead to objections from new or existing users about the consequent expenditure and inconvenience; it may require as much, if not more, management effort than the redeployment process.

While spectrum planning and the monitoring of spectrum requirements will not solve all redeployment problems, building these processes into the development of a national spectrum strategy may be a simpler way to limit problems associated with implementing spectrum redeployment.

Technical issues such as frequency usage plans and equipment characteristics are important considerations for administrations and users that need to be available for efficient and successful spectrum redeployment within the appropriate timeframes.

Reference the reports by the Electronic Communications Committee (ECC) within the European Conference of Postal and Telecommunications Administrations (CEPT) and the Permanent Consultative Committee III (PCC III): Radiocommunications of the Inter-American Telecommunication Commission (CITEL) could provide further information on the issues from a regional perspective and also include lessons from the experiences of other countries.

Attachments 1 to 6 provide examples of administrations' experiences.

**Attachment 1**
**to Annex 1**

**An example of the spectrum redeployment process based on the French experience.**

This Attachment is based on the French experience. However, the general principles identified may well apply to other countries.

Redeployment is a spectrum management tool which makes it possible to observe the timetable laid down for the availability of frequencies to newcomers.

**1 Interests driving the decision to redeploy spectrum.**

The community as a whole must derive sufficient benefit from a redeployment of radio-frequency bands to merit the granting of authorization. This benefit is reflected, in economic terms, through a maximization of the community surplus. In other words, one must reach an equilibrium point such that no other use of the spectrum can improve the community surplus, according to the Pareto optimality criterion.

In seeking this equilibrium point, it is useful to compare the preferences (utilities) of the various players involved. Their utility functions are expressed in terms of private value and social value for the community. Private value corresponds to the profits they can derive from the use of the frequency bands, whereas the social value corresponds to the importance of the service to society at large. The calculation of private value is fairly simple, whereas quantifying the social value is relatively complex. It is possible to call on the notion of "opportunity" in trying to evaluate the social value of the service. In other words, by calculating what the absence of the service would cost the community.

As regards the process of spectrum redeployment, it is necessary to compare the utilities in terms of private value and social value of the agent being asked to relinquish the frequency bands and of the incoming agent.

Let $U_{outgoer}$ and $U_{incomer}$ denote the respective utilities (comprising the private and social values) of the operator leaving the spectrum and the operator who replaces him. Let $C_{removal}$ denote the spectrum redeployment cost for the outgoer:

if $U_{incomer} \square U_{outgoer} \square C_{removal}$ then the removal is socially and economically optimal;

if $U_{incomer} \square U_{outgoer}$ then the removal is not socially and economically optimal; and

if $U_{outgoer} \square U_{incomer} \square U_{outgoer} \square C_{removal}$ then a choice has to be made.

## 2 The cost of redeployment

It is assumed that, as the result of spectrum redeployment, the user of a frequency band is obliged to relinquish the band and to pursue his activity in a different frequency band or to use a non-radio solution where this is possible. For this user, the obligation to leave the frequency band may induce an additional cost that he would not have incurred in the absence of this obligation. In what follows, this additional cost will be known as the "redeployment cost." The removal cost $C_{removal}$ discussed earlier forms part of the redeployment cost.

In the telecommunication sector in particular, the resale value of the equipment involved in the move is in most cases unknown. Investments made in these networks are often so-called "sunk costs" for the users. This means that if the activity ceases the users cannot recoup their investments. Calculation of the residual value makes it possible to determine the theoretical value of this equipment when it cannot be resold. It is useful to distinguish the residual book value and the residual economic value. For this reason, two methods are envisaged and presented below for the calculation of the redeployment cost:

- calculation using residual book value;
- calculation using residual economic value.

## 3 Calculation of the redeployment cost using the residual book value

The book value method is applied in particular when the outgoer keeps normal accounts. Moreover, in the case of commercial activity, this method takes into account the tax advantages that the outgoer has enjoyed relating to the depreciation of his equipment.

### 3.1 Evaluation of the cost incurred by the user on leaving the frequency band.

#### 3.1.1 Move to another part of the spectrum or exit from the spectrum.

It must first be determined whether the outgoing user is obliged to use radio frequencies if he is to pursue his activity. If this is the case (as, for example, for an operator of mobile services), the outgoing user is moved to another frequency band and the cost, *Cd*, of this move to another part of the spectrum is evaluated. If this is not the case (as for example, for an organism owning fixed radio links), the two following hypotheses must be envisaged:

- the user is moved to a different frequency band and the cost *Cd* is evaluated;
- the user gives up the use of frequencies in favour of an alternative wire-based system and an evaluation is made of the cost, *Cs*, corresponding to the exit from the radio spectrum.

The choice between these two hypotheses, taking only the economic criterion, leads to adopting the least costly of the two.

Let *Ci* be the cost incurred by the user on leaving the frequency band. *Ci* is equal either to *Cd* if the user is obliged to occupy a different frequency band, or to the smaller of *Cd* and *Cs* if the user has the possibility of adopting a wire-based solution.

### 3.2 The residual book value, *Vcr*

This method makes allowance for the age of the outgoing user's equipment, taking the residual book value *Vcr* of this equipment. The usual definition of the residual book value of an item of equipment is obtained as follows:

*Vcr* □ purchase price of the equipment ready for use minus depreciation.

*Vcr* represents the value of the fraction of equipment remaining to be depreciated. If at this stage in the depreciation, its owner can no longer use the equipment, the latter, according to accounting theory, would incur a loss equal to *Vcr*.

### 3.3 Renewal costs

Because of technological evolution and the ageing of equipment, the occupier of a frequency band is called upon to renew his equipment even in the absence of any change of band. Let *Cr* be this cost of renewal of equipment, with identical properties and the same frequency band. *Cr* in this case represents the cost this occupant would incur even in the absence of any spectrum redeployment.

### 3.4 Calculation of the redeployment cost

Take the user of a frequency band whose present equipment has a residual book value *Vcr* and who has to evacuate this band by reason of redeployment. Leaving the band means that he has to spend a sum equal to *Ci* (see § 3.1) in order to be able to pursue his activities. The fact of evacuating the band will probably mean that it is impossible for him to use his present equipment, hence causing a loss equal to *Vcr* (see § 3.2). If he were to stay in the band, he would have to spend a sum equal to *Cr* (see § 3.3). We therefore have the following relationship:

Redeployment cost = additional cost for the user obliged to leave the frequency band

$$Ci = Vcr - Cr$$

Remarks:

- if the calculation results in a negative redeployment cost, this means that the user has an interest in leaving of his own accord the frequency band he currently occupies;
- calculating the redeployment cost of a frequency band requires, in each case, an expert appraisal to establish the actual costs of the existing network and the new network.

The results of the calculation are overly sensitive to the level of depreciation and the architecture of the existing network.

## 4 Calculation of the redeployment cost using residual economic value

The economic approach makes it possible, among other things, to leave aside the following two aspects:

- the fact that the actual service life of the equipment may be different from the life used for accounting purposes[2] (determined on the basis of depreciation periods);
- the possibility that the outgoing user does not apply a depreciation regime.

### 4.1 Analysis of the value of networks

Once the incomer has recognized his interest in using radio waves to provide his service and when it is established that the value to the incomer is greater than the value to the outgoer plus the cost of moving (in other words $U_{incomer}$ ☐ $U_{outgoer}$ ☐ $C_{removal}$), the outgoer has five options:

*Option 1*: *The outgoer ceases activity*: the outgoer provides a service whose value to society is small, whose technology is obsolete, or which no longer has any justification; all these are cases in which it is preferable that the outgoer cease his activity.

*Option 2*: *Sharing frequency bands for a single service*: the existing operator uses frequencies but in an inefficient manner or is unable to justify the quantity at his disposal; in this case, he could, without technical handicap, agree to another operator being installed to provide the same service.

*Option 3*: *Sharing frequency bands between different services*: the incomer may exploit the host frequency band without the existing operator having to move and the latter can also continue exploiting the spectrum without interference from the incomer. This is the solution of sharing frequency bands for the provision of different uses.

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[2] Depreciation for bookkeeping purposes is different from economic depreciation. Equipment that has been completely depreciated can often go on being used for several years before being replaced. In concrete terms, economic depreciation is the sum of a depreciation term (the loss of nominal value of the equipment in the course of a year) and the term representing the remuneration of fixed capital at discount rate *k* (or cost of capital). Only the remuneration of that portion of capital that is financed by borrowing (debt) is included in the financial charges recorded in the accounts. As a result, the depreciation for bookkeeping purposes corresponding to the cost of constant use (investment divided by the life of the equipment used in the accounts) and decreasing financial charges, presents a difference in coverage compared with economic depreciation. For the latter, the remuneration is applied to the total capital value of the investment in question, given that part of the financing is in fact obtained internally. It therefore covers both the equivalent of the financial charges and the remuneration of the investment out of own resources (remuneration of shareholders, etc.).

*Option 4*: *The outgoer moves his activity to another host frequency band*: the incomer has the exclusive use of the whole frequency band, and the existing operator must move his activity to another frequency band.

*Option 5*: *The outgoer moves his activity to a totally different platform*: the incomer wishes to benefit from the exclusive use of the whole frequency band and the existing operator must move his activity. On examination, it turns out that the development cost of the activity of the outgoer on other frequency bands is higher than the development cost of the same activity on a wire-based support (cable, optical fibre, etc.). It is preferable, for an unchanged service, that the outgoer evacuate the frequency bands and move to an alternative platform.

Each of these cases can be tackled by an economic study of the different investment options.

Referring to the work carried out in France on the unbundling of the local loop and the calculation of network costs, the spectrum redeployment cost is examined by comparing different options (again referred to in terms of "configurations"). Take the case of the operator who has to evacuate his frequency band (totally or partially) and move to a different frequency band or a different platform (or simply adjust his use of the frequency band in order to accommodate another operator). The removal of the operator (called the outgoer) must not be to his detriment. The move must involve an incentive for the outgoer. Otherwise, he will not evacuate the frequency band or will try to delay his departure. Equally, the move by the operator must not give rise to the constitution of profits. As a result, an equilibrium point has to be found through the calculation of "fair" compensation. This is done through a comparison between the situation of the outgoer who has to bear the costs of the move and the situation of this same operator if he had not had to move and if he had only incurred the costs of renewing his equipment.

## 5 The redeployment fund and redeployment procedures

### 5.1 The redeployment fund

The fund is managed by the body responsible for managing the spectrum (Agence nationale des fréquences (ANFR)) with a specific budget that is kept strictly separate from the ANFR's general budget. It can be financed in several ways, including contributions from public entities for the requirements of redeployment. So far, the only contributions have come from the Ministry of Finance.

The Ministry of Finance supplies the initial share of the fund, on an annual basis of 3 million euros, increased by an additional amount determined each year on a case-by-case basis in the light of the cases dealt with. From 1997 to 2001, the contributions emanating from the Ministry of Finance have amounted to 65 million euros because of the moves required to accommodate GSM 1800, IMT-2000, and SRD applications (including Bluetooth). At a later stage, contributions will also come from private persons. Users may be called on to pay their contributions into the fund at the time they obtain the new frequency band. For example, GSM operators will contribute in 2002 for additional frequencies in the 1.8 GHz band and IMT-2000 operators will pay the contribution just after the granting of the authorizations, i.e. in September 2001.

The ministries and the independent authorities (or the entities delegated for the purpose) benefiting from the redeployment fund sign a redeployment convention with the ANFR.

The Board of the ANFR, on which all the ministries and authorities concerned are represented, approves these conventions. The cumulative total of conventions signed as of 30 June 2002 is 59 million euros. The entities that have already benefited from the redeployment fund are mainly the operator France Telecom and the Defence Ministry. Other beneficiaries are notably Electricité de France (EDF) and Société nationale des chemins de fer (SNCF).

### 5.2 The redeployment procedures

The procedures are launched by the part of the administration responsible for assigning frequencies before the re-attribution of the frequency band. In France, the bodies in charge of assigning frequencies are known as "affectataires."

At their request, the tasks delegated by the State to the ANFR are as follows:

- to prepare the evaluation of the various cost elements and redeployment principles;
- to propose a schedule for the redeployment operation;
- to organize the supervision of the procedure;
- to manage the redeployment fund.

To carry out these tasks, the ANFR relies on a number of commissions within which consensus is sought and found.

The Commission pour la planification des fréquences (CPF) receives, examines, and coordinates the demands for frequencies emanating from "affectataires."

It has the following tasks:

- to draw up and keep up to date the national Table of Frequency Allocations and to harmonize, as necessary, the use of frequency bands;
- to examine all issues relating to the use and allocation of frequencies having national or international implications;
- to issue directives to the Commission d'assignation des fréquences (CAF), which is accountable to it and for which it acts as the appeals body.

Other commissions are involved in synthesis and prospective in order to:

- contribute to prospective analyses of the radio-frequency spectrum with a view to optimizing its use by public and private users;
- make proposals regarding the rules for electromagnetic compatibility, spectrum engineering and the standards needed to ensure proper use of radio systems;
- bring together representatives of the departments concerned, as well as those of operators of networks open to the public and the industries concerned.

Usually, all decisions are taken by consensus. However, when this is not possible, the decision is taken by the ANFR Board, which is the highest decision-making body on matters related to the frequency spectrum. An appeals procedure can then be launched with the Prime Minister's office at the request of a member of the ANFR Board.

To date, all redeployment cases have been handled using the usual procedure, with consensus obtained in the commissions concerned and with full transparency guaranteed.

**Attachment** **2**
**to Annex 1**

**Examples of the spectrum redeployment process based on the UAE experience.**

This Attachment is based on the UAE experience of spectrum redeployment which may be of use for some of the developing countries.

**1 The change in channel plan for private mobile radio**

The Telecommunications Regulatory Authority (TRA) of the UAE follows a transparent mechanism for the development of the spectrum regulatory framework whereby all regulations undergo a public consultation procedure. The private mobile radio regulations cover the channel plans for the VHF and the UHF bands where the TRA proposed to reduce the channel size from 12.5 kHz to 6.25 kHz for doubling the number of channels available for assignment. Majority of the respondents informed that very few vendors are manufacturing equipment supporting 6.25 kHz. The digital mobile radio works on 12.5 kHz and delivers spectrum efficiency of 6.25 kHz per communication channel by making use of two-slot time division multiple access (TDMA) to provide a doubling of capacity compared to analogue systems by accommodating two simultaneous and independent calls within the same 12.5 kHz channel. There are two FDMA-based systems offering 6.25 kHz, but the challenge is that one standard is proprietary and for the other only one vendor is manufacturing the equipment. Therefore, the decision has to be made in such cases based on the following principles:

- Consumer benefit by access to low-cost equipment available from variety of manufacturers.
- Not to create market disruption by stopping a certain category of equipment on channel size.
- Use of spectrum pricing as a tool for incentivizing use of 6.25 kHz.
- Adopt channel plan which caters for both 6.25 kHz and 12.5 kHz channels.

## 2 The use of 8.33 kHz channelling for VHF aeronautical mobile

The UAE TRA initiated consultations with the stakeholders to implement 8.33 kHz channelling in the VHF aeronautical mobile band. Although the majority of the UAE aircraft are fitted with equipment which supports this channelling, very few old aircraft do not have compliant radios. This example is quoted as the challenge in this band cannot be addressed by a single country and has to be taken at a regional level. ICAO EUR Region enforced mandatory carriage of 8.33 kHz radios above FL245 in 1999 to alleviate the congestion in the VHF. The European Commission decided to regulate on the implementation of VHF 8.33 kHz to the European airspace above FL195. Several studies were conducted, and the implementation was done in phases and the details are available on the EUROCONTROL website. The issue will now be dealt at the ICAO MID region level through consensus of all participating countries.

## 3 The digital switchover planning in the VHF and UHF bands

The UAE TRA initiated its digital broadcast switch-over plan after the conclusion of the GE06 Agreement. This planning involved the following:

- Evaluation of existing penetration of terrestrial analogue TV;
- Requirements of existing analogue TV broadcasters;
- Business modelling for switch over of existing operators to digital broadcast;
- Planning of national frequency layers for the operators with reservation of digital dividend spectrum for mobile service;
- Decision to use VHF TV band III for introducing digital audio broadcasting (DAB);
- Use of SFN as the choice based on planning;
- Decision to adopt more spectrum efficient system (DVB-T2);
- Selection of most viable business model based on number of possible frequency layers;
- Decision to give spectrum rights to broadcasters;
- Dialog with broadcasters to use existing infrastructure to deploy digital transmission;
- Encourage site sharing to operate multiple MUX from the same site to reduce transmission costs;
- Regional harmonization of system and switch-over dates as both will contribute towards economies of scale;
- Regional harmonization for an earlier analogue switch-off date to make the digital dividend band available for mobile at an earlier date.

**Attachment** **3**
**to Annex 1**

**An example of the spectrum redeployment process at the regional level**

This Attachment is based on the experience of redeployment at the regional level for the aeronautical mobile.

Communications for air-traffic control use the aeronautical mobile (R) between 117.975-137 MHz. The number of available VHF assignments was increased by optimizing frequency reuse (improved coordination and possibly confining VHF assignments to smaller areas), using more spectrum (118 to 132 MHz increased to 117.975-137 MHz), and splitting the radio spectrum into narrower bandwidths. This example shows the challenges associated with redeployment on a regional basis.

In 1947, VHF assignments for aeronautical mobile (R) in 118-132 MHz used 200 kHz spacing, providing just 70 channels. In 1958, the spacing was reduced to 100 kHz, doubling the number of channels to 140. In 1959 the upper limit of the aviation band was expanded to 136 MHz, giving another 40 channels, bringing the total to 180. In 1964, the channel spacing was halved again to 50 kHz, resulting in 360 channels being available. The channel spacing was further cut to 25 kHz in 1972, doubling the available channels to 720. Seven years later, in 1979, the upper limit of the aviation band was once again expanded to 137 MHz, bringing the total number of channels to 760.

In 1995, the proposal was made to reduce the channel spacing to 8.33 kHz, resulting in 2 280 channels. With each iteration of the improvements in number of channels by reducing the channel size, a much higher number of radios required replacement and the time-scales for the implementation also increased.

Following consultations with the stakeholders concerned, the European Commission, in January 2006, decided to address the scope of the mandate in two phases. The first phase, aimed at the deployment of 8.33 kHz channel spacing in the airspace above flight level 195 (FL195), was completed with the adoption and publication of Commission Regulation (EC) No. 1265/2007, with below FL195 (Second Phase) to be managed through a later amendment. Eurocontrol has published a Close-Out report (http://www.eurocontrol.int/vhf833/public/standard_page/above_fl195.html) detailing to what extent the original planning and assumptions have been satisfied by the actual execution of the above FL195 phase. The report discusses the lessons learned, with equal emphasis given to successes and failures.

**Attachment 4**
**to Annex 1**

**An example of spectrum redeployment process based on the Benin experience.**

The redeployment of the spectrum is a complex task which can become harder when implemented in a developing country because of the immaturity of the national framework for spectrum management and especially the lack of a national strategy shared by all stakeholders (government, regulatory authority, operators ...).

However, these reasons should not be taken as an obstacle for developing countries as a redeployment may represent a real opportunity for effective and efficient use of the spectrum. Indeed, due to the lack of a national strategy for spectrum management, various technologies from various regions have often been deployed in inadequate frequency bands, so a spectrum redeployment usually put things in order and allow the introduction of appropriate technologies and services.

This Attachment is based on the Benin experience of spectrum redeployment of the 790-890 MHz frequency band, which may be useful for some of the developing countries.

**1 Issues and objectives of the redeployment**

The Benin telecommunications sector is driven by three main actors offering various services:

– a public operator offering fixed telephony (wired and wireless) and internet access services;

– five private operators offering mobile telephony and internet services;

– five internet access providers through wireless access networks.

The 790-890 MHz frequency band was previously occupied by the public operator for its CDMA 2000 network as fixed internet wireless access system. Due to the decision of the Government of the Republic of Benin to grant licences for new generations networks, it has been necessary to carry out a redeployment of this band.

The main objective of this redeployment was to make the 790-890 MHz frequency band available for the promotion of broadband, and by doing so, to enable the efficient use of the band.

## 2 Methodology

The regulatory authority of Benin is the structure responsible for the management and control of the radio spectrum. As such, it could lead the redeployment process, from design to implementation, but in order to be impartial and due to the short time given, it was decided to hire a consulting company to carry out the redeployment.

The selection of the company was made according to criteria such as expertise in radio engineering, planning and deployment of CDMA and UMTS networks and knowledge of associated costs.

A committee was appointed to monitor the redeployment process, with members from the regulatory authority, the Ministry of ICT, and operators involved. The study mission lasted five months and required regular meetings with all the operators involved. At the end of the mission, the following deliverables were developed:

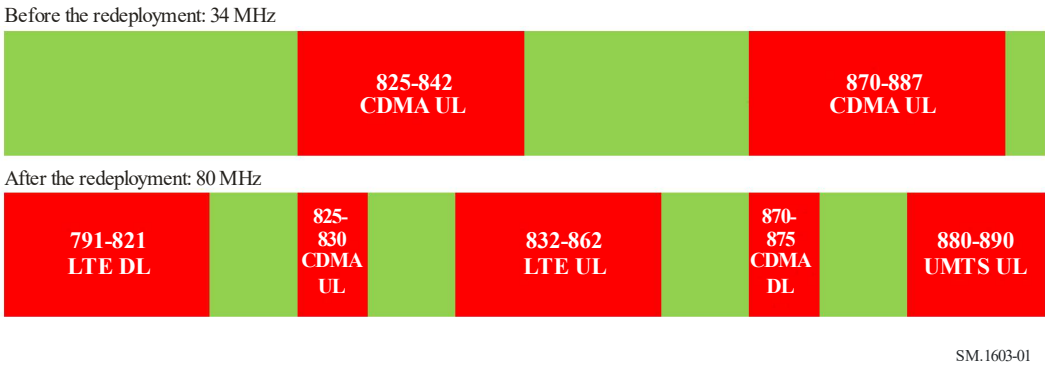
- a document detailing three options for the outgoing operator with the frequency plan, the benefits, and the technical constraints of each option;
- the schedule of implementation of each option;
- the cost of the redeployment regarding each option with the detailed elements associated costs;
- a detailed communication plan to address the subscribers of the outgoing operator.

## 3 Results of the redeployment

– First digital dividend made available and improvement of the spectral efficiency

This redeployment has achieved the main goal consisting of making available the 790-890 MHz frequency band for the promotion of broadband in Benin.

Figure 1 shows the evolution of the occupation of the spectrum before and after the redeployment:




– Economic and social benefits

The redeployment of the 790-890 MHz frequency band offer both economic and social advantages. Indeed, the CDMA network operated by the public operator has 93,012 voice subscribers and 48,890 data subscribers (Population of Benin: 9,500,000 inhabitants in 2012) with limited coverage and services.

It is therefore obvious that the introduction of mobile broadband in the band will lead to important economic benefits (new licences, operators' contribution, payment of fees, etc.), as well as social benefits (universal service, job creation, access to mobile broadband for everyone, etc.).

## 4 Conclusion

This redeployment was a very good thing for Benin because it has helped achieving an important aim, which is making available the first digital dividend for the deployment of third generation networks, in line with international trends. This has led to better use of spectrum resources.

Moreover, this redeployment allowed to experience the main difficulties of a redeployment and find appropriate solutions. Special attention should be given to the following points during an operation of redeployment in a developing country:

- The involvement of all stakeholders in the redeployment:

  This is an elementary precaution that will guarantee success. Indeed, it is essential all stakeholders be actively involved in the redeployment to ensure that their needs and constraints are taken into account.

- Service continuity:

  Redeployment should not in any case lead to services disruption for subscribers; service continuity must then be ensured. To do so, it should be necessary to make a clear and detailed communication plan to subscribers, as well as a detailed schedule of changing customer equipment when necessary.

- Financial assessments:

  Validation of financial assessments was one of the most difficult tasks of the study because of the lack of documentation to determine the depreciation of the equipment and the residual value of the equipment. The outgoing operator was not able to provide purchase invoices, so the evaluations were based on estimations collected from suppliers.

- Redeployment funding:

  As there is usually no redeployment funding in developing countries, it is crucial to determine early source of funds to finance the implementation of the redeployment and to ensure that these funds will be available when required, so that the effective implementation of the redevelopment will not be delayed.

**Attachment** **5**
**to Annex 1**

**An example of the spectrum redeployment process based on the Ukrainian experience.**

This Attachment contains the description of the spectrum redeployment process in Ukraine aimed for introduction of the CDMA-450 (IMT-MC-450 EV-DO) technology in the 450 MHz band, started at the end of 2006 and finished in 2011.

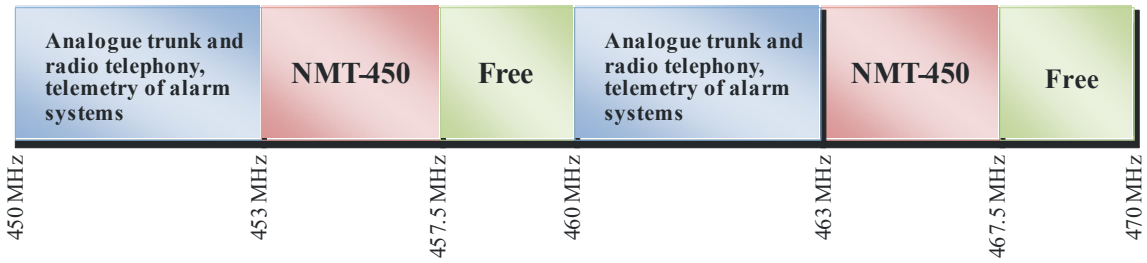
## 1 Prerequisites and objectives of the redeployment

The prerequisites of the redeployment process were decreasing the number of NMT-450 users due to operation of GSM-900 on one hand and ever-growing demand for mobile data transmission services on another hand.

Before starting the redeployment process, the 450-470 MHz frequency band was occupied by the public operator of the NMT-450 network (453-457.5/463-467.5 MHz) and operators of analogue trunk and radio telephony communications, telemetry of alarm systems (450-453/460-463 MHz, with a frequency step 25 kHz), as shown in Fig. 2.

FIGURE 2

**Frequency use in the band 450-470 MHz before redeployment**




SM.1603-02

The operator of NMT-450 network appealed to the Ukrainian regulator, the National Commission on Communication Regulation of Ukraine, for changing its license for outdated standard NMT-450 into the new one for CDMA-450 standard in the same frequency range.

The request was satisfied in accordance with the Law of Ukraine on Telecommunications allowing operator to do so without auction.

In order to create a competitive environment in the band, the Regulator adopted the Decision No. 450 of 17 November 2006 on considering of frequency plan for development of digital cellular communication technology CDMA-450. The main objective of the Decision was to make the band 450-470 MHz available for CDMA-450. Thus, this Decision launched the redeployment process in the occupied frequency band 450-453/460-463 MHz.

## 2 Redeployment planning

In order to make the band 450-470 MHz available for CDMA-450, the Regulator together with the Ukrainian State Centre of Radio Frequencies (UCRF) studied the occupancy of the bands 450-453/460-463 MHz in Ukraine. Totally 147 users operated in 27 regions of Ukraine in this band.

Based on the results of the analysis, the proposals on arranging redeployment process were prepared as follows:

- to inform operators that prolongation of issued licenses for analogue trunk and radio telephony in the bands 450.6-453/460.6-463 MHz is not planned;
- to leave the frequency band 450.0-450.6/460.0-460.6 MHz for analogue trunk communications and rearrange it for the usage of frequency step of 12.5 kHz instead of 25 kHz;
- to shift analogue trunk and radio telephony frequencies from the band 450.6-453/460.6-463 MHz to the bands 450.0-450.6/460.0-460.6 MHz and 413-420/423-430 MHz;
- to stop licensing the band 450.6-453/460.6-463 MHz from 01.11.2007;
- to set the end of transition period for 01 November 2011.

The redeployment process was planned in such a way as to ensure the following:

- minimal negative impact to existing operators in the band;
- minimal financial expenses;
- providing as much as possible alternative frequencies in the band 450-450.6/ 460-460.6 MHz;
- possible financial compensation to operators.

During the planning of redeployment process several rounds of public consultations were done with operators, using the frequency band 450.6-453/460.6-463 MHz in order to agree on redeployment proposals and terms.

## 3 Redeployment implementation

In the frequency band 450.0-450.6/460.0-460.6 MHz, the Regulator and UCRF succeeded to assign frequencies for 89% of operators. From 01 November 2007, the process of licences and permissions reissuing started. The duration of the transition period was set for one year.

For the rest of operators, proposals for shifting to the frequency band 413-420/423-430 MHz were prepared. From 01 July 2008, the process of licences and permissions reissuing started. The duration of the transition period was set for two years.

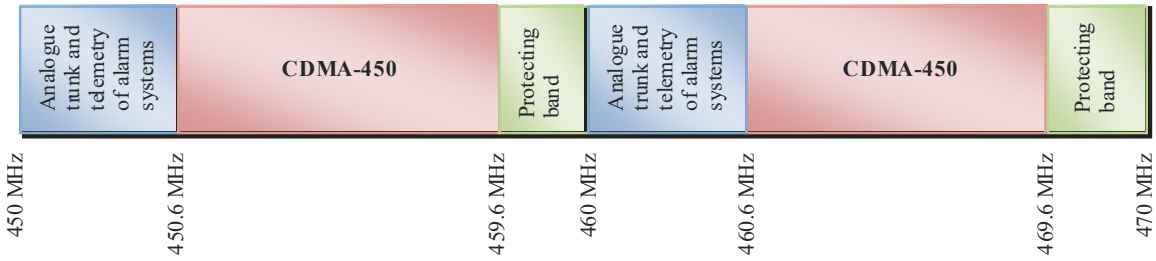
As the usage of the band 450-470 MHz changed, the UCRF made efforts for concluding new coordination agreements with the neighbouring countries.

In order to compensate partly financial expenses occurred because of shifting operators to another frequency band, the Regulator adopted Decision No. 988 of 30 October 2007 providing operators 40% reduction for the works of the UCRF on EMC calculation, frequency assigning and radio frequency monitoring. This norm was valid till 31 December 2007.

The use of the band 450-470 MHz after redeployment is shown in Fig. 3.

FIGURE 3

**Frequency use in the band 450-470 MHz after redeployment**




SM.1603-03

## 4 Conclusion

The frequency redeployment process in the band 450-470 MHz in Ukraine succeeded because of cooperation of the Regulator and operators. Several rounds of public consultations were done.

During the frequency redeployment planning and implementation, a combination of the following methods was used:

- voluntary and regulatory spectrum redeployment;
- redeployment at the expiration of the current licence;
- migration to frequency bands within the tuning range of equipment used as much as possible;
- compensations.

**Attachment 6**
**to Annex 1**

**An example of the spectrum redeployment (refarming) process based on the United States of America experience.**

"Refarming" is the informal name of a notice and comment rule-making proceeding (PR Docket No. 92-235 http://apps.fcc.gov/ecfs/comment/view?id=107799) opened in 1992 to develop an overall strategy for using the spectrum in the private land mobile radio (PLMR) allocations more efficiently to meet future communications requirements.

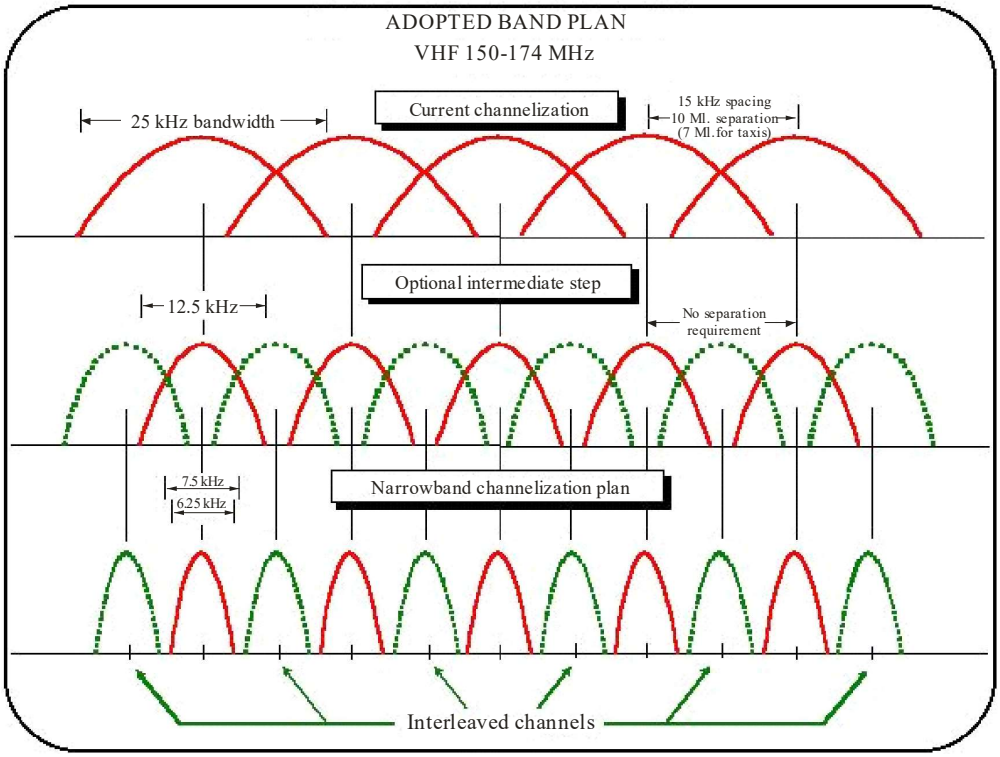
In June 1995, the Commission adopted a new narrowband channel plan in the PLMR bands below 800 MHz http://apps.fcc.gov/ecfs/comment/view?id=146897. In February 1997, the Commission adopted a Second Report and Order http://apps.fcc.gov/ecfs/comment/view?id=180426 which did away with 20 discrete radio services and replaced them with two frequency pools: the Public Safety Pool and the Industrial/Business Pool. In May 2001, the Commission adopted the Sixth Memorandum Opinion and Order which resolved all outstanding issues and terminated the proceeding.

The rules adopted in the refarming proceeding are applicable to the Private Land Mobile bands below 800 MHz. Specifically, the technical rules adopted affect the licensing and use of radios in the following bands:

FIGURE 4

**150-174 MHz**

**VHF high band; available nationwide, channels are generally spaced every 7.5 kHz, authorized bandwidth is 20 kHz, 11.25 kHz, or 6 kHz.**




SM.1603-04

FIGURE 5

**421-430 MHz**

**Available only in Detroit, Buffalo, and Cleveland, channels spaced every 6.25 kHz, authorized bandwidth is 20 kHz, 11.25 kHz, or 6 kHz.**

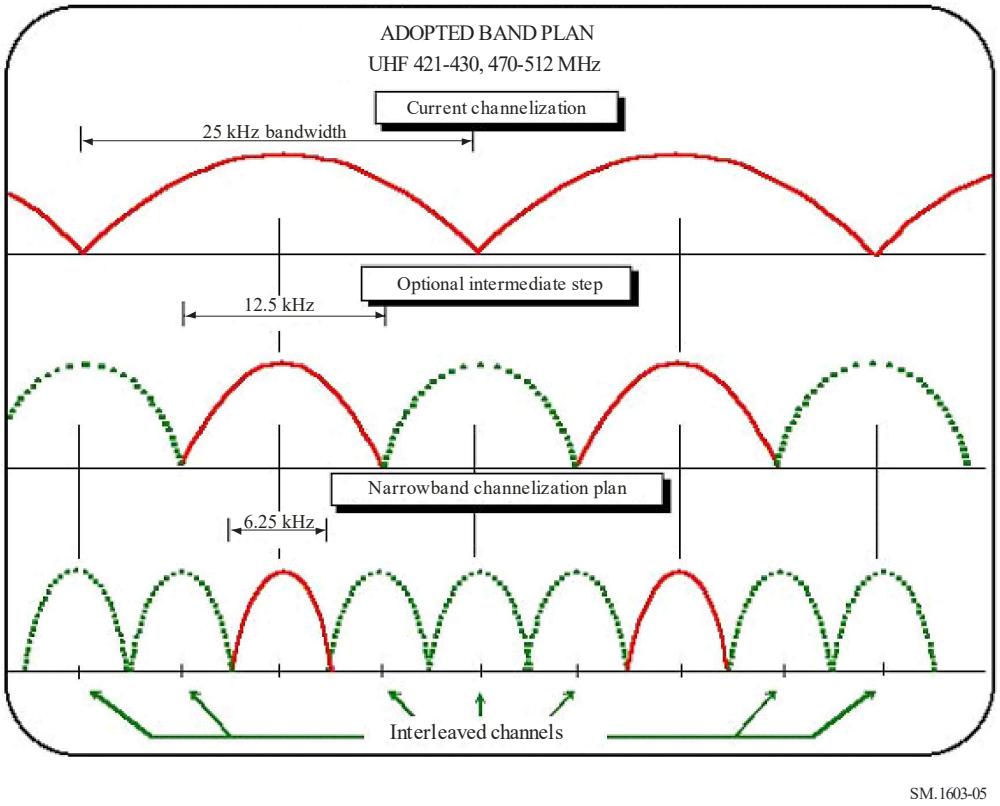


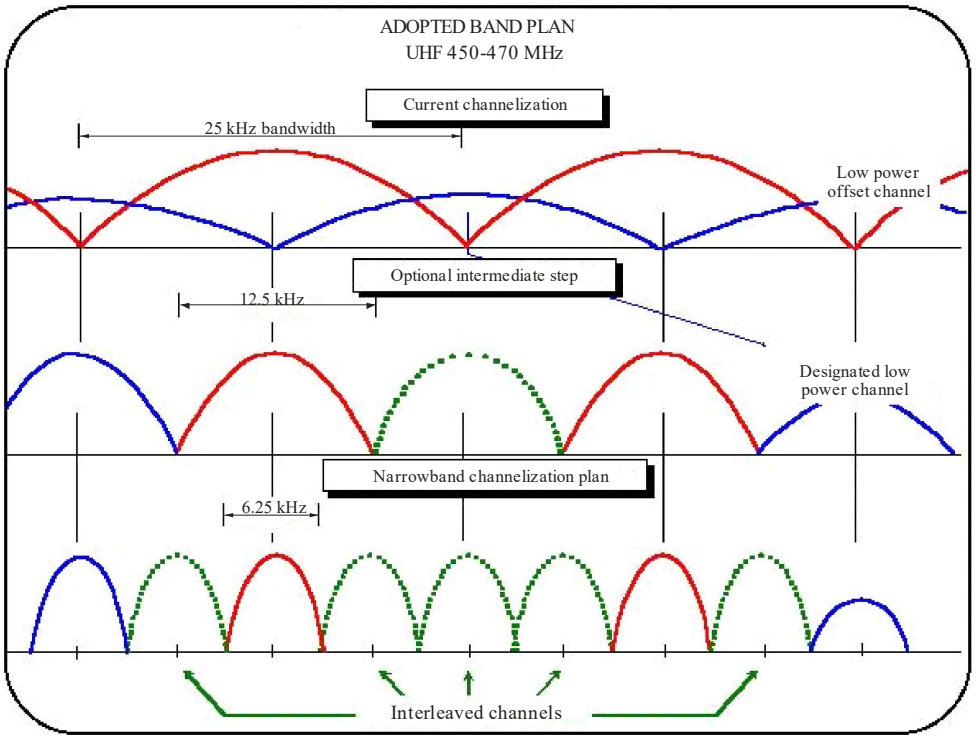

FIGURE 6

**450-470 MHz**

**Available nationwide, channels are generally spaced every 6.25 kHz, authorized**

**bandwidth**

**is 20 kHz, 11.25 kHz, or 6 kHz.**




SM.1603-06

FIGURE 7

**470-512 MHz**

**Shared with UHF-TV; available only in 11 cities, channels are spaced every 6.25 kHz, authorized bandwidth is 20 kHz, 11.25 kHz, or 6 kHz.**

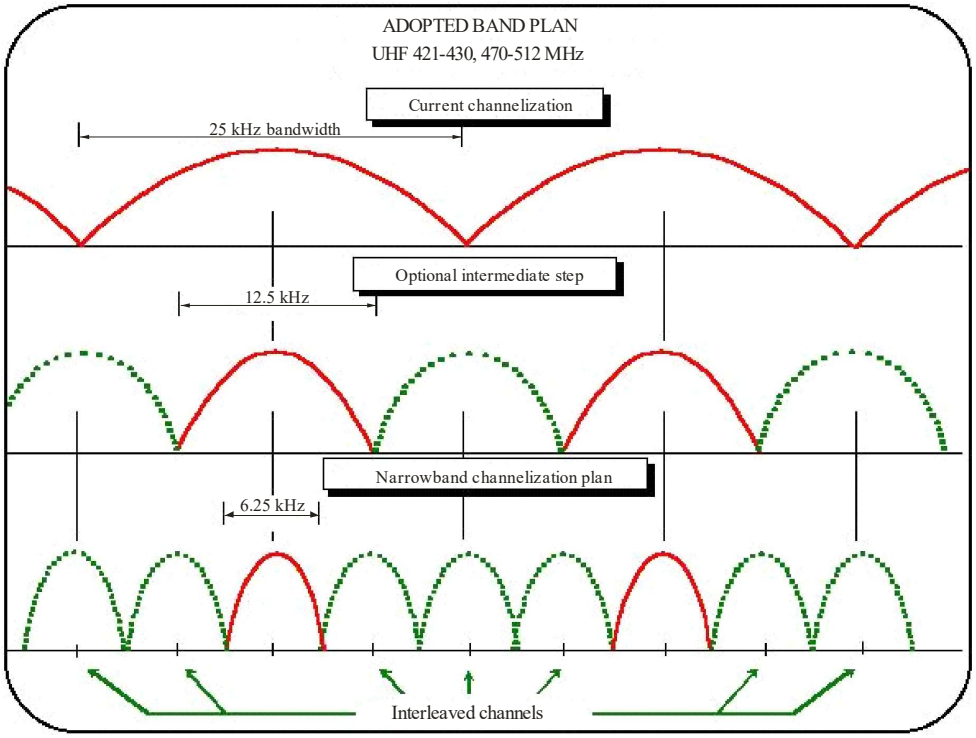
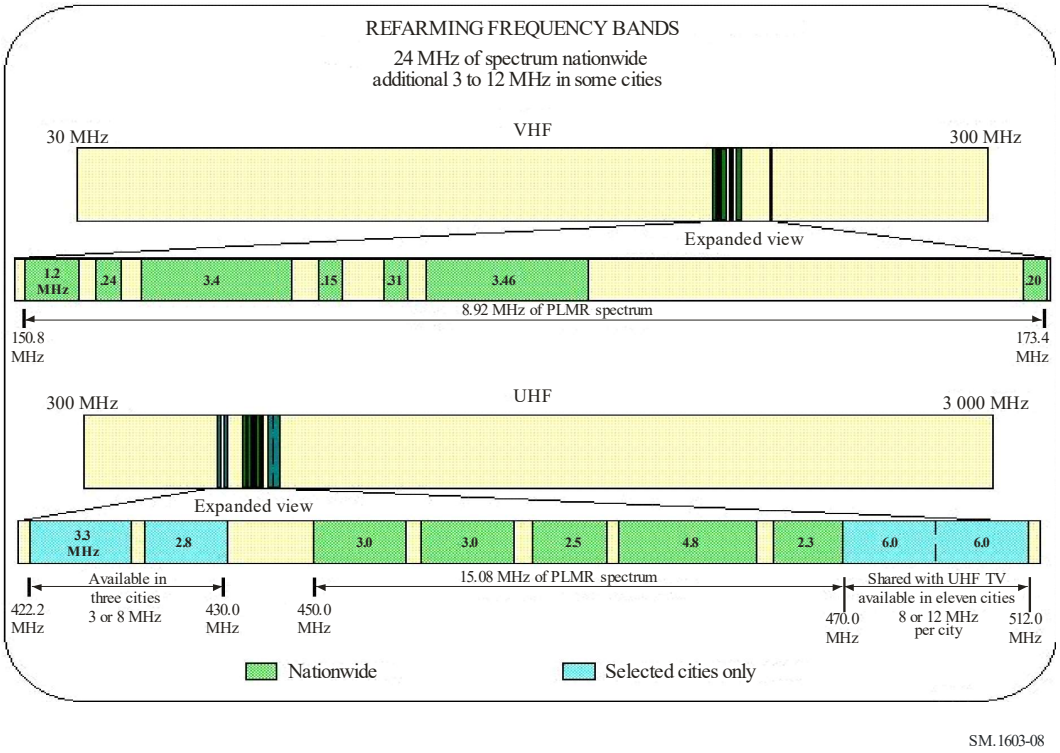


FIGURE 8




Information on the public safety radio systems operating in the 150-512 MHz radio bands and transition can be accessed at http://transition.fcc.gov/pshs/public-safety-spectrum/narrowbanding.html

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