

INDEPENDENT COMMUNICATIONS AUTHORITY OF SOUTH AFRICA

NO. 2786

25 November 2022

**HEREBY ISSUES A NOTICE REGARDING DRAFT RADIO FREQUENCY ASSIGNMENT PLANS FOR THE FREQUENCY BAND 138 TO 144 MHZ IN TERMS OF REGULATION 3 OF THE RADIO FREQUENCY SPECTRUM REGULATIONS, 2015**

1. The Independent Communications Authority of South Africa ("the Authority"), hereby publishes the **Draft Radio Frequency Spectrum Assignment Plan for the frequency band 440 MHz to 450 MHz for public consultation** in terms of regulation 3 of the Radio Frequency Spectrum Regulations 2015 and the Radio Frequency Migration Plan of 2013 and 2019.
2. The Radio Frequency Migration Regulations 2013 provide that upon completion of this Radio Frequency Spectrum Assignment Plan the Authority will issue a notice to users to be migrated (Regulation 6(1) of the Radio Frequency Migration Regulations of 2013)
3. Interested persons are hereby invited to submit written representations of their views on the RFSAPs, in both MS Word and .pdf format.

Submission must be made no later than 16h00 on Friday 13 January 2023.

4. Persons making representations are further invited to indicate whether they require an opportunity to make oral representations.
5. Written representations or enquiries may be directed by email to:

Attention:

Mr Manyapelo Richard Makgotlho

e-mail: rmakgotlho@icasa.org.za

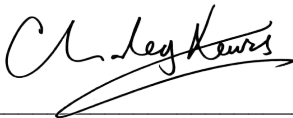
cc: jdikgale@icasa.org.za

6. All written representations submitted to the Authority pursuant to this notice will be made available for inspection by interested persons from 17 January 2023 at the ICASA Library. Electronic copies of such representations are obtainable on request and documents will be obtainable on payment of a fee.

440 - 450 MHz

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7. The draft plans and non-confidential representations will be uploaded to the ICASA website under this link: <https://www.icasa.org.za/legislation-and-regulations/radio-frequency-spectrum-plans/draft-radio-frequency-spectrum-plans>
8. In terms of section 4D of the ICASA Act, any person may request that any part of the pre-registration notice be treated as confidential. Confidential documents must be clearly marked as such and submitted together with the original written representation. Requests for Confidentiality must be submitted in line with the Guidelines for Confidentiality Request published in Government Gazette No 41839 (Notice No. 849) dated 17 August 2018.
9. Where an Applicant has requested confidentiality on sections of its written representations, the written representations must be accompanied by one (1) non-confidential copy with sections that are redacted. The non-confidential version of the written representations will be published for public comment if the request for confidentiality is granted. Requests for confidentiality will be considered within fourteen (14) working days of receiving the request. The Authority will communicate its decision to the respective Applicant.
10. In the event that the request for confidentiality is refused, the Applicant may choose to withdraw the information on which confidentiality is requested.



DR CHARLES LEWIS
ACTING CHAIRPERSON



Radio Frequency Spectrum Assignment Plan

Rules for Services operating in the Frequency Band
440 MHz to 450 MHz

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1 Glossary

In this Radio Frequency Spectrum Assignment Plan, terms used shall have the same meaning as in the Electronic Communications Act 2005 (no. 36 of 2005); unless the context indicates otherwise:

“Act”	means the Electronic Communications Act, 2005 (Act No. 36 of 2005) as amended
“Administration”	means any governmental department or service responsible for discharging the obligations undertaken in the Constitution of the International Telecommunication Union, in the Convention of the International Telecommunication Union and in the Administrative Regulations (CS 1002).
“DF”	means Dual Frequency
“DMR”	means Digital Mobile Radio
“EIRP”	means Effective Isotropic Radiated Power
“ERP”	means Effective Radiated Power
“FAP”	means Frequency Allocation Plan
“ITU”	means the International Telecommunication Union
“ITU-R”	means the International Telecommunication Union Radiocommunication Sector
“NRFP”	means the National Radio Frequency Plan 2021 for South Africa
“PAMR”	means Private Access Mobile Radio
“PMR”	means Public Mobile Radio
“PPDR”	means Public Protection and Disaster Recovery
“RFSAP”	means Radio Frequency Spectrum Assignment Plan
“SADC”	means Southern African Development Community

2 Purpose

2.1 The Radio Frequency Spectrum Assignment Plan (RFSAP) provides information on the requirements attached to the use of a frequency band in line with the allocation and other information in the National Radio Frequency Plan (NRFP). This information includes technical characteristics of radio systems, frequency channelling, coordination, and details on required migration of existing users of the band and the expected method of assignment.

- 2.2** This RFSAP states the requirements for the utilization of the frequency band 440 MHz - 450 MHz. The latest National Radio Frequency Plan 2021 aligns the allocation of this frequency band with the International Telecommunication Union (ITU) table with primary allocations to Fixed and Mobile. In this latest plan, too, there is an additional primary allocation for SPACE OPERATION (Earth-to-space) and SPACE RESEARCH (Earth-to-space) in South Africa.
- 2.3** The Authority resolved the following in the Radio Frequency Migration Plan 2019¹
- 2.3.1** A feasibility study into the possibility to use the band 440 MHz – 450 MHz for Public Protection and Disaster Recovery (PPDR) is to be performed.
- 2.3.2** A Radio Frequency Assignment Plan is to be developed.
- 2.3.3** The proposed allocations for this band are Short Range Business Radio and Public Mobile Radio (PMR²) services *only*. The band should be cleared of all other users. Communal repeaters can be allocated in this band
- 2.4** Therefore, a feasibility study was carried out concerning the 440-450 MHz band³ as mandated by the 2019⁴ Radio Frequency migration plan.
- 2.5** However, at the conclusion of the feasibility study into this band⁵, the Authority has concluded the following:
- 2.5.1** The Authority concludes that its thinking on this band at this stage is that there is a high risk of leading to more inefficient use of this spectrum band if it proceeds with a PPDR allocation and subsequent PPDR-based RFSAP. This is because the Authority has seen little to no evidence of a PPDR ecosystem emerging in this band as for other bands like 410-430 MHz and 450-470 MHz as was envisaged five years to a decade ago, and there is a strong case for largely maintaining the status quo and taking a longer-term outlook watching brief (i.e., > 3 years) for the band.
- 2.5.2** The Authority will also closely watch the activities happening in 446-446.2 MHz on Analogue and Digital PMR⁶ to make any further decisions given developments in Europe.
- 2.6** So, the intention of this RFSAP is to largely leave the band as it is today. The most recent ITU and Southern African Development Community (SADC) allocations are shown in Tables 1 and 2 for completeness.

¹ ICASA. 2019. Radio Frequency Migration Plan 2019. Government Gazette No 42337, 29 March 2019.

² Some key technical parameters for 446-446.1 MHz band short range devices (SRD) are listed in: Regulations in Respect of Licence Exemptions, Government Gazette No 31290 (Notice 926 of 2008), 29 July 2008.

³ Implementation of the Radio Frequency Migration Plan and the International Mobile Telecommunications (IMT) Roadmap for public consultation, Government Gazette No. 45690, 24 December 2021.

⁴ ICASA. 2019. Radio Frequency Migration Plan 2019. Government Gazette No 42337, 29 March 2019.

⁵ Implementation of the Radio Frequency Migration Plan and the International Mobile Telecommunications (IMT) Roadmap for public consultation, Government Gazette No. 45690, 24 December 2021.

⁶ EN 303 405 Analogue and Digital PMR446 Equipment.

Region 1	Region 2	Region 3
440-450	FIXED MOBILE except aeronautical mobile Radiolocation 5.269 5.270 5.271 5.284 5.285 5.286	

Table 1: ITU frequency allocations for the 440-450 MHz band.

440-450 MHz FIXED MOBILE except aeronautical mobile Radiolocation 5.269 5.270 5.271 5.284 5.285 5.286	440-450 MHz FIXED MOBILE except aeronautical mobile 5.286	PMR and/or PAMR PPDR PMR446 (446-446.1 MHz) FIXED (telemetry, dual frequency alarm systems)	The use of this band for PPDR to be studied. PMR446-ERC/DEC/(98)25
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Table 2: SADC Radio Frequency Spectrum Allocation Plan⁷ for the 440-450 MHz band

3 General

- 3.1 Technical characteristics of the equipment used for Fixed, Mobile, SPACE OPERATION (Earth-to-space) and SPACE RESEARCH (Earth-to-space) shall conform to all applicable South African standards, international standards, ITU and its radio regulations as agreed and adopted by South Africa
- 3.2 All installations must comply with safety rules as specified in applicable standards.
- 3.3 The equipment used shall be certified under South African law and regulations.
- 3.4 The allocation of this frequency band and the information in this RFSAP are subject to review.
- 3.5 Frequency band's sub-allocations will be as per South Africa's National Radio Frequency Plan for the 440-450 MHz band, as shown in Appendix A (Table 4).
- 3.6 The following documents may also be useful when considering the 440-450 MHz band:
- Decision (EU) 2019/1345, Commission Implementing Decision (EU) 2019/1345 of 2 August 2019 amending Decision 2006/771/EC updating harmonised technical conditions in the area of radio spectrum use for short-range devices (notified under document C (2019) 5660) (Text with EEA relevance.), 2 August 2019. (<https://docdb.cept.org/document/12983>)
 - ECC/DEC/ (19)02, ECC Decision of 8 March 2019 on Land mobile systems in the frequency ranges 68-87.5 MHz, 146-174 MHz, 406.1-410 MHz, 410-430 MHz, 440-450 MHz, and 450-470 MHz, 8 March 2019. (<https://docdb.cept.org/document/9680>)
 - T/R 25-08, Recommendation T/R of 30 May 2008 on Planning criteria and cross-border coordination of frequencies for land mobile systems in the range 29.7-470 MHz. Latest amended on 28 September 2018.

⁷ SADC Radio Frequency Spectrum Allocation Plan (SADC RFSAP) 8.3 kHz – 3000 GHz, Edition 2021, https://assets.website-files.com/5fb8ce4adbd6ad2ccc1423e7/612fe72be15121775ae6a121_2021%20SADC%20RADIO%20FREQUENCY%20SPECTRUM%20ALLOCATION%20PLAN.%20docx%5B1%5D.pdf

- ECC/DEC/ (15)05, ECC Decision of 3 July 2015 on the harmonised frequency range 446.0-446.2 MHz, technical characteristics, exemption from individual licensing and free carriage and use of analogue and digital PMR 446 applications. Amended on 2 March 2018.
- Decision (EU) 2017/1483, Commission Implementing Decision (EU) 2017/1483 of 8 August 2017 amending Decision 2006/771/EC on harmonisation of the radio spectrum for use by short-range devices and repealing Decision 2006/804/EC, 8 August 2017.
- CEPT Report 059, Annual update of the technical annex of the Commission Decision on the technical harmonisation of radio spectrum for use by short range device Addendum to the report is also to be found here, 17 June 2016.
- ECC Report 199, User requirements and spectrum needs for future European broadband PPDR systems (Wide Area Networks), 30 May 2013.
- ECC Report 099, TETRA Enhanced Data Services (TEDS): Impact on existing PMR/PAMR and Air Ground Air (AGA) systems in the 400 MHz band, 20 September 2007.
- ECC Report 097, Cross Border Interference for Land Mobile Technologies, 20 February 2007.
- ECC Report 102, Public protection and disaster relief spectrum requirements, 6 February 2007.
- CEPT Report 011, Report from CEPT to the European Commission in response to the Mandate on: EFIS (ECO Frequency Information System), 27 September 2006.
- ERC Report 075, Narrowband return path two way paging compatibility studies in the 406.1 - 410 MHz, 440 - 470 MHz and 862 - 871 MHz bands, 1999-05-01
- ETSI EN 303 405 V1.1.1 (2017-05) Land Mobile Service; Analogue and Digital PMR446 Equipment; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU⁸.

4 Channelling Plan

4.1 The frequency band 440 - 450 MHz will be assigned according to Figure 1.

⁸ https://www.etsi.org/deliver/etsi_en/303400_303499/303405/01.01.01_60/en_303405v010101p.pdf

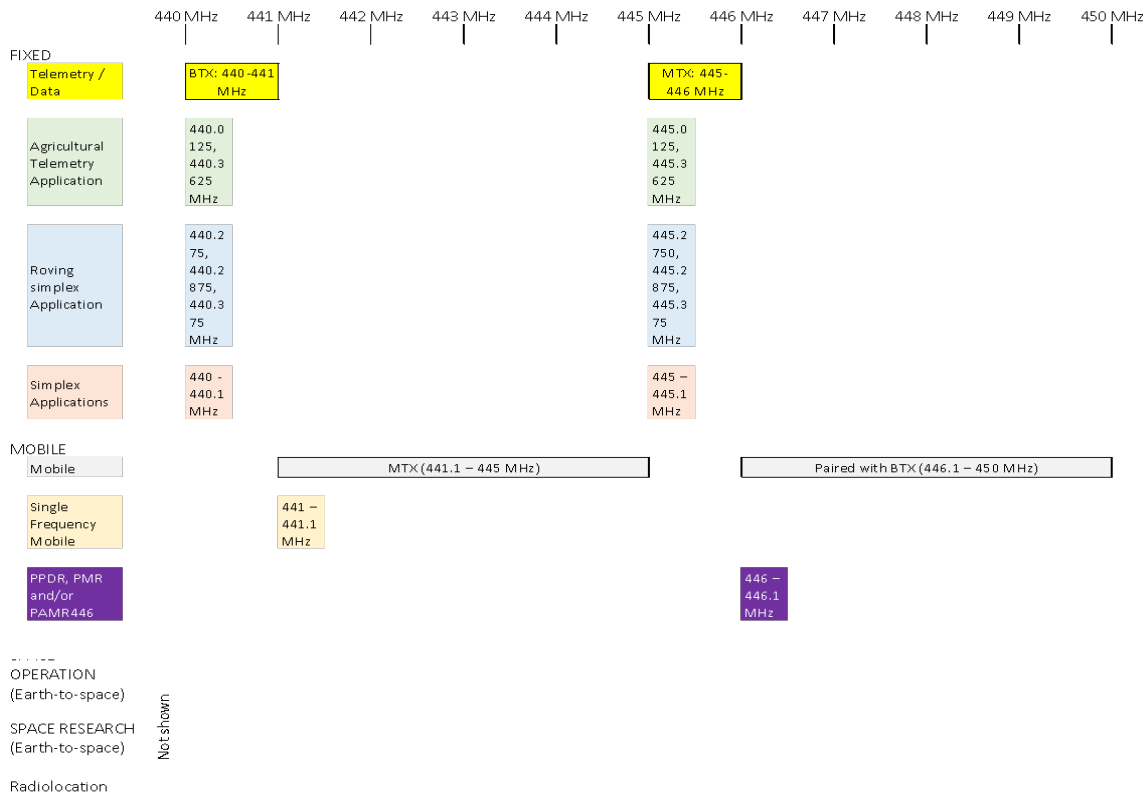


Figure 3. Band allocation, as per National Table of Frequency Allocations (see Appendix A). The allocations are shown as ranges or centre frequencies of the channels (separated by commas).

More details follow.

4.2 Channelling arrangements for analogue and digital land mobile systems with channel spacing of up to 25 kHz, of 50 kHz, 100 kHz, or 150 kHz, as guided by T/R 25-08⁹, is recommended to follow the following approach.

The channel centre frequencies (hereinafter called *centre frequencies*) use the following *preferred formula*. This preferred formula should be used whenever possible, but at least in new and re-farmed bands:

$$F_{CH} = \text{Band Edge} - (\text{Channel Spacing}/2) + n \times \text{Channel Spacing},$$

Where:

F_{CH} = channel centre frequency
 $n = 1, 2, 3, \dots$ - channel number;

⁹ Recommendation T/R 25-08, Planning criteria and cross-border coordination of frequencies for land mobile systems in the range 29.7-470 MHz, Approved 15 January 1990. Amended 28 September 2018. (<https://docdb.cept.org/document/909>, <https://docdb.cept.org/download/2544>)

Band Edge is the lower edge of allocated frequency band, i.e., 440 MHz.

For systems using a channel spacing of 200 kHz the centre frequencies should be selected according to the preferred formula with an option to offset these centre frequencies by 100 kHz.

- 4.2.1** Duplex or two-frequency simplex channel separation, location of sub-bands and guard bands ¹⁰
- 4.2.2** A sub-band can be simplex or duplex. The lower and upper part of a duplex sub-band should be in the same allocated band.
- 4.2.3** The frequencies of emissions of base or repeater stations should be placed in the upper band and those of mobile stations in the lower band. The same positions of upper and lower bands should be selected for bordering/adjacent countries.
- 4.2.4** The channel centre frequency of a digital land mobile system using a channel spacing greater than 25 kHz may be selected in a way that the channel pertaining to the centre frequency with its nominal channel spacing falls entirely into a sub-band and does not overlap the guard band necessary around the edges of simplex sub-bands and the edges of the lower parts and upper parts of duplex sub-bands.
- 4.2.5** For Analogue and Digital Public Mobile Radio (PMR) in the band 446-446.2 MHz, the requirements are listed in Government Gazette No 45690 dated 24 December 2021¹⁵ (replacing the channelisation scheme provided in Government Gazette 38641 dated 30 March 2015 which was compliant to 34.4) and refer to ETSI EN 303 405 ¹¹ and CEPT/ERC/REC 70-03 ¹².
- 4.2.6** The sub-band 440 - 441 MHz, follows Figure 3 above instead:
For low-power wide area networks (LPWAN) using the band 440 – 441 MHz, Government Gazette No 42230 ¹³ provides the following channel arrangements:
1. The 440 MHz to 441 MHz frequency band is split into a total of five 125 kHz bandwidth channels.
 2. These channels have a guard-band between them and are spaced 200 kHz apart as shown in Figure 4 and Table 3.

¹⁰ECC Recommendation T/R 25-08, Planning criteria and coordination of frequencies for land mobile systems in the range 29.7-470 MHz. <http://spectrum.welter.fr/international/cept/erc-recommendations/erc-recommendation-25-08-public-land-mobile-29-MHz-470-MHz.pdf>

¹¹ ETSI EN 303 405 V1.1.1 (2017-05) Land Mobile Service; Analogue and Digital PMR446 Equipment; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU. (https://www.etsi.org/deliver/etsi_en/303400_303499/303405/01.01.01_60/en_303405v010101p.pdf)

¹² ERC Recommendation 70-03, Relating to the use of Short Range Devices (SRD), Tromsø 1997, Subsequent amendments 12 February 2021 (<https://docdb.cept.org/download/25c41779-cd6e/Rec7003e.pdf>).

¹³ Radio Frequency Spectrum Assignment Plan: Rules for Services operating in the Frequency Band 440 to 441 MHz, Government Gazette No 42230, 15 February 2019, pages 212 - 222. (<https://archive.opengazettes.org.za/archive/Z/A/2019/government-gazette-ZA-vol-644-no-42230-dated-2019-02-15.pdf>)

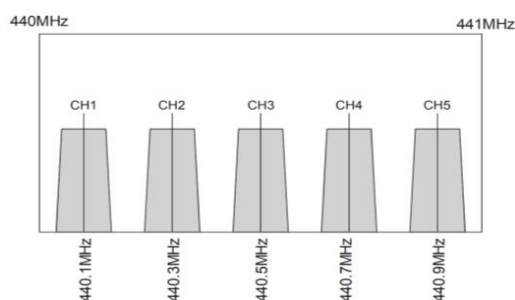


Figure 4. LPWAN channels in 440-441 MHz visualised

CHANNEL	CENTER FREQ	BANDWIDTH (kHz)
1	440.100MHz	125kHz
2	440.300MHz	125kHz
3	440.500MHz	125kHz
4	440.700MHz	125kHz
5	440.900MHz	125kHz

Table 3: LPWAN channels in 440-441 MHz

3. The frequency band 440 – 441 MHz provides a total bandwidth of 1 MHz for burglar alarms and related security telemetry services.

4.2.7 For PMR446 associated with the band 446.0 – 446.2 MHz, the guidance on channelisation is provided in ETSI EN 303 405 6 and ECC/DEC/(15)05¹⁴.

5 Requirements for usage of radio frequency spectrum

5.1 This chapter covers the minimum key characteristics considered necessary in order to make the best use of the available frequencies.

5.2 The use of the band is limited to Fixed, Mobile and SPACE OPERATION (Earth-to-space) and SPACE RESEARCH (Earth-to-space) on Primary basis.

5.3 In some cases, a radio system conforming to the requirements of this RFSAP may require modifications if harmful interference is caused to other radio stations or systems.

5.4 The allocation of spectrum and shared services within these bands are found in the National Radio Frequency Plan (NRFP), and an extract of NRFP is shown in Appendix A.

5.5 Maximum radiated power is specified through the Type Approval process for the equipment used.

5.6 In addition to §5.5 above, the land mobile systems with channel bandwidths of 6.25 kHz, 12.5 kHz and 25 kHz, 50 kHz, 100 kHz, 150 kHz and 200 kHz (the same requirements apply for channel bandwidth **between** 6.25 kHz and 200 kHz) should comply with requirements listed in ECC/DEC/(19)02¹⁵, including

5.6.1 Within the wanted channel at the carrier frequency, the effective radiated power used shall comply with the authorisation conditions. Normal effective radiated power

¹⁴ ECC Decision (15)05, The harmonised frequency range 446.0-446.2 MHz, technical characteristics, exemption from individual licensing and free carriage and use of analogue and digital PMR 446 applications. Approved 3 July 2015. Amended 2 March 2018. (<https://docdb.cept.org/download/1491>)

¹⁵ ECC Decision (19)02, Land mobile systems in the frequency ranges 68-87.5 MHz, 146-174 MHz, 406.1-410 MHz, 410-430 MHz, 440-450 MHz and 450-470 MHz. Approved 8 March 2019 (<https://docdb.cept.org/download/1455>)

emissions within the wanted channel do normally not exceed 40 dBm for user equipment and 53 dBm for base station equipment.

- 5.6.2 Transmitter Adjacent and Alternate Adjacent Channel Power:** The power in the first two lower and upper adjacent channels, shall not exceed a value of 60 dBc below the transmitter output power without the need to be below -36 dBm ERP. These limits are valid for all base stations, user equipment and repeaters.
- 5.6.3 Transmitter Unwanted Emissions in The Spurious Domain:** The unwanted emissions within the spurious domain during operation shall not exceed -36 dBm for frequencies up to 1 GHz and shall not exceed -30 dBm for frequencies above 1 GHz. In standby mode, the unwanted emissions shall not exceed -57 dBm for frequencies up to 1 GHz and shall not exceed -47 dBm for frequencies above 1 GHz.
- 5.6.4 Transmitter Intermodulation Attenuation:** This requirement applies only to transmitters to be used in base stations or repeaters. Intermodulation attenuation is a measure of the capability of a transmitter to inhibit the generation of signals in its non-linear elements caused by the presence of the transmitter power and an interfering signal entering the transmitter via its antenna. In general, the intermodulation attenuation ratio shall be at least 40 dB for any intermodulation component. Note that the Administration may require a more stringent intermodulation attenuation requirement for base station equipment to be used in special service conditions, e.g., at sites where more than one transmitter will be in service, this is recommended to be at least 70 dB for any intermodulation component.
- 5.6.5 Transmitter Adjacent Channel Transient Power:** Transient power is the power falling into adjacent spectrum due to switching the transmitter on and off. The transient power in the adjacent channels (e.g., caused by push-to-talk functionality) shall not exceed -60 dBc in the adjacent channels, or -50 dBc for equipment, without the need to be below -36 dBm.
- 5.6.6 Receiver Adjacent Channel Selectivity:** The adjacent channel selectivity is the measure of the capability of the receiver of the land mobile system to receive a wanted modulated signal at the nominal operating frequency without exceeding a given degradation due to the presence of another land mobile system in assumed 25 kHz channels adjacent to the channel bandwidth for which the equipment is intended. E.g., the centre of an adjacent channel relative to the centre of the nominal channel is at +/- 62.5 kHz for a land mobile system operating with a 100 kHz channel bandwidth. The adjacent channel selectivity is described with the following table:

Channel bandwidth	Unwanted signal levels
Up to 200 kHz	-37 dBm

- 5.6.7 Receiver blocking: Blocking** is the measure of the capability of the receiver to receive a wanted modulated signal without exceeding a given degradation due to the presence

of an unwanted input signal at any frequencies outside of the wanted channel and the first two lower and upper adjacent. The blocking level shall not be less than -27 dBm.

- 5.6.8** The blocking level shall not be less than -27 dBm. It is possible that interference may still occur despite fulfilling the above requirements. If interference, guidance provided in Appendix B will may be followed
- 5.7** In addition to §5.5 above, for Analogue and Digital Public Mobile Radio (PMR) in the band 446-446.2 MHz, the requirements listed in Government Gazette No 45690 dated 24 December 2021¹⁶ (e.g., maximum radiated power 500 mW ERP) must be complied to.
- 5.8** In addition to 5.5, as per Government Gazette 42230, all transmissions from any low power wide area networks/burglar alarms and security related telemetry operating in 400 – 401 MHz band, should not exceed 100 mW (20 dBm) EIRP.
- 5.9** On a case-by-case basis, higher EIRP may be permitted. In some cases, a radio system conforming to the requirements of this RFSAP may require modifications if major interference is caused to other radio stations or systems.

6 Implementation

- 6.1** This RFSAP shall be effective on the date of issue.
- 6.2** No new assignment for the band 440 – 450 MHz shall be approved unless they comply with this RFSAP.

7 Co-ordination Requirements

- 7.1** Coordination is performed by the Authority during the process of assignment.
- 7.2** Planning characteristics in border areas

The location, the power, and the antenna heights of all stations in the network should be selected in such a way that their range is confined, as far as possible, to the zone to be covered by the intended service.

Excessive antenna heights and transmitter outputs should be avoided, by using several locations of reduced height wherever possible. In border areas directional antennas should be used to minimise the interference potential.

The effective radiated power and the height of the antenna should be as low as possible in relation to the area to be served.

- 7.3** In the event of any interference, the Authority will require affected parties to carry out coordination. If the interference continues to be unresolved after 24 hours, the affected parties may refer the matter to the Authority for a resolution. The Authority will decide the necessary modifications and schedule of modifications to resolve the dispute. The Authority will be guided by the interference resolution process as shown in Appendix B.
- 7.4** Assignment holders shall take full advantage of interference mitigation techniques such as antenna discrimination, tilt, polarization, frequency discrimination, shielding/blocking (introduce diffraction loss), site selection, and/or power control to facilitate the coordination of systems.

¹⁶ Amendment of the radio frequency spectrum regulations, 2015, Government Gazette No 45690, 24 December 2021 (https://www.gov.za/sites/default/files/gcis_document/202112/45690gen737.pdf).

7.5 Indicative coordination thresholds for analogue or digital land mobile systems, as per T/R 25-08¹⁷

7.5.1 The aim of coordination thresholds is to avoid harmful interference between stations located in neighbouring countries. To achieve this, indicative coordination thresholds are established which should not be exceeded without coordination between neighbouring countries.

7.5.2 Indicative coordination thresholds for land mobile systems (co-channel, 50% locations, 10% time¹⁸, 10 m receiving antenna height, within a reference bandwidth of 25 kHz, at the border-line) is 20 dB(μ V/m).

7.5.3 For systems using a channel spacing greater than 25 kHz, the following bandwidth conversion formula can be used provided that the spectral power distribution within this channel spacing is uniform within the channel:

$$BC = 10 \times \log_{10} (\text{channel spacing} / 25 \text{ kHz}), \text{ dB}$$

7.5.4 The value (BC) resulting from the formula should be added to the indicative coordination threshold as listed above.

7.5.5 For all other spectral power distributions, indicative coordination threshold levels should be applied within every 25 kHz bandwidth within the channel spacing.

8 Assignment

8.1 Standard Approach

The assignment of frequency will take place according to the Standard Application Procedures in the Radio Frequency Spectrum Regulations 2015.

9 Revocation

9.1 Not applicable.

10 Frequency Migration

10.1 Specific Procedure

There is no specific technical procedure needed.

¹⁷ Recommendation T/R 25-08: "Planning criteria and cross-border coordination of frequencies for land mobile systems in the range 29.7-470 MHz", Approved 15 January 1990, Amended 28 September 2018, <https://docdb.cept.org/document/909>

¹⁸ In certain situations, the 1% time curves should be used for digital systems, e.g. to better protect analogue systems.

APPENDIX A National Radio Frequency Plan

Table 4 shows an extract from the National Frequency Plan for South Africa.

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
440-450 MHz FIXED	440-450 MHz FIXED	Telemetry / Data BTX (440 – 441 MHz) FIXED (telemetry, dual frequency alarm systems) Agricultural Telemetry Application Roving simplex Application	Paired with MTX (445 – 446 MHz) Channels 440.0125, 440.3625, 445.0125 and 445.3625 MHz are used for Agricultural Telemetry. Channels 440.275 MHz, 440.2875 MHz, 445.2750 MHz, 445.2875 MHz, 440.375 MHz and 445.375 MHz are roving simplex channels. Channels 440 - 440.100 MHz and 445 – 445.1 MHz are used as simplex.
MOBILE except aeronautical mobile	MOBILE except aeronautical mobile	Simplex Applications Mobile MTX (441.1 – 445 MHz) Single Frequency Mobile (441 – 441.1 MHz)	Paired with BTX (446.1 – 450 MHz) 8 channels - PMR446-ERC/DEC/ (98)25
Radiolocation 5.269 5.270 5.271 5.284 5.285 5.286	SPACE OPERATIONS (Earth-to-space) SPACE RESEARCH (Earth-to-space) Radiolocation 5.269 5.270 5.271 5.284 5.285 5.286	PPDR, PMR and/or PAMR446 (446 – 446.1 MHz)	Radio Frequency Spectrum Assignment Plan GG 42230 Notice 74 of 2019 Radio Frequency Spectrum Regulations (Annex B) (GG. No. 38641, 30 March 2015). Further studies Final Frequency Migration Plan 2019 (GG No .42337 Notice 36 of 2019)

Table 4: National Radio Frequency Plan for South Africa for 440 to 450 MHz band¹⁹

¹⁹ National Radio Frequency Plan 2021, (NRFP-21) 8.3 kHz – 3000 GHz, Independent Communications Authority of South Africa, Government Gazette No 46088 (Notice 911 of 2022), 25 March 2022 (<https://www.icasa.org.za/uploads/files/National-Radio-Frequency-Plan-2021.pdf>)

Appendix B Interference Resolution Process

Technical procedures related to bilateral and multilateral cross-border frequency coordination agreements for four (4) geographical sub-regions are defined by the African Union, which includes the Southern African sub-region of ten (10) countries. Cross-Border Frequency Coordination and interference resolution should follow the Harmonized Calculation Method for Africa (HIPSSA²⁰ and (HCM4A)²¹ or any appropriate method applicable.

When requesting coordination, the relevant characteristics of the base station and the code or PCI group number should be forwarded to the Administration affected. All the following characteristics should be included:

- a) carrier frequency [MHz]
- b) name of transmitter station
- c) country of location of transmitter station
- d) geographical coordinates [latitude, longitude]
- e) effective antenna height [m]
- f) antenna polarisation
- g) antenna azimuth [degrees]
- h) antenna gain [dBi]
- i) effective radiated power [dBW]
- j) expected coverage zone or radius [km]
- k) date of entry into service [month, year].
- l) code group number used
- m) antenna tilt [degrees]

The Administration affected will evaluate the request for coordination and will, within thirty (30) days, notify the Administration requesting coordination the result of the evaluation. If, in the course of the coordination procedure, the Administration affected requires additional information, it may request such information.

If no reply is received by the Administration requesting coordination within (30) days, it may send a reminder to the Administration affected. Where the Administration fails to respond within thirty (30) days following communication of the reminder will be deemed to have given its consent, and the code coordination may be put into use with the characteristics given in the request for coordination.

The above-mentioned periods are subject to extension by common consent.

²⁰ Cross-Border Frequency Coordination: Harmonized Calculation Method for Africa (HCM4A), Agreement. HIPSSA - Harmonization of ICT Policies in Sub-Saharan Africa, ITU, 2013, 54pp. Available online at https://www.itu.int/en/ITU-D/Projects/ITU-EC-ACP/HIPSSA/Documents/FINAL%20DOCUMENTS/FINAL%20DOCS%20ENGLISH/hcm4a_agreement.pdf.pdf

²¹ Cross-Border Frequency Coordination Agreement Harmonized Calculation Method for Africa (HCM4A): On the coordination of frequencies between 29.7 MHz and 43.5 GHz For the fixed service and the land mobile service. Adopted on [01.01.2022]. DRAFT, 25pp. Available online at https://www.itu.int/en/ITU-D/Projects/ITU-EC-ACP/PRIDA/PublishingImages/Pages/default/HCM4A_2022_%20Main%20text_and%20annex%2012%20EN_v.0.pdf