GOVERNMENT GAZETTE

OF THE

REPUBLIC OF NAMIBIA

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COMMUNICATIONS REGULATORY AUTHORITY OF NAMIBIA

No. 444 2021

THE FREQUENCY CHANNELING PLAN FOR THE SPECTRUM BANDS 694-790 MHz

The Communications Regulatory Authority of Namibia in terms of section 100 of the Communications Act, 2009 (Act No. 8 of 2009):

a) Makes the Frequency Channeling Plan for the Spectrum Band 694-790 MHz as set out in the Schedule; and

b) repeals the Frequency Channeling Plan for the Spectrum Band 694-790 MHz as published in Government Gazette No. 6160, General Notice No. 423 on 28 October 2016.

H. M. GAOMAB II
CHAIRPERSON OF THE BOARD OF DIRECTORS
COMMUNICATIONS REGULATORY AUTHORITY OF NAMIBIA

SCHEDULE

FREQUENCY CHANNELING PLAN FOR THE SPECTRUM BANDS 694-790 MHz

(a) **Background**

The following principles have been considered to define the IMT frequency arrangement:

i. To facilitated in the implementation of mobile broadband communications for robust and reliable mission critical emergency services for Public Protection and Disaster Relief (PPDR) in accordance with Resolution 646 (WRC-19);

ii. Spectrum efficiency and high level of flexibility in order to adapt to national circumstances as well as to meet the changing need and demand for capacity in time and geography;

iii. Protection to broadcasting services below 694 MHz;

iv. Use of a 5 MHz block approach which is in line with the foreseen mobile systems to be used in the 700 MHz spectrum band; and

v. Facilitation of roaming and cross-border coordination.

Recommendation ITU-R M.1036-6 as approved by the ITU Radio Assembly provides as follows-

"International Mobile Telecommunications (IMT) encompasses both IMT-2000 and IMT-Advanced collectively.

Key features of IMT-2000 and IMT-Advanced are contained in Recommendation ITU-R M.1645 and ITU-R M-1822. Frequency aspects and unwanted emission parameters are contained in Recommendations ITU-R M.1580, IT-R M.1581, ITU-R M.2070 and ITU-R M.2071."

Definitions

1. In these regulations, a word or expression to which a meaning is assigned in the Act or the Regulations has the same meaning, and unless the context otherwise indicates

"**Act**" means the Communications Act, 2009 (Act No. 8 of 2009)
"**IMT**" means International Mobile Telecommunications
"**ITU**" means International Telecommunications Union
"**WRC**" means ITU World Radio Conference

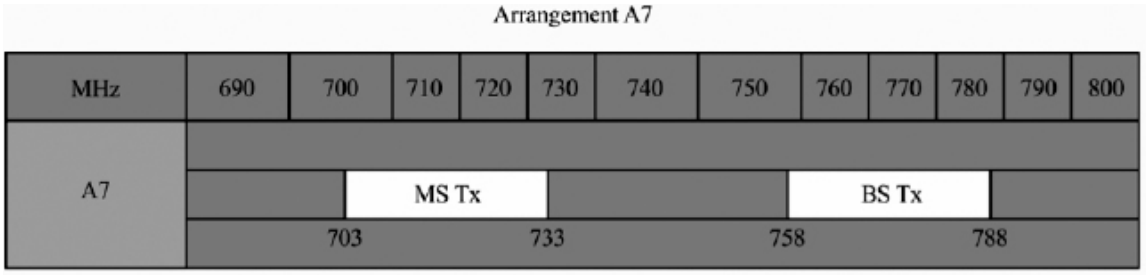
Purpose

2. To set out the Frequency Channeling plan for the provision of IMT services in the spectrum bands 694-790 MHz

Frequency channeling arrangement for the 694-790 MHz spectrum band

3. As graphically depicted below, 2x 30 MHz (6 blocks of 5 MHz each) FDD spectrum will be allocated for IMT services. This frequency arrangement was approved by the ITU Radio Assembly as contained in ITU-R M.1036-6 and is shown in Figure 1.

Figure 1



4. The allocation for PPDR services in accordance with Resolution 646 (WRC-19) and the SADC Framework for Harmonisation of Radio Frequency Spectrum for Public Protection and Disaster Relief (PPDR)-

a. 698 – 703 MHz for Uplink and 753 – 758 MHz for downlink (2x5 MHz); and

b. 733 -736 MHz uplink and 788 – 791 MHz downlink (2x3 MHz) is shown in Figure 2 below:

Figure 2

698-703	703-708	708-713	713-718	718-723	723-728	728-733	733-736	736-753	753-758	758-763	763-768	768-773	773-778	778-783	783-788	788-791
PPDR a) up-link	b) IMT uplink (MFCN)						PPDR c) up-link	…	PPDR a) down-link	b) IMT downlink (MFCN)						PPDR c) down-link
5 MHz	30 MHz (6 blocks of 5 MHz)						3 MHz		5 MHz	30 MHz (6 blocks of 5 MHz)						3 MHz

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COMMUNICATIONS REGULATORY AUTHORITY OF NAMIBIA

No. 445 2021

AMENDMENT TO REGULATIONS PRESCRIBING THE NATIONAL NUMBERING PLAN FOR USE IN THE PROVISION OF TELECOMMUNICATIONS SERVICES IN THE REPUBLIC OF NAMIBIA, NUMBERING LICENCE FEES AND PROCEDURES FOR NUMBER LICENCES: COMMUNICATIONS ACT, 2009

The Communications Regulatory Authority of Namibia, in terms of Sections 81(5) and 129 of the Communications Act, 2009 (Act No. 8 of 2009), amends the Regulations Prescribing the National Numbering Plan for Use in the Provision of Telecommunications Services in the Republic of Namibia, Numbering Licence Fees and Procedures for Number Licences as published in the Government Gazette No. 5983, General Notice No. 18 dated 01 April 2021 as set out in the Schedule.

H. M. GAOMAB II
CHAIRPERSON
COMMUNICATIONS REGULATORY AUTHORITY OF NAMIBIA

SCHEDULE

AMENDMENT OF THE REGULATIONS PRESCRIBING THE NATIONAL NUMBERING PLAN FOR USE IN THE PROVISION OF TELECOMMUNICATIONS SERVICES IN THE REPUBLIC OF NAMIBIA, NUMBERING LICENCE FEES AND PROCEDURES FOR NUMBER LICENCES: COMMUNICATIONS ACT, 2009

Amendment of regulation 39

1. Regulation 39 of the Regulations is amended by the substitution for subregulation (1)(b) of the following subregulation

(a) The Authority shall calculate the chargeable fee per number based on the 'chargeable quantity of numbers by applying the reference value to a weight,[1] to reflect the value of shorter numbers.

Number	Weight
3 Digit Numbers	=1 000,000
4 Digit Numbers	=100,000
5 Digit Numbers	=10, 000
6 Digit Numbers	=1, 000
7 Digit Numbers	=100
8 Digit Numbers	=10
9 Digit Numbers	= 1

2. Regulation 39 of the Regulations is amended by the substitution for subregulation (1)(e) of the following subregulation

(e) The reference value is determined by the Authority as set out in Annexure **D** and may be reviewed on annual basis.

3. Regulation 39 of the Regulations is amended by the repeal of subregulation (1)(f).

ANNEXURE D

Regulation 39(e)

CHARGEABLE FEE

In terms of regulation 39(e) the Authority hereby determine the reference value.

*The reference value is set at Zero Namibian Dollars and Four Eight Zero Three Cents (**N$ 0.4803**).*

Number	Weight	N$ (fees payable)
3 Digit Numbers	=1 000,000	=480,300
4 Digit Numbers	=100,000	=48,030
5 Digit Numbers	=10, 000	=4,803
6 Digit Numbers	=1, 000	=480.30
7 Digit Numbers	=100	=48.03
8 Digit Numbers	=10	=4.803
9 Digit Numbers	= 1	= 0.4803

Annual Number Fee = number x weight x reference value

[1] Weighting refers to the total numbers not available for use if a certain number with lesser digits is allocated for use to a licensee.

ANNEXURE E

DISCUSSION PAPER ON NUMBERING FEES FOR CRAN

1. Introduction

In 2016 CRAN set out *Regulations prescribing the National Numbering Plan for use in the Provision of Telecommunications Services in the Republic of Namibia, Numbering Licence Fees and Procedures for Number Licences*. The fees prescribed in these regulations were charged for the first time in 2018 and then in subsequent years. Telecom Namibia and MTC challenged the fees based on section 81(5) which states that "*the Authority must allocate numbers in return for a fee that is no greater than necessary to compensate for the management costs of the numbering plan and control of its use."*

The objectives of the Act guide all of CRAN's actions: The fees CRAN collects are subject to the objectives of the Act, which fit in with the general trend towards liberalisation, privatisation and increased competition in order to meet the objectives of affordability and increased penetration.

2. Economics of Numbering

The rise of new services and the advent of competition have given to telecommunication numbers a significant economic dimension. Any economic considerations around numbers arise for two main reasons:

- First, a fairly administered numbering plan can facilitate competition in service provision and thus bring benefits to users by reducing tariffs and by increasing the quality standards in services provided. In order for competition to flourish, however, operators and service providers should be treated on an equal basis regarding access to number resources.

- Second, numbers become important tools in the hands of value-added service providers. Given that most of these services are highly profitable for operators, the allocation of specific number ranges to provide exclusive access to services such as mobile telephony, personal communication and premium rate services increases the value of numbers. Moreover, it is recognised that a limited range of numbers contain "higher" value than others because their memorable structure brings benefits to the called party. (OCDE/GD(95)117).

As competition increases and new numbering requirements emerge it becomes universally recognised that "*telephone numbers are a national resource and should be for the customer -- not for the operators to brand*" (OFTEL, 1993a). New operators and service providers need to have access to numbers and have the right to utilise them in a way that best suits their needs and can facilitate service provision.

Not all number ranges have the same value to users. Different users may attribute more value to a number than others based on how easy it is to remember and what it might be utilised for. Numbers are therefore a scarce resource that should be managed and paid for taking the economic value of the number into consideration.

3. Current Numbering Fees

Regulation 39(f) of the Regulations Prescribing the National Numbering Plan for Use in the provision of Telecommunications Services in the Republic of Namibia, Numbering Licence Fees and Procedures for Number Licences set the reference value for numbers at N$ 1.00. The Regulation further makes provision that it should be reviewed every three (3) years.

In line with the above requirement CRAN has therefore decided that a recalculation of numbering fees have to be done as well as some amendments to the current regulations.

The current numbering fees are as follows:

3 Digit Numbers	= 1,000,000
4 Digit Numbers	= 100,000
5 Digit Numbers	=10,000
6 Digit Numbers	=1,000
7 Digit Numbers	=100
8 Digit Numbers	=10
9 Digit Numbers	= 1

4. CRAN Financials for Numbering

The total cost of managing the numbering plan includes cost for the numbering audit, legal fees, calculation of fees, management of number portability, etc.

The costs from 2018/2019 to 2022/2023 are as follows:

Table 1: Financials and Calculations for Numbering					
	2018/2019	**2019/2020**	**2020/2021**	**2021/2022**	**2022/2023**
Financials	6,696,309	7,654,700	2,000,000	2,090,000	2,184,050
Numbers	41,208,451	48,988,851	4,164,462	4,164,462	4,164,462
Cost/number	***0.16***	***0.155***	***0.4803***	***0.502***	***0.5244***
Source:	*AFS for CRAN 2018/19 – 2019/20*		*Budget 2020/2021*	*Projected Budget*	

There are a number of reasons on why the cost per number increased:

a. Due to more efficient number use 3-digit numbers were withdrawn by licensees and licensees started utilising 5-digit numbers; and

b. Unutilised numbers were withdrawn;

The CRAN budget to manage the number licenses have also decreased due to fewer number licences, but the total cost per number still increased.

5. Numbering Fees in other Jurisdictions

Most countries that charge fees for numbering resources have a number of fees that are charged for such as registration-, usage- and annual fees. A number of SADC countries do not charge numbering fees at all even though they have numbering plans due to their legislation not providing for the charging for numbers.

Table 2: Zambia ZICTA's Fee structure for Numbering	**Fee Units**	
Item	**ZMW**	**N$**
Registration fees		
All other categories	40,000	26,942
Carrier pre-selection	200,000	134,712
Annual Fees (C)	1	0.674
Annual Fee (F_A)		
Annual Return	233	157

Table 2: Zambia ZICTA's Fee structure for Numbering	Fee Units	
Item	**ZMW**	**N$**
Other Codes		
Mobile Network Code	20,000	13,471
National Destination Code	20,000	13,471
International Signaling Point Codes	20,000	13,471
National Signaling Point Codes	20,000	13,471
Network Colour Codes	20,000	13,471
SIM Headers	10,000	6,736
Service Numbers (Freephones, Premiums)	10,000	6,736
Carrier Selection Codes	100,000	67,356
Short Codes		
3 digits	100,000	67,356
4 digits	60,000	40,414
Source:	https://www.zicta.zm/storage/posts/attachments/0r9W6SdgD02vUW4N7D8k5NlA9dDCeVDex-QDHFzx8.pdf	

- *Registration fees are once-off fees to be paid at lodging the application*
- *The subscriber number (C) fee set out in the table shall be the application fee for the purpose of determination of the annual numbering fee formulae, where C=1 unit*
- *For resource user's individually assigned number blocks, the payable annual fees shall be calculated as per equation below; F_A=B x C, where a. F_A is the annual numbering fee to be paid by resource user, B is the total number block assigned, allocated to the resource user C, C is the fee for each subscriber number in the assigned number block allocated to the resource user*

Uganda charges no fees for the other numbering resources except for short codes. Their numbering plan is currently under review.

Tanzania also uses a number of fees.

Table 3: Tanzania TCRA's Fee structure for Numbering						
Type of Numbering Resource	**Application**		**Registration**		**Annual Maintenance Fee**	
	USD	**N$**	**USD**	**N$**	**USD**	**N$**
Prefix for Networks (NDC & MNDC)	10	145	2,000	29,055	2,000	29,055
Subscriber Numbers	N/A		N/A		0.20/subscriber number	2.89
National Signaling Point	10	145	2,000	29,055	2,000	29,055
International Signaling Point	10	145	2,000	29,055	2,000	29,055
Mobile Network Identification Code	10	145	2,000	29,055	2,000	29,055
SIM Header	10	145	2,000	29,055	2,000	29,055
Data Network Identification Codes	10	145	2,000	29,055	2,000	29,055

Table 3: Tanzania TCRA's Fee structure for Numbering						
Type of Numbering Resource	**Application**		**Registration**		**Annual Maintenance Fee**	
	USD	**N$**	**USD**	**N$**	**USD**	**N$**
Corporate Services Network Access Numbers	10	145	2,000	29,055	2,000	29,055
Carrier Selection/Preselection Codes	10	145	10,000	145,277	5,000	72,639
Premium Rate Access Codes	10	145	10,000	145,277	5,000	72,639
Special and Fixed Access Codes (block)	10	145	1,000	14,528	2,000	29,055
Special and Fixed Access Codes Premium Rate Access codes (Single number)	10	145	2,000	29,055	2,500	36,319
VAS SMS & Special Services Short Codes:						
Gold	10	145	4,000	58,111	2,500	36,319
Source:	https://www.tcra.go.tz/document/Application%20Guidelines%20and%20Fees%20for%20Numbering%20Resources%20-%20April%202018					

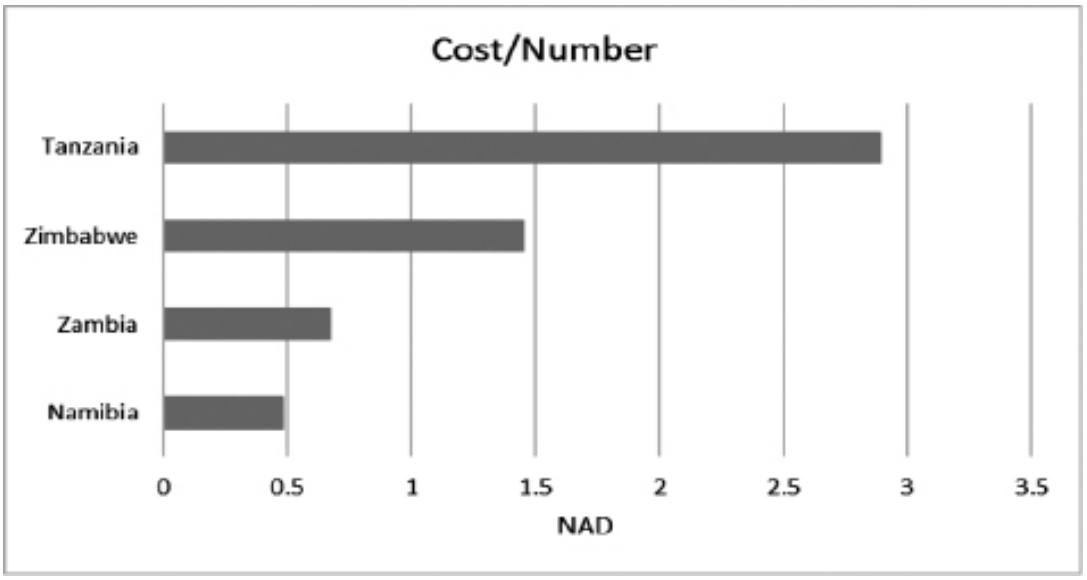
Zimbabwe has the following fee structure for numbering.

Table 4: Zimbabwe - POTRAZ's license fee structure		
	USD	**N$**
Subscriber numbers	0.10/unit	1.45
Network Destination Codes	50	723
Premium Rate service Short Code	1,200	17,356
No Premium Rate service Short Code	50	723
International Signaling Point Codes	50	723
National Signaling Point Codes	50	723
Mobile Network Identifiers – MNC + NCC	50	723
System Access (USSD) Short Codes	50 (excl 15% VAT)	723 (excl 15% VAT)
Premium Rates Short Code	1,200 (excl 15% VAT)	17,356 (excl 15% VAT)
Source	http://www.potraz.gov.zw/?p=80	

ICASA is not charging any numbering fees.

Namibia's proposed numbering fees are on par with those countries in the SADC region that charge for numbering and is lower than most countries used in the comparison.

Figure 1: Numbering Fees in SADC (N$/number)



6. Conclusion and Recommendations

The following is therefore recommended:

a. A reference value of NAD 0.4803 per number based on the costing and approved budget of CRAN resulting in the table below:

Number	Weight	Fee in NAD
3 Digit Numbers	1,000,000	= 480,300
4 Digit Numbers	100,000	= 48,030
5 Digit Numbers	10,000	= 4,803
6 Digit Numbers	1,000	= 480.30
7 Digit Numbers	100	= 48.03
8 Digit Numbers	10	= 4.803
9 Digit Numbers	1	= 0.4803

Annual Number Fee = number x weight x reference value

b. That a new fee for numbering be determined, annually, based on the cost in the approved budget and the number audit to ensure no over– or under recovery as set out in section 81(5) of the Communications Act.

7. References

OECD (1995-01-01), "The Economic and Regulatory Aspects of Telecommunication Numbering", OECD Digital Economy Papers, No. 12, OECD Publishing, Paris. http://dx.doi.org/10.1787/237502514428

http://www.potraz.gov.zw/?p=80

https://www.tcra.go.tz/document/Application%20Guidelines%20and%20Fees%20for%20Numbering%20Resources%20-%20April%202018

https://www.zicta.zm/storage/posts/attachments/0r9W6SdgD02vUW4N7D8k5NlA9dDCeVDexQDHFzx8.pdf

COMMUNICATIONS REGULATORY AUTHORITY OF NAMIBIA

No. 446 2021

AMENDMENT OF THE REGULATIONS PRESCRIBING PROCEDURES REGARDING APPLICATION FOR, AND AMENDMENT, RENEWAL, TRANSFER AND CANCELLATION OF SPECTRUM LICENCES: COMMUNICATIONS ACT, 2009

The Communications Regulatory Authority of Namibia, under section 129 read with section 101(14) and section 101(16) of the Communications Act, 2009 (Act No. 8 of 2009) -

(a) Amends the Regulations Prescribing Procedures Regarding Application for, and Amendment, Renewal, Transfer and Cancellation of Spectrum Licences published in the Government Gazette No. 6888, General Notice No. 104 dated 29 April 2019;

(b) Repeals the amendment to the Regulations prescribing Procedures regarding Application for, and Amendment, Renewal, Transfer and Cancellation of Spectrum Licences published in the Government Gazette No. 7196, General Notice No. 152 dated 29 April 2020.

H. M. GAOMAB II
CHAIRPERSON OF THE BOARD
COMMUNICATIONS REGULATORY AUTHORITY OF NAMIBIA

SCHEDULE

Definitions

1. In these Regulations, any word or expression to which a meaning is assigned in the Act, shall have the same meaning and –

"Act" means the Communications Act, 2009 (Act No. 8 of 2009)

"Regulations" means the Regulations Prescribing Procedures Regarding Application for, and Amendment, Renewal, Transfer and Cancellation of Spectrum Licences published in the Government Gazette No. 6888, General Notice No. 104 dated 29 April 2019.

"WRC-19" means World Radio Conference held from 28 October 2019 to 22 November 2019 in Sharm El-Sheikh, Egypt.

Substitution of regulation 12 (9) and 12(10) of Regulations

2. Regulation 12(9) and 12(10) of the Regulations is hereby amended by the substitution of those paragraphs with the following paragraphs:

"(9) The Authority must forthwith publish a notice of the aforesaid application or amendment in terms of sub-regulation (7) in the *Gazette* and invite the public to make written comments to the Authority within the time set out in the notice, which time may not be less than 14 days from the date of the publication.

(10) The Authority will provide the opportunity to an applicant or licensee to respond to any written comments contemplated in sub-regulation (9)."

Insertion of the following sub-regulations after regulation 12(10) of Regulations

3. The Regulations is amended by the insertion of the following sub-regulations after regulation 12(10) of the Regulations:

"(11) An applicant's or licensee's response to public comments must be submitted in writing to the Authority within the time set out by the Authority, which time may be not less than 14 days from the deadline for the submission of public comments or if the notice for submissions of responses is published in a subsequent *Gazette*, not less than 14 days from the date of that publication.

(12) The times for the submissions of public comments and applicant or licensee's responses are to be determined by the Authority in lights of the nature of the application or amendment (in terms of sub-regulation 7).

(13) The Authority may consider written submissions not timeously filed if, in its opinion, it is practical to do so.

(14) The Authority may request further written submissions, such as for further information or clarification, which must be provided to the Authority in the time and the manner set out by the Authority.

(15) All written submissions must-

(a) contain the name and contact details of the person making the written submissions or the name and contact details of the person for whom the written submission is made, if different;

(b) be clear and concise; and

(c) conform to any further requirements determined by the Authority from time to time.

(16) After considering any application made in terms of this regulation and any written or oral submissions, if any referred to herein, the Authority may refuse or grant the application, in whole or in part.

(17) If the Authority grants application the Authority must amend the spectrum license in the form determined and subject to the conditions imposed by the Authority.

(18) After considering any written or oral submissions in respect of an amendment envisaged in sub-regulation 7 or in case of absence of comments thereof, the Authority may amend or refrain from amending the spectrum licence.

(19) The Authority must whether or not requested by an applicant or licensee, furnish reasons for its decision to grant or amend the spectrum license."

Insertion of the following sub-regulations after regulation 16(5) of Regulations

4. The Regulations is amended by the insertion of the following sub-regulations after regulation 16(5) of the Regulations:

"(6) The Authority must forthwith publish a notice of the aforesaid application in the *Gazette* and invite the public to make written comments to the Authority within the time set out in the notice, which time may not be less than 14 days from the date of the publication.

(7) The Authority will provide the opportunity to an applicant to respond to any written comments contemplated in sub-regulation (6).

(8) An applicant's response to public comments must be submitted in writing to the Authority within the time set out by the Authority, which time may be not less than 14 days from the deadline for the submission of public comments or if the notice for submissions of responses is published in a subsequent *Gazette*, not less than 14 days from the date of that publication.

(9) The times for the submissions of public comments and applicant or licensee's responses are to be determined by the Authority in lights of the nature of the application.

(10) The Authority may consider written submissions not timeously filed if, in its opinion, it is practical to do so.

(11) The Authority may request further written submissions, such as for further information or clarification, which must be provided to the Authority in the time and the manner set out by the Authority.

(12) All written submissions must-

(a) contain the name and contact details of the person making the written submissions or the name and contact details of the person for whom the written submission is made, if different;

(b) be clear and concise; and

(c) conform to any further requirements determined by the Authority from time to time.

(13) After considering any application made in terms of this regulation and any written
or oral submissions, if any referred to herein, the Authority may refuse or grant the application, in whole or in part.

(14) The Authority must whether or not requested by an applicant or licensee, furnish reasons for its decision to withdraw or refuse to withdraw the spectrum license."

Substitution of Annexure B

5. The Regulations is amended by the substitution for Annexure B of the following Annexure.

ANNEXURE B

RADIO APPARAUS EXEMPT FROM SPECTRUM LICENSE

Explanation:

1. The use or possession of the radio apparatus listed in Column B below, in accordance with the specifications listed in Columns A, C, D and E of the Table below does not require a spectrum license.

2. Use and possession of all radio apparatus exempt in terms of the above table must comply with the following:

2.1 All radio apparatus must be type-approved by the Authority or by the Independent Communications Authority of South Africa or, upon request to the Authority, by any other regulatory authority in a country other than Namibia or South Africa.

2.2 The frequencies, transmitting power and external high-gain antenna of the radio apparatus must not be altered without a new type-approved certificate issued by the Authority or any other regulatory authority referred to in paragraph 2.1.

2.3 The radio apparatus must be operated within, and not exceed, the technical parameters set out in each of the applicable Columns C and D of the Table with respect to the frequency band, maximum radiated power or field strength limits and channel spacing, relevant standards and duty cycles and antennas to be used and contained in Column E.

2.4 The antenna of the radio apparatus must not be higher or above average ground level than the lowest point of the place where the radio apparatus operates effectively.

2.5 The radio apparatus may not cause interference with any licensed radio frequency spectrum.

2.6 The user of the radio apparatus in the license-exempt frequency spectrum operates on a non-interference and zero protection basis from interference.

Frequency band	Typical Applications	Maximum power or magnetic field strength	Duty Cycle restriction	Prescribed Channel Spacing	Harmonised Standard	Notes (Additional information)
8.3-9kHz	Inductive applications	82 dBµA/m at 10m	None	None	EN 300 330	Antenna size of < 1/20 λ (see note 1)
9-90 kHz		72 dBµA/m at 10m				RFIDs operating in the frequency sub-band 119-135 kHz shall meet the spectrum mask given in EN 300 330. This will permit a simultaneous use of the various sub-bands within the range 90 – 148.5 kHz (Note 11)
90-119 kHz		42 dBµA/m at 10m				
119-135 kHz		66 dBµA/m at 10m				
135-140 kHz		42 dBµA/m at 10m				
140-148.5 kHz		37.7 dBµA/m at 10m				
9-315 kHz	Active medical implants	30 dBµA/m at 10m	<10%	None	EN 302 195	
400-600 kHz	Inductive applications	-8 dBµA/m at 10 m				For RFID only
442.2-450 kHz	Tracking, Tracing and Data Acquisition	7 dBµA/m at 10m	None	Continuous wave (CW) - no modulation, channel spacing ≥150 Hz		
456.9-457.1 kHz	Tracking, Tracing and Data Acquisition	7 dBµA/m at 10 m	None	Continuous wave (CW) at 457 kHz - no modulation		
3 155-3 400 kHz	Inductive applications	13.5 dBµA/m at 10m	None	None	EN 300 330	ITU-R M.1076 applies RR No. **5.116** applies
6 765-6 795 kHz	- Inductive applications - Non-specific SRDs	42 dBµA/m at 10m	None	None	EN 300 330	ISM band (RR No. **5.138**)
7 400-8 800 kHz	Inductive applications	9 dBµA/m at 10m	None	None	EN 300 330	
10200-11000kHz	Inductive applications	9 dBµA/m at 10m	None	None	EN 300 330	
13553-13567 kHz	Inductive applications	42 dBµA/m at 10m 60 dBµA/m at 10m (for RFID and EAS only)	None	None	EN 302 291	ISM band (RR No. **5.150**)
	Non-specific SRDs	10 mW e.r.p	None	None	EN 300 330	ISM band (RR No. **5.150**)

Frequency band	Typical Applications	Maximum power or magnetic field strength	Duty Cycle restriction	Prescribed Channel Spacing	Harmonised Standard	Notes (Additional information)
26957-27283 kHz	Inductive applications	42 dBµA/m at 10m	None	None	EN 300 220	ISM band (RR No. **5.150**) ERC/DEC/(01)16
	Model control (26990-27200 kHz)	100 mW e.r.p	None	10 kHz	EN 300 220	ERC/DEC/(01)10 (26.995 MHz, 27.045 MHz, 27.095 MHz, 27.145 MHz, 27.195 MHz
	Non-specific SRDs	10 mW e.r.p.	None	None	EN 300 220 EN 300 330	ERC/DEC/(01)02
26990-27200 kHz	Non-specific SRDs	100 mWe.r.p	≤ 0.1 %	None		
29.7-47 MHz	Radio Microphones	10 mW e.r.p.	None	≤ 50 kHz		
30-37.5 MHz	Active Medical Implants	1 mW e.r.p.	≤ 10%	None		
34.995-35.225 MHz	Model Control	100 mW e.r.p	None	10 kHz		Only flying models
40.66-40.7 MHz	Non-specific SRDs	10 mW e.r.p.	None	None	EN 300 220	ISM band (RR No. **5.150**) ERC/DEC/(01)03
	Model control	100 mW e.r.p	None	10 kHz	EN 300 220	ERC/DEC/(01)12 (40.665 MHz, 40.675 MHz, 40.685 MHz, 40.695 MHz)
138.2-138.45 MHz	Non-specific SRDs	10 mW e.r.p.	≤ 1%	None		
169.4-174 MHz	Radio Microphones	10 mW e.r.p.	None	≤ 50 kHz		
169.4-169.5875MHz	Assistive listening devices	500 mW e.r.p.	None	≤ 50 kHz		
169.4-169.475 MHz	Tracking, Tracing and Data Acquisition	500 mW e.r.p.	≤ 10%	≤ 50 kHz		
169.4-169.4875 MHz	Non-specific SRDs (169.4-169.475 MHz)	500 mWe.r.p	≤ 1%	≤ 50 kHz		
	Non-specific SRDs (169.4-169.4875 MHz)	10 mW e.r.p.	≤ 1%			
169.4875-169.5875 MHz	Non-specific SRDs	10 mW e.r.p.	≤ 0.001% duty cycle except for 00:00 h to 06:00 h local time where the duty cycle limit is ≤ 0.1%			

Frequency band	Typical Applications	Maximum power or magnetic field strength	Duty Cycle restriction	Prescribed Channel Spacing	Harmonised Standard	Notes (Additional information)
169.5875-169.8125 MHz	Non-specific SRDs	10 mW e.r.p.	≤ 0.1%			
173.965-216 MHz	Assistive listening devices	10 mW e.r.p.	None	≤ 50 kHz		
174-216 MHz	Radio Microphones	50 mW e.r.p.	None	None		
433.05-434.79 MHz	Non-specific SRDs	10 mW e.r.p. (433.05-434.79 MHz)	<10% (Note 1)	None	EN 300 220	(Note 2)
		1 mW e.r.p. -13 dBm/10 kHz (433.05-434.79 MHz)	None	None	EN 300 220	Power density limited to -13 dBm/10 kHz for wideband modulation with a bandwidth greater than 250 kHz (Note 5)
		10 mW e.r.p. (434.04-434.79 MHz)	None	Up to 25 kHz	EN 300 220	(Note 5)
401-402 MHz	Active medical implants and associated peripherals	25 µW e.r.p.	LBT or duty cycle ≤0.1% (Note 3), p21	25 kHz	EN 302 537	ITU-R RS.1346[1] Max occupied BW = 100 kHz
402-405 MHz		25 µW e.r.p.	(Note 4), p21	25 kHz	EN 301 839	ITU-R RS.1346 Max occupied BW = 300 kHz ERC/DEC/(01)17
405-406 MHz		25 µW e.r.p.	LBT or duty cycle ≤0.1% (Note 4), p21)	25 kHz	EN 302 537	ITU-R RS.1346 Max occupied BW = 100 kHz
446 – 446.2 MHz	PMR446	500 mW		12.5 kHz	EN 300 296	
470-786 MHz	Radio Microphones	50 mW e.r.p.	None	None		
862-863 MHz	Non-specific SRDs	25 mWe.r.p	≤ 0.1%	≤ 350 kHz		
863-865 MHz	Wireless Audio applications	10 mW e.r.p.	None	None	EN 301 357	
	Non-specific SRDs	25 mW e.r.p.	≤ 0.1% duty cycle or LBT+AFA			
864.8-865 MHz	Wireless Audio applications	10 mW e.r.p.	None	50 kHz	EN 300 220	Narrow band analogue voice devices (only this band)

Frequency band	Typical Applications	Maximum power or magnetic field strength	Duty Cycle restriction	Prescribed Channel Spacing	Harmonised Standard	Notes (Additional information)
865-868 MHz	Non-specific SRDs	25 mW e.r.p.	≤ 1% duty cycle or LBT +AFA			
	Tracking, Tracing and Data Acquisition	500 mW e.r.p.	Adaptive Power Control (APC) required for spectrum sharing (note 1) and the following duty cycle restrictions also apply: ≤ 10% duty cycle for network access points; ≤ 2.5% duty cycle otherwise	≤ 200 kHz		
865.0-865.6 MHz	RFID	100 mW e.r.p.	None	200 kHz	EN 302 208	(Note 13)
865.6-867.6 MHz		2 W e.r.p.	None	200 kHz	EN 302 208	
867.6-868.0 MHz		500 mW e.r.p.	None	200 kHz	EN 302 208	
863-870 MHz	Non-specific SRDs	≤ 25 mW e.r.p.	≤ 0.1% or LBT (notes 1 and 5)	≤ 100 kHz for 47 or more channels (note 3)	EN 300 220	FHSS modulation Note4, Note 2, Note 7 and Note 9 Note (TZA)

[1] Sharing between the meteorological aids service and medical implant communication systems (MICS) operating in the mobile service in the frequency band 401-406 MHz.

Frequency band	Typical Applications	Maximum power or magnetic field strength	Duty Cycle restriction	Prescribed Channel Spacing	Harmonised Standard	Notes (Additional information)
863-870 MHz	Non-specific SRDs	≤ 25 mW e.r.p. (note 7) Power density : - 4.5 dBm/100 kHz (note 8)	≤ 0.1% or LBT+AFA (notes 1, 6 and 7)	No spacing	EN 300 220	DSSS and other wideband modulation other than FHSS (Notes 2, 4, 7 and 9) Note (TZA)
		≤ 25 mW e.r.p.	≤ 0.1% or LBT+AFA (notes 1 and note 6)	≤ 100 kHz, for 1 or more channels. Modulation bandwidth ≤ 300 kHz (note 3)		Narrow/wide-band modulation (Notes 2, 4, 7 and 9) Note (TZA)
868-868.6 MHz	Non-specific SRDs	≤ 25 mW e.r.p.	≤ 1% or LBT+AFA (note 1)	No spacing, for 1 or more channels (note 3)	EN 300 220	Narrow / wide-band modulation. No channel spacing, however the whole stated frequency band may be used (Note 2)
868.6-868.7 MHz	Alarms	10 mW e.r.p.	≤ 1%	25 kHz	EN 300 220	Or whole band may be used as 1 channel
868.7-869.2 MHz	Non-specific SRDs	≤ 25 mW e.r.p.	≤ 0.1% or LBT+AFA (note 1)	No spacing, for 1 or more channels (note 3)	EN 300 220	Narrow / wide-band modulation. No channel spacing, however the whole stated frequency band may be used Note (TZA)
869.25-869.3 MHz	Alarms	10 mW e.r.p.	< 0.1%	25 kHz	EN 300 220	Note (TZA)
869.2-869.25 MHz	Alarms	10 mW e.r.p.	< 0.1%	25 kHz	EN 300 220	Social alarms Note (TZA)
869.3-869.4 MHz	Alarms	10 mW e.r.p.	< 1%	25 kHz	EN 300 220	Note (TZA)
869.400-869.650 MHz	Non-specific SRDs	≤ 500 mW e.r.p.	≤ 10% or LBT+AFA (note 1)	25 kHz (for 1 or more channels)	EN 300 220	Narrow / wide-band modulation The whole stated frequency band may be used as 1 channel for high speed data transmission Note (TZA)
869.65-869.7 MHz	Alarms	25 mW e.r.p.	< 10%	25 kHz	EN 300 220	Note (TZA)

Frequency band	Typical Applications	Maximum power or magnetic field strength	Duty Cycle restriction	Prescribed Channel Spacing	Harmonised Standard	Notes (Additional information)
869.700-870.000 MHz	Non-specific SRDs	≤ 5 mW e.r.p.	No requirement	No spacing (for 1 or more channels)	EN 300 220	Narrow / wide-band modulation. No channel spacing, however the whole stated frequency band may be used (Note 5) Note (TZA)
		≤ 25 mW e.r.p.	up to 1% or LBT+AFA (note 1)			
870-874.4 MHz	Tracking, Tracing and Data Acquisition	500 mW e.r.p.	Adaptive Power Control (APC) required for spectrum sharing (note 1) and the following duty cycle restrictions also apply: ≤ 10% duty cycle for network access points; ≤ 2.5% duty cycle otherwise	≤ 200 kHz		
	Non-specific SRDs.	25 mW e.r.p.	≤ 1% duty cycle. For ER-GSM protection (873-876 MHz, where applicable): the duty cycle is limited to ≤ 0.01% and to a maximum transmit on time of 5ms/1s	≤ 600 kHz		
2 446-2 454 MHz	RFID	≤ 500 mW e.i.r.p.	None	None	EN 300 440	2 400-2 500 is a ISM band (RR No. **5.150**) (Note 12)
2 446-2 454 MHz		> 500 mW – 4 W e.i.r.p.	≤ 15% FHSS techniques should be used	None	EN 300 440	2 400-2 500 is a ISM band (RR No. **5.150**) Power levels above 500 mW are restricted to be used inside the boundaries of a building and the duty cycle of all transmissions shall in this case be ≤15 % in any 200 ms period (30 ms on /170 ms off). (Note 12)

Frequency band	Typical Applications	Maximum power or magnetic field strength	Duty Cycle restriction	Prescribed Channel Spacing	Harmonised Standard	Notes (Additional information)
2 400-2 483.5 MHz	Non-specific SRDs	10 mW e.i.r.p.	None	None	EN 300 440	2 400-2 500 is a ISM band (RR No. **5.150**)
	Wideband Data Transmission systems (WAS/RLANs)	100 mW e.i.r.p.	See Rec 70-03 note 1 (p9)	None	EN 300 328	2 400-2 500 is a ISM band (RR No. **5.150**) ERC/DEC/(01)07
	Radiodetermination	25 mW e.i.r.p.	None	None	EN 300 440	2 400-2 500 is a ISM band (RR No. **5.150**) ERC/DEC/(01)08
2483.5-2500 MHz	Active Medical Implants	10 dBm e.i.r.p.	LBT+AFA and ≤ 10% duty cycle. The equipment shall implement a spectrum access mechanism as described in the applicable harmonised standard or an equivalent spectrum access mechanism	1 MHz		For Low Power Active Medical Implants and associated peripherals, covered by the applicable harmonised standard. Individual transmitters may combine adjacent channels on a dynamic basis for increased bandwidth higher than 1 MHz. Peripheral units are for indoor use only.
5 150-5 350 MHz	Wideband Data Transmission systems (WAS/RLANs)	200 mW mean e.i.r.p. See note 4, p9	See notes 1 and 3 (p9)	None	EN 301 893	ECC/DEC/(04)08 Restricted to indoor use. The maximum mean e.i.r.p. density shall be limited to 10 mW/MHz in any 1 MHz band For RLANs Resolution 229 (WRC-19) applies.
5 470-5 725 MHz	Wideband Data Transmission systems (WAS/RLANs)	250 mWe.r.p	See notes 1 and 3 (p9)	None	EN 301 893	ECC/DEC/(04)08 Indoor as well as outdoor use allowed. The maximum mean e.i.r.p. density shall be limited to 50 mW/MHz in any 1 MHz band In MWI, TZA and ZMB this band is used for BFWA on a licensed basis.

Frequency band	Typical Applications	Maximum power or magnetic field strength	Duty Cycle restriction	Prescribed Channel Spacing	Harmonised Standard	Notes (Additional information)
5 725-5 875 MHz	Wideband data transmission BFWA is limited to 5725 - 5850 MHz (to protect satellite)	PTP/PTMP: max mean e.i.r.p = 4 W Mesh/AP-MP: max mean e.i.r.p = 2 W			EN 302 502	ISM band (RR No. **5.150**) One of the main bands for wideband data transmission and BFWA (incl. Wi-Fi in laptops, cell phones, etc.) ECC/REC(06)04 refers In MWI this band is used for BFWA on a licensed basis. In AFS this band can be used up to 8W in specific circumstances (refer to national regulations) Footnote 5.453 (WRC-19) applies
5725-5875 MHz	Tracking, Tracing and Data Acquisition	400 mW e.i.r.p. Adaptive Power Control (APC) required	Adequate spectrum sharing mechanisms (e.g. DFS and DAA) shall be implemented	≥ 1 MHz and ≤ 20 MHz		
5 725-5 875 MHz	Non-specific SRDs	25 mW e.i.r.p.	None	None	EN 300 440	
5 795-5 805 MHz	RTTT	2 W e.i.r.p. 8 W e.i.r.p.	None	None	EN 300 674	ECC/DEC/(02)01 Note 10
5 805-5 815 MHz			None	None	EN 300 674	ECC/DEC/(02)01 For this band an individual licence in required in EU Note 10
24.00-24.25 GHz	Non-specific SRDs	100 mW e.i.r.p.	None	None	EN 300 440	ISM band (RR No. **5.150**)
	Radiodetermination	100 mW e.i.r.p.	None	None	EN 300 440	
	RTTT (24.05-24.075 GHz)	100 mW e.i.r.p.	None		EN 300 440	For vehicle radars
	RTTT(24.075-24.15 GHz)	0.1mW e.i.r.p.	None		EN 300 440	For vehicle radars

Frequency band	Typical Applications	Maximum power or magnetic field strength	Duty Cycle restriction	Prescribed Channel Spacing	Harmonised Standard	Notes (Additional information)
24.15-24.25 GHz	RTTT	100 mW e.i.r.p.	None)		EN 300 440	For vehicle radars. The spectrum access and mitigation requirement is given for devices mounted behind a bumper. If mounted without a bumper, the requirement should be 3µs/40kHz maximum dwell time every 3ms
		100 mW e.i.r.p.	≤ 1ms/40kHz dwell time every 40ms (note 1)		EN 300 440	The spectrum access and mitigation requirement is given for devices mounted either behind a bumper or mounted without a bumper
			None		EN 300 440	For vehicle radars
57-64 GHz	Non-Specific SRDs	100 mW e.i.r.p. 10 mW output power	None			
61.0-61.5 GHz	Non-specific SRDs	100 mW e.i.r.p.	None	None		ISM band (RR No. **5.138**)
76-77 GHz	RTTT	55 dBm peak e.i.r.p.	None	None	EN 301 091	ECC/DEC/(02)01 Power level 55 dBm peak power e.i.r.p. 50 dBm average power - 23.5 dBm average power for pulse radar only Vehicle and infrastructure radar systems
77-81 GHz	Automotive Short-Range Radars				EN 302 264	
122-122.25 GHz	Non-Specific SRDs	10 dBm/250MHz e.i.r.p. -48 dBm/MHz at >30° elevation	None	None		
122.25-123 GHz	Non-Specific SRDs	100 mW e.i.r.p.	None	None		
244-246 GHz	Non-Specific SRDs	100 mW e.i.r.p.	None	None		

Footnotes

Note 1: When either duty cycle, Listen-Before-Talk (LBT) or equivalent technique applies then it shall not be user dependent/adjustable and shall be guaranteed by appropriate technical means. For LBT devices without Adaptive Frequency Agility (AFA), or equivalent techniques, the duty cycle limit applies. For any type of frequency agile device the duty cycle limit applies to the total transmission unless LBT or equivalent technique is used.

Note 2: Audio and video applications are allowed provided that a digital modulation method is used with a maximum bandwidth of 300 kHz. Analogue and digital voice applications are allowed with a maximum bandwidth ≤ 25 kHz.

Note 3: The preferred channel spacing is 100 kHz allowing for a subdivision into 50 kHz or 25 kHz.

Note 4: Sub-bands for alarms are excluded (see ERC/REC 70-03 Annex 7).

Note 5: Audio and video applications are excluded. Analogue or digital voice applications are allowed with a maximum bandwidth ≤ 25 kHz and with spectrum access technique such as LBT or equivalent. The transmitter shall include a power output sensor controlling the transmitter to a maximum transmit period of 1 minute for each transmission.

Note 6: Duty cycle may be increased to 1% if the band is limited to 865-868 MHz.

Note 7: For other wide-band modulation than FHSS and DSSS with a bandwidth of 200 kHz to 3 MHz, duty cycle can be increased to 1% if the band is limited to 865-868 MHz and power to ≤10 mW e.r.p.

Note 8: The power density can be increased to +6.2 dBm/100 kHz and -0.8 dBm/100 kHz, if the band of operation is limited to 865-868 MHz and 865-870 MHz respectively.

Note 9: Certain channels may be occupied by RFID operating at higher powers (See Annex 11 for further details). To minimise the risk of interference from RFID, SRDs should use LBT with AFA or observe suitable separation distances. (In the high power RFID channels typically these may vary from 918 m (indoor) to 3.6 km (rural outdoor). In the remaining 2.2 MHz, where tags at -20 dBm e.r.p. occupy the spectrum, this may vary from 24 m (indoor) to 58 m (rural outdoor)). The adjacent frequency bands below 862 MHz and above 870 MHz may be used by high power systems. Manufacturers should take this into account in the design of equipment and choice of power levels.

Note 10: The frequency band 5795-5805 MHz is intended for road to vehicle systems, particularly (but not exclusively) road toll systems. The frequency bands 5795-5805 MHz and 5805-5815 MHz are recommended for 5 MHz channel spacing systems with the frequencies: 5797.5 MHz, 5802.5 MHz, 5807.5 MHz and 5812.5 MHz. For 10 MHz channel spacing systems 5800 MHz and 5810 MHz. 5805 - 5815 MHz on a national basis for multi-lane road junctions, particularly, but not exclusively road toll systems. The use of 8 W e.i.r.p. allows for 1 Mbit/s in accordance with ETSI standard ES 200 674-1. 2W e.i.r.p. allows for 500 kbit/s downlink and 250 kbit/s uplink in accordance with EN 300 674-1 and for low data rates (31 kbit/s) in accordance with EN 300 674-2.
