



**REPUBLIQUE DU BURUNDI
PRESIDENCE DE LA REPUBLIQUE
AGENCE DE REGULATION ET DE
CONTROLE DES TELECOMMUNICATIONS
(ARCT)**

GUIDELINE ON THE USE OF SHORT RANGE DEVICES

Avril 2016

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Foreword

This guideline sets out the harmonised spectrum allocations for Short Range Devices (SRDs) for Burundi.

It should also be noted that radio technology continuously evolving to reflect the many changes that are taking place in the radio environment. It is therefore important that spectrum allocations reflect these changes and therefore this guideline will be reviewed continuously.

When selecting parameters for new SRDs, which may have inherent safety of life implications, manufacturers and users should pay particular attention to the potential for interference from other systems operating in the same or adjacent bands.

1. Introduction

Short Range Radio Devices (SRDs) are transmitters or receivers or both that generate and use radio frequencies locally. These devices are generally designed to operate over short range and at low power levels and have low capability of causing harmful interference to other radio communication services. Such devices are permitted to operate on secondary basis on non-interference and non-protected basis subject to national regulations and relevant technical standards. Therefore, only duly authorised equipment, operating in the specifically defined frequency bands for a specified range shall be used for such applications.

SRDs operate in various frequency bands, including the ISM bands. They share these frequencies with other radio applications and are generally prohibited from causing harmful interference to or claiming protection from those radio applications. If an SRD does cause interference to authorized radio-communication services, even if the device complies with all the technical standards and equipment authorization requirements, then its operator will be required to cease its operation, at least until the interference problem is solved.

This guideline provides technical and operating parameters and spectrum use for short-range radio communication devices in Burundi.

2. Applications

SRDs are used virtually everywhere to provide low cost communication solutions. They include many different types of wireless equipment used in data collection with auto identification systems or item management in warehousing, retail and logistic systems, baby monitors, access control i.e. door and gate openers, wireless home data telemetry and/or security systems, Local Area Networks (LANs), medical implants, Ultra Wideband (UWB) sensors and radars, keyless automobile entry systems and hundreds of other types of common electronic equipments rely on such transmitters to function.

3. Categories of SRDs

Due to the many different applications provided by these devices, no description can be exhaustive; however, the following categories are amongst those regarded as SRDs:

- 3.1. Telecommand:** The use of Radiocommunication for the transmission of signals to initiate, modify or terminate functions of equipment at a distance.
- 3.2. Telemetry:** The use of Radiocommunication for indicating or recording data at a distance.
- 3.3. Voice and video:** These are voice cover applications like walkie-talkie, baby monitoring and similar use. Citizen band (CB) and private mobile radio (PMR 446) equipment is excluded. With video applications, non-professional cordless cameras are meant mainly to be used for controlling or monitoring purposes.
- 3.4. Broadband radio local area networks:** Broadband radio local area networks (RLANs) are replacement of physical cables for the connection of data networks within a building, thus providing networks within the business and industrial environments.

These systems use spread spectrum modulation or other redundant (i.e. error correction) transmission techniques. To ensure compatibility with other radio applications in the 2.4 GHz and 5 GHz band a number of restrictions and mandatory features are required. In these bands, simple licensing requirements are applied or licence exemption similar to SRDs.

- 3.5. Railway applications:** These are applications specifically intended for use on railways and comprise mainly automatic vehicle identification (AVI) system, Balise system and Loop system used to provide automatic and unambiguous identification of a passing vehicle and transmission of data between train and track.
- 3.6. Road transport and traffic telematics:** Road transport and traffic telematics (RTTT) systems are systems providing data communication between two or more road vehicles and between road vehicles and the road infrastructure for various information-based travel and transport applications, including automatic toll-collection, route and parking guidance, collision avoidance and similar applications.
- 3.7. Equipment for detecting movement and equipment for alert:** Equipment for detecting movement and equipment for alert are low power radar systems for radio determination purposes. Radio determination means the determination of the position, velocity and/or other characteristics of an object, or the obtaining of information relating to these parameters, by means of the propagation properties of radio waves.
- 3.8. Alarms:** The use of Radiocommunication for indicating an alarm condition at a distant location.
- 3.9. Inductive applications:** Inductive loop systems are communication systems based on magnetic fields generally at low RF frequencies. Inductive applications include for example car immobilizers, car access systems or car detectors, animal identification, alarm systems, item management and logistic systems, cable detection, waste management, personal identification, wireless voice links, access control, proximity sensors, anti-theft systems including RF anti-theft induction systems, data transfer to handheld devices, automatic article identification, wireless control systems and automatic road tolling.
- 3.10. Radio microphones:** Radio microphones (also referred to as wireless microphones or cordless microphones) are small, low power (50 mW or less) unidirectional transmitters for the transmission of sound over short distances for personal use.
- 3.11. RF identification systems:** The object of any RF identification (RFID) system is to carry data in suitable transponders, generally known as tags, and to retrieve data, by hand- or machine-readable means, at a suitable time and place to satisfy particular application needs.
- 3.12. Ultra low power active medical implant:** The ultra-low power active medical implant (ULP-AMIs) are part of a medical implant communication systems (MICS) for use with implanted medical devices, like pacemakers, implantable defibrillators, nerve stimulators, and other types of implanted devices.
- 3.13. Wireless audio applications:** Applications for wireless audio systems include the following: cordless loudspeakers, cordless headphones, cordless headphones for portable use, i.e. portable compact disc players, cassette decks or radio receivers carried on a person, cordless headphones for use in a vehicle, for example for use with a radio or mobile telephone, etc., in-ear monitoring, for use in concerts or other stage productions.

Systems should be designed in such a way that in the absence of an audio input no RF carrier transmission shall occur.

4. Technical and Operating Conditions for SRDs

4.1. Scope

This Specification defines the minimum technical requirements for SRD transmitters and receivers to operate in authorized frequency bands or frequencies, and transmit within the corresponding output power levels given in the Annex attached to this guideline. Short range devices are intended for communications in confined areas of buildings as well as for localized on-site operations. Short range devices may be fixed, mobile or portable stations that come with a radio frequency output connector and dedicated antenna or an integral antenna.

4.2. General Requirements

The Annex attached lists the frequency bands in which SRDs are allowed to operate and the maximum allowed power limits and the following conditions shall apply;

- i. The SRDs operate on secondary basis on unprotected and shared frequency bands subject to not causing interference to other authorized radio communication services and accepting interference from other radio communication services including Industrial, Scientific, and Medical (ISM) equipment.
- ii. Short range device vendors require to be registered under the type approval guidelines and they shall be issued with a vendor's license. SRDs are required to operate in the relevant spectrum segment on a shared basis and are subject to the same conditions. These guidelines specify the frequencies that can be used, equipment standards/features, technical and operational parameters. The authorization is a general class license and does not have to be applied individually.
- iii. The device shall not be constructed with any external or readily accessible control which permits the adjustments of its operation parameters in a manner that is inconsistent with this guideline.

4.3. Marking Requirements

The equipment shall be marked with the following information;

- a) Supplier/manufacturer's name or identification mark;
- b) The equipment's trade name, model name and serial number;
- c) Other markings such as type approval and compliance label for equipment as required by the relevant standards. The markings shall be legible, indelible and readily visible. All information on the marking shall be in English Language.

4.4. Technical Requirements

4.4.1. General Requirements

In order to ensure co-existence with other services in the authorized bands, SRDs shall comply with the maximum Effective Isotropic Radiated Power (EIRP) and Transmitter & Receiver Spurious Emissions given in the Annex. The authorised EIRP powers are expected to self-limit the transmission coverage of SRDs, and where necessary, will be reviewed to ensure that SRDs operate as expected.

It is recommended that for SRDs operating in frequency ranges between 70 MHz and 900 MHz the bandwidth should not be wider than 0.25% of the fundamental frequency. For operating frequencies higher than 900 MHz, the occupied bandwidth should not exceed 0.5% of the fundamental frequency.

SRD may be AC powered or DC powered. For AC powered equipment, the technical requirements shall be complied with when operating from an AC mains supply of voltage, 240+/-10% and frequency 50Hz+/-2%. The SRD operating with mains power supply shall comply with internationally accepted electrical safety standards (Ref: EN60950).

The SRD shall comply with internationally accepted Electromagnetic Compatibility Requirements EMC standards such as but not limited to EN 301 489-1 and EN 301 489-3.

4.4.2. Spectrum Allocations

SRDs are deployed in both bands designated for ISM applications and other bands not designated for ISM applications. The designated frequency band for use short by SRDs based on ITU-R Radio Regulations, Member countries Frequency Allocations, and other prevailing international standards.

The frequency bands designated for short range devices are indicated in the Annex of this guideline. However, it should be noted that short-range radio-communication devices may generally not be permitted to use bands allocated to the following services namely passive services and those ensuring safety of life and search and rescue operations according to the relevant RR provisions:

- Radio astronomy;
- Aeronautical mobile;
- Safety of life services including radio navigation;

4.4.3. Emission masks for the Short-Range Devices

Short-range devices shall conform to the spurious domain emission limits given in RR Appendix 3. Specifically, Table II of RR Appendix 3 lists the attenuation values used to calculate maximum permitted spurious domain emission power levels for use with radio equipment. For example, low power radio device equipment intended for short-range communication or control purposes and operating at output power less than 100 mW, must meet an attenuation level of 56 +10 log (P), or 40 dBc, whichever is less stringent.

4.4.4. Antenna requirements

Basically three types of transmitter antennas are used for short-range radio communication transmitters namely Integral (no external antenna socket), dedicated (type approved with the

equipment) or external (equipment type approved without antenna). In most cases SRD transmitters are equipped with either integral or dedicated antennas.

The Burundi regulatory authority ARCT shall only allow (type approve) short-range Radiocommunication transmitters that are designed in such way that no type of antenna can be used other than one which has been designed and type approved by the manufacturer to show conformity with the appropriate emission level. This would help in preventing the interference problems to the authorized Radiocommunication services.

4.4.5. Interference Mitigation

The SRDs shall not cause interferences to other radio communications services. Upon notification by the regulatory authority, the SRDs shall cease all transmissions until the interference is eliminated. SRDs users shall be required to comply with this guideline and shall take reasonable measures to ensure that no interference is caused to other users within or outside the designated band for use by SRDs.

The SRDs shall not be accorded any protection from interferences by other radio communications services and the regulatory authority shall not investigate complaints of interferences. It is however recommended that best practice implementation be adhered to, in order to retain value in the quality of service of the SRDs. The regulatory authority may from time to time carry out tests to ensure that best practice implementation is adhered to.

5. Authorization

The approval and use of the relevant SRDs in Burundi is subject to the terms and conditions in this guideline and the following conditions:

- 5.1.** All SRD radio apparatus like other radio apparatus must be type-approved by ARCT in accordance with the guidelines.
- 5.2.** The frequencies, transmitting power and external high-gain antenna of these radio apparatus must not be altered without a new type approval certificate being issued by the regulatory authority.
- 5.3.** The radio apparatus must be operated within and must not exceed the technical parameters set out in each of the applicable columns of the table in the Annex with respect to the frequency band, maximum radiated power or field strength limits and channel spacing, relevant standard and duty cycles and antennas to be used.
- 5.4.** The antenna of the radio apparatus must not be higher above average ground level than the lowest point of the place where the radio apparatus operates effectively.
- 5.5.** The radio apparatus must not cause interference to any authorized network issued with a radio frequency spectrum license.
- 5.6.** The user of the radio apparatus in the license-exempt frequency spectrum operates on non-interference and no protection basis from interference.

6. Administrative Requirements

The short range devices shall be checked and tested for compliance with the applicable technical requirements stipulated in the attached Annex of this guideline, in accordance with test methods and conditions given in one or more of the references applicable to the device under test

The type approval procedure requires that tests be performed on the transmitter to be authorized using an accredited laboratory by International Laboratory Accreditation Cooperation (ILAC) that has calibrated its test site or, if the transmitter is incapable of being tested at a laboratory, at the installation site. These tests measure the levels of radio frequency energy that are radiated by the transmitter into the open air or conducted by the transmitter on to the power lines.

A description and declaration of conformity of the measurement facilities where these tests were performed and relevant technical documentation in English language must accompany the application for certification.

After these tests have been performed, a report must be produced showing the test procedure, the test results, and some additional information about the device including design drawings, internal and external photos, expository statement, etc. The vendor must produce this report on application as evidence that the device meets the technical standards.

7. Use of SRDs On-Board Aircrafts

The use of SRDs on-board registered aircrafts may be authorized under the Aircraft radio Station License. Operation of both 2400–2483.5 MHz and 5725 – 5875 MHz bands is allowed provided that all transmissions remain strictly within the aircraft and are carried out at above 3000 meters altitude. The same restrictions apply to use of SRDs on-board foreign registered aircrafts while flying over the BURUNDI territory, however, no license is required in this regard.

8. Breach of Guidelines

In order to maintain standards, users and vendors shall be required to ensure that SRD equipment used within Burundi comply with these guidelines especially with regard to minimum technical characteristics including but not limited to; operating frequency, frequency range, type of modulation and RF power.

SRD users and vendors are strictly required to comply with this guideline. Any violation of the guideline shall result in regulatory measures.

9. Other Conditions

These guidelines are subject to review by ARCT from time to time.

References

1. ERC Recommendation 70-03 Relating to the use of Short Range Devices (SRD) - CEPT/ERC/REC 70-03
2. ETSI Standard EN 300 220 Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment to be used in the 25 MHz to 1000 MHz frequency range with power levels ranging up to 500 mW.
3. ETSI Standard EN 300 330 Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz.
4. ETSI Standard EN 300 440 Electromagnetic compatibility and Radio spectrum Matters (ERM); Short range devices; Radio equipment to be used in the 1 GHz to 40 GHz frequency range.
5. ITU Radio Regulations (Edition of 2012)

ANNEX

Column A	Column B	Column C	Column D	Column E
Frequency Bands	Type of Device	Maximum Radiated Power or Field Strength Limits & Channel Spacing	Relevant Standard	Additional Requirements
9 – 59.75 kHz	Inductive Loop System	72 dB μ A/m @ 10m No duty cycle restriction; No channel spacing	EN 300 330 EN 301 489-1, 3 EN 60950	CEPT/ERC/REC 70-03
59.75 - 60.25 kHz 70 - 119 kHz	Inductive Loop System	42 dB μ A/m @ 10m No duty cycle restriction; No channel spacing	EN 300 330 EN 301 489-1, 3 EN 60950 ISO 18000-2	CEPT/ERC/REC 70-03
60.25 - 70 kHz 119 - 135 kHz	Inductive Loop System	72 dB μ A/m @ 10m No restriction on duty cycle; No channel spacing	EN 300 330 EN 301 489-1, 3 EN 60950 ISO/IEC 18047-2	CEPT/ERC/REC 70-03
7.4 – 8.8 MHz	Inductive Loop System	9 dB μ A/m @ 10m No restriction on duty cycle; No channel spacing	EN 300 330 EN 301 489-1, 3 EN 60950	CEPT/ERC/REC 70-03
6.765 - 6.795 MHz	Inductive Loop System	42 dB μ A/m @ 10m No restriction on duty cycle; No channel spacing	EN 300 330 EN 301 489-1, 3 EN 60950	CEPT/ERC/REC 70-03
13.553 - 13.567 MHz	Inductive Loop System	42 dB μ A/m @ 10m No restriction on duty cycle; No channel spacing	EN 300 330 EN 301 489-1, 3 EN 60950	CEPT/ERC/REC 70-03
26.957 - 27.283 MHz	Inductive Loop System	42 dB μ A/m @ 10m No restriction on duty cycle; No channel spacing	EN 300 330 EN 301 489-1, 3 EN 60950	CEPT/ERC/REC 70-03
26.995; 27.045;	Surface Model Control	100 mW erp.	EN 300 220	CEPT/ERC/REC

27.095; 27.145; 27.195 MHz		No restriction on duty cycle; 10kHz channel spacing	EN 301 489-1, 3 EN 60950	70-03
36.65 - 36.75 MHz	Wireless Microphones	100mW erp. 100% duty cycle No channel spacing	EN 300 422 EN 301 489-9 EN 60950	CEPT/ERC/REC 70-03
40.65-40.7 MHz	Wireless Microphones	100mW erp. 100% duty cycle No channel spacing	EN 300 422 EN 301 489-9 EN 60950	CEPT/ERC/REC 70-03
40.66-40.7 MHz	Non Specific SRDs	10mW erp No restriction on duty cycle; No channel spacing	EN 300 220-1 EN 301 489-1, 3 EN 60950	CEPT/ERC/REC 70-03
53-54 MHz	Wireless Microphone	50 mW erp for class 1 equipment 100mW e.i.r.p. 100% duty cycle No channel spacing	EN 300 422 EN 301 489-1, 9 EN 60950	CEPT/ERC/REC 70-03
402-405 MHz	Medical Implants	25 μ W erp No duty cycle restriction for devices with LBT. Otherwise \leq 1%. 25 KHz Channel spacing.	EN 301 839 EN 301 489-1,3 EN 60950 EN 300 220-1	ITU-R RS. 1346 CEPT/ERC/REC 70-03
402-406	Doppler shift movement detectors, wireless microphones, garage door openers, Vehicle alarm systems	10 mW erp. No channel spacing 100% duty cycle	EN 300 422 EN 300 220-1 EN 301 489-1, 3 EN 60950	
433.05-434.79 MHz	Non-specific SRD	1 mW erp No channel spacing. 100% duty cycle.	EN 300 220-1 EN 301 489-1, 3 EN 60950	CEPT/ERC/REC 70-03

		10 mW erp 100% duty cycle Up to 25 KHz Channel spacing.	ISO/IEC – 18047-7	
446-446.1 MHz includes the following 8 channels. 446.00625; 446.01875; 446.03125; 446.04375; 446.05625; 446.08125; 446.09125; 446.09375	Public Mobile Radio (PMR)	500mW erp 12.5 kHz channel spacing	EN 300 296-2 EN 301 489-5 EN 60950	
863-865 MHz	Wireless Audio Systems	10 mW erp 100% duty cycle No channel spacing	EN 301 357 EN 301 489-9 EN 60950	CEPT/ERC/REC 70-03
863-865 MHz	Wireless Microphone	10 mW erp 100% duty cycle No channel spacing	EN 300 422 EN 301 489-9 EN 60950	CEPT/ERC/REC 70-03
865.0-865.6 MHz ,865.6-867.6 MHz & 867.6-868.0 MHz	Radio frequency identification (RFID)	100 mW erp. 200 kHz channel spacing No restriction on duty cycle.	EN 300 320 EN 301 489-1,3 EN 60950	
868 - 868.6 MHz	Non-specific SRD	25mW erp ≤1% duty cycle or LBT+AFA	EN 300 220-2 EN 301 489-1, 3 EN 60950	CEPT/ERC/REC 70-03 (01) O4
868.6-868.7 MHz	Alarms	10mW erp ≤1% duty cycle 25kHz channel spacing	EN 300 220-2 EN 301 489-1,3 EN 60950	CEPT/ERC/REC 70-03
868.7-869.2 MHz	Non-specific SRD	25mW erp	EN 300 220-2	CEPT/ERC/REC

		≤1% duty cycle or LBT+AFA	EN 301 489-1,3 EN 60950	70-03
869.25-869.3 MHz	Alarms	10mW erp ≤0.1% duty cycle 25kHz channel spacing	EN 300 220-2 EN 301 489-1,3 EN 60950	CEPT/ERC/REC 70-03
869.4-869.65 MHz	Non-specific SRD	500mW erp ≤10% duty cycle or LBT+AFA	EN 300 220-2 EN 301 489-1,3 EN 60950	
869.65-869.7 MHz	Alarms	25mW erp ≤10% duty cycle 25kHz channel spacing	EN 300 220-2 EN 301 489-1,3 EN 60950	CEPT/ERC/REC 70-03
869.7- 870 MHz	Non-specific SRD	5mW erp No Requirement	EN 300 220-2 EN 301 489-1,3 EN 60950	
		25mW erp ≤10% duty cycle or LBT+AFA		
2400 - 2483.5 MHz	Non-specific SRD	10mW eirp No duty cycle restriction No channel spacing	EN300 328-2 EN 300 440 EN 301 489-1,3 EN 60950	CEPT/ERC/REC 70-03
2400-2483.5 MHz	Wideband Wireless Systems. WAS/RLANs	100mW eirp No duty cycle No channel spacing	EN 300 328 EN 301 489-1,17 EN 60950	CEPT/ERC/REC 70-03
5150-5350 MHz	Wireless Access Systems/Radio Local Access Network (WAS & RLAN) indoor use only.	200mW eirp Dynamic Frequency Selection(DFS) & Transmitter Power control(TPC) Modulation schemes obligatory	EN 300 836-1 EN 301 893 EN 301 489-1,17 EN 60950	ITU-R M.1625 Rec. ITU-R M.1450- 4, Resolution 229 (Rev.WRC-12)
5470-5725 MHz	Wireless Access Systems/Radio Local	1W eirp Dynamic Frequency	EN 300 836-1 EN 301 489-1,17	ITU-R M.1625 Rec. ITU-R M.1450-

	Access Network(WAS/RLAN) indoor and outdoor use	Selection(DFS) & Transmitter Power control(TPC) Modulation schemes obligatory	EN 301 893 EN 301 489-1,17 EN 60950	4, Resolution 229 (Rev.WRC-12)
5725-5875 MHz	Fixed Wireless systems	2W eirp, psd 100mW/MHz,	EN 302 502	ISM band footnote 5.150 of the ITU Radio Regulations
5725-5875 MHz	Non-specific SRD	25mW eirp No duty cycle restriction No channel spacing	EN 300 400 EN 301 489-1, 3 EN 60950	CEPT/ERC/REC 70-03
24.00-24.25 GHz	Non-specific SRD	100mW eirp No duty cycle restriction No channel spacing	EN 300 440 EN 301 489-1,3 EN 60950	CEPT/ERC/REC 70-03
76-77 GHz	RTTT short range radar	55dBm peak No duty cycle restriction No channel spacing	EN 301 091 EN 301 489-1,3 EN 60950	CEPT/ERC/REC 70-03