

TELECOMMUNICATIONS UNIT

Policy on the use of the Licence-Exempt Frequency Bands in Barbados

1. Introduction

Regulators are cognizant of the fact that radio frequency spectrum use is continually evolving in an ever- increasing technological world and must therefore design policies to reflect the changes that are taking place in the radio environment. The International Telecommunications Union (ITU), of which Barbados is a member, has recommended a number of Licence-Exempt Frequency Bands called the Industry Scientific and Medical (ISM) Bands. Barbados has adopted the recommendations and has offered these ISM Bands, as unlicensed but not unregulated band. Barbados has also determined that the Unlicensed National Information Infrastructure (UNII) Band should also be licence-exempt but regulated. All equipment used in these bands should be type-approved and must conform to the International Standards adopted Telecommunications Unit.

Licence-exempt spectrum in Barbados is aimed at:

- Encouraging more efficient and creative use of the spectrum,
- Enabling cost effective and innovative technologies, and
- Encouraging competition and the creation of new business opportunities in the delivery of wireless technologies and services.

The regulation also ensures that users of the licence-exempt band use authorized equipment which does not interfere with each other or with other licensed users.

2. Purpose

This policy is to establish the technical and operational framework for the use of licence-exempt spectrum, including compliance requirements. The bands to be operated on a licence-exempt basis are:

- 902-928 MHz.
- 2.4- 2.4835 GHz.
- 5.725-5.850 GHz.
- 5.150 –5.250 GHz (Indoor use only)
- 5.250 –5.350 GHz (RLAN)

3. Summary

The policy refers to the use of radio frequency in the licence-exempt spectrum.

- Low powered radio communication devices may be operated in the licence-exempt bands on a no-interference, no-protection basis. They may not cause radio interference and cannot claim protection from interference. See Barbados Short Range Device (SDR's) Policy.
- No licence fee will be required for operation in licence-exempt spectrum.
- Radio Systems may operate within the band 902 -928 MHz, with a maximum power level of 1 Watt with bandwidth of 250 KHz and 0.25 Watts with bandwidth of 500 KHz. See **Barbados Short Range Device (SDR's) Policy.**
- Radio Systems may operate within the band 2.4 -2.4835 GHz, with a maximum power level of 1 Watt and minimum bandwidth of 1 MHz. See **Barbados Short Range Device (SDR's) Policy.**

- Radio Systems may operate within the band 5.725- 5.850 GHz. with a maximum power level of 0.75Watts and a minimum bandwidth of 1 MHz. Except in cases authorized under the **Barbados Wireless Networking Policy**.
- Radio Systems with design specifications which conform to the technical conditions as stated herein, will not be the subject of individual licences, but must satisfy the requirements for type approval as established by the Telecommunications Unit.
- Enforcement of the rules related to the licence-exempt spectrum will be carried out pursuant to the Telecommunications Act 2001-36 and Regulations made under the Act.
- Penalties shall be applied to entities found in breach the rules governing the use of the licence-exempt spectrum.

4. Definitions

For the purposes of this document,

- **Public Radio System** – A public radio system is one where the beneficiary of the system might not be the licensee or anyone concerned with the business of the licensee. The licensee may receive payment, consideration or other benefits for providing service and maintaining radio facilities for use by a third party.
- **Private Radio System** - A private radio system is one which is used solely by a person or a group of affiliated persons where the purpose and exclusive benefit of use of the radio system is solely in the interest of the licensee's business.
- **Short Range Devices (SRD's)** - This covers a variety of radio devices providing either unidirectional or omni-directional communication (point to point or point to multipoint)

and which, due to their low transmitter power, have a low risk of interference to other devices.

5. Technical Requirements

The licence-exempt bands are:

902 – 928 MHz

2.400 – 2.4835 GHz and

5.725 – 5.850 GHz

5.150 –5.250 GHz (Indoor use only)

5.250 –5.350 GHz (RLAN)

The modulation methods of the equipment that will be allowed in these bands are those methods that minimize the mutual interference caused by multiple devices operating in the same band with geographic overlap. In this regard the two (2) most common forms of spread spectrum techniques are:

- (i) Frequency Hopping Spread Spectrum , FHSS, and
- (ii) Direct Sequence Spread Spectrum, DSSS.

902 – 928 MHz Band

For systems operating with FHSS technique, if the minimum bandwidth of the hopping channel is 250 kHz, then the minimum number of hopping channels shall be 50, the average time in each hopping channel shall be 0.4 second within a 20 second period, and the maximum peak output power shall be 1Watt. For FHSS systems with hopping channel of minimum bandwidth of 500 kHz, the minimum number of hopping channel shall be 25, with the average time in each hopping channel being 0.4 seconds within a 10 second period, and the maximum peak output power shall be 0.25 Watt.

2.4 – 2.4835 GHz Band

The hopping channels shall have a minimum bandwidth of 1 MHz. If the minimum number of hopping channel is 15, then the average time within the hopping channel shall be 0.4 sec. times 15 (hopping channels), and the power shall be 1 Watt. If the minimum number of hopping channel is 75, then the average time within the hopping channel shall be 0.4 sec. times 75.

5.725 – 5.850 GHz Band

The hopping channels shall have a minimum bandwidth of 1 MHz. The minimum number of hopping channels shall be 75, the average time within each hopping channel shall be 0.4 sec. in a 30 sec. period. The maximum output power level shall be 0.75 Watts.

DSSS systems operating in all three bands shall occupy at least 500 kHz at the 6 dB point, with the maximum peak output power being 0.5 Watt in urban and 1 Watt in rural areas.

5.150 – 5.250 GHz Band (Indoor Use Only)

Stations in the band 5150 – 5250 MHz shall be restricted to indoor use. Stations that operate with a bandwidth equal to or greater than 1 MHz shall not exceed a maximum e.i.r.p. of 200mw and a maximum e.i.r.p. density of 10mw/MHz in any 1 MHz band.

5.250 – 5.350 GHz Band (RLAN)

Stations in the band 5250-5380 MHz stations shall be restricted to a peak transmit power not to exceed the lesser 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 MHz band. If transmitting antennas of directional gain greater than 6dBi are used, both the peak transmit

power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Out of Band Emissions

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum system is operating, the radio frequency power that is produced by the system shall be at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

FREQUENCY BAND	SPREAD SPECTRUM MODULATION TECHNIQUE	MINIMUM BANDWIDTH OF HOPPING CHANNEL	AVERAGE TIME IN EACH HOPPING CHANNEL	MINIMUM NUMBER OF HOPPING CHANNELS	MAXIMUM POWER LEVEL
902 - 928MHz	Frequency Hopping	250KHz	0.4 sec within 20 sec period	50	1 Watts
		500KHz	0.4 sec within 10 sec period	25	0.25 Watts
2.4 - 2.4835GHz	Frequency Hopping	1MHz	0.4 sec within 0.4 (15) (no. of Hopping Channel/sec)	15	1 Watt

FREQUENCY BAND	SPREAD SPECTRUM MODULATION TECHNIQUE	MINIMUM BANDWIDTH OF HOPPING CHANNEL	AVERAGE TIME IN EACH HOPPING CHANNEL	MINIMUM NUMBER OF HOPPING CHANNELS	MAXIMUM POWER LEVEL
			0.4 sec within 0.4 x 75 sec	75	0.5 Watts
5.725 - 5.850 GHz	Frequency Hopping	1MHz	0.4 sec in 30 sec period	75	0.75 Watts
All 3	Direct Sequence Spread Spectrum	500KHz for 6db	N/A	N/A	0.75 Watts

6. Applicable Radio Systems and Devices

6.1 The following radio communication equipment can be operated in licence exempt spectrum.

- All low powered, short range devices (SRD's) which currently operate within these bands and do not require licensing¹ by the Telecommunications Unit. These include cordless phones, gate openers etc.
- Devices operated under IEE 802.11b standard, used for WLAN applications both for indoor (linking of communication equipment within an office) or outdoor applications. These include, WiFi, WiMax, and Bluetooth.

¹ All devices are required to be type approved.

7. Standards

- 7.1 In addition to the power levels, licence exempt equipment would be required to operate to the standards IEEE 802.11b, Bluetooth or any other standard developed for WLAN equipment or short-range devices.
- 7.2 Equipment should also comply with one or more of the following standards (see Annex 1).
- FCC Code of Regulations 47. Section 15. 247 (American Standard)
 - ETSI EN 300 328-1 VI.3.1 (2001-12) (European Standard)
 - AS / NZS 4771: 2000 (Australian Standard)
 - RSS-210 (Canadian)

8. Certification and Registration

- 8.1 All equipment must satisfy the Telecommunications Unit's type approval requirements contained in the Telecommunications (Prescribed Telecommunications and Radio Communications Apparatus) Regulations, 2003 S.I. 2003 No.74. The process of type approval involves an assessment of the technical specifications of the device to ensure that it is suitable for operations in the licence exempt bands in Barbados and that it conforms to the required international standards. Equipment restricted under The Telecommunications (Restriction and Prohibition) Regulations, 2003 S.I. 2003 No. 76 will not be type approved by the Telecommunications Unit.
- 8.2 To facilitate individual importation of radio equipment which are not for purposes of resale, the Telecommunications Unit will hold a list of pre-approved equipment which satisfy its type approval requirements.

8.3 All entities which intend to offer a service to the public must first obtain the requisite service provider licence from the Telecommunications Unit.

9. Interference Management

9.1 Devices shall not emit more energy than is required for their intended functions. The limits stated in this policy may not prevent harmful interference under all circumstances.

9.2 The operation of equipment within the licence exempt spectrum would be on a no-interference, no-protection basis. This means that licence exempt users of the spectrum must not cause interference to other licensed users, nor could they claim protection from interference from such users.

9.3 Users of licence-exempt devices are required to cease operation immediately should harmful interference occur to licensed users of the radio spectrum.

9.4 The parties responsible for the equipment should employ the minimum field strength necessary and provide greater attenuation of unwanted emissions than required by these rules in line with good engineering practice. In any case, devices should not exceed the limits established by these rules.

9.5 Complaints of interference by licence exempt users will not be investigated by the Telecommunications Unit.

10. Enforcement

10.1 All activities within the licence exempt spectrum must comply with the Telecommunications Act 2001-36 and applicable regulations made under the Act.

- 10.2 It is an offence under the Telecommunication Act 2001-36 to install and use unauthorized radio communication equipment, within the declared unlicensed bands.
- 10.3 Equipment type does not comply with any of the approved standards as stated in these rules will not be type-approved. Operating equipment that is not type-approved is an offence under the Telecommunications Act 2001-36.

11. Sanctions/ Penalties

- 11.1 Entities found to be operating outside of the technical standards as prescribed in these rules will be subject to seizure of such radio communication equipment.
- 11.2 Entities which are operating outside of the technical standards and which are causing undue interference to licensed users of the spectrum will be subject to seizure of such radio communication equipment and equipment and penalties as defined in the Telecommunications Act 2001-36 and Regulations made under the Act.
- 11.3 Entities which are found to be operating non-type-approved equipment within the licence-exempt spectrum will be subject penalties in accordance with the Telecommunications Act 2001-36.
- 11.4 Entities which engage in the sale of radio communication equipment, not type approved by the Telecommunications Unit for use in the declared licence-exempt bands may be subject to seizure of such radio communication equipment and penalties as defined in the Telecommunications Act 2001-36.

Prepared by
Minister Responsible for Telecommunications
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Annex 1

FCC Code of Regulations 47. Section 15 (American Standard)

Subsection: 15.247 - Operation within the bands 902-928 MHz, 2400-2483.5GHz,
and 5725 – 5850GHz

ETSI EN 300 328-1 V1.3.1 (2001-12) (European Standard)

Electromagnetic compatibility and Radio Spectrum Matters (ERM):

Wideband transmission systems

Data Transmission Equipment

Operating in the (900 MHz, 2.4 GHz and 5GHz bands)

Essential requirements under Article 3.2 of the Radio & Telecommunications Terminal
Equipment directives.

AS/NZS 4771: 2000 (Australian Standard)

Technical characteristics and test conditions for data transmission equipment operating in the
900MHz, 2.4 MHz and 5.8 MHz bands and using spread spectrum modulation techniques.

The compliance level for these devices is level 2. This level applies to devices whose non-
compliance would have moderate risk of causing interference to other devices using the radio
frequency spectrum. Level 2 only apply to transmission equipment using spread spectrum
modulation techniques.

RSS – 210 (Canadian Standard)

Section 6.2.2

See FCC Code of Regulations: 47 Sect. 15 for test and certification.