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RSS-236
Issue 1
September 2012

Spectrum Management and Telecommunications

Radio Standards Specification

General Radio Service Equipment Operating in the Band 26.960 to 27.410 MHz (Citizens Band)

Preface

Radio Standards Specification RSS-236, Issue 1, *General Radio Service Equipment Operating in the Band 26.960 MHz to 27.410 MHz (Citizens Band)* sets out general requirements for, and provides information on, the certification of radio apparatus that is used for the General Radio Service, also known as Citizens Band (CB). This document shall be used in conjunction with other Radio Standards Specifications (RSS) specifically applicable to the type of radio apparatus for which certification is sought.

This document will be in force as of the publication date of Notice No. SMSE-020-12 in *Canada Gazette*, Part I. As a result of this new standard, RSS-136 will be rescinded.

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All Spectrum Management and Telecommunications publications are available on the following website: <http://www.ic.gc.ca/spectrum>.

Issued under the authority of
the Minister of Industry

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Contents

1.	Scope.....	1
2.	Purpose and application	1
2.1	Channel Allocation	1
2.2	Frequency Allocation.....	1
2.3	RSS-Gen Compliance	1
3.	Related Documents	2
3.1	Reference Publications	2
4.	Requirements	2
4.1	External Controls	2
4.2	Use of Batteries.....	2
4.3	Antennas	2
4.4	Equipment Labelling.....	3
4.5	Receivers.....	3
5.	Measurement Method.....	3
5.1	Measurements for Single-Sideband (SSB) and Double-Sideband (DSB)	3
5.2	Minimum Standard	4
5.3	Types of Emissions	4
5.4	Transmitter Spurious Emissions	4

1. Scope

Radio apparatus covered under RSS-236 are considered Category I equipment, comprising radio apparatus for which a technical acceptance certificate (TAC) issued by the Certification and Engineering Bureau of Industry Canada or a certificate issued by a recognized Certification Body (CB) is required, pursuant to subsections 4(2) of the *Radiocommunication Act* and 21(1) of the *Radiocommunication Regulations*.

However, all radio apparatus operating in compliance with the technical requirements outlined in RSS-236 Issue 5 are exempted from the requirement to be authorized pursuant to a radio station licence. Operators should reference the operational policies and procedures outlined in *Radiocommunication Information Circular RIC-18*, General Radio Service (GRS).

2. Purpose and application

The Citizens Band (CB) is a two-way, short-distance voice communications service for either personal or business activities of the general public.

2.1 Channel Allocation

CB channel allocations have been established in the band 26.960 - 27.410 MHz with the following frequencies:

26.965	27.065	27.165	27.255	27.335
26.975	27.075	27.175	27.265	27.345
26.985	27.085	27.185	27.275	27.355
27.005	27.105	27.205	27.285	27.365
27.015	27.115	27.215	27.295	27.375
27.025	27.125	27.225	27.305	27.385
27.035	27.135	27.235	27.315	27.395
27.055	27.155	27.245	27.325	27.405

Note: All transmitters shall operate the nominal carrier frequency (fc) at the above frequencies.

2.2 Frequency Allocation

In the case of double-sideband (DSB) radio equipment, the assigned frequency shall be the nominal carrier frequency (fc). In the case of single-sideband (SSB) equipment, the assigned frequency shall be 1.40 kHz above the carrier frequency (fc) for upper-sideband (USB) operation, and 1.40 kHz below for lower-sideband (LSB) operation.

2.3 RSS-Gen Compliance

In addition to RSS-236, the requirements in RSS-Gen, *General Requirements and Information for the Certification of Radio Apparatus*, shall be met.

3. Related Documents

ANSI C63.10 *American National Standard for Testing Unlicensed Wireless Devices*

ANSI C63.4 *Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz*

RSS-Gen *General Requirements and Information for the Certification of Radio Apparatus*

CPC-2-0-03 *Radiocommunication and Broadcasting Antenna Systems*

RIC-18 *General Radio Service (GRS)*

RSP-100 *Radio Equipment Certification Procedure*

RIC-66 *Addresses and Telephone Numbers of Regional and District Offices of Industry Canada*

TRC-43 *Designation of Emissions*

3.1 Reference Publications

ANSI C63.10 *American National Standard for Testing Unlicensed Wireless Devices*

4. Requirements

4.1 External Controls

There shall be no external controls which could cause the equipment to operate in a manner that would violate the requirements of this standard. If a speech clarifier control is provided, it shall not change the transmitter frequency.

4.2 Use of Batteries

Connection to batteries (if used) shall be made in such a manner as to permit replacement by the user without causing improper operation of the transmitter.

4.3 Antennas

The equipment may have external connections for a detachable antenna, except in the case of portable equipment where this requirement may be relaxed, provided the transmitter circuit is readily accessible for detaching the antenna. Some equipment will require the use of an external antenna system and supporting structure. All antennas, masts, towers or other antenna-supporting structures are required to be compliant with the terms of CPC-2-0-03 – *Radiocommunication and Broadcasting Antenna Systems*.

4.4 Equipment Labelling

Equipment subject to RSS-236 shall comply with the applicable labelling requirements set out in RSS-Gen.

4.5 Receivers

Requirements for receivers for use with transmitters, which are subject to RSS-236, are set out in RSS-Gen.¹

5. Measurement Method

In addition to the requirements in RSS-Gen, the techniques and procedures for measuring equipment below 30 MHz are provided in ANSI C63.10 *American National Standard for Testing Unlicensed Wireless Devices*.

The test report shall be prepared in accordance with ANSI C63.10 *American National Standard for Testing Unlicensed Wireless Devices*. The limits in this standard, as well as associated Industry Canada standards, shall apply.

Note: The use of rod antennas is not permitted for radiated emission measurements below 30 MHz.

5.1 Measurements for Single-Sideband (SSB) and Double-Sideband (DSB)

For Single-Sideband Emissions – The transmitter shall be modulated with a two-tone audio input signal. The test signals shall consist of two sinusoidal tones at the frequencies of 500 Hz +/- 5% and 2400 Hz +/- 5%, which—when simultaneously applied to the audio input of an SSB transmitter—result in equal amplitude radio frequency output signals.

A sample of the output shall be fed to a spectrum analyzer (or an equivalent instrument) to which the level of the audio input signal is increased, until the highest amplitude, odd-order, difference frequency intermodulation product is 20 dB below the level of either of the two test tones or until there is no further increase in output power. The average power output shall then be measured by suitable means. The means used shall be clearly specified in the test report. The peak envelope power is then twice the average power.

For Double-Sideband Emissions – The transmitter shall be operated without modulation. The average carrier power output shall then be measured by suitable means. The means used shall be clearly specified in the test report.

¹ Regulatory Standards NOTICE 2012-DRS0126 must be referenced.

5.2 Minimum Standard

The transmitter output power shall not exceed 4.0 watts for a DSB mode of operations. For SSB, the RF peak envelope power output shall not exceed 12 watts.

5.3 Types of Emissions

A CB transmitter shall not employ a digital modulation and shall not transmit non-voice data.

5.3.1 Permissible Emissions

Permissible emissions include the following types: A1D, H1D, J1D, R1D, A3E, H3E, J3E and R3E.

A non-voice emission is limited to selective calling or tone-operated squelch tones to establish or to continue voice communications.

5.3.2 Authorized Bandwidth

The authorized bandwidth for emission types H1D, J1D, R1D, H3E, J3E and R3E is 4 kHz. The authorized bandwidth for emission type A1D or A3E is 8 kHz.

When emission type A3E is transmitted by a CB transmitter having a total power of greater than 2.5 W, the CB transmitter must automatically prevent the modulation from exceeding 100%.

Each CB transmitter that transmits emission type H3E, J3E or R3E must be capable of transmitting the upper sideband. The capability of also transmitting the lower sideband is permitted.

5.4 Transmitter Spurious Emissions

Spurious emissions from licence-exempt transmitters shall comply with the field strength limits described in RSS-Gen. Additionally, the level of any transmitter's spurious emission shall not exceed the level of the transmitter's fundamental emission.

5.4.1 Single-Sideband Transmitters

The transmitter shall be operated into the standard output termination across the antenna terminals with the carrier suppressed and modulated with two frequency test signals at a level to produce 50% of the average power measured in Section 5.1. A sample of the output shall be fed to a spectrum analyzer (or equivalent test equipment) and the level of the input signal increased by 10 dB, with the levels of both fundamental signals equal. The sampled output shall be analyzed from the lowest IF frequency generated to 1000 MHz and levels of all significant components recorded in the test report.

5.4.2 Double-Sideband Transmitters

The transmitter shall be operated into the standard output terminations across the antenna terminals and modulated with a 2400 Hz sinusoidal signal at a level sufficient to produce 50% of modulation.

A sample of the RF output shall be fed to a spectrum analyzer or equivalent test equipment and the level

of the input signal increased by 16 dB. The sampled output shall be analyzed from the lowest IF frequency generated to 1000 MHz and the levels of all significant components recorded in the test report.

5.4.3 Minimum Standards

The following requirements apply to each transmitter, both with and without the connection of all attachments acceptable for use with the transmitter, such as an external speaker, microphone, power cord, antenna, etc.

5.4.4 Transmitter Spurious Emissions (Unwanted Emissions)

The power of each unwanted emission shall be less than the total transmitter power (Pt) by the following levels.

For A1D and A3E:

- At least 25 dB on any frequency removed from the center of the authorized bandwidth by more than 50%, up to and including 100% of the authorized bandwidth;
- At least 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100%, up to and including 250% of the authorized bandwidth;
- At least $53 + 10 \log_{10}(P_t)$ dB on any frequency removed from the center of the authorized bandwidth by more than 250% of the authorized bandwidth; and
- At least 60 dB on any frequency equal to or greater than twice the fundamental frequency.

For H1D, J1D, R1D, H3E, J3E and R3E:

- At least 25 dB on any frequency removed from the center of the authorized bandwidth by more than 50%, up to and including 150% of the authorized bandwidth;
- At least 35 dB on any frequency removed from the center of the authorized bandwidth by more than 150%, up to and including 250% of the authorized bandwidth;
- At least $53 + 10 \log_{10}(P_t)$ dB on any frequency removed from the center of the authorized bandwidth by more than 250% of the authorized bandwidth; and
- At least 60 dB on any frequency equal to or greater than twice the fundamental frequency.