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Location and Monitoring Service in the Band 902-928 MHz

Preface

Radio Standards Specification 137, Issue 2, *Location and Monitoring Service in the Band 902-928 MHz*, replaces Issue 1, Revision 1 of RSS-137, dated September 25, 1999.

This document will be in force as of the publication date of Notice SMSE-003-09 in *Canada Gazette*, Part I. Upon publication, the public has 120 days to submit comments. The comments received will be taken into account in the preparation of the next version of the document.

Listed below are the changes:

1. General reformatting and transfer of material common to most RSS to RSS-Gen.
2. **Section 2.1:** Low-power mobile transponders with integral antennas that respond only to a received radio signal have been exempted from licensing.
3. **Section 3.1:** The requirement that RSS-Gen be used in conjunction with this standard is stated.
4. **Section 6:** The standard specification for transmitters has been revised to harmonize with the current standard.

Issued under the authority of
the Minister of Industry

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1. Scope

This Radio Standards Specification (RSS) sets out requirements for the certification of radio equipment for the location and monitoring service (LMS) in the band 902-928 MHz.

2. General Information

Equipment certified under this standard is classified as Category I equipment, and a technical acceptance certificate (TAC), issued by the Certification and Engineering Bureau of Industry Canada, or a certificate issued by a Certification Body (CB), is required.

2.1 Licensing Requirements

Equipment covered by this standard is subject to licensing pursuant to subsection 4(1) of the *Radiocommunication Act*. However, mobile transponders certified under this standard that have integral antennas, produced power lower than 3 mW, and respond only to a received radio signal shall be exempted from licensing.

2.2 Definitions

Multilateral system (M-LMS) is a system that uses several base stations to locate a mobile station by triangulation. It is primarily intended for locating vehicles, but the service may be used for other locating functions provided that vehicle locating is the primary function of the system.

Non-Multilateral system (N-LMS) is a system that uses one transmitter for its operation. It is primarily intended for the transmission of data signals to and from vehicles, such as for road toll collection.

Wideband transmitter is a transmitter that has an emission occupying more than a 50 kHz bandwidth.

3. General Requirements

3.1 RSS-Gen Compliance

RSS-137 shall be used in conjunction with RSS-Gen, *General Requirements and Information for the Certification of Radiocommunication Equipment*, for general specifications and information relevant to the equipment to which this standard applies.

4. Measurement Method

4.1 Transmitter Output Power

The transmitter power and unwanted emissions shall be measured in peak value.

4.2 Transmitter Unwanted Emissions

The unwanted emissions power shall be measured with a resolution bandwidth of 100 kHz; however, in the case of emission mask B in section 6.5.2, a resolution of 300 Hz shall be used for measuring centre frequencies within 1 MHz of the equipment operating sub-band edges.

5. General Standard Specifications

A detailed description of the system (base and mobile stations) shall accompany the certification application.

6. Transmitter and Receiver Standard Specifications

6.1 Frequency Band and Occupied Bandwidth

6.1.1 Multilateral LMS Systems

Multilateral LMS Sub-band (MHz)	
Reverse Link ^(Note 1)	Associated Forward Link
904-909.75	927.75-928
919.75-921.75	927.5-927.75
921.75-927.25	927.25-927.5

Note 1: Forward links (base to mobile) for multilateral LMS systems may also be contained within these LMS sub-bands. However, the maximum allowable power in these sub-bands is 30 watts equivalent radiated power (e.r.p.).

Multilateral LMS Sub-band (MHz)	Maximum Occupied Bandwidth Permitted ^(Note 2) (MHz)
904-909.75	5.75
919.75-921.75	2
921.75-927.25	5.50
927.25-927.5	0.25
927.5-927.75	0.25
927.75-928	0.25

Note 2: The maximum occupied bandwidth permitted for a multilateral LMS system shall be 5.75 MHz if the 921.75-927.25 and its associated forward link 927.25-927.5 MHz are combined; and 8 MHz if the 919.75-921.75 MHz and 921.75-927.75 MHz and their associated forward links 927.25-927.5 MHz and 927.5-927.75 MHz are aggregated.

6.1.2 Non-Multilateral LMS Systems

Non-Multilateral LMS Sub-band (MHz)	Maximum Occupied Bandwidth Permitted (MHz)
902-904	2
909.75-921.75	12

6.2 Types of Modulation

The devices may employ any type of modulation technique. The type of modulation used must be reported.

6.3 Frequency Stability

The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm for any type of equipment unless indicated otherwise.

Fixed N-LMS transmitters with an emission bandwidth located more than 40 kHz from the band edge, intermittently operated hand-held readers and mobile transponders are exempt from meeting the frequency stability limit.

6.4 Transmitter Output Power

The output power shall be within ± 1.0 dB of the manufacturer's rated value, and the e.r.p. shall not exceed 30 watts for the band 902-927.25 MHz and 300 watts for the band 927.25-928 MHz.

6.5 Transmitter Unwanted Emissions

The LMS sub-band edges for multilateral LMS systems for which unwanted emissions shall be attenuated are specified in section 6.1.1.

6.5.1 Emission Mask A – Wideband Multilateral Transmitters

Except as provided in section 6.5.4, the unwanted emission limits for wideband multilateral transmitters operating in the sub-bands 904-909.75 MHz, 919.75-921.75 MHz, and 921.75-927.25 MHz shall comply with the following:

In any 100 kHz band outside the equipment operating sub-band edge, the power of emissions shall be attenuated below the maximum permitted transmitter output power, P_{\max} , by the following equation:

$16 + 0.4(f_d - 50) + 10 \log_{10} B$ dB, or 31 dB, whichever is more stringent (attenuation greater than 66 dB is not required).

Where:

- B is the occupied bandwidth in MHz; and
- f_d is the magnitude of the difference between the centre frequency of the measurement bandwidth and the centre frequency of the equipment operating sub-band, expressed as a percentage of the occupied bandwidth.

6.5.2 Emission Mask B – Narrowband Multilateral Forward Link Transmitters

For narrowband multilateral forward link transmitters operating in the band 927.25-928 MHz, the power of any emission outside the equipment operating sub-band edge shall be attenuated below the maximum permitted transmitter output power, P_{max} , by at least:

$$116 \log_{10} ((f_{ed}+10)/6.1) \text{ dB or } 50 + 10 \log_{10} P_{max} \text{ dB, or } 70 \text{ dB, whichever is less stringent.}$$

Where:

- f_{ed} is the magnitude of the difference between the centre frequency of the measurement bandwidth and the equipment operating sub-band edge, expressed as a percentage of the occupied bandwidth.

6.5.3 Emission Mask C – Other Transmitters

Except as provided in sections 6.5.1, 6.5.2 and 6.5.4, the unwanted emission of all other transmitters operating in the band 902-928 MHz shall comply with the following:

The power of any emission outside the equipment operating sub-band edge shall be attenuated below the maximum permitted output power P_{max} by at least $55 + 10 \log_{10} P_{max}$ dB.

6.5.4 Emission Mask D – Intermittent Transmitters

In the band 902-928 MHz, mobile transponders with integral antennas (i.e. transmitters that respond only to a received radio signal) and intermittently operated hand-held transmitters shall not be required to comply with the above emission masks, provided that their 20 dB bandwidth does not exceed the maximum occupied bandwidth permitted. In addition, on any frequency distanced from the carrier frequency by more than 250% of the occupied bandwidth, the power of any emission shall be attenuated below the maximum permitted transmitter output power, P_{max} , by at least $43 + 10 \log_{10} P_{max}$ dB, measured in a bandwidth of 100 kHz.

6.6 Receiver Spurious Emissions

Receiver spurious emissions shall comply with the limits specified in RSS-Gen.