Innovation, Science and Economic Development Canada
Innovation, Sciences et Développement économique Canada

RSS-181
Issue 2
August 2019

Spectrum Management and Telecommunications

Radio Standards Specification

Coast and Ship Station Equipment Operating in the Maritime Service in the Frequency Range 1605-28000 kHz

Aussi disponible en français – CNR-181

Canada

Preface

Radio Standards Specification RSS-181, issue 2, *Coast and Ship Station Equipment Operating in the Maritime Service in the Frequency Range 1605-28000 kHz* replaces RSS-181, issue 1, *Coast and Ship Station Single Sideband Radiotelephone Transmitters and Receivers Operating in the 1,605-28,000 kHz Band* dated April 1, 1971.

Listed below are the main changes:

1. Modernized to reflect the current Radio Standards Specification (RSS) structure.

2. Permits equipment employing modulation other than amplitude modulation, single sideband (AM-SSB).

3. For shipborne equipment, covers only equipment that is not a global maritime distress and safety system (non-GMDSS).

4. States requirement that RSS-Gen, *General Requirements for Compliance of Radio Apparatus* must be used in conjunction with this RSS.

5. Removed equipment categories (L, C, V and Y) according to power and type.

6. Removed performance requirements on receivers as these are now covered in international standards that are governed by Transport Canada.

7. Removed requirement for minimum standards under environmental conditions as these are now covered in international standards that are governed by Transport Canada.

8. Removed the section on receiver spurious emission as this is covered in RSS-Gen.

9. Updated requirements related to spectrum management (frequency stability, transmitter unwanted emissions, power, etc.).

Issued under the authority of
the Minister of Innovation, Science and Economic Development

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Martin Proulx
Director General
Engineering, Planning and Standards Branch

Contents

1. Scope

This Radio Standards Specification (RSS) sets out certification requirements for equipment operating in the maritime service in the frequency range 1605-28000 kHz.

For shipborne equipment, this standard applies only to equipment that is not a global maritime distress and safety system (GMDSS). GMDSS equipment is covered under RSS-288, *Global Maritime Distress and Safety System (GMDSS)*.

2. Transition period

This document will be in force upon publication on Innovation, Science and Economic Development Canada's (ISED) website. However, a transition period of six (6) months following its publication will be provided, within which applications for the certification of equipment as per RSS-181, issue 2, or RSS-181, issue 1, will be accepted. After this period, only applications for certification of equipment under RSS-181, issue 2, will be accepted and equipment manufactured, imported, distributed, leased, offered for sale or sold in Canada shall comply with this issue.

A copy of RSS-181, issue 1, is available upon request by email.

3. Certification

Equipment covered by this standard is classified as Category I equipment. Either a technical acceptance certificate (TAC) issued by ISED's Certification and Engineering Bureau or a certificate issued by a recognized certification body (CB) is required.

4. Licensing requirements

Equipment covered by this standard is subject to licensing pursuant to subsection 4(1) of the *Radiocommunication Act*. However, in some cases, radio equipment that is operated on board a ship or vessel in the performance of the maritime service is exempt from licensing requirements pursuant to subsections 15.2, 34(1), 34(2) and 34.2 of the *Radiocommunication Regulations*. For further information, consult the Licensing exemptions web page.

5. Inquiries concerning Transport Canada requirements

Inquiries concerning Transport Canada's requirements should be directed to:

Manager, Navigation Safety and Radiocommunications
Marine Safety, Transport Canada
10th Floor
Tower C, Place de Ville
330 Sparks Street
Ottawa ON K1A 0N8
Email: TC.NavRadio.TC@Tc.gc.ca

6. RSS-Gen compliance

RSS-181 shall be used in conjunction with RSS-Gen, *General Requirements for Compliance of Radio Apparatus* for general specifications and information relevant to the equipment covered by this standard.

7. Related documents

ISED documents are available in the *Official publications* section of the Spectrum Management and Telecommunications website.

The following document should be consulted in conjunction with this RSS:

- RBR-2, *Technical Requirements for the Operation of Mobile Stations in the Maritime Service*

RBR – Regulation by Reference

8. Definitions

Coast Station is a land station in the maritime mobile service.

Digital Selective Calling (DSC) is a synchronous system developed by the International Telecommunication Union Radiocommunication Sector (ITU-R), used to establish contact with a station or groups of stations automatically by means of radio.

Ship Station is a mobile station in the maritime mobile service located on board a vessel that is not permanently moored, other than a survival craft.

9. Digital Selective Calling equipment

For ship station equipment with Digital Selective Calling (DSC) capability, the applicant shall provide a statement indicating that the equipment's DSC capability complies with the latest version of ITU-R Recommendation M.493, *Digital selective-calling system for use in the maritime mobile service*.

10. Measurement methods

This section describes the measurement methods for frequency stability and transmitter power.

10.1 Frequency stability

The frequency stability shall be measured as described in RSS-Gen. However, for frequency stability measurement with variation of temperature at the manufacturer's rated supply voltage, the equipment's unmodulated carrier frequency shall be measured at -20 °C, +20 °C and +50 °C.

10.2 Transmitter power

Transmitter power shall be measured as peak envelope power (PEP) for single sideband emission. For other emission types, the transmitter power shall be measured as average unmodulated carrier power multiplied by 1.67.

11. Transmitter standard specifications

This section describes the transmitter standard specifications.

11.1 Emission types

Equipment shall employ emission types listed in table 1 and table 2 for ship stations and coast stations, respectively.

Table 1: Emission types permitted for ship stations

Application types	Emission types
Radiotelegraphy (manual)	A1A, J2A, J2B*, J2D*
Facsimile	F1C, F3C, J2C, J3C
Radiotelephony	H3E, J2D*, J3E, R3E

* J2B and J2D are permitted only on 2000-27500 kHz.

Table 2: Emission types permitted for coast stations

Application types	Emission types
Radiotelegraphy (1605-2850 kHz)	
Manual	A1A, J2A
Facsimile	F1C, F3C, J2C, J3C
Radiotelegraphy (4000-27500 kHz)	
Manual	A1A, J2A, J2B, J2D
DSC	F1B, J2B
Facsimile	F1C, F3C, J2C, J3C
Radiotelephony	H3E, J3E, R3E, J2D*

* J2B and J2D are permitted only on 2000-27500 kHz.

11.2 Requirements for amplitude modulation

Equipment employing amplitude modulation (AM) shall meet the following requirements:

1) for double sideband emission, the peak modulation shall be maintained between 75% and 100%; or
2) for single sideband emission, only the upper sideband shall be transmitted (single sideband transmitters shall automatically limit the PEP to meet the requirements in section 10.2).

11.3 Authorized bandwidth

Equipment shall not have the occupied bandwidth exceed the authorized bandwidth specified in table 3.

Table 3: Authorized bandwidth

Class of emission	Authorized bandwidth (kHz)
A1A	0.4
F1B	0.3 0.5
J2A	0.4
J2B	0.3 0.5 3.0
For all other emission types	3.0

11.4 Single sideband power level

Equipment employing single sideband emission shall have the carrier power:

(i) between 3 and 6 dB below PEP, for full carrier transmitters;
(ii) at 40 dB below PEP, for suppressed carrier transmitters; or,
(iii) at 18±2 dB below PEP, for reduced or variable level carrier .

11.5 Frequency stability

The carrier frequency shall not depart from the reference frequency in excess of the limits listed in table 4.

Table 4: Frequency stability limits

Frequency bands and categories of equipment	Frequency stability limit (±Hz)
1600-4000 kHz	
a. Coast station equipment with	
i. single sideband emissions	20
ii. DSC or data emissions	10
iii. other emissions	50
b. Ship station equipment with	
i. data emissions	10
ii. all other emissions	20

Frequency bands and categories of equipment	Frequency stability limit (±Hz)
4000-27500 kHz	
a. Coast station equipment with	
i. single sideband emissions	20
ii. DSC or data emissions	10
iii. Morse telegraphy emissions	10 ppm
iv. Other emissions	15
b. Ship station equipment with	
i. data emissions	10
ii. all other emissions	20

11.6 Transmitter output power

The transmitter output power shall not exceed the limits shown in table 5.

Table 5: Transmitter output power limit

Equipment type and frequency band	Power limit (W)
Coast station	
a. Radiotelegraphy	
i. 2035-2065 kHz	6600
ii. 4000-8000 kHz	10000
iii. 8000-9000 kHz	20000
iv. 12000-27500 kHz	30000
b. Radiotelephony	
i. 2000-4000 kHz	1000
ii. 4000-27500 kHz	10000
iii. 2000-27500 kHz	10000 for J2D emission
Ship station	
a. Radiotelegraphy	
i. J2D emission	1500
ii. other emissions	8000
b. Radiotelephony	
i. 2000-4000 kHz	150
ii. 4000-27500 kHz	1500
iii. 2000-27500 kHz	1500 for J2D emission

11.7 Transmitter unwanted emissions

Equipment shall comply with the following unwanted emission limits:

a. For equipment employing emission H3E, J3E and R3E, the average power of emissions shall be attenuated (in dB) below the transmitter power, P (dBW), by:

   i. 28 dB for any frequency removed from the carrier frequency by more than 50% up to and including 150% of the authorized bandwidth;
   ii. 35 dB for any frequency removed from the carrier frequency by more than 150% up to and including 250% of the authorized bandwidth; and
   iii. $43 + 10 \log_{10} p$ (watts) for any frequency removed from the carrier frequency by more than 250% of the authorized bandwidth.

b. For other equipment, the average power of emissions shall be attenuated (in dB) below the transmitter power, P (dBW), by:

   i. 25 dB for any frequency removed from the carrier frequency by more than 50% up to and including 150% of the authorized bandwidth;
   ii. 35 dB for any frequency removed from the carrier frequency by more than 150% up to and including 250% of the authorized bandwidth; and
   iii. $43 + 10 \log_{10} p$ (watts) for any frequency removed from the carrier frequency by more than 250% of the authorized bandwidth.