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

RSS-287
Issue 4
TDB
Draft

Spectrum Management and Telecommunications

Radio Standards Specification

Emergency Position Indicating Radio Beacons (EPIRB), Emergency Locator Transmitters (ELT), Personal Locator Beacons (PLB), and Maritime Survivor Locator Devices (MSLD)

Aussi disponible en français – CNR-287

Canada

Preface

Radio Standard Specification 287, issue 4, *Emergency Position Indicating Radio Beacons (EPIRB), Emergency Locator Transmitters (ELT), Personal Locator Beacons (PLB), and Maritime Survivor Locator Devices (MSLD)*, replaces RSS-287, issue 3, dated April 2024.

Main changes are listed below:

1. removed definitions from section 1 and moved them to a separate definitions section 4
2. removed additional information from section 1 and moved the information to a separate introductions section 2
3. moved certification requirements for Innovation, Science and Economic Development Canada to section 3.2
4. modified the Digital Selective Calling (DSC) closed loop configuration from section 3.5 to include open loop
5. added sections 3.6.1.5 and 3.6.1.6 containing the reference to documents for certifying Maritime Survivor Locator Devices with DSC
6. added section 5.5 for Maritime Survivor Locator Devices requirements
7. grouped all 121.5 MHz and 243 MHz transmitter requirements under section 9.4
8. editorial changes and clarifications, as appropriate.

Inquiries may be submitted by one of the following methods:

1. Online using the General Inquiry form. In the form, select the Directorate of Regulatory Standards radio button and specify "RSS-287" in the General Inquiry field.

2. By mail to the following address:

   Innovation, Science and Economic Development Canada
   Engineering, Planning and Standards Branch
   Attention: Regulatory Standards Directorate
   235 Queen St
   Ottawa ON K1A 0H5
   Canada

3. By email to consultationradiostandards-consultationnormesradio@ised-isde.gc.ca

Additional information and guidance are available on the Innovation, Science and Economic Development Canada (ISED) webpages Common Questions and Answers and General Notices.

Comments and suggestions for improving this standard may be submitted online using the Standard Change Request form, or by mail or email to the above addresses.

All ISED publications related to spectrum and telecommunications are available on the Spectrum Management and Telecommunications website.

Issued under the authority of the Minister of Industry

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Wen Kwan
Director General
Engineering, Planning and Standards Branch

Contents

1. Scope

This Radio Standard Specification (RSS) document sets out the requirements for certifying the radio transmitter capabilities of:

- emergency position indicating radio beacons (EPIRBs), which are carried on ships
- emergency locator transmitters (ELTs), which are carried on aircraft
- personal locator beacons (PLBs), which are for use by persons
- maritime survivor locator devices (MSLDs), which are devices worn on a person while aboard a vessel

2. Introduction

EPIRBs, ELTs, and PLBs may send a distress signal on the 406 MHz dedicated frequency band via satellite systems. These devices are also intended and designed to provide the standardized capabilities necessary to transmit alert and location information via coded messages to be relayed through the COSPAS-SARSAT system to Search and Rescue agencies.

MSLDs are intended and designed to provide limited proximity alerting and locating capability. The device will transmit low-power alerting and homing signals to an appropriate directional receiver on board a vessel in the devices' vicinity to facilitate the distressed user's rescue.

Important note:

MSLDs DO NOT comply with Transport Canada (TC) and National Search and Rescue Secretariat (NSS) minimum performance standards governing EPIRBs and PLBs, respectively.

MSLDs are NOT considered to be EPIRBs or PLBs by ISED, in agreement with TC and the NSS.

MSLDs are NOT intended or designed to provide the standardized capabilities necessary to transmit alerts via satellites.

MSLDs, EPIRBs and PLBs with added capabilities, such as AIS and DSC, are to be used on a non-interference basis to the COSPAS-SARSAT satellite system.

In an emergency situation, the radio for all types of beacons transmitting on the 406 MHz frequency shall be turned on either:

a. automatically, such as a water activated switch in an EPIRB or an inertia switch in an ELT; or
b. manually by the user.

The manufacture, importation, or sale of EPIRBs and PLBs operating only on 121.5 MHz, 243 MHz, or only on both of these frequencies is prohibited.

ELTs shall be certified only if the equipment has, at a minimum, an operating frequency of 121.5 MHz or 406 MHz.

3. General requirements

This section sets out the general requirements and references related to this RSS.

3.1 Coming into force

This standard will be in force as of the date of its publication on ISED's website.

However, a transition period of six months from the publication date is provided. During this period, compliance with issue 3 or issue 4 of RSS-287 is accepted. After this period, only applications for the certification of equipment under issue 4 of RSS-287 will be accepted. Furthermore, after this transition period, equipment manufactured, imported, distributed, leased, offered for sale, or sold in Canada shall comply with issue 4 of RSS-287.

A copy of RSS-287, issue 3, is available upon request by emailing consultationradiostandards-consultationnormesradio@ised-isde.gc.ca.

3.2 Certification requirements

Equipment covered by this RSS is classified as Category I equipment. Either a technical acceptance certificate (TAC) issued by the Certification and Engineering Bureau of ISED or a certificate issued by a recognized certification body (CB) is required, pursuant to subsection 21(1) of the *Radiocommunication Regulations*.

For EPIRBs the acceptance letter issued by TC (see section 5.3.2), confirming that the equipment has met TC requirements, shall be included as part of the certification application sent to the Certification and Engineering Bureau (CEB) or a recognized CB.

If applicable, ISED or the recognized CB shall evaluate the evaluation results for the homing transmitter.

For ELTs, the certification application for an ELT device shall provide, in the test report specified in RSS-Gen, a Declaration of Compliance (DOC) stating that the device meets all the applicable requirements from section 104 of AWM chapter 551 and the applicable CAN-TSO standards for its operating frequencies.

For PLBs, NSS will provide a recommendation letter to the applicant (see section 5.4.2), confirming that the equipment has met NSS Standards, which shall be included as part of the certification application sent to the CEB or a recognized CB.

If applicable, ISED or the recognized Certification Body shall review the evaluation results for the homing transmitter.

3.3 Licensing requirements

Equipment covered by this standard is exempt from licensing requirements pursuant to section 15 of the *Radiocommunication Regulations*.

3.4 RSS-Gen compliance

Equipment being certified under this standard shall also comply with the general requirements set out in Radio Standards Specification RSS-Gen, *General Requirements for Compliance of Radio Apparatus*. Where contradictions exist between this standard and RSS-Gen, this standard shall take precedence.

3.5 Transmitter frequency configurations

The equipment shall comply with the following configurations:

EPIRB: 406 MHz primary transmitter with homing frequency on 121.5 MHz and/or 243 MHz, and optional AIS locating signal on 161.975 MHz or 162.025 MHz

ELT: Shall transmit on at least one of the following frequencies:

- 406 MHz or
- homing frequency on 121.5 MHz

PLB: 406 MHz with homing frequency on 121.5 MHz and/or 243 MHz, and optional AIS locating signal on 161.975 MHz or 162.025 MHz

MSLD: Shall transmit on at least one of the following frequencies:

- homing frequency on 121.5 MHz
- AIS locating signal on 161.975 MHz or 162.025 MHz or
- DSC communication, channel 70, on 156.525 MHz

DSC shall have the capability to transmit either as closed loop or open loop; however, DSC shall transmit as closed loop for at least 5 minutes or until an accurate position and time from the integrated electronic position fixing device is included in the signal before it can transmit as open loop.

3.6 References

This section specifies documents relevant to the RSS.

3.6.1 Normative publications

Where applicable, the equipment shall comply with the standards listed in this section. These documents can be obtained at the addresses listed in Annex A.

3.6.1.1 ISED documents

CPC-2-3-07, *Obtaining Identities in the Maritime Mobile Service*

3.6.1.2 COSPAS/SARSAT documents

C/S T.001, *Specification for COSPAS-SARSAT 406 MHz Distress Beacons*
C/S T.007, *COSPAS-SARSAT 406 MHz Distress Beacons Type Approval Standard*
C/S T.018, *Specification for Second Generation COSPAS-SARSAT 406 MHz Distress Beacons*
C/S S.007, *Handbook on Beacon Regulations Canada*
C/S G.005, *COSPAS-SARSAT Guidelines on 406 MHz Beacon Coding, Registration and Type Approval*

The above documents can be obtained from the COSPAS-SARSAT website.

3.6.1.3 Transport Canada Civil Aviation documents

Canadian Aviation Regulations, Part VI, section 605.38

Airworthiness Manual (AWM) Chapter 551, *Aircraft Equipment and Installation – Canadian Aviation Regulations (CARs),* section 551.104, prescribing the Canadian standards of airworthiness for the design and installation of ELT equipment.

Airworthiness Manual Chapter 537, *Standards Appliances and Parts – Canadian Aviation Regulations (CARs)*

3.6.1.4 Federal Aviation Administration Technical Standard Orders (TSO)

TSO-C126: *406 MHz Emergency Locator Transmitter (ELT)*

TSO-C126a: *406 MHz Emergency Locator Transmitter (ELT)*

TSO-C126b: *406 MHz Emergency Locator Transmitter (ELT)*

TSO-C126c: *406 MHz Emergency Locator Transmitter (ELT)*

The above documents can be obtained from the Dynamic Regulatory System website.

3.6.1.5 International Telecommunication Union Radiocommunication (ITU-R)

For devices having 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*

For devices having AIS capability, the applicant shall refer to:

M.1371-5, *Technical characteristics for an automatic identification system using time division multiple access in the VHF maritime mobile frequency band*

For devices having DSC and AIS capability, the applicant shall refer to:

M.2135-1, *Technical characteristics of autonomous maritime radio devices operating in the frequency band 156-162.05 MHz*

3.6.1.6 International Electrotechnical Commission (IEC)

For devices having DSC capability, the applicant shall refer to the IEC minimum requirements, methods of testing and required test results:

IEC 63269, *Maritime navigation and radiocommunication equipment and systems – Maritime survivor locating devices (man overboard devices) – Minimum requirements, methods of testing and required test results*

3.6.2 Related documents

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

4. Definitions

The Automatic Identification System (AIS) is a maritime navigation safety communication system standardized by the International Telecommunication Union (ITU) and adopted by the International Maritime Organization (IMO).

AIS automatically provides vessel information (including the vessel's identity, type, position, course, speed, navigation status and other safety-related information) to appropriately equipped shore stations, other ships and aircrafts.
In addition, AIS:

a. automatically receives such information from similarly fitted ships
b. monitors and tracks ships and
c. exchanges data with shore-based facilities

Digital Selective Calling (DSC) is a type of synchronous system developed by the ITU Radiocommunication Sector (ITU-R) that is used to establish contact using digital codes with a station or groups of stations by means of radiocommunication. DSC may transmit using either open loop or closed loop:

- Open Loop is the capability of transmitting to all ships in the vicinity.
- Closed Loop is the capability of transmitting an individual transmission to a predefined ship or for a predefined group of ships in the vicinity.

5. Transport Canada and NSS requirements

This section sets out the TC and NSS requirements that are applicable to radio transmitters subject to this standard.

5.1 COSPAS-SARSAT (406 MHz) compliance for EPIRB, ELT, and PLB

Tests to show compliance to COSPAS-SARSAT standards for the 406 MHz transmitter shall be carried out by a test facility that has been approved by COSPAS-SARSAT. A list of COSPAS-SARSAT approved test facilities can be obtained from the COSPAS-SARSAT website.

5.2 Additional COSPAS-SARSAT requirements for EPIRBs and PLBs

In addition to the requirements in the test report specified in RSS-Gen, the certification application of EPIRB and PLB devices that transmit on the 406.0-406.1 MHz frequencies shall include documentation to show that the equipment is certified by a test facility

recognized by one of the COSPAS-SARSAT Partners and that the equipment complies with the requirements in COSPAS-SARSAT Standards C/S T.001 and C/S T.007.

5.3 EPIRB requirements

This section sets out the requirements for EPIRBs.

5.3.1 Battery and reliability tests

Battery and reliability tests shall be carried out by a test facility approved by Transport Canada (Marine Safety) or a country that is a signatory to the SOLAS Convention. Addresses of these test facilities can be obtained from Transport Canada (Marine Safety).

5.3.2 Verification by Transport Canada

EPIRBs require verification from TC that they meet TC's operational requirements before the applicant can submit the equipment to ISED for certification under this RSS. TC requirements can be found in the *Navigation Safety Regulations*, 2020.

The test report sent to TC shall contain the following:

a. the signature of the testing and supervising officers
b. the name of the signing persons
c. phone and facsimile numbers
d. the full name and address of the testing facility and
e. proof that the facility is an approved test facility (see section 5.1)

Proof of compliance submitted to TC (Marine Safety) shall be in the form of documentation issued by a classification society or by a recognized independent testing establishment. See Annex A for TC (Marine Safety) contact information.

Inquiries concerning TC's requirements should be directed to Manager, Navigation Safety and Radiocommunications listed in Annex A.

5.4 PLB requirements

This section sets out the requirements for PLBs.

5.4.1 Battery and reliability tests

Battery and reliability tests for PLBs shall be carried out by a test facility approved by the National Search and Rescue Secretariat. Addresses of such test facilities are obtainable from this organization.

5.4.2 Verification by NSS

The applicant shall refer to the National Search and Rescue Secretariat, *406 megahertz (MHZ) Personal Locator Beacon* performance document, which is amended from time to time. PLB devices require verification from The National Search and Rescue Secretariat and confirmation that it meets requirements in the 406 megahertz (MHz) Personal Locator Beacon performance document before the applicant can submit the equipment to ISED for certification under this RSS.

The test report sent to NSS shall contain the following:

a. the signature of the testing and supervising officers
b. the name of the signing persons
c. phone and facsimile numbers
d. the full name and address of the testing facility and
e. proof that the facility is an approved test facility (see section 5.1)

Proof of compliance submitted to NSS shall be in the form of documentation issued by a classification society or by a recognized independent testing establishment. See Annex A for contact information.

Inquiries concerning the NSS document should be directed to NSS COSPAS-SARSAT listed in Annex A.

5.5 MSLD requirements

MSLDs enabled with the DSC protocol shall have a receiver to allow DSC Coast Stations or ships with Class A stations to acknowledge and deactivate the alert.

NOTE 1 The Canadian Coast Guard MCTS Coast Stations are an example of a DSC Coast stations.

NOTE 2 Class A stations are shipborne equipment, as defined in Annex 2 of M.493 (section 3.6.1.5), which includes all the facilities defined in Annex 1 of M.493 (section 3.6.1.5), and complies with the IMO GMDSS carriage requirements for MF/HF installations and/or VHF installations.

6. Labelling requirements

This section specifies the labelling requirements that are in addition to those in RSS-Gen.

6.1 General

Each device shall be labelled with the following:

a. its type designator, as listed in section 7,
b. for EPIRB, ELT and PLB, its class type, as listed in section 8.

6.2 EPIRB

Labelling required by TC (Marine Safety) for EPIRBs, as specified in the document IMO Resolution MSC.471(101), may be combined with the labelling requirements in RSS-Gen and section 6.1 into a single label.

6.3 ELT

Labelling required by TC (Civil Aviation) for ELTs, as specified in the *Airworthiness Manual*, section 551.104, may be combined with the labelling requirements in RSS-Gen and section 6.1 into a single label.

6.4 PLB

Labelling required by The National Search and Rescue Secretariat for PLBs, as specified in the document 406 megahertz (MHz) Personal Locator Beacon, may be combined with the labelling requirements in RSS-Gen and section 6.1 into a single label.

6.5 MSLD

The sale packaging and user manual of MSLDs shall clearly indicate the following or equivalent bilingual statement:

This radio device is designed to only provide an effective alerting and locating capability in close proximity to a vessel. This radio beacon is NOT an EPIRB.

Cette radiobalise est conçue uniquement dans le but de fournir une fonction d'alerte et de localisation efficace à proximité immédiate d'un navire. Cette radiobalise n'est PAS une RLS.

For DSC capable MSLDs :

Users should be reasonably familiar on how to properly configure their equipment such as the appropriate input of the up-to-date vessel's MMSI in addition to the proper manipulation of their equipment, especially on how to perform manufacturer specific regular testing to avoid undesired transmissions.

Les utilisateurs devraient être raisonnablement familiers avec la bonne configuration de leur équipement, comme l'entrée appropriée du MMSI du navire à jour, en plus de la manipulation appropriée de leur équipement, notamment sur la manière d'effectuer des tests réguliers spécifiques au fabricant afin d'éviter des transmissions indésirables.

7. Type designator

An appropriate type designator shall be appended as a suffix (as shown below) to the certification number or alternatively, the correct suffix/equipment type can be identified while submitting the online application, to indicate the class of the device.

Table 1 – Type designators

Suffix	Abbreviated Definition
E1	EPIRB, float free
E2	EPIRB, manual activation
E3	EPIRB + AIS, float free
E4	EPIRB + AIS, manual activation
PL	PLB
PL1	PLB + AIS
A	ELT, automatically ejected
AD	ELT, automatic deployable
F	ELT, Fixed
AF	ELT, automatic fixed
AP	ELT, automatic portable
W	ELT, water activated
S	ELT, survival
DT	ELT, Distress Tracking
X	MSLD
X1	MSLD + AIS
X2	MSLD + DSC
X3	MSLD + AIS + DSC

8. Transmitter frequency and output power stability for all devices operating on 121.5 MHz or 243 MHz frequencies

The output power and frequency stability measurements described below shall be carried out just before the end-of-life battery test that is required by TC or NSS. Other tests, such as the out-of-band emissions test, may be carried out at any time.

The output power and unmodulated carrier frequency shall be measured at the antenna connector and under the conditions specified below. A sufficient stabilization period at each temperature shall be used prior to each frequency measurement:

a. at 10 degree intervals of temperatures between the temperatures listed below and at the manufacturer's rated supply voltage and

b. at +20°C temperature and ±15% supply voltage variations

The equipment shall be tested at the following temperature ranges:

ELT, EPIRB and PLB: Class 0: -55°C to +70°C
Class 1: -40°C to +55°C
Class 2: -20°C to +55°C

MSLDs: -20°C to +55°C

9. Transmitter and receiver standard specifications

This section specifies the transmitter and receiver standard specifications for the equipment specified in this RSS.

9.1 ELT requirements

ELTs shall comply with all the requirements in the AWM standard, section 551.104 (see section 3.6.1.3).

9.2 EPIRB and PLB requirements

The 406 MHz transmitter of EPIRBs and PLBs shall comply with the technical requirements in COSPAS-SARSAT standards listed in section 5.2.

9.3 MSLD requirements

MSLDs with operating frequencies of 161.975 MHz, 162.025 MHz or 156.525 MHz shall comply with the transmitter specifications requirements of RSS-182, *Maritime Radio Equipment Operating in the 156-162.5 MHz Band*, as applicable.

9.4 EPIRBs, PLBs, and MSLDs transmitters operating on 121.5 MHz and 243 MHz

This section specifies requirements for EPIRBs, PLBs, and MSLDs transmitters operating on 121.5 MHz and 243 MHz.

9.4.1 Modulation characteristics

The modulation technique for each carrier shall be as follows:

a. The type of emission shall be A3X, with periods of voice modulation or no modulation (CW) permitted. During A3X transmissions, the emissions shall have the distinctive characteristic achieved by amplitude modulating the carrier with an audio frequency sweeping upwards or downwards for EPIRBs and upwards for PLBs, over a range of not less than 700 Hz within the band 300 Hz to 1600 Hz, at a sweep repetition rate between 2 and 4 Hz.

b. The modulation factor for A3X modulation shall be at least 85% and not more than 100%; that is, over-modulation is not permitted.

c. The transmission shall be continuous, except in the case of a homing transmitter when it may be interrupted for up to two seconds during the transmission of the 406 MHz burst.

d. The A3X modulation shall have a clearly defined carrier frequency distinct from the modulation sideband components. For this, at least 30% of the total power emitted during any transmission shall be contained within ±30 Hz of the carrier frequency in the case of the 121.5 MHz beacon, and within ±60 Hz of the carrier frequency in the case of the 243.0 MHz beacon. Additionally, if the type of modulation is changed during transmission, the carrier frequency shall not shift by more than ±30 Hz and ±60 Hz for the 121.5 MHz and 243.0 MHz transmitters, respectively.

e. Modulation duty cycle, which is the ratio of the positive modulation duration measured at the half-amplitude points on the modulation signal envelope to the period of the audio modulating frequency, shall be between 33% and 55%.

9.4.2 Transmitter frequency stability

The carrier frequency shall not depart by more than 0.005% (±50 ppm) from that measured at 20°C and the rated supply voltage. If the 121.5 MHz and 243 MHz frequencies are derived from the same oscillator circuitry, the frequency stability test may be performed on only one of these frequencies.

9.4.3 Radiated transmitter power

The transmitter shall be modulated by an A3X signal as described in section 9.4.1(a). The resolution bandwidth of the spectrum analyzer shall be wide enough to include all significant modulation products. The bandwidth used shall be reported.

The radiated power of a 121.5 or 243 MHz transmitter is required only in the main beam (i.e. antenna pattern is not required).

The average output power of EPIRBs and PLBs shall not be less than 50 mW when the transmitter is used as a primary beacon and not less than 25 mW when used as a homing transmitter.

The peak radiated power of MSLDs shall not be less than 25 mW and shall not exceed 100 mW.

9.4.4 Transmitter unwanted emissions

The transmitter unwanted emissions shall be measured at room temperature and this temperature shall be recorded. The transmitter shall be modulated with an audio sweep signal as described in section 9.4.1(a).

The average power of unwanted emissions in a 300 Hz resolution bandwidth shall be attenuated below the level of the average transmitter power P (dBW) by:

a. at least 25 dB on any frequency removed from the centre of the authorized bandwidth by more than 50%, up to and including 100% of the authorized bandwidth, and

b. at least 30 dB on any frequency removed from the centre of the authorized bandwidth by more than 100%

where the authorized bandwidth is set at 25 kHz with the transmit frequency at the centre of this bandwidth.

9.4.5 Modulation factor and audio sweep

The transmitter shall be modulated with an A3X signal as described in section 9.4.1(a) and its output displayed on the oscilloscope.

a. Measure and record the peak and through voltages of the RF envelope of the modulated carrier to determine the modulation factor, which is the ratio of the

difference to the sum of the carrier levels at the peaks and troughs of the modulated RF envelope, that is:

$$\text{Modulation factor} = \frac{V_{peak} - V_{trough}}{V_{peak} + V_{trough}}$$

b. Measure and record the direction of the audio sweep.

c. Measure and record the highest and the lowest audio frequencies of the sweep.

d. Measure and record the audio sweep repetition rate.

e. Measure and record the modulation duty cycle (see definition in section 9.4.1(e)).

f. Modulate the transmitter with voice and CW (carrier wave) if the beacon is equipped with this feature. Provide a diagram of the modulated signal in the time domain, properly labelled to show the duration of each mode (A3X, A3E, N0N) of modulation.

9.4.6 Spectrum characteristics

The spectrum characteristics described in section 9.4.1(d) are to be measured.

The transmitter shall be modulated with an A3X signal, as described in sections 9.4.1(a) and 9.4.1(d).

Set the resolution bandwidth of the spectrum analyzer to 60 Hz for 121.5 MHz transmitters and to 120 Hz for 243 MHz transmitters. If a spectrum analyzer of the correct resolution bandwidth is not available, use a narrower bandwidth and sum the powers over the desired band. Record all measurements.

If the beacon design is such that the type of modulation is changed during transmission (e.g. from A3E to N0N), describe the test and verify that the carrier frequency shift complies with section 9.4.1(d).

The average total power in the resolution bandwidth specified in this section shall not be more than 5 dB below the transmitter average power that is measured by a wideband meter (see section 8 or 9.4.3). This indicates that at least 30% of the power resides within the band f_c ±30 Hz (at 121.5 MHz) and within the band f_c ±60 Hz (at 243 MHz), where f_c is the carrier frequency.

10. Authorization to perform radiation tests

Before carrying out any tests at offset frequencies or at distress frequencies in Canada that involve radiation of signal into the air (including any tests not performed in a properly shielded room, whether the antenna is attached to the device or not), prior authorization from the offices/agencies nearest to where radiation testing is to be conducted shall be obtained. The agencies are listed below (see addresses in Annex A or the nearest office/agency):

- NAV CANADA Area Control Centres (ACC)
- Canadian Mission Control Centre (CMCC) at CFB Trenton, Ontario (406 MHz devices only)
- Joint Rescue Coordination Centres (JRCC)

Note: The local NAV CANADA office should be contacted for up-to-date telephone numbers of the above-mentioned personnel/agencies. In informing each party, the testing officer shall provide the following information several days in advance: name, telephone number, date and duration of the test (test time shall be as short as possible), and location of the test site.

The agencies' written consent to the test shall be submitted to the local ISED office for the purpose of issuing the authorization to use the radio frequency.

Unless there are valid reasons to use distress frequencies, only offset frequencies may be authorized as follows:

- 121.100 to 121.450 MHz; 121.550 to 121.900 MHz
- 242.200 to 242.900 MHz; 243.100 to 243.800 MHz
- 406.000 to 406.99 MHz (in accordance with CMCC authorization and COSPAS-SARSAT technical directives, see C/S T.007)

Great care shall be taken not to accidentally radiate in the forbidden bands (121.5 MHz ±50 kHz and 243 MHz ±100 kHz).

No activation of operationally coded 406 MHz devices is permitted without prior registration in the appropriate National Beacon Registry.

Annex A. Addresses

The following addresses are relevant to this document. The addresses, especially telephone and fax numbers, are subject to change without notice:

Canadian Mission Control Centre (CMCC)
P.O. Box 1000, Canadian Forces Base Trenton, 8 Wing
Astra ON K0K 3W0
Duty Officer Tel: (613) 965-2026/fax: (613) 965-7045
Tel: 1-877-406-7671
Fax: 1-877-406-3298
Email: cbr@sarnet.dnd.ca

COSPAS/SARSAT Secretariat
1250 René-Lévesque Blvd W
Suite 4215
Montréal QC H3B 4W8
Tel: (514) 500-7999
Fax: (514) 500-7996
Email: mail@406.org
Website: http://406.org

International Civil Aviation Organization
Document Sales Unit
999 University St
Montréal QC H3C 5H7
Tel: (514) 954-8219
Fax: (514) 954-6077
Email: icaohq@icao.int
Web support: web@icao.int

International Maritime Organization
4 Albert Embankment
London, England SE1 7SR
United Kingdom
Tel: +44 (0) 22 7735 7611
Fax: +44 (0) 22 7587 3210

International Telecommunication Union
Publication Sales
Place des Nations, CH-1211
Geneva 20, Switzerland

Tel: +41 22 730 6141 (English)
Fax: +41 22 730 5194
Email: sales@itu.int

Public Safety Canada
National Search and Rescue Secretariat (NSS)
COSPAS-SARSAT section
269 Laurier Ave W
Ottawa, ON K1A 0P8
Tel: 1-800-830-3118 or 613-944-4875
Public Inquiries: communications@ps-sp.gc.ca

Joint Rescue Coordination Centres (JRCCs), East to West:

Joint Rescue Coordination Centre Halifax
Canadian Forces Base, Halifax
P.O. Box 99000 Stn Forces
Halifax NS
B3K 2X0
Tel: (902) 427-2104
Fax: (902) 424-2114

Joint Rescue Coordination Centre Trenton
Canadian Forces Base Trenton, 8 Wing
P.O. Box 1000
Astra ON
K0K 3W0
Tel: (613) 965-3870
Toll Free: (800) 267-7270

Joint Rescue Coordination Centre Victoria
Canadian Forces Base, Esquimalt
P.O. Box 17000 Stn Forces
Victoria BC
V9A 7N2
Tel: (250) 413-8933
Fax: (250) 413-8932

Transport Canada Civil Aviation
Attention: Program Manager
Aircraft Design Standards (AARTC/D)
330 Sparks St
Ottawa ON K1A 0N5
Email: TC.AARTCDAircraftDesignStandards-NormesdeconceptiondesaeronefsAARTCD.TC@tc.gc.ca

Transport Canada (Marine Safety)
Place de Ville, 10th Floor
330 Sparks Street
Ottawa ON K1A 0N5

Tel: (613) 991-3134
Fax: (613) 993-8196
Email: marinesafety-securitemaritime@tc.gc.ca

NAV CANADA Area Control Centre (ACC)

Gander Area Control Centre
Tel: 1-888-672-2052
Email: tocqxacc@navcanada.ca

Moncton Area Control Centre
Tel: 1-888-672-2051
Email: mrccqm@navcanada.ca

Montréal Area Control Centre
Tel: 1-877-533-3281
Email: tocmontreal@navcanada.ca

Toronto Area Control Centre
Tel: 1-800-268-4986
Email: toctoronto@navcanada.ca

Winnipeg Area Control Centre
Tel: 1-877-672-2994
Email: tocywg@navcanada.ca

Edmonton Area Control Centre
Tel: 1-877-672-2934
Email: egacctoc@navcanada.ca

Vancouver Area Control Centre
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