



Industry  
Canada

Industrie  
Canada

RSS-287  
Issue 2  
March 2014

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)**

## Preface

Radio Standard Specification 287, Issue 2, *Emergency Position Indicating Radio Beacons (EPIRB), Emergency Locator Transmitters (ELT), Personal Locator Beacons (PLB), and Maritime Survivor Locator Devices (MSLD)*, replaces RSS-287, Issue 1, dated February 2007.

This document will be in force as of the publication date of notice SMSE-002-14, in the *Canada Gazette*, Part I. Upon publication, the public has 120 days to submit comments. Comments received will be taken into account in the preparation of the next version of the document.

Listed below are the changes:

1. The requirement that RSS-Gen, [General Requirements and Information for the Certification of Radio Apparatus](#) shall be used in conjunction with this RSS is stated.
2. Material common to most Radio Standards Specifications has been moved to RSS-Gen.
3. An addition of technical requirements for Maritime Survivor Locator Devices (MSLDs) operating at 161.975 MHz and 162.025 MHz has been made.
4. The manufacturing, importation, or sale for use of EPIRB and PLB that operates only on 121.5 MHz or 243 MHz is prohibited.
5. ELT equipment without 406 MHz frequency is not allowed to be certified.
6. PLB equipment is required to include a homing frequency on 121.5 MHz.
7. The previous requirement to submit a letter of ELT approval from Transport Canada has been replaced with the requirement for a certification applicant to submit a Declaration of Conformity (DOC) that ELT complies with the requirements outlined in the *Canadian Aviation Regulations Part VI*, Section 605.38, Airworthiness Manual (AWM) 551.104.

Issued under the authority  
of the Minister of Industry

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Marc Dupuis  
Director General  
Engineering, Planning and Standards Branch

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## 1. Scope

1.1 This Radio Standard Specification (RSS) document sets out the requirements for certification of:

- emergency position indicating radio beacons (EPIRBs);
- emergency locator transmitters (ELTs);
- personal locator beacons (PLBs); and
- maritime survivor locator devices (MSLDs).

1.2 EPIRBs are for carriage on ships, ELTs are for carriage on aircraft, and PLBs are for use by persons who may need to send a distress signal and are intended and designed to provide the standardized capabilities necessary to alert satellites, aircraft and vessels.

MSLDs are devices worn on the person while aboard a vessel, that 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 the vessel to facilitate the distressed user's rescue.

**Important Note:** As MSLDs DO NOT comply with Transport Canada (TC) and National Search and Rescue Secretariat (NSS) minimum performance standards governing EPIRBs and PLBs, respectively, and are NOT intended or designed to provide the standardized capabilities necessary to alert satellites, aircraft and vessels, they are NOT considered to be EPIRBs or PLBs by Industry Canada, in agreement with the Canadian Coast Guard and the National Search and Rescue Secretariat.

1.3 MSLD use is on a non-interference basis to the COSPAS-SARSAT satellite system.

1.4 In an emergency situation, the radio beacon is turned on either automatically, such as a water-activated switch in an EPIRB or an inertia switch in an ELT, or manually by the user.

1.5 The manufacturing, importation, or sale for use of EPIRB and PLB operating only on 121.5 MHz or/and 243 MHz is prohibited.

1.6 ELT shall be certified only if the equipment has both operating frequencies of 121.5 MHz and 406 MHz.

## 2. General Information

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 Industry Canada or a certificate issued by a recognized Certification Body (CB) is required, pursuant to subsection 21(1) of the *Radiocommunication Regulations*.

## 2.1 Licensing Requirements

Equipment covered by this RSS 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 Industry Canada's Licensing Exemptions website at [http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h\\_sf01775.html](http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h_sf01775.html).

## 2.2 Transmitter Frequency Configurations

The equipment shall comply with the following frequency:

**EPIRB:** 406 MHz primary transmitter with homing frequency on 121.5 MHz.

**ELT:** 406 MHz and 121.5 MHz.

**PLB:** 406 MHz with homing frequencies on 121.5 MHz and/or 243 MHz.

**MSLD:** 121.5 MHz, 161.975 MHz, and 162.025 MHz.

## 2.3 Applicable Standards and Related Documents

The equipment shall comply with the standards listed in this section, where applicable. These documents can be obtained at the addresses listed in Annex 1.

### 2.3.1 Industry Canada Documents

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

### 2.3.2 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*

The above documents can be obtained from the COSPAS-SARSAT website at <http://www.cospas-sarsat.org>.

### 2.3.3 Transport Canada Civil Aviation Documents

#### **Canadian Aviation Regulations Part VI, Section 605.38**

**Airworthiness Manual (AWM) Chapter 551:** *Aircraft Equipment and Installation*, Section 551.104, prescribing the Canadian standards of airworthiness for the design and installation of Emergency Locator Transmitter (ELT) equipment.

### 2.3.4 Technical Standard Order (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)*

### 2.3.5 Transport Canada (Marine Safety) Documents

**International Maritime Organization (IMO) Resolution A.810(19):** *Performance standards for float-free satellite emergency position-indicating radio beacons (EPIRBs) operating on 406 MHz*

**International Maritime Organization (IMO) Resolution A.660(16):** *Carriage of satellite emergency position indicating radio beacons (EPIRBs)*

**International Maritime Organization (IMO) Resolution A.662(16):** *Performance standards for float-free release and activation arrangements for emergency radio equipment*

**IEC 61097-2 of the International Electrotechnical Commission:** *Global maritime distress and safety system (GMDSS) - Part 2: COSPAS-SARSAT EPIRB - Satellite emergency position indicating radio beacon operating on 406 MHz - Operational and performance requirements, methods of testing and required test results*

**ETS 300 066 of the European Telecommunications Standards Institute:** *Radio Equipment and Systems (RES); Float-free maritime satellite Emergency Position Indicating Radio Beacons (EPIRBs) operating on 406.025 MHz; Technical characteristics and methods of measurement*

### 2.3.6 National Search and Rescue Secretariat (NSS) Document

**NSS-PLB 06:** *National Search and Rescue Secretariat, Performance Standard for 406 MHz Personal Locator Beacon (PLB)*

## 3. General Requirements

### 3.1 RSS-Gen Compliance

RSS-287 shall be used in conjunction with RSS-Gen, [General Requirements and Information for the Certification of Radio Apparatus](#), for general specifications and information relevant to the equipment for which this standard applies. Should there be any discrepancies between the requirements in this standard and RSS-Gen, the requirements in this standard shall govern.

### **3.2 Approved Test Facilities**

3.2.1 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.

List of COSPAS-SARSAT approved test facilities can be obtained from the COSPAS-SARSAT website at <http://www.cospas-sarsat.org>.

3.2.2 Battery and reliability tests shall be carried out by a test facility approved by Transport Canada (Marine Safety) or a country to which the SOLAS Convention applies for EPIRBs, and by National Search and Rescue Secretariat for PLBs. Addresses of such test facilities are obtainable from these organizations.

### **3.3 EPIRB and PLB Certification Requirements**

In addition to the requirements in the test report specified in RSS-Gen, the certification application of EPIRB and PLB that transmits on the 406.0-406.1 MHz 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.

### **3.4 Declaration of Compliance (DOC) for ELT**

The certification application for ELT devices shall provide information required, where applicable, in the test report specified in RSS-Gen, and a DOC to state that the devices meet all the requirements in section 104 of the standard AWM 551 and the applicable TSO standards for its operating frequencies.

### **3.5 Transport Canada and NSS Requirements**

The equipment certification applicant shall forward the test report (in duplicate) showing that the equipment complies with the requirements in this standard for review to:

- Transport Canada (Marine Safety) in the case of EPIRBs; and
- NSS in the case of PLBs.

The test report shall contain the following:

- (i) the signature of the testing and supervising officers;
- (ii) the name of the signing persons;
- (iii) phone and facsimile numbers;
- (iv) the full name and address of the testing facility; and
- (v) proof that the facility is an approved test facility.

Once the information has been reviewed, Transport Canada-Marine Safety forwards the test report with its evaluation result to the applicant who will then submit it to the Certification and Engineering Bureau of Industry Canada or the appropriate Recognized Certification Body by e-filing with the complete application. Proof of compliance submitted for Transport Canada-Marine Safety review shall be in the form of documentation issued by a classification society or by a recognized independent testing establishment. See Annex 1 for Transport Canada-Marine Safety's contact information.

Industry Canada or the appropriate Certification Body shall evaluate the test results for the homing transmitter, if applicable.

#### 4. Labelling Requirements

In addition to the labelling requirements in RSS-Gen, the equipment shall be labelled with the following:

- (a) Each radio beacon shall also be labelled with its type designator, as listed in Section 5.
- (b) Labelling required by Transport Canada (Civil Aviation) for ELTs (see *Airworthiness Manual*, Section 551.104), by Transport Canada (Marine Safety) for EPIRBs (see document IMO A.810(19)), and by NSS for PLBs (see document NSS-PLB 06), may be combined with the labelling requirements in RSS-Gen and Section 4(a) and put into a single label.
- (c) The sale packaging and user manual of MSLDs shall indicate clearly 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.*

#### 5. Type Designator

An appropriate type of designator (see list below) will be appended as a suffix to the technical acceptance certification number to indicate the class of the device.

Suffix	Abbreviated Definition
E1	EPIRB, float free
E2	EPIRB manual activation
PL	PLB
A	ELT, automatically ejected
AD	ELT, automatic deployable
F	ELT, Fixed

<b>Suffix</b>	<b>Abbreviated Definition</b>
AF	ELT, automatic fixed
AP	ELT, automatic portable
W	ELT, water activated
S	ELT, survival
X	MSLD

## **6. Measurement Methods for Equipment Operating with 121.5/243 MHz Frequency Except ELT**

### **6.1 Transmitter Frequency and Output Power Stabilities**

The output power and frequency stability measurements described below shall be carried out at (i.e. 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, can 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:

**EPIRBs and MSLDs:** float free: -20° to +55°C  
manual activation: -20° to +55°C

**PLBs:** Class 1: -40° to +55°C  
Class 2: -20° to +55°C

### **6.2 Transmitter Output Power (Radiated)**

The transmitter shall be modulated by A3X signal as described in Section 7.4.1(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).

### 6.3 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 7.4.1(a).

### 6.4 Modulation Factor and Audio Sweep

The transmitter shall be modulated with A3X signal as described in Section 7.4.1(a) and its output displayed on the oscilloscope.

- (i) Measure and record the peak and trough 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, i.e.:

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

- (ii) Measure and record the direction of the audio sweep.
- (iii) Measure and record the highest and the lowest audio frequencies of the sweep.
- (iv) Measure and record the audio sweep repetition rate.
- (v) Measure and record the modulation duty cycle (see definition in Section 7.4.1(e)).
- (vi) 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.

### 6.5 Spectrum Characteristics

The spectrum characteristics described in Section 7.4.1(d) are to be measured.

The transmitter shall be modulated with A3X signal, as described in Sections 7.4.1(a) and (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 7.4.1(d).

## **7. Transmitter and Receiver Standard Specifications**

### **7.1 ELT**

ELT shall comply with all the requirements in the standard AWM 551.104 and with the applicable TSO standards for its operating frequencies.

### **7.2 EPIRB and PLB Transmits on 406 MHz**

EPIRB and PLB transmits on 406 MHz shall comply with the technical requirements in COSPAS-SARSAT Standards C/S T.001 and COSPAS-SARSAT Standards C/S T.007 (see Section 3.3).

### **7.3 MSLD Operating with 161.975 MHz and 162.025 MHz**

MSLD with operating frequencies of 161.975 MHz or 162.025 MHz shall comply with the requirements in Section 7 of RSS-182, where applicable.

### **7.4 121.5 MHz and 243 MHz Transmitter Excluding ELT**

#### **7.4.1 Modulation Characteristics**

The modulation technique for each carrier is described as follows:

- (a) The type of emission shall be A3X (described below), with periods of voice modulation or no modulation (CW) permitted, as described below.

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%, i.e. 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 must 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  $\pm 30$  Hz of the carrier frequency in the case of the 121.5 MHz beacon, and  $\pm 60$  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  $\pm 30$  Hz and  $\pm 60$  Hz for the 121.5 MHz and 243.0 MHz transmitters, respectively.

- (e) Modulation Duty Cycle: Modulation Duty Cycle 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. This duty cycle shall be between 33% and 55%.

#### **7.4.2 Transmitter Frequency Stability**

The carrier frequency shall not depart by more than 0.005% ( $\pm 50$  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, it is not necessary to repeat the frequency stability test for the other frequency.

#### **7.4.3 Transmitter Output Power (Radiated)**

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 output power of MSLDs shall be less than 25 mW.

#### **7.4.4 Transmitter Unwanted Emissions**

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 the bandwidth.

#### **7.4.5 Spectrum Characteristics**

The total power in the resolution bandwidth (see Section 6.5) shall not drop by more than 5 dB below the transmitter mean output power that is measured by a wideband meter (for the latter, see either Section 6.1 or 6.2), indicating that at least 30% of the power resides within the band  $f_c \pm 30$  Hz (at 121.5 MHz) and within the band  $f_c \pm 60$  Hz (at 243 MHz).

## 8. 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 (see addresses in Annex 1) nearest to where radiation testing is to be conducted shall be obtained. The agencies are listed below:

- NAV CANADA Area Control Centre (ACC)
- NAV CANADA Air Traffic Control Agencies
- Canadian Mission Control Centre (CMCC) at CFB Trenton, Ontario
- Joint Rescue Coordination Centre (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 Industry Canada office for the purpose of issuing the authorization to use the radio frequency.

Unless there are valid reasons to use distress frequencies (other than 406.025 MHz), 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;
- 406.025 MHz (i.e. no offset provided that the beacon test bit pattern is set to "test protocol;" see C/S T.007).

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

## Annex 1 – Addresses

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

- (1) 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: (613) 965-3660  
Fax: (613) 965-7190
  
- (2) COSPAS/SARSAT Secretariat  
700 de la Gauchetière West  
Suite 2450  
Montréal, QC  
H3B 5M2  
Tel: (514) 954-6761
  
- (3) International Civil Aviation Organization  
Document Sales Unit  
999 University Street  
Montréal, QC  
H3C 5H7  
Tel: (514) 954-8022  
Fax: (514) 954-6769  
E-mail: sale@icao.int
  
- (4) International Maritime Organization  
4 Albert Embankment  
London, England, SE1 7SR  
Tel: (44) 71-735-7611  
Fax: (44) 71-587-3210
  
- (5) International Telecommunication Union  
Publication Sales  
Place des Nations, CH-1211  
Geneva 20, Switzerland  
Tel : +41 22 730 6141 (English)  
Fax: +41 22 730 5194  
E-mail: sales@itu.int

- (6) National Search and Rescue Secretariat  
275 Slater Street, 4th Floor  
Ottawa, ON  
K1A 0K2  
Tel: (613) 992-6667  
Fax: (613) 996-3746
- (7) Joint Rescue Coordination Centres (JRCCs), East to West:
- |   |  |
|---|--|
| Joint Rescue Co-ordination Centre Halifax<br>Canadian Forces Base, Halifax<br>P.O. Box 99000 Stn Forces<br>Halifax, NS<br>B3K 2X0<br>Tel: (902) 427-2104<br>Fax: (902) 424-2114 | Joint Rescue Co-ordination Centre<br>Trenton<br>Canadian Forces Base, Trenton<br>P.O. Box 810<br>Trenton, ON<br>K8V 5W6<br>Tel: (613) 392-2811 ext 3875<br>Fax: (613) 965-7190 |
|---|--|
- Joint Rescue Co-ordination Centre Victoria  
Canadian Forces Base, Esquimalt  
P.O. Box 17000 Stn Forces  
Victoria, BC  
V0F 1B0  
Tel: (604) 363-2988  
Fax: (604) 363-2944
- (8) Transport Canada Civil Aviation  
Attention: Manager, Avionics and  
Electrical Systems Engineering (AARDD/A)  
Place de Ville, Tower "C"  
330 Sparks Street  
Ottawa, ON  
K1A 0N8  
Tel: (613) 952-4328  
Fax: (613) 996-9178
- (9) Transport Canada (Marine Safety)  
Place de Ville, 10<sup>th</sup> Floor  
330 Sparks Street  
Ottawa, ON  
K1A 0N5  
Tel: (613) 991-3134  
Fax: (613) 993-8196  
E-mail: marinesafety@tc.gc.ca

(10) NAV CANADA Air Traffic Control Agencies, East to West:

Eastern Regional Director  
1601 Tom Roberts Avenue, U53  
Gloucester, ON  
K1V 1E5  
Tel: (613) 248-4070  
Fax: (613) 248-4061

Western Regional Director  
300-9925 109 Street, Suite 300  
Edmonton, AB  
T5K 2J8  
Tel: (780) 413-5303  
Fax: (780) 413-5304

(11) NAV CANADA Area Control Centre (ACC), East to West:

Gander Area Control Centre  
ANS Building  
2C Memorial Drive  
P.O. Box 328  
Gander, NL  
A1V 1W7  
Tel: (709) 651-5230  
Fax: (709) 651-5235

Ottawa Terminal Control Unit  
1601 Tom Roberts Avenue  
P.O. Box 9824 Stn. T  
Gloucester, ON  
K1G 6R2  
Tel: (613) 248-3818  
Fax: (613) 248-3823

Moncton Area Control Centre  
222 Old Coach Road  
Riverview, NB  
E1B 4G2  
Tel: (506) 851-7150  
Fax: (506) 851-7170

Winnipeg Area Control  
777 Moray Street  
Winnipeg, MB  
R3J 3W8  
Tel: (204) 983-8566  
Fax: (204) 983-8347

Montréal Area Control Centre  
1750 Chemin St-François  
Dorval, QC  
H9P 2P6  
Tel: (514) 633-2870  
Fax: (514) 633-2881

Edmonton Area Control Centre  
P.O. Box 9867  
Edmonton, AB  
T5J 2T2  
Tel: (403) 890-8322  
Fax: (403) 890-8451

Toronto Area Control Centre  
6055 Midfield Rd.  
Mississauga, ON  
L4W 2P7  
Tel: (905) 676-4561  
Fax: (905) 676-4654

Vancouver Area Control Centre  
4611 Cowley Crescent  
Richmond, BC  
V7B 1B9  
Tel: (604) 775-9613  
Fax: (604) 775-9657