Low-power Licensed Radio Apparatus
Preface

Client Procedures Circulars describe the various procedures or processes to be followed by the public when dealing with Industry Canada. The information contained in these circulars is subject to change without notice. It is therefore suggested that interested persons consult the nearest district office of Industry Canada for additional details. While every reasonable effort has been made to ensure accuracy, no warranty is expressed or implied. As well, these circulars have no status in law.

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

The Minister of Industry, through the *Department of Industry Act*, the *Radiocommunication Act* and the *Radiocommunication Regulations*, with due regard to the objectives of the *Telecommunications Act*, is responsible for spectrum management in Canada. As such, the Minister is responsible for developing national policies and goals for spectrum resource use and ensuring effective management of the radio frequency spectrum.

2. **Mandate**

Section 5 of the *Radiocommunication Act* specifies that the Minister may issue radio licences in respect of radio apparatus. Section 6 of the Act specifies that the Governor in Council may exempt a radio apparatus from the requirement to be licensed.

3. **Related Documents**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>RSS-123</td>
<td><em>Licensed Low-Power Radio Apparatus</em></td>
</tr>
<tr>
<td>BETS-1</td>
<td><em>Technical Standards and Requirements for Low Power Announce Transmitters in the Frequency Bands 525-1,705 kHz and 88-107.5 MHz</em></td>
</tr>
<tr>
<td>RSS-Gen</td>
<td><em>General Requirements and Information for the Certificate of Radio Apparatus</em></td>
</tr>
<tr>
<td>RSS-210</td>
<td><em>Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment</em></td>
</tr>
<tr>
<td>RSS-310</td>
<td><em>Licence-exempt Radio Apparatus (All Frequency Bands): Category II Equipment</em></td>
</tr>
</tbody>
</table>

*Canadian Radio-television and Telecommunications Commission Public Notice CRTC 2000-10*

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**BETS - Broadcasting Equipment Technical Standards**  
**RSS - Radio Standards Specification**

4. **Policy**

4.1 **General**

Low-power radiocommunication apparatus includes products such as cordless telephones, baby monitors, Family Radio Service (FRS) portable two-way radios, wireless microphones and wireless cameras. This procedure does not include transmitters that are used as broadcasting transmitters. The requirement to obtain a radio licence is dependent upon the Radio Standards Specification under which the low-power device has been approved for use in Canada.

Devices approved under RSS-210 or RSS-310 do not require a licence.
However, any apparatus approved under RSS-123 is subject to radio licensing pursuant to subsection 4(1) of the *Radiocommunication Act* and the policies contained within this document.

As of January 1, 2010, low-power devices are no longer being licensed in frequency bands 698-806 MHz. Existing stations operating in frequency bands 764-776 MHz and 794-806 MHz are prohibited from operating effective March 31, 2011.

*Table 1* lists the permissible frequency bands effective March 31, 2011, allowable bandwidths and types of devices commonly approved under RSS-123 for which a licence is required.

**Table 1 - Frequency Bands for Devices Approved Under RSS-123**

<table>
<thead>
<tr>
<th>Frequency Band (MHz)</th>
<th>Maximum Bandwidth, Device Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>26.10-26.48</td>
<td>200 kHz, wireless microphone</td>
</tr>
<tr>
<td>FM Broadcasting</td>
<td></td>
</tr>
<tr>
<td>88-107.5</td>
<td>200 kHz, wireless microphone</td>
</tr>
<tr>
<td>VHF TV Broadcasting</td>
<td></td>
</tr>
<tr>
<td>54-72</td>
<td>20 kHz, voice; 200 kHz, wireless microphone; 6 MHz, analog or digital video</td>
</tr>
<tr>
<td>76-88</td>
<td></td>
</tr>
<tr>
<td>174-216</td>
<td></td>
</tr>
<tr>
<td>150-174</td>
<td>54 kHz, wireless microphone</td>
</tr>
<tr>
<td>450-451</td>
<td>200 kHz, auxiliary broadcasting wireless microphone</td>
</tr>
<tr>
<td>455-456</td>
<td></td>
</tr>
<tr>
<td>UHF TV Broadcasting</td>
<td></td>
</tr>
<tr>
<td>470-608</td>
<td>20 kHz, voice; 200 kHz, wireless microphone; 6 MHz, analog or digital video</td>
</tr>
<tr>
<td>614-698</td>
<td></td>
</tr>
</tbody>
</table>

**Note 1:** Maximum transmit power for all devices is 1.0 watt mean power, except 1.0 watt peak envelope power for NTSC video transmissions.

**Note 2:** In the FM broadcasting band (88-107.5 MHz), FM transmitters using carrier frequencies 88.1, 88.3, ... 107.5 MHz (i.e. spaced 200 kHz apart) may be authorized for public information or land mobile service under certain conditions as described later in this document. Carrier frequencies above 107.5 MHz will not be authorized in order to protect the aeronautical service above 108 MHz.
5. **Authorization and Operational Requirements for Wireless Microphone and Wireless Camera Systems**

5.1 **General**

A wireless microphone system consists of all the wireless microphones and associated monitors or receiving stations. Similarly, a wireless camera system consists of all the wireless cameras and associated monitors or receiving stations. For each type of system, the radius of operation must not exceed 500 metres, and all licences for wireless microphones and cameras will indicate that:

(a) the authorization is granted on a no-interference, no-protection basis; and

(b) it is the licensee’s responsibility to resolve of any interference problems caused to other spectrum users. For example, “Should interference be caused to other spectrum users, you will be required to take whatever steps are necessary to alleviate the interference, including the cessation of station operation.”

Independent of the operating frequency band of the wireless microphone or camera, care will be exercised in the frequency assignment process to ensure that interference is not unduly caused to the primary users of the frequency band involved.

5.2 **Wireless Microphones**

A single mobile radio station licence will be issued for all microphones associated with the system, and a single land station radio licence will be issued for all associated fixed receivers. The mobile licence will indicate all authorized transmit frequencies, and the land licence will indicate all authorized receive frequencies; however, licence fees will only be charged for a single channel (channel capacity “01”).

Wireless microphones operating in the bands 26.10-26.48 MHz, 450-451 MHz, and 455-456 MHz are not required to operate on specific carrier frequencies, but the assigned frequencies will be sufficiently away from the band edges to ensure that the occupied bandwidth falls entirely within the band. For microphones operating in the bands 88-107.5 MHz, 54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz and 614-698 MHz, the assigned frequencies will be offset from the upper or lower band limits by 25 kHz, or an integral multiple thereof, and will be sufficiently away from the band edges to ensure that the occupied bandwidth falls entirely within the band.

Furthermore, frequencies for wireless microphones operating in a frequency band allocated to television or FM broadcasting will be selected to ensure that interference will not occur with the reception of broadcasting signals that are available in the immediate area.

**Table 2** lists the preferred frequencies for general-use wireless microphones operating in the 150-174 MHz frequency band.
Table 2 - Preferred Frequencies in the 150-174 MHz Frequency Band

<table>
<thead>
<tr>
<th></th>
<th>169.445</th>
<th>170.245</th>
<th>171.045</th>
<th>171.845</th>
</tr>
</thead>
<tbody>
<tr>
<td>169.505</td>
<td>170.305</td>
<td>171.105</td>
<td>171.905</td>
<td></td>
</tr>
</tbody>
</table>

Should none of the frequencies listed in Table 2 be assignable, the Department may consider assigning one of the Broadcasting Auxiliary Use frequencies listed in Table 3 on a special case basis.

Table 3 - Frequencies Allocated for Broadcasting Auxiliary Use (MHz)

<table>
<thead>
<tr>
<th></th>
<th>152.870</th>
<th>153.050</th>
<th>153.230</th>
<th>166.250*</th>
<th>172.740</th>
</tr>
</thead>
<tbody>
<tr>
<td>152.930</td>
<td>153.110</td>
<td>153.290</td>
<td>170.150*</td>
<td>172.830</td>
<td></td>
</tr>
<tr>
<td>152.990</td>
<td>153.170</td>
<td>153.350</td>
<td>172.680</td>
<td>172.890</td>
<td></td>
</tr>
</tbody>
</table>

* 166.250 MHz and 170.150 MHz are reserved exclusively for nationwide use by the Canadian Broadcasting Corporation.

5.3 Wireless Cameras

Wireless cameras approved under RSS-123 operate in one or more of the following television broadcasting sub-bands: 54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz or 614-698 MHz.

A single mobile radio station licence will be issued for all cameras associated with the system, and a single land radio station licence will be issued for all associated fixed receivers. The mobile licence will indicate all authorized transmit frequencies and the land licence will indicate all authorized receive frequencies. However, licence fees will only be charged for a single channel (channel capacity “01”).

Frequencies for wireless cameras will be selected to ensure that there is no interference to the reception of television broadcasting signals that are available in the immediate area.

An authorization for a wireless camera system will only be granted to security, public safety, broadcasters or arts and entertainment organizations.

6. Authorization and Operational Requirements for Wireless Voice and Data Devices

As noted in Table 1, RSS-123 permits the certification of voice and data devices that operate in the VHF and UHF television sub-bands. Frequency assignment and licensing criteria applicable to wireless microphones and wireless cameras operating in these bands also apply to 20 kHz maximum bandwidth voice devices and 6 MHz maximum bandwidth data devices respectively.

Furthermore, frequencies for voice and data radio devices operating in the television sub-bands will be selected to avoid the use of frequencies close to the visual, colour and sound carrier frequencies of television broadcasting channels. These frequencies are 1.25 MHz, 4.829545 MHz and 5.75 MHz respectively from the lower band edge of each television broadcasting channel.
An authorization for a low-power data device will only be granted to security and public safety related organizations.

7. Public Information and Other Non-Broadcasting Services in the 88-107.5 MHz Band

The public information service is defined in the Radiocommunication Regulations as “...a radiocommunication service that provides for communications in which the transmissions are intended for the public, but does not include transmissions by a broadcasting undertaking.” Accordingly, a radio authorization can be issued for this type of radio apparatus certified under RSS-123 provided that all of the following criteria are met:

- The transmitter uses frequency modulation on one of the following carrier frequencies: 88.1, 88.3, ..., 107.5 MHz (i.e. frequency spacing of 200 kHz);

- The apparatus is not engaged in broadcasting as defined in the Broadcasting Act (i.e. “any transmission of programs, whether or not encrypted, by radio waves or other means of telecommunication for reception by the public by means of broadcasting receiving apparatus, but does not include any such transmission of programs that is made solely for performance or display in a public place”). Applicants should consult the Canadian Radio-television and Telecommunications Commission (CRTC) if it is unclear whether their application meets this definition;

- The radio apparatus is intended to provide an information service within the confines of a public place (e.g. shopping centre, museum, school, arena, drive-in theatre, parking lot, etc.);

- The effective radiated power (e.r.p.) is limited to 1 watt maximum and the field strength is limited to 100 microvolts per metre (µV/m) at the public place boundary. Boundary field strength levels can be influenced by reducing transmitter power or by changing various transmitter antenna characteristics such as gain, height and location (i.e. indoor vs. outdoor).

The following licence condition will be added to the licence:

\[
\text{The radiated emission of this station shall be confined to the public place where this station is authorized by limiting the field strength produced at the public place boundary to 100 microvolts per metre (µV/m). This authorization is granted on a no-interference, no-protection basis.}
\]

A second scenario involves the use of this type of equipment for purposes such as the distribution of information to employees working on company property. In this case, the transmissions are not intended to be received by the general public, nor are the transmissions made within a public place. Therefore, a land mobile service radio licence can be issued. The modulation, carrier frequency, power and field strength limitations noted above must be respected. For this scenario, the following licence condition will be added to the licence:
The radiated emission of this station shall be confined to the private property where this station is authorized by limiting the field strength produced at the private property boundary to 100 microvolts per metre (μV/m). This authorization is granted on a no-interference, no-protection basis.

Radio apparatus operating within 18 nautical miles (33 km) of an airport or using a frequency higher than 100 MHz may be subject to coordination with NAV CANADA. The regional and/or district office involved in broadcasting certification should be consulted to confirm this requirement.

As noted earlier, apparatus certified under RSS-210 and not used for broadcasting is exempted from the requirement to obtain a radio licence. Such apparatus includes personal audio devices equipped with short-range FM transmitters that send radio signals to nearby FM receivers.

8. Low-power Announcement Service (LPAS) and Other Broadcasting Services in the 88-107.5 MHz FM Broadcasting Band

If radio transmissions are intended for reception by the general public and/or the signal is not confined to a public place, the installation must be considered a broadcasting undertaking. As such, operators are required to obtain an Industry Canada broadcasting certificate and a CRTC broadcasting licence; such installations must also use radio equipment certified under appropriate Broadcasting Equipment Technical Standards (BETS). However, in accordance with Industry Canada and CRTC policy, certain broadcasting undertakings may be exempted from the requirement for an authorization. Refer to the CRTC Exemption Orders and Industry Canada’s Broadcasting Certificate-exempt Radio Apparatus List for current information. This list can be found on Industry Canada’s Spectrum Management and Telecommunications website.

Low-power announcement service (LPAS) stations allow real estate agents, store owners, local authorities, etc., to communicate messages of an informative, sometimes commercial nature, to the general public by means of ultra low-power transmitters (e.g. “talking signs”). As a broadcasting service, an LPAS undertaking may require an Industry Canada broadcasting certificate and a CRTC broadcasting licence. However, as noted in Public Notice CRTC 2000-10 in the section “Exemption order respecting low-power radio: Ultra low-power announcement service (LPAS) undertakings,” the CRTC describes the conditions under which an LPAS undertaking may be exempted from the requirement to obtain a broadcasting licence. If the LPAS radio apparatus is certified under BETS-1, then the LPAS undertaking is exempted from the requirement to obtain an Industry Canada broadcasting certificate. If the radio apparatus that is used that is not certified under BETS-1, the operator must apply for a broadcasting certificate by following the relevant Broadcasting Procedures and Rules (i.e. BPR-1 and BPR-3).

Appendix 1 provides an overview of the authorization process for both non-broadcasting and broadcasting services in the 88-107.5 MHz band.
Appendix 1 – Authorization Process for the 88-107.5 MHz Band

1. Max ERP ≤ 1 watt. Subject to coordination with NavCanada if located within 33 km of an airport, or if frequency ≥ 100 MHz, and.
2. Field strength ≤ 100 μV/m at the property boundary, including parking lot.