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Spectrum and Telecommunications Management

Radiocommunication Information Circular

# **Frequently Asked Questions on Low Power FM Broadcasting**

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In the past few years, Industry Canada has received quite a few queries on low power FM broadcasting. With increased interest in providing low power FM broadcasting, coupled with new developments in the broadcasting technologies and standards in Canada and other countries, Industry Canada publishes this Circular to clarify a few important points on the topic.

*Q. Who regulates FM broadcasting in Canada?*

A. Broadcasting is regulated by two government organizations, Industry Canada and the Canadian Radio-television and Telecommunications Commission (CRTC). To operate a FM broadcasting transmitter, one must apply for the authorization to do so, from Industry Canada in the form of a Broadcasting Certificate, and from the CRTC in the form of a Broadcasting Licence. Industry Canada, as the Radio Frequency Spectrum Manager, determines, among many things, if the proposed transmission is compatible with other broadcasting transmissions, as well as non-broadcasting transmissions. The CRTC regulates, among other things, the programming content and ownership issues of the proposed undertaking (<http://www.crtc.gc.ca>). The procedure to apply for a FM Broadcasting Certificate from Industry Canada can be found in the Broadcasting Procedures and Rules, Parts I and III (BPR-I and BPR-III), available free of charge on Industry Canada's Web site: <http://strategis.ic.gc.ca/spectrum>.

*Q. What are considered low power FMs in Canada?*

A. In Canada, there are two classes of low power FM broadcasting stations, very low power FM (VLPFM), which normally allows up to 10 W effective radiated power (ERP) in any direction, and low power FM (LPFM), which normally allows up to 50 W ERP. The ERP is equal to the transmitter power supplied to the antenna multiplied by the relative gain (dipole) of the antenna in a given direction. Generally, VLPFMs and LPFMs are only allowed in remote areas.

*Q. I heard that certain 5 W FM broadcasting transmitters are exempted from Industry Canada's authorization and CRTC's licensing requirements. Is that right?*

A. Industry Canada has not exempted **any** 5 W FM broadcasting transmitters from authorization requirements, regardless of the equipment manufacturer, purpose of the transmission, or the affiliation of the operator. The FM broadcasting radio frequency spectrum, at 88 - 108 MHz, is adjacent to the aeronautical navigation and communications (NAV/COM) spectrum at 108 - 137 MHz. The navigational frequencies include those for the instrument landing system (ILS) localizer and the very-high frequency, omni-directional beacon (VOR). Due to the demonstrated potential of interference from FM broadcasting transmissions into the NAV/COM frequency band, Industry Canada is understandably cautious about authorizing FM broadcasting

undertakings (both Canada and other countries have seen actual cases of interference). In Canada, NAV CANADA ([www.navcanada.ca](http://www.navcanada.ca)) is the agency responsible for aeronautical safety. Industry Canada and NAV CANADA have a working arrangement that all FM broadcasting applications will be studied for possible interference to NAV/COM frequencies.

For a short explanation of the interference mechanisms from FM broadcasting signals to aeronautical frequencies, one can refer to BPR-III. For a more in-depth look and explanation, refer to Recommendations by the International Telecommunications Union (ITU), ITU-R IS.1009-1, *Compatibility Between the Sound-Broadcasting Service in the Band of About 87 - 108 MHz and the Aeronautical Services in the Band 108 -137 MHz* (available for a fee from the ITU Web site: [www.itu.int](http://www.itu.int)).

Industry Canada has no plan to exempt 5 W FM broadcasting transmitters from authorization requirements, since such an exemption would open the FM broadcasting band to all users, resulting in substantial increase in interference to both the aeronautical and the FM broadcasting bands. Interference to the aeronautical band is taken very seriously by Industry Canada because the possible consequence is too great to dismiss. Interference to the broadcasting band disrupts the public's reception of authorized broadcasting undertakings. Industry Canada will locate and shut down unauthorized transmitters. Anyone who installs, possesses or operates an unauthorized transmitter which causes interference may be prosecuted for contravention of the *Radiocommunication Act*. In addition to the statutory penalties imposed for breaches of the Act, the operator may also be liable for any damages to third parties arising from their unauthorized installation, possession or use of transmitters.

The CRTC has exempted from licensing certain low power AM and FM broadcasting undertakings, for example, Limited Duration Special Events Distribution Undertakings, Temporary Resource Development Distribution Undertakings, and Public Emergency Radio Undertakings, provided that certain conditions are met. For information on the CRTC Exemption Orders please contact your local CRTC office, or visit the Web site: <http://www.crtc.gc.ca>.

It should be noted that because Industry Canada and the CRTC are responsible for different aspects of broadcasting, the two organizations have each established exemption criteria in its area of responsibility. A broadcasting transmitter exempted from CRTC's licensing is not automatically exempted from Industry Canada's authorization requirement, and vice versa. A VLPFM or LPFM exempted from licensing requirement from the CRTC would still be required to meet all authorization requirements from Industry Canada.

- Q. Are there any FM broadcasting transmitters exempted from Industry Canada's authorization requirements?*
- A. Currently, the only FM broadcasting transmitters that Industry Canada exempts from authorization are those that meet the requirement of Broadcasting Equipment Technical Standards 1 (BETS-1). These transmitters, commonly called Low Power Announcement Radios or alternatively real estate radios, have very small coverage areas. According to BETS-1, "*The maximum power output of the transmitter into its antenna, with no modulation, shall not produce a field strength level of more than 100  $\mu$ V/m as measured at a distance of 30 metres*", which corresponds to a transmitter power output of much less than 1 milliwatt (mW). **CRTC licence exempt or not, any broadcasting transmitter not meeting the technical standard specified in BETS-1 will require authorization from Industry Canada for installation and operation**, regardless of the identity of the equipment manufacturer, purpose of the broadcasting transmission, or the affiliation of the operator.

- Q. What is Industry Canada's view on using LPFM for emergency broadcasting purposes?*
- A. Industry Canada, as the Radio Frequency Spectrum Manager, which also has a role to play in facilitating emergency telecommunications, is prepared to work with emergency organizations during an actual emergency to streamline authorization and to give access to radio spectrum as soon as possible, but is not prepared to give blanket exemption to VLPFM or LPFM broadcasting transmitters for the reasons given above. Because most Public Welfare and Public Order emergencies are under provincial jurisdiction, Industry Canada is of the opinion that there might be a need to obtain an agreement from the provincial Emergency Measure Organization (EMO) if a request is submitted by a municipality or a non-government organization for emergency purposes, as in the case of using a FM broadcasting transmitter to broadcast emergency messages.

Industry Canada encourages emergency broadcasting in cooperation with local broadcasters wherever they are present, from both the spectrum management and the emergency preparedness perspectives. Local broadcast stations have large coverage areas, available expertise, and the general public expects to obtain information from them when an emergency situation occurs. Built-in redundancy is ensured by the fact that there are multiple broadcast stations, many of which also have alternate and/or emergency standby transmitters.

For further information on Industry Canada's role in emergency telecommunications, including emergency broadcasting, visit the Web site:  
<http://spectrum.ic.gc.ca/urgent/htms/index-e.htm>.

*Q. Isn't it true that the FCC is a lot more relaxed about LPFMs? How are the rules different in Canada and the U.S.?*

A. In Canada, there are over 500 **authorized** VLPFM and LPFM broadcasting transmitters all over the country, ranging from less than 1 W to 50 W ERP, broadcasting original programming or rebroadcasting another authorized station to audiences in remote and not so remote areas. Each of these low power operations is authorized according to Industry Canada and the CRTC rules, and was studied in the authorization stage to ensure that it would cause no interference to the local aeronautical frequencies and other broadcasting undertakings.

In January 2000, after consultation with the public, the FCC adopted rules creating a new low power FM service comprised of two classes of radio stations. They are (1) LP100, with power from 50 - 100 W, and (2) LP10, with power from 1 - 10 W. Licensing is required for both classes of LPFM.

*Q. Is it true that 2<sup>nd</sup> and 3<sup>rd</sup> adjacent channel protection requirement in the FM broadcasting band will be dropped?*

A. Under the current rules, Industry Canada requires all FM broadcasting undertakings to protect 2<sup>nd</sup> and 3<sup>rd</sup> adjacent FM channels (see BPR-III for details). This requirement has not changed, and there is no immediate plan to change the protection criteria. However, Industry Canada will monitor the international development on this front. Industry Canada will modify the protection criteria only if it can be convinced that in doing so, the radio spectrum will not be compromised, and only after consultation with the public and the broadcasting industry.

*Q. Is it possible to network several LPFMs on the same frequency to serve a larger area?*

A. In general, networking several LPFM broadcasting transmitters together will not increase effective coverage. The receivers, bombarded by signals from the multiple FM transmitters, will be unlikely to lock in on a usable signal, and will produce poor quality audio. Currently, only digital radio broadcasting (DRB) is designed to operate multiple transmitters on a single frequency, called a single-frequency network (SFN), to increase the effective coverage area.

For any additional information on Industry Canada's rules on LPFMs, please contact your local Industry Canada district office. Publications on Industry Canada's rules and the database for broadcasting stations in Canada can be downloaded from the Web site:  
<http://strategis.gc.ca/spectrum>.