

**LOW POWER RADIO DEVICES OPERATING IN  
VARIOUS FREQUENCY RANGES**

The XIIth Meeting of Permanent Executive Committee III – Radiocommunications,

**CONSIDERING:**

- (a) That a number of CITEL administrations have made provision for the operation of low power devices in the frequency bands 902 – 928 MHz, 2400 – 2483.5 MHz, 5150-5250 MHz, 5250-5350 MHz and 5725-5825 MHz;
- (b) That low power radio devices in these frequency ranges have many possible applications including local area networks, connecting computers to high speed data networks, and community networks;
- (c) That education and health institute, business, as well as individuals could benefit from the introduction of low power radio devices in these ranges;
- (d) That the development of cost effective low power radio devices can be enhanced by establishing common frequency bands;
- (e) That there is sufficient spectrum in these bands to support narrow-band and wide-band devices;
- (f) That a number of studies have been conducted by administrations and reviewed by the ITU-R that address the technical criteria for co-existence of low power devices and other radio services using these bands; and
- (g) That within the ITU Radio Regulations spectrum is generally allocated to broad radio services such as fixed and mobile and not for specific systems or devices.

**RECOGNIZING:**

- (a) That it would not be appropriate to identify frequency bands in the Radio Regulations for low power radio devices;
- (b) That a number of Questions are being studied within the ITU-R to facilitate the operation of low power radio devices;
- (c) That low power radio devices are license-exempt devices in some CITEL administrations;

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<sup>1</sup> Reference: PCC.III/doc.1284/99.

- (d) That regional and global harmonization on the use of spectrum for low power radio devices is an important element to the successful implementation of new technologies in the 5 GHz bands, and other frequency bands;
- (e) That low power radio devices in the 5 GHz frequency range operating at less than the maximum 1 watt effective isotropic radiated power for a 100 MHz bandwidth (as per PCC.III/Rec.33/IX-97) are generally limited to short range applications, such as indoor wireless LANS; and
- (f) That technical studies are required to further identify low power radio applications and their respective technical parameters that are compatible with existing radio services in the 5150-5250 MHz, 5250-5350 MHz and 5725-5825 MHz frequency bands,

#### **FURTHER RECOGNIZING**

- (a) That the ITU Radio Regulations do not have any fixed or mobile service allocations in Region 2 for the bands 5150-5250 MHz, 5250-5350 MHz and 5725-5825 MHz, and
- (b) That the ITU Radio Regulations, S4.4, allows administrations to assign frequencies to stations in derogation of the Table of Frequency Allocations on the express condition that such a station shall not cause harmful interference to, and shall not claim protection from harmful interference caused by, a station operating in accordance with the provisions of the Radio Regulations.

#### **RECOMMENDS:**

1. That CITEL administrations consider adopting provisions to permit the operation of low power radio devices in the frequency bands 902-928 MHz, 2400-2483.5 MHz, 5150-5250 MHz, 5250-5350 MHz and 5725-5825 MHz.
2. That CITEL administrations consider the adoption of common technical parameters that would harmonize the development of low power radio devices and facilities in the 5150-5250 MHz, 5250-5350 MHz and 5725-5825 MHz frequency bands.
3. That CITEL administrations work towards the development of a common set of technical parameters that take into account the operation of radio services allocated in the 5150-5250 MHz, 5250-5350 MHz and 5725-5825 MHz frequency bands.
4. That the technical parameters in Annex 1 can be used as reference for technical certification of low power radio devices and facilities in the 5 GHz frequency range.
5. That other annexes be developed to cover other frequency bands, as appropriate.

**ANNEX 1**  
**TECHNICAL PARAMETERS FOR THE 5150-5250 MHZ, 5250-5350 MHZ**  
**AND 5725-5825 MHZ FREQUENCY BANDS**

**Table 1 : Maximum Permissible Levels**

Col. 1	2	3	4	5
Band MHz	Max. Power Spectral Density, dBm / MHz	Maximum Transmitter Output Power, dBm	Indoor/outdoor or	Maximum EIRP
5150-5250 Note 1	4	$4 + 10 \log (B)$ , maximum 17 dBm per carrier	Only indoor use	10 dBm/MHz; max. 23 dBm per carrier.
5250-5350 Note 2	11	$11 + 10 \log (B)$ , maximum 24 dBm per carrier	Outdoor or indoor	17 dBm/MHz; max. 30 dBm per carrier
5725-5825 Note 3	17	$17 + 10 \log (B)$ , maximum 30 dBm per carrier	Outdoor or indoor	23 dBm/MHz; max. 36 dBm per carrier
5725-5825 Note 4	17	$17 + 10 \log (B)$ , maximum 30 dBm per carrier	Outdoor or indoor	40 dBm/MHz; max. 53 dBm per carrier

**Notes:**

- (1) The parameters in this row (5150-5250 MHz) are for devices for low EIRP indoor usage; the transmitters shall be equipped with integral antennas. This category of indoor devices can also extend the band to cover 5150-5350 MHz and 5725-5825 MHz.
- (2) The parameters in this row (5250-5350 MHz) are for low gain antenna systems, and are for indoor as well as outdoor usage.
- (3) The parameters in this row (5725-5825 MHz) are for low gain antenna systems, including point-to-multipoint, and are for either indoor or outdoor, at up to 36 dBm EIRP.
- (4) The parameters in this row (5725-5825 MHz) are for point-to-point high gain antenna systems, at up to 53 dBm EIRP. Point-to-multipoint or co-located transmitters transmitting the same information are not permitted for this category.

B is the -26 dB bandwidth of the emission, i.e. where the spectral density is -26 dB relative to the maximum inband spectral density, measured with a resolution bandwidth of approximately 1.0% of the emission bandwidth.

The device's measured level must not exceed any of the limits in each row. The "per carrier" term also means "per transmitter" if multicarrier modulation such as OFDM (orthogonal frequency division multiplex) is used. Systems using bandwidths less than 1 MHz shall adjust their levels accordingly. On the other hand, systems employing bandwidths in excess of 20 MHz are not permitted to exceed the col. (5) EIRP limit per carrier.

The device shall automatically discontinue transmission in case of absence of information to transmit or operational failure. A description on how this is met shall accompany the application for equipment certification. Note that this is not intended to prohibit transmission of control or signaling information or the use of repetitive codes where required by the technology.

### **PCC.III/REC.46 (XII-99)<sup>2</sup>**

## **LOW POWER RADIO DEVICES GENERAL OPERATING CONDITIONS**

The XIIth Meeting of Permanent Executive Committee III – Radiocommunications,

### **CONSIDERING:**

- (a) That a number of CITEL administrations have made provisions for low power radio devices to operate within their national boundaries;
- (b) That a number of Questions are being studied within the ITU-R relating to the operation of low power radio devices;
- (c) That low power radio devices are license-exempt devices in some CITEL administrations, and
- (d) That PCC.III/REC.33(IX-97), “Technical and Procedural Framework for Low Power PCS in the use of 1910-1930 MHz Band” recommended a technical and procedural framework that CITEL Member States could adopt to ensure coexistence among systems operating in the same band and in the same geographic area,

### **RECOGNIZING:**

- (a) That Administrations may authorize low power radio devices to operate in frequency bands which are allocated to other radio services and to industrial, scientific and medical (ISM) applications.
- (b) That the ITU Radio Regulations S1.169 defines harmful interference as:

Interference which endangers the functioning of a radionavigation service or of other safety services or seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service operating in accordance with these Regulations (CS).
- (c) That the ITU Radio Regulations, S4.4 allows administrations to assign frequencies to stations in derogation of the Table of Frequency Allocations on the express condition that such a station shall not cause harmful interference to, and shall not claim protection from harmful

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<sup>2</sup> Reference: PCC.III/doc.1285/99.

interference caused by, a station operating in accordance with the provisions of the Radio Regulations.

**FURTHER RECOGNIZING:**

That even if a low power radio device is constructed in accordance with good engineering design and manufacturing – practice within the technical requirements specified by the Administration, it may not prevent harmful interference under all circumstances.

**RECOMMENDS:**

1. That Administrations might, consistent with their national laws and regulations, consider establishing Low Power Radio Devices as license-exempt systems or exempt from any other authorization, or authorized in a general manner.
2. That the general operating conditions for a low power radio device should include:
  - a. that no harmful interference is caused to, and shall not claim protection from interference caused by a station operating in accordance with provisions of the Radio Regulations.
  - b. that of each Member States, according to their laws and regulations, shall study the treatment to be given to the operators of low power radio devices, in the case these devices might cause harmful interference to other service stations operating according to the provisions under the ITU Radio Regulations.
3. That CITEL Member States wanting to adopt operating conditions for low power radio devices might consider adopting a technical and procedural framework that is developed for use in a particular frequency band.