

## Regulation

# ON COLLECTIVE FREQUENCIES FOR LICENCE-EXEMPT RADIO TRANSMITTERS AND ON THEIR USE

Issued in Helsinki on 31 December 2013

The Finnish Communications Regulatory Authority (FICORA) has, under section 7(2) of the Act on Radio Frequencies and Telecommunications Equipment of 16 November 2001 (1015/2001), prescribed as follows:

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### General provisions

#### Section 1 Scope of application

This regulation applies to the following radio transmitters, which conform with the requirements set out in sections 21a or 45 of the Act on Radio Frequencies and Telecommunications Equipment, and which operate only on the collective frequencies assigned in the Annex:

- 1) cordless CT1 telephones taken into use on 31 December 2003 at the latest, cordless CT2 telephones taken into use on 31 December 2004 at the latest, and DECT equipment;
- 2) mobile terminals and other terminals for GSM, UMTS, digital broadband mobile networks and terrestrial systems capable of providing electronic communications services;
- 3) LA telephones (national Citizen Band equipment) which have been approved according to the regulations of 25 March 1981 by the General Directorate of Posts and Telecommunications and taken into use on 31 December 1992 at the latest;
- 4) CB and PR 27 telephones;
- 5) non-specific short range devices except radio transmitters on the collective frequency 468.200 MHz and which have not been taken into use on 31 December 2007 at the latest;
- 6) telecommand equipment for use with scale model aircraft;
- 7) equipment for automatic vehicle identification for railways (AVI);
- 8) wide-band data transmission equipment (WAS/RLAN);
- 8A) broadband fixed wireless access (BFWA);
- 9) low-power alarms for security and safety and social alarms;
- 10) equipment for detecting movement and equipment for alert;

- 11) radio frequency identification devices (RFID);
- 12) on-site paging systems;
- 13) wireless loudspeakers, equipment for in-ear monitoring, headphones, hearing aids, helmet radio telephones and radio microphones;
- 14) ultra low-power medical implants;
- 15) terminal equipment for mobile satellite communications which operate under the control of a satellite system and which have a transmitter and a receiver part, and terminal equipment for mobile communications which are registered to a satellite system and which have only transmitter part, except stations aboard vessels and aircraft operating in the frequency bands 1626.5–1645.5 MHz and 1646.5–1660.5 MHz;
- 16) OmniTRACS stations within the EUTELTRACS system;
- 17) terminal equipment for fixed wireless access networks which is connected to a central switching exchange and for which the Finnish Communications Regulatory Authority has granted a licence referred to in Section 7 of the Act on Radio Frequencies and Telecommunications Equipment;
- 18) terminals belonging to the VIRVE (Finland's Public Authority Network) emergency services network;
- 19) PMR446 telephones;
- 19A) digital PMR446 equipment;
- 20) road transport and traffic telematics;
- 21) HEST<sup>1</sup> and LEST<sup>2</sup> terminals for fixed satellite communications;
- 22) terminals of the GSM-R network of the Finnish State Railways;
- 23) mobile satellite earth stations on the collective frequency 14–14.5 GHz placed on board an aircraft (AES);
- 24) low-power FM transmitters;
- 25) UWB equipment; and
- 26) earth stations on mobile platforms (ESOMP) for fixed satellite communications in the frequency band 29.5–30 GHz.

## **Section 2 Possession and use of radio transmitters**

No licence, as referred to in section 7 of the Act on Radio Frequencies and Telecommunications Equipment, is required for the possession and use of the radio transmitters referred to in section 1 above. The provisions set out below must be obeyed in the use of these radio transmitters.

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<sup>1</sup> High EIRP satellite terminals

<sup>2</sup> Low EIRP satellite terminals

**Special provisions on use**

**Section 3 Cordless telephones, DECT, wide-band data transmission equipment (WAS/RLAN) and Broadband fixed wireless access (BFWA)**

1. Only antennas with which it was attested that the equipment meets the essential requirements may be connected to the equipment. However, an antenna with a maximum gain of 12 dBi may be connected to DECT equipment.
2. An amplifier must not be connected between the equipment and the antenna or the base station and the antenna, if it is not attested that the equipment combination complies with requirements.

**Section 4 Mobile terminals, other terminals for GSM, UMTS, digital broadband mobile networks and terrestrial systems capable of providing electronic communications services, terminal equipment for mobile satellite communications referred to in paragraph 15 under section 1, OmniTRACS stations, HEST satellite terminals, ESOMP satellite terminals and terminals of the GSM-R network of the Finnish State Railways**

1. These terminals must not be used on board airborne aircraft or in any other equipment used in aviation, with the exception of the following
  - a) In the minimum altitude of 3,000 metres, it is permitted to use terminal equipment for the GSM 1800 mobile network on board airborne aircraft equipped with an operational base station referred to in ECC Decision ECC/DEC/(06)07; and
  - b) ESOMP satellite terminals may be used on board aircraft in the satellite network referred to in ECC Decision ECC/DEC/(13)01.
2. HEST and ESOMP satellite terminals must not be used in the vicinity of an airfield. The minimum distance allowed to the airfield (from the airfield boundary fence) is based on the radiated power:

Radiated power dBW EIRP of the satellite terminal	>34-50	>50-55.3	>55.3-57	>57-60
Safe distance from the airfield (airfield boundary fence)	500 m	1 800 m	2 300 m	3 500 m

**Section 5 LA radio telephones, CB and PR 27 telephones**

1. These telephones must not be used on board airborne aircraft or in any other equipment used in aviation.
2. An amplifier must not be connected between the telephone and its antenna, if it is not attested that the equipment combination complies with requirements.
3. With these telephones a separate antenna with a maximum gain of 3 dBd may be used.
4. The country-specific settings of the CB telephone must not be changed to work on other frequencies and transmitter power than referred to in item 4 in the Annex.

**Section 6 Satellite earth stations placed on board an aircraft**

1. A satellite earth station on the collective frequency 14–14.5 GHz, placed on board on aircraft must not be used within 100 metres of an airfield runway or a control tower.

**Section 7 Other radio transmitters to which this regulation must apply**

1. Radio transmitter must not be used on board airborne aircraft or in any other equipment used in aviation, unless allowed on any collective frequency defined in the Annex to this regulation.
2. An amplifier must not be connected between a radio transmitter and its antenna, if it is not attested that the equipment combination complies with requirements.

**Miscellaneous provisions****Section 8 Period of validity**

This regulation enters into force on 31 December 2013 and will remain in force until further notice.

This regulation sets aside the Regulation bearing the same title (FICORA 15AE/2013 M) issued on 26 March 2013.

## Section 9 Information and publication

This regulation is included in the Series of Regulations issued by the Finnish Communications Regulatory Authority and it can be obtained from the FICORA Customer Service Office:

Visiting address	Itämerenkatu 3 A, Helsinki
Postal address	P.O. BOX 313, FI-00181 Helsinki
Tel.	0295 390 100
Fax	0295 390 270
Website	<a href="http://www.ficora.fi/">http://www.ficora.fi/</a>
Business ID	0709019-2

The Decisions and Recommendations of the European Radiocommunications Committee (ERC) and the European Electronic Communications Committee (ECC), referred to in this regulation, can be obtained at the website of the European Communications Office (ECO), address <http://www.cept.org/eco/>.

Helsinki on 31 December 2013

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Jorma Koivunmaa  
Director of Administration  
On behalf of Director-General

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Tapio Penkkala  
Deputy Director  
On behalf of Director

## **COLLECTIVE FREQUENCIES ASSIGNED BY THE FINNISH COMMUNICATIONS REGULATORY AUTHORITY FOR THE RADIO TRANSMITTERS REFERRED TO IN SECTION 1**

The Radio Frequency Regulation and its Annex, The Frequency Allocation Table, (Regulation 4) must also be obeyed in the use of the radio transmitters mentioned below.

### **Effective radiated power**

The effective radiated power of a radio transmitter is the sum of transmitter power and antenna gain subtracted by the attenuation of transmission line. The effective radiated power is defined in W ERP - units by comparison to dipole antenna (gain dBd) or W EIRP - units by comparison to isotropic antenna (gain dBi).

### **Freedom from interference on collective frequency**

There are several users on a collective frequency. Therefore there may appear interference on collective frequencies caused by other licence-exempt or licensed radio transmitters.

### **1 CORDLESS CT1 TELEPHONES TAKEN INTO USE ON 31 DECEMBER 2003 AT THE LATEST, CORDLESS CT2 TELEPHONES TAKEN INTO USE ON 31 DECEMBER 2004 AT THE LATEST, AND DECT EQUIPMENT**

CT1 phones, fixed part	959.0125 MHz + (0...39) x 25 kHz
CT1 phones, portable part	914.0125 MHz + (0...39) x 25 kHz
CT2 phones	864.150 MHz + (0...39) x 100 kHz
DECT equipment	1881.792 MHz + (0...9) x 1.728 MHz

### **2 MOBILE TERMINALS AND OTHER TERMINALS FOR GSM, UMTS, DIGITAL BROADBAND MOBILE NETWORKS AND TERRESTRIAL SYSTEMS CAPABLE OF PROVIDING ELECTRONIC COMMUNICATIONS SERVICES**

Digital broadband 450 mobile network	452.425–456.925 MHz
Terrestrial systems capable of providing electronic communications services	832-862 MHz
GSM	880.200 MHz + (0...173) x 200 kHz 1710.200 MHz + (0...373) x 200 kHz
UMTS	882.400 MHz + (0...151) x 200 kHz 1712.400 MHz + (0...351) x 200 kHz 1902.400 MHz + (0...76) x 200 kHz 1922.400 MHz + (0...276) x 200 kHz
LTE	1710.100 MHz–1784.900 MHz
Digital broadband 2000 mobile network	2010–2025 MHz

Terrestrial systems capable of providing  
electronic communications services 2500-2620 MHz

Terrestrial systems capable of providing  
electronic communications services 3410-3590 MHz

**3 LA TELEPHONES APPROVED ACCORDING TO THE REGULATIONS OF 25 MARCH 1981 BY THE GENERAL DIRECTORATE OF POSTS AND TELECOMMUNICATIONS AND TAKEN INTO USE ON 31 DECEMBER 1992 AT THE LATEST**

Channel	Frequency	Channel	Frequency	Channel	Frequency
1	26.965 MHz	9	27.065 MHz	16	27.155 MHz
2	26.975 "	10	27.075 "	17	27.165 "
3	26.985 "	11	27.085 "	18	27.175 "
4	27.005 "	11A	27.095 "	19	27.185 "
5	27.015 "	12	27.105 "	20	27.205 "
6	27.025 "	13	27.115 "	21	27.215 "
7	27.035 "	14	27.125 "	22	27.225 "
8	27.055 "	15	27.135 "		

Transmitter power  $\leq 5$  W and effective radiated power of equipment with integral antenna  $\leq 1$  W ERP.

Channel spacing 10 kHz.

**4 CB AND PR 27 TELEPHONES<sup>3</sup>**

Channel	Frequency	Channel	Frequency	Channel	Frequency
1	26.965 MHz	14	27.125 MHz	27	27.275 MHz
2	26.975 "	15	27.135 "	28	27.285 "
3	26.985 "	16	27.155 "	29	27.295 "
4	27.005 "	17	27.165 "	30	27.305 "
5	27.015 "	18	27.175 "	31	27.315 "
6	27.025 "	19	27.185 "	32	27.325 "
7	27.035 "	20	27.205 "	33	27.335 "
8	27.055 "	21	27.215 "	34	27.345 "
9	27.065 "	22	27.225 "	35	27.355 "

<sup>3</sup> ECC Decision ECC/DEC/(11)03.

10	27.075 "	23	27.255 "	36	27.365 "
11	27.085 "	24	27.235 "	37	27.375 "
12	27.105 "	25	27.245 "	38	27.385 "
13	27.115 "	26	27.265 "	39	27.395 "
				40	27.405 "

Transmitter power and effective radiated power (ERP) of equipment with integral antenna:

- 1) at frequency modulation<sup>4</sup>  $\leq 4$  W (these devices were previously referred to as PR 27),
  - 2) at double-sideband modulation<sup>5</sup> carrier power  $\leq 4$  W and
  - 3) at single-sideband modulation<sup>6</sup> modulation peak power  $\leq 12$  W.
- Channel spacing 10 kHz.

## 5 NON-SPECIFIC SHORT RANGE DEVICES<sup>7</sup>

Voice applications and other short range audio applications and video applications are allowed only on frequencies above 2.4 GHz, unless stated otherwise.

The use of non-specific short range devices is allowed also in an airborne aircraft or any other equipment used in aviation.

In the frequency bands where channel spacing is defined, the centre frequency of the first channel is at a distance of channel spacing/2 from the lower frequency band edge.

26.825 MHz	Transmitter power of equipment using an external antenna $\leq 500$ mW and effective radiated power of equipment with integral antenna $\leq 100$ mW ERP. Channel spacing 10 kHz.
26.845 "	
26.865 "	
26.885 "	
26.905 "	
26.925 "	
26.935 "	
26.945 "	
26.995 "	
27.045 "	
27.095 "	
27.145 "	
27.195 "	
27.255 "	

26.957–27.283 MHz	Effective radiated power $\leq 10$ mW ERP. Voice and audio applications are allowed.
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<sup>4</sup> FM, 3GE

<sup>5</sup> AM DSB, A3E

<sup>6</sup> SSB, J3E and R3E

<sup>7</sup> Non-specific short-range devices are, among others, equipment for control, alarm, telemetry, telecommand and data transmission, social alarms and video applications. ERC Recommendation CEPT/ERC/REC 70-03, applicable parts of Annexes 1 and 8, and applicable parts of ERC Decisions ERC/DEC/(01)03, ERC/DEC/(01)10 and ERC/DEC/(01)12. European Commission Decision 2006/771/EC, the valid technical Annex is in Decision 2013/752/EU.



40.660–40.790 MHz	Transmitter power of equipment using an external antenna $\leq 500$ mW and effective radiated power of equipment with integral antenna $\leq 100$ mW ERP.
40.660–40.700 MHz	Effective radiated power $\leq 10$ mW ERP. Voice and audio applications are allowed.
138.200–138.450 MHz	Effective radiated power $\leq 500$ mW ERP. Duty cycle $\leq 10$ % <sup>8</sup> .
169.400–169.475 MHz	Effective radiated power $\leq 500$ mW ERP. Channel spacing $\leq 50$ kHz. Duty cycle $\leq 1$ % <sup>8</sup> .
169.400–169.4875 MHz	Effective radiated power $\leq 10$ mW ERP. Duty cycle $\leq 0,1$ % <sup>8</sup> .
169.4875–169.5875 MHz	Effective radiated power $\leq 10$ mW ERP. Duty cycle $\leq 0,001$ % <sup>8, 9</sup> .
169.5875–169.8125 MHz	Effective radiated power $\leq 10$ mW ERP. Duty cycle $\leq 0,1$ % <sup>8</sup> .
433.050–434.790 MHz	Effective radiated power $\leq 25$ mW ERP. Duty cycle $\leq 10$ % <sup>8, 10</sup> . Voice applications are allowed. Digital audio and video applications are allowed.
433.050–434.790 MHz	Effective radiated power $\leq 1$ mW ERP. Power spectral density of transmission below -13 dBm/10 kHz ERP for broadband transmitters. No restrictions on duty cycle. Voice applications allowed with an appropriate access protocol <sup>12</sup> together with an automatic carrier time-out timer.
434.040–434.790 MHz	Effective radiated power $\leq 10$ mW ERP. Channel spacing max. 25 kHz. No restrictions on duty cycle. Voice applications allowed with an appropriate access protocol <sup>12</sup> together with an automatic carrier time-out timer.
468.200 MHz	Transmitter power $\leq 500$ mW and effective radiated power $\leq 500$ mW ERP. Total bandwidth of emission max. 25 kHz. New equipment to be taken into use on 31 December 2007 at the latest.
863.000–870.000 MHz <sup>11</sup>	Effective radiated power $\leq 25$ mW ERP. Duty cycle $\leq 0.1$ % <sup>8</sup> or an appropriate access protocol <sup>12</sup> .

<sup>8</sup> The duty cycle is defined as the ratio, expressed as a percentage, of the maximum transmitter "on" time, relative to a one hour period.

<sup>9</sup> Between 00:00h and 06:00h a duty cycle may be  $\leq 0,1\%$ .

<sup>10</sup> The duty cycle  $\leq 10$  % entered into force for radio transmitters to be placed on the market from 1 April 2003, no restrictions on the duty cycle before that.

<sup>11</sup> Sub-bands 868.600-868.700 MHz, 869.200-869.250 MHz, 869.250-869.300 MHz, 869.300-869.400 MHz, 869.650-869.700 MHz are not included, because these sub-bands are intended for low-power alarms for security and safety and social alarms (see section 9 of the Annex).

	Voice applications are allowed. Digital audio and video applications are allowed.
868.000–868.600 MHz	Effective radiated power $\leq$ 25 mW ERP. Duty cycle $\leq$ 1 % <sup>8</sup> or an appropriate access protocol <sup>12</sup> . Voice and audio applications are allowed. Digital video applications are allowed.
868.700–869.200 MHz	Effective radiated power $\leq$ 25 mW ERP. Duty cycle $\leq$ 0.1 % <sup>8</sup> or an appropriate access protocol <sup>12</sup> . Voice and audio applications are allowed. Digital video applications are allowed.
869.400–869.650 MHz	Effective radiated power $\leq$ 500 mW ERP. Channel spacing 25 kHz. Duty cycle $\leq$ 10 % <sup>8</sup> or an appropriate access protocol <sup>12</sup> . The frequency band may be used as 1 channel for high-speed data transmission. Voice and audio applications are allowed. Digital video applications are allowed.
869.700–870.000 MHz	Effective radiated power $\leq$ 5 mW ERP. Voice applications allowed with an appropriate access protocol <sup>12</sup> together with an automatic carrier time-out timer.
869.700–870.000 MHz	Effective radiated power $\leq$ 25 mW ERP. Duty cycle $\leq$ 1 % <sup>8</sup> or an appropriate access protocol <sup>12</sup> . Voice applications are allowed. Digital audio and video applications are allowed.
2400.000–2483.500 MHz	Effective radiated power $\leq$ 10 mW EIRP.
5725–5875 MHz	Effective radiated power $\leq$ 25 mW EIRP.
24.00–24.25 GHz	Effective radiated power $\leq$ 100 mW EIRP.
57–64 GHz	Effective radiated power $\leq$ 100 mW EIRP. Transmitter power $\leq$ 10 dBm and power spectral density $\leq$ 13 dBm/MHz.
61.00–61.50 GHz	Effective radiated power $\leq$ 100 mW EIRP.
122–123 GHz	Effective radiated power $\leq$ 100 mW EIRP.
244–246 GHz	Effective radiated power $\leq$ 100 mW EIRP.

**Collective frequency bands with restrictions relating to individual pieces of equipment:**

230.000–231.000 MHz	Collective frequency band for social alarms whose conformity with the essential requirements has been attested based on an application that has arrived before 1 August 1997, and which have been taken into use on 30 June
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<sup>12</sup> One appropriate access protocol is defined in ETSI Standard EN 300 220.

1998 at the latest, and for non-specific short range devices whose conformity with the essential requirements has been attested based on an application that has arrived before 31 December 1997, and which have been taken into use on 31 December 1998 at the latest.  
Effective radiated power  $\leq$  500 mW ERP.

868.150–868.650 MHz      Effective radiated power  $\leq$  500 mW ERP for non-specific short range devices whose conformity with the essential requirements has been attested based on an application that has arrived before 31 July 1998, and which have been taken into use on 31 December 1998 at the latest.

## **6 TELECOMMAND EQUIPMENT FOR USE WITH SCALE MODEL AIRCRAFT<sup>13</sup>**

34.995–35.225 MHz      Effective radiated power  $\leq$  100 mW ERP.

## **7 EQUIPMENT FOR AUTOMATIC VEHICLE IDENTIFICATION FOR RAILWAYS (AVI)<sup>14</sup>**

2447.0 MHz    2448.5 MHz    2450.0 MHz    2451.5 MHz    2453.0 MHz

Effective radiated power  $\leq$  500 mW EIRP. Channel spacing 1.5 MHz.

## **8 WIDE-BAND DATA TRANSMISSION EQUIPMENT (WAS/RLAN)<sup>15</sup>**

2400.000–2483.500 MHz      Effective radiated power  $\leq$  100 mW EIRP.

5150.000–5250.000 MHz      Effective radiated power  $\leq$  200 mW EIRP, power spectral density of transmission has to be  $\leq$  10 mW/1 MHz EIRP. Only indoor use permitted.

5250.000–5350.000 MHz      Effective radiated power  $\leq$  200 mW EIRP, power spectral density of transmission has to be  $\leq$  10 mW/1 MHz EIRP. Only indoor use permitted.

5470.000–5725.000 MHz      Effective radiated power  $\leq$  1 W EIRP, power spectral density of transmission has to be  $\leq$  50 mW/1 MHz EIRP.

57.0–66.0 GHz      Effective radiated power  $\leq$  40 dBm EIRP, power spectral density of transmission has to be 13 dBm/MHz EIRP. Fixed outdoor installations not permitted.

RLAN equipment operating in the bands 5250–5350 MHz and 5470–5725 MHz must employ transmit power control which provides a mitigation factor of at least 3 dB on the maximum permitted output power of the systems. If transmit power control is not

<sup>13</sup> Short range devices, ERC Recommendation CEPT/ERC/REC 70-03, applicable parts of Annex 8, ERC Decision ERC/DEC/(01)11.

<sup>14</sup> Short range devices, ERC Recommendation CEPT/ERC/REC 70-03, applicable parts of Annex 4.

<sup>15</sup> Short range devices, ERC Recommendation CEPT/ERC/REC 70-03, applicable parts of Annex 3 and ERC Decision ERC/DEC/(01)07 and ECC Decision ECC/DEC/(04)08. European Commission Decisions 2005/513/EC and 2007/90/EC. European Commission Decision 2006/771/EC, the valid technical Annex is in Decision 2013/752/EU.

in use, the maximum permitted mean EIRP and the corresponding mean EIRP density limits must be reduced by 3 dB.

RLAN equipment operating in the bands 5250–5350 MHz and 5470–5725 MHz must use mitigation techniques complying with the detection, operational and response requirements described in Standard EN 301 893.

## **8A BROADBAND FIXED WIRELESS ACCESS (BFWA)<sup>16</sup>**

5725.000–5795.000 MHz      Effective radiated power  $\leq 4$  W EIRP, power spectral density of transmission has to be  $\leq 23$  dBm/1 MHz EIRP.

5815.000–5850.000 MHz      Effective radiated power  $\leq 4$  W EIRP, power spectral density of transmission has to be  $\leq 23$  dBm/1 MHz EIRP.

Equipment operating in the bands 5725–5795 MHz and 5815–5850 MHz must use mitigation techniques complying with the detection, operational and response requirements described in Standard EN 302 502.

## **9 LOW-POWER ALARMS FOR SECURITY AND SAFETY AND SOCIAL ALARMS<sup>17</sup>**

In the frequency bands where channel spacing is defined, the centre frequency of the first channel is at a distance of channel spacing/2 from the lower frequency band edge.

142.250 MHz      Effective radiated power  $\leq 1$  mW ERP. Total bandwidth of emission  $\leq 25$  kHz.

169.4000–169.4750 MHz      Meter reading systems. Effective radiated power  $\leq 500$  mW ERP. Channel spacing  $\leq 50$  kHz. Duty cycle  $\leq 10$  %<sup>8</sup>.

868.600–868.700 MHz      Effective radiated power  $\leq 10$  mW ERP. Channel spacing 25 kHz. Duty cycle  $\leq 1$  %<sup>8</sup>. The frequency band may be used as 1 channel for high-speed data transmission.

869.250–869.300 MHz      Effective radiated power  $\leq 10$  mW ERP. Channel spacing 25 kHz. Duty cycle  $\leq 0.1$  %<sup>8</sup>.

869.300–869.400 MHz      Effective radiated power  $\leq 10$  mW ERP. Channel spacing 25 kHz. Duty cycle  $\leq 1.0$  %<sup>8</sup>.

869.650–869.700 MHz      Effective radiated power  $\leq 25$  mW ERP. Channel spacing 25 kHz. Duty cycle  $\leq 10$  %<sup>8</sup>.

869.200–869.250 MHz      Only for social alarms. Effective radiated power  $\leq 10$  mW ERP. Channel spacing 25 kHz. Duty cycle  $\leq 0.1$  %<sup>8</sup>.

<sup>16</sup> ECC Recommendation ECC/REC/(06)04.

<sup>17</sup> Short range devices, ERC Recommendation CEPT/ERC/REC 70-03, applicable parts of Annexes 2 and 7. ECC Decision ECC/DEC/(05)02. European Commission Decision 2006/771/EC, the valid technical Annex is in Decision 2013/752/EU.

## 10 EQUIPMENT FOR DETECTING MOVEMENT AND EQUIPMENT FOR ALERT<sup>18</sup>

2400.000–2483.500 MHz	Effective radiated power $\leq$ 25 mW EIRP.
9500–9975 MHz	Effective radiated power $\leq$ 25 mW EIRP. Restrictions relating to individual pieces of equipment: Effective radiated power $\leq$ 500 mW EIRP for equipment for detecting movement and equipment for alert whose conformity with requirements has been attested based on an application that has arrived before 31 December 1998 and which have been taken into use on 31 December 1999 at the latest.
10.45–10.50 GHz	Effective radiated power $\leq$ 500 mW EIRP.
10.500–10.600 GHz	Effective radiated power $\leq$ 25 mW EIRP. Duty cycle $\leq$ 10 % <sup>8</sup> . Only indoor use permitted.
13.40–14.00 GHz	Effective radiated power $\leq$ 25 mW EIRP.
17.1–17.3 GHz	Ground based synthetic aperture radars (GBSAR). Effective radiated power $\leq$ 26 dBm EIRP. Appropriate access protocol <sup>19</sup> .
24.00–24.25 GHz	Effective radiated power $\leq$ 100 mW EIRP. Restrictions relating to individual pieces of equipment: Effective radiated power $\leq$ 500 mW EIRP for equipment for detecting movement and equipment for alert whose conformity with requirements has been attested based on an application that has arrived before 31 December 1998 and which have been taken into use on 31 December 1999 at the latest.
4.5–7.0 GHz	Tank level probing radars. Spectral power density outside the tank $\leq$ -41.3 dBm/MHz EIRP. Effective radiated power inside the tank $\leq$ +24 dBm EIRP.
8.5–10.6 GHz	Tank level probing radars. Spectral power density outside the tank $\leq$ -41.3 dBm/MHz EIRP. Effective radiated power inside the tank $\leq$ +30 dBm EIRP.
24.05–27.00 GHz	Tank level probing radars. Spectral power density outside the tank $\leq$ -41.3 dBm/MHz EIRP. Effective radiated power inside the tank $\leq$ +43 dBm EIRP.
57–64 GHz	Tank level probing radars. Spectral power density outside the tank $\leq$ -41.3 dBm/MHz EIRP. Effective radiated power inside the tank $\leq$ +43 dBm EIRP.
75–85 GHz	Tank level probing radars. Spectral power density outside the tank $\leq$ -41.3 dBm/MHz EIRP. Effective radiated power inside the tank $\leq$ +43 dBm EIRP.

<sup>18</sup> Short range devices, ERC Recommendation CEPT/ERC/REC 70-03, applicable parts of Annex 6, ERC Decision ERC/DEC/(01)08. European Commission Decision 2006/771/EC, the valid technical Annex is in Decision 2013/752/EU.

<sup>19</sup> One appropriate access protocol is defined in ETSI Standard EN 300 440.

6.0–8.5 GHz  
24.05–26.50 GHz  
57–64 GHz  
75–85 GHz

Level probing radars<sup>20</sup>.

**Collective frequency bands with restrictions relating to individual pieces of equipment:**

10.50–10.55 GHz

Collective frequency band for equipment for detecting movement and equipment for alert whose conformity with the essential requirements has been attested based on an application that has arrived before 31 December 1997, and which have been taken into use on 31 December 1998 at the latest.  
Effective radiated power  $\leq$  500 mW EIRP.

**11 RADIO FREQUENCY IDENTIFICATION DEVICES (RFID)<sup>21</sup>**

865.000–865.600 MHz

Effective radiated power  $\leq$  100 mW ERP. Channel spacing 200 kHz<sup>22</sup>.

865.600–867.600 MHz

Effective radiated power  $\leq$  2 W ERP. Channel spacing 200 kHz<sup>22</sup>.

867.600–868.000 MHz

Effective radiated power  $\leq$  500 mW ERP. Channel spacing 200 kHz<sup>22</sup>.

865.000–868.000 MHz

Frequency bands of the interrogator:  
865.600–865.800 MHz  
866.200–866.400 MHz  
866.800–867.000 MHz  
867.400–867.600 MHz  
Effective radiated power of the interrogator  $\leq$  2 W ERP.

2446.0–2454.0 MHz

Effective radiated power  $\leq$  500 mW EIRP.  
Effective radiated power  $\leq$  4 W EIRP only indoors and duty cycle  $\leq$  15 %<sup>23</sup>.

**12 ON-SITE PAGING SYSTEMS**

27.720 MHz	27.820 MHz	27.920 MHz
27.740 "	27.840 "	27.940 "

<sup>20</sup> Technical conditions and geographical restrictions are defined in standard EN 302 729 and ECC Decision ECC/DEC/(11)02.

<sup>21</sup> ERC Recommendation CEPT/ERC/REC 70-03, applicable parts of Annex 11. European Commission Decision 2006/804/EC. European Commission Decision 2006/771/EC, the valid technical Annex is in Decision 2013/752/EU.

<sup>22</sup> Access protocol and channelling are based on standard EN 302 208-2 V1.1.1.

<sup>23</sup> The duty cycle must be  $\leq$  15 % during any 200 ms period (i.e. 30 ms on, 170 ms off).

27.760 "	27.860 "	30.300 "
27.780 "	27.880 "	40.680 "
27.800 "	27.900 "	

Transmitter power  $\leq 5$  W and effective radiated power of equipment with integral antenna  $\leq 5$ W ERP. Channel spacing 10 kHz.

**Collective frequencies for on-site paging systems up to and including 31 December 2004:**

26.965 MHz	Transmitter power $\leq 5$ W and effective radiated power of equipment with integral antenna $\leq 5$ W ERP. Channel spacing 10 kHz.
27.075 "	
27.255 "	
27.400 "	

**Collective frequencies with restrictions relating to individual pieces of equipment:**

27.450 MHz	Collective frequencies only for on-site paging systems that have been taken into use on 1 January 1989 at the latest.
27.490 MHz	
	Transmitter power $\leq 5$ W and effective radiated power of equipment with integral antenna $\leq 5$ W ERP. Channel spacing 10 kHz.

**13 WIRELESS LOUDSPEAKERS, EQUIPMENT FOR IN-EAR MONITORING, HEADPHONES, HEARING AIDS, HELMET RADIO TELEPHONES AND RADIO MICROPHONES<sup>24</sup>**

In frequency bands where the channel spacing is defined, the centre frequency of the first channel must be at a distance of channel spacing/2 from the lower edge of the frequency band.

31.100 MHz	33.500 MHz	Effective radiated power $\leq 10$ mW ERP. Total bandwidth of emission max. 200 kHz.
32.100 "	36.700 "	
32.900 "	37.100 "	
42.400–43.600 MHz		
169.4000–169.4750 MHz		Effective radiated power $\leq 10$ mW ERP. Channel spacing $\leq 50$ kHz. Hearing aids. Shared use with short range devices.
169.4875–169.5875 MHz		Effective radiated power $\leq 10$ mW ERP. Channel spacing $\leq 50$ kHz. Hearing aids. Shared use with short range devices.

<sup>24</sup> Short range devices, ERC Recommendation CEPT/ERC/REC 70-03, applicable parts of Annexes 10 and 13, ECC Decision ECC/DEC/(05)02. European Commission Decisions 2005/928/EC and 2008/673/EC. European Commission Decision 2006/771/EC, the valid technical Annex is in Decision 2013/752/EU.

173.965–174.015 MHz	Effective radiated power $\leq$ 2 mW ERP. Channel spacing $\leq$ 50 kHz. Only hearing aids.
823–826 MHz	Effective radiated power $\leq$ 12 mW ERP, body worn radio microphones $\leq$ 60 mW ERP. Channel spacing $\leq$ 200 kHz. Only radio microphones, equipment for in-ear monitoring and hearing aids.
826–832 MHz	Effective radiated power $\leq$ 60 mW ERP. Channel spacing $\leq$ 200 kHz. Only radio microphones, equipment for in-ear monitoring and hearing aids.
863.000–865.000 MHz	Effective radiated power $\leq$ 10 mW ERP.
864.800–865.000 MHz	Effective radiated power $\leq$ 10 mW ERP. Channel spacing max. 50 kHz. Narrow band analogue voice devices.

#### **14 ULTRA LOW-POWER MEDICAL IMPLANTS<sup>25</sup>**

30.0–37.5 MHz	Applications for blood pressure measuring. Effective radiated power $\leq$ 1 mW ERP. Duty cycle $\leq$ 10 %.
401.000–402.000 MHz	Effective radiated power $\leq$ 25 $\mu$ W ERP and an appropriate access protocol or duty cycle $\leq$ 0.1 % and radiated power $\leq$ 250 nW ERP. Channel spacing $\leq$ 25 kHz. Adjacent channels may be combined for increased bandwidth up to 100 kHz.
402.000–405.000 MHz	Effective radiated power $\leq$ 25 $\mu$ W ERP. Channel spacing $\leq$ 25 kHz. Adjacent channels may be combined for increased bandwidth up to 300 kHz.
405.000–406.000 MHz	Effective radiated power $\leq$ 25 $\mu$ W ERP and an appropriate access protocol or duty cycle $\leq$ 0.1 % and radiated power $\leq$ 250 nW ERP. Channel spacing $\leq$ 25 kHz. Adjacent channels may be combined for increased bandwidth up to 100 kHz.
2483.5–2500 MHz	Effective radiated power $\leq$ 10 mW EIRP. Duty cycle $\leq$ 10 %. An appropriate access protocol. Channel spacing $\leq$ 1 MHz. The whole frequency band may be used as a single channel for high-speed data transmission. Peripheral units are for indoor use only.

#### **15 TERMINAL EQUIPMENT FOR MOBILE SATELLITE SYSTEMS<sup>26</sup>**

Terminal equipment with a transmitter and a receiver part:

<sup>25</sup> Short range devices, ERC Recommendation CEPT/ERC/REC 70-03, Annex 12, ERC Decision ERC/DEC/(01)17. European Commission Decision 2006/771/EC, the valid technical Annex is in Decision 2013/752/EU.

<sup>26</sup> ERC Decisions ERC/DEC/(99)05 and ERC/DE/(99)06. ECC Decisions ECC/DEC/(06)09, ECC/DEC/(12)01, ECC/DEC/(09)02 and ECC/DEC/(09)04. European Commission Decisions 2007/98/EC and 2009/449/EC and Decision No 626/2008/EC of the European Parliament and of the Council.



148.00–150.05 MHz	Orbcomm
1610.0–1626.5 MHz	
1980–1995 MHz	Inmarsat Ventures Limited
1995–2010 MHz	Solaris Mobile Limited
1626.5–1645.5 MHz	
1646.5–1660.5 MHz	
1670–1675 MHz	

Terminal equipment with only a transmitter part:

401.620–401.680 MHz	Tracking transmitters belonging to the Argos satellite system <sup>27</sup> .
1613.8–1626.5 MHz	Effective radiated power $\leq$ 30 dBm EIRP. Duty cycle $\leq$ 1 %.

## **16 OMNITRACS STATIONS WITHIN THE EUTELTRACS SYSTEM<sup>28</sup>**

14.00–14.25 GHz

## **17 TERMINAL EQUIPMENT FOR FIXED WIRELESS ACCESS NETWORKS**

3410–3590 MHz  
10.150–10.240 GHz / 10.500–10.590 GHz  
24.549–25.333 GHz / 25.557–26.341 GHz

## **18 TERMINALS BELONGING TO THE VIRVE (FINLAND'S PUBLIC AUTHORITY NETWORK) EMERGENCY SERVICES NETWORK**

380.0125 MHz + (0...199) x 25 kHz (380.0125–384.9875 MHz)

Direct Mode Operation (DMO):

380.0125 MHz + (0...239) x 25 kHz (380.0125–385.9875 MHz)

390.0125 MHz + (0...239) x 25 kHz (390.0125–395.9875 MHz)

Use allowed in an aircraft and other equipment used in aviation.

## **19 PMR446 TELEPHONES<sup>29</sup>**

446.00625 MHz + (0...7) x 12.5 kHz

Effective radiated power  $\leq$  500 mW ERP.

Total bandwidth of emission 12.5 kHz.

<sup>27</sup> Argos certified transmitter including platform identification number.

<sup>28</sup> ERC Decisions ERC/DEC/(98)17 (ARCANET) and ERC/DEC/(98)15 (Euteltracs-Omnitracs).

<sup>29</sup> ERC Decisions CEPT/ERC/DEC/(98)/25 and CEPT/ERC/DEC/(98)/26.

## 19A DIGITAL PMR446 EQUIPMENT<sup>30</sup>

446.10625 MHz + (0...7) x 12.5 kHz

Effective radiated power ≤ 500 mW ERP. Channel spacing 12.5 kHz.

446.103125 MHz + (0...15) x 6.25 kHz

Effective radiated power ≤ 500 mW ERP. Channel spacing 6.25 kHz.

## 20 ROAD TRANSPORT AND TRAFFIC TELEMATICS<sup>31</sup>

5795–5805 MHz	Road toll systems. Effective radiated power ≤ 8 EIRP.
24.250–24.495 GHz	Automotive radars. Effective radiated power ≤ -11 dBm EIRP <sup>32</sup> .
24.250–24.500 GHz	Automotive radars. Effective radiated power ≤ 20 dBm EIRP (forward facing radar) and effective radiated power ≤ 16 dBm EIRP (rear facing radar) <sup>32</sup> .
24.495–24.500 GHz	Automotive radars. Effective radiated power ≤ -8 dBm EIRP <sup>32</sup> .
21.650–26.650 GHz	Automotive Short Range Radars (SRR). The spectral power density of UWB transmission ≤ -41.3 dBm/MHz EIRP, except for frequencies below 22 GHz where the spectral power density is ≤ -61.3 dBm/MHz EIRP, and spectral density measured as peak value 0 dBm/50 MHz EIRP. 24.05–24.25 GHz narrowband component, peak power 20 dBm EIRP. Duty cycle ≤ 10 % for peak emission higher than -10 dBm EIRP. Radars operating in the frequency band 21.65–24.25 GHz must be taken into use on 30.6.2013 at the latest. Radars operating in the frequency band 24.25–26.65 GHz must be taken into use on 1.1.2018 at the latest <sup>33</sup> .
76.00–77.00 GHz	Effective radiated power: Peak power ≤ 316 W EIRP. Average power ≤ 100 W EIRP. Average power for pulsed radars ≤ 225 mW EIRP.
77–81 GHz	Automotive Short Range Radars (SRR). The spectral power density ≤ -3 dBm/MHz EIRP and peak power ≤ 55 dBm EIRP. The spectral power density ≤ -9 dBm/MHz EIRP outside a vehicle <sup>34</sup> .

<sup>30</sup> ECC Decision ECC/DEC/(05)/12.

<sup>31</sup> Short range devices, ERC Recommendation CEPT/ERC/REC 70-03, applicable parts of Annex 5. European Commission Decision 2006/771/EC, the valid technical Annex is in Decision 2013/752/EU.

<sup>32</sup> Harmonised standards include further terms for the use of equipment.

<sup>33</sup> ECC Decision ECC/DEC/(04)10 and European Commission Decisions 2005/50/EC and 2011/485/EU also include further terms for taking equipment into use.

<sup>34</sup> European Commission Decision 2004/545/EC and ECC Decision ECC/DEC/(04)03.

## **21 HEST AND LEST SATELLITE TERMINALS FOR FIXED SATELLITE COMMUNICATIONS<sup>35</sup>**

HEST satellite terminals

14.0–14.25 GHz

29.5–30.00 GHz

Effective radiated power  $\leq$  60 dBW EIRP.

LEST satellite terminals

14.0–14.25 GHz

29.5–30.00 GHz

Effective radiated power  $\leq$  34 dBW EIRP.

## **22 TERMINALS OF THE GSM-R NETWORK OF THE FINNISH STATE RAILWAYS**

876.2000 MHz + (0...19) x 200 kHz

Direct Mode Operation (DMO):

876.0125 MHz + (0...4) x 12,5 kHz

## **23 MOBILE SATELLITE EARTH STATIONS ON THE COLLECTIVE FREQUENCY 14 - 14.5 GHz PLACED ON BOARD AN AIRCRAFT (AES)<sup>36</sup>**

14–14.5 GHz

Effective radiated power  $\leq$  50 dBW EIRP.

## **24 LOW-POWER FM TRANSMITTERS<sup>37</sup>**

87.5–108 MHz

Effective radiated power  $\leq$  50 nW ERP.

## **25 UWB DEVICES<sup>38</sup>**

3.1–4.8 GHz

UWB devices using low duty cycle (LDC). Power spectral density  $\leq$  -41.3 dBm/MHz EIRP. Fixed installed equipment for indoor use and for use in automotive and railway vehicles only.

3.1–4.8 GHz

UWB equipment using DAA mitigation techniques. Power spectral density of transmission  $\leq$  -41.3 dBm/MHz EIRP. Fixed installed equipment for indoor use and for use in automotive and railway vehicles only. Fixed installed

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<sup>35</sup> ECC Decisions ECC/DEC/(06)03 (HEST) and ECC/DEC/(06)02 (LEST).

<sup>36</sup> ECC Decision ECC/DEC/(05)11.

<sup>37</sup> ERC Recommendation CEPT/ERC/REC 70-03, applicable parts of Annex 13. European Commission Decision 2006/771/EC, the valid technical Annex is in Decision 2013/752/EU.

<sup>38</sup> ECC Decisions ECC/DEC/(06)04 and ECC/DEC/(07)01 and European Commission Decisions 2007/131/EC and 2009/343/EC. The limits for effective radiated power in different frequency ranges for each application are defined in the relevant harmonised standards. Placing on the market of equipment requires the use of a Notified Body until the relevant harmonized standard has been published.

equipment in automotive and railway vehicles must employ transmit power control (TPC) or have a power spectral density of  $\leq -53.3$  dBm/MHz EIRP.

4.2–4.8 GHz

Power spectral density  $\leq -41.3$  dBm/MHz EIRP. New devices must be taken into use on 31 December 2010 at the latest. For devices without mitigation technique, to be taken into use after this date, the power spectral density is  $\leq -70$  dBm/MHz EIRP. Fixed installed equipment for indoor use for use in automotive and railway vehicles only.

Fixed installed equipment in automotive and railway vehicles must employ transmit power control (TPC) or have a power spectral density of  $\leq -53.3$  dBm/MHz EIRP.

6.0–8.5 GHz

Power spectral density  $\leq -41.3$  dBm/MHz EIRP. Fixed installed equipment for indoor use and for use in automotive and railway vehicles only.

Fixed installed equipment in automotive and railway vehicles must employ transmit power control (TPC) or have a power spectral density of  $\leq -53.3$  dBm/MHz EIRP.

8.5–9.0 GHz

UWB equipment using DAA mitigation techniques. Power spectral density of transmission  $\leq -41.3$  dBm/MHz EIRP. Fixed installed equipment for indoor use and for use in automotive and railway vehicles only.

Fixed installed equipment in automotive and railway vehicles must employ transmit power control (TPC) or have a power spectral density of  $\leq -53.3$  dBm/MHz EIRP.

2.2–8.5 GHz

Building material analysis and material sensing devices using UWB technology.

## **26 EARTH STATIONS ON MOBILE PLATFORMS (ESOMP SATELLITE TERMINALS) FOR FIXED SATELLITE COMMUNICATIONS IN THE FREQUENCY BAND 29.5 - 30 GHz<sup>39</sup>**

29.5–30.00 GHz

Effective radiated power  $\leq 60$  dBW EIRP.

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<sup>39</sup> Satellite terminals operating in the satellite network in accordance with ECC Decision ECC/DEC/(13)01.