

## CEPT/ERC RECOMMENDATION 70-03 (Tromsø 1997)

### RELATING TO THE USE OF SHORT RANGE DEVICES (SRD)

Recommendation adopted by the Frequency Management, Radio Regulatory and Spectrum Engineering Working Groups

#### Foreword

This Recommendation sets out the general position on common spectrum allocations for Short Range Devices (SRDs) for countries within the CEPT. In using this Recommendation it should be remembered that it represents the most widely accepted position within the CEPT but it should not be assumed that all allocations are available in all countries. An indication of where allocations are not available or where deviations from the CEPT position occur is to be found in Appendix 3.

It should also be remembered that the pattern of radio use is not static. It is continuously evolving to reflect the many changes that are taking place in the radio environment; particularly in the field of technology. Spectrum allocations must reflect these changes and the position set out in this Recommendation is therefore subject to continuous review.

Moreover, many administrations still have national allocations that do not conform to the CEPT position set out in this Recommendation. Details of national allocations can be found in the ERO Contribution on Short Range Devices.

For these reasons, those wishing to develop or market SRDs based on this Recommendation are advised to contact the relevant national administration to verify that the position set out herein still applies.

**When selecting parameters for new SRDs, which may have inherent safety of human life implications, manufacturers and users should pay particular attention to the potential for interference from other systems operating in the same or adjacent bands.**

#### INTRODUCTION

The CEPT has adopted Recommendations to deal with low power devices, and specific short range devices. The European Telecommunications Standards Institute (ETSI) has now developed standards for the majority of these devices.

The term "Short Range Device" (SRD) is intended to cover the radio transmitters which provide either uni-directional or bi-directional communication and which have low capability of causing interference to other radio equipment. SRDs use either integral, dedicated or external antennas and all modes of modulation can be permitted subject to relevant standards. Due to the many different services provided by these devices, no description can be exhaustive, however, the following categories are amongst those covered:

- Telecommand and Telecontrol
- Telemetry
- Alarms
- Speech and Video

This Recommendation describes the requirements for SRDs relating to allocated frequency bands, maximum power levels, equipment antenna, channel spacing, duty cycle, licensing, conformity assessment, marking and free circulation requirements.

Appendix 1 Table 1 lists the applications covered by this Recommendation. Tables 2 to 7 in Appendix 1 list parameters relevant to these applications. The Tables in the following annexes give the possible combinations which may be utilised for different applications. For example, in Annex 1 for the frequency band 40.660-40.700 MHz as mentioned in the fourth row of the first column, equipment may operate with maximum radiated power level 8 (i.e., 10 mW e.r.p.). Equipment in the frequency band 61.0-61.5 GHz may operate with maximum radiated power level 11 (i.e., 100 mW e.i.r.p.). In neither case are individual licences required and both antenna type 1 (integral antenna) and type 2 (dedicated antenna) may be applied. The same allotment applies to channel spacing, duty cycle, conformity assessment, marking and free circulation.

Relevant ERC Decisions and standards produced by ETSI are mentioned in Appendix 2 of this Recommendation. Relevant ETSI Standards are also mentioned by their ETS or EN number in the corresponding annexes.

“The European Conference of Postal and Telecommunications Administrations,

*considering*

- a) that SRDs in general operate in shared bands and are not permitted to cause harmful interference to other radio services;
- b) that in general SRDs cannot claim protection from other radio services;
- c) that due to the increasing interest in the use of SRDs for a growing number of applications it is necessary to harmonise frequencies and regulations for these devices;
- d) that ETSI has developed technical standards covering different kinds of SRDs;
- e) that for some applications CEPT Recommendations detail frequency allocations without ETSI having yet developed standards,

*recognising*

- a) that there is a need to distinguish between different applications;
- b) that additional applications and associated annexes will be added as necessary;
- c) that the list of applications currently covered by this Recommendation is shown in Appendix 1, Table 1;
- d) that conformity assessment, marking and free circulation requirements which have been developed in the CEPT are applicable to SRDs;
- e) that maintenance of Appendices 2 and 3 and also the related cross-references in the Annexes may be undertaken by the ERO based on information from Administrations,

*noting*

- a) that information about the regulatory requirements for placing SRD equipment on the market and for their use should be obtained by contacting individual administrations, especially with regard to equipment operating in frequencies or frequency bands that may be designated for SRDs by administrations in addition to those covered in this recommendation;
- b) that, for those countries implementing this Recommendation, national restrictions in respect of the annexes can be found in Appendix 3;
- c) that the CEPT should amend or abrogate relevant parts of CEPT Recommendations where indicated in the annexes but equipment marketed before the adoption of this ERC Recommendation marked with abbreviations defined in the CEPT Recommendations to be abrogated should be allowed continuation of free circulation and use,

*recommends*

- 1) that CEPT Administrations implement the parameters listed in Appendix 1 (Applications and Parameter Tables) in accordance with the indications mentioned in the annexes;
- 2) that technical parameter limits should not be exceeded by any function of the equipment;
- 3) that whenever there are ERC Decisions harmonising the radio parameters and adopting European standards so that the ERC Decision ERC/DEC/(97)10 is applicable, CEPT Administrations should accept the conformity assessment performed by bodies in other CEPT member countries without requiring national conformity assessment;
- 4) that whenever recommends (3) cannot be applied but there is an ETSI standard mentioned in the Annexes, CEPT Administrations should accept the test results reached by an accredited test laboratory in another country in accordance with ERC Recommendation CEPT/ERC/REC 01-06 (Brussels 1994) (Procedure for mutual recognition of type testing and type-approval for radio equipment);
- 5) that in cases not covered by recommends 3 and 4, Administrations should introduce national conformity assessment based on national type testing;
- 6) that CEPT Administrations should allow visitors from other countries to carry and use their equipment temporarily without any further formalities whenever free circulation and the use of the equipment is indicated in the annexes, unless there are national restrictions as shown in Appendix 3.”

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**Appendix 1****Applications and Parameter Tables.****Table 1: Applications**

Annex	Application
1	Non-specific Short Range Devices
2	Equipment for Detecting Avalanche Victims
3	Local Area Networks, RLANs and HIPERLANs
4	Automatic Vehicle Identification for Railways (AVI)
5	Road Transport & Traffic Telematics (RTTT)
6	Equipment for Detecting Movement and Equipment for Alert
7	Alarms
8	Model Control
[aa]	Inductive Applications*
[bb]	Anti-theft Systems * [proposed to be combined with Annex aa]
[cc]	Radio Microphones *
[dd]	RF Identification Systems *
[ee]	Ultra Low Power Active Medical Implants *
[ff]	Wireless Audio Applications *

\* Annexes in preparation

**Table 2: Radiated Power or Field Strength**

	Maximum power level
1.	7 dB $\mu$ A/m at 10 metres
2.	42 dB $\mu$ A/m at 10 metres
3.	72 dB $\mu$ A/m at 10 metres (at 30 kHz descending 3.5 dB/octave)
4.	38 dB $\mu$ A/m at 10 metres (at 135 kHz descending 3.5 dB/octave to 4.78 MHz)
5.	<i>To be determined (t.b.d.)</i>
6.	1 mW <sup>1</sup>
7.	2 mW <sup>1</sup>
7a.	5 mW <sup>1</sup>
8.	10 mW <sup>1</sup>
9.	25 mW <sup>1</sup>
10.	50 mW <sup>1</sup>
11.	100 mW <sup>1</sup>
12.	500 mW <sup>1</sup>
13.	1 W <sup>1</sup>
14.	2 W <sup>1</sup>
15.	8 W <sup>1</sup>
16.	<i>To be determined (t.b.d.)<sup>1</sup></i>

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<sup>1</sup> Levels are either effective radiated power (e.r.p.) or equivalent isotropically radiated power (e.i.r.p.) as indicated in the relevant annex.

**Table 3: Transmitter antenna source**

	Type of transmitter antenna
1.	Integral (no external antenna socket)
2.	Dedicated (type approved with the equipment)
3.	External (equipment type approved without an antenna)

**Table 4. Channel spacing permitted**

	Channel spacing
1.	5 kHz
2.	6.25 kHz
3.	10 kHz
4.	12.5 kHz
5.	20 kHz
6.	25 kHz
7.	50 kHz
8.	75 kHz
9.	100 kHz
10.	150 kHz
11.	200 kHz
12.	Other channel spacing - see specific annex
13.	No channel spacing – whole stated frequency band may be used

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.

**Table 5: Licensing requirements**

	Individual licence
1.	Required <sup>2</sup>
2.	Not required

**Table 6: Conformity assessment, marking requirements and free circulation.**

	Conformity assessment	Marking	Free circulation and use
1.	Mutual recognition of conformity assessment ERC/DEC/(97)AA	Rxxxx SRD Aa <sup>3</sup>	Yes <sup>4</sup>
2.	Mutual recognition of test results (CEPT/ERC/REC 01-06 (Brussels 1994))	CEPT SRD Aa Y <sup>3</sup>	Yes <sup>4</sup>
3.	National conformity assessment <sup>5</sup>	National marking	No

<sup>2</sup> A licence may not be necessary in certain CEPT countries.

<sup>3</sup> 'xxxx' is the identification number of the responsible conformity assessment body. The updated list of these identification numbers will be available from the ERO.

'A' is the number of the relevant Annex associated with this recommendation.

'a' is the letter of the leftmost column in the Annexes defining the frequency band alternative. 'a' may be more than one letter in the case of multi-band equipment. All frequency bands in which equipment is intended to operate must be specified.

'Y' is the symbol for the country which issued the type approval.

<sup>4</sup> There are restrictions as defined in Appendix 3

<sup>5</sup> National conformity assessment may also be based on mutual recognition of test results (CEPT/ERC/REC 01-06).



**Table 7: Duty cycle categories**

For the purposes of this Recommendation the duty cycle is defined as the ratio, expressed as a percentage, of the length of time that a transmitter is transmitting (on) in relation to the total time period for one on/off cycle.

	Name	Transmitting time/Full cycle	Explanation
1.	Very low	$\leq 0.1 \%$	For example, typically "on" for 1 second or less in 1000 seconds.
2.	Low	$\leq 1.0 \%$	For example, typically "on" for between 0.1 and 1 second in 100 seconds.
3.	High	$\leq 10 \%$	For example, typically "on" for between 0.1 and 1 second in 10 seconds
4.	Very high	Up to 100 %	Typically continuous transmissions but also those with a duty cycle greater than 10%

The averaging time period of a full cycle is up to 1 hour.

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**Appendix 2****List of relevant ERC Decisions, Recommendations and ETSI Standards****ERC Decisions**

ERC/DEC/(92)02	On the frequency bands to be designated for the coordinated introduction of Road Transport Telematics Systems.
ERC/DEC/(96)03	On the harmonised frequency band to be designated for the introduction of High Performance Radio Local Area Networks (HIPERLANs).
ERC/DEC/(95)01	On the free circulation of radio equipment in CEPT member countries.
ERC/DEC(97)06	On the harmonised frequency band to be designated for Social Alarm Systems.
ERC/DEC/(97)10	On the mutual recognition of conformity assessment procedures including marking of radio equipment and radio terminal equipment.
[ERC/DEC/(... )	On adoption of national type approval regulations for short range devices operating in the frequency range 25 to 1000 MHz with power levels of up to 500mW based on the European Telecommunications Standard (ETS) 300 220.]

**ERC Recommendations**

CEPT/ERC/REC 01-06	Procedure for mutual recognition of type testing and type-approval for radio equipment.
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**ETSI Standards****Generic standards**

EN 300 220	Radio Equipment and Systems (RES); Short range devices; Technical characteristics and test methods for radio equipment to be used in the 25 MHz to 1000 MHz frequency range with power levels ranging up to 500 mW.
EN 300 330	Radio Equipment and Systems (RES); Short range devices (SRDs); Technical characteristics and test methods for radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz.
EN 300 440	Radio Equipment and Systems (RES); Short range devices; Technical characteristics and test methods for radio equipment to be used in the 1 GHz to 25 GHz frequency range.

Specific standards

ETS 300 328	Radio Equipment and Systems (RES); Wideband transmission systems; Technical characteristics and test conditions for data transmission equipment operating in the 2.4 GHz ISM band and using spread spectrum modulation techniques.
EN 300 422	Radio Equipment and Systems (RES); Technical characteristics and test methods for wireless microphones in the 25 MHz to 3 GHz frequency range.
ETS 300 454	Radio Equipment and Systems (RES); Wide band audio links; Technical characteristics and test methods.
prETS 300 836	Radio Equipment and Systems (RES); High Performance Radio Local Area Network (HIPERLAN) Type 1 Conformance Testing Specification. (Approved for Public Enquiry).
EN 300 674	Radio Equipment and Systems (RES); Road Transport and Traffic Telematics (RTTT); Technical characteristics and test methods for data transmission equipment operating in the 5.8 GHz Industrial, Scientific and Medical (ISM) band. (Rejected in vote, revised version out to public enquiry 19/9/97)]
ETS 300 718	Radio Equipment and Systems (RES); Avalanche beacons; Transmitter-receiver systems.
EN 300 761	Radio Equipment and Systems (RES); Automatic Vehicle Identification (AVI) for Railways. (In voting)
EN 301 091	Radio Equipment and Systems (RES); Automotive radar systems in the 76-77 GHz frequency band.



Annex	Administration	Remarks/Restrictions
1	<p>Hungary</p> <p>Lithuania</p> <p>Portugal</p> <p>Romania</p> <p>Sweden</p> <p>UK</p>	<p>869-870 MHz excluded.</p> <p>Band 'c': operation not allowed in the CB channels. Band 'd': channel spacing 10 kHz. Band 'e': audio is not allowed. Bands 'f' to 'm': licences required.</p> <p>868-870 MHz: implementation not before 1 July 1998. In the meantime a licence will be required.</p> <p>Only 6765-6795 kHz, 13.553-13.567 MHz, 26.957-26.960 MHz, 40.660-40.700 MHz, 433.050-434.790 MHz.</p> <p>The bands in Annex 8 are also applicable for non-specific SRDs. Inductive loop systems in the frequency range 9 kHz to 30 MHz are not considered as being radio transmitters and thereby not subject to national regulatory requirements under the Radiocommunications Act. In bands 26.957 - 27.283 MHz and 40.660 - 40.700 MHz, 100 mW is currently allowed. In bands 433.050 - 434.790 MHz and 2400 - 2483.5 MHz, 25mW is currently allowed. In band 24.00 - 24.25 GHz, 500 mW is currently allowed. These higher power limits are under consideration at the moment. The bands 868 - 870 MHz and 5725 - 5875 MHz are under implementation. At the moment the use of these bands requires a licence.</p> <p>Only 26.995, 27.045, 27.095, 27.145, 27.195 MHz at 10 kHz, erp 1 mW. Only 433.72- 434.12 MHz use restricted to "In-vehicle systems including Radiokeys". Only 2445-2455 MHz. 5725-5875 MHz excluded. Only 24.150-24.350 GHz. 61.0-61.5, 122-123 &amp; 244-246 GHz under review.</p>
2	<p>Denmark</p> <p>Lithuania</p> <p>Portugal</p>	<p>Not implemented.</p> <p>Not implemented.</p> <p>Implementation under study.</p>
3	<p>Denmark</p> <p>Finland</p>	<p>Until 1 January 1998 an individual licence is required for HIPERLANs.</p> <p>Bands 'c' and 'd': frequencies available in the national frequency allocation table but not included yet in the licence exemption and type approval requirements regulations.</p>

Annex	Administration	Remarks/Restrictions
3	<p>France</p> <p>Germany</p> <p>Hungary</p> <p>Lithuania</p> <p>Portugal</p> <p>Romania</p> <p>Sweden</p> <p>UK</p>	<p>The band for RLAN is limited to 2446.5-2483.5 MHz with some geographical constraints and the e.i.r.p. is limited to -20 dBW/MHz.</p> <p>5250-5300 MHz and 17.1-17.3 GHz excluded.</p> <p>5150-5250 MHz and 17.1-17.3 GHz only. System provider for third party traffic may require a Telecommunications Act licence.</p> <p>5250-5300 MHz excluded.</p> <p>Bands 'a', 'b', 'c': licences required.</p> <p>5150-5250 MHz, 5250-5300 MHz, and 17.1-17.3 GHz: implementation not before 1 July 1998. In the meantime a licence will be required.</p> <p>Only 2400-2483.5 MHz (on a secondary basis). T/R 22-06 not implemented.</p> <p>In bands 5150 - 5250 MHz, 5250 - 5300 MHz, 17.1 - 17.3 GHz HIPERLANs are currently allowed with a licence. As soon as the relevant standards are implemented the use will be licence exempted.</p> <p>System provider for third party traffic may require a Wireless Telegraphy and/or Telecommunications Act Licence.</p>
4	<p>Denmark</p> <p>France</p> <p>Lithuania</p> <p>Portugal</p> <p>Romania</p> <p>Sweden</p>	<p>AVI will be implemented before 1 January 1998.</p> <p>Not implemented.</p> <p>Licences required.</p> <p>2446-2454 MHz: implementation under study.</p> <p>Not implemented.</p> <p>A licence is required.</p>

Annex	Administration	Remarks/Restrictions
5	Denmark  Finland  France  Germany  Lithuania  Portugal  Romania  Sweden  UK	An individual licence is required until an ETSI standard is available.  Frequencies available in the national frequency allocation table but not included yet in the licence exemption and type approval requirements regulations.  5805-5815 MHz excluded. In the band 5795-5805 MHz, the power limit is 2 W e.i.r.p.  System provider may require a Telecommunications Act licence to operate at 5795-5805 MHz and/or 5805-5815 MHz. A general licence will be granted for the end users (vehicle units).  Licences required.  For the time being a licence is required. Licence exemption is under consideration.  Not implemented.  Licence exemption is under consideration.  System provider may require a Wireless Telegraphy and/or Telecommunications Acts licence to operate at 5795-5805 and/or 5805-5815 MHz. The end user (vehicle units) will be licence exempted.
6	Austria  Denmark  Finland  France  Germany  Hungary  Lithuania	10.5-10.6 GHz excluded.  9200-9500 MHz, 9540-9975 MHz, 10.5-10.6 GHz and 13.4-14.0 GHz are presently under study.  Band 'b': not available Band 'd': not available. Available band: 10.45 GHz to 10.50 GHz. Band 'e': not available  2400-2483.5 MHz limited to 2446-2454 MHz with a e.i.r.p. max of 500 mW. 9.5-9.975 MHz is limited to 9.88-9.92 GHz with a e.i.r.p. max of 50 mW. 10.57-10.61 GHz applicable with a e.i.r.p. max of 20 mW. Individual licence is not required. 24.05-24.25 GHz is limited to 24.175-24.275 GHz. The power is to be defined.  9500-9975 MHz and 10.5-10.6 GHz excluded  10.5-10.6 GHz: maximum e.i.r.p. 25mW  Band 'd' is not allowed.



Annex	Administration	Remarks/Restrictions
6	Portugal  Romania  Sweden  UK	2400-2483.5 MHz: only 10mW. 9200-9500 MHz, 10.5-10.6 GHz and 24.05-24.25 GHz: under study.  13.4-13.75 GHz and 24.05-24.25 GHz excluded.  2400 - 2483.5 MHz, 9200 - 9500 MHz and 9500 - 9975 MHz excluded. Only 10.51 - 10.58 MHz (No licence required). Also 10.25 - 10.28 and 10.35 - 10.38 MHz licence exempted. In band 13.4 - 14.0 GHz licence is required. In band 24.00 - 24.25 GHz, 500 mW is allowed.  Only 2445-2455 MHz, 10.577-10.597 GHz, 10.675-10.699 GHz, 13.4-14.0 GHz and 24.15-24.35 GHz.
7	Denmark  France  Hungary  Lithuania  Portugal  Romania  Sweden	"Alarms in general" are presently under study.  Implementation of Annex 7 is under study.  868.6-868.7 MHz and 869.2-869.25 MHz only.  Under study.  Implementation not before 1 July 1998. In the meantime a licence will be required.  Only 869.2-869.25 MHz.  These bands are under implementation. Alarm systems are currently allowed on 26.55 MHz (100 mW), 169.3875 MHz (25 mW) and 429.450 MHz (500 mW).

Annex	Administration	Remarks/Restrictions
8	Austria	In frequency band 'b' 35.010-35.190 MHz only.
	Denmark	Only 35.010-35.200 MHz of the 35 MHz band is allowed. An extension of the band is under study.
	France	Not implemented.
	Germany	35.01-35.20 MHz and 35.82-35.91 MHz only; individual licence required.
	Lithuania	Band 'b': licences required.
	Portugal	In band 'b': only 35.005-35.205 MHz allowed. Band 'c': except 40.675 MHz and 40.685 MHz.
	Romania	In the band 34.995-35.225 MHz: only 35.090 MHz, 35.111 MHz, 35.140 MHz, 35.190 MHz. Individual licence is required for equipment with erp of more than 100 mW.
	Sweden	Other applications, in accordance with Annex 1, are allowed in the 27 MHz and 40 MHz bands. Also 26.825, 26.865 and 26.885 MHz. Only 35.030 - 35.200 MHz. Also 40.705, 40.715, 40.725, 40.735 and 40.745 MHz.





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## Annex 1

## Title: Non-specific Short Range Devices

This annex is primarily for Telemetry, Telecommand, Alarms, Data in general and other similar applications. Video applications only above 2.4 GHz.

When selecting parameters for new SRDs, which may have inherent safety of human life implications, manufacturers and users should pay particular attention to the potential for interference from other systems operating in the same, or adjacent, bands.

Applicable ETSI Standard:

Product Standards: EN 300 220  
EN 300 330  
EN 300 440

Superseded Recommendations: CEPT Recommendation T/R 01-04  
CEPT Recommendation T/R 20-03

Note: Equipment marketed before the adoption of this ERC Recommendation marked with the abbreviation CEPT LPD Y according to the abrogated CEPT Recommendation T/R 01-04 should be allowed continuation of free circulation and use.

Technical and regulatory parameters:

For interpretation of codes, see Appendix 1

	Frequency Band	Power (Table 2)	Antenna (Table 3)	Channel spacing (Table 4)	Licensing requirement (Table 5)	Approvals (Table 6)	Duty cycle (Table 7)
a	6765 - 6795 kHz <sup>1</sup>	2	1 or 2	13	2	1 or 2	[-]
b	13.553 - 13.567 MHz <sup>1</sup>	2	1 or 2	13	2	1 or 2	[-]
c	26.957 - 27.283 MHz <sup>1</sup>	2 or 8 <sup>2</sup>	1 or 2	13	2	1 or 2	[-]
d	40.660 - 40.700 MHz <sup>1</sup>	8 <sup>2</sup>	1 or 2	13	2	1 or 2	[-]
e	433.050 - 434.790 MHz <sup>1</sup>	8 <sup>2</sup>	1 or 2	13	2	1 or 2	[-]
f	868.000 - 868.600 MHz <sup>3</sup>	9 <sup>2</sup>	1 or 2	6 <sup>4,5</sup>	2	1 or 2	2
g	868.700 - 869.200 MHz	9 <sup>2</sup>	1 or 2	6 <sup>4,5</sup>	2	1 or 2	1
[h]	869.300 - 869.400 MHz <sup>6</sup>	t.b.d.	1 or 2	6	2	1 or 2	t.b.d.]

The table continues on the next page.

<sup>1</sup> The band is also designated for industrial, scientific and medical (ISM) application

<sup>2</sup> e.r.p.

<sup>3</sup> To avoid mutual interference between CT2 and SRDs it is recommended that SRDs below 868.5 MHz should avoid using a dedicated frequency channel and instead use a technology that allows automatic channel selection of a free channel within the band.

<sup>4</sup> The frequency band may also be used for wideband data (frequency varying transmitters).

<sup>5</sup> The frequency band may also be used for spread spectrum technology with a maximum bandwidth of around 100 kHz

<sup>6</sup> [SRD applications in the band 869.3-869.4 MHz should use an access protocol in accordance with EN XXX XXX]

Technical and regulatory parameters:

For interpretation of codes, see Appendix 1

	Frequency Band	Power (Table 2)	Antenna (Table 3)	Channel spacing (Table 4)	Licensing requirement (Table 5)	Approvals (Table 6)	Duty cycle (Table 7)
i	869.400 - 869.650 MHz	12 <sup>2</sup>	1 or 2	6 <sup>7</sup>	2	1 or 2	3
k	869.700 - 870.000 MHz	7a <sup>2</sup>	1 or 2	6 or 7 <sup>4</sup>	2	1 or 2	4
l	2400 - 2483.5 MHz <sup>1</sup>	8 <sup>8</sup>	1 or 2	13	2	1 or 2	[-]
m	5725 - 5875 MHz <sup>1</sup>	9 <sup>7</sup>	1 or 2	13	2	1 or 2	[-]
n	24.00 - 24.25 GHz <sup>1</sup>	11 <sup>7</sup>	1 or 2	13	2	1 or 2	[-]
o	61.0 - 61.5 GHz <sup>1,9</sup>	11 <sup>7</sup>	1 or 2	13	2	3	[-]
p	122 - 123 GHz <sup>1,8</sup>	11 <sup>7</sup>	1 or 2	13	2	3	[-]
q	244 - 246 GHz <sup>1,8</sup>	11 <sup>7</sup>	1 or 2	13	2	3	[-]

<sup>7</sup> The whole frequency band may also be used as 1 channel for high speed data transmission.

<sup>8</sup> e.i.r.p.

<sup>9</sup> No ETSI standard currently available



**Annex 2****Title: Devices for Detecting Avalanche Victims**

Applicable ETSI Standard:

Product Standards: ETS 300 718

Superseded Recommendations: CEPT Rec T/R 24-02

Technical and regulatory parameters:

For interpretation of codes, see Appendix 1

	Frequencies	Power (Table 2)	Antenna (Table 3)	Channel spacing (Table 4)	Licensing requirement (Table 5)	Approvals (Table 6)	Duty cycle (Table 7)
a	2275 Hz	2	1	12 <sup>1</sup>	2	1 or 2	4
b	457 kHz	1	1	12 <sup>1</sup>	2	1 or 2	4

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<sup>1</sup> Continuous wave (CW) – no modulation

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**Annex 3****Title: Local Area Networks, RLANs and HIPERLANs****Radio Local Area Networks (RLANs)** (formerly known as wideband data transmission systems)

Applicable ETSI Standard:

Product Standards: ETS 300 328

Superseded Recommendations: CEPT Recommendation T/R 10-01

Note: Equipment marketed before the adoption of this ERC Recommendation marked with the abbreviation CEPT RLAN Y according to the abrogated CEPT Recommendation T/R 10-01 should be allowed continuation of free circulation and use.

Technical and regulatory parameters: For interpretation of codes, see Appendix 1

	Frequency Band	Power (Table 2)	Antenna (Table 3)	Channel spacing (Table 4)	Licensing requirement (Table 5)	Approvals (Table 6)	Duty cycle (Table 7)
a	2400 - 2483.5 MHz	11 <sup>1,2</sup>	1 or 2	13 <sup>3</sup>	2	1 or 2	-

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<sup>1</sup> e.i.r.p.

<sup>2</sup> For direct sequence spread spectrum, the maximum spectrum power density is limited to -20 dBW/1 MHz.

For frequency hopping spread spectrum, the maximum spectrum power density is limited to -10 dBW/100 kHz.

<sup>3</sup> Minimum data rate: 250 kbit/s.

**High Performance Radio Local Area Networks (HIPERLANs)**

Applicable ETS:

Product Standards: ETS 300 836

Spectrum relevant ERC Decision: ERC/DEC/(96)03

Superseded Recommendations: CEPT Recommendation T/R 22-06

Technical and regulatory parameters: For interpretation of codes, see Appendix 1

	Frequency Band	Power (Table 2)	Antenna (Table 3)	Channel spacing (Table 4)	Licensing requirement (Table 5)	Approvals (Table 6)	Duty cycle (Table 7)
b	5150-5250 MHz	13 <sup>1</sup>	2	13	2	1 or 2	-
c	5250-5300 MHz <sup>4</sup>	13 <sup>1</sup>	2	13	2	3	-
d	17.1-17.3 GHz <sup>5</sup>	11 <sup>1</sup>	2	13	2	3	-

<sup>4</sup> Only available in some countries.

<sup>5</sup> No ETSI standard currently available.

**Annex 4****Title: Automatic Vehicle Identification for Railways (AVI)**

Applicable ETSI Standard:

Product Standards: EN 300 761

Superseded Recommendations: None

Technical and regulatory parameters:

For interpretation of codes, see Appendix 1

	Frequency Band	Power (Table 2)	Antenna (Table 3)	Channel spacing (Table 4)	Licensing requirement (Table 5)	Approvals (Table 6)	Duty cycle (Table 7)
a	2446-2454 MHz	12 <sup>1</sup>	1 or 2	12 <sup>2</sup>	2	1 or 2	-

<sup>1</sup> e.i.r.p., transmitting only in presence of train.

<sup>2</sup> 5 channels, each 1.5 MHz wide, within the band 2446-2454 MHz, i.e: 2447.0, 2448.5, 2450.0, 2451.5, 2453.0 MHz.

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**Annex 5****Title: Road Transport & Traffic Telematics (RTTT)**

Applicable ETSI Standard:

Product Standards: EN 300 674  
EN 301 091

Spectrum relevant ERC Decision: ERC/DEC/(92)02

Superseded Recommendations: CEPT Recommendation T/R 22-04

Technical and regulatory parameters:

For interpretation of codes, see Appendix 1

	Frequency Band	Power (Table 2)	Antenna (Table 3)	Channel spacing (Table 4)	Licensing requirement (Table 5)	Approvals (Table 6)	Duty cycle (Table 7)
a	5795-5805 MHz <sup>1</sup>	14 or 15 <sup>2</sup>	1 or 2	12 <sup>3</sup>	2	1 or 2	-
b	5805-5815 MHz <sup>4</sup>	14 or 15 <sup>2</sup>	1 or 2	12 <sup>3</sup>	1	3	-
c	63-64 GHz <sup>5</sup>	16 <sup>2</sup>	2	13	2	1 or 2	-
d	76-77 GHz <sup>6</sup>	16 <sup>2</sup>	2	13	2	1 or 2	-

<sup>1</sup> 5795-5805 MHz road to vehicle systems, particularly (but not exclusively) road toll systems.

<sup>2</sup> e.i.r.p.

<sup>3</sup> For 5 MHz channel spacing systems, frequencies are: 5800 MHz – 2.5 MHz; 5800 MHz + 2.5 MHz; 5810 MHz – 2.5 MHz; 5810 MHz + 2.5 MHz. For 10 MHz channel spacing systems, frequencies are 5800 MHz and 5810 MHz.

<sup>4</sup> 5805-5815 MHz on a national basis for multi-lane road junctions

<sup>5</sup> Vehicle to vehicle systems

<sup>6</sup> Vehicle radar systems

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**Annex 6****Title: Equipment for Detecting Movement and Equipment for Alert**

Applicable ETSI Standard:

Product Standards: EN 300 440

Superseded Recommendations: CEPT Recommendation T/R 60-01

Technical and regulatory parameters:

For interpretation of codes, see Appendix 1

	Frequency Band	Power (Table 2)	Antenna (Table 3)	Channel spacing (Table 4)	Licensing requirement (Table 5)	Approvals (Table 6)	Duty cycle (Table 7)
a	2400-2483.5 MHz	9 <sup>1</sup>	1 or 2	13	2 <sup>2</sup>	3	-
b	9200-9500 MHz	9 <sup>1</sup>	1 or 2	13	2 <sup>2</sup>	3	-
c	9500-9975 MHz	9 <sup>1</sup>	1 or 2	13	2 <sup>2</sup>	1 or 2	-
d	10.5-10.6 GHz	12 <sup>1</sup>	1 or 2	13	1	3	-
e	13.4-14.0 GHz	9 <sup>1</sup>	1 or 2	13	2 <sup>2</sup>	1 or 2	-
f	24.05-24.25 GHz	11 <sup>1</sup>	1 or 2	13	2 <sup>2</sup>	1 or 2	-

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<sup>1</sup> e.i.r.p.

<sup>2</sup> Some countries may allow equipment with transmitter powers between 25 mW and 500 mW in which case an individual licence or a general licence may be required.

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**Annex 7****Title: Alarms**

This annex covers frequency bands recommended exclusively for alarm systems including social alarms and alarms for security and safety.

When selecting parameters for new SRDs, which may have inherent safety of human life implications, manufacturers and users should pay particular attention to the potential for interference from other systems operating in the same or adjacent bands.

Applicable ETSI Standard:

Product Standards: EN 300 220

Spectrum relevant ERC Decision: ERC/DEC/(97)06

Superseded Recommendations:

Technical and regulatory parameters:

For interpretation of codes, see Appendix 1

**Alarms in general**

	Frequency Band	Power (Table 2)	Antenna (Table 3)	Channel spacing (Table 4)	Licensing requirement (Table 5)	Approvals (Table 6)	Duty cycle (Table 7)
a	868.600-868.700 MHz <sup>1</sup>	8 <sup>2</sup>	1 or 2	6	2	1 or 2	1
b	869.250-869.300 MHz	8 <sup>2</sup>	1 or 2	6	2	1 or 2	1
c	869.650-869.700 MHz	9 <sup>2</sup>	1 or 2	6	2	1 or 2	3

**Social Alarms**

	Frequency Band	Power (Table 2)	Antenna (Table 3)	Channel spacing (Table 4)	Licensing requirement (Table 5)	Approvals (Table 6)	Duty cycle (Table 7)
d	869.200-869.250 MHz	8 <sup>2</sup>	1 or 2	6	2	1 or 2	1

<sup>1</sup> The frequency band may be used for high speed data transmissions.

<sup>2</sup> e.r.p.

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**Annex 8****Title: Model Control**

This annex covers the application of model control equipment, which is solely for the purpose of controlling the movement of the model, in the air, on land or over or under the water surface. Although the bands are not harmonised, the parameters given in the table are common in a majority of CEPT countries. Additional frequencies or frequency bands may be available for use in particular countries. It should be noted that the bands are not exclusive for this type of application.

Applicable ETSI Standard:

Product Standards: EN 300 220

Superseded Recommendations: CEPT Recommendation T/R 20-03  
CEPT Recommendation T/R 20-04

Technical and regulatory parameters:

For interpretation of codes, see Appendix 1

	Frequency Bands or Channels	Power (Table 2)	Antenna (Table 3)	Channel spacing (Table 4)	Licensing requirement (Table 5)	Approvals (Table 6)	Duty cycle (Table 7)
a	26.995, 27.045, 27.095, 27.145, 27.195 MHz	11 <sup>1</sup>	2	3	2	1 or 2	-
b	34.995-35.225 MHz <sup>2</sup>	11 <sup>1</sup>	2	3	2	1 or 2	-
c	40.665, 40.675, 40.685, 40.695 MHz	11 <sup>1</sup>	2	3	2	1 or 2	-

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<sup>1</sup> e.r.p.

<sup>2</sup> Only allowed for flying models.