



CEPT Report **77**

In response to the EC Permanent Mandate on the

“Annual update of the technical annex of the Commission Decision on the technical harmonisation of radio spectrum for use by short range devices”

Report approved on 5 March 2021 by the ECC

0 EXECUTIVE SUMMARY

This Report describes the proposed Eighth Update of the technical annex to the EC Decision on the technical harmonisation of radio spectrum for use by Short Range Devices (SRD) and has been developed in the 2019-2020 timeframe by the European Conference of Postal and Telecommunications Administrations (CEPT) in response to the Permanent Mandate to CEPT regarding the annual update of the technical annex of the Commission Decision on the technical harmonisation of radio spectrum for use by short range devices.

As part of the eighth Update, the changes being proposed to the technical annex are presented in Annex 3 and 4 to this Report:

Task a.) Consider the bands recently added or currently under discussion for addition to ERC Recommendation 70-03 for potential inclusion in the next update of the SRD decision 2006/771/EC

It is proposed:

- to add new regulations to allow use of the bands below 130 MHz by enclosed Nuclear Magnetic Resonance (NMR) applications to reflect changes already made to ERC Recommendation 70-03, Annex 6 [1];
- to add to the list of applications include in the definitions for inductive devices in table to reflect changes already made to ERC Recommendation 70-03, Annex 9.

Task b.) Re-assess the technical parameters, in particular the relevance and appropriateness of 'other usage restrictions', for the relevant SRD categories

For the Decision (EU) 2018/1538 [12], it is proposed:

- to remove Articles 2(2), 2(3) and 2(4) since note (4) already provides the relevant definitions for SRD in data networks and in order to avoid a perceived ambiguity;
- to amend Article 2(5) by removing the wording "in the same band" which is an undue limitation;
- to replace "All devices within the data network shall be under the control of network access points" by "All nomadic and mobile devices within the data network shall be controlled by a master network access point" for entries 1, 2, 4 and 5 in the other usage restrictions;
- to add a minimum bandwidth of 600 kHz in entry 2 for wideband data transmission in 917.4-919.4 MHz, so that the balance is maintained with non-specific SRD;
- to remove some ambiguity in note (10) with regard to the RFID tag frequency range by replacing 'frequency band' by 'frequency range'.

For the SRD Decision (EU) 2019/1345 [14], it is proposed:

- to replace the text in "Transport and Traffic Telematics devices" entries 19 and 23 contained in the "Other usage restrictions" column with "This set of usage conditions is only available for Eurobalise transmissions in the presence of trains and using the 27 090-27 100 kHz band for telepowering as per Band 28" in order to identify that this entry is also valid for railway balises together with entries 19 and 23.

Some additional contributions for further work under task b) have been received, and it is recommended that these proposals can be reviewed as part of a future piece of consolidated work. Section 9 proposes more detailed recommendations for future work in this area.

Task c.) Investigate, where useful, more enhanced aspects of duty cycle mechanisms in cooperation with ETSI, as well as other enablers for further spectrum sharing (e.g., channelling and/or channel access and occupation rules)

Some contributions for further work under task c) have been received, and it is recommended that these proposals can be reviewed as part of a future piece of consolidated work. Section 9 proposes more detailed recommendations for future work in this area.

Task d.) Undertake a more detailed review to identify opportunities for cognitive-radio enabled SRD where rewarding principles could be introduced, having regard in particular to requests from stakeholders

Some contributions for further work under task d) have been received, and it is recommended that these proposals can be reviewed as part of a future piece of consolidated work. Section 9 proposes more detailed recommendations for future work in this area.

Task e.) Investigate the possibility and benefits and/or drawbacks of defining additional spectrum sharing rules explicitly within the SRD Decisions in a clear and technology neutral way

Some contributions for further work under task e) have been received, and it is recommended that these proposals can be reviewed as part of a future piece of consolidated work. Section 9 proposes more detailed recommendations for future work in this area.

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LIST OF ABBREVIATIONS

Abbreviation	Explanation
ALD	Assistive Listening Device
CBRS	Citizens Broadband Radio Service
CEPT	European Conference of Postal and Telecommunications Administrations
CR	Cognitive Radio
DC	Duty Cycle
DCS	Dynamic Channel Selection
DECT	Digital European Cordless Telecommunications
DFS	Dynamic Frequency Selection
EAS	Electronic Article surveillance
EC	European Commission
ECC	Electronic Communications Committee
e.i.r.p	Equivalent isotropically radiated power
e.r.p.	Effective Radiated Power
EN	European Standard
ERC	European Radiocommunications Committee
ETSI	European Telecommunications Standards Institute
EU	European Union
HD-GBSAR	High Definition Ground Based Synthetic Aperture Radar
ITS	Intelligent Transport Systems
MBANS	Medical Body Area Network System
MRI	Magnetic Resonance Imaging
NBN	Narrowband Networked
NMR	Nuclear Magnetic Resonance
RED	Directive 2014/53/EU - Radio Equipment Directive
RF	Radio Frequency
RFID	Radio Frequency Identification
RLAN	Radio Local Area Network
SRD	Short Range Devices
SScs	Security Scanners
TLPR	Tank Level Probing Radar
TPC	Transmit Power Control
TR	Technical Report
TTT	Transport and Traffic Telematics

ULP-WMCE	Ultra Low Power Wireless Medical Capsule Endoscopy
UWB	Ultra Wide Band
WG FM	Working Group Frequency Management
WPT	Wireless Power Transfer

1 INTRODUCTION

This Report has been developed in 2019/2020 by the European Conference of Postal and Telecommunications Administrations (CEPT) in response to the Permanent Mandate to CEPT regarding the annual update of the technical annex of the Commission Decision on the technical harmonisation of radio spectrum for use by short range devices.

Pursuant to Article 4 of the Radio Spectrum Decision, the Commission may issue mandates to the CEPT for the development of technical implementing measures with a view to ensuring harmonised conditions for the availability and efficient use of radio spectrum; such mandates shall set the task to be performed and the timetable thereof.

This Report for the eighth update of the technical annexes of the SRD Decision 2006/771/EC [5][5] and 1st update of the technical annex of Decision 2018/1538 [12] has been developed within SRD/MG and approved by WG FM and the ECC with contributions from administrations, ETSI and industry. It was submitted to the European Commission in accordance with the timescales of the Guidance to CEPT (see Annex 2 to this Report).

In the seventh update of SRD Decision 2006/771/EC a number of items for further work were identified for consideration in the work of the eighth update of SRD Decision 2006/771/EC. As part of the development of this Report a process for considering whether to recommend including these items as part of the eighth update of SRD Decision 2006/771/EC was carried out. Any items discarded are for the following reasons:

- Limited incentives or particular national circumstances means EU administrations unable to implement these changes in the SRD Decision 2019/1345/EC [14];
- No additional studies were needed or carried out;
- The changes proposed were already included in the seventh update of SRD Decision 2006/771/EC;
- Studies on the work items have not been initiated or are still under discussion within CEPT.

2 GENERAL PRINCIPLES

This Report takes into account a number of general principles. Most of these principles are set out in ECC Reports or previous CEPT Reports on updates of the technical annex of the EC SRD Decision. References to the relevant reports are made to avoid copying of material.

SRD strategy: the SRD strategy is described in CEPT Report 14 [3], and a detailed explanation is in CEPT Report 26, section 3.1 [7]. One important element from the strategy is not to create new application specific frequency designations, i.e. use existing SRD bands on the basis of equal access to spectrum (no exclusive access to spectrum) as much as possible. In addition to this, Appendix 1 of the ERC Recommendation 70-03 [1] provides an indication of the level of harmonisation of frequency bands for usage by SRD within CEPT countries. The terminology “soft harmonisation” refers to situations when considering the removal of as many as possible of the national barriers within existing SRD designations whilst ensuring the protection of the radio services. This means the inclusion in ERC Recommendation 70-03 first and then achieves the status of “harmonised” or “nearly harmonised”. The same applies for the introduction of “new” (application neutral) frequency ranges.

Application and technology neutrality: The debate on application and technology neutrality for SRD is set out in CEPT Report 44 [4] and ECC Report 181 [6]. The consensus is that application neutrality in ERC Recommendation 70-03 should be strived for as much as possible, but technology neutrality is in conflict with spectrum efficiency. This should, besides the need for protection of primary services, be the main argument to have technology specific requirements for different frequency ranges.

Predictable sharing environment: For intra-SRD sharing, this is the minimum set of technical regulatory parameters with which the Harmonised European Standard addresses the sharing question. ECC compatibility studies in combination with the required technical application performance provide the technical base for this regulation. Traditionally, the definition of an application category was used for this; nowadays CEPT works more towards a technical spectrum access definition. CEPT Report 44, section 5, provides a detailed explanation.

Requirements and technical parameters: CEPT will provide the Commission with only those requirements and technical parameters considered essential to meet the objectives of equitable and efficient sharing of spectrum by SRD as formulated in the Radio Equipment Directive [2].

Spectrum efficiency for SRD as a goal: Spectrum efficiency for SRD is inter-alia described in ECC Report 181. ECC Report 181 outlines how to achieve good group spectrum efficiency by describing the sharing environment with a minimum set of technical parameters. The EC SRD Decision and ERC Recommendation 70-03 [1] traditionally have their main focus on the physical and session layer of the OSI model, leaving the rest to be described in Harmonised European Standards. Developments in the area of cognitive radio may be beneficial to spectrum efficiency but also may require some guidance on solutions in the application layer, assisting the more technical physical and session layer based techniques. When doing so, one has to keep in mind the principle from CEPT Report 14 that intra-SRD sharing is addressed in Harmonised European Standards while the regulation has to ensure an equal access to the spectrum.

3 BANDS RECENTLY REVIEWED OR ADDED OR CURRENTLY UNDER DISCUSSION FOR ADDITION TO ERC RECOMMENDATION 70-03

3.1 NEW ENTRY IN ERC RECOMMENDATION 70-03, ANNEX 6

- To add new regulations to allow use of the bands below 130 MHz by enclosed Nuclear Magnetic Resonance (NMR) applications to reflect changes already made to ERC Recommendation 70-03, Annex 6:

ETSI TR 103 517 v1.1.1 (2018-12) [13] sets out the existing and future applications of NMR. It states; “NMR allows the observation of specific quantum mechanical magnetic properties of the atomic nucleus. Many scientific techniques exploit NMR phenomena to study molecular physics, crystals, and non-crystalline materials through nuclear magnetic resonance spectroscopy. NMR is also routinely used in advanced medical imaging techniques, such as in magnetic resonance imaging (MRI).”

“In future NMR technology can be used for a wide range of determination applications. This is based on technology improvement of static magnets, electronics and related cost, size and weight reduction.

Field of applications are:

- Food determination (quality, quantity/packaging and composition);
- Pharmacy determination (quality, quantity/packaging and composition);
- Building materials determination (humidity, hidden objects and composition);
- Vital monitoring;
- Fluid determination (fuel quality and composition, engine oil quality, hydraulic oil).

Above mentioned applications are to be met with use case specific NMR sensor devices. Possible sensors include benchtop devices for stationary use, mobile devices to be carried by the user to the point of interest and sensor devices to be embedded in existing products, i.e. cars, home appliances or industrial machinery.

The 94th meeting of WG FM in Tallinn approved the publication of a revision of ERC Recommendation 70-03, Annex 6 [1] that included the new NMR entries.

Frequency Band	Power/Magnetic Field	Notes
100 Hz-148 kHz	46 dB μ A/m at 10 m distance at 100 Hz outside the NMR device	For enclosed Nuclear Magnetic Resonance (NMR) applications. Magnetic field strength descending 10dB/decade above 100 Hz
148-5000 kHz	-15 dB μ A/m at 10 m distance outside the NMR device	For enclosed Nuclear Magnetic Resonance (NMR) applications
5000 kHz-30 MHz	-5 dB μ A/m at 10m distance outside the NMR device	For enclosed Nuclear Magnetic Resonance (NMR) applications
30-130 MHz	-36 dBm e.r.p. outside the NMR device	For enclosed Nuclear Magnetic Resonance (NMR) applications

Presently there are no published Harmonised standards for NMR.

The above table (taken from ERC Recommendation 70-03) applies to frequencies from 100 Hz, it should be noted that the proposed changes shown in the technical annex in the EC Decision on Short Range Devices will only apply to frequencies from 9 kHz.

3.2 NEW ENTRY IN ERC RECOMMENDATION 70-03, ANNEX 9

To add to the list of applications include in the definitions for inductive devices in table to reflect changes already made to ERC Recommendation 70-03, Annex 9.

Presently, the Decision (EU) 2019/1345 [14] describes the scope of Inductive devices as:

“Covers radio devices that use magnetic fields with inductive loop systems for near field communications. This typically includes devices for car immobilisation, animal identification, alarm systems, cable detection, waste management, personal identification, wireless voice links, access control, proximity sensors, anti-theft systems as well as RF anti-theft induction systems, data transfer to hand-held devices, automatic article identification, wireless control systems and automatic road tolling”.

The first proposal is to amend the definition shown above as shown below:

“Covers radio devices that use magnetic fields with inductive loop systems for near field communications and determination applications. This typically includes devices for car immobilisation, animal identification, alarm systems, cable detection, waste management, personal identification, wireless voice links, access control, proximity and metal sensors, anti-theft systems as well as RF anti-theft induction systems, data transfer to hand-held devices, automatic article identification, wireless control systems and automatic road tolling”.

4 RE-ASSESS THE TECHNICAL PARAMETERS, IN PARTICULAR THE RELEVANCE AND APPROPRIATENESS OF 'OTHER USAGE RESTRICTIONS', FOR THE RELEVANT SRD CATEGORIES

4.1 PROPOSAL FOR DECISION (EU) 2018/1538

The purpose of these proposals is to align Decision (EU) 2018/1538 [12] with the latest amendments to Decision 2006/771/EC, and to take into account the latest evolution of ERC Recommendation 70-03 [1].

4.1.1 Definitions

In Decision 2006/771/EC as amended by Decision (EU) 2019/1345 [14], Article 2 only provides generic definitions of 'short-range device', 'non-interference and non-protected basis' and 'category of short-range devices'. The definition of SRD in data networks is provided as note [g] below Table 2 on the harmonised technical conditions.

In Decision (EU) 2018/1538, Article 2 provides both the generic definitions and three definitions related to SRD in data networks in addition to the one provided as note (4) below the table on the harmonised technical conditions:

- Compared to Article 2(2) in Decision 2006/771/EC [5], Article 2(5) in Decision (EU) 2018/1538 adds a restriction with "in the same band". It is proposed to delete this mention;
- Notes [g] in Decision 2006/771/EC and (4) in Decision (EU) 2018/1538 are the same. But Articles 2(2), 2(3) and 2(4) in Decision (EU) 2018/1538 are not fully aligned and bring some ambiguity. It is proposed to remove these Articles since note (4) provides the relevant definition.

4.1.2 Other usage restrictions for SRD in data networks

This section deals with entries 1, 2, 4 and 5 in Decision (EU) 2018/1538.

These entries are equivalent to entries c2 to c4 in ERC Recommendation 70-03, Annex 2 and to entry a2 in ERC Recommendation 70-03, Annex 3. It is proposed to align the EC Decision with ERC Recommendation 70-03 by replacing "All devices within the data network shall be under the control of network access points" by "All nomadic and mobile devices within the data network shall be controlled by a master network access point" (while keeping the notes). Fixed devices are from now on excluded from this requirement.

4.1.3 Wideband data transmission in 917.4-919.4 MHz

This section deals with entry 2 in Decision (EU) 2018/1538.

ECC Report 246 [9] and ECC Report 261 [8] only considered 1 MHz channel bandwidth for wideband data transmission systems and no study was performed with smaller or higher bandwidth.

The entry 2 considered here competes with entry 5 intended for non-specific SRD with a typical bandwidth of 200 or 600 kHz. In order to maintain the balance between non-specific SRD and wideband data transmission, it is proposed to add a minimum bandwidth of 600 kHz to entry 2.

Entry 2 is still rather new and was only introduced late in 2018. There is also an entry for non-specific SRD with 25 mW and bandwidth of ≤ 600 kHz in the same frequency range. The introduction of the minimum bandwidth of 600 kHz is not sought to need any grandfathering clause.

This change has already been done for entry 84 in Decision 2006/771/EC as amended by Decision (EU) 2019/1345, as well as in ERC Recommendation 70-03, Annex 3.

4.1.4 RFID in 916.1-918.9 MHz

This section deals with entry 3 in Decision (EU) 2018/1538 [12].

Entry 3 of Decision 2018/1538/EU, note (10), provides additional information on RFID tags. In order to avoid misinterpretation, it is proposed to replace the wording 'frequency band' by 'frequency range' to identify the operating frequencies for the tags. This is in-line with the latest amendments to entry 47a in Decision 2006/771/EC [5].

4.2 Proposal for SRD Decision (EU) 2019/1345

CEPT Report 76 [15] states there is no need to maintain Commission Decision 1999/569/EC for balise telepowering in 27 090-27 100 kHz since the technical conditions in entry 28 of Commission Decision 2019/1345/EC as amended allow balise telepowering (see CEPT Report 44 [4]).

Entry 28 covers 26 957-27 283 kHz for non-specific SRD. In order to well identify that this entry is also valid for railway balises together with entries 19 and 23, it is proposed to replace the text in "Transport and Traffic Telematics devices" entries 19 and 23 contained in the "Other usage restrictions" column with "This set of usage conditions is only available for Eurobalise transmissions in the presence of trains and using the 27 090-27 100 kHz band for telepowering as per Band 28" in order to identify that this entry is also valid for railway balises together with entries 19 and 23.

5 INVESTIGATE MORE ENHANCED ASPECTS OF DUTY CYCLE MECHANISMS

Some contributions for further work under task c) have been received, and it is recommended that these proposals can be reviewed as part of a future piece of consolidated work. Section 9 proposes more detailed recommendations for future work in this area.

6 UNDERTAKE A MORE DETAILED REVIEW TO IDENTIFY OPPORTUNITIES FOR COGNITIVE-RADIO ENABLED SHORT RANGE DEVICES

Some contributions for further work under task d) have been received, and it is recommended that these proposals can be reviewed as part of a future piece of consolidated work. Section 9 proposes more detailed recommendations for future work in this area.

7 INVESTIGATE THE POSSIBILITY OF DEFINING ADDITIONAL SPECTRUM SHARING RULES

Some contributions for further work under task e) have been received, and it is recommended that these proposals can be reviewed as part of a future piece of consolidated work. Section 9 proposes more detailed recommendations for future work in this area.

8 OVERVIEW OF CEPT PROPOSAL

As part of the eighth Update, the following changes are proposed to the technical annex of the EC Decision for SRD:

Task a.) Consider the bands recently added or currently under discussion for addition to ERC Recommendation 70-03 for potential inclusion in the next update of the SRD decision 2006/771/EC

It is proposed:

- to add new regulations to allow use of the bands below 130 MHz by enclosed Nuclear Magnetic Resonance (NMR) applications to reflect changes already made to ERC Recommendation 70-03, Annex 6 [1];
- to add to the list of applications include in the definitions for inductive devices in table to reflect changes already made to ERC Recommendation 70-03, Annex 9.

Task b.) Re-assess the technical parameters, in particular the relevance and appropriateness of 'other usage restrictions', for the relevant SRD categories

For the Decision (EU) 2018/1538 [12] **Error! Reference source not found.**, it is proposed:

- to remove Articles 2(2), 2(3) and 2(4) since note (4) already provides the relevant definitions for SRD in data networks and in order to avoid a perceived ambiguity;
- to amend Article 2(5) by removing the wording "in the same band" which is an undue limitation;
- to replace "All devices within the data network shall be under the control of network access points" by "All nomadic and mobile devices within the data network shall be controlled by a master network access point" for entries 1, 2, 4 and 5 in the other usage restrictions;
- to add a minimum bandwidth of 600 kHz in entry 2 for wideband data transmission in 917.4-919.4 MHz, so that the balance is maintained with non-specific SRD;
- to remove some ambiguity in note (10) with regard to the RFID tag frequency range by replacing 'frequency band' by 'frequency range'.

For the SRD Decision (EU) 2019/1345 [14], it is proposed:

- to replace the text in "Transport and Traffic Telematics devices" entries 19 and 23 contained in the "Other usage restrictions" column with "This set of usage conditions is only available for Eurobalise transmissions in the presence of trains and using the 27 090-27 100 kHz band for telepowering as per Band 28" in order to identify that this entry is also valid for railway balises together with entries 19 and 23.

Some additional contributions for further work under task b) have been received, and it is recommended that these proposals can be reviewed as part of a future piece of consolidated work. Section 9 proposes more detailed recommendations for future work in this area.

Task c.) Investigate, where useful, more enhanced aspects of duty cycle mechanisms in cooperation with ETSI, as well as other enablers for further spectrum sharing (e.g., channelling and/or channel access and occupation rules)

Some contributions for further work under task c) have been received, and it is recommended that these proposals can be reviewed as part of a future piece of consolidated work. Section 9 proposes more detailed recommendations for future work in this area.

Task d.) Undertake a more detailed review to identify opportunities for cognitive-radio enabled SRD where rewarding principles could be introduced, having regard in particular to requests from stakeholders

Some contributions for further work under task d) have been received, and it is recommended that these proposals can be reviewed as part of a future piece of consolidated work. Section 9 proposes more detailed recommendations for future work in this area.

Task e.) Investigate the possibility and benefits and/or drawbacks of defining additional spectrum sharing rules explicitly within the SRD Decisions in a clear and technology neutral way

Some contributions for further work under task e) have been received, and it is recommended that these proposals can be reviewed as part of a future piece of consolidated work. Section 9 proposes more detailed recommendations for future work in this area.

9 WORK ITEMS FOR FURTHER INVESTIGATIONS (NINTH UPDATE)

The following items for possible work items that may be included as part of the Ninth Update:

Recommendation to consider in relation to follow on work from task b) discussions

To review terminology and definitions contained in both in ERC Recommendation 70-03 [1] and the EC Decision on SRD with the aim to provide more clarity with respect to the technical terms used in the regulations, the initial work could look at possible changes that could implemented in ERC Recommendation 70-03 then a separate exercise could form part of the work on the ninth update.

Recommendation to consider in relation to follow on work from tasks c), d) and e) discussions

As we have mentioned above, we have recommended to re-consider task c), d) and e) as a part of a comprehensive review which will also investigate the development of spectrum sharing methods and rules for SRD. See below for the outline of the basic premise for this work:

- Towards task c) to concentrate in exploring the possible development of basic spectrum sharing methods and other sharing and mitigation techniques should be able to comply with for some of the requirements in ERC Recommendation 70-03 and EC Decision on SRD;
- Option for task d) on identifying opportunities for cognitive-radio enabled SRD as future developments can be covered within a revised task c);
- Option for task e) as defining additional spectrum sharing rules and possible developments can be covered within a revised task c) rather than under a specific task in a generic way.

The following paragraphs are provided as background for these recommendations. Cognitive radio (CR) although a separate entity in terms of technology has resulted in a few specific sharing solutions that have been developed and used in practice in some wireless technologies. The most common cognitive solutions can be seen as specific sharing solutions used as mitigation techniques such as Dynamic Frequency or Channel Selection (DFS/DCS) in 5 GHz RLAN, UWB and DECT bands. Other less common solutions have also been developed such as automatic look up tables that provide real time data managed by online databases, such as those used in TV White Space bands (470-690 MHz) and CBRS bands (US 3.5 GHz band). Such mechanisms were developed and studied by regulators to solve specific sharing problems and were initiated as a result of monitoring and following CR technology evolution. This process of continuing to use the evolution in cognitive technologies can continue to take place under task c) rather than be covered by a specific task in future mandates.

The intent behind the proposal above for further work under task c) is to try to provide a method to apply more flexibility to open up, if possible, some of the frequency bands used by SRD to a larger number of applications and technologies.

Specific work items already being addressed in CEPT/ETSI that may be looked at in a future update and may potentially trigger studies within CEPT

- High Definition Ground Based Synthetic Aperture Radar (HD-GBSAR) in 74-81 GHz;
- 433/434 MHz bands regulation review;
- Wireless Power Transmission (WPT) systems;
- additional studies related to SRD in data networks (including NBN) operating in the band 915-921 MHz;
- Security Scanners (SSCs) within the frequency range from 60 GHz to 82 GHz;
- 2400-2483.5 MHz review based on SRdoc being developed by ETSI.

ANNEX 1: GUIDANCE TO CEPT ON THE EIGHTH UPDATE OF THE SRD DECISION (AS PER RSCOM19-6REV2)

1. PERMANENT MANDATE ON UPDATING THE TECHNICAL ANNEX TO THE SRD DECISION

This document provides the Commission services' guidance to CEPT for the eighth update of the technical annex to the Short Range Devices (SRD) Decision 2006/771/EC as well as – where relevant – for the update of the technical annex of Decision 2018/1538/EU. Both Decisions are jointly referred to as the SRD Decisions. Such guidance is foreseen in the permanent Mandate to CEPT regarding the annual update of the technical annex of the Commission Decision 2006/771/EC on harmonisation of radio spectrum for use by short range devices¹ and Decision 2018/1538/EU is the result of such an update. As guiding principles, the proposed evolution of the European regulatory framework for short-range devices should take into due consideration backward compatibility with current SRD systems in harmonised bands and relevant incumbent non-SRD usages, as well as efficient use of spectrum and spectrum sharing.

2. RECOMMENDED FOCUS FOR THE NEXT UPDATE

New entries are regularly added to ERC Recommendation 70-03 based on spectrum demand expressed in ETSI SRDocs and assessed in compatibility studies. The non-mandatory, flexible harmonisation on the CEPT level within ERC Recommendation 70-03 is a beneficial source for potential future EU harmonisation. Adding its entries, where possible and useful, to the SRD Decisions, leads to legally binding implementation across the EU and allows producers and users of SRDs to profit from the benefits of the Digital Single Market.

The Commission invites CEPT to:

- a. consider the bands recently added or currently under discussion for addition to ERC Recommendation 70-03 for potential inclusion in the next update of the SRD decision 2006/771/EC;*

Some technical parameters, e.g., 'usage restrictions', currently in the annex of the SRD Decisions 2006/771/EC and – where relevant - 2018/1538/EU, may require re-assessment on a case by case basis. Enhancing technical parameters, for instance removing or relaxing 'usage restrictions', where compatibility with radio services allows, may create new opportunities for the quick deployment of SRD solutions in certain categories and hence increase market penetration and socio-economic benefits of SRDs.

The Commission invites CEPT to:

- b. re-assess the technical parameters, in particular the relevance and appropriateness of 'other usage restrictions', for the relevant SRD categories;*

¹ RSCOM06-27 Rev (5 July 2006)

During the sixth update, the duty cycle definitions in ERC/REC 70-03 - Appendix 5 and the Annex to Decision 2006/771/EC have been aligned. The new definition allows for observation times different from the current standard of one hour for a given SRD entry and hence opens the possibility to improve spectrum sharing. The development of additional parameters (such as channelling and/or channel access and occupation rules) could enable a future withdrawal of some existing 'other usage restrictions' (see also point b).

The Commission invites CEPT to:

- c. *investigate, where useful, more enhanced aspects of duty cycle mechanisms in cooperation with ETSI, as well as other enablers for further spectrum sharing (e.g., channelling and/or channel access and occupation rules).*

Radio resources can be shared in frequency, time and space. Cognitive techniques² allow for an increased level of efficient use of spectrum by sharing along all of these three dimensions and hence cognitive-radio enabled SRDs could open new frequency bands for SRDs in the future. CEPT Report 59 contains an initial analysis of cognitive techniques for SRDs and comes to the conclusion that such an approach to spectrum usage could be further encouraged by rewarding principles (e.g., increased duty cycle allowances when certain cognitive techniques are applied).

The Commission invites CEPT to:

- d. *undertake a more detailed review to identify opportunities for cognitive-radio enabled SRDs where rewarding principles could be introduced, having regard in particular to requests from stakeholders.*

Given spectrum resources are scarce, they need to be used as efficiently as possible and spectrum sharing is important in securing this goal. Spectrum usage rules – i.e. radio interface specifications including spectrum sharing (medium access) rules – fall under the competence of the spectrum managers. In the interest of promoting regulatory certainty, the technical conditions for spectrum sharing, resulting from CEPT studies, should provide a clear framework for the development of harmonized standards in order to implement the essential requirements of the equipment regulation, notably Article 3.2 of the Radio Equipment Directive.

The Commission invites CEPT to:

- e. *investigate the possibility and benefits and/or drawbacks of defining additional spectrum sharing rules explicitly within the SRD Decisions in a clear and technology neutral way;*

3. ROADMAP FOR THE EIGHTH UPDATE CYCLE

1. ECC (September 2019): launch of the eighth update cycle. CEPT starts work on the update proposal pursuant to the permanent Mandate and this guidance document.

² The terms "cognitive techniques" and "cognitive radio" are often understood as limited to sensing of other use only. In this context they are used with a broad meaning and also include other approaches such as geo-location databases, without prejudgment of any specific solution.

2. ECC (November 2020): Approval for public consultation of the draft CEPT Report.
3. RSC (December 2020): CEPT to submit its draft report (subject to public consultation) pursuant to the permanent Mandate. Commission services examine the CEPT proposal for amendment of the technical annex to the SRD Decision 2006/771/EC and – if relevant – a draft Commission Decision updating the technical annex to Decision 2018/1538/EU.
4. RSC (July 2021): CEPT submits final CEPT report and the Commission services present a draft Commission Decision updating the technical annex to the SRD Decision 2006/771/EC and – if relevant – a draft Commission Decision updating the technical annex to Decision 2018/1538/EU.

ANNEX 2: CEPT MANDATE



EUROPEAN COMMISSION

Information Society and Media Directorate-General

Electronic Communications Policy

Radio Spectrum Policy

Brussels, 5 July 2006

DG INFSO/B4



FINAL

**PERMANENT MANDATE TO CEPT REGARDING THE ANNUAL
UPDATE OF THE TECHNICAL ANNEX OF THE COMMISSION
DECISION ON THE TECHNICAL HARMONISATION OF RADIO
SPECTRUM FOR USE BY SHORT RANGE DEVICES**

This mandate is issued to the CEPT without prejudice to the one-month right of scrutiny by the European Parliament, pursuant to Council Decision 1999/468/EC of 28 June 1999 (OJ L 184, 17.7.1999, p. 23) on Comitology procedure.

This one-month period is extended until 28 September 2006.



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Title

Permanent Mandate to CEPT regarding the annual update of the technical annex of the Commission Decision on the technical harmonisation of radio spectrum for use by short range devices.¹

Purpose

Pursuant to Article 4 of the Radio Spectrum Decision, the Commission may issue mandates to the CEPT for the development of technical implementing measures with a view to ensuring harmonised conditions for the availability and efficient use of radio spectrum; such mandates shall set the task to be performed and the timetable therefor.

Pursuant to this permanent Mandate, CEPT shall provide the Commission with a yearly report on needs for revising the technical annex of the Commission Decision on the technical harmonisation of radio spectrum for use by short range devices (SRDs).

The yearly proposal will serve as a basis for an amendment, when needed, of the technical annex of the Commission Decision on SRDs.

Justification

The Commission Decision for SRDs foresees a regular update of the list of frequencies, as well as their associated conditions of use. This update should be performed on a regular basis in order to take due account of the rapid technological and market developments prevailing in this area. This permanent Mandate to CEPT is to formalise the preparation of the yearly proposal by CEPT for updating the technical annex of Commission Decision on SRDs.

Objectives

In addition to the core objectives of the Decision itself, the aim of this permanent

¹Commission Decision 2006/ 771/EC on the technical harmonisation of radio spectrum for use by short range radio devices.

mandate is to provide relevant technical information necessary to:

1. Modify, whenever appropriate, the technical conditions of use of the frequency bands included in the technical annex;
2. Identify new frequency bands and/or new applications (types of SRDs) which should be added to the list included in the technical annex of the Decision in order to further the “Class I” equipment category and providing such equipment with legal certainty on EU level, thereby consolidating the Single Market through spectrum harmonisation;
3. Remove frequency bands (and hence types of SRDs) from the list included in the technical annex, when required and duly justified (e.g. in case a particular use has become obsolete);
4. Continuously improve the presentation of the technical annex to reflect best practices.

The European Commission may provide, on a yearly basis, input and orientation to CEPT reflecting EU policy priorities requiring special attention in the context of spectrum usage by SRDs. This input and orientation, which aims at focussing the CEPT analysis, would be delivered in time to allow to be taken into account by CEPT when preparing the annual report with proposals for revising the technical annex.

The Commission, with the assistance of the Radio Spectrum Committee (RSC) pursuant to the Radio Spectrum Decision, may consider applying the results of this permanent Mandate in the European Union.

Duration

This mandate will be kept as long as the Commission Decision on SRDs is applicable.

However, the Commission, having received the advice of the RSC in the matter and with due consultation with CEPT, may terminate or modify this mandate at a specified point in time in case it would have become redundant, obsolete or needs to be updated.

Order and Schedule

1. CEPT is hereby mandated to undertake all relevant work to meet the objectives stated above.
2. The CEPT is mandated to produce a yearly report to the European Commission including the proposed revision of the technical annex of the Commission Decision on SRDs. This report shall take into account the input and orientation given by the Commission if provided. The CEPT report shall be delivered in **July** of each year.
3. An indicative schedule of the process is given in table 1.
4. In implementing this mandate, the CEPT shall, where relevant, take the utmost account of Community law applicable, notably the RTTE Directive, 1999/5/EC, and to support the principles of technological neutrality, non-discrimination and proportionality.

Table 1 – **Schedule for review of SRD Decision** (revolving cycle)

The reference date of the annual cycle of revision of the technical annex of the Commission Decision on SRDs is July of each year at which time CEPT is expected to deliver its annual report containing the proposal for revising the technical annex of the Commission Decision on SRDs.

Year Y -1

November-December	Optional: input and orientation presented by the Commission to the RSC in view of formal transmission to CEPT by the end of year Y-1
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Year Y

July	CEPT to finalise the response to the Mandate for year Y and submit formally a report to the Commission.
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ANNEX 3: PROPOSED AMENDMENTS TO THE TECHNICAL ANNEX OF THE EC DECISION FOR SRD (EU) 2019/1345

Frequency bands with corresponding harmonised technical conditions and implementation deadlines for short-range devices

Table 1 defines the scope of different categories of short-range devices (defined in Article 2(3)) to which the present Decision applies. Table 2 specifies different combinations of frequency band and category of short-range devices, and the harmonised technical conditions for spectrum access and implementation deadlines applicable thereto.

General technical conditions applicable to all bands and short-range devices that fall within the scope of this Decision:

- Member States must allow adjacent frequency bands set out in Table 2 to be used as a single frequency band provided the specific conditions of each of these adjacent frequency bands are met;
- Member States must allow the usage of spectrum up to the **transmit power, field strength or power density** set out in Table 2. Pursuant to Article 3(3) of this Decision, they may impose less restrictive conditions, that is to say allow the use of spectrum with higher transmit power, field strength or power density, provided it does not reduce or compromise the appropriate coexistence between short-range devices in bands harmonised by this Decision;
- Member States may only impose the **additional parameters** (channelling and/or channel access and occupation rules) set out in Table 2, and must not add other parameters or spectrum access and mitigation requirements. Less restrictive conditions pursuant to Article 3(3), means that Member States may completely omit these additional parameters in a given cell or allow higher values, provided that the appropriate sharing environment in the harmonised band is not compromised;
- Member States may only impose the **other usage restrictions** set out in Table 2 and must not add additional usage restrictions. Since less restrictive conditions may be applied pursuant to Article 3(3), Member States may omit one or all of these restrictions, provided that the appropriate sharing environment in the harmonised band is not compromised;
- Less restrictive conditions pursuant to Article 3(3) must apply without prejudice to Directive 2014/53/EU.

For the purposes of this Annex, the following **duty cycle** definition applies:

“**duty cycle**” means the ratio, expressed as a percentage, of $\Sigma(T_{on})/(T_{obs})$ where T_{on} is the “on” time of a single transmitter device and T_{obs} is the observation period. T_{on} is measured in an observation frequency band (F_{obs}). Unless otherwise specified in this technical annex, T_{obs} is a continuous one hour period and F_{obs} is the applicable frequency band in this technical annex. Less restrictive conditions within the meaning of Article 3(3), mean that Member States may allow a higher value for “duty cycle”.

Table 1: Categories of short-range devices pursuant to Article 2(3) and their scope

Category of short-range devices	Scope
Non-specific short-range devices (SRDs)	Covers all kinds of radio devices, regardless of the application or their purpose, which fulfil the technical conditions as specified for a given frequency band. Typical uses include telemetry, telecommand, alarms, data transmissions in general and other applications.
Active medical implant devices	Covers the radio part of active implantable medical devices that are intended to be fully or partially introduced, surgically or medically, into the human body or that of an animal, and where applicable their peripherals. Active implantable medical devices are defined in Council Directive 90/385/EEC (1) .
Assistive listening devices (ALDs)	Covers radio communications systems that allow persons with hearing impairment to increase their listening capability. Typical system installations include one or more radio transmitters and one or more radio receivers.
High duty cycle/continuous transmission devices	Covers radio devices that rely on low latency and high duty cycle transmissions. These devices are typically used for personal wireless audio and multimedia streaming systems used for combined audio/video transmissions and audio/video sync signals, mobile phones, automotive or home entertainment system, wireless microphones, cordless loudspeakers, cordless headphones, radio devices carried on a person, assistive listening devices, in-ear monitoring, wireless microphones for use at concerts or other stage productions, and low power analogue FM transmitters.
Inductive devices	Covers radio devices that use magnetic fields with inductive loop systems for near field communications and determination applications . This typically includes devices for car immobilisation, animal identification, alarm systems, cable detection, waste management, personal identification, wireless voice links, access control, proximity and metal sensors, anti-theft systems as well as RF anti-theft induction systems, data transfer to hand-held devices, automatic article identification, wireless control systems and automatic road tolling.
Low duty cycle/high reliability devices	Covers radio devices that rely on low overall spectrum utilisation and low duty cycle spectrum access rules to ensure highly reliable spectrum access and transmissions in shared bands. Typical applications include alarm systems that use radio communication for indicating an alert condition at a distant location and social alarm systems that allow reliable communication for a person in distress.
Medical data acquisition devices	Covers the transmission of non-voice data to and from non-implantable medical devices in order to monitor, diagnose and treat patients in healthcare facilities or in their homes as prescribed by duly authorised healthcare professionals.
PMR446 devices	Covers hand portable equipment (without base station or repeater use) carried on a person or manually operated, which uses integral antennas only in order to maximise sharing and minimise interference. PMR 446 equipment operates in short-range peer-to-peer mode and must not be used neither as a part of infrastructure network nor as a repeater.

Category of short-range devices	Scope
Radio determination devices	Covers radio devices used for determining the position, velocity and/or other characteristics of an object, or for obtaining information relating to these parameters. Radio determination equipment typically conducts measurements to obtain such characteristics. Radio determination devices exclude any kind of point-to-point or point-to-multipoint radio communications.
Radio frequency identification (RFID) devices	Covers tag/interrogator based radio communications systems, consisting of (i) radio devices (tags) attached to animate or inanimate items and (ii) transmitter/receiver units (interrogators) which activate the tags and receive data back. Typical applications include the tracking and identification of items, for instance for the purpose of electronic article surveillance (EAS), and collecting and transmitting data relating to the items to which tags are attached, which may be either battery-less, battery assisted or battery powered. The responses from a tag are validated by its interrogator and passed to its host system.
Transport and traffic telematics devices	Covers radio devices that are used in the fields of transport (road, rail, water or air, depending on the relevant technical restrictions), traffic management, navigation, mobility management and in intelligent transport systems (ITS). Typical applications include interfaces between different modes of transport, communication between vehicles (e.g. car to car), between vehicles and fixed locations (e.g. car to infrastructure) as well as communication from and to users.
Wideband data transmission devices	Covers radio devices that use wideband modulation techniques to access the spectrum. Typical uses include wireless access systems such as radio local area networks (WAS/RLANs) or wideband SRDs in data networks.

Table 2: CEPT proposals

Band no	Frequency band	Category of short-range devices	Transmit power limit/field strength limit/power density limit	Additional parameters (channelling and/or channel access and occupation rules)	Other usage restrictions	Implementation deadline
1	9-59,750 kHz	Inductive devices	72 dB μ A/m at 10 metres			1 July 2014
2	9-315 kHz	Active medical implant devices	30 dB μ A/m at 10 metres	Duty cycle limit: 10 %	This set of usage conditions is only available to active implantable medical devices.	1 July 2014
3	59,750-60,250 kHz	Inductive devices	42 dB μ A/m at 10 metres			1 July 2014
4	60,250-74,750 kHz	Inductive devices	72 dB μ A/m at 10 metres			1 July 2014

Band no	Frequency band	Category of short-range devices	Transmit power limit/field strength limit/power density limit	Additional parameters (channelling and/or channel access and occupation rules)	Other usage restrictions	Implementation deadline
5	74,750-75,250 kHz	Inductive devices	42 dB μ A/m at 10 metres			1 July 2014
6	75,250-77,250 kHz	Inductive devices	72 dB μ A/m at 10 metres			1 July 2014
7	77,250-77,750 kHz	Inductive devices	42 dB μ A/m at 10 metres			1 July 2014
8	77,750-90 kHz	Inductive devices	72 dB μ A/m at 10 metres			1 July 2014
9	90-119 kHz	Inductive devices	42 dB μ A/m at 10 metres			1 July 2014
10	119-128,6 kHz	Inductive devices	66 dB μ A/m at 10 metres			1 July 2014
11	128,6-129,6 kHz	Inductive devices	42 dB μ A/m at 10 metres			1 July 2014
12	129,6-135 kHz	Inductive devices	66 dB μ A/m at 10 metres			1 July 2014
13	135-140 kHz	Inductive devices	42 dB μ A/m at 10 metres			1 July 2014
14	140-148,5 kHz	Inductive devices	37,7 dB μ A/m at 10 metres			1 July 2014
15	148,5-5 000 kHz [1]	Inductive devices	– 15 dB μ A/m at 10 metres in any bandwidth of 10 kHz. Furthermore the total field strength is – 5 dB μ A/m at 10 m for systems operating at bandwidths larger than 10 kHz			1 July 2014
17	400-600 kHz	Radio Frequency Identification (RFID) devices	– 8 dB μ A/m at 10 metres			1 July 2014
85	442,2-450,0 kHz	Non-specific short-range devices	7 dB μ A/m at 10 m	Channel spacing \geq 150 Hz	This set of usage conditions is only available for person detection and collision avoidance devices.	1 January 2020
18	456,9-457,1 kHz	Non-specific short-range devices	7 dB μ A/m at 10 m		This set of usage conditions is only available for emergency detections	1 July 2014

Band no	Frequency band	Category of short-range devices	Transmit power limit/field strength limit/power density limit	Additional parameters (channelling and/or channel access and occupation rules)	Other usage restrictions	Implementation deadline
					of buried victims and valuable items devices.	
19	984-7 484 kHz	Transport and Traffic Telematics devices	9 dB μ A/m at 10 m	Duty cycle limit: 1 %	This set of usage conditions is only available for Eurobalise transmissions in the presence of trains and using the 27 090-27 100 kHz band for telepowering as per Band 2827 MHz band for telepowering.	1 July 2014
20	3 155 -3 400 kHz	Inductive devices	13,5 dB μ A/m at 10 metres			1 July 2014
21	5 000 -30 000 kHz [2]	Inductive devices	– 20 dB μ A/m at 10 metres in any bandwidth of 10 kHz. Furthermore the total field strength is – 5 dB μ A/m at 10 m for systems operating at bandwidths larger than 10 kHz			1 July 2014
22	6 765 -6 795 kHz	Inductive devices	42 dB μ A/m at 10 metres			1 July 2014
23	7 300 -23 000 kHz	Transport and Traffic Telematics devices	– 7 dB μ A/m at 10 m	Antenna requirements apply [8].	This set of usage conditions is only available for Euroloop transmissions in the presence of trains and using the 27 090-27 100 kHz band for telepowering as per Band 2827 MHz band for telepowering.	1 July 2014
24	7 400 -8 800 kHz	Inductive devices	9 dB μ A/m at 10 metres			1 July 2014
25	10 200 -11 000 kHz	Inductive devices	9 dB μ A/m at 10 metres			1 July 2014
27a	13 553 -13 567 kHz	Inductive devices	42 dB μ A/m at 10 metres	Transmission mask and antenna requirements for all combined frequency segments apply [8], [9].		1 January 2020

Band no	Frequency band	Category of short-range devices	Transmit power limit/field strength limit/power density limit	Additional parameters (channelling and/or channel access and occupation rules)	Other usage restrictions	Implementation deadline
27b	13 553 -13 567 kHz	Radio Frequency Identification (RFID) devices	60 dB μ A/m at 10 metres	Transmission mask and antenna requirements for all combined frequency segments apply [8], [9].		1 July 2014
27c	13 553 -13 567 kHz	Non-specific short-range devices	10 mW e.r.p.			1 July 2014
28	26 957 -27 283 kHz	Non-specific short-range devices	10 mW e.r.p.			1 July 2014
29	26 990 -27 000 kHz	Non-specific short-range devices	100 mW e.r.p.	Duty cycle limit: 0,1 %. Model control devices [d] may operate without duty cycle restrictions.		1 July 2014
30	27 040 -27 050 kHz	Non-specific short-range devices	100 mW e.r.p.	Duty cycle limit: 0,1 %. Model control devices [d] may operate without duty cycle restrictions.		1 July 2014
31	27 090 -27 100 kHz	Non-specific short-range devices	100 mW e.r.p.	Duty cycle limit: 0,1 %. Model control devices [d] may operate without duty cycle restrictions.		1 July 2014
32	27 140 -27 150 kHz	Non-specific short-range devices	100 mW e.r.p.	Duty cycle limit: 0,1 %. Model control devices [d] may operate without duty cycle restrictions.		1 July 2014
33	27 190 -27 200 kHz	Non-specific short-range devices	100 mW e.r.p.	Duty cycle limit: 0,1 %. Model control devices [d] may operate without duty cycle restrictions.		1 July 2014
34	30-37,5 MHz	Active medical implant devices	1 mW e.r.p.	Duty cycle limit: 10 %	This set of usage conditions is only available to ultra-low power medical membrane implants for blood pressure measurements within the definition of active implantable medical devices.	1 July 2014
35	40,66-40,7 MHz	Non-specific short-range devices	10 mW e.r.p.			1 January 2018

Band no	Frequency band	Category of short-range devices	Transmit power limit/field strength limit/power density limit	Additional parameters (channelling and/or channel access and occupation rules)	Other usage restrictions	Implementation deadline
36	87,5-108 MHz	High duty cycle/continuous transmission devices	50 nW e.r.p.	Channel spacing up to 200 kHz.	This set of usage conditions is only available to wireless audio and multimedia streaming transmitters with analogue frequency modulation (FM).	1 July 2014
37a	169,4-169,475 MHz	Assistive Listening Devices (ALD)	500 mW e.r.p.	Channel spacing: max 50 kHz.		1 July 2014
37c	169,4-169,475 MHz	Non-specific short-range devices	500 mW e.r.p.	Channel spacing: max 50 kHz. Duty cycle limit: 1,0 %. For metering devices [a], the duty cycle limit is 10,0 %		1 July 2014
38	169,4-169,4875 MHz	Non-specific short-range devices	10 mW e.r.p.	Duty cycle limit: 0,1 %.		1 January 2020
39a	169,4875-169,5875 MHz	Assistive Listening Devices (ALD)	500 mW e.r.p.	Channel spacing: max 50 kHz.		1 July 2014
39b	169,4875-169,5875 MHz	Non-specific short-range devices	10 mW e.r.p.	Duty cycle limit: 0,001 %. Between 00.00 and 6.00 local time a duty cycle limit of 0,1 % may be used.		1 January 2020
40	169,5875-169,8125 MHz	Non-specific short-range devices	10 mW e.r.p.	Duty cycle limit: 0,1 %.		1 January 2020
82	173,965-216 MHz	Assistive Listening Devices (ALD)	10 mW e.r.p.	On a tuning range basis [5]. Channel spacing: max 50 kHz. A threshold of 35 dB μ V/m is required to ensure the protection of a DAB receiver located at 1,5 m from the ALD device, subject to DAB signal strength measurements taken around the ALD operating site. The ALD device should operate under all circumstances at least 300 kHz away from the channel edge of an occupied DAB channel.		1 January 2018

Band no	Frequency band	Category of short-range devices	Transmit power limit/field strength limit/power density limit	Additional parameters (channelling and/or channel access and occupation rules)	Other usage restrictions	Implementation deadline
				Requirements on techniques to access spectrum and mitigate interference apply [7].		
41	401-402 MHz	Active medical implant devices	25 μ W e.r.p.	Channel spacing: 25 kHz. Individual transmitters may combine adjacent channels for increased bandwidth up to 100 kHz. Requirements on techniques to access spectrum and mitigate interference apply [7]. Alternatively a duty cycle limit of 0,1 % may also be used.	This set of usage conditions is only available for systems specifically designed for the purpose of providing non-voice digital communications between active implantable medical devices and/or body-worn devices and other devices external to the human body used for transferring non-time critical individual patient-related physiological information.	1 July 2014
42	402-405 MHz	Active medical implant devices	25 μ W e.r.p.	Channel spacing: 25 kHz. Individual transmitters may combine adjacent channels for increased bandwidth up to 300 kHz. Other techniques to access spectrum or mitigate interference, including bandwidths greater than 300 kHz, can be used provided they ensure compatible operation with the other users and in particular with meteorological radiosondes [7].	This set of usage conditions is only available to active implantable medical devices.	1 July 2014
43	405-406 MHz	Active medical implant devices	25 μ W e.r.p.	Channel spacing: 25 kHz Individual transmitters may combine adjacent channels for increased bandwidth up to 100 kHz. Requirements on techniques to access spectrum and mitigate interference apply [7]. Alternatively a duty cycle limit of 0,1 % may also be used.	This set of usage conditions is only available for systems specifically designed for the purpose of providing non-voice digital communications between active implantable medical devices and/or body-worn devices and other devices external to the human body used for transferring non-time critical individual patient-related physiological information.	1 July 2014

Band no	Frequency band	Category of short-range devices	Transmit power limit/field strength limit/power density limit	Additional parameters (channelling and/or channel access and occupation rules)	Other usage restrictions	Implementation deadline
86	430-440 MHz	Medical data acquisition devices	– 50 dBm/100kHz e.r.p. power density but not exceeding a total power of – 40 dBm/10MHz (both limits are intended for measurement outside of the patient's body)		The set of usage conditions is only available for Ultra-Low Power Wireless Medical Capsule Endoscopy (ULP-WMCE) applications [h].	1 January 2020
44a	433,05-434,79 MHz	Non-specific short-range devices	1 mW e.r.p. and – 13 dBm/10 kHz power density for bandwidth modulation larger than 250 kHz		Voice applications are allowed with advanced mitigation techniques. Other audio and video applications are excluded.	1 July 2014
44b	433,05-434,79 MHz	Non-specific short-range devices	10 mW e.r.p.	Duty cycle limit: 10 %		1 January 2020
45c	434,04-434,79 MHz	Non-specific short-range devices	10 mW e.r.p.	Duty cycle limit: 100 % subject to channel spacing up to 25 kHz.	Voice applications are allowed with advanced mitigation techniques. Other audio and video applications are excluded.	1 January 2020
83	446,0-446,2 MHz	PMR446	500 mW e.r.p.	Requirements on techniques to access spectrum and mitigate interference apply [7].		1 January 2018
87	862-863 MHz	Non-specific short-range devices	25 mW e.r.p.	Duty cycle limit: 0,1 %. Bandwidth: ≤ 350 kHz.		1 January 2020
46a	863-865 MHz	Non-specific short-range devices	25 mW e.r.p.	Requirements on techniques to access spectrum and mitigate interference apply [7]. Alternatively a duty cycle limit of 0,1 % may also be used.		1 January 2018
46b	863-865 MHz	High duty cycle/continuous transmission devices	10 mW e.r.p.		This set of usage conditions is only available to wireless audio and multimedia streaming devices.	1 July 2014
84	863-868 MHz	Wideband data transmission devices	25 mW e.r.p.	Requirements on techniques to access spectrum and mitigate interference apply [7]. Bandwidth: > 600 kHz and ≤ 1 MHz. Duty cycle: ≤ 10 % for network access points [g]	This set of usage conditions is only available for wideband SRDs in data networks [g].	1 January 2018

Band no	Frequency band	Category of short-range devices	Transmit power limit/field strength limit/power density limit	Additional parameters (channelling and/or channel access and occupation rules)	Other usage restrictions	Implementation deadline
				Duty cycle: $\leq 2,8$ % otherwise		
47	865-868 MHz	Non-specific short-range devices	25 mW e.r.p.	Requirements on techniques to access spectrum and mitigate interference apply [7]. Alternatively a duty cycle limit of 1 % may also be used.		1 January 2020
47a	865-868 MHz [6]	Radio Frequency Identification (RFID) devices	2 W e.r.p. Interrogator transmissions at 2 W e.r.p. only permitted within the four channels centred at 865,7 MHz, 866,3 MHz, 866,9 MHz and 867,5 MHz RFID interrogator devices placed on the market before the repeal date of EC Commission Decision 2006/804/EC ⁽²⁾ are “grandfathered”, i.e. they are continuously permitted to be used in line with the provisions set out in EC Decision 2006/804/EC before the repeal date.	Requirements on techniques to access spectrum and mitigate interference apply [7]. Bandwidth ≤ 200 kHz		1 January 2018
47b	865-868 MHz	Non-specific short-range devices	500 mW e.r.p. Transmissions only permitted within the frequency ranges 865,6-865,8 MHz, 866,2-866,4 MHz, 866,8-867,0 MHz and 867,4-867,6 MHz. Adaptive Power Control (APC) required. Alternatively other mitigation technique with at least an equivalent level of spectrum compatibility.	Requirements on techniques to access spectrum and mitigate interference apply [7]. Bandwidth: ≤ 200 kHz Duty cycle: ≤ 10 % for network access points [g] Duty cycle: $\leq 2,5$ % otherwise	This set of usage conditions is only available for data networks [g].	1 January 2018
48	868-868,6 MHz	Non-specific short-range devices	25 mW e.r.p.	Requirements on techniques to access spectrum and mitigate interference apply [7]. Alternatively a duty cycle limit of 1 % may also be used.		1 January 2020

Band no	Frequency band	Category of short-range devices	Transmit power limit/field strength limit/power density limit	Additional parameters (channelling and/or channel access and occupation rules)	Other usage restrictions	Implementation deadline
49	868,6-868,7 MHz	Low duty cycle/high reliability devices	10 mW e.r.p.	Channel spacing: 25 kHz. The whole frequency band may also be used as a single channel for high-speed data transmission. Duty cycle limit: 1,0 %	This set of usage conditions is only available to alarm systems [e].	1 July 2014
50	868,7-869,2 MHz	Non-specific short-range devices	25 mW e.r.p.	Requirements on techniques to access spectrum and mitigate interference apply [7]. Alternatively a duty cycle limit of 0,1 % may also be used.		1 January 2020
51	869,2-869,25 MHz	Low duty cycle/high reliability devices	10 mW e.r.p.	Channel spacing: 25 kHz. Duty cycle limit: 0,1 %	This set of usage conditions is only available to social alarm devices [b].	1 July 2014
52	869,25-869,3 MHz	Low duty cycle/high reliability devices	10 mW e.r.p.	Channel spacing: 25 kHz. Duty cycle limit: 0,1 %	This set of usage conditions is only available to alarm systems [e].	1 July 2014
53	869,3-869,4 MHz	Low duty cycle/high reliability devices	10 mW e.r.p.	Channel spacing: 25 kHz. Duty cycle limit: 1,0 %	This set of usage conditions is only available to alarm systems [e].	1 July 2014
54	869,4-869,65 MHz	Non-specific short-range devices	500 mW e.r.p.	Requirements on techniques to access spectrum and mitigate interference apply [7]. Alternatively a Duty cycle limit of 10 % may also be used.		1 January 2020
55	869,65-869,7 MHz	Low duty cycle/high reliability devices	25 mW e.r.p.	Channel spacing: 25 kHz Duty cycle limit: 10 %	This set of usage conditions is only available to alarm systems [e].	1 July 2014
56a	869,7-870 MHz	Non-specific short-range devices	5 mW e.r.p.		Voice applications are allowed with advanced mitigation techniques. Other audio and video applications are excluded.	1 July 2014
56b	869,7-870 MHz	Non-specific short-range devices	25 mW e.r.p.	Requirements on techniques to access spectrum and mitigate interference apply [7].		1 January 2020

Band no	Frequency band	Category of short-range devices	Transmit power limit/field strength limit/power density limit	Additional parameters (channelling and/or channel access and occupation rules)	Other usage restrictions	Implementation deadline
				Alternatively a duty cycle limit of 1 % may also be used.		
57a	2 400 -2 483,5 MHz	Non-specific short-range devices	10 mW equivalent isotropic radiated power (e.i.r.p.)			1 July 2014
57b	2 400 -2 483,5 MHz	Radio determination devices	25 mW e.i.r.p.			1 July 2014
57c	2 400 -2 483,5 MHz	Wideband data transmission devices	100 mW e.i.r.p. and 100 mW/100 kHz e.i.r.p. density applies when frequency hopping modulation is used, 10 mW/MHz e.i.r.p. density applies when other types of modulation are used	Requirements on techniques to access spectrum and mitigate interference apply [7].		1 July 2014
58	2 446 -2 454 MHz	Radio Frequency Identification (RFID) devices	500 mW e.i.r.p.	Requirements on techniques to access spectrum and mitigate interference apply [7].		1 July 2014
59	2 483,5 -2 500 MHz	Active medical implant devices	10 mW e.i.r.p.	Requirements on techniques to access spectrum and mitigate interference apply [7]. Channel spacing: 1 MHz. The whole frequency band may also be used dynamically as a single channel for high-speed data transmissions. In addition, a duty cycle limit of 10 % applies.	This set of usage conditions is only available to active implantable medical devices. Peripheral master units are for indoor use only.	1 July 2014
59a	2 483,5 -2 500 MHz	Medical data acquisition devices	1 mW e.i.r.p.	Requirements on techniques to access spectrum and mitigate interference apply [7]. Modulation Bandwidth: ≤ 3 MHz. In addition, a duty cycle: ≤ 10 % applies.	The set of usage conditions is only available for medical body area network system (MBANS) [f] for indoor use within healthcare facilities	1 January 2018
59b	2 483,5 -2 500 MHz	Medical data acquisition devices	10 mW e.i.r.p.	Requirements on techniques to access spectrum and mitigate interference apply [7]. Modulation Bandwidth: ≤ 3 MHz. In addition, a duty cycle: ≤ 2 % applies	The set of usage conditions is only available for medical body area network system (MBANS) [f] for indoor use within the patient's home	1 January 2018
60	4 500 -7 000 MHz	Radio determination devices	24 dBm e.i.r.p. [3]	Requirements on techniques to access spectrum and mitigate interference apply [7].	This set of usage conditions is only available	1 July 2014

Band no	Frequency band	Category of short-range devices	Transmit power limit/field strength limit/power density limit	Additional parameters (channelling and/or channel access and occupation rules)	Other usage restrictions	Implementation deadline
					to Tank Level Probing Radar [c].	
61	5 725 -5 875 MHz	Non-specific short-range devices	25 mW e.i.r.p.			1 July 2014
62	5 795 -5 815 MHz	Transport and Traffic Telematics devices	2 W e.i.r.p.	Requirements on techniques to access spectrum and mitigate interference apply [7].	This set of usage conditions applies only to road tolling applications and smart tachograph, weight and dimension applications [i].	1 January 2020
88	5 855 -5 865 MHz	Transport and Traffic Telematics devices	33 dBm e.i.r.p., 23 dBm/MHz e.i.r.p. density and a Transmit Power Control (TPC) range of 30 dB	Requirements on techniques to access spectrum and mitigate interference apply [7].	This set of usage conditions is only available to vehicle-to-vehicle, vehicle-to-infrastructure and infrastructure-to-vehicle systems.	1 January 2020
89	5 865 -5 875 MHz	Transport and Traffic Telematics devices	33 dBm e.i.r.p., 23 dBm/MHz e.i.r.p. density and a Transmit Power Control (TPC) range of 30 dB	Requirements on techniques to access spectrum and mitigate interference apply [7].	This set of usage conditions is only available to vehicle-to-vehicle, vehicle-to-infrastructure and infrastructure-to-vehicle systems.	1 January 2020
63	6 000 -8 500 MHz	Radio determination devices	7 dBm/50 MHz peak e.i.r.p. and – 33 dBm/MHz mean e.i.r.p.	Automatic power control and antenna requirements as well as requirements on techniques to access spectrum and mitigate interference apply [7], [8] [10].	This set of usage conditions is only available to Level Probing Radar. Established exclusion zones around radio astronomy sites must be obeyed.	1 July 2014
64	8 500 -10 600 MHz	Radio determination devices	30 dBm e.i.r.p. [3]	Requirements on techniques to access spectrum and mitigate interference apply [7].	This set of usage conditions is only available to Tank Level Probing Radar [c].	1 July 2014
65	17,1-17,3 GHz	Radio determination devices	26 dBm e.i.r.p.	Requirements on techniques to access spectrum and mitigate interference apply [7].	This set of usage conditions is only available to ground-based systems.	1 July 2014

Band no	Frequency band	Category of short-range devices	Transmit power limit/field strength limit/power density limit	Additional parameters (channelling and/or channel access and occupation rules)	Other usage restrictions	Implementation deadline
66	24,05-24,075 GHz	Transport and Traffic Telematics devices	100 mW e.i.r.p.			1 July 2014
67	24,05-26,5 GHz	Radio determination devices	26 dBm/50 MHz peak e.i.r.p. and – 14 dBm/MHz mean e.i.r.p.	Automatic power control and antenna requirements as well as requirements on techniques to access spectrum and mitigate interference apply [7], [8], [10]	This set of usage conditions is only available to Level Probing Radar. Established exclusion zones around radio astronomy sites must be obeyed.	1 July 2014
68	24,05-27 GHz	Radio determination devices	43 dBm e.i.r.p. [3]	Requirements on techniques to access spectrum and mitigate interference apply [7].	This set of usage conditions is only available to Tank Level Probing Radar [c].	1 July 2014
69a	24,075-24,15 GHz	Transport and Traffic Telematics devices	100 mW e.i.r.p.	Requirements on techniques to access spectrum and mitigate interference apply [7].	This set of usage conditions is only available to ground-based vehicle radars.	1 July 2014
69b	24,075-24,15 GHz	Transport and Traffic Telematics devices	0,1 mW e.i.r.p.			1 July 2014
70a	24,15-24,25 GHz	Non-specific short-range devices	100 mW e.i.r.p.			1 July 2014
70b	24,15-24,25 GHz	Transport and Traffic Telematics devices	100 mW e.i.r.p.			1 July 2014
74a	57-64 GHz	Non-specific short-range devices	100 mW e.i.r.p. and a maximum transmit power of 10 dBm			1 January 2020
74b	57-64 GHz	Radio determination devices	43 dBm e.i.r.p. [3]	Requirements on techniques to access spectrum and mitigate interference apply [7].	This set of usage conditions is only available to Tank Level Probing Radar [c].	1 July 2014

Band no	Frequency band	Category of short-range devices	Transmit power limit/field strength limit/power density limit	Additional parameters (channelling and/or channel access and occupation rules)	Other usage restrictions	Implementation deadline
74c	57-64 GHz	Radio determination devices	35 dBm/50 MHz peak e.i.r.p. and – 2 dBm/MHz mean e.i.r.p.	Automatic power control and antenna requirements as well as requirements on techniques to access spectrum and mitigate interference apply [7], [8], [10].	This set of usage conditions is only available to Level Probing Radar.	1 July 2014
75	57-71 GHz	Wideband data transmission devices	40 dBm e.i.r.p. and 23 dBm/MHz e.i.r.p. density	Requirements on techniques to access spectrum and mitigate interference apply [7].	Fixed outdoor installations are excluded.	1 January 2020
75a	57-71 GHz	Wideband data transmission devices	40 dBm e.i.r.p., 23 dBm/MHz e.i.r.p. density and maximum transmit power of 27 dBm at the antenna port or ports	Requirements on techniques to access spectrum and mitigate interference apply [7].		1 January 2020
75b	57-71 GHz	Wideband data transmission devices	55 dBm e.i.r.p., 38 dBm/MHz e.i.r.p. density and a transmit antenna gain ≥ 30 dBi	Requirements on techniques to access spectrum and mitigate interference apply [7].	This set of usage conditions is only available to fixed outdoor installations.	1 January 2020
76	61-61,5 GHz	Non-specific short-range devices	100 mW e.i.r.p.			1 July 2014
77	63,72-65,88 GHz	Transport and Traffic Telematics devices	40 dBm e.i.r.p.	TTT devices placed on the market before the 1 January 2020 are “grandfathered”, i.e. they are permitted to use the previous frequency range 63-64 GHz, and otherwise the same conditions apply.	This set of usage conditions is only available to vehicle-to-vehicle, vehicle-to-infrastructure and infrastructure-to-vehicle systems.	1 January 2020
78a	75-85 GHz	Radio determination devices	34dBm/50 MHz peak e.i.r.p. and – 3 dBm/MHz mean e.i.r.p.	Automatic power control and antenna requirements as well as requirements on techniques to access spectrum and mitigate interference apply [7], [8], [10].	This set of usage conditions is only available to Level Probing Radar. Established exclusion zones around radio astronomy sites must be obeyed.	1 July 2014
78b	75-85 GHz	Radio determination devices	43 dBm e.i.r.p. [3]	Requirements on techniques to access spectrum and mitigate interference apply [7].	This set of usage conditions is only available to Tank Level Probing Radar [c].	1 July 2014

Band no	Frequency band	Category of short-range devices	Transmit power limit/field strength limit/power density limit	Additional parameters (channelling and/or channel access and occupation rules)	Other usage restrictions	Implementation deadline
79a	76-77 GHz	Transport and Traffic Telematics devices	55 dBm peak e.i.r.p. and 50 dBm mean e.i.r.p. and 23,5 dBm mean e.i.r.p. for pulse radars	Requirements on techniques to access spectrum and mitigate interference apply [7]. Fixed transportation infrastructure radars have to be of a scanning nature in order to limit the illumination time and ensure a minimum silent time to achieve coexistence with automotive radar systems.	This set of usage conditions is only available to ground-based vehicle and infrastructure systems.	1 June 2020
79b	76-77 GHz	Transport and Traffic Telematics devices	30 dBm peak e.i.r.p. and 3 dBm/MHz average power spectral density	Duty cycle limit: ≤ 56 %/s	This set of usage conditions is only available to obstacle detection systems for rotorcraft use [4].	1 January 2018
80a	122-122,25 GHz	Non-specific short-range devices	10 dBm e.i.r.p./250 MHz and – 48 dBm/MHz at 30° elevation			1 January 2018
80b	122,25-123 GHz	Non-specific short-range devices	100 mW e.i.r.p.			1 January 2018
81	244-246 GHz	Non-specific short-range devices	100 mW e.i.r.p.			1 July 2014
TBD	9 kHz - 148 kHz	Radio determination devices	46 dBµA/m at 10 m distance at a reference of 100Hz, outside the NMR device. Magnetic field strength descending 10dB/decade above 100Hz		For enclosed Nuclear Magnetic Resonance (NMR) applications.	TBD
TBD	148-5000 kHz	Radio determination devices	-15 dBµA/m at 10 m distance outside the NMR device		For enclosed Nuclear Magnetic Resonance (NMR) applications	TBD
TBD	5000 kHz - 30 MHz	Radio determination devices	-5 dBµA/m at 10m distance outside the NMR device		For enclosed Nuclear Magnetic Resonance (NMR) applications	TBD
TBD	30-130 MHz	Radio determination devices	-36 dBm e.r.p. outside the NMR device		For enclosed Nuclear Magnetic Resonance (NMR) applications	TBD

Band no	Frequency band	Category of short-range devices	Transmit power limit/field strength limit/power density limit	Additional parameters (channelling and/or channel access and occupation rules)	Other usage restrictions	Implementation deadline
Applications and devices referred to in Table 2:						
<p>[a] “Metering devices” means radio devices that are part of bidirectional radio communications systems which allow remote monitoring, measuring and transmission of data in smart grid infrastructures, such as electricity, gas and water.</p> <p>[b] “Social alarm devices” means radio communications systems that allow reliable communication for a person in distress in a confined area to initiate a call for assistance. Typical uses of social alarm are to assist elderly or disabled people.</p> <p>[c] “Tank Level Probing Radar” (TLPR) means a specific type of radiodetermination application, which is used for tank level measurements and is installed in metallic or reinforced concrete tanks, or similar structures made of material with comparable attenuation characteristics. The purpose of the tank is to contain a substance.</p> <p>[d] “Model control devices” means a specific kind of telecommand and telemetry radio equipment that is used to remotely control the movement of models (principally miniature representations of vehicles) in the air, on land or over or under the water surface.</p> <p>[e] An alarm system is a device which uses radio communication support for indicating an alert to a system or a person, as a main functionality, at a distant location when a problem or a specific situation occurs. Radio alarms include social alarms and alarms for security and safety.</p> <p>[f] Medical Body Area Network Systems (MBANSs) are used for medical data acquisition and are intended for low-power wireless networking of a plurality of body-worn sensors and/or actuators as well as of a hub device placed on/around the human body.</p> <p>[g] A network access point in a data network is a fixed terrestrial short-range device that acts as a connection point for the other short-range devices in the data network to service platforms located outside of that data network. The term data network refers to several short-range devices, including the network access point, as network components and to the wireless connections between them.</p> <p>[h] Wireless medical capsule endoscopy is used for medical data acquisition designed for use in medical doctor-patient scenarios with the aim of acquiring images of human digestive tract.</p> <p>[i] Smart tachograph, weight and dimension applications are defined as remote enforcement of the tachograph in Appendix 14 of Commission Implementing Regulation (EU) 2016/799 (OJ L 139, 26.5.2016, p. 1 Error! Reference source not found.) and for the weights and dimensions enforcement in Article 10d of Directive (EU) 2015/719 of the European Parliament and of the Council (OJ L 115, 6.5.2015, p. 1 Error! Reference source not found.).</p> <p><u>Enclosed NMR sensors are devices where the material/object under investigation is put inside the enclosure of the NMR device. NMR techniques use nuclear magnetic resonance excitation and magnetic field strength response of a material/object under test to get information about material properties based on resonance frequency responses of isotopes of atoms. Nuclear magnetic resonance imaging and magnetic resonance tomography systems are not included in this scope.</u></p> <p>[j] <u>Excited NMR sensors are devices where the material/object under investigation is put inside the enclosure of the NMR device. NMR techniques use nuclear magnetic resonance excitation and magnetic field strength response of a material/object under test to get information about material properties based on resonance frequency responses of isotopes of atoms. Nuclear magnetic resonance imaging and magnetic resonance tomography systems are not included in this scope.</u></p>						
Other technical requirements and clarifications referred to in Table 2:						
<p>[1] In band 20 higher field strengths and additional usage restrictions apply for inductive applications.</p> <p>[2] In bands 22, 24, 25, 27a, and 28 higher field strengths and additional usage restrictions apply for inductive applications.</p> <p>[3] The power limit applies inside a closed tank and corresponds to a spectral density of – 41,3 dBm/MHz e.i.r.p. outside a 500 litre test tank.</p> <p>[4] Member States can specify exclusion zones or equivalent measures in which the obstacle detection application for rotorcraft use shall not be used for the protection of the radioastronomy service or other national use. Rotorcraft is defined as EASA CS-27 and CS-29 (resp. JAR-27 and JAR-29 for former certifications);</p>						

Band no	Frequency band	Category of short-range devices	Transmit power limit/field strength limit/power density limit	Additional parameters (channelling and/or channel access and occupation rules)	Other usage restrictions	Implementation deadline
[5]						Devices shall implement the whole frequency range on a tuning range basis.
[6]						RFID tags respond at a very low power level (– 20 dBm e.r.p.) in a frequency range around the RFID interrogator channels and must comply with the essential requirements of Directive 2014/53/EU.
[7]						Techniques to access spectrum and mitigate interference that provide an appropriate level of performance to comply with the essential requirements of Directive 2014/53/EU shall be used. If relevant techniques are described in harmonised standards or parts thereof the references of which have been published in the <i>Official Journal of the European Union</i> under Directive 2014/53/EU, performance at least equivalent to these techniques shall be ensured.
[8]						Antenna requirements that provide an appropriate level of performance to comply with the essential requirements of Directive 2014/53/EU shall be used. If relevant restrictions are described in harmonised standards or parts thereof the references of which have been published in the <i>Official Journal of the European Union</i> under Directive 2014/53/EU, performance at least equivalent to these restrictions shall be ensured.
[9]						Transmission mask that provides an appropriate level of performance to comply with the essential requirements of Directive 2014/53/EU shall be used. If relevant restrictions are described in harmonised standards or parts thereof the references of which have been published in the <i>Official Journal of the European Union</i> under Directive 2014/53/EU, performance at least equivalent to these restrictions shall be ensured.
[10]						Automatic power control that provides an appropriate level of performance to comply with the essential requirements of Directive 2014/53/EU shall be used. If relevant restrictions are described in harmonised standards or parts thereof the references of which have been published in the <i>Official Journal of the European Union</i> under Directive 2014/53/EU, performance at least equivalent to these restrictions shall be ensured.

ANNEX 4: PROPOSED AMENDMENTS TO THE TECHNICAL ANNEX OF THE EC DECISION FOR SRD (EU) 2018/1538

Frequency bands with corresponding harmonised technical conditions and implementation deadlines for short-range devices

The table below specifies different combinations of frequency band and category of short-range devices (as defined in Article 2(6)), and the harmonised technical conditions for spectrum access and implementation deadlines applicable thereto.

General technical conditions which apply to all bands and short-range devices which fall in the scope of the present Decision:

- Member States must allow the usage of spectrum up to the **transmit power, field strength or power density** given in this table. In accordance with Article 3(3), they may impose less restrictive conditions, i.e. allow the use of spectrum with higher transmit power, field strength or power density, provided that this does not reduce or compromise the appropriate coexistence between short-range devices in bands harmonised by this Decision;
- Member States may only impose the '**additional parameters** (channelling and/or channel access and occupation rules)' identified in the table, and shall not add other parameters or spectrum access and mitigation requirements. Less restrictive conditions within the meaning of Article 3(3), mean that Member States may completely omit the 'additional parameters (channelling and/or channel access and occupation rules)' in a given cell or allow higher values, provided that the appropriate sharing environment in the harmonised band is not compromised.
- Member States may only impose the '**other usage restrictions**' identified in the table and shall not add additional usage restrictions unless the conditions mentioned in Article 3(2) apply. As less restrictive conditions may be introduced within the meaning of Article 3(3), Member States may omit one or all of these restrictions, provided that the appropriate sharing environment in the harmonised band is not compromised.

Terms used:

'**Duty cycle**' is defined as the ratio, expressed as a percentage, of $\Sigma(T_{on})/(T_{obs})$ where T_{on} is the 'on' time of a single transmitter device and T_{obs} is the observation period. T_{on} is measured in an observation frequency band (F_{obs}). Unless otherwise specified in this technical annex, T_{obs} is a continuous one hour period and F_{obs} is the applicable frequency band in this technical annex. Less restrictive conditions within the meaning of Article 3(3), mean that Member States may allow a higher value for 'duty cycle'.

Table 3: CEPT proposals

Band no	Frequency band	Category of short-range devices	Transmit power limit/field strength limit/power density limit	Additional parameters (channelling and/or channel access and occupation rules)	Other usage restrictions	Implementation deadline
1	874-874,4 MHz (8)	Non-specific short-range devices (1)	500 mW e.r.p. Adaptive Power Control (APC) required, alternatively other mitigation techniques which achieve at least an equivalent level of spectrum compatibility	Techniques to access spectrum and mitigate interference that provide an appropriate level of performance to comply with the essential requirements of Directive 2014/53/EU shall be used. If relevant techniques are described in harmonised standards or parts thereof the references of which have been published in the Official Journal of the European Union under Directive 2014/53/EU, performance at least equivalent to these techniques shall be ensured. Bandwidth: ≤ 200 kHz Duty cycle: ≤ 10 % for network access points (4) Duty cycle: 2,5 % otherwise	This set of usage conditions is only available for data networks All <u>nomadic and mobile</u> devices within the data network shall be <u>under the control</u> led by a master-of network access points (4)(5)(6)(7)	1 February 2019
2	917,4-919,4 MHz (9)	Wideband data transmission devices (3)	25 mW e.r.p.	Techniques to access spectrum and mitigate interference that provide an appropriate level of performance to comply with the essential requirements of Directive 2014/53/EU shall be used. If relevant techniques are described in harmonised standards or parts thereof the references of which have been published in the Official Journal of the European Union under Directive	This set of usage conditions is only available for wideband short-range devices in data networks All <u>nomadic and mobile</u> devices within the data network shall be <u>under the control</u> led by a master-of network access points (4) (5) (6)	1 February 2019

Band no	Frequency band	Category of short-range devices	Transmit power limit/field strength limit/power density limit	Additional parameters (channelling and/or channel access and occupation rules)	Other usage restrictions	Implementation deadline
				<p>2014/53/EU, performance at least equivalent to these techniques shall be ensured.</p> <p>Bandwidth: $> 600 \text{ kHz and } \leq 1 \text{ MHz}$</p> <p>Duty cycle: $\leq 10 \%$ for network access points (4)</p> <p>Duty cycle: $\leq 2,8 \%$ otherwise</p>		
3	916,1-918,9 MHz (10)	Radio Frequency Identification (RFID) devices (2)	Interrogator transmissions at 4 W e.r.p. only permitted at the centre frequencies 916,3 MHz, 917,5 MHz, 918,7 MHz	<p>Techniques to access spectrum and mitigate interference that provide an appropriate level of performance to comply with the essential requirements of Directive 2014/53/EU shall be used. If relevant techniques are described in harmonised standards or parts thereof the references of which have been published in the Official Journal of the European Union under Directive 2014/53/EU, performance at least equivalent to these techniques shall be ensured.</p> <p>Bandwidth: $\leq 400 \text{ kHz}$</p>	(5) (6) (7)	1 February 2019
4	917,3-918,9 MHz	Non-specific short-range devices (1)	<p>500 mW e.r.p.</p> <p>Transmissions only permitted within the frequency ranges 917,3-917,7 MHz, 918,5-918,9 MHz</p>	Techniques to access spectrum and mitigate interference that provide an appropriate level of performance to comply with the essential requirements of Directive 2014/53/EU shall be used. If relevant techniques	<p>This set of usage conditions is only available for data networks</p> <p>All <u>nomadic and mobile</u> devices within the data network shall be <u>under the</u></p>	1 February 2019

Band no	Frequency band	Category of short-range devices	Transmit power limit/field strength limit/power density limit	Additional parameters (channelling and/or channel access and occupation rules)	Other usage restrictions	Implementation deadline
			Adaptive Power Control (APC) required, alternatively other mitigation techniques which achieve at least an equivalent level of spectrum compatibility	<p>are described in harmonised standards or parts thereof the references of which have been published in the Official Journal of the European Union under Directive 2014/53/EU, performance at least equivalent to these techniques shall be ensured.</p> <p>Bandwidth: ≤ 200 kHz</p> <p>Duty cycle: ≤ 10 % for network access points (4)</p> <p>Duty cycle: $\leq 2,5$ % otherwise</p>	controlled by a master-of network access points (4) (5) (6) (7)	
5	917,4-919,4 MHz (9)	Non-specific short-range devices (1)	25 mW e.r.p.	<p>Techniques to access spectrum and mitigate interference that provide an appropriate level of performance to comply with the essential requirements of Directive 2014/53/EU shall be used. If relevant techniques are described in harmonised standards or parts thereof the references of which have been published in the Official Journal of the European Union under Directive 2014/53/EU, performance at least equivalent to these techniques shall be ensured.</p> <p>Bandwidth: ≤ 600 kHz</p> <p>Duty cycle: ≤ 1 %</p>	<p>This set of usage conditions is only available for short-range device in data networks</p> <p>All <u>nomadic and mobile</u> devices within the data network shall be <u>under the controlled by a master-of</u> network access points (4) (5) (6)</p>	1 February 2019

Band no	Frequency band	Category of short-range devices	Transmit power limit/field strength limit/power density limit	Additional parameters (channelling and/or channel access and occupation rules)	Other usage restrictions	Implementation deadline
<p>(1) The non-specific short-range device category covers all kinds of radio devices, regardless of the application or the purpose, which fulfil the technical conditions as specified for a given frequency band. Typical uses include telemetry, telecommand, alarms, data transmissions in general and other applications.</p> <p>(2) The radio frequency identification (RFID) device category covers tag/interrogator based radio communications systems, consisting of radio devices (tags) attached to animate or inanimate items and of transmitter/receiver units (interrogators) which activate the tags and receive data back. Typical uses include the tracking and identification of items, such as for electronic article surveillance (EAS), and collecting and transmitting data relating to the items to which tags are attached, which may be either battery-less, battery assisted or battery powered. The responses from a tag are validated by its interrogator and passed to its host system.</p> <p>(3) The wideband data transmission device category covers radio devices that use wideband modulation techniques to access the spectrum. Typical uses include wireless access systems such as radio local area networks (WAS/RLANs) or wideband short-range devices in data networks.</p> <p>(4) A network access point in a data network is a fixed terrestrial short-range device that acts as a connection point for the other short-range devices in the data network to service platforms located outside of that data network. The term data network refers to several short-range devices, including the network access point, as network components and to the wireless connections between them.'</p> <p>(5) According to Article 3(1) the frequency bands shall be designated and made available on a non-exclusive and shared basis. The harmonised technical conditions should make it possible for most short-range devices in most Member States to be operated subject to a general authorisation regime under national law. This is without prejudice to Article 5 of Directive 2002/20/EC, Article 9(3) and (4) of Directive 2002/21/EC, Article 7 of Directive 2014/53/EU and Article 3(2), Member States may limit usage of this entry such that installation and operation are performed only by professional users and may consider individual authorisation, e.g. to administer geographical sharing and/or the application of mitigation techniques to ensure protection of radio services.</p> <p>(6) In Member States where parts or all of this frequency range are used for public order and public security purposes and defence and coordination is not possible, Member States may decide not to implement this entry partially or entirely, in accordance with Article 1(4) of Decision 676/2002/EC and Article 3(2) of this Decision.</p> <p>(7) National rules, such as local coordination, may also be needed in order to avoid interference to radio services operating in the adjacent bands, for example due to intermodulation or blocking.</p> <p>(8) This frequency range 874-874,4 MHz is the harmonised minimum core band.</p> <p>(9) This frequency range 917,4-919,4 MHz is the harmonised minimum core band.</p> <p>(10) RFID tags respond at a very low power level (– 10 dBm e.r.p.) in a frequency <u>rangeband</u> around the RFID interrogator channels and must comply with the essential requirements of Directive 2014/53/EU.</p>						

ANNEX 5: LIST OF REFERENCES

- [1] ERC Recommendation 70-03: "Relating to the use of Short Range Devices (SRD)", approved October 2020
- [2] Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC
- [3] CEPT Report 14: "Report from CEPT to the European Commission in response to the Mandate to: Develop a strategy to improve the effectiveness and flexibility of spectrum availability for Short Range Devices (SRDs)", approved July 2006
- [4] CEPT Report 44: "In response to the EC Permanent Mandate on the "Annual update of the technical annex of the Commission Decision on the technical harmonisation of radio spectrum for use by short range devices", approved March 2013
- [5] Commission Decision 2006/771/EC on the harmonisation of the radio spectrum for use by short-range devices (SRD)
- [6] ECC Report 181: "Improving spectrum efficiency in the SRD bands", approved September 2012
- [7] CEPT Report 26: "Annual update of the technical annex of the Commission Decision on the technical harmonisation of radio spectrum for use by SRDs", approved March 2009
- [8] ECC Report 261: "Short Range Devices in the frequency range 862-870 MHz", approved January 2017
- [9] ECC Reports 246: "Wideband and Higher DC Short Range Devices in 870-875.8 MHz and 915.2-920.8 MHz (companion to ECC Report 200)", approved January 2017
- [10] COMMISSION IMPLEMENTING REGULATION (EU) 2016/799 of 18 March 2016 implementing Regulation (EU) No 165/2014 of the European Parliament and of the Council laying down the requirements for the construction, testing, installation, operation and repair of tachographs and their components
- [11] DIRECTIVE (EU) 2015/719 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 29 April 2015 amending Council Directive 96/53/EC laying down for certain road vehicles circulating within the Community the maximum authorised dimensions in national and international traffic and the maximum authorised weights in international traffic
- [12] Commission Implementing Decision 2018/1538/EU of 11 October 2018 on the harmonisation of radio spectrum for use by short-range devices within the 874-876 and 915-921 MHz frequency bands
- [13] ETSI TR 103 517: SRdoc; SRD using Nuclear Magnetic Resonance (NMR); Technical characteristics for SRD equipment using Nuclear Magnetic Resonance (NMR) technology in the frequency range 0,1 kHz to 130 MHz
- [14] Commission Implementing Decision (EU) 2019/1345 of 2 August 2019 amending Decision 2006/771/EC updating harmonised technical conditions in the area of radio spectrum use for short-range devices
- [15] CEPT Report 76: "in response to the Mandate on spectrum for the future railway mobile communications system" (Report B), approved November 2020