CEPT Report 005

Report from CEPT to the European Commission in response to the Mandate to:

SHORT RANGE DEVICES
RADIO SPECTRUM HARMONISATION

Report approved on 12 November 2005 by the:

CEPT ECC
Electronic Communications Committee

Electronic Communications Committee (ECC)
within the European Conference of Postal and Telecommunications Administrations (CEPT)

Final Report by the ECC in response to the EC Mandate to CEPT on SRD Radio Spectrum Harmonisation

Executive summary

CEPT has developed this final report in response to the Commission's Mandate of 11 March 2004 which required the CEPT to identify and prioritise further spectrum harmonisation of SRDs. This report has been developed within the Short Range Device Maintenance Group with contributions from administrations and industry. An interim report was approved by the ECC at its meeting on 5-9 July 2004 and has been further developed in this final report by the SRD MG and WGFM and approved by the ECC at its meeting in Brugge, 8-12 November 2005.

The SRD MG has looked at the harmonised bands and sought to identify priorities for further harmonisation but was not able to finalise this work in the time given. In many cases, much harmonisation has already taken place and the remaining spectrum has legacy issues which will take time to resolve. This is an on-going task for the SRD MG. In addition to the legacy issues, there is a growing need to assess the wider aspects of harmonisation including a cost benefit analysis and risk assessment when considering new bands for SRDs. This report gives an indication of how these issues are to be managed.

Recommendation 70-03 has been developed with industry to ensure that SRDs can share spectrum and, so far as possible, avoid the possibility of mutual interference ensuring that the user has a quality of service appropriate to the device. A critical assessment needs to be made of any further expansion of these bands and this should include an explanation of why the existing bands are not suitable or insufficient for these new and innovative devices.

In the near future it will be necessary to consider the benefits to be gained from techniques that are becoming affordable for SRDs. These techniques permit additional features to be built into integrated circuits for SRD transceivers including:

- Adaptive frequency agility (AFA);
- Listen before talk (LBT);
- Dynamic power control (DPC).

Such features will allow SRDs to have a polite access to both new and traditional SRD bands and their use shall be investigated within SRD MG.

Conclusions

The following conclusions were developed:

1. In considering frequency bands for harmonisation, the relative economic and other benefits should be taken into account
2. The most likely use of the band should be determined. This could involve consultation with manufacturers of potentially licence exempt equipment
3. In deciding whether individual or general authorisation will be more beneficial, there should be an economic assessment of alternative uses and consideration of congestion affecting similar bands or similar uses
4. If a general authorisation is indicated in determining the regulatory restrictions that should apply the regulator should make a judgement as to the most appropriate level of restriction
5. The allocation of frequency bands should be based on the wider consideration of the European consumer and not on the narrow interests of individual manufacturers.
6. That, so far as practical, the need to protect existing users should be taken into account. The SRDs shall operate on a non-interference and unprotected basis.
7. That manufacturers, when developing new products, should seek to use the existing frequency bands identified for SRDs before requesting new allocations of valuable spectrum. Request for additional harmonised spectrum should clearly be justified.
8. That the benefits to be gained from techniques that are becoming affordable for SRDs should be investigated. These techniques permit a number of polite access features to be built into integrated circuits for SRD transceivers which could permit more effective use of existing spectrum and facilitate access to new bands.

Table of contents

0 INTRODUCTION

This draft report has been developed by the European Conference of Postal and Telecommunications Administrations (CEPT) to the European Commission (EC) under a Mandate pursuant to article 4 of the Radio Spectrum Decision to analyse further harmonisation of frequency bands in use for Short Range Devices (SRDs). (see Annex 1)

The Mandate was issued to CEPT by 3rd March 2004. The report has been developed within the Short Range Device Maintenance Group (SRD/MG) with contributions from administrations and industry. The draft outline of the report was presented to the FM WG meeting in Copenhagen and the first interim report adopted by the ECC meeting July 2004 in accordance with the timescales of the Mandate.

Separate Mandates with relationship to Short Range Devices have been agreed regarding

- 5 GHz Radio LANs
- Short Range Radars
- Generic Ultra Wide Band

The current Mandate is expected to cover Short Range Devices in general with the objective to cover frequency harmonisation, legal certainty and support of long term pro innovation policies.

This report assesses the progress that has been made so far in providing harmonised frequency bands for SRDs. It also considers the principle that should be applied in the consideration of new frequency bands for SRDs. These take into account the relative benefits, economic and otherwise, of agreeing new harmonised SRD bands. These should encourage innovation and research whilst supporting the generic principles of maximising the benefits derived from spectrum, technology neutrality and proportionality.

1 BACKGROUND

1.1 "ERC Recommendation 70-03 Definition of Short Range Devices"

"In ERC Recommendation 70-03 the term "Short Range Devices" (SRD) is "intended to cover the radio transmitters which provide either unidirectional or bi-directional communication and which have low capability of causing interference to other radio equipment. SRDs use either integral, dedicated or external antennas and all modes of modulation can be permitted subject to relevant standards. Due to the many different services provided by these devices, no description can be exhaustive; however, the following categories are amongst those covered:

- Telecommand and Telecontrol
- Telemetry
- Alarms
- Speech and Video
- Wideband Data Transmission systems
- Railway applications

- Road Transport and Traffic Telematics
- Movement Detection and Alert
- Inductive applications
- Radio Frequency Identification Systems
- Medical Implants

1.2 Market development for SRDs in Europe

Beyond the ETSI studies, no detailed market information for each category of SRD application is available. The industry requests are focused on the operation of SRDs within wider bands to achieve higher data rates, with increased power levels and duty cycles by using different techniques e.g. Frequency Hopping Spread Spectrum (FHSS), Direct Sequence Spread Spectrum (DSSS) with low power density and low duty cycles and frequency agility with listen before each transmit.

The use of any technique such as adaptive frequency agility (AFA) with listen before each transmit protocols etc. to ease spectrum sharing should be encouraged as much as possible and stipulated in the ERC/REC 70-03 and relevant ERC Decisions.

The number of NON-specific SRD equipment categories is likely to grow in the near future due to the existing and future demands to this type of equipment. The innovative technologies such as Listen Before Talk will serve as a driving force for the development of these equipment.

The use of RFID is likely to grow considerably over the next few years. This is being driven by the plans of many major retailers to adopt the technology for the tracking of all goods sold in their stores. If this growth is realised in practice, it will place increasing strain on the spectrum that so far has been made available.

Cordless audio has expanded from cordless headsets (2 channel stereo) in the 863-865MHz band to a wide range of devices which are expanding to 10 channel systems for “surround sound” from televisions and audio systems. With the integration of these devices into PC’s as well as conventional audio and TV systems the market penetration has extensively increased

Radiomicrophones have similarly expanded from a mainly professional broadcast function to theatres with 40 plus channel systems and now to a non professional market which includes audio/visual presentations in all walks of life to complex use of multichannel systems for personal video recording and the extension of in ear monitoring (which have reduced the incidence of deafness in the industry) to small musical groups.

1.3 Community policies in relation to SRDs.

In accordance with the Mandate (Annex 1) the main EU policy objectives for further harmonisation of frequencies for SRDs are concentrated on a number of horisontal policy objectives including:

- Consolidation of the internal market with creation of a genuine common market
- The strategic goal set by the European Council in Lisbon for the Community *“to become the most competitive and dynamic knowledge-based economy in the world*

capable of sustainable economic growth with more and better jobs and greater social cohesion".

- Competition
- Promotion of innovation and research

and vertical policy objectives including

- Information society
- Collaboration in civil protection and in justice and home affairs
- Transport

The specific objectives for the report includes

- Availability of 'Class 1' equipment and strengthening of the legal basis for 'class 1' equipment for SRDs.
- More permissive conditions for use of SRDs
- Identifying band for generic SRD usage instead of specific applications
- Proposals for target deadlines for EU harmonisation and implementation of SRD bands and priorities for this activity.

1.4 Background for the development of ERC Recommendation 70-03

The ERC Recommendation 70-03 was developed by the CEPT during mid 1990s. Previously a number of CEPT recommendations had been in force on a number of specific low power devices designating sub bands for low power applications.

The adoption of the new ERC Recommendation was based on proposals from FM WG Project Team FM26. It was agreed to develop a general Recommendation with an Annex regarding Non-specific Short Range Devices and a number of new Annexes on specific types of Short Range Devices. As the regulation for Short Range Devices within CEPT countries was based on different types of legislation and frequency plans it was agreed to establish a list of National Restrictions allowing administrations to reserve their position on the implementation of particular frequency bands which may not be available in their country. Appendix 3 includes all these national restrictions and was originally the prerequisite for a CEPT agreement and implementation of the new ERC Recommendation 70-03.

Since the Tromsø meeting of the FM WG in 1997 where the ERC Recommendation was adopted a number of new annexes have been added and a restructuring of the information provided in ERC REC 70-03 has been agreed. The ERC REC 70-03 includes currently 13 Annexes covering a total of 67 sub-bands. The Recommendation is regularly updated to cover the introduction of new sub-bands or when other parameters have been altered such as where power levels have been increased. It also covers the introduction of new concepts or technologies such as Listen Before Talk (LBT) protocols and other techniques intended to improve spectrum efficiency and permit greater sharing of valuable spectrum.

The Short Range Device Maintenance Group (SRD/MG) was established by the Tromsø FM WG meeting to manage the update of the Recommendation including also the update of Appendix 3 with national restrictions.

The ERC Recommendation is in general implemented and transferred to the national legislation within the 25 EU member states and the EEA/EFTA countries Island, Liechtenstein, Norway

and Switzerland. The list of national restrictions provided in Appendix 3 reflects the limited implementation in some CEPT countries to particular sub-bands.

ERC Recommendation 70-03 was developed to reflect the actual usage of frequency spectrum for Short Range Devices in CEPT countries with the aim of promoting harmonisation. For a number of SRD applications, however, European harmonisation is not possible.

The principle of "lowest common denominator" is used in determining class 1 equipment" are based under the R&TTE Directive. In contrast, the ERC REC 70-03, which reflects the actual parameters permitted in CEPT member countries. as do The " common denominator" principle is also not in accordance with the principle the ERC/ECC Decisions adopted to provide more binding commitment to the implementation of SRD bands. Thus it can not be expected that all Annexes to ERC REC 70-03 and all ERC/ECC Decisions will be implemented in all EU member states and in all CEPT countries. The harmonised solution is only reflected in the class 1 equipment.

1.5 ERC/ECC Decisions to provide more binding commitment

In order to achieve more binding agreements regarding the use of spectrum for SRDs the ECC agreed to develop ERC/ECC Decisions for frequency sub-bands that had been implemented widely and thus achieve a strong element of harmonisation in this important area.

A total of 18 ERC Decision were adopted in 2001. The ECC meeting in March 2004 adopted 2 new ECC Decisions regarding the 457 kHz frequency for Avalanche Victims and the 433-434 MHz band for generic SRDs. Another two 24 GHz decisions were also considered for adoption, however, consideration of these decisions was postponed until the autumn 2004 meeting of ECC, pending further consideration of the use of the 24 GHz band.

The ERC/ECC Decisions on Short Range Devices are generally implemented by the EU member states including the new member states. As indicated in the details provided in Annex 2 to this report 9 Decisions have not been implemented in 1 or 2 of the EU member states. For some Decisions only partial implementation has been possible in 6 countries. Thus there is further scope for full implementation within EU member states and EEA/EFTA of the ERC/ECC Decisions regarding Short Range Devices.

1.6 Harmonised standards developed within ETSI

For SRDs harmonised standards have been developed in accordance with the provisions of the R&TTE Directive. A total of three generic short range device harmonised standards covering essential requirements under article 3.2 of the R&TTE Directive have been developed:

- *radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz (EN 300 330-3);*
- *radio equipment to be used in the 25 MHz to 1 000 MHz frequency range with power levels ranging up to 500 mW (EN 300 220-2);*
- *radio equipment to be used in the 1 GHz to 40 GHz frequency range (EN 300 440-2)."*

A total of 11 specific standards have also been developed for specific types of SRD-applications. Those standards are referred to in the Annexes to ERC REC 70-03.

The standard normally contains the technical requirements for SRD equipment for conformity assessment in accordance with the R&TTE Directive while designation of frequency bands, power levels and duty cycle is regulated within the CEPT deliverables. In particular the generic standards cover a range of power levels and duty cycles and thus the regulatory parameters must be found in ERC REC 70-03.

2 STATUS OF OTHER REGIONS

2.1 Japanese requirements for low-power non-licensed radio equipment

In Japan, establishment of a radio station requires a licence from the Ministry of Post and Telecommunications (MPHPT). However, radio stations emitting extremely low power and low-power radio stations can be established without obtaining a licence.

In Japan the tolerable value of electrical field strength 3 m distant from a radio station emitting extremely low power is the following:

Frequency band	Electric field strength (μV/m)	mW
$f \leq 322$ MHz	500	
322 MHz $< f \leq 10$ GHz	35	
10 GHz $< f \leq 150$ GHz	$3.5 \times f$ (1), (2)	
150 GHz $< f$	500	

(1) f (GHz).

(2) If 3.5 □ f □ 500 □V/m, the tolerable value is 500 □V/m.

Radio stations using only radio equipment 10 mW or less in antenna power and certified for technical standards compliance can be established without obtaining a licence if they are intended for specific SRD uses limited to the used of frequencies and with technical characteristics as specified by MPT.

2.2 Technical parameters and spectrum requirements for Low-power radio stations in Korea

Radio stations operated without individual license are listed in the Radio Law and classified into eight categories.

The electrical field strength of radio equipment for extremely low-power devices shall comply with the following table measured at the distance of 3 m.

Frequency band	Electric field strength in 3 m (µV/m)	mW
$f \leq 322$ MHz	500(1)	
322 MHz < $f \leq 10$ GHz	35	
$f \geq 10$ GHz	$3.5 \times f$(2), but not greater than 500	

(1) The near field measurement compensation factor 20 log (wavelength/[m]/6π) should be applied for the frequency of less than 15 MHz.

(2) Frequency in GHz

For typical SRD applications the electrical field strength shall be less than 200 µV/m measured at the distance of 500 m. A list of spectrum requirements and spectrum criteria are defined. Similarly requirements and power levels are defined for cordless telephones, citizen band transceivers, specific low-power radio stations including RLANs and vehicle identification systems.

2.3 Technical and operating parameters and spectrum requirements for SRDs currently used in China.

In China the use of SRDs need not be licensed, however the device has to pass examinations or tests as required by the radio regulatory office to ensure that the SRD perform within the limits given.

According to the rules issued by the State Radio Office the relevant formalities have to be adhered in order to develop, produce or import SRDs. SRDs, without type approval performed by the State Radio Office, cannot be produced, sold and used in China. Besides these general provisions additional specific regulations apply for a number of SRD applications.

SRDs are classified into twelve categories with maximum radiated power between 750 µW and 1 Watt, using frequency bands which are not in accordance with the European regulations except for some bands mentioned in ITU Radio Regulations footnotes 5.138 and 5.150 respectively.

2.4 ITU-R Recommendation SM.1538-1

The ITU-R Recommendation SM.1538-1 (Technical and Operating Parameters and Spectrum Requirements for Short-Range Radiocommunication Devices) suggests using a list of technical and operating parameters and spectrum requirements for short-range radio communication devices including the above from USA, Japan, Korea and Europe as guidance and that the parameters for SRD applications should not be more restrictive than indicated in the ITU-R Recommendation. The ITU-R Recommendation is currently under revision.

2.5 Mutual Recognition Agreements (MRAs) between countries

Administrations have in many cases found it beneficial and efficient to establish mutual agreements between countries/regions providing for recognition of the conformity test results of a recognized/accredited test laboratory in another country/region. Mutual Recognition Agreements (MRAs) have been established between among others EU and the USA, Canada, Australia, New Zealand and Japan.

2.6 FCC rules for legal low-power, non-licensed transmitters

Part 15 of the FCC Rules permits the operation of low power radio frequency devices without a license from the Commission or the need for frequency co-ordination. The technical standards for Part 15 are designed to ensure that there is a low probability that these devices will cause harmful interference to other users of the spectrum. Intentional radiators, i.e., transmitters, are permitted to operate under a set of general emission limits or under provisions that allow higher emission levels, than those for unintentional radiators, in certain frequency bands. Intentional radiators generally are not permitted to operate in certain sensitive or safety-related bands, designated as restricted bands, or in the bands allocated for television broadcasting. The measurement procedures for determining compliance with the technical requirements for Part 15 devices are provided or referenced within the rules.

A Part 15 transmitter must be tested and authorized before it may be marketed. There are two ways to obtain authorization: certification and verification and the authorization procedures for each type of part 15 transmitters are defined.

The general limits for any intentional transmitter is defined in Part 15 as:

Frequency (MHz)	**Field Strength (µmicrovoltsV/meter)**	**Measurement Distance (meters)**	mW
0.009 – 0.490	2400/F(kHz)	300	
0.490 – 1.705	24000/F(kHz)	30	
1.705 – 30.0	30	30	
30 – 88	100	3	
88 – 216	150	3	
216 – 960	200	3	
Above 960	500	3	

A list of Exception or Exclusions from the General Limits with specific allowed emission limits for specific sub bands.

The FCC has rules to limit the potential for harmful interference to licensed transmitters by low-power, non-licensed transmitters. In its rules, the FCC takes into account that different types of products that incorporate low-power transmitters have different potentials for causing harmful interference. As a result, the FCC's Rules are most restrictive on products that are most likely to cause harmful interference, and less restrictive on those that is least likely to cause interference.

2.6.1 Comparison between FCC part 15 and ERC Recommendation 70-03

The approach to market access and access to spectrum for SRDs differs in USA and Europe. The following highlights of advantages and disadvantages are provided in order to clarify some of the details in the regulatory process.

2.6.1.1 Market access

In **Europe** the placing on the market the manufacturer or their representative has to ensure that equipment complies with all relevant EU Directives. The aim is to allow manufacturers to get equipment onto the market quickly, however, the responsibility falls on to the manufacturer.
In **USA** the Authorisation is required from the FCC before equipment can be legally imported into or marketed. This Authorisation requirement helps to ensure that Part 15 transmitters comply with the Commission's technical standards. This is similar to the type approval scheme which the R&TTE Directive replaced.

2.6.1.2 Access to spectrum

In **Europe** a frequency allocation/designation is needed before a device can be used. Where there is a new application which requires a new band then ECC will identify a possible allocation/designation. Compatibility studies will then be carried out to determine whether the application can co-exist with existing services in the band. Once all the studies have been completed and the technical parameters have been established then the application may be used, subject to any national restriction which may apply. Depending on the application this process can take from a few months to a few years.
In **USA** the FCC Part 15 specifies the generic limit which varies with frequency. However, this limit is very low:

- 11 dBµA/m @ 10m at 490 kHz to 1 dBµA/m @ 10m at 1700 kHz
- -57 dBm above 30 MHz
- -54 dBm above 88 MHz
- -51 dBm above 216 MHz
- -43 dBm above 960 MHz.

These levels are at or near to current spurious emission levels for SRD transmitters as defined by ECC/ETSI.
In **Europe** there is currently not generic level adopted. For the band 148-1600 kHz a level of -5 dBµA/m @ 10 m has been considered based on compatibility studies and a revision to Annex 9 to ERC REC 70-03 to allow this is currently subject to public consultation.
In Germany a generic level of -5 dBµA/m @ 10 m applies to all inductive applications below 30 MHz and in United Kingdom a generic level of +9 dBµA/m @ 10 m applies. No interference due to this use of spectrum has been reported even if mass market products have been placed on the market in these countries applying these regulations.

In addition to the FCC generic limits there are numerous bands across the radio spectrum open to SRD applications with power levels approximately equivalent to 1 milliwatt.

2.6.1.3 Interference

In **Europe** a majority of the bands identified for SRDs are shared with other compatible services. This reduces the potential of interference between applications.
In **USA** Non-licensed transmitters operate on a variety of frequencies. They must share these frequencies with licensed transmitters and are prohibited from causing interference to licensed transmitters. Licensed primary and secondary services are protected from Part 15 devices. The FCC has rules to limit the potential for harmful interference to licensed transmitters by low-power, non-licensed transmitters. In its rules, the FCC takes into account that different types of products that incorporate low-power transmitters have different potentials for causing harmful interference. As a result, the FCC's Rules are most restrictive on products that are most likely to cause harmful interference, and less restrictive on those that is least likely to cause interference.

From an industry point of view the following considerations may apply:

2.6.1.4 Advantages with the FCC rules

1. The manufacturer has a much wider choice of spectrum than in Europe.
2. Clear technical limits show the operating parameters which the manufacturer can achieve for equipment in any part of the spectrum
3. The FCC approval of the equipment provides the manufacturer with a 'right' that will not be challenged by market surveillance unless the equipment causes interference
4. Where the regulation allows the spurious limits to be used this gives greater flexibility to the manufacturer
5. By using the whole spectrum allocation the density of devices in any part of the spectrum is reduced
6. The FCC removes the majority of the licensing and spectrum planning process for the devices covered by Part 15, making equipment easier to use for the end user.

2.6.1.5 Disadvantages with the FCC rules

1. Part 15 is a complex document
2. Mandatory third party testing
3. time taken for testing and approval process
4. Whilst the limits have been chosen to minimise interference, the proximity of different technologies in an enclosed space such as an office can provide a reduced service to the user
5. Those companies who have paid large license fees may feel cheated
6. No spectrum planning in the sense of ERC REC 70-03 to maximise compatibility of equipment within the same allocation.
7. For some devices the Part 15 limits will be inadequate by special cases allowing additional power is available with tighter specifications.

In summary Europe has

- Difficulty in identifying new bands for SRD applications
- Relatively easy to place equipment on to the European market

and the USA has

- Numerous frequency bands available, however, they tend to be shared with other licensed services which must be protected
- A mandatory type approval procedure and the equipment must be authorised by the FCC.

3 R&TTE DIRECTIVE AND CLASSIFICATION OF RADIO EQUIPMENT

The Commission Decision of 6 April 2000[1] establishing the initial classification of radio equipment and telecommunications terminal equipment and associated identifiers specified 'class-1' type equipment which can be placed on the market and be put into service without restrictions in EU member states. For SRD equipment to be 'class 1' the air interface has to be harmonised within member states.

The ECC has developed a list of proposals for 'class-1' equipment and decision has been taken by TCAM for a total of 30 types of SRD equipment to be classified as 'class 1'. The current list of 'class 1' equipment and a list of nearly harmonised bands were only one or two EU member states have not yet implemented a specific type of short range device is indicated in Annex 3.

With the enlargement of the EU by May 2004 the harmonisation of SRD-bands to achieve 'class 1' status covers 25 member countries and 4 EEA/EFTA countries. An analysis of the current situation is provided in chapter 4 of this report.

Harmonisation of frequency bands for Short Range Devices is ongoing and both current and new member states have taken initiatives to achieve common European harmonisation of SRD bands resulting in more candidate bands for 'class-1'.

4 ERC RECOMMENDATION 70-03 AND STATUS OF IMPLEMENTATION.

The prime purpose of the ERC Recommendation is to provide the agreed regulatory parameters for SRDs and to provide information about the relevant harmonised standards and ECC Reports with compatibility studies which have been used as the basis for the frequency designation in the ERC Recommendation. Recommendation 70-03 is updated on average 3 times a year and is widely used by industry and organisations as guidance on regulations for SRDs. Interest in this Recommendation is considerable – it is downloaded more than 1000 times a month from the ERO web site and the implementation overview is followed intensively.

Elements of the recommendation
Each of the 13 Annexes contains:

- The scope of the particular type of SRD related to each Annex,
- Regulatory information on the frequency band, power level and duty cycle allowed,
- Informative issues such as information about the relevant harmonised standard and technical information already contained in the Standard but relevant to the particular type of SRD-application and use of the frequency band.

The following Annexes have been agreed and are published in the Recommendation:

[1] Commission Decision of 6 April 2000 establishing the initial classification of radio equipment and telecommunications terminal equipment and associated identifiers.

4.1 Annex 1 for Non-Specific Short Range devices

The Annex provides regulatory parameters recommended primarily for Telemetry, Telecommand and Alarms, data in general and other similar applications.

The Annex covers currently 19 frequency bands and the 3 generic standards are referenced. Most of the frequency bands are also allocated to Industrial Scientific and Medical applications (ISM). Thus some of the bands are designated to SRD applications in their capacity as ISM bands but are not yet implemented as equipment and standards have not yet been developed. This is in particular relevant for Annex 1 band o), p) and q).

In the 800 MHz range it was intended to use the 868-870 MHz band for data communication while voice and audio in the 800 MHz band should be limited to 863-865 MHz See also information Regarding Annex 10, Annex 13 and the ECC Report 11 with a Strategic plans for the future use of the frequency bands 862-870 MHz and 2400-2483.5 MHz for Short Range Devices.

In general Video transmissions should use spectrum above 2.4 GHz and Audio and Voice signals should be avoided in the band 433.050-434.790 MHz.

10 of the sub-bands are covered by ERC Decisions and a new ECC Decision finally adopted in March 2004 covers another 3 sub-bands in the 434 MHz band.

The current implementation situation (March 2004)

Annex and frequency band	**Implemented EU/EEA/EFTA**	Limited implementation	Not implemented	**Implemented new members**	Limited implementation	Not implemented	**Implemented other CEPT**	Limited	Not impl.	No info
Annex 1 - Non Specific SRD										
Annex 1A 6765-6795 kHz	18	1		10			3		1	
Annex 1B 13.553-13.567 MHz	18	1		10			3		1	
Annex 1C 26.957-27.283 MHz	14	5		10			4			
Annex 1D 40.660-40.700 MHz	19			10			4			
Annex 1R 138.2-138.45 MHz	4		15	4		6				
Annex 1E 433.050-434.790 MHz	19			9	1		4			
Annex 1E1 433.050-434.790 MHz	17		1	7		2		1		5
Annex 1E2 434.040-434.790 MHz	17			7		2		1		6
Annex 1F 868.000-868.600 MHz	19			9		1	1		3	
Annex 1G 868.700-869.200 MHz	19			9		1	1		3	
Annex 1H - 869.3-869.4 MHz	16		2	7		1				3
Annex 1I – 869.400-869.650 MHz	18	1		9		1	1		3	
Annex 1k 869.700-870.000 MHz	19			9		1		1	3	
Annex 1L 2400-2483.5 MHz	18	1		10			3	1		
Annex 1M 5725-5875 MHz	19			10			4			
Annex 1N 24.00–24.25 GHz	15	2	2	10			3	1		
Annex 1O 61.0-61.5 GHz	14		5	8		2	1	1	2	
Annex 1P 122-123 GHz	13		6	8		2	2		2	
Annex 1Q 244-246 GHz	13		6	8		2	2	1	1	

Analysis of the implementation

The Non-specific SRD bands are in general widely implemented in Europe.

The frequency band 138.2-138.45 MHz was chosen on request by some administrations realising that the band could not be implemented all over Europe and that the use of this band would probably be very specific on animal tracking. It is clear that the particular frequency band can not be harmonised European wide as the band is used for military services in most countries. The ISM bands o), p) and q) will be made available if and when standards and equipment are developed.

There is a need to consider in detail the still outstanding full implementation of some of the bands both within current and future member states. Priorities and timescales should be agreed with administrations involved**.**

4.2 Annex 2 for Devices Detecting Avalanche Victims

The frequency 457 kHz is designated for short range devices detecting avalanche victims. The equipment is sold all over Europe but is only used in connection with skiing and where avalanches may occur.

ECC Decision (04)01 was adopted by ECC in March 2004.

The current implementation situation (March 2004)

Annex and frequency band	**Implemented EU/EEA/EFTA**	Limited implementation	Not implemented	**Implemented new members**	Limited implementation	Not implemented	**Implemented other CEPT**	Limited	Not impl.	No info
Annex 2 Avalanche Victims										
Annex 2B 457 kHz	15		4	7		3	3		1	

Analysis of the implementation

There is still not full implementation within EU member states of this band.

Some administrations in countries not having mountains and avalanches had designated this particular frequency for other purposes and are therefore reluctant to allow such devices as ‘class 1’ equipment on this frequency. Recent information indicates, however, that legal initiatives have been taken to allow ‘class 1’ for this frequency.

Timescales should be agreed with administrations concerned.

4.3 Annex 3 Wideband Data Transmission systems including Radio LANs

The Annex covers frequency designation for wireless LANs/wireless access points within the 2.45 GHz – 5 GHz and 17 GHz bands and specific harmonised standards are referred to in the Annex.

An ERC Decision was adopted in 2001 for the 2.45 GHz band and a separate ERC Decision was adopted in 1998 on the use of the 5 GHz band. With the positive results of the WRC-03 on 5 GHz RLANs this ERC Decision is subject to revision and the final adoption of the revised Decision is envisaged in November 2004.

The frequency band 17.1-17.3 GHz had been designated for RLAN systems on the request of industry, but equipment and standards had not yet been developed. A liaison statement from ETSI BRAN indicates the interest of industry for both Point to Point wireless links and Wireless PANs and that a system reference document (SRDoc) is in preparation and thus the band could be implemented within the next couple of years.

The current implementation situation (March 2004)

Annex and frequency band	**Implemented EU/EEA/EFTA**	Limited implementation	Not implemented	**Implemented new members**	Limited implementation	Not implemented	**Implemented other CEPT**	Limited	Not impl.	No info
Annex 3 Wideband Data Transmission										
Annex 3A 2400-2483.5 MHz	18	1		10			3	1		
Annex 3B 5150-5350 MHz	16	3		9	1		1	2	1	
Annex 3C 5470-5725 MHz	16		3	7		3	1		3	
Annex 3D 17.1–17.3 GHz	11		8	6		4	1	1	2	

Analysis of the implementation

The 2.45 GHz band is very widely implemented within Europe and only one administration still has a limitation on this band.

The 5 GHz bands are in general used for other services and applications such as the Radiolocation Service and the Earth Exploration Satellite Service. It is envisaged that the result of the WRC-03 will pave the way for more common implementation of this band in Europe.

Detailed analysis is, however, needed. Priorities and timescales must be agreed with the administrations concerned.

The 17 GHz band is awaiting technology and equipment development. Timescales for full implementation should be developed in close cooperation with ETSI on this band.

4.4 Annex 4 Railway applications

The annex covers frequency issues for railway applications including automatic vehicle identification (AVI), Eurobalise and Euroloop systems (train control systems).

The frequency band 2446-2454 MHz (ISM band) has been designated to AVI in Europe [as well as in other parts of the world].

The frequency 27.095 MHz is used for Eurobalise and Euroloop downlink (train to ground) and the frequencies 4234 and 4516 kHz is used for Euroloop and Eurobalise uplink (ground to train). The system is only active when the train is passing.

The current implementation situation (March 2004)

Annex and frequency band	Implemented EU/EEA/EFTA	Limited implementation	Not implemented	Implemented new members	Limited implementation	Not implemented	Implemented other CEPT	Limited	Not impl.	No info
Annex 4 Railway applications										
Annex 4A 2446-2454 MHz	13	1	5	8		2	2	1	1	
Annex 4B 27.095 MHz	15		4	9		1		1	3	
Annex 4C 4515 kHz	11		8	9		1			4	

Analysis of the implementation

The system is widely implemented in Europe. However, it is not used in some countries – decided by the train operators. Iceland has no train network.

Detailed analysis is, however, needed. Priorities and timescales must be agreed with the administrations concerned. (Compare implementation of band B and C as those bands are part of the same system).

4.5 Annex 5 Road Transport and Traffic Telematics (RTTT)

The annex covers frequency designation for RTTT applications in the 5.8 GHz, 63 GHz and the 76 GHz band. Although outside the scope of radio regulations and hence outside the scope of Rec. 70-03, the infra-red band is also important because this is the subject of regulation and standards that are more precise than that generally allowed for near light devices, and are approved ETSI work items.

The 5 GHz band is in use for toll, access control and information systems, and potentially for Electronic vehicle registration Identification systems.

Millimetre band systems in the 63-64 GHz band are currently under development as extensions of available and installed and development systems in the 25-30 GHz band. In Japan 60 GHz systems are already in operation in test tracks, and there has been agreement between experts in Europe and Japan that the currently allocated 63-64 GHz European band would be appropriate. For the 63-64 GHz band, an ETSI System Reference Document, which addresses power levels and harmonisation of the use of this band, is currently under preparation. ETSI currently plans to deliver the document to the ECC in mid-January 2005.

The frequency band 76-77 GHz is in use for vehicle and infrastructure radar systems (long range radars). Short Range Radars needs to be included in this annex for the 77-81 GHz band.

ETSI is aware of the coming requirement for continuous communications with vehicles, particularly for E-safety implementations. ETSI, working in close cooperation with ISO, is developing Standards and test procedures to support networking between media and to support safety messaging over multiple media. In addition to working with 5 GHz, Millimetre and Infra-red media, these networking protocols will also support networking using GPRS and 3G cellular technology. In addition to the related Standards under development for 5GHz, Millimetre and Infra-red media for continuous communications with vehicles, ETSI are also developing Standards to enable the use of GPRS and 3G cellular media for continuous communications with vehicles.

An ERC Decision covering all 4 bands was adopted in 2001.

The current implementation situation (March 2004)

Annex and frequency band	**Implemented EU/EEA/EFTA**	Limited implementation	Not implemented	**Implemented new members**	Limited implementation	Not implemented	**Implemented other CEPT**	Limited	Not impl.	No info
Annex 5 RTTT										
Annex 5A 5795–5805 MHz	13	5	1	8	2		2		2	
Annex 5B 5805-5815 MHz	13	3	3	8	1	1	1	1	2	
Annex 5C 63-64 GHz	11		7	8		2	1	1	2	
Annex 5D 76-77 GHz	19			9		1	1	1	2	

Analysis of the implementation

The bands are widely implemented but the 5 GHz bands have limitations which need further detailed consideration with agreement on priorities and timescales.

For the 63-64 GHz band a System Reference Document is needed from ETSI in order to agree on power levels and harmonisation of the use of this band.

4.6 Annex 6 Detection of movement and Alert

The annex covers frequency designation for SRD equipment for detecting movement and alert in the 2.45 GHz, 9 GHz, 10 GHz, 13 GHz and 24 GHz bands. Most of the frequency bands are also used for other services and the original intention with this Annex was to provide a possibility for administrations to choose one or more of the bands for national implementation.

The 2.45 GHz band is widely available in Europe and an ERC Decision for this band was adopted in 2001. An ECC Decision for the 24 GHz band has been subject to public consultation and adoption by ECC is envisaged autumn 2004.

The current implementation situation (March 2004)

Annex and frequency band	**Implemented EU/EEA/EFTA**	Limited implementation	Not implemented	**Implemented new members**	Limited implementation	Not implemented	**Implemented other CEPT**	Limited	Not impl.	No info
Annex 6 Movement Detection										
Annex 6A 2400-2483.5 MHz	17	2		10			2		2	
Annex 6B 9200-9500 MHz	12	1	6	8		2	2		2	
Annex 6C 9500-9975 MHz	14	2	3	6		4	2		2	
Annex 6D 10.5-10.6 GHz	9	6	4	4	2	4		1	3	
Annex 6E 13.4-14.0 GHz	16		3	8		2	1		3	
Annex 6F 24.05-24.25 GHz	17	2		10			2		2	

Analysis of the implementation
The frequency bands for detection of movement and alert were not envisaged as harmonised bands but rather as a choice for administrations dependent on the other services in the bands to be taken into account on a national basis.

The analysis of implementation indicates, however, a possibility for further harmonisation of one or more of the bands, and this option should be considered further indicating priorities and timescales.

4.7 Annex 7 Alarms

The annex covers frequency designation for SRD equipment for Alarms in 4 sub bands within the frequency band 868.6-869.25 MHz including the special designation for Social Alarms in the band 869.2-869.25 MHz.

An ERC Decision was adopted for Social Alarms in 1997 and a specific decision covering the other 3 bands was adopted in 2001.

The current implementation situation (March 2004)

Annex and frequency band	**Implemented EU/EEA/EFTA**	Limited implementation	Not implemented	**Implemented new members**	Limited implementation	Not implemented	**Implemented other CEPT**	Limited	Not impl.	No info
Annex 7 Alarms										
Annex 7A 868.6-868.7 MHz	19			9		1	2		2	
Annex 7B 869.25-869.30 MHz	19			9		1	2		2	
Annex 7C 869.650-869.700 MHz	19			9		1	2		2	
Annex 7D 869.2-869.25 MHz	19			9		1	3		1	

Analysis of the implementation
The bands are widely implemented within Europe. Only one of the new members still has difficulties in implementation of the 800 MHz bands for SRD applications. Further detailed consideration should be given to this issue in order to achieve the full harmonisation of this band.

4.8 Annex 8 Model control

The annex covers frequency designation for SRD equipment for Model Control on 3 groups of specific frequencies in the 27 MHz, 35 MHz and the 40 MHz bands. The frequency bands are intended for controlling the movement of a model in the air, on land or over/under the water surface. The 35 MHz band is intended for flying models only. The bands are not exclusive for this type of use but are widely implemented in Europe and separate ERC Decisions for each of the bands were adopted in 2001.

The current implementation situation (March 2004)

Annex and frequency band	Implemented EU/EEA/EFTA	Limited implementation	Not implemented	Implemented new members	Limited implementation	Not implemented	Implemented other CEPT	Limited	Not impl.	No info
Annex 8 Model Control										
Annex 8A 29.995,27.045,27.095, 27.145,27.195	18		1	9	1		3		1	
Annex 8B 34.995-35.225 MHz	13	4	1	9	1		2	1	1	
Annex 8C 40.665,40.675 40.685, 40.695 MHz	18		1	9	1		3		1	

Analysis of the implementation

The bands are widely implemented in Europe. However, limitations by one or two member states and the non implementation by one administration need further consideration with timescales for a possible implementation.

4.9 Annex 9 Inductive applications

The annex covers frequency designation for SRD equipment for inductive applications within 14 different sub-bands ranging from 9 kHz to 27.283 MHz. Inductive applications cover a range of detailed applications including car immobilisers, animal identification, alarm systems, cable detection, waste management, personal identification, wireless voice links, access control, proximity sensors, antitheft systems including RF anti-theft induction systems, data transfer to handheld devices, automatic article identification, wireless control systems and automatic road tolling. It should be noted that other types of anti-theft systems can be operated in accordance with other relevant annexes.

Most of the bands are widely implemented in Europe and 4 ERC Decision were adopted in 2001 covering most of the bands. New sub bands have recently been included in this annex.

A proposal to allow inductive equipment below a certain field strength level without further compatibility studies and regulation is currently considered in Europe. Such regulation is already introduced in a number of European countries including Germany, Finland,UK.

The current implementation situation (March 2004)

Annex and frequency band	Implemented EU/EEA/EFTA	Limited implementation	Not implemented	Implemented new members	Limited implementation	Not implemented	Implemented other CEPT	Limited	Not impl.	No info
Annex 9 Inductive applications										
Annex 9AA 9-59.750 kHz	17	2		10					4	
Annex 9AB 59.750-60.250 kHz	18	1		10					4	
Annex 9AC 60.250-70 kHz	18	1		10					4	
Annex 9B 70-119 kHz	18	1		10					4	
Annex 9C 119-135 kHz	18	1		10					4	
Annex 9C1 135-140 kHz	11		5	6		3				8
Annex 9C2 140-148.5 kHz	11		5	6		3				8
Annex 9D 6765-6795 kHz	19			10			1		3	

Annex 9E 7400-8800 kHz	20			10					3	
Annex 9F 13.553-13.567 MHz	19			10			1		3	
Annex 9G 26.957-27.283 MHz	19		1	10			1		2	
Annex 9K 3155-3400 kHz	11		7	5	1	3				7

Analysis of the implementation

Annex 9 is widely implemented in Europe and in particular in the new member states.
A limitation in one country needs further consideration and timescales for implementation should be considered in detail.
In particular the band 135-148.5 kHz is not fully harmonised. This band is used in connection with band 9c) 119-135 kHz and should be implemented fully as soon as possible.

Detailed consideration should be given to this band in order to achieve full harmonisation within member states.

4.10 Annex 10 Radio microphones

The annex covers frequency designation for SRD equipment for radio microphones 6 different frequency ranges from 29.7 to 1800 MHz. the applications are Narrowband audio, Aids for handicapped and Radio microphones.

The frequency bands designated are typically in frequency ranges used by the Broadcasting Service for Television applications. Thus both TV-band III, IV and V are mentioned. These bands are not harmonised within Europe as the intention is to use the radio microphones on a tuning range basis and on a strictly non interference and non protected basis. This is becoming increasingly difficult with the implementation of DVB-T

The frequency band 863-865 MHz is extensively used for radio microphones in Europe.

The current implementation situation (March 2004)

Annex and frequency band	**Implemented EU/EEA/EFTA**	Limited implementation	Not implemented	**Implemented new members**	Limited implementation	Not implemented	**Implemented other CEPT**	Limited	Not impl.	No info
Annex 10 – Radio microphones										
Annex 10A 29.7-47 MHz	5	12	2	4	5	1		2	2	
Annex 10B 173.965-174.015 MHz	8	2	9	9		1			4	
Annex 10C 863-865 MHz	19			10				1	3	
Annex 10D 174-216 MHz	13	3	3	8	1	1	1		3	
Annex 10E 470-862 MHz	11	6	2	8	1	1		3	1	
Annex 10F 1785-1800 MHz	11	6	2	7		3			4	

Analysis of the implementation

The bands used by the Broadcasting Service 10D), 10E) are not intended to be harmonised but to be chosen by administrations as it fits with the broadcasting use on a national basis.
The frequency band 863-865 MHz is fully harmonised and also ‘class 1’
Further consideration should be given to stronger harmonisation initiatives in the other bands.

4.11 Annex 11 Radio frequency identification applications

The annex covers frequency designation for SRD equipment for RFIDs in the frequency band 2446-2454 MHz (ISM). The applications include automatic article identification, asset tracking, alarm systems, waste management, personal identification, access control, proximity sensors, anti-theft systems, location systems, data transfer to handheld devices and wireless control systems. It should be noted that other types of RFID systems can be operated in accordance with other relevant annexes.

The Annex was added in 2002 and has not yet been fully harmonised within Europe. A specific restriction to use within the boundaries of a building in duty cycle for systems with an eirp level above 500mW has been agreed in accordance with the compatibility studies with other services.

New bands are suggested in the 865-868 MHz band.

The current implementation situation (March 2004)

Annex and frequency band	**Implemented EU/EEA/EFTA**	Limited implementation	Not implemented	**Implemented new members**	Limited implementation	Not implemented	**Implemented other CEPT**	Limited	Not impl.	No info
Annex 11 Radio Frequency Identification (RFID)										
Annex 11a 2446-2454 MHz	13	3	3	5	1	2			1	5

Analysis of the implementation

Harmonisation of the use needed and should be further considered.

4.12 Annex 12 Ultra Low Power Active Medical Implants.

The annex covers frequency designation for SRD equipment for ULP-AMI applications in the band 402-405 MHz and within the range 9-315 kHz.
The 400 MHz band is widely implemented in Europe and an ERC Decision was adopted for this frequency band in 2001. The 9-315 kHz band was designated in 2002. Further frequency bands have been suggested.

The current implementation situation (March 2004)

Annex and frequency band	**Implemented EU/EEA/EFTA**	Limited implementation	Not implemented	**Implemented new members**	Limited implementation	Not implemented	**Implemented other CEPT**	Limited	Not impl.	No info
Annex 12 Medical Implants										
Annex 12A 402-405 MHz	19			10						4
Annex 12B 9-315 kHz	14	1	2	5		4				8

Analysis of the implementation

Full harmonisation only achieved for one band.
Detailed consideration should be given to full harmonisation of the other bands for ULP-AMI.

4.13 Annex 13 Wireless Audio Applications

The annex covers frequency designation for SRD equipment for wireless audio applications including cordless loudspeakers; cordless headphones; cordless headphones for portable use, for example portable CD, cassette or radio devices carried on a person; cordless headphones for use in a vehicle, for example for use with a radio or mobile telephone etc; in-ear monitoring, for use with concerts or other stage productions. The frequency band 863-865 MHz is designated and is widely used within Europe. An ERC Decision was adopted in 2001 for this particular frequency band.

In order to allow narrow band analogue voice applications such as baby monitors etc. a 200 kHz band was designated in 864-8-865 MHz and the generic standard EN 300 220 was referenced.

The current implementation situation (March 2004)

Annex and frequency band	**Implemented EU/EEA/EFTA**	Limited implementation	Not implemented	**Implemented new members**	Limited implementation	Not implemented	**Implemented other CEPT**	Limited	Not impl.	No info
Annex 13 Wireless Audio										
Annex 13A 863-865 MHz	19			10				1	3	
Annex 13B 864.8-865 MHz	17		2	7		1		1		5

Analysis of the implementation

Full harmonisation achieved for the use of the band 863-865 MHz. Further consideration of the band 864-8-865 MHz is still needed in order to achieve harmonisation.

4.14 General analysis on implementation

Most SRD sub bands are widely implemented both in current EU member states (March 2004) and the new member states. As indicated in the table below consideration is still needed to achieve full harmonisation and legal certainty on the use of a number of SRD bands.

Annex and frequency band	**Implemented EU/EEA/EFTA**	Limited implementation	Not implemented	**Implemented new members**	Limited implementation	Not implemented	**Implemented other CEPT**	Limited	Not impl.	No info
Average per band	**15**	**1**	**2**	**8**	**0**	**1**	**1**	**0**	**2**	**1**

It must, however, be realised that not all bands are subject to full harmonisation in particular sub bands in Annex 6 and Annex 10.

5 PRIORITIES AND TIMESCALES FOR HARMONISATION AND REASONS FOR NON IMPLEMENTATION

- An analysis of the individual national restrictions preventing full harmonisation within EU/EEA/EFTA should be made.
- Proposals for priorities and timescales for full implementation should be developed in close cooperation with the individual administrations since non implementation or limited implementation is usually result of actual serious difficulties related to current use of the bands under consideration. A general aim of class 1 status for typically generic SRD bands and for as many specific bands should be achieved.
- A detailed questionnaire has been distributed to Administrations in order to achieve information about priorities and timescales.

5.1 5bis Consideration of the benefits of harmonisation

In considering the Community dimension to making spectrum available for Surds, it is necessary to consider whether or not a particular exempt band should be harmonised. SRDs often, but not always, have characteristics that lend themselves to a harmonised approach. In many cases they are internationally mobile and users value the opportunity to use them in other countries. There may be economies of scale in their manufacture. Moreover, it can be difficult to prevent SRDs from being taken across national borders and users may, inadvertently or otherwise, use them even where their use is not authorised. This is exacerbated if they are mass-produced, low-cost items that are widely available through a range of retail outlets. In these circumstances, it is difficult to prevent them from appearing on the market, especially if they can legally be used and sold in another member state.

It is also necessary to consider, if a band is to be harmonised, what technical standards, service restrictions and operational constraints (e.g. frequencies, spectrum masks and power levels). These should be as generic as possible so as not to favour particular technologies or products.

However, the above questions, important as they are, cannot be considered in isolation. There is an important prior question about whether spectrum should be made available on an unlicensed basis or reserved for licensed applications.

A possible framework for deciding whether or not to designate a band for general authorisation involves three key stages:

- Determine the most likely use of the band. This could involve consultation with manufacturers of potentially exempt equipment.
- Decide whether individual or general authorisation will be more beneficial. This involves an economic assessment of alternative uses and consideration of congestion affecting similar bands or similar uses.
- If general authorisation is indicated, determine the regulatory restrictions that should apply. The regulator will need to make a judgment as to the most appropriate level of restriction.

6 PROCESS OF DESIGNATION AND IMPLEMENTATION OF FREQUENCY BANDS FOR SRD APPLICATIONS

The process of designation of new frequency bands for generic or specific SRDs follows the cooperation agreement between ECC and ETSI.

The process includes the following elements:

- **Presentation of industry requirements**. The requirements are developed based on the need to fulfil operational needs and to ensure a quick market access at affordable prices. The industry requirements are presented in a System Reference Document which is an approved ETSI deliverable (Technical Report). The process of developing a system reference document is time consuming but very well received by the ECC and provides a solid background for the frequency management process.
- **General consideration of the frequency allocations requested.** The FM WG evaluates the SRDoc and forwards it to the SRD/MG for detailed consideration. The document may be forwarded directly to the Project Team SE24 as well for initial compatibility studies.
- **Compatibility studies**. SE24, SE7 or other relevant SE WG Project Teams develop the necessary compatibility studies vis-à-vis existing services in the band. Representatives from industry and interest organisations participate in the work requesting the necessary protection of existing services and normally a compromise will be found. The studies are, however, often based on conservative protection criteria and include safeguards to protect other services. Live tests and measurements are only very seldom used in the compatibility studies.
- **Frequency designation** and update of the ERC REC 70-03 in SRD/MG and the FM WG is based on the compatibility studies and is expected to meet the general and specific requirements from European policies and also include economic studies and other benefits/drawbacks of the proposed SRD use and alternative uses in the band.

It is clear that the process of designating spectrum for new SRD applications can be very slow and time consuming. Even if elements within the process are carried out in parallel the time taken to reach the decision is often unduly extended. Simple and straight forward frequency designation for a new SRD band would take at least 1-1.5 years while more complicated issues involving a number of new services may take more than 2 years.

The process of public consultation for ECC Decisions and ECC Recommendations and Reports extends this process further adding another 6 months to the process.

To industry requesting frequency spectrum for new and innovative SRD applications in competition with other regions such a frequency allocation process is too slow as well as resource consuming. A general consideration of the frequency management process within ECC is under consideration within the ECC PT7.

6.1 Typical timescales for frequency availability and proposals for improvements

Further work needs to done in CEPT on e.g., description of typical timescales and milestones including the process of achieving legal certainty by class 1 equipment, proposals for more certainty in the process with agreed milestones and proposals for a shorter process including

implementation on a national and on a European basis. The concept of very light regulation allowing generic rather than specific SRDs should be applied in as many bands as possible but will require special care as the applications, and their conditions of deployment, that can be developed in the long term are very difficult to predict.

7 NATIONAL IMPLEMENTATION PROCESSES

The process for implementing a new SRD frequency band or altering the terms and conditions under which an existing band has been implemented varies slightly from country to country. As a guide, details of the implementation process in the UK, France, Germany and Denmark are set out in Annex 4 to this report.

As it appears from the contributions, the process of implementation is based on national consultations which lead to a certain delay and in some cases to national restrictions in the implementation of the new bands.

8 FUTURE FREQUENCY DESIGNATION FOR SRDS.

This chapter describes the new innovative technologies to be introduced in Short Range Devices such as the use of Listen before talk (LBT) instead of duty cycle and Adaptive Frequency Agility (AFA). A generic scheme for Listen-before-Talk (LBT) and frequency agility are described in order to permit a dynamic channel allocation.

A listen-mode is understood to be the action taken by a device to detect an unoccupied sub-band or channel prior to transmitting. Listen-before-talk then becomes the combination of listen modes followed by the transmit modes.

Frequency agility can be defined as the ability to select an unoccupied channel for operation in order to avoid other users within the same band and hence minimize interference.

The proposed scheme here is intended to be suitable for all applications and caters for a wide range of user requirements, which include:

- Receiver wake up, establish communication, send a short message and stand down. For battery-operated equipment the time spent establishing the link is important.
- To set up a link in order to transfer large amounts of data. This might take the form of long packets with short return acknowledgements.
- To rapidly switch between transmit and receive, sending short bursts in each direction in order to simulate a full duplex data link.
- To organise multiple nodes with a network.

The basic principle for LBT is that equipment can transmit at any time if the channel is free. If the channel is busy the equipment is prevented from transmitting until the channel is free or the frequency is changed to a free channel.

As one of the most possible bands to be widely used by SRDs 863-870 MHz band is considered. A Strategic Plan for future use by Short Range Devices in the Band 863 – 870 MHz was developed as part of DSI Phase III.

An equipment with LBT functionality will be allowed to operate over the entire 863-870 MHz band excluding the frequency range for social alarms. According to ECC Report 37 it is assumed that equipment shall be compatible with the existing SRDs without LBT operating in 863-865 MHz and 868 - 870 MHz bands as regulated by Annex 1, Annex 7 (alarms, in general), Annex 10 and Annex 13 (audio applications) of ERC Recommendation 70-03.

The band 868-870 MHz is designated for different types of SRD applications with defined duty cycle and power levels in order to allow a particular type of application to develop within a particular sub-band. Thus Annex 1 to ERC REC 70-03 contains the regulations for NON-specific SRD applications within 868-870 MHz and Annex 7 contains sub bands with technical parameters specifically designated for alarm systems including Social alarms within the band 869.20 - 869.25 MHz.

8.1 Generic limits for inductive applications

Possible solutions for inductive applications below 30 MHz including common thresholds of magnetic field strength and consideration of possible general power threshold where SRDs may be allowed without specific frequency designation should be developed.

As mentioned above -5 dBµA/m generic limit has been introduced in Germany and +9 dBµA/m in United Kingdom with no reported interference problems. Compatibility studies are ongoing within the Project Team SE24 but a generic limit for inductive applications below 30 MHz may not be achieved across Europe.
Several administrations and frequency users argue that this should not be retained as an argument for supporting the adoption of such generic regulation as most devices currently deployed under this generic regulation operates with power levels well below the -5 dBµA/m generic limit.
Furthermore, calculations conducted by CEPT project team SE24 provide relative high protection distances, based on non-conservative protection criteria. Typical protection distances found in the range 3-30 MHz are indeed in the order of 300 m and suggest caution before implementing a regulation that could potentially address a mass market for unlicensed devices.

It has been suggested that practical tests and measurements are carried out to supplement the theoretical studies in the SE Project Team.

8.2 SRD transmitters in the FM Broadcasting band

The SRD/MG had noted that during the past 3 month period more than 1,250,000 new devices had been imported illegally into the European market. From tests carried out in the USA where FCC Part 15 allows a field strength of 250 µV/m no interference could be discovered outside the cars and in general no interference problems had been reported when using this SRD device in Europe.

A possible technical solution is under development within the SRD/MG in close cooperation with ETSI. CEPT administrations have initiated tests and measurements to confirm a proposed solution to allow SRD transmitters in parts of the FM broadcasting band with limited power level.

8.3 New frequency bands

New frequency bands for SRD applications should be considered in particular using the LBT applications with timeout timer to provide the necessary protection of other services. In particular attention should be given to the future use of the following bands and services but without the prior assumption that they should be made available for SRD applications to the exclusion of alternatives:

- Possible use of the frequency range 30-87.5 MHz including TV band 1
- Possible use of VHF bands including 169 MHz band (ERMES)
- Aids for the handicapped (hearing aids)
- Further spectrum in the 400 MHz bands.

In addition to the above, telemetry is increasingly more important within the medical sector and is used intensively in hospitals and other related areas. In the future hospitals will be forced to reduce costs and this will leads to reductions in personnel. At the same time the proportion of elderly people will be higher and the need of hospital treatment will increase. This will lead to a situation where medical telemetry is needed even more than today. New frequency bands for Medical Telemetry are also required to support the Commission's *e*-health initiative. Consideration of frequencies for medical telemetry has already been started within SRD/MG.

9 CONCLUSIONS AND RECOMMENDATIONS

This report recognises the importance of the Short Range Device industry to the EU and the benefits to be derived from this fast moving and innovative sector. It also recognises the need to ensure that the industry has sufficient spectrum to both meet existing needs and encourage the development of new products. However, against a background of increasing spectrum scarcity, the provision of this spectrum for SRDs should take into account a range of considerations such as economic benefits, spectrum efficiency, competition, consumer benefits etc and balance these against the benefits from non-SRD applications that may require individual authorisation.

If it is decided in the light of that assessment to devote a band to SRDs, in considering harmonisation, it is necessary to consider what technical standards, services restrictions and operational constraints (eg frequencies, spectrum masks and power levels) should be applied. These should be as generic as possible so as not to favour particular technologies or products.

It is recommended that

1. In considering frequency bands for harmonisation, the relative economic and other benefits should be taken into account
2. The most likely use of the band should be determined. This could involve consultation with manufacturers of potentially licence exempt equipment
3. In deciding whether individual or general authorisation will be more beneficial, there should be an economic assessment of alternative uses and consideration of congestion affecting similar bands or similar uses
4. If a general authorisation is indicated in determining the regulatory restrictions that should apply the regulator should make a judgement as to the most appropriate level of restriction
5. The allocation of frequency bands should be based on the wider consideration of the European consumer and not on the narrow interests of individual manufacturers.

6. That, so far as practical, the need to protect existing users should be taken into account. The SRDs shall operate on a non-interference and unprotected basis.
7. That manufacturers, when developing new products, should seek to use the existing frequency bands identified for SRDs before requesting new allocations of valuable spectrum. Request for additional harmonised spectrum should clearly be justified.
8. That the benefits to be gained from techniques that are becoming affordable for SRDs should be investigated. These techniques permit a number of polite access features to be built into integrated circuits for SRD transceivers which could permit more effective use of existing spectrum and facilitate access to new bands.

9.1 Detailed recommendations for Annexes of ERC REC 70-03:

Annex 1: The Non-specific SRD bands are widely implemented in Europe. There is a need to consider in detail the still outstanding full implementation of some of the bands both within current and future member states. Priorities and timescales should be agreed with administrations involved**.**

Annex 2: There is still not full implementation within EU member states of the only band for devices for detecting avalanche victims. Some administrations in countries not having mountains and avalanches had designated this particular frequency for other purposes and are therefore reluctant to allow such devices as 'class 1' equipment on this frequency. Recent information indicates, however, that legal initiatives have been taken to allow 'class 1' for this frequency. Timescales should be agreed with administrations concerned.

Annex 3: The 2.45 GHz band is very widely implemented within Europe and only one administration still has a limitation on this band.

The 5 GHz bands are in general used for other services and applications such as the Radiolocation Service and the Earth Exploration Satellite Service. Detailed analysis is, however, needed. Priorities and timescales must be agreed with the administrations concerned.

The 17 GHz band is awaiting technology and equipment development. Timescales for full implementation should be developed in close cooperation with ETSI on this band.

Annex 4: The system is widely implemented in Europe. However, it is not used in some countries. Detailed analysis is needed. Priorities and timescales must be agreed with the administrations concerned.

Annex 5: The bands are widely implemented but the 5 GHz bands have limitations which need further detailed consideration with agreement on priorities and timescales.

For the 63-64 GHz band a System Reference Document is needed from ETSI in order to agree on power levels and harmonisation of the use of this band.

Annex 6: The frequency bands for detection of movement and alert were not envisaged as harmonised bands but rather as a choice for administrations dependent on the other services in the bands to be taken into account on a national basis. The analysis of implementation

indicates a possibility for further harmonisation of one or more of the bands, and this option should be considered further, indicating priorities and timescales.

Annex 7: The bands are widely implemented within Europe. Only one of the new members still has difficulties in implementation of the 800 MHz bands for SRD applications. Further detailed consideration should be given to this issue in order to achieve the full harmonisation of this band.

Annex 8: The bands are widely implemented in Europe. However, limitations by one or two member states and the non implementation by one administration need further consideration with timescales for a possible implementation.

Annex 9: This Annex is widely implemented in Europe and in particular in the new member states. A limitation in one country needs further consideration and timescales for implementation should be considered in detail.

The band 135-148.5 kHz is not fully harmonised. This band is used in connection with band 9c) 119-135 kHz and should be implemented fully as soon as possible. Detailed consideration should be given to this band in order to achieve full harmonisation within member states.

Annex 10: The bands used by the Broadcasting Service 10D), 10E) are not intended to be harmonised but to be chosen by administrations as it fits with the broadcasting use on a national basis. The frequency band 863-865 MHz is fully harmonised and also ‘class 1’
Further consideration should be given to stronger harmonisation initiatives in the other bands.

Annex 11: Harmonisation of the use of the 2446-2454 MHz band is needed and should be further considered.

Annex 12: Full harmonisation only achieved for one band. Detailed consideration should be given to full harmonisation of the other bands for ULP-AMI

Annex 13: Full harmonisation achieved for the use of the band 863-865 MHz. Further consideration of the band 864-8-865 MHz is still needed in order to achieve harmonisation.

ANNEX 1

Mandate to CEPT

to analyse further harmonisation of

frequency bands in use for Short Range Devices (SRDs)

EUROPEAN COMMISSION
Information Society Directorate-General

The Director-General

Brussels, 11 III 2004
DG INFSO/B4/AG/D (2004) 509800

Dear Mr. Furrer,

Subject: Mandate to CEPT to harmonise the frequency usage for Short Range Devices (SRDs)

Considering Article 4 par. 2 of Radio Spectrum Decision 676/2002/EC of the European Parliament and of the Council, and the favourable opinion expressed by the Radio Spectrum Committee by an advisory procedure, which was given on 3 March 2004, I am pleased to hereby issue to CEPT the attached mandate to harmonise the frequency usage for Short Range Devices in Europe.

I would welcome if CEPT ECC accepts this mandate at its earliest convenience. Upon completion of this mandate, I would appreciate receiving from CEPT the deliverables called for in the mandate, along with an explanatory note on how the tasks have been accomplished.

Should you have any further queries, do not hesitate to contact Mr. Niepold, Chairman of the Radio Spectrum Committee (+32.2.296 8955).

Yours sincerely,

Fabio Colasanti

CC: Mr. Chris van Diepenbeek, Chairman of ECC
Mr. Van den Emden, CEPT Secretariat

Mr. Marc Furrer
President of the CEPT
BAKOM
Zukunftstrasse 44
CH-2501 Bienne

Commission européenne, B-1049 Bruxelles / Europese Commissie, B-1049 Brussel - Belgium. Telephone: (32-2) 299 11 11.
Office: BU24 03/43. Telephone: direct line (32-2) 295.71.67. Fax: (32-2) 296.83.95.

MANDATE TO CEPT TO ANALYSE FURTHER HARMONISATION OF FREQUENCY BANDS IN USE FOR SHORT RANGE DEVICES (SRDs)

Final version

1. PURPOSE

To mandate CEPT to identify and prioritise further spectrum harmonisation of relevant classes of short range devices (SRDs), and propose a target implementation time table.

2. JUSTIFICATION

Pursuant to Article 4 of the Radio Spectrum Decision[1], 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.

SRDs are key enablers for a range of applications (e.g. RLANs, medical implants, telemetry, RFIDs) supporting the implementation of important EU policies. For instance, increased harmonisation of frequency use and equipment should improve the prospects of a genuine Internal Market for SRDs. Market developments of SRDs are highly dependent on economies of scale and it is therefore important that the potential of the Internal Market be exploited to its fullest extent by ensuring that harmonised frequencies and conditions of use are available in a timely fashion.

Co-ordinated action on SRDs carried until now in the context of the CEPT Recommendation ERC REC 70-03 has achieved some notable harmonisation on a voluntary basis. However, in view of the expansion of the European Union and of the increasing proliferation of short-range devices, the current regulatory situation of SRDs in the European Union requires further attention, in particular:

- Radio spectrum and equipment harmonisation should be accelerated, in order to strengthen the single market in radio-based applications and to ensure EC-wide regulatory coherence where beneficial;
- Harmonised conditions of use should be simplified to assist in the rapid and cost-effective introduction of new applications;
- Legal certainty for manufacturers and users across the EU should be improved;
- Regulation to support long-term pro-innovation policies should be developed.

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[1] Decision 676/2002/EC of the European Parliament and of the Council of 7 March 2002 on a regulatory framework for radio spectrum policy in the European Community, OJ L 108 of 24.4.2002, p.1.

This Mandate aims to address the harmonisation of conditions of use of SRDs in a generic sense, in an approach similar and complementary to REC 70-03. Specific mandates on SRDs such as RLAN, SRR or UWB have already been addressed to CEPT, and such mandates ought to be considered as reference on such issues.

3. MAIN EU POLICY OBJECTIVES

In considering priorities for further harmonisation of frequencies in use for SRDs, EU priorities and policy objectives should be duly taken into account. Here are some notable ones:

3.1. Horizontal policy objectives

Consolidation of the Internal Market: the creation of a genuine common market for goods, finances, services and persons by the removal of existing barriers is one of the most important objectives and areas of action of the European Community. As most SRDs are mass market products, the internal market dimension is of paramount importance in terms of increasing economies of scale and lowering costs for consumers and suppliers. The affordability of SRD equipment should in turn accelerate market developments and contribute to support the vertical Community policy objectives described later in this section.

Competition: facilitating the single market also increases competition, a simple and efficient means of guaranteeing a wider choice of consumer products and services of excellent quality at competitive prices. Competition also contributes to the competitiveness of European industry. In this context, proposed measures regarding SRDs should aim at stimulating industrial investments, by increasing legal certainty, facilitating technical standardisation and lowering barriers to entry.

Promotion of innovation and research: the market for SRDs is also characterised by a high degree of innovation. SRD technology is one of the fastest-evolving segment of the radiocommunications equipment market and is paving the way for the emerging "ambient computing" society. SRDs are also a powerful vector of innovation in the field of efficient use of spectrum and pioneering spectrum management approaches (e.g. with regards unlicensed bands, smart radio concepts, underlay technologies) It is therefore the responsibility of regulators to facilitate the development of the emerging SRD market and allow stakeholders to explore the best uses of promising technologies.

3.2. Vertical policy objectives

Information society: the European Union's goal for this policy is to ensure that Europe's citizens, businesses and governments can be provided with increasingly rich, advanced and diversified information services. SRDs support several aspect of this objective: for instance, Radio Local Area Network (RLAN) equipment enables advanced broadband radio access and is a key contribution to the *eEurope* broadband objectives[2]. Part of *eEurope* are sector-specific initiatives for *eInclusion* and *eHealth,* which also can be supported by SRD technology, as well as the objectives of enabling mobility and of reducing the "digital divide" in society.

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[2] http://europa.eu.int/information_society/eeurope/2005/index_en.htm

Collaboration in Civil Protection and in Justice & Home Affairs: SRDs also play an indispensable role in the case of many security applications (e.g. devices for detecting avalanche victims, alarms, identification systems such as RFIDs) which can assist in the protection of people and property, including across borders.

Transport: the common transport policy aims to develop an integrated and safe transport system in the European Union, inclusive of all transport modes. Several types of SRDs support directly or indirectly this objective, to name a few: Radio Frequency Identification (RFIDs) systems, Automotive Short Range Radars (Automotive SRRs), Automatic Vehicle Identification for Railways (AVI), Road Transport & Traffic Telematics (RTTT) systems.

4. SPECIFIC OBJECTIVES

With this proposed Mandate, the European Commission wishes to:

- support the availability of Class I equipment under the R&TTE Directive 1999/5/EC[3] by increasing both the number of SRD categories and the frequency ranges with this status;
- strengthen the legal basis of Class I equipment, by ensuring that when conditions of use for specific equipment are harmonised across the EU, such common regulations are rapidly implemented in national legislation and remain harmonised;
- endeavour to provide more permissive conditions of use for short-range devices, (including inductive applications), to harmonise European regulations on the least restrictive limitations compatible with the need to avoid harmful interference, and to explore the possibility for a general authorisation for operation below a common power threshold;
- take into consideration the benefits of identifying bands for generic SRD usage instead of for specific applications. Such bands should be available for Class I equipment usage as far as possible;
- provide additional harmonised bands to emerging types of SRDs as needs evolve. In this context, particular consideration should be given to general authorisations and very limited frequency regulation;

ECC Recommendation 70-03 itself does not specify target deadlines for implementation, nor set priorities. Therefore, specific target deadlines for harmonisation at EU level of the classes in the Recommendation should be developed as a key activity under this mandate. A prioritised time table should allow the stakeholders to effectively monitor progress and ensure that harmonisation of conditions for radio spectrum use is achieved within the agreed time frame.

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[3] Equipment classes in this paper refer to the definition by Article 4.1. of the R&TTE Directive and the related Commission Decision of 6 April 2000 establishing the initial classification of Radio Equipment and Telecommunications Terminal Equipment and associated identifiers.

5. ORDER AND SCHEDULE

CEPT is mandated to carry out activities intended to support the objectives and policies presented above, and in particular to:

- review the status of national implementation of Recommendation ERC REC 70-03, including an analysis of outstanding restrictions on conditions of use, in particular for frequency bands related to SRDs already pertaining to Class I equipment, with a view to remove them as far as possible;

- propose a common approach and a set of priorities for further harmonisation of frequencies for SRDs at EU level in the light of the harmonisation work achieved so far and of the main policies stated above. The proposal should also include a general definition of equipment that shall be considered as SRD under this initiative, an assessment of feasibility of further harmonisation, as well as a consideration for identifying additional harmonised bands for generic SRD applications, and an ambitious, but achievable, target implementation time table;

The deliverables for this Mandate will be an interim report and the final report subject to the following delivery dates:

- **15 September 2004**: Submission of a interim report to the Commission and the RSC giving initial findings, preliminary proposals or strategies, commenting on the progress of the work.

- **15 November 2004**: Submission of the final report to the Commission and the RSC.

In implementing this mandate, the CEPT shall, where relevant, take the utmost account of Community law applicable, notably the R&TTE Directive 1999/5/EC, and to support the generic principles of technological neutrality and proportionality.

The Commission, with the assistance of the Radio Spectrum Committee as per the Radio Spectrum decision, may consider to apply the results of this Mandate in the European Community, and to issue further mandates to CEPT on this matter.

* * *

	ERC DEC(01)01	ERCDEC(01)02	ERCDEC(01)03	ERCDEC(01)04	ERCDEC(01)05	ERCDEC(01)06	ERCDEC(01)07	ERCDEC(01)08	ERCDEC(01)09	ERCDEC(01)10	ERCDEC(01)11	ERCDEC(01)12	ERCDEC(01)13	ERCDEC(01)14	ERCDEC(01)15	ERCDEC(01)16	ERCDEC(01)17	ERCDEC(01)18	ERCDEC(97)06	ERCDEC(04)01	ERCDEC(04)02		Y=Implemented	C=Committed	P=Partly imp	N=Not impl	U=Under study
Aurtria	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				19				
Belgium	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				19				
Denmark	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		21				
Spain	Y	N	Y	Y	Y	C	Y	U	Y	P	P	Y	Y	Y	Y	N	Y	C	Y				12	2	2	2	1
Finland	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				18			1	
France	Y	C	Y	Y	P	Y	P	P	Y	N	N	N	Y	Y	P	Y	Y	Y	Y				11	1	4	3	
Germany	Y	Y	Y	P	Y	Y	Y	Y	Y	Y	P	Y	P	Y	Y	Y	Y	Y	Y				16		3		
Greece	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	U				17				1
Iceland	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				19				
Italy	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				19				
Ireland	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				19				
Liechtenstein	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				19				
Luxembourg	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	Y	Y	Y	Y	Y	Y				18	1			
Netherlands	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				19				
Norway	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				19				
Portugal	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				19				
Switzerland	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				19				
Sweden	Y	P	Y	Y	Y	Y	Y	Y	Y	Y	P	Y	Y	Y	Y	Y	N	Y	P				15		3	1	
United Kingdom	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				19				
EU/EFTA total																											
Implemented	19	15	19	18	18	18	18	17	19	17	15	18	17	19	18	18	18	18	17								
Committed		1				1							1					1						**4**			
partly impl.		1		1	1		1	1		1	3		1		1				1						**12**		
not impl		2								1	1	1				1	1									**7**	
understudy								1											1								**2**
Czech Republic	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				19				
Cyprus	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	P	Y	Y	Y	Y				18		1		
Estonia	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				19				
Hungary	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				18			1	
Lithuania	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				19				
Latvia	C	Y	Y	Y	C	Y	C	C	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				15	4			
Malta																			Y				1				
Poland	Y	Y	Y	Y	Y	Y	P	P	Y	Y	Y	Y	Y	Y	P	Y	P	P	Y				14		5		
Slovenia	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				19				
Slovak Republic	Y	Y	Y	N	Y	Y	Y	C	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	C				15	2		2	
New members																											
Implemented	8	9	8	8	8	9	7	6	8	9	9	9	9	9	7	9	8	8	9								
Committed	1				1		1	2											1					**6**			
partly impl.							1	1							2		1	1							**6**		
not impl			1	1					1																	**3**	
understudy																											
Bulgaria	P	P	P	P	P	P	Y	P	P	P	P	P	P	P	N	Y	N	P	N				2		14	3	
Croatia																			Y				1				
Romania																											
Russian Federation												Y											1				
Turkey	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				19				
Total																											
Implemented	28	25	28	27	27	28	27	24	28	27	25	28	27	29	26	29	27	27	26								
Committed	1	1			1	1	1	2					1					1	1					10			
partly impl.	1	2	1	2	2	1	2	3	1	2	4	1	2	1	3		1	2	1						32		
not impl		2	1	1					1	1	1	1			1	1	2		1							13	
understudy								1											1								2

Annex 3

Indicative list of Class 1 equipment for SRDs as agreed by TCAM in accordance with the R&TTE Directive and Commission Decision 6 April 2000 - published ERO web site/EFIS – July 2004. The detailed subclasses are available on www.ero.dk/rtte

Sub class	Frequency band	GSM
19	40.665 MHz, 40.675 MHz, 40.685 MHz, 40.695 MHz	Non Specific Short Range Devices
20	433.05-434.79 MHz	Non Specific Short Range Devices
21	2400-2483.5 MHz	Non Specific Short Range Devices
22	2400-2454 MHz	Wideband Data Transmission Systems incl RLANs
22	2400-2483.5 MHz	Wideband Data Transmission Systems incl RLANs
24	13.553-13.567 MHz	Inductive applications
25	26.995 MHz, 27.045 MHz, 27.145 MHz, 27.195 MHz	Non Specific Short Range Devices
26	2446-2454 MHz	Movement Detection
27	24.15-24.175 GHz	Movement Detection
28	868.0-868.6 MHz	Non-Specific Short Range Device
29	868.7-869.2 MHz	Non-Specific Short Range Device
30	869.4-869.65 MHz	Non-Specific Short Range Device
31	869.7-870 MHz	Non-Specific Short Range Device
32	868.6-868.7 MHz	Alarms
33	869.25-869.3 MHz	Alarms
34	869.65-869.7 MHz	Alarms
35	869.2-869.25 MHz	Social Alarms
36	20.05-59.75 kHz	Inductive applications
37	59.750-60.250 kHz	Inductive applications
38	60.250-67 kHz	Inductive applications
39	67-70 kHz	Inductive applications
40	70-119 kHz	Inductive applications
41	119-127 kHz	Inductive applications
42	127-135 kHz	Inductive applications
43	5725-5875 MHz	Non Specific Short Range Device
44	6765-6795 kHz	Inductive applications
47	402-405 MHz	Ultra Low Power Active Medical Implants
48	863-865 MHz	Wireless Audio
49	7400-8800 kHz	Inductive applications
50	26.957-27.283 MHz	Inductive applications

Annex 4

Nearly harmonised frequency bands for Short Range Devices (July 2004)

The following table includes the frequency bands for Short Range Devices with technical parameters, which are nearly harmonised across the 19 EEA/EFTA countries Austria, Belgium, Denmark, Spain, Finland, Greece, France, Germany, Iceland, Italy, Ireland, The Netherlands, Liechtenstein, Luxembourg, Norway, Portugal Switzerland, Sweden and United Kingdom. Nearly harmonised means that only 1 or 2 administrations have not been able to implement a particular band or have introduced limited implementation.

Application	Frequencies / Frequency band	Power / Magnetic field	Duty cycle	Channel spacing	Administrations not implementing or with limited implementation
Non specific SRD	6765 – 6795 kHz	42 dBµA/m at 10m	No	No	UK
Non specific SRD	13.553-13.567 MHz	42 dBµA/m at 10m	No	No	UK
Non specific SRD	869.4 – 869.65 MHz	500 mW e.r.p.	< 10%	25 kHz	Italy
Non specific SRD	24.15-24.25 GHz	100 mW e.r.p.	No	No	France
WBDTS(RLANs)	2400 – 2483.5 MHz	100 mW e.i.r.p.	≤ 100%	No	France
RTTT	5795 - 5805 MHz	2 W e.i.r.p.	No	No	Sweden
Movement Detection	2400 – 2483.5 MHz	25 mW e.i.r.p.	No	No	France United Kingdom
Movement Detection	24.05 – 24.25 GHz	100 mW e.i.r.p.	No	No	France United Kingdom
Model Control	26.995, 27.045, 27.095, 27.145, 27.195 MHz	100 mW e.r.p.	No	10 kHz	France
Model Control	40.665, 40.675. 40.685, 40.695 MHz	100 mW e.r.p.	No	10 kHz	France
Inductive applications	9 – 59.75 kHz	72 dBµA/m at 10m Field strength level descending 3 dB/oct at 30 kHz	No	No	Germany Spain
Inductive applications	59.75 – 60.25 kHz	42 dBµA/m at 10m	No	No	Germany
Inductive applications	60.25 – 70 kHz	69 dBµA/m at 10m Field strength level descending 3 dB/oct at 30 kHz	No	No	Germany
Inductive applications	70 – 119 kHz	42 dBµA/m at 10m	No	No	Germany
Inductive applications	119 – 135 kHz	66 dBµA/m at 10m Field strength level descending 3 dB/oct at 30 kHz	No	No	Germany
Wireless Audio	864.8-865 MHz	10 mW e.r.p.	No	50 kHz	Greece, Italy

Annex 5

National implementation process for new SRD bands

The following information has been provided as examples on the national implementation process from the administrations in UK, France, Germany and Denmark. See chapter 7.

United Kingdom

Within the UK, the Office of Communications (Ofcom) has responsibility for managing all civil use of the spectrum and also represents all UK interests in international negotiations concerned with radio regulation and spectrum management. Ofcom maintains contact with its spectrum users and discusses with them emerging needs and developments in order to arrive at a national position. Once a new allocation has been agreed within the ITU or the CEPT such as a change within Recommendation 70-03, the views of the existing and potential users are taken into account in determining the need to incorporate it into the UK's national table. In view of the rising demand for spectrum, it is becoming more necessary to carry out an analysis of the relative economic and other benefits of implementing new allocations or using the target spectrum for an alternative purpose. Any proposed changes to the UK's frequency table have to be agreed by government departments.

France

Radio spectrum is part of the public domain, it is inalienable and non-transferable. States have sovereignty in the area of frequency management, in the respect of the ITU-R Radio Regulation (RR), which has a value of international treaty.

The Agence nationale des fréquences (ANFR) is in charge of planning, management and control of the radio spectrum. It prepares French position and coordinates action of French delegation in European and International groups dealing with radio regulatory matters. The ANFR elaborates and updates in particular the '*Tableau national de répartition des bandes de fréquences*' (TNRBF), which clarifies the sharing conditions of the radio spectrum between 'Affectataires'. This situation is revised periodically, generally after each WRC.

The access to frequency bands is indeed subordinated to the 'Affectataires' which are state administrations or independent authorities:

- State administrations : frequency management for their own use

  Ministère de la défense, Ministère de l'intérieur, Centre national d'études spatiales (CNES), Administration de la météorologie, Administration de l'aviation civile, Administration des ports et de la navigation maritime, Ministère de l'éducation nationale, de la recherche et de la technologie.

- Independent authorities : frequency management for attribution to third parties

  Autorité de régulation des télécommunications (ART), Conseil supérieur de l'audiovisuel (CSA)

The French telecommunication Authority (ART) is the French regulator for telecommunications and is in charge of the attribution of frequencies for all telecommunications services/application including short ranges devices.

The implementation of a SRD frequency band is achieved through the adoption of an ART Decision that is published in the JO RF (Journal Officiel). An ERC/ECC Decision that was signed by the French administration should therefore be enforced by means of an ART Decision.

ERC Recommendation 70-03 is a key reference for the development of regulation for SRDs in France. The structure of ERC/Rec. 70-03 is reproduced in Annex 7 of the TNRBF (i.e. the National Allocation Table), which provides the list of SRD bands available in France.

Several ART decisions have besides been taken to withdraw frequency bands that are not recommended in ERC/Rec.70-03, after an alternative harmonised solution was clearly identified.

The different steps for the adoption of a national regulation that attributes frequencies and defines the condition of use for SRDs can be described as follows:

- ART prepares two draft Decisions, one to attribute frequencies, and another one to define the condition of use of this frequency band for SRD.
- Theses drafts are submitted for comments to the Commission Consultative for Radiocommunications (CCR) which meets different representative of the radiocommunication community as administrations, operators, manufacturer…
- In case of frequency bands shared with other administrations a consultation/negotiation is undertaken in order to reach an agreement to allow the use of these bans by SRD.
- In order to finalise theses drafts, ART takes into account comments and proposals.
- Revised draft Decisions are then sent to the European Commission for notification under Article 4.1 of the R&TTE Directive.
- At the end of this process, these Decisions shall be signed by the Prime Minister and published at the Journal Officiel. de la République Française.

Conclusion:
This highly collaborative and consultative process necessarily lead to a certain delay in the implementation of the decisions taken at CEPT level and may, when the general interest of the radiocommunication actors in France differs from the content of these decisions, conduct to the inadequacy of the implementation of the latter in a short or medium term.

Germany
Process of designation and implementation of frequency bands in Germany

No market in the Federal Republic of Germany has developed as rapidly in recent years as the telecommunications market, especially in the radio sector.

This development is due to the population's increasing demand for mobile communication services. Not least because of the new technical possibilities, demand for more bandwidth will continue to rise with increasing mobility in the near future. Both growing demand and technological innovation call for the availability of adequate frequency spectrum.

Apart from market aspects, the interests of the professional, scientific, military and safety-relevant radiocommunication services also need to be taken into account within the framework of frequency regulation.

However, because of its type of use and the current technological state-of-the-art, the frequency spectrum available is a scarce resource. The use of frequencies hence cannot merely be left to the free play of market forces but needs a forward-looking, non-discriminatory and proactive frequency regulation by the regulatory authority.

Goal of this frequency regulation is the provision of this scarce resource in line with demand and requirements. The focus is not only on existing frequency use but on future technological and market-related developments as well. Only by these means will Reg TP be able to deal with changed market demands and any changes in overall conditions at short notice. This also involves taking into account users' interests and the enabling of innovative technologies, and more specifically, the need to guarantee both efficient and interference-free frequency use and fair and workable competition.

With increasing worldwide market globalisation and in view of the European Union's goals regarding a common internal market, international frequency spectrum harmonisation and hence due consideration of international planning and specifications are factors constantly gaining in importance in national frequency regulation.

These multiple goals must be borne in mind at planning level and in frequency assignments to ensure that as many interests as possible are taken into account in frequency regulation.

Planning level

One means of shaping frequency regulation is the abstract planning phase. At national and international level comprehensive planning is needed, especially in order to ensure interference-free and efficient frequency use for a variety of different applications and technologies whilst at the same time securing fair and workable competition on the telecommunications markets. This implies that existing applications are given adequate planning security, and also that planning endeavours should provide enough leeway for new technologies and their modes of implementation.

International planning

In view of the increasing globalisation of the international telecommunications markets, international harmonisation of the frequency spectrum and frequency applications is constantly becoming more important. Not just radiocommunication services as defined by the ITU but also quite specific frequency uses and their spectrum requirements and usage conditions are laid down. These international specifications have a direct effect on national frequency planning since in individual cases very little leeway is left for diverging national specifications. This constellation will be intensified by the new EU bodies as their decisions – as opposed to those of the CEPT – will be binding.

In view of this fact Reg TP's involvement in international bodies is becoming ever more important. It is for this reason that apart from the federal government the regulatory authority actively participates in the international harmonisation process. It sends its experts to the ITU and to European bodies such as the CEPT, the ECC and to the new bodies within the EU which have been established by the new telecommunications regulatory framework. Their prime task is to present German interests at international level. Only by doing so is it possible for national concepts to find as broad a hearing as possible within the framework of international decision-making processes.

Apart from purely abstract planning, intergovernmental specifications and agreements on specific frequency applications along borders are needed. For although radio frequencies are basically subject to national regulatory sovereignty, they are not bound to country borders owing to their propagation. Especially a country such as Germany with a central location in Europe and numerous neighbouring countries needs to take care of crossborder frequency coordination. This task is also undertaken by Reg TP.

National planning

National frequency planning tools are the Table of Frequency Allocations and the frequency usage plan which together form the basis of frequency assignments. These planning instruments are established by different institutions, viz. the Federal Ministry of Economics and Labour (Table of Frequency Allocations) and the regulatory authority (frequency usage plan). The planning must create a stable basis for existing and future frequency applications by laying down possibly definitve specifications for the various frequency applications. Only by these means can efficient and interference-free frequency use and fair competition be ensured for all concerned. At the same time the specifications must be flexible enough to cope with the short development cycles and not to hinder the introduction of innovative technologies.

For this reason Reg TP participates in the preparations of a plan or plan change within national bodies to establish a close relationship with the market and to be informed of technological developments in advance. (For example, Initiative Digital Broadcasting or similar national groups or workshops, fora, technically, economically, competition focussed working parties.) Reg TP thus accompanies the technical progress from its inception to its actual application so as not to be overwhelmed by these developments and to be able to incorporate them in its planning well in advance.

This incorporation also calls for an early examination of potentially suitable frequency spectrum for new technologies. Economic, frequency-related technical and competitive factors must be borne in mind from the very beginning. Only a balanced view of these factors will ensure an appropriate planning. Especially in view of the ever shorter innovation cycles and the scarcity of the frequency resource this will become even more important in the future.

The regulatory authority compiles the frequency usage plan on the basis of the Table of Frequency Allocations with due consideration being given to regulatory goals. In particular, during plan compilation it must safeguard the interests of users, it must ensure fair and workable competition and efficient and interference-free frequency use and it needs to bear the interests of the broadcasting sector in mind. In addition to those aspects, it must take into account European harmonisation, technological progress and the compatibility of frequency applications in the transmission media. Apart from the establishment of the Table and the plan the various developments and trends on the market must be taken into consideration.

This list of merely legal provisions illustrates the bandwidth of issues which arises in the context of the compilation of the frequency usage plan. Reg TP's task, especially in view of the complexity of the different interests a balance between which needs to be found, is extremely demanding. For within the frequency usage planning process it is necessary to decide on how to identify the frequency spectrum for the individual frequency applications and to determine which framework conditions relating to the individual applications should be incorporated in the plan while at the same time finding a compromise between the interests of manufacturers, network operators, frequency users, and end customers. Reg TP also needs to consider economic, competitive and regulatory aspects. The same applies to refarming within the framework of frequency ranges no longer being used or being phased out.

An essential part of the compilation and modification of the plans is hence the consultation of the public which at the same time ensures the requisite transparency.

On the procedural side, ensuring this large-scale transparency takes up a great deal of time until the plans have been completed. This applies to the same degree to necessary changes of a frequency usage plan that has become effective. Unlike an urban development plan, which may remain valid unchanged for any length of time, a frequency usage plan may often need to be adapted at short notice to technological developments or international specifications. To enable any such modifications as early as possible, the regulatory authority has decided to lay down merely the vital regulatory and competitive conditions pertaining to frequency regulation at plan level to attain the goals under the Telecommunications Act. A more detailed description of these framework conditions is set forth in internal administrative rules. Such an approach ensures that Reg TP retains a maximum of flexibility to adapt frequency usage conditions to technical or market developments at extremely short notice. Concurrently, the necessary transparency and planning certainty is maintained for all market players, since the administrative rules are published by Reg TP and the content and necessary modifications of these administrative rules are confined to the framework laid down in the frequency usage plan. Any changes going beyond this framework still require the adaptation of the frequency usage plan with the associated open and transparent proceedings.

Assignment level

Under the Telecommunications Act each frequency application needs a frequency assignment. The transposition of the abstract general planning for concrete frequency use takes place via the assignment to ensure that efficient, interference-free and non-discriminatory frequency use by all frequency users is achieved in every single case.

With the frequency assignment the assignment holder is given the right by Reg TP to use a specific frequency under specified conditions.

Assignments take place in the form of either a general or an individual assignment. Whereas these two assignment types are deemed equal in the current Telecommunications Act, general assignments will in future be given priority as a result of the provisions in the EU's telecommunications directives and their national implementation. Individual assignments are only permitted in those cases where general assignments are not possible, especially when the risk of technical interference cannot be eliminated by other means or if such a step is necessary to ensure efficient frequency use.

Although Reg TP had already issued numerous general assignments in the past, the new legal framework imposes an even more stringent obligation to examine all frequency ranges with a view to their susceptibility to general assignment. In this connection the regulatory authority is tasked not only to identify such frequency ranges but also to lay down, in particular, usage conditions permitting actual interference-free use by the public.

Nevertheless, individual assignments will still be needed on a large scale. In these cases Reg TP must particularize the abstract meaning of the framework conditions laid down at planning level. Apart from frequency-related technical specifications, competitive and economic aspects will tend to become more important in future. This is necessary because apart from the assignment regime for specific areas, the licensing regime used hitherto already took such aspects into account prior to assignment. Owing to the EU Directives to be implemented, such licences will no longer be issued so that future frequency assignments will need to take these competitive and economic aspects into account to a greater degree than was hitherto the case.

The Frequency Assignment Ordinance specifies that frequencies shall be assigned if they are earmarked for the intended application in the frequency usage plan, if they are available, and if compatibility with other frequency applications is guaranteed. The Act hence basically normalises a claim to frequency assignment. As such, a prerequisite for frequency assignment is dependent not only on the dedication of the frequencies for the relevant application but also their availability. As mentioned earlier, the frequency spectrum actually available is a limited resource owing to its type of use and the current technological state-of-the-art which implies that adequate frequencies are not available to the same extent for all frequency applications.

In such cases it is Reg TP's responsibility to apply the non-discriminatory, objective and transparent procedures defined in the Act for the award of scarce frequencies in individual cases and to develop award rules.

In view of the above, in each individual frequency assignment case and irrespective of the fact whether or not a frequency is assigned upon application or within award proceedings, Reg TP has to define specific usage conditions to ensure compatibility with other frequency applications. They must be defined in a manner ensuring efficient and interference-free frequency use but they may not be defined so narrowly that the user is restricted unnecessarily in his use of the frequency. For example, the principle of technological neutrality must be adhered to so that no industrial-political factors are taken into account.

Apart from these objective criteria, in its assignment of frequencies Reg TP must examine not only the planned use but also each applicant's individual prerequisites. Apart from subjective prerequisites to be met by the actual person submitting the application (reliability, efficiency and technical expertise), the principle of efficient frequency use requires that the applicant may need to justify his frequency needs.

To ensure that the scarce resource "frequency" is not permanently withdrawn from the market by an assignment, Reg TP attaches a fixed period clause to its frequency assignments. In the determination of the fixed period in terms of a certain duration or a uniform date of expiry for all applications within a certain frequency range, e.g. in order to create the prerequisites for refarming, the regulatory authority must bear economic, competitive and frequency-related regulatory factors in mind.

Implementation of „Short Range Devices"

The development of the market for SRD applications is deemed significant. It would be justified to refer to a mass market with corresponding repercussions on the requisite regulatory situation and on the obvious spread of the systems. In general, SDRs rely on jointly used frequency ranges and no harmful interference should be caused by them to other radio services. In the same vein, these applications cannot claim protection against other radio services. The mass distribution of these systems and the globalisation of the markets necessitate frequency regulation by general frequency assignments. In addition, increasing mobility of the population calls for European harmonisation.

However, regulation by general frequency assignments does imply an intensive prior examination of the compatibility situation which is rendered more difficult by the anticipated number of devices. The SRDs constitute an excellent example of the fact that an application which is only used to a limited degree evinces no or only a very low interference potential with regard to other applications can significantly affect other frequency uses when it has taken on mass market dimensions. This has also lead to the distribution of the various SRD applications among several frequency ranges, each of which must meet the special

requirements of the application on the one hand, and must also guarantee the requisite compatibility with other applications on the other.

Denmark

Implementation process for new SRD frequency bands in Denmark.

- **New SRD frequency band adopted in FM WG**
  National consultation in Denmark in parallel with the FM WG public consultation
- **Possible change of the Danish frequency usage plan**
  The Danish frequency usage plan is normally updated once a year where accumulated changes are included in the plan. Urgent changes may be included within a 3 months period.
- **Change of secondary legislation regarding frequency usage without individual license**.
  The secondary legislation is normally updated once a year in connection with change of the frequency usage plan. In urgent cases even the secondary legislation may be updated within a 3 month period.
- **Change of existing or development of new radio interface specifications**
  In accordance with the provisions of Directive 98/34/EF the radio interface specifications shall be notified to the European Commission. A member state is obliged to wait adopting a radio interface specification for 3 months after the Commission has received the notification. Objections from the Commission or other member states may postpone further the adoption. Notification to the Commission may take place in parallel with the change of the frequency usage plan and the secondary legislation.
- **Duration of the process**
  From the above it appears that the duration of the implementation process for a new SRD frequency or frequency band in Denmark will be between 3 and 12 month dependent upon the importance of the frequency usage in question.