



CEPT Report 43

In response to the EC Mandate

"To undertake technical studies on the efficient use of the harmonised 169.4-169.8125 MHz frequency band (169 MHz – Review Mandate)"

01 June 2012

0 EXECUTIVE SUMMARY

This Report describes the proposed actions after the first step of investigations in response to the Mandate to CEPT (“169 MHz-Review Mandate”) to undertake the necessary technical studies in support of a possible review of Decision 2005/928/EC [1], as amended by Decision 2008/673/EC [2] (hereafter 169 MHz Decision) in order to ensure the efficient use of the harmonised frequency range (169.4-169.8125 MHz¹), pursuant to Art. 5 of the 169 MHz Decision.

The first step of investigations was to undertake a survey of the current users of the harmonised frequency range (169.4-169.8125 MHz) covered by the 169 MHz Decision, i.e. in both the low power and the high power bands, and provide detailed feedback on the current use of the harmonised sub-band C.

This considered inter-alia:

- an investigation and preliminary assessment was conducted based on the responses received to the questionnaire;
- study the implications for current users of increasing the flexibility in the lower power part of the band (sub-bands A and B) by removing the established channelling arrangements and the implications of the altered usage parameter for social alarms (proposed to be 10mW e.r.p. and < 0,1% duty cycle).

This Report proposes actions which include items for further spectrum engineering work. As an interim result after step one of the investigations conducted by the SRD/MG, the following possible changes to the Decision 2005/928/EC are under study:

- There seems to be no requirement for a European harmonisation measure regarding high power radio applications in the 169 MHz band. Therefore the removal of the high power part C from the Commission Decision should be considered. Almost all existing usage in the sub-band C is local or nationwide but there was no evidence for a requirement for having European- wide harmonisation neither from the technical side nor from the application perspective. Such a removal of an EC harmonisation measure would on the other side not affect the existing services;
- There is evidence that sub-band C is under-used. Further investigations by the SRD/MG are proposed to see whether some utilisation by low power SRD applications in parts of sub-band C is possible. This investigation for possible co-existence should include two items:
 - 1) non-specific SRDs using Low Duty Cycle (LDC) for applications in the whole range from 169.4-169.8125 MHz such as Meter Reading;
 - 2) additional frequency opportunities for hearing aids.
- Two measurements sessions were organised in Kolberg, Germany in the premises of BNetzA (25-26 January 2012 and 28-29 February 2012). The study considered Hearing aids (also called Assistive Listening Devices, ALD), Smart Grid/Smart Metering and PMR devices and the following initial conclusions from the spectrum engineering work has been reached:
 - To open band B for Smart Grid / Smart Metering and other LDC applications may be possible with a long term duty cycle; but then the risk of a permanent blocking by smart grid “Concentrators” needs to be avoided.
 - The usage of ALD and Smart Grid/Smart Metering (with long term duty cycle) applications in band C maybe considered.

¹ For the work carried out under the mandate, the frequency range shall be differentiated in three sub-bands, two lower power parts (A, B) and one high power part (C) according to the table below:

A	Low power	Non-exclusive access	169.4-169.475 MHz
B	Low power	Exclusive access	169.475-169.6 MHz
C	High power	Non-exclusive access	169.6125-169.8125 MHz

- The deployment of Smart Grid/Smart Metering concentrators in band A could limit the value of band A for ALDs.

The definition of the precise LDC parameters is still under study and is expected to be available in due time for the fifth update of the EC Decision for SRDs.

It should be noted in this context that the CEPT has received from ETSI information about activities for the design of LDC in ETSI Special Task Force STF411 and that investigations on LDC are already ongoing in the WG SE Project Team SE24, although for a different frequency range. This action can increase the effective utilisation of the frequency band;

- Social alarms should be kept in the range 169.4750 MHz to 169.4875 MHz but with a maximum e.r.p. of 10 mW and a duty cycle limit of 0.1%. The ECC recently received ETSI System Reference Document TR 103 056 [13] about alarm and social alarm systems. The document does not suggest the use of the 169 MHz band for social alarms. The VHF environment is not preferred because of antenna size issues and confirms the result of the earlier ECC survey under step 1 of the activities that the vast majority of the social alarm products on the market are operating in the UHF frequencies and not in the VHF frequency range;
- The spectrum engineering study provided so far evidence that LDC spectrum access for non-specific SRD may be possible without undue impact on the existing services and applications, there should not be exclusive spectrum access specified anymore for sub-band B;
- The existing channelling for hearing aids, meter reading and asset tracking and tracing in frequency sub-bands A and B of the EC Decision may be kept since it is either meanwhile adopted in applicable standards or helps to avoid interference. A removal was by the vast majority of responding stakeholders not seen as offering a real benefit. However, introducing a possibility for accessing the frequencies by means of the LDC medium access / mitigation technology may provide at the same time a solution for increased flexibility and has potential to be used by a wide variety of non-specific SRD applications. LDC is the most promising technology but other technologies may also be investigated in the future, if requested;
- As a result of the above mentioned on-going investigations, there may be a possibility to finally withdraw the Decision 2005/928/EC. The remaining harmonisation measures (existing and additional ones) for low power / short range devices could be incorporated in the fifth amendment of the technical annex of the EC Decision for Short Range Devices in line with the schedule for the fifth update. This approach would provide better visibility and transparency for the 169 MHz regulation. For instance, social alarms may fit in a LDC regulation;
- The plan and actions proposed above appear to be fully backwards-compatible with the existing usage in the frequency band 169.4-169.8125 MHz. In addition, the plan provides a simpler regulation due to the withdrawal of one EC Decision and introduces flexibility that can be used by many different SRD applications having LDC / limited transmitter activity factors. It may therefore also foster innovation;
- New SRD applications operating in the sub-band C should not cause harmful interference to existing services and applications and have to protect themselves against interference from existing high power applications. The latter can be achieved for example by spreading over the frequency range or by supporting frequency agility used as an interference mitigation technique;
- Finally, ECC may also need to consider a further amendment of ECC/DEC/(05)02 [3];
- Recommendation T/R 25-08 [5] on the planning criteria and coordination of frequencies in the Land Mobile Service in the range 29.7-921 MHz should also contain a reference to the new amended ECC/DEC/(05)02 [3] and brought in line with the final results of this process;
- Further investigations have been started on technical parameters and usage conditions in the frequency band 174-216 MHz (ERC REC 70-03 [4] Annex 10 band d) that may allow the usage of adaptive hearing aids in order to give a more robust environment and some additional frequency opportunities. The technical characteristics of the Hearing Aids (ALD transmitters) for these studies are understood to be the same as for equipment operating in the 169.4 MHz to 169.8125 MHz band and the equipment can operate over a tuning range covering the 169.4 MHz to 169.8125 MHz as well as 174-216 MHz range.

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LIST OF ABBREVIATIONS

Abbreviation	Explanation
CATV	Cable Television
CEPT	European Conference of Postal and Telecommunications Administrations
DC	Duty Cycle
DMR	Digital Mobile Radio
DPMR	Digital PMR
EC	European Commission
ECC	Electronic Communications Committee
ECO	European Communications Office
ERC	European Radio communications Committee
ERMES	Enhanced Radio MESSage System
E.R.P.	Effective Radiated Power
ETSI	European Telecommunications Standards Institute
FM	Frequency Modulation
FSK	Frequency Shift Keying
GFSK	Gaussian FSK
LBT	Listen Before Talk
LDC	Low Duty Cycle
LTE	Long Term Evolution
PMR	Private Mobile Radio
RSCOM	Radio Spectrum Committee
PPDR	Public Protection and Disaster Relief
RSPG	Radio Spectrum Policy Group
SRD	Short Range Devices
SRD/MG	Short Range Device Maintenance Group
TETRA	Terrestrial Trunked Radio
UHF	Ultra High Frequency
VHF	Very High Frequency
4 GFSK	4- Gaussian FSK

1 INTRODUCTION

This Report has been developed in 2011 by the European Conference of Postal and Telecommunications Administrations (CEPT) in response to the Mandate to CEPT (169 MHz-Review Mandate) to undertake the necessary technical studies in support of a possible review of Decision 2005/928/EC [1], as amended by Decision 2008/673/EC [2] (hereafter 169 MHz Decision) in order to ensure the efficient use of the harmonised frequency range (169,4-169,8125 MHz), pursuant of Article 5 of the 169 MHz Decision.

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

This draft CEPT Report for providing a proposal on the way forward for the frequency range 169,4-169,8125 MHz has been developed within SRD/MG and has been approved by WG FM and the ECC with contributions from administrations, ETSI and industry for the public consultation process.

It was submitted to the European Commission in accordance with the timescales of the Mandate to CEPT issued 6 July 2011 (ref. Ares(2011)814005 - 26/07/2011) which is given in Annex 1 to this Report.

2 BACKGROUND

The European Commission has mandated the CEPT to undertake the necessary technical studies in support of a possible review of Decision 2005/928/EC [1], as amended by Decision 2008/673/EC [2] (hereafter 169 MHz Decision) in order to ensure the efficient use of the harmonised frequency range (169,4-169,8125 MHz²), pursuant of Article 5 of the 169 MHz Decision. The CEPT has been asked to collect detailed information on the current use of the low power and the high power parts of the harmonised band in Members States and to identify technical and regulatory provisions that ensure the efficient use of the band and guarantee best possible usage conditions for applications that support the community objectives, such as ICT for supporting an ageing society and ensuring the inclusion of persons with disabilities.

In this questionnaire, respondents were asked to provide their views, in regard to the following aspects that originate from recent amendments adopted for ECC/DEC/(05)02 [3].

Currently, the users of the band benefit from legal certainty in regard to the established channelling arrangements in the sub-bands A and B. Increasing the flexibility by removing the channelling arrangements for these sub-bands could therefore have an impact on the way users share these bands presently. It would be important to know if any users at national level potentially affected by the proposed changes have signalled any possible negative impact. Such implications would need to be assessed.

The existing channelling arrangements on the basis of 169 MHz Decision are currently being introduced into a harmonised standard in the context of Mandate M/441 for meter reading systems³. Given that meter reading systems share sub-band A with other users, the implications for these users of removing channelling arrangements from the decision to the harmonised standard would therefore also warrant a closer analysis.

Conversely, since the existing channelling arrangements for social alarms would be preserved based on the simplified frequency plan, the implication of the new usage parameters would have to be assessed as well. Particularly in regard to the effect that the proposed new parameters for social alarms (max. 10mW e.r.p. and duty cycle < 0,1% instead of max. 500 mW e.r.p.) would have on existing users of the band. Also in this regard, the Commission services would find any feedback from affected users at the national level to be useful.

² For the work carried out under the mandate, the frequency range shall be differentiated in three sub-bands, two lower power parts (A, B) and one high power part (C) according to the table below:

A	Low power	Non-exclusive access	169,4-169,475 MHz
B	Low power	Exclusive access	169,475-169,6 MHz
C	High power	Non-exclusive access	169,6125-169,8125 MHz

3 DISCUSSION

3.1 HISTORY

The ERC/DEC(94)02 [12] designated the frequency band 169.4125 – 169.8125 MHz for ERMES and has divided the band into 16 frequency channels for these systems. The EU Council Directive 90/544/EEC [6] also designated the band 169.4 – 169.8 MHz for the same purpose and states that these systems should have priority over and protection from other systems in the same band. The EU Directive also listed four preferred frequency channels for ERMES. Since the adoption of the ERC Decision and EU Directive the requirement for paging systems within Europe has changed. Therefore the ERO and the Frequency Management Working Group of the ECC collected information on the deployment of ERMES and other paging systems (in 1999 the European Commission recommended the end of exclusive use of the ERMES standard in the 169 MHz channels) in the frequency band 169.4 – 169.8125 MHz within Europe as well as the use of this band by other radio applications..

The information obtained showed (as of January 2002) that ERMES systems only remained operational in a few European countries. However, there were some countries in which paging systems were in operation, or licences were still in force. In some cases these licences cannot be withdrawn for legal reasons. On the other hand the information showed that in most countries some channels were available for other applications, and in several countries all 16 channels were available.

In recent years more emphasis has been put on the question of designation of harmonised frequency bands for several existing or new services, and therefore the WG FM has agreed to reconsider the use of the band 169.4-169.8 MHz, and many applications have been proposed for this frequency band. Based on information from administrations and interested parties it has been agreed that the following existing and new applications should be implemented in this band.

- **Meter reading systems**

There is an increasing demand from utility companies among others for remote reading of meters for water usage, electricity etc. Since such meters are often installed in buildings or underground the upper part of the VHF band is particularly useful for this purpose. Meter reading equipment includes facilities for remote status monitoring and service commands.

- **Tracing and asset tracking systems**

In the beginning 1998 the ERO prepared, following a Work Requirement (no.48400) in accordance with the “EC-ERO Framework Contract”, the “Report on Alarm Systems for Tracing Lost or Stolen Items” This report among other things describes various tracing and tracking systems operating in different frequency bands. One of the recommendations in this report is that some frequencies should be designated in the VHF band alarm systems used for tracing lost or stolen items. The WG FM has previously made an unsuccessful attempt to harmonise frequencies for this purpose. There is a growing demand for systems for tracing lost or stolen (such as vehicles, car, boat, valuables, etc.), and the trade in stolen items has become an international problem.

- **Social alarms**

The social alarm application is intended to assist persons, in particular elderly or disabled people summon assistance, when they are in a distress situation. This application requires reliable telecommunication systems and networks. A number of measures are taken in order to ensure the highest level of reliability, as is practically feasible, when designing and operating these systems. In 1997 the ERC adopted ERC/DEC/(97)06 [7] that designates the frequency band 869.20-869.25 MHz for the use of social alarm systems in accordance with ERC/REC 70-03 [4] on SRDs. However, at that time it was pointed out that a lower frequency range would have been better suited for this purpose because of wider coverage and better penetration in buildings, but no such harmonised frequency band within CEPT could be found. At that time, it was also concluded that parts of the band 169.4-169.8125 MHz would be well suited for some types of social alarm systems.

- **Aids for hearing impaired**

Originally there were no harmonised bands for these kinds of systems and frequencies had been designated according to national frequency tables with the result that these systems operated on many different frequencies throughout Europe. This again led to segmentation of the market and more expensive equipment for the users of such systems. The increased mobility of people and equipment

gives rise to an increased demand for some harmonised spectrum for aids for the hearing impaired, and a part of the band 169.4-169.8125 MHz band was set aside for this purpose.

- **PMR Applications**

It is to note that, according to national regulations, PMR radio equipment can normally be tuned in parts or all frequencies from 146 MHz to 174 MHz including the 169 MHz band.

Moreover, this band may also be used by temporary applications (mostly PMR systems) that are licenced for short periods from say a day or two up to about a few months is to assist organisation of entertainment and other special events. The main purpose for harmonising frequencies for this is to ease the licensing procedures during international events for which it is impossible to change frequencies of the transceivers during border crossing. Especially due to the fact that there is a need to use these frequencies from high altitude for wide area distribution of information implying long interference ranges and need for strict regulations.

- **Paging system**

Simplex paging systems using a base station with the mobile as a receiver are often using different protocols including in some case the ERMES protocol. Existing paging systems were allowed to remain in operation as long as required or as long as the licences for these systems are valid, and develop as the technology progresses. These systems are to great extent in use for emergency or security services in local, regional or sometimes even nation-wide level.

It has to be noted that sometimes, the Paging system may also be available by means of a PMR licence.

3.2 AMENDMENT OF ECC/DEC/(05)02 IN 2010

CEPT informed the EC in 2010 about the amendment of the ECC/DEC/(05)02 [3] as follows:

The hearing aid industry represented in CEPT supported initially an amendment of existing amended ECC/DEC/(05)02 [3] consisting of shifting down channels 4, 5, 6 & 7 by 12.5 kHz so as to enable 4 "25 kHz bandwidth" channels for '*Aids for the hearing impaired*' in this portion of the 169 MHz band that do not overlap with channels 4a & 8b designated for '*Social alarms*' (instead of 3 previously).

This industry requirement had however triggered additional proposals in view of setting minimum regulation and introducing greater flexibility for the use of frequency band 169.4-169.8125 MHz.

It was observed within the frame of the review process in 2010 that, since the initial adoption of ECC/DEC/(05)02 [3], spectrum regulations for the SRD applications identified for operation in the 'low power part' of band 169.4-169.8125 MHz had been incorporated in ERC/REC 70-03 [4] (see Annexes 2, 7 and 10) and that these parameters have been presented in ERC/REC 70-03 [4] in a manner that is more consistent with the EFIS format (e.g. reference to frequency band, not to centre frequencies).

This comprehensive review exercise had actually provided an opportunity for:

- aligning the presentation with current template for ECC Decision as far as practical,
- making more explicit what CEPT administration are requested to implement,
- prohibiting language such as "exclusive use", "preferred application" or "alternative application": implementation is about designating or not a frequency for a given application,
- aligning the terminology used for the applications with that used in ERC/REC 70-03 [4] and EFIS.

CEPT agreed at that time that ECC/DEC/(05)02 [3] should define only the harmonised frequency plan for the use of frequency 169.4-169.8125 MHz and no longer define the "conditions of use of the spectrum" for each relevant SRD application. Possible optimum channelling arrangement could still be defined in relevant harmonised standards as appropriate.

Under this approach, should a regulatory parameter for the low power applications such as the maximum power, duty cycle or the channel spacing have to be modified, then only ERC/REC 70-03 [4] would need to be amended. ECC/DEC/(05)02 [3] would still provide a useful overview of the harmonised applications for operation in the whole of the frequency band 169.4-169.8125 MHz.

3.3 PROPOSED IMPACT ON COMMISSION DECISION AFTER AMENDING ECC/DEC/(05)02

A similar approach was envisaged for the corresponding Commission Decision:

- the annex of Decision 2005/928/EC [1] could be replaced by proposed simplified ‘frequency plan for the 169.4-169.8125 MHz band’ as presented in the annex to this document.
- the harmonised SRD regulations for the ‘low power part’ applications could be transferred into the EC Decision on Short Range Devices (2006/771/EC) [8].

Under this approach, the title of Decision 2005/928/EC [1] could remain unchanged: this Decision was still about the harmonisation of the 169.4-169.8125 MHz frequency band in the Community.

The technical parameters for short-range devices operated in the band 169.4-169.6 MHz to be presented in the EC Decision on SRDs were proposed to be consistent with those presented in ERC/REC 70-03 [4] and corresponding ETSI harmonised standards, as summarised in the table below:

Table 1: Recommendations as in ERC/REC 70-03

Frequency band	Applications	Power	Spectrum access and mitigation requirement	Channel spacing
169.4000- 169.4750 MHz	Aids for the hearing impaired	500 mW e.r.p.*	-	Max 50 kHz
	Meter reading	500 mW e.r.p.	< 10% duty cycle	Max 50 kHz
	Asset tracking and tracing	500 mW e.r.p.	< 1% duty cycle	Max 50 kHz
169.4750- 169.4875 MHz	Social alarms	10 mW e.r.p.	< 0.1% duty cycle	-
169.4875- 169.5875 MHz	Aids for the hearing impaired	500 mW e.r.p.*	-	Max 50 kHz
169.5875- 169.6000 MHz	Social alarms	10 mW e.r.p.	< 0.1% duty cycle	-

Note: the maximum power specified in Annex 10 of ERC/REC 70-03 is currently 10 mW. CEPT is considering the inclusion of the 500 mW power limit for public hearing aids systems.

The following figure shows the differences between the EC Decision and ECC Decision:

Decision 2005/928/EC, as amended by Decision 2008/673/EC
 Channelling arrangement for the 169.4 – 169.8125 MHz band

12.5 kHz bandwidth		25 kHz bandwidth		50 kHz bandwidth	
Channel number	Centre frequency	Channel number	Centre frequency	Channel number	Centre frequency
1a	169.406250				
1b	169.418750				
2a	169.431250	2	169.437500	0'	169.437500
2b	169.443750				
3a	169.456250	3	169.462500		
3b	169.468750				
4a	169.481250	4	169.487500		
4b	169.493750				
5a	169.506250	5	169.512500	'1'	169.512500
5b	169.518750				
6a	169.531250	6	169.537500		
6b	169.543750				
7a	169.556250	7	169.562500	'2'	169.562500
7b	169.568750				
8a	169.581250	8	169.587500		
8b	169.593750				
12.5 kHz 'guard band'					
9a	169.618750	9	169.625000		
9b	169.631250				
10a	169.643750	10	169.650000		
10b	169.656250				
11a	169.668750	11	169.675000		
11b	169.681250				
12a	169.693750	12	169.700000		
12b	169.706250				
13a	169.718750	13	169.725000		
13b	169.731250				
14a	169.743750	14	169.750000		
14b	169.756250				
15a	169.768750	15	169.775000		
15b	169.781250				
16a	169.793750	16	169.800000		
16b	169.806250				

ECC Decision (ECC/DEC/(05)02) amended 12.11.2010

Annex
 Frequency plan for the 169.4 - 169.8125 MHz band¹

Frequency band	Applications
169.4000 - 169.4750 MHz	Aids for the hearing impaired Meter reading Asset tracking and tracing
169.4750 - 169.4875 MHz	Social alarm
169.4875 - 169.5875 MHz	Aids for the hearing impaired
169.5875 - 169.6000 MHz	Social alarm
169.6000 - 169.6125 MHz	'Guard band'
169.6125 - 169.6375 MHz	Asset tracking and tracing
169.6375 - 169.6625 MHz	Paging
169.6625 - 169.6875 MHz	Paging
169.6875 - 169.7125 MHz	Paging
169.7125 - 169.7375 MHz	Asset tracking and tracing
169.7375 - 169.7625 MHz	Asset tracking and tracing
169.7625 - 169.7875 MHz	Paging
169.7875 - 169.8125 MHz	Asset tracking and tracing

Legend: **Non-exclusive spectrum access** Unusable 25 kHz channels for hearing aids, because channels 4a and 8b are for social alarms only.
Exclusive spectrum access

Figure 1: Differences between EC Decision and ECC Decision

4 RESULTS OF THE QUESTIONNAIRE

The CEPT was asked to collect detailed information on the current use of the low power and the high power parts of the harmonised band in Member States and to identify technical and regulatory provisions that ensure the efficient use of the band and guarantee best possible usage conditions for applications that support community objectives, such as ICT for supporting an ageing society and ensuring the inclusion of persons with disabilities.

WGFM adopted at their May 2011 meeting a questionnaire on the use of the frequency band 169.4 to 169.8125 MHz.

In total, 54 responses were received at the European Communications Office (ECO), 24 from industry sources (part A of the questionnaire) and 30 from administrations (part B of the questionnaire).

The full results are attached in the summary from ECO which was subsequently endorsed by the SRD/MG in September 2011. In addition, SRD/MG agreed on preliminary assessments which were added to the summary from the ECO. The full summary is provided in annex 2. The main results of the questionnaire can be summarized as follows.

4.1 LOW-POWER SUB-BANDS A AND B (BASED ON THE ANSWERS FROM INDUSTRY AND USERS)

4.1.1 Meter Reading

Six answers were received from the meter reading market. This included 2 answers from sources representing more than 1 million devices sold per annum and 3 answers representing more than 100 000 devices sold per annum. The projected figures for 2016 exceed 13 million devices sold for the meter reading

market for operation in the frequency band 169.4-169.8125 MHz. This application field seems to contain to some extent also building automation and industrial controls. One metering service provider indicated not using the frequency range at present but that the usage of this band would be interesting if there would be more bandwidth available. It is to note that the forecast figures could to some extent represent a strategic forecast and therefore may be optimistic.

The 5 metering companies provided technical data for equipment operating in the 169 MHz range indicating channel bandwidths from 12.5 kHz up to 50 kHz, one or up to 6 channels implemented in the equipment, and using FSK, GFSK or 4GFSK modulation. All meter reading devices access the spectrum using duty cycles.

4.1.2 Social alarms

1 manufacturer of social alarm devices indicated that the frequency range 169.4-169.8125 MHz is not considered optimal for their social alarm products and therefore they use other frequency possibilities in the 869 MHz frequency range. It was further noted that in the past there was a VHF frequency opportunity for social alarms in some countries, e.g. 173.280 MHz in Belgium and 173.230 MHz in UK. There was no interest from manufacturers because at that moment there was no harmonisation possible.

Another manufacturer of social alarm devices indicated to have no current product for the 169 MHz range but plans for a new product for this frequency range. Finally, the single manufacturer of social alarm devices for the 169 MHz frequency band provided figures of less than 1 million devices sold per annum but projected growth to more than 5 million devices in 2016.

The 2 manufacturers who replied to equipment parameters in the 169 MHz frequency range indicated FSK/GFSK modulation and channel bandwidths of 12.5 kHz or 25 kHz as well as 1 channel operation. One manufacturer indicated to plan a product employing LBT and reception acknowledgements, hence obtaining more flexibility to adapt to a more flexible frequency environment.

The two manufacturers who currently do not use the 169 MHz frequency range (although one plans a new product for this range) indicated to sell more than 10 million devices per annum operating in the UHF frequencies for social alarms at 869 MHz. Therefore, it is likely that the major part of the market for social alarms is nowadays selecting the UHF solution rather than the VHF solution at 169 MHz.

The future use of the 169 MHz band by the social alarms application will be affected by the UHF Roadmap results and 863-870 MHz review. ETSI is preparing a new ETSI Systems Reference Document TR 103 056 on the subject. If the results of the Roadmap adversely affect the bands for social alarms in the UHF, then the use of 169 MHz may increase.

However, the following considerations have been brought forward so far by several manufacturers:

169 MHz is also used in CATV systems. Normally the cables of such systems are screened enough but in case of failure a social alarm system could be blocked.

Due to the required high reliability of a social alarm system a category1 receiver is specified in ETSI EN 300 220. This receiver requires blocking of 84 dB. Blocking is a measure of the capability of the receiver to receive a wanted modulated signal without exceeding a given degradation due to the presence of an unwanted input signal. This value can only be reasonably achieved with SAW filters. SAW filters for such low frequencies with the required performance are economically priced not available and producible at the present time.

The benefit of less free space attenuation at VHF compared to UHF (approx. +14 dB) is compensated by the effect of a non optimized antenna (approx -14 dB).

4.1.3 Hearing aids

6 manufacturers provided figures about devices operating in the 169 MHz frequency range. The responses from one manufacturer and 6 affiliated regional sales offices were counted only once. This included 4 answers from sources representing less than 100 000 devices sold per annum and 2 answers representing less than 1 000 devices sold per annum. One respondent provided the statement that the total market volume for hearing aids might be below 100 000 devices per annum in Europe. The projected figures for 2016 do however show some increase and 2 answers provided projections of less than 1 million devices for 2016.

The hearing aid devices are predominantly FM modulated and use continuous medium access although one reply indicated duty cycle channel access. The channel bandwidths in use are either 25 kHz or 50 kHz and the equipment employs mostly 3 to 8 channels.

4.2 HIGH-POWER SUB-BAND C (INFORMATION FROM PMR MANUFACTURERS)

4.2.1 PMR

Three answers from PMR manufacturers were noted. Two stated that the band was not of interest to them, one, however, manufactured radio products for this range as part of the normal 2m- band VHF equipment tuning range from 146 MHz to 174 MHz. In this context it was noted that Selex and Motorola manufacture TETRA and DMR radio devices also for use in the VHF frequency range. As appears from the answers, the frequency range 169.4-169.8125 MHz is not in the focus of PMR equipment manufacturers for any PMR future product developments.

4.3 HIGH-POWER SUB-BAND C (BASED ON DATA PROVIDED BY THE ADMINISTRATIONS):

4.3.1 Paging

5 countries provided information on paging networks. Only Romania operates a high number of 8 nationwide and 7 local networks. The other countries operate a maximum of 2 nationwide networks (the Netherlands, Sweden), 1 nationwide and 1 regional network (Belgium). Switzerland indicated adding a third frequency for paging systems.

A considerable number of these paging systems are used by security or emergency services on a local, regional or nationwide basis but without the need for European wide harmonisation.

The revised ECC/DEC/(05)02 [3] as amended in 2010 indicates a total of 100 kHz for paging systems in sub-band C which corresponds to 4 x 25 kHz or 8 x 12.5 kHz.

4.3.2 PMR

8 countries indicated the existence of licences for PMR services: Finland (111 licences), Bosnia Herzegovina (33 licences), Denmark (5 licences, including one nationwide licence), The Netherlands (5 licences), Estonia (2 licences), Spain (2) and Slovakia (1 licence).

Current PMR usage can be expected to be mostly of an analogue nature with 25 kHz channel bandwidth equipment, although newer digital PMR technologies with 12.5 kHz or even 6.25 kHz channel bandwidth are also available (e.g. DMR or DPMR). Sub-band C in this context, has to be understood as being a part of the traditional “2 meter” VHF PMR band and equipment on the market has a tuning range that also covers his sub-band, however, the equipment is not limited to operate within this specific frequency sub-band.

4.3.3 Tracking & Tracing

5 countries use this sub-band for tracking & tracing applications whereas 2 additional countries indicated plans for the future for this application.

Latvia and Lithuania have for this application each one licence for a nationwide network. Austria and Belgium indicated that there is interest or plans for a countrywide network. Portugal reported one network with 12 base stations. Switzerland also indicated usage of this sub-band for tracking & tracing purposes. Germany provided 2 licences, however not on a national basis.

Regarding the frequency usage by tracking & tracing systems, the administrations reported about using channels 9, 13 and 14 as defined in Decision 2005/928/EC [1]. No indication was given regarding usage in channel 16 for such applications. One administration reported that tracking & tracing is included in their frequency utilisation plan, however there was a lack of demand.

The revised ECC/DEC/(05)02 [3] as amended in 2010 indicates a total of 100 kHz for tracking & tracing systems in sub-band C which corresponds to 4 x 25 kHz or 8 x 12.5 kHz for paging systems.

4.3.4 Other usage

Two administrations are using the sub-band C for occasional / short term use (Belgium, Ireland). One administration is using the sub-band C for PPDR applications (Russian Federation). Two administrations did not specify the usage but informed about licences: The United Kingdom has one licenced user on a 25 kHz simplex channel (channel 15) and Slovenia also reported about one regional licence, 2 x 25 kHz.

The EC counsellor expressed his interest in the results of the questionnaire in the SRD/MG meeting in September 2011 and mentioned that the information received while being useful, also indicates the difficult task to develop and propose technical and regulatory parameters to ensure and maximise the efficient use of the harmonised high power sub-band C.

In this regard the group was informed that in the RSC the EC had requested Member States to provide information on the extent to which the high power sub-band C (169.6125-169.8125 MHz) is still used by paging systems and private mobile radio communications that have been authorised at the date of notification of 169 MHz Decision (14.12.2005) and which would therefore be out of the scope of the 169 MHz Decision and may continue for as long as the authorisation remains valid.

Based on the responses received, the overview shows that 12 Member States do have valid rights of use for such legacy systems with varying or non-specified expiry dates:

1. In three EU Member States rights of use for the harmonised high power sub-band C exist for legacy paging systems which expire in 2011/2019 and 2016, respectively or have no specified expiry date.
2. In seven EU Member States the harmonised high power sub-band C or part of it is used by private mobile radio communications systems which are authorised until 2024, 2021 and 2013, respectively or for which no expiry date has been specified.
3. Two EU Member States have unspecified authorisations that expire in 2015 and 2013, respectively. In accordance with the 169 MHz Decision, three EU Member States have authorised channels of the high power sub-band C for asset tracking and tracing systems or paging systems. In addition, four Member States state that no rights of use exist for the high power sub-band C.

Regarding the forthcoming analysis, the importance of backward compatible solutions was underlined.

5 ASSESSMENTS OF THE SRD/MG

The answers provided by the Meter Reading industry indicated that the industry currently use the spectrum designated to this application. It is the meter reading industry who claims to sell most devices and they have forecasted they expect a huge increase in the sales. These figures could represent a strategic forecast and are not validated. The Meter Reading devices access spectrum using Duty Cycle.

The answers from the PMR industry point out the frequency band around 169 MHz is not their most favourable choice of band and it has only very limited interest to them.

The social alarm industry has the choice of using the UHF band and the 169 MHz. The spectrum is not regarded as ideal by the social alarm industry. Only one manufacturer who uses the 169 MHz band for a product responded and did expect an increase in the annual turnover for this piece of device. Again, this could be a strategic forecast.

Most answers came from the hearing aid industry. All answers from this industry claims to sell less than 100 000 devices. The hearing aids use mostly FM modulation and the channel bandwidths are either 25 kHz or 50 kHz.

From the SRD/MG point of view the two main stakeholders in this band are the smart metering and the hearing aid industries. With regard to the answers concerning the expectations to sold devices in the future, SRD/MG is of the opinion that these forecasts might be extra positive, in order to hold on to the possibility of using the band in the future.

The amended ECC Decision (05)02 [3] from 2010 is regarded as easy to understand. Some responses recommend it should be considered to reintroduce the segmentation from the earlier versions. With some exceptions the 169 MHz band regulatory parameters suits the applications. An improvement could be to reintroduce the segmentation.

It could be considered to combine the frequency band 174-216 MHz and 169 MHz to give the hearing aid a more robust environment. This requires further investigations on usage conditions in this band including compatibility studies with existing services and/or systems as necessary.

One of the answers from the meter reading industry indicated that the 169 MHz band do not contain sufficient spectrum for the future use of Smart Meter devices.

General the answers showed that interference due to congestion of the spectrum is not a big problem though especially the hearing aid sector from time to time had encountered interference. A response from a social alarm manufacture indicated a concerned about the need to define some spectrum access techniques to insure coexistence with high power VHF systems. SRD/MG could suggest SE24 make some studies on this issue.

From the hearing impaired industry point of view the channelling arrangement gives the possibility to avoid interference. The answers also show concerns of increased in interference against hearing impaired children caused by meter reading applications. SRD/MG suggests that this issue also could be addressed to SE24.

From the metering industry, the channeling is useful for a better frequency planning. They also point out the risk of interferences if the channeling disappears. It was also mentioned that the channeling is also specified in the prEN 13757-4 [9].

The SRD/MG concluded that there is no benefit in removing the channeling arrangement for the meter reading applications. Moreover, SRD/MG noted that the meter reading industry in general is against removing the channeling arrangements.

The answers indicate that there is a general concern of interfering the hearing impaired. Low duty cycle and other mitigation techniques should be used in order to prevent interference against hearing impaired. Another possibility is that a part of the band will be dedicated to the hearing impaired only.

The industry think it is a good idea of setting the maximum permitted e.r.p. available to Social Alarm of 10 mW with a Duty Cycle limit of 0.1%. This value should be considered in the light of the new definition of duty cycle as resulted from WI23 and follow-on studies of SE24.

SRD/MG also suggests that the social alarms cannot be completely removed to the UHF band. By using bands in the VHF and in the UHF band interference may be avoided with regard to LTE.

SRD/MG suggests that LDC can be used as sharing techniques in the band and should be studied.

High power sub-band C:

Most answers indicated that this band was used for (1) Tracking and Tracing, (2) PMR), (3) Paging. The biggest column indicates that there is No Current Use of the band.

The responses from the 30 administrations have shown that the different high power applications are used only to a limited extend within CEPT. In those countries in which licences have been granted, only a small fraction of these licences cover nationwide usage. If information on the technology has been provided, e.g. for PMR, it can be seen that mostly analogue technique is in use (which probably had been introduced before the Commission Decision was set into force).

By taking into account this information, it seems to be that there is no requirement for a harmonisation measure regarding high power radio applications in the 169 MHz band, Therefore the removal of the high power part from the frequency regulation (Commission Decision) is recommended. Moreover, this recommendation is supported by compatibility problems mentioned by hearing impaired industry with PMR applications as mentioned in the first part of the questionnaire.

6 REVIEW OF ERC/REC 70-03 RELEVANT TO THE 169 MHz FREQUENCY BAND

For the review of ERC/REC 70-03 [4] the version of September 2011 is used.

6.1 TRACKING, TRACING AND DATA ACQUISITION

The table below presents the frequency bands included in Annex 2 of ERC/REC 70-03 [4] and their status with respect to the EC Decision on SRDs.

Table 2: Annex 2 of ERC/REC 70-03

Annex 2	Tracking, Tracing and Data Acquisition	Comments / Status
2a	457 kHz	For Detection of avalanche victims. Not identified as a priority for inclusion in the EC Decision on SRD. Already “class 1” (see sub-class 49).
2b	169.4-169.475 MHz	For Meter Reading. Already covered by the EC Decision on the harmonisation of the 169.4-169.8125 MHz frequency band (2005/928/EC).
2c	169.4-169.475 MHz	For Asset Tracking and Tracing. Already covered by the EC Decision on the harmonisation of the 169.4-169.8125 MHz frequency band (2005/928/EC).

6.2 ALARMS

The table below presents the frequency bands included in Annex 7 of ERC/REC 70-03 and their status with respect to the EC Decision on SRDs.

Table 3: Annex 7 of ERC/REC 70-03

Annex 7	Alarms	Comments / Status
7a	868.6-868.7 MHz	Already covered by the EC Decision on SRDs
7b	869.25-869.3 MHz	Already covered by the EC Decision on SRDs
7c	869.65-869.7 MHz	Already covered by the EC Decision on SRDs
7d	869.2-869.25 MHz	For Social alarms Already covered by the EC Decision on SRDs
7e	869.300-869.400 MHz	Already covered by the EC Decision on SRDs
7f	169.4750-169.4875 MHz	For Social alarms Already covered by the EC Decision on the harmonisation of the 169.4-169.8125 MHz frequency band (2005/928/EC)
7g	169.5875-169.600 MHz	For Social alarms Already covered by the EC Decision on the harmonisation of the 169.4-169.8125 MHz frequency band (2005/928/EC)

6.3 RADIO MICROPHONES APPLICATIONS INCLUDING AIDS FOR THE HEARING IMPAIRED

The table below presents the frequency bands included in Annex 10 of ERC/REC 70-03 [4] and their status with respect to the EC Decision on SRDs.

Table 4: Annex 10 of ERC/REC 70-03

Annex 10	Radio microphones applications including aids for the hearing impaired	Comments / Status
10a	29.7-47 MHz	Frequency band identified on a tuning range basis. Not planned for inclusion in the EC Decision on SRDs.
10b	173.965-174.015 MHz	For Aids for the hearing impaired. Low harmonisation in Europe. Not planned for inclusion in the EC Decision on SRDs due to harmonised frequencies available at 169 MHz
10c	863-865 MHz	Already covered by the EC Decision on SRDs
10d	174-216 MHz	Frequency band identified on a tuning range basis. Individual licence required. Not planned for inclusion in the EC Decision on SRDs.
10e1	470-786 MHz	Frequency band identified on a tuning range basis. Individual licence required. Not planned for inclusion in the EC Decision on SRDs.
10e2	786-789 MHz	The majority of member states have no or limited licences exempt implementation of these frequency bands. Inclusion of these bands in the EC decision is not possible.
10e3	823-826 MHz	
10e4	826-832 MHz	
10f	1785-1795 MHz	Initially not identified as a priority for inclusion in the EC Decision on SRD. Industry request to consider inclusion.
10g	1795-1800 MHz	Initially not identified as a priority for inclusion in the EC Decision on SRD. Industry request to consider inclusion.
10h1	169.4000-169.4750 MHz	For Aids for the hearing impaired. Already covered by the EC Decision on the harmonisation of the 169.4-169.8125 MHz frequency band (2005/928/EC).
10h2	169.4875-169.5875 MHz	For Aids for the hearing impaired. Already covered by the EC Decision on the harmonisation of the 169.4-169.8125 MHz frequency band (2005/928/EC).
10i	169.4-174.0 MHz	For Aids for the hearing impaired. Frequency band identified on a tuning range basis. Not planned for inclusion in the EC Decision on SRDs due also to harmonised frequencies available at 169 MHz

7 LOW DUTY CYCLE

During the workshop on future spectrum requirements for SRD, RFID, smart metering and smart grids, the following low duty cycle characteristics were provided as currently under study in ETSI STF411. The content in table 5 is illustrative and considered in the present report to depict the LDC concept and represents work in progress:

Application	Latency	Max Cumulated TxON time	TxON time /s	Average	TxOFF	Cumulated TxON per day	Max equivalent DC	Comment	Number of devices	Urban density
	in sec	over 1 second [in seconds]	%	activity	in s	in seconds	with current definition		Estimated in Europe	Estimated
	100ms	1	100.00%	1400	0.1	1400	1.620%			
Metering		25ms to 1s								
without in home display	8s	0.025	2.50%	1	0.1	0.025	0.000029%		Millions	
with in home display	1s	0.025	2.50%	96	0.1	2.4	0.003%		Hundred thousands	
Repeaters	100ms	0.025	2.50%	50	0.01	1.25	0.001%		Millions	
EN13753 Mode R2	15min	1	100.00%	20	0.1	20	0.023%			
Alarms		25ms to 1s								
Intrusion alarm	3s	0.025	2.50%	24	0.1	0.6	0.001%		Millions	
Social alarm	2s	0.15	15.00%	4	0.1	0.6	0.001%		Millions	
Battery power devices	1 min	1	100.00%	24	0.1	24	0.028%		Millions	
Imaging	3s	1	100.00%	6	0.1	6	0.007%	3 mins of transmission once a month	New request from customers	
Referee voice system		0.1	10.00%	3600	0.9	360	0.417%			

ANNEX 1: MANDATE TO CEPT TO UNDERTAKE TECHNICAL STUDIES ON THE EFFICIENT USE OF THE HARMONISED 169.4-169.8125 MHZ FREQUENCY BAND

"This mandate is issued to the CEPT without prejudice to the right of scrutiny by the European Parliament and the Council, pursuant to Article 11 of Regulation (EU) No 182/2011 of the European Parliament and the Council of 16 February 2011 (OJ L 55, 28.02.2011, p. 13) laying down the rules and general principles concerning mechanisms for control by Member States of the Commission's exercise of implementing powers."

INTRODUCTION

Mandate to CEPT (169 MHz-Review Mandate) to undertake the necessary technical studies in support of a possible review of Decision 2005/928/EC, as amended by Decision 2008/673/EC (hereafter 169 MHz Decision) in order to ensure the efficient use of the harmonised frequency range (169.4-169.8125 MHz⁴), pursuant of Art. 5 of the 169 MHz Decision.

PURPOSE

To collect detailed information on the current use of the low power and the high power parts of the harmonised band in Members States and to identify technical and regulatory provisions that ensure the efficient use of the band and guarantee best possible usage conditions for applications that support the community objectives, such as ICT for supporting an ageing society and ensuring the inclusion of persons with disabilities.

JUSTIFICATION

Pursuant to Article 4 of the Radio Spectrum Decision⁵, 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 therefore.

In 2003 the Commission issued the first mandate to CEPT in order to review the various possible harmonised applications for the band 169.4 to 169.8 MHz in the light of Community policies (RSCOM03-10). In 2005 the Commission adopted the 169 MHz Decision (Decision 2005/928/EC, as amended by Decision 2008/673/EC) to harmonise the conditions for the availability and efficient use of the 169.4-169.8125 MHz radio spectrum band in the Community. Pursuant Art. 5 of this Decision Member States are required to keep the use of the 169.4-169.8125 MHz radio spectrum band under review to ensure the efficient use thereof and report their findings to the Commission.

BACKGROUND

In 2010 the CEPT in its liaison statement⁶, dated 19 November 2010, has informed the Commission about changes adopted for one of its decisions⁷ that covers the same frequency range as the 169 MHz Decision.

⁴ For the work carried out under the mandate, the frequency range shall be differentiated in three sub-bands, two lower power parts (A, B) and one high power part (C) according to the table below:

A	Low power	Non-exclusive access	169.4-169.475 MHz
B	Low power	Exclusive access	169.475-169.6 MHz
C	High power	Non-exclusive access	169.6125-169.8125 MHz

⁵ 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.

⁶ Document RSCOM10-74

The changes are aimed at setting only minimum regulatory conditions and introducing greater flexibility for the use of frequency bands. They concern the channelling arrangements in the harmonized frequency range and the level of detail regarding the technical usage parameters that are provided in the respective ECC decision.

In particular, a shortcoming in the channelling arrangements in sub-band B has been identified, which effectively reduces the number of 25 kHz channels for exclusive use by "hearing aid" applications from four to three. The handicap is caused by a partial overlap in the current channelling arrangement between the exclusive channels for "hearing aids" and those for "social alarms"⁸.

In the explanatory memorandum of the ECC decision, the CEPT refers to the usage situation in the high power sub-band C on the basis of information collected in 2002 and states that the high power paging systems "only remain(ed) operational in a few European countries" and that in "several countries all 16 channels were available". However, the memorandum also states that "there were some countries in which paging systems were in operation, or licences were still in force. In some cases these licences cannot be withdrawn for legal reasons".

In order to ensure that the harmonised bands are used efficiently and to adapt the regulation in place where found necessary, the Commission services seek technical advice on the impact of the proposed changes. The Commission services at the same time request to assess to what extent the sub-band C is still used by legacy paging systems and private mobile radio communications that have been "authorised at the date of notification" of 169 MHz Decision (Art. 4.6) and seeks technical advice on possible new arrangements for this sub-band better reflecting the evolved situation.

ORDER AND SCHEDULE

The CEPT is hereby mandated to undertake all relevant technical work to support the review of the 169 MHz Decision and to undertake studies with regard to collecting up-to-date and detailed information on the current use of the low power and the high power sub-bands (A, B and C), identify technical and regulatory provisions that ensure the efficient use of the harmonised band and guarantee best possible usage conditions for applications that support the community objectives.

In particular the CEPT is mandated to:

Part 1

Undertake a survey of the current users of the harmonised frequency range (169.4-169.8125 MHz) covered by the 169 MHz Decision, i.e. in both the low power and the high power bands, and provide detailed feedback on the current use of the harmonised sub-band C.

Investigate, on the basis of a questionnaire, the implications for current users of increasing the flexibility in the lower power part of the band (sub-bands A and B) by removing the established channelling arrangements and the implications of the altered usage parameter for social alarms (proposed to be 10mW e.r.p. and < 0,1% duty cycle).

Part 2

Based on the result of part 1 of the 169 MHz-Review Mandate:

- to confirm or adapt the channel arrangement for the sub-bands A and B, including implications for on-going or new standardisation activities;
- to develop and propose regulatory parameters with which the efficient use of the harmonised high power sub-band C (200 kHz) can be ensured and maximised in the medium and long-term, for example in regard to innovative long-range technologies⁹.

⁷ ECC/DEC/(05) 02 amended 12 November 2010

⁸ For a detailed overview of the relevant changes and the possible implications for a review of the 169-MHz Decision, see Document RSCOM11-09 Rev.

⁹ For more information please refer to the recent Opinion and Report from the RSPG on cognitive technologies (RSPG10-348 and RSPG10-306).

CEPT is expected to summarise the results on the above-mentioned tasks in a report to the Commission. The CEPT is mandated to provide the deliverables according to the following schedule:

Table 6: Schedule

Delivery date	Deliverable	Subject
October 2011	Report from CEPT to the Commission on 169 MHz-Review Mandate subject to public consultation	Description of work undertaken and results achieved under this Mandate prior to public consultation.
July 2012	Final Report from CEPT to the Commission on 169 MHz-Review Mandate	Description of work undertaken and results achieved under this Mandate.

The Commission will decide whether the results of this Mandate can be made applicable in the European Union, pursuant to Article 4 of the Radio Spectrum Decision¹⁰.

In implementing this Mandate, the CEPT shall, where relevant, take the utmost account of Community law applicable.

¹⁰ 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).

ANNEX 2: DETAILED RESULTS OF THE QUESTIONNAIRE – ECO SUMMARY AND SRD/MG ASSESSMENTS

Part A: Questions to industry, sellers, users, testhouses, trade associations etc.

Table 7: Responses from the following 24 manufacturers and providers were received

Manufacturers	
Bosch	Phonak UK
Cassidian (EADS)	PhonicEar
GN Resound Group	Radiocraft AS
Hydrometer	SAPPEL
ICOM	Siemens
Itron	Selex
Oticon	Starkey Lab
Phonak	Suez Environment
Phonak Belgium	Techem
Phonak Finland	Tunstall
Phonak Italy	Tynetec
Phonak Turkey	Widex

The activity of the responders was indicated as follows in figure 2 (multiple choices possible):

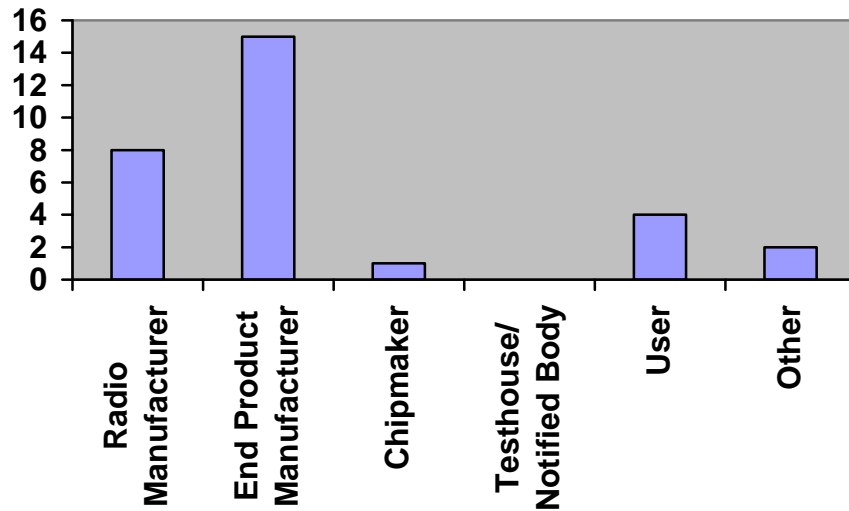


Figure 2: Field of activity of the responders

As can be seen, the vast majority of all answers have come from manufacturers of wireless products, either the radio module or the end product

The responsibilities of the persons in charge of sending responses for the companies were as follows:

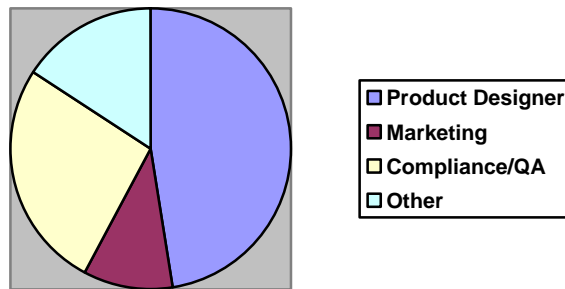


Figure 3: Responsibility of the person who provided the response

All responders stated that there is a person responsible for the compliance of their product with the regulatory and standards framework in their company/ organisation

Distribution of the answers over application fields:

Meter Reading

Six answers were received from the meter reading market. This included 2 answers from sources representing more than 1 million devices sold per annum and 3 answers representing more than 100 000 devices sold per annum. The projected figures for 2016 exceed 13 million devices sold for the meter reading market for operation in the frequency band 169.4-169.8125 MHz. This application field seems to contain to

some extent also building automation and industrial controls. One metering service provider indicated not using the frequency range at present but that the usage of this band would be interesting if there would be more bandwidth available.

The 5 metering companies provided technical data for equipment operating in the 169 MHz range indicating channel bandwidths from 12.5 kHz up to 50 kHz, one or up to 6 channels implemented in the equipment, and using FSK, GFSK or 4GFSK modulation. All meter reading devices access the spectrum using duty cycles.

PMR

Three answers from PMR manufacturers were noted. Two stated that the band is not of interest to them, one, however, manufactured radio products for this range as part of the normal 2m- band VHF equipment tuning range from 146 MHz to 174 MHz. In this context it was noted that Selex and Motorola manufacture TETRA and DMR radio devices also for use in the VHF frequency range. As appears from the answers, the frequency range 169.4-169.8125 MHz is not in the focus of PMR equipment manufacturers.

Social alarms

1 manufacturer of social alarm devices indicated that the frequency range 169.4-169.8125 MHz is not considered optimal for their social alarm products and therefore they use other frequency possibilities in the 869 MHz frequency range.

Another manufacturer of social alarm devices indicated to have no current product for the 169 MHz range but plans for a new product for this frequency range. Finally, the single manufacturer of social alarm devices for the 169 MHz frequency band provided figures of less than 1 million devices sold per annum but projected growth to more than 5 million devices in 2016.

The 2 manufacturers who replied to equipment parameters in the 169 MHz frequency range indicated FSK/GFSK modulation and channel bandwidths of 12.5 kHz or 25 kHz as well as 1 channel operation. One manufacturer indicated to plan a product employing LBT and reception acknowledgements, hence obtaining more flexibility to adapt to a more flexible frequency environment.

The two manufacturers who currently do not use the 169 MHz frequency range (although one plans a new product for this range) indicated to sell more than 10 million devices per annum operating in the UHF frequencies for social alarms at 869 MHz. Therefore, it is likely that the major part of the market for social alarms is nowadays selecting the UHF solution rather than the VHF solution at 169 MHz. This estimate has been confirmed by a market study from Frost & Sullivan from June 2006 that showed a combined market share of greater than 80% for the two manufacturers using UHF at 869 MHz who replied to the questionnaire.

Hearing aids

6 manufacturers provided figures about devices operating in the 169 MHz frequency range. The responses from one manufacturer and 6 affiliated regional sales offices were counted only once. This included 4 answers from sources representing less than 100 000 devices sold per annum and 2 answers representing less than 1 000 devices sold per annum. One respondent provided the statement that the total market volume for hearing aids might be below 100 000 devices per annum in Europe. The projected figures for 2016 do however show some increase and 2 answers provided projections of less than 1 million devices for 2016.

The hearing aid devices are predominantly FM modulated and use continuous medium access although one reply indicated duty cycle channel access. The channel bandwidths in use are either 25 kHz or 50 kHz and the equipment employs mostly 3 to 8 channels.

Preliminary assessment of SRD/MG:

The answers provided by the Meter Reading industry indicated that the industry currently use the whole spectrum 169.4-169.8125 MHz. It is the meter reading industry who claims to sell most devices and they have forecasted they expect an huge increase in the sales. These figures could represent a strategic forecast and are not validated. The Meter Reading devices access spectrum using DC.

The answers from the PMR industry point out the frequency band around 169 MHz is not their most favorable choice of band and it has only very limited interest to them.

The social alarm industry has the choice of using the UHF band and the 169 MHz. Only one manufacturer who uses the 169 MHz band for a product responded and did expect an increase in the annual turnover for this piece of device. Again, this could be a strategic forecast.

Most answers came from the hearing aid industry. All answers from this industry claims to sell less than 100 000 devices. The hearing aids use mostly FM modulation and the channel bandwidths are either 25 kHz or 50 kHz.

From the SRD/MG point of view the two main stakeholders in this band are the Smart Metering and the hearing aid industries. With regard to the answers concerning the expectations to sold devices in the future SRD/MG is of the opinion that these forecasts might be extra positive, in order to hold on to the possibility of using the band in the future.

Detailed questions

Question 4: Is the existing ECC/DEC/(05)02 easy to understand?

The majority stated YES, however three respondents from the hearing aids area complained about the withdrawal of the segmentation previously included in earlier versions of the ECC Decision. On the other side, one respondent welcomed the removal of the 12.5 kHz separation of channel 4b between social alarms and hearing aids.

Preliminary assessment of SRD/MG:

The ECC/DEC/(05)02 is regarded as easy to understand.

Some responses recommend it should be considered to reintroduce the segmentation from the earlier versions.

Question 5: Do the existing 169.4-169.8125 MHz regulatory parameters suit your application(s)?

The respondents answered yes to this question except for two responses. Another two responses stated yes adding that the segmentation was considered helpful towards having less interference or would help the system design.

Two statements were also made that additional channels could be used in the empty spaces between the TV channels in the band 174-216 MHz or that less interference towards hearing aids (i.e. more robust operation) could be achieved by combining the 169 MHz band channels with additional channels from the 174-216 MHz band.

One respondent provided the opinion that the 169 MHz band was not the optimal frequency band for social alarms. The benefit of having less propagation attenuation than in the 869 MHz frequencies for social alarms would be more than outweighed by lower antenna performance and additional losses. The dimensions of the antenna would be too big and class 1 receivers be realised easier in the UHF using SAW filters.

It should be noted in this context that ETSI is creating an ETSI System Reference Document describing the market and containing technical information as well as a proposal for future usage of frequencies by social alarms.

One meter reading operator stated that the 169 MHz band would not provide sufficient bandwidth for their applications and indicated that more channels/bandwidth for meter reading would be needed to attract them to use the frequency band.

Preliminary assessment of SRD/MG:

With some exceptions the 169 MHz band regulatory parameters suits the applications. An improvement could be to reintroduce the segmentation. Further investigations on technical parameters and usage conditions in the frequency band 174-216 MHz (ERC/REC 70-03 [4] Annex 10 band d) may allow the usage of hearing aids with 169 MHz in order to give a more robust environment and some additional frequency opportunities. This requires further investigations on usage conditions in this band.

The spectrum is not regarded as ideal by the social alarm industry and one of the answers from the meter reading industry indicated that the 169 MHz band do not contain sufficient spectrum for the future use of Smart Meter devices.

Question 6: Do you have knowledge of situations where the normal operation of your application/device is affected by congestion of the spectrum or harmful interference? (If necessary please multiply table below)

6 respondents indicated that they have experienced interference. Reports come mainly from the hearing aids sector and the source of interference is likely through analogue PMR-like usage, in one exceptional case in Finland due to radar emissions. The problem occurs occasionally and was only reported by one respondent as being “frequent”. Interference cases normally would be resolved by sending a technician out who would in most cases solve the problem by changing manually the frequency of operation, i.e. the hearing aids equipment is not adaptive to the presence of interference.

Another source of interference could be VHF radio stations very close to operational sites of hearing aids systems such as schools for hearing impaired children. This problem would normally be solved by the manufacturer of the receiver radio module.

Another respondent who plans a social alarm product for the 169 MHz band was also concerned about the possible unwanted emissions from VHF high power systems operating in the adjacent frequencies. A category 1 receiver according to ETSI EN 300 220 would be needed and the respondent was concerned that there is no spectrum access scheme in the existing 169 MHz allocation (no % duty cycle limits).

It should be noted that not a single case of congested spectrum was mentioned in the answers.

Preliminary assessment of SRD/MG:

General the answers showed that interference due to congestion of the spectrum is not a big problem though especially the hearing aid sector from time to time had encountered interference. A response from a social alarm manufacture indicated a concerned about the need to define some spectrum access techniques to insure coexistence with high power VHF systems. SRD/MG could suggest SE24 make some studies on this issue.

Question 7: Please give your views on the following change of the regulations? (while noting the differences between the current EC Decision and ECC Decision).

Not all respondents from industry replied to question 7. Of those who did, the majority stated that they are concerned there could be more interference cases in a plan offering more flexibility but no clear benefits for their (mostly existing) products. The few who are planning new products made comments to take into account and “build-in” the new flexibility offered by the ECC Decision. The comments are provided in the table below and help to understand the background of the current situation in the frequency band 169 MHz.

<p>How does increasing the flexibility, by removing the channelling arrangements impact on your applications?</p>	<p>There is no arrangement impact to the applications, but the higher flexibility is bought dearly with a higher interference risk.</p> <p>There is a risk of increased interference</p> <p>EN50134 the European standard for social alarms mandates the use of a Class 1 receiver (EN300-220), if flexible channel arrangements were introduced, it would be impossible to produce a Class 1 receiver as mandated with the necessary 10kHz separation required for spot frequency testing.</p> <p>In addition we believe that the change to flexible channel arrangements would impact badly on current social alarm applications, potentially blocking the social alarm transmission which is at much lower power, and may result in the failure of its safety critical application.</p> <p>As is well documented the ageing population is forecast to double over the next 15 years, and this will produced similar growth in numbers of social alarm applications, it is essential that the Class 1 safety critical nature of social alarms is maintained. This would not be possible if the existing channelling arrangements in band B are removed.</p> <p>No changes considered necessary.</p> <p>We can accommodate the new flexibility in the new design – we do not have currently any legacy products in 169 MHz band.</p> <p>Removing the channelling arrangement in part B (non-shared access) will give a possibility for more flexible channel planning at schools or to avoid interferences.</p> <p>Possibly, it might open new options to avoid interference in schools, but due to high bandwidth channels necessary for the hearing aids application there is not much room for flexibility.</p>
<p>Do you see a benefit in removing the channelling arrangements for meter reading applications?</p>	<p>No (8 answers).</p> <p>No. The channelling has been adapted in prEN 13757-4, and will work fine for meter reading. (2 answers)</p> <p>No. We only want narrow band audio transmitters.</p> <p>Yes. This allows reducing the design constraints.</p> <p>Yes. By having designated channels then it is possible to do frequency planning. (2 answers)</p> <p>Yes, clearly meter reading applications are not yet widely employed, but when they are, it would result in much lower congestion and more specific use for critical applications.</p>
<p>Do you see a problem in removing the channelling arrangements for meter reading applications?</p>	<p>Yes. We see a big problem in these high power devices being used. Most likely the devices will also be placed close to or even in schools. From what we know they will transmit up to 6-10 minutes/hour → a large interference problem can be foreseen.</p> <p>-Ultimately there is a big risk hearing impaired children will be severely disturbed during classes.</p>

	<p>YES. More interference problems are possible (5 answers).</p> <p>Yes, because the free definition of their channels might overlap more than one channel used by our applications and thus block the access to more than one channels for our applications by overlapping partially at least two channels (2 answers).</p> <p>No (4 answers)</p>
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Preliminary assessment of SRD/MG:
The social alarm industry has some concerns about removing the channeling arrangements. They fear it will create more interference on social alarms. SRD/MG could address this concern to SE24 and ask them to make some studies on this issue.

From the hearing impaireds point of view the channeling arrangement gives the possibility to avoid interference. The answers also show concerns of increased in interference against hearing impaired children caused by meter reading applications. SRD/MG think that this issue also could be addressed to SE24.

The SRD/MG concluded that the benefit in removing the channeling arrangement for the meter reading applications was divided in both YES and NO's though the greatest part of the answers indicated that there was no benefits. SRD/MG is of the opinion that the meter reading industry in general is against removing the channeling arrangements.

Question 8: Please can you describe any suggestion you have for improvement in the spectrum access arrangements?

A total of 19 suggestions was received which are included in the table below. Similar suggestions were grouped together (the numbering indicates the number of respondents for a particular suggestion). The suggestions made under question 12 (regarding “any other suggestions”) were also included in the present table).

The 169.4 to 169.8125 MHz band, parts A and C is currently shared by several preferred applications. Can you suggest alternative sharing mechanisms? Or do you have a general suggestion for improvement in the spectrum access arrangements, in particular but not limited to the shared parts of the band?

Suggestion 1-4:

Metering applications should be exclusive in the 169.4-169.475 MHz band. They may also be further restricted in duty cycle much below 10%. LBT is not useful for metering.

Sharing the band with asset tracking may work, but better if the band will be a dedicated band for metering, as metering is well regulated for co-existence in EN 13757-4.

We are not using the band for hearing aids, but I think a 10% duty cycle is not very useful for audio. However, if the duty cycle is increased it may create interoperability issues with metering and tracking devices. Better to remove hearing aids from this band.

Also, the number of metering devices (up to 500mW) is predicted to increase substantially over the next few years, and could also create problem for hearing aids in the same band.

Our suggestion is therefore to move hearing aids completely from this band to the dedicated band at 169.4875-169.5875 MHz. And the same for asset tracking, move to 169.6125-169.8125 MHz

Coexistence between different metering systems is handled by prEN 13757-4 and should not be a problem using the channel plan and duty cycle limitations in that standard.

Metering applications is supposed to grow very rapidly in the coming years. The very good performance we are achieving with this frequency band result in an increasing interest from the metering business actors (see French gas pilots results, deployment on Malta's water distribution network,...).

169 MHz is the only band with an (almost) exclusive use for AMR applications, with the ongoing European projects on Smartmetering and the pressure on energy management improvement, we consider that the existing space that is allocated to metering applications does not reflects the market.

We therefore suggest that a larger part of the band is allocated to metering applications to allow for more channels to be proposed and that it is made 100% exclusive for those applications.

Have dedicated bands for paging in segment C does not seem to be very future-oriented.

It would be better to reserve a larger part of the band for exclusive use for metering. Metering applications is the fastest growing application in this band. Due to long range it is important to have several channels to choose from.

Today meter reading can only use 75 KHz out of the 412.5 kHz wide band. This does not reflect the expected growth in AMR systems that will be using this band. Do also note that 169 MHz is the ONLY band which is (almost) exclusive to AMR, so the pressure on this band will be very large.

The current regulation is OK and suitable. For meter reading there is seen a high potential of using in the future. For wireless meter reading

an appropriable spectrum with spectrum access methods is important!

Suggestion 5

Consideration of the real usage made of this band by hearing aids and paging systems should be studied carefully (today and in the near future). Especially the large size of the antenna linked to the low frequency value compared with UHF is probably not so well suited for hearing equipments.

Suggestion 6:

It was **decided** that 2 channels in the 169 MHz band (4a and 8b) are exclusively allocated for social alarm applications. The amendment of 2005/928/EC lead to 2008/673/EC which still preserved the exclusive frequency allocation due to the utmost importance of social alarm applications.

In the time being the industry chose the UHF band (869 MHz) instead of the VHF band (169 MHz) for social alarm applications due to technical and physical reasons which were recognized during the usage of such devices in the real environment.

This was considered in ERC/REC 70-03, Annex 7 and frequency band b was **recommended** for social alarm applications.

Reasons for using UHF instead of VHF:

Advantage of VHF (169 MHz) use

1. approx 14 dB less field loss

The field loss is lower, e.g. app. 46.5 dB for 169 MHz and 30m distance and 60.8 dB for 869.2125 MHz. This is app. 14 dB less field loss, meaning the necessary power could theoretically be decreased.

Disadvantage of VHF (169 MHz) use

1. The dimensions of social alarm transmitter has to be very small and light-weighted in order to have acceptance from the user (body worn). A lower frequency requires a larger antenna for optimized performance (wavelength depending). Using a smaller antenna leads in an additional antenna loss what will consume the lower field loss.

Rule of thumb: 6dB additional antenna loss if the antenna is halved from optimum. This calculates to app. -14dB antenna loss for 169 MHz (1.8 m wavelength) compared with if 869 MHz (0.35 m wavelength) assuming the same size/dimension of the body worn device.

The benefit of less free space attenuation at VHF (approx. +14 dB) is now compensated by the effect of a non optimized antenna (approx - 14 dB).

2. For the antenna of the receiver of the system (base station/gate way) applies the same as for the transmitter antenna (body worn). The antenna size in the receiver is not as critical as for the transmitter but there is still no optimum antenna possible (antenna size at 169 MHz is 5 times more than at 869 MHz) This is in praxis not achievable.

Therefore an additional loss of app. 6 dB has to be taken into account.

3. . Summary of the link budget: the system at VHF will have only half of the link distance than the UHF variant.

4. Many years ago a competitor (Tunstall) introduced a country specific 173.225 MHz system for UK (today 869 MHz). Bosch developed a similar system for UK. Measurements confirm the statements given before.

It is not known if any manufacturer for social alarm produces devices for the VHF band today in Europe.

5. Due to the required high reliability of a social alarm system a category1 receiver (EN 300 220) is recommended. This receiver requires blocking of 84 dB. Blocking is a measure of the capability of the receiver to receive a wanted modulated signal without exceeding a

given degradation due to the presence of an unwanted input signal. This value can only be reasonably achieved with SAW filters. SAW filters for such low frequencies with the required performance are economically priced not available and producible.

6.. 169 MHz is used in CATV systems. Normally the cables of such systems are screened enough but in case of failure a social alarm system could be blocked. Interference from and into cable systems using the same radio spectrum is not unusual.

Conclusion:

The use of 169 MHz for a small and almost not visible and therefore from the end user accepted social alarm system is not the optimum. Preferred by the European industry is the recommended band at 869 MHz (ERC/REC 70-03).

Therefore it may be assessed/investigated if the VHF band (169 MHz) is the appropriate one for social alarms in the present and the future. The justification for the social alarm application (independent of the frequency range) done by the EC in 2005/928/EC and 2008/673/EC is still valid.

Additional the mandate (“169 MHz-Review Mandate” from DG INFSO/B4, 1st April 2011) purposes

“2. Purpose

.....and guarantee best possible usage conditions for applications that support the community objectives, such as ICT for supporting an ageing society and ensuring the inclusion of persons with disabilities....”

Robert Bosch GmbH prefers to protect the existing frequency segment in the UHF (869 MHz) band for social alarm applications by an EC decision and kindly asked to consider an additional segment of 50 kHz in the band 870-876 MHz for the requirements in a medium and long time frame (> 5 years) taking into account the significant change in aging of the European population.

It may be questioned if these specific applications need the 169 MHz band for the time being and the future. For an effective use of spectrum the 169 MHz band may be used by other applications which may benefit from the physical and technical parameter related to this (low) frequency band.

Suggestion 7:

From a social alarm perspective, existing arrangements in ECC/DEC/(05)02 before amendment in 2010 were entirely acceptable.

Suggestion 8-12:

Low duty cycle applications / high power applications that can utilize retransmission in the event of a collision should be grouped separately from continuous time applications.

From our point of view a very practical and useful way for coexistence is reached when similar devices use the same spectrum but also a spectrum mechanism has to be regulated. If devices with and without Duty Cycle restriction are using the same parts of the frequency band this cause many troubles. A hearing aid device with no duty cycle restriction leads to no possible usage of other devices!

Applications with similar access mechanism (e.g. Duty Cycle) shall share the same frequency band. This means that hearing aids with no sharing mechanism shall use an own spectrum range. They shall not operate in a spectrum range protected with Duty Cycle.

This means that the hearing aids allowed in Band A are seen as

risk for efficient spectrum using at all!!

The hearing aids in Band A should be allowed just with Duty Cycle restriction of less than 10%!

The Duty Cycle is a very helpful and efficient spectrum access method and is a very effective solution for spectrum access of many users. A reduction of the Duty Cycle is seen as improvement

Suggestion 13:

A listen before talk / acknowledged TX scheme would help

Suggestion 14:

A mix up of several spectrum access methods like in the 863-870 MHz band should be avoided in this band.

Suggestion 15 - 17:

Well defined channels are preferable – and of course – more bandwidth

Only clear channelling definitions give the option for frequency planning via selection of interference free channels, which is the preferred way for hearing aid systems in schools

In the case of shared bands, by clear channelling definition one can identify the occupied channels in case of interference and find a free channel from the list of all available channels

Suggestion 18:

It might be useful, if the whole subband 169.4-169.475 MHz could be used as one channel.

Suggestion 19:

Different bands for different applications. Do not mix! Try to keep power levels in the same region for each band.

Preliminary assessment of SRD/MG:

The answers indicate that there is a general concern of interfering the hearing impaired. Low duty cycle and other mitigation techniques should be used in order to prevent interference against hearing impaired. Another possibility is that a part of the band will be dedicated to the hearing impaired only.

Question 9: Please give your view on the impact of setting the maximum permitted e.r.p. available to Social Alarm of 10 mW with a Duty Cycle limit of 0.1%?

2 opinions were received from social alarms manufacturers:

- Arguably this would not impact on social alarm applications, and would potentially improve the future reliability;
- Can accept a maximum e.r.p. of 10mW. The duty cycle limit of 0.1% is also acceptable and seems a good idea.

1 comment from meter reader industry received (twice):

- Long range social alarm would benefit from 169 MHz with output power up to 500mW. The duty cycle can be 0.1% as these are very rare events.

Preliminary assessment of SRD/MG:
 The industry think it is a good idea of setting the maximum permitted e.r.p. available to Social Alarm of 10 mW with a Duty Cycle limit of 0.1%.

Question 10: Please indicate any other bands where Social Alarms are used by your customers

There was only one social alarm manufacturer currently having products in the 169 MHz range. This respondent claims that 169 MHz was originally proposed and selected, as it would offer wider coverage, better penetration in buildings and is more suitable for this application.

Two others indicated the usage of the 869 MHz frequency opportunity for social alarms. It seems that the major part of the market for social alarms is nowadays selecting rather the UHF solution and not the VHF solution in 169 MHz.

One manufacturer made a suggestion to move completely to UHF. Another announced new product plans for the 169 MHz range, however also linked to more flexible usage. It is important to note the creation of a new ETSI System Reference Document on social alarms in this respect.

2 manufacturers stated concerns about interference (blocking) from LTE mobile stations unwanted emissions. This concern has been supported by testing carried out by OFCOM UK.

Preliminary assessment of SRD/MG:
 Preliminary assessment of SRD/MG: The social alarms can not be completely removed to the UHF band. By using bands in the VHF and in the UHF band interference may be avoided with regard to LTE.

Question 11: Frequency band segment B: Please state alternative technical means (sharing mechanisms such as low duty cycle or alternative) to achieve equivalent protection of services in part B of the band (currently frequency band segment B with non-shared usage).

What other technical method can you suggest that would replace band segmentation, but gives similarly robust and reliable communications?	Only 1 respondent made a statement: We may need to use low cost transmitters, so do not want to be forced to use Listen before talk, or an acknowledged TX scheme. Hence, we would prefer to have only the duty cycle limit as mandatory.
What would be the needed protection requirement?	Only 1 respondent made a statement: 0.1% channel occupancy is adequate for our needs
No other method is suggested.	10 respondents made this statement.

Preliminary assessment of SRD/MG:
 Preliminary assessment of SRD/MG: LDC can be used as sharing techniques.

Part B: Questions to administrations

30 Administrations provided information with regard to the question in part B where they were requested to provide information about the high power band C apparatus authorisations:

Please indicate the types of apparatus/application and the approximate number of licences that you have issued for the high power band C?

Please indicate possible restrictions, geographical distribution (e.g. regional or site-by-site licensing), planned expiry date or phasing out.

A variety of applications was named in the responses:

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Paging:

5 countries provided information on paging networks. Only Romania operates a high number of 8 nationwide and 7 local networks. The other countries operate 2 nationwide networks (the Netherlands, Sweden), 1 nationwide and 1 regional network (Belgium). Switzerland indicated adding a third frequency for paging systems.

A considerable number of these paging systems are used by security or emergency services.

The revised ECC/DEC/(05)02 as amended in 2010 indicates a total of 100 kHz for paging systems in sub-band C which corresponds to 4 x 25 kHz or 8 x 12.5 kHz.

PMR:

8 countries indicated the existence of licences for PMR services: Finland (111 licences), Bosnia Herzegovina (33 licences), Denmark (5 licences, including one nationwide licence), The Netherlands (5 licences), Estonia (2 licences), Spain (2) and Slovakia (1 licence).

Current PMR usage can be expected to be mostly of an analogue nature with 25 kHz channel bandwidth equipment, although newer digital PMR technologies with 12.5 kHz or even 6.25 kHz channel bandwidth are also available (e.g. DMR or DPMR). Sub-band C in this context, has to be understood as being a part of the traditional 2m-band VHF PMR band and equipment on the market has a tuning range that also covers his sub-band.

Tracking & Tracing

5 countries use this sub-band for tracking & tracing applications whereas 2 additional countries indicated plans for the future for this application.

Latvia and Lithuania have for this application each one licence for a nationwide network. Austria and Belgium indicated that there is interest or plans for a countrywide network. Portugal reported one network with 12 base stations. Switzerland also indicated usage of this sub-band for tracking & tracing purposes. Germany provides 2 licences, however not on a national basis.

Regarding the frequency usage by tracking & tracing systems, the administrations reported about using channels 9, 13 and 14 as defined in Decision 2005/928/EC. No indication was given regarding usage in channel 16 for such applications. One administration reported that tracking & tracing is included in their frequency utilisation plan, however there was a lack of demand.

The revised ECC/DEC/(05)02 as amended in 2010 indicates a total of 100 kHz for tracking & tracing systems in sub-band C which corresponds to 4 x 25 kHz or 8 x 12.5 kHz for paging systems.

Other usage

Two administrations are using the sub-band C for occasional / short term use (Belgium, Ireland). One administration is using the sub-band C for PPDR applications (Russian Federation). Two administrations did not specify the usage but informed about licences: The United Kingdom has one licensed user on a 25 kHz simplex channel (channel 15) and Slovenia also reported about one regional licence, 2 x 25 kHz.

Detailed Information:

Country	Licences			
Austria	Until now no licences have been issued for applications according to the relevant ECC Decisions. But there is an interest for a countrywide tracking and tracing network.			
Belgium	Type of application	Number of licences	National/Regional/Site by Site	Expire date
	Pogsac Paging	1 licence/1000's of users	National (security services)	undetermined
	Pogsac Paging	1 licence/10's of users	1 site (security services)	undetermined
	Temporary Use	1 licence/100's of users	National / Cross-border events	undetermined
	Temporary Use	10's of licences	Site by site short term assignments	when needed
	Tracking & Tracing	1 licence planned	National / Cross border harmonised	undetermined
Bosnia Herzegovina	Bosnia and Herzegovina assigns licences to PMR systems in this band. We currently have 33 assignments in this specific sub band. All licences are being issued with expiry date of 31.12.2013, when the planned transition to T/R 25-08 channel arrangement for PMR/PAMR should take place. However even within this new regulative, there should be 33 new channels (central frequencies) within 169.6125-169.8125 MHz to assign to PMR users.			
Croatia	Asset tracking and tracing in Frequency Allocation Table. 0 licences issued so far. Site-by-site licensing.			
Cyprus	No authorizations have been issued for the use of the high power sub-band C (169,6125 – 169,8125 MHz).			
Czech Republic	First of all please note that operation of the last ERMES transmitter was terminated on 31 January 2009. Currently only single local PMR network is operated on channel 10 (169.650 MHz) on territory of the Czech Republic. This network is made up by 4 base stations with associated mobile stations (totally approx. 50). Radiated power of base stations is 10 W e.r.p. into half-wave dipoles. Stations are active within circle with diameter of 22 km from centre located at 18 E 33 37 / 49 N 36 19 (city of Frydek-Mistek). Stations are operated under conditions of a secondary service. Individual authorisation will expire on 31 December 2015, its prolongation the Office will consider if the holder will submit such requirement.			
Denmark	One licence is issued on one frequency (bandwidth 25 kHz), covering 4 positions and used for PMR (Basestation). The same licensee also has two licences on the same frequency (bandwidth 25 kHz) for nationwide coverage (PMR basestation and PMR Mobile respectively). Two other frequencies (both with bandwidth 25 kHz) are issued for regional coverage (Four licences) and are used for PMR (Mobile). Planned expiry date is 31 December 2024. New licences are issued according to the decision.			
Estonia	PMR, two licences, regional. No any expiry date is designated. Licence is extended automatically after payment of State fee.			
Finland	In the frequency band 169,6125-169,8125 MHz there are private mobile radio networks in Finland. Altogether 111 frequency assignments have been issued and there are about 80 different licence holders. Almost all available channels are in use.			
France	This frequency band was occupied by a paging system (ERMES) but all authorisations have expired in 2008 without renewal, and so, there is no longer use of this frequency band by a lack of demands.			

Germany	<p>2 individual licences</p> <ul style="list-style-type: none"> - Tracking tracing (Guard systems) 169.74375-169.76875 MHz (2X 12.5 kHz) - Tracking tracing (logistic institute university Bremen) 169.625 MHz (25 kHz) <p>no restrictions</p>
Hungary	<p>In Hungary the band is allocated for tracking and asset tracing systems. 2 Radio licences have been issued for these applications using 169.718750 MHz and 169.731250 MHz. International frequency coordination is required in the border areas</p>
Ireland	<p>Within Ireland, the band 169.61875-169.80625 MHz is currently employed for the licensing of special events and temporary frequency channel assignments, specifically for Private Mobile Radio applications.</p> <p>Channels are assigned for temporary use under a <i>Temporary Business Radio Licence</i>, in accordance with the channel plans outlined in Appendix A of the following ComReg document:</p> <p>http://www.comreg.ie/_fileupload/publications/ComReg0808R1.pdf</p> <p>Restrictions:</p> <ul style="list-style-type: none"> • Max ERP is restricted to 5W. • Licensing is carried out on a case-by-case basis, with temporary frequency assignments made on a site-by-site or regional basis as required. <p>Licences are issued on a non-interference, non-protected basis.</p>
Latvia	<p>One (1) permit for usage of two (2) frequency assignments for asset tracking and tracing applications in the high power band C (channels 14a and 14b) is issued in Latvia.</p> <p>Area of operation covers the whole country and it is foreseen that the mentioned permit will be valid at least till end of 2016 with rights to extend its validity.</p>
Lithuania	<p>One licence to use the frequencies in the band 169.7375-169.7625 MHz for tracking and property safeguard applications in the territory of Lithuania is issued. Expiry date – 1 Oct 2014</p>
Luxembourg	<p>No licence is issued for the high power band C in Luxembourg</p>
Macedonia	<p>There are no frequency authorisations in this band. This band is free and ready to use. Till now, there is no interest to use these frequencies.</p>
Malta	<p>The high power band C is not in use in Malta.</p> <p>No licences are awarded for the provision of services in this band.</p>
Montenegro	<p>According to the existing regulatory frame in Montenegro (National Table of allocations) and due to the provisions of Rulebook on radio frequencies and the conditions under which radio frequencies can be used without obtaining authorisations this band is allocated to SRD devices used as aids for the hearing impaired. According to this rulebook they are licence/authorisation exempt.</p>
Poland	<p>The use of radio equipment in this frequency range in Poland requires a radio licence. So far there has been no interest in using this band and therefore no licences have been issued.</p>
Portugal	<p>In Portugal there is only one licence using two channels with frequencies 169.71875 MHz and 169.73125 MHz.</p> <p>It is used for tracking and telematic services based in a network consisting of 12 base stations.</p> <p>The service started in 9 December 2009 with no restrictions in a nationwide base.</p>
Romania	<p>High power paging – 8 regional networks and 7 local networks of the Ministry of Health for emergency medical services; the number of networks will be increased to extend the coverage at national level.</p>

	<ul style="list-style-type: none"> - e.r.p between 15 W and 32 W; - regional or local licensing and site-by-site technical authorization; - planned expiry date (phasing out): 2017;
Russian Federation	<p>Applications, including high power apparatuses are used in the high power band C.</p> <p>All the operating sub-bands are used on mostly exclusive basis, for the government regulation, government communication, national defense and law enforcement needs.</p>
Slovakia	<p>1 Individual authorisation, local,</p> <ul style="list-style-type: none"> - expiration 31.12.2013 due to implementation CEPT T/R 25-08, - assigned frequency 169.700 MHz, - ERP 5W, - PMR, mobile/vehicle radio stations.
Slovenia	1 licence / 2 x 25 kHz / regional
Spain	At this moment, in Spain there are 2 licences for PMR networks in the high power frequency
Sweden	Two licences for nationwide paging systems including 800 base stations in total. Expiry date is 2016-12-31. No decision regarding phase out has been made. The systems have been in operation since approx. 15-20 years.
Switzerland	<p>169.650 MHz Paging</p> <p>169.700 MHz Paging</p> <p>169.725 MHz Tracing / Tracking</p> <p>169.775 MHz Paging planned</p>
The Netherlands	<p>There are at the moment 7 licences in the above mentioned band. There are 5 PMR licences and 2 licences for paging.</p> <p>One for ERMES (169.750 MHz) this authorisation expires in August 2011, but a request for extension has been received. A second one is for P2000 (169.650 MHz), which is part of a network for emergency services and this authorisation expires in 2019.</p> <p>Both paging networks have base stations in the whole country and their coverage is nation-wide.</p>
United Kingdom	<p>Ofcom(UK) has one licenced user operating on a 25kHz simplex channel, 169.775MHz (channel number 15).</p> <p>There is no licenced use on the following frequencies: 169.625000, 169.650000, 169.675000, 169.700000, 169.725000, 169.750000, 169.800000</p> <p>Ofcom complies with the EC Decision 2005/928/EC, as amended by 2008/673/EC, and so has no restrictions beyond that stated within the EC Decision.</p>

Preliminary assessment of SRD/MG:

Most answers indicated that this band was used for (1)Tracking and Tracing, (2) PMR), (3) Paging. The biggest column indicates that there is No Current Use of the band.

The responses from the 30 administrations have shown that the different high power applications are used only to a limited extend within CEPT. In those countries in which licences have been granted, only a small fraction of these licences cover nationwide usage. If information on the technology has been provided, e.g. for PMR, it can be seen that mostly analogue technique is in use (which probably had been introduced before the Commission Decision was set into force).

By taking into account this information, it seems to be that there is no requirement for a harmonisation measure regarding high power radio applications in the 169 MHz band, Therefore the removal of the high power part from the frequency regulation (Commission Decision) is recommended.

ANNEX 3: LIST OF REFERENCE

- [1] Commission Decision 2005/928/EC of 20 December 2005 on the harmonisation of the 169.4-169.8125 MHz frequency band in the Community;
- [2] Commission Decision 2008/673/EC of 13 August 2008 amending Decision 2005/928/EC on the harmonisation of the 169.4-169.8125 MHz frequency band in the Community;
- [3] ECC/DEC/(05)02 on a harmonised frequency plan for the use of the band 169.4-169.8125 MHz;
- [4] ERC/REC 70-03 RELATING TO THE USE OF SHORT RANGE DEVICES (SRD);
- [5] Recommendation T/R 25-08 PLANNING CRITERIA AND COORDINATION OF FREQUENCIES IN THE LAND MOBILE SERVICE IN THE RANGE 29.7-921 MHz;
- [6] Council Directive 90/544/EEC of 9 October 1990 on the frequency bands designated for the coordinated introduction of pan-European land-based public radio paging in the Community
- [7] ERC Decision of 30 June 1997 on the harmonised frequency band to be designated for Social Alarm Systems (withdrawn)
- [8] Commission Decision 2006/771/EC of 9 November 2006 on harmonisation of the radio spectrum for use by short-range devices
- [9] CEN EN 13757-4 on communication systems for meters and remote reading of meters - Part 4: Wireless meter (Radio meter reading for operation in SRD bands);
- [10] Cenelec EN 50134 series of standards for Social Alarms;
- [11] ETSI EN 300 220: Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment to be used in the 25 MHz to 1 000 MHz frequency range with power levels ranging up to 500 mW
- [12] ERC/DEC/(94)02 on Frequencies for ERMES (withdrawn)
- [13] ETSI TR 103 056 Electromagnetic compatibility and Radio spectrum Matters (ERM); System Reference Document; Short Range Devices (SRD); Technical characteristics for SRD equipment for social alarm and alarm applications