



ECC Decision (13)03

The harmonised use of the frequency band 1452-1492
MHz for Mobile/Fixed Communications Networks
Supplemental Downlink (MFCN SDL)

Approved 8 November 2013

EXPLANATORY MEMORANDUM

1 INTRODUCTION

This ECC Decision harmonises the use of the 1452-1492 MHz band for terrestrial mobile/fixed communications networks supplemental downlink (MFCN SDL) while allowing individual countries to adapt to specific national circumstances in part of the band for terrestrial broadcasting and other terrestrial applications. It provides the harmonised technical conditions for the deployment of MFCN SDL within CEPT.

An MFCN SDL is a mobile broadband system, which by means of base station transmitters in the network, uses unpaired spectrum in the downlink to provide a supplemental downlink capacity to carry comprehensive text, audio, images, data, sound and video content in general, in a unicasting, multicasting or broadcasting mode.

The harmonisation of the 1452-1492 MHz band unpaired spectrum for MFCN SDL through this ECC Decision is important to enhance the downlink capability of mobile broadband systems and represents a strategic tool to tackle the growing mobile data traffic asymmetry.

This ECC Decision contains annexes defining the harmonised frequency arrangement and applicable least restrictive technical conditions for the use of the band by MFCN SDL within CEPT.

2 BACKGROUND

The 1452-1492 MHz band has remained unused in most European countries for the past decade. Since 2002, the 1452-1479.5 MHz sub-band has been harmonised for terrestrial audio broadcasting systems (T-DAB) through the Maastricht, 2002 Special Arrangement. The arrangement was later revised in Constanța, in 2007. Since 2003, the 1479.5-1492 MHz sub-band has been harmonised for satellite digital audio broadcasting (S-DAB) through the ECC/DEC/(03)02.

Late 2010, ECC decided to undertake a review of the use of the frequency band 1452-1492 MHz with the aim to change this situation and enable the use of those 40 MHz of spectrum for new services and applications that could bring substantial social and economic benefits for Europe. To that end, ECC developed Report 188 which included an impact analysis to determine the most appropriate future use of the 1452-1492 MHz band in CEPT. This impact analysis was based on a number of criteria the 1) compatibility with the current regulatory framework, 2) possibility to share with other applications/uses, 3) extent (maximisation) of social and economic benefits, 4) timeframe for availability of equipment on a large scale and for application deployment - status of standardisation and 5) potential for economy of scale (need and potential for harmonisation within and outside CEPT).

The conclusion of ECC Report 188 is that the most appropriate regulatory framework for the future use of the 1452-1492 MHz band in ECC is the harmonisation of this band for mobile broadband / mobile supplemental downlink, while allowing individual countries to adapt to specific national circumstances in part of the band for terrestrial broadcasting and other terrestrial applications. This regulatory framework will bring the highest benefits for CEPT, with those benefits being maximised when mobile supplemental downlink is deployed under this framework. The implementation of this regulatory framework consists of an ECC Decision designating the band to mobile/fixed communications networks supplemental downlink (MFCN SDL) and defining the least restrictive technical conditions (LRTC) with a harmonised band plan for the 1452-1492 MHz band.

It is noted that radio spectrum below 1452 MHz and above 1492 MHz is also used for defence systems according to ERC Report 25 (The European table of frequency allocations and applications in the frequency range 8.3 kHz to 3000 GHz).

3 REQUIREMENT FOR AN ECC DECISION

The ECC recognises that the use of the band 1452-1492 MHz for MFCN SDL based on least restrictive technical conditions (LRTC) and on a harmonised frequency arrangement will maximise the opportunities and benefits for end users, will reduce capital expenditure for operators and cost of manufacturing equipment and will secure future investments by providing economy of scale.

An ECC Decision is required to provide guidance and certainty to the industry so that the UMTS/HSPA (3GPP specification Release 9 and beyond) standard and LTE-Advanced (3GPP specification Release 10 and beyond) standard, that are capable of aggregating multiple downlink channels in multiple bands, thus allowing the use of an unpaired spectrum for SDL, specify the 1452-1492 MHz band as a SDL band to be implemented in chipsets, devices and equipment.

The ECC recognises that an ECC Decision harmonising the use of the frequency band 1452-1492 MHz leaves flexibility for administrations to adapt to specific national circumstances in part of the band for terrestrial broadcasting and other terrestrial applications.

ECC DECISION OF 8 NOVEMBER 2013 ON THE HARMONISED USE OF THE FREQUENCY BAND 1452-1492 MHz FOR MOBILE/FIXED COMMUNICATIONS NETWORKS SUPPLEMENTAL DOWNLINK (MFCN SDL) (ECC/DEC/(13)03)

“The European Conference of Postal and Telecommunications Administrations,

considering

- a) that the frequency band 1452-1492 MHz is allocated to the mobile service (except aeronautical mobile service), fixed service, broadcasting service and broadcasting satellite service on a co-primary basis in ITU Region 1. In some CEPT countries, the band is also allocated on a co-primary basis to aeronautical mobile service for the purpose of aeronautical telemetry within the national territory according to No 5.342 of the ITU Radio Regulation;
- b) that ECC Report 188 concluded on the most appropriate regulatory framework for the future use of the 1452-1492 MHz band in CEPT;
- c) that terrestrial mobile/fixed communications networks (MFCN) for the purpose of this Decision includes IMT and other communications networks in the mobile and fixed services;
- d) that harmonised frequency arrangements facilitate economies of scale and availability of low-cost equipment;
- e) that a MFCN supplemental downlink (SDL) is a mobile broadband system, which by means of base station transmitters in the network, uses unpaired spectrum in the downlink to provide a supplemental downlink capacity to carry comprehensive text, audio, images, data, sound and video content in general, in a unicasting, multicasting or broadcasting mode;
- f) that a MFCN SDL could aggregate the usual downlink channel of a MFCN paired (FDD) band with a supplemental downlink channel(s) in the unpaired spectrum to increase the downlink capacity;
- g) that there could be differences in the market demand for spectrum for MFCN SDL and that different licensing schemes across CEPT countries could lead to different timescales concerning the introduction of mobile/fixed communication services in the frequency band 1452-1492 MHz;
- h) that data based traffic over mobile broadband networks is predicted to increase over the coming years with a particular evolution towards asymmetrical traffic due to mobile multimedia usage leading to an increasing demand for downlink capacity;
- i) that some radio-communication standards enable the efficient delivery of live and on-demand content to mobile devices over MFCN SDL for example using broadcast over eMBMS (evolved Multimedia Broadcast Multicast Service) and dynamic unicast/broadcast hand-off techniques;
- j) that some mobile broadband standards e.g. UMTS/HSPA and LTE-Advanced are capable of aggregating multiple downlink channels across multiple bands, thus allowing the use of unpaired spectrum for MFCN SDL;
- k) that roaming and economies of scale are facilitated by harmonised frequency arrangements for the use of MFCN terminals;
- l) that the appropriate frequency block size for MFCN SDL is 5 MHz, or a multiple thereof, which does not preclude smaller channel bandwidths within a block;
- m) that the block edge mask (BEM) concept has been developed by CEPT to facilitate implementation of spectrum rights of use which are as technology neutral as possible;
- n) that the designation of the frequency band 1452-1492 MHz to MFCN SDL does not prevent administrations from using part of the band for terrestrial broadcasting, aeronautical telemetry, MFCN other than SDL or other terrestrial applications to adapt to national circumstances;
- o) that administrations wishing to implement terrestrial digital sound broadcasting networks in part of the frequency band 1452-1492 MHz may choose to do so using the MA02revCO07 Plan and its possible modifications, based on a 1.7 MHz channel bandwidth;
- p) that the protection of terrestrial broadcasting within the frequency band 1452-1492 MHz may require measures at the national level to mitigate the potential interference cases;

- q) that the MA02revCO07 Special Arrangement provides the necessary regulatory procedures for cross-border coordination between administrations having to coordinate terrestrial digital sound broadcasting networks in one country and mobile service in another country;
- r) that the use of aeronautical mobile service in the countries mentioned in No 5.342 RR is subject to coordination and agreement between the administrations concerned;
- s) that MFCN SDL to MFCN SDL cross-border coordination in the frequency band 1452-1492 MHz needs to be addressed and is expected to be addressed in an appropriate ECC Recommendation;
- t) that the protection of services in frequency bands adjacent to 1452-1492 MHz needs to be addressed;
- u) that in EU/EFTA countries the radio equipment that is under the scope of this Decision shall comply with the R&TTE Directive. Conformity with the essential requirements of the R&TTE Directive may be demonstrated by compliance with the applicable harmonised European standard(s) or by using the other conformity assessment procedures set out in the R&TTE Directive.

DECIDES

1. that the **purpose of this ECC Decision** is to harmonise the use of the band 1452-1492 MHz for terrestrial mobile/fixed communications networks supplemental downlink (MFCN SDL);
2. that CEPT **administrations shall** designate the frequency band 1452-1492 MHz to MFCN SDL, taking into account *considering n*);
3. that the **following technical and operational parameters** apply to MFCN SDL in the frequency band 1452-1492 MHz:
 - a) the harmonised frequency arrangement is given in Annex 1;
 - b) the least restrictive technical conditions (LRTC) are specified in Annex 2;
4. that this Decision **enters into force** on 8 November 2013;
5. that the preferred **date for implementation** of this Decision shall be 8 May 2014;
6. that CEPT administrations shall communicate the **national measures** implementing this Decision to the ECC Chairman and the Office when this ECC Decision is nationally implemented.

Note:

Please check the Office documentation database <http://www.ecodocdb.dk> for the up to date position on the implementation of this and other ECC Decisions.

ANNEX 1: HARMONISED FREQUENCY ARRANGEMENT FOR THE BAND 1452-1492 MHz

The harmonised frequency arrangement is based on a block size of 5 MHz, resulting in the following 8 frequency blocks in 1452-1492 MHz.

Table 1: Harmonised frequency arrangement

1452 -1457	1457-1462	1462-1467	1467-1472	1472-1477	1477-1482	1482-1487	1487-1492
Downlink (base station transmit)							
40 MHz (8 blocks of 5 MHz)							

Note: Administrations which do not have the full band 1452-1492 MHz available for MFCN SDL (see *considering n*)) may consider a partial implementation of the frequency arrangement described above.

ANNEX 2: LEAST RESTRICTIVE TECHNICAL CONDITIONS

The least restrictive technical conditions (LRTC) presented in this annex are in the form of a block-edge mask (BEM) and out of band (OOB) emission limits. LRTC are related to the avoidance of interference between users of spectrum. The LRTC in the 1452-1492 MHz band are optimised for, but are not limited to MFCN SDL. The LRTC given in this annex apply to the harmonised frequency arrangement as described in Annex 1.

A BEM is an emission mask that is defined, as a function of frequency, relative to the block edge of spectrum. BEMs are emission restrictions without implication on the levels of the emission restriction applicable to the spurious domain. The term *block edge* refers to the frequency boundary of spectrum licensed to a mobile/fixed communication network.

The BEM has been derived to allow coexistence between MFCN SDL in the 1452-1492 MHz band.

In addition, OOB emission limits for MFCN SDL have been defined to address compatibility between MFCN SDL in the 1452-1492 MHz band and other applications in adjacent bands but in the same geographical area.

Other deliverables will address:

- adjacent channel compatibility between MFCN SDL and other terrestrial applications in the band to take into account national circumstances (see *considering n*) above), for administration which consider a partial implementation of the harmonised frequency arrangement;
- in-band cross-border coordination between MFCN SDL and other terrestrial applications (see *considering n*) above);
- cross-border coordination between two MFCN SDL systems applicable in the 1452-1492 MHz.

Operators of mobile/fixed communications networks in the 1452-1492 MHz band may agree, on a bilateral or multilateral basis, different technical parameters providing that they continue to comply with the technical conditions applicable for the protection of other services, applications or networks and with their cross-border obligations. Administrations should ensure that these technical parameters can be used, if agreed among all affected parties.

Technical conditions for base stations

Administrations should take into account the following aspects:

- It is not desirable to restrict the in-band e.i.r.p. as the 1452-1492 MHz band could be aggregated with FDD coverage bands in lower frequencies and thus higher in-band e.i.r.p. for a base station allows benefiting of the SDL capacity across the base station cell.
- Based on deployment requirements and on compatibility studies with other services operating in adjacent bands (see ECC Report 202), an administration could at national level:
 - restrict base stations in-band e.i.r.p.. Such limit may range up to 68 dBm. Higher e.i.r.p.s may be considered in specific circumstances;

and/or according to the service considered:

- handle coordination of stations.

Tables 2 and 3 define, respectively, base stations BEM out-of-block e.i.r.p. limits within the band 1452-1492 MHz and base stations OOB e.i.r.p. limits out of the band 1452-1492 MHz:

Table 2: Base station BEM out-of-block e.i.r.p. limits within the band 1452-1492 MHz per antenna

Frequency range of out-of-block emissions	Maximum mean out-of-block e.i.r.p. [dBm]	Measurement Bandwidth [MHz]
-10 to -5 MHz from lower block edge	11 dBm	5 MHz
-5 to 0 MHz from lower block edge	16.3 dBm	5 MHz
0 to +5 MHz from upper block edge	16.3 dBm	5 MHz
+5 to +10 MHz from upper block edge	11 dBm	5 MHz
Remaining MFCN SDL frequencies	9 dBm	5 MHz

Table 3: Base station OOB e.i.r.p. limits out of the band 1452-1492 MHz

Frequency range of out-of-band emissions	Maximum mean out-of-band e.i.r.p. [dBm]	Measurement Bandwidth [MHz]
Below 1449 MHz	-20 dBm	1 MHz
1449-1452 MHz	14 dBm	3 MHz
1492-1495 MHz	14 dBm	3 MHz
Above 1495 MHz	-20 dBm	1 MHz