

TECHNICAL ARRANGEMENT

**BETWEEN THE NATIONAL FREQUENCY MANAGEMENT
AUTHORITIES OF**

**AUSTRIA, CROATIA, HUNGARY, ROMANIA, SERBIA
THE SLOVAK REPUBLIC and SLOVENIA**

ON BORDER COORDINATION

**FOR
TERRESTRIAL SYSTEMS CAPABLE OF
PROVIDING ELECTRONIC
COMMUNICATIONS SERVICES AND
NATIONAL OPTIONS**

IN THE 700 MHz FREQUENCY BAND

agreed by correspondence in 2025

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1 INTRODUCTION

The aim of this Technical Arrangement is to lay down the principles, the technical provisions and administrative procedure necessary to regulate the deployment of terrestrial systems capable of providing electronic communications services in the band 694 - 790 MHz in border areas.

In the framework of Article 6 of ITU Radio Regulations, of bi- or multilateral agreements, arrangements or protocols dealing with frequency coordination in general (e.g. the "HCM Agreement"), the Federal Ministry of Finance (Austria), the Croatian Regulatory Authority for Network Industries (Croatia), the National Media and Infocommunications Authority (Hungary), the National Authority for Management and Regulation in Communications of Romania (Romania), Regulatory Authority for Electronic Communications and Postal Services (Republic of Serbia), the Regulatory Authority for Electronic Communications and Postal Services (the Slovak Republic) and Agency for Communication Networks and Services of the Republic of Slovenia (Slovenia) (hereinafter called Signatory Authorities) concluded this Technical Arrangement concerning the usage of the frequencies for terrestrial systems capable of providing electronic communications services in the band 694-790 MHz in border areas.

The Signatory Authorities have agreed on the coordination procedures and rules regarding frequency usage in border areas detailed in the sections below.

2 PRINCIPLES OF FREQUENCY PLANNING AND FREQUENCY USAGE IN BORDER AREAS

2.1 Relevant regulations

From regulatory point of view, the following deliverables play an important role in the regulation of cross border coordination in the band 694 - 790 MHz:

- COMMISSION IMPLEMENTING DECISION (2016/687/EU) of 28 April 2016 on the harmonisation of the 694-790 MHz frequency band for terrestrial systems capable of providing wireless broadband electronic communications services and for flexible national use in the Union;
- ECC DECISION (ECC/DEC/(15)01) approved 06 March 2015
Harmonised technical conditions for mobile/fixed communications networks (MFCN) in the band 694-790 MHz including a paired frequency arrangement (Frequency Division Duplex 2x30 MHz) and an optional unpaired frequency arrangement (Supplemental Downlink) (*Approved 06 March 2015*);
- ECC RECOMMENDATION (ECC/REC/(15)01) approved 13 February 2015 latest amended on 10 June 2022;

Cross-border coordination for mobile / fixed communications networks (MFCN) in the frequency bands: 694-790 MHz, 1452-1492 MHz, 3400-3600 MHz and 3600-3800 MHz

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- ECC RECOMMENDATION (ECC/REC/(16)03) approved 17 October 2016
Cross-border coordination for Broadband Public Protection and Disaster Relief (BB-PPDR) systems in the frequency band 698 to 791 MHz;
- CEPT REPORT 53 of 28 November 2014
REPORT A from CEPT to the European Commission in response to the Mandate "to develop harmonised technical conditions for the 694-790 MHz ('700 MHz') frequency band in the EU for the provision of wireless broadband and other uses in support of EU spectrum policy objectives" (Report approved on 28 November 2014 by the ECC);
- CEPT REPORT 60 of 01 March 2016
REPORT B from CEPT to the European Commission in response to the Mandate "to develop harmonised technical conditions for the 694-790 MHz ('700 MHz') frequency band in the EU for the provision of wireless broadband and other uses in support of EU spectrum policy objectives" (Report approved on 01 March 2016 by the ECC);
- CEPT REPORT 29 of 26 June 2009
Technical considerations regarding harmonisation options for the digital dividend in the European Union. Guideline on cross border coordination issues between mobile services in one country and broadcasting services in another country;
- ECC REPORT 239 Approved 30 September 2015
Compatibility and sharing studies for BB PPDR systems operating in the 700 MHz range;
- ECC REPORT 242 Approved 04 March 2016
Compatibility and sharing studies for M2M applications in the 733-736 MHz / 788-791 MHz band.

The versions of the above mentioned deliverables available at the time of signing this technical arrangement are attached for reference in Annex 3.

2.2 Regulated bands

The 700 MHz band, as referred to in this Technical Arrangement, covers the preferred harmonised frequency arrangement in the band 694-790 MHz according to COMMISSION IMPLEMENTING DECISION (2016/687/EU) / ECC Decision ECC/DEC/(15)01 (see Figure below) including

- a 2x30 MHz FDD frequency arrangement in the 703-733 MHz / 758 – 788 MHz band used for MFCN;
- "zero or up to four block(s) of 5 MHz based on national demands" used for Supplemental Downlink (SDL) in the 738-758 MHz band;
- a 2x5 MHz and/or a 2x3 MHz FDD frequency arrangement in the 698-703 MHz / 753-758 MHz and 733-736 MHz / 788-791 MHz bands as a national option for public protection and disaster relief (PPDR) radio communications;
- a 2x3 MHz FDD frequency arrangement in the 733-736 MHz / 788-791 MHz bands as a national option for licensed machine to machine (M2M) radio communications.

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2.3 Access to the spectrum in general

One of the most important aims of this Technical Arrangement is to give simple procedure and rules so that networks in border areas may be deployed in a fast and effective way ensuring proper access to the frequency spectrum.

In order to assure equitable access to the spectrum for the operators in neighbouring countries, the coordination principle applied in this Technical Arrangement is based on the concept of trigger field strength values applicable for all concerned operators in the border areas and the concept of preferential physical-layer cell-identity (PCI) codes.

As a consequence, according to this Technical Arrangement, neither coordination nor notification of stations is required. Nevertheless, this kind of frequency usage in the border areas is only viable if the trigger field strength values given in this Technical Arrangement are fulfilled and the field strength values are calculated using accurate radio wave propagation methods. It is also beneficial if radio parameters of the systems are coordinated between neighbouring operators.

It is also important that the information about bringing the frequency bands into use by the operators is available for the interested Administrations and this information can be seen in EFIS (<https://efis.cept.org/>).

2.4 Radio wave propagation methods

Achieving equitable access to the spectrum rather depends upon the radio wave propagation method applied to calculate the field strength since that method serves as a tool for enforcing the rules of this Technical Arrangement.

2.4.1 Calculation of field strength for planning and effectuation

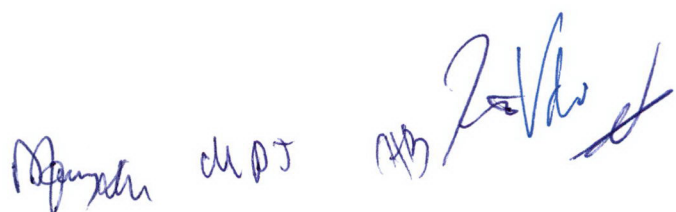
For the calculation of the field strength values to assess compliance with the triggers given in section 4.2 the method of the HCM Agreement shall be applied. Time probability for the calculation of field strength values for electronic communications services is 10%.

2.4.2 Calculations in case of reported interference

As for interference field strength prediction, the following three methods are proposed to be considered by administrations in the relevant frequency coordination Recommendation ECC/REC/(15)01:

- site general model with line calculations (hereinafter called "site general method");
- path specific model with radial calculations from base stations (hereinafter called "radial calculations");
- area calculations with a path specific model (hereinafter called "area calculations").

Using a site general method (like "HCM" Agreement) for the assessment of interference cannot ensure proper protection against harmful interference for several cases and results in less efficiency in frequency usage in border areas.

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Radial calculations can only give better result than site general methods if steps along paths are small enough and the number of radial directions is high enough. Still, there may be some cases causing harmful interference.

Area calculations, especially alongside using clutter data, can eliminate the mistakes of both site general methods and radial calculations and, in addition, important geographic areas can also be protected. Therefore, area calculations are preferable in case where it is necessary to evaluate interference in detail. Thus, operators are expected to apply area calculations based on a commonly agreed wave propagation model, trigger values and method used for evaluation of interference to protect their networks or a special part of the border area and to enhance spectrum efficiency in border areas.

3 GENERAL TECHNICAL PROVISIONS

In this section the general technical provisions are given while section 4 details the additional technical provisions for the trigger field strengths values in border areas.

This Technical Arrangement applies only for the band usage by MFCN systems complying with the frequency arrangement in section 3.1 and radio parameters specified in section 3.2.

This Agreement covers Wideband (WB) vs. Wideband systems cross-border coordination scenarios and does not address cross-border coordination of MFCN vs. other systems in these bands. Wideband systems include LTE and New Radio (NR).

In case of any other technology or radio service the Signatory Authorities concerned shall reach an agreement for properly modifying this Technical Arrangement before putting any station into operation.

3.1 Frequency arrangement

In accordance with the COMMISSION IMPLEMENTING DECISION (2016/687/EU) of 28 April 2016 / ECC DECISION (ECC/DEC/(15)01) approved 06 March 2015 the preferred harmonised frequency arrangement shall be as follows:

- within the paired 703-733 MHz and 758-788 MHz frequency bands
 - the mode of operation shall be Frequency Division Duplex (FDD); the duplex spacing shall be 55 MHz with
 - terminal station transmission located in the lower frequency band 703-733 MHz (FDD uplink);
 - base station transmission (FDD downlink) located in the upper frequency band 758-788 MHz;
 - the block sizes shall be in multiples of 5 MHz;
 - the lower frequency limit of an assigned block shall be aligned with or spaced at multiples of 5 MHz from the band edge of 703 MHz;
- within the 738-758 MHz frequency band an unpaired frequency arrangement (supplemental downlink, SDL) on optional basis:
 - the use of this band shall be limited to base station ("downlink-only") transmission;
 - the lower band edge of the designated spectrum range shall start at one of the following: 738 MHz, 743 MHz, 748 MHz or 753 MHz;

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- the assigned block sizes within the designated spectrum range shall be in multiples of 5 MHz (SDL using "zero or up to four" of the following frequency blocks: 738 – 743 MHz, 743 – 748 MHz, 748 – 753 MHz and 753 – 758 MHz, however this does not preclude smaller channel bandwidths within a block);
- the upper frequency limit of an assigned block shall be aligned with or spaced at multiples of 5 MHz from the upper band edge;
- within the 698-703 MHz/753-758 MHz and 733-736 MHz/788-791 MHz bands
 - the mode of operation shall be Frequency Division Duplex (FDD); the duplex spacing shall be 55 MHz with
 - terminal station transmission (PPDR uplink) located in the lower frequency band 698-703 MHz and/or 733-736 MHz;
 - base station transmission (PPDR downlink) located in the upper frequency band 753-758 MHz and/or 788-791 MHz;
- within the 733-736 MHz/788-791 MHz bands
 - the mode of operation shall be Frequency Division Duplex (FDD); the duplex spacing shall be 55 MHz with
 - terminal station transmission (M2M uplink) located in the lower frequency band 733-736 MHz;
 - base station transmission (M2M downlink) located in the upper frequency band 788-791 MHz.

Bands	694-698	698-703	703-733	733-736	736-738	738-743	743-748	748-753	753-758	758-788	788-791	791-821	
PPDR 2x3 MHz			UL MFCN Band 28	UL PPDR						DL MFCN Band 28	DL PPDR	DL MFCN Band 20	
PPDR 2x5 MHz		UL PPDR							DL PPDR				
M2M 2x3 MHz				UL M2M							DL M2M		
SDL 4x5 MHz				DL MFCN SDL									
PMSE	PMSE			PMSE									
Block Size [MHz]	4	5		30	3	2	5	5	5		5		30

Source: ECC Report 242

3.2 Radio parameters

Radio parameters of mobile and base stations such as power limits shall comply with the requirements given in COMMISSION IMPLEMENTING DECISION (2016/687/EU) of 28 April 2016 / ECC DECISION (ECC/DEC/(15)01)/ approved 06 March 2015.

When one country uses 733-736 MHz for UL, another country is using adjacent spectrum with only 2 MHz guard band for SDL in 738-743 MHz, coexistence parameters and mitigation techniques proposed in ECC Report 242 and/or ECC report 239 should be taken into account to prevent possible interference issues at the borderline between neighbouring countries.

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Operators are required to share the preferential physical-layer cell identities (PCI) according to Annex 1 to this Technical Arrangement.

In addition, it is also desirable for the operators to coordinate radio parameters of their systems to minimise the deteriorating effects of uplink interference in line with the related Recommendation.

4 TECHNICAL PROVISIONS RELATED TO TRIGGER FIELD STRENGTH VALUES

4.1 Basic rules

Trigger field strength values given in section 4.2 refer to a reference frequency block of 5 MHz. The trigger field strength values shall be modified taking into consideration the value of the bandwidth and the aggregated power correction factor given below. The modified field strength triggers shall be applied to each individual base station.

a) Bandwidth correction factor

If the nominal channel bandwidth of a system is not equal to 5 MHz, the value of the bandwidth correction factor (BCF) according to the following formula shall be added to the field strength triggers given in section 4.2:

$$\text{BCF} = 10 * \log (\text{CB}/5 \text{ MHz}) \quad (\text{dB})$$

where

“CB” nominal channel bandwidth (MHz).

b) Aggregated power correction factor

If there is more than one transmitter within the sector operating in a respective reference frequency block, in case of single entry interference calculation the trigger field strength values given in section 4.2 shall be decreased by the value of the aggregated power correction factor according to the following formula in each antenna sector:

$$10 * \log n \quad (\text{dB})$$

where

“n” the number of the transmitters or transmissions in the respective antenna sector

If a transmission with nominal channel spacing falls into a respective reference frequency block (even if partly), it shall be included in the value of “n”.

If there is more than one transmitter within the sector operating in a respective reference frequency block and the aggregated power of all transmitters is considered, this correction factor is not required.

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