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Electronic Communications Committee

ERC Recommendation 01-01

Cross-border coordination for mobile/fixed communications networks (MFCN) in the frequency bands: 1920-1980 MHz and 2110-2170 MHz

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ERC RECOMMENDATION 01-01 OF FEBRUARY 2001 ON CROSS-BORDER COORDINATION FOR MOBILE/FIXED COMMUNICATIONS NETWORKS (MFCN) IN THE FREQUENCY BANDS: 1920-1980 MHZ AND 2110-2170 MHZ, REVISED IN 2003, 2007 AND 2016, UPDATED 18 NOVEMBER 2022

“The European Conference of Postal and Telecommunications Administrations,

considering

a) that the Radio Regulations (RR 5.388) [1] identify the bands 1885-2025 and 2110-2200 MHz for IMT;

b) that these frequency bands are allocated to the Mobile Service and the Fixed Service on a co-primary basis and also to the space research service in 2110-2120 MHz;

c) that ECC Decision (06)01 [2] provides the harmonised conditions for mobile/fixed communications networks (MFCN) operating in the bands 1920-1980 MHz and 2110-2170 MHz;

d) that in the implementation of MFCN it is necessary to take account of national policies for the use of the frequency bands in question;

e) that national frequency and code and Preferential Physical-Layer Cell Identities (PCI) planning for the MFCN is carried out by the operators and approved by the administrations or carried out by these administrations in cooperation with the operators,

f) that “mobile/fixed communications networks” (MFCN) for the purpose of this Recommendation includes IMT and other communications networks in the mobile and fixed services;

g) that in many CEPT member countries there may be multiple operators for MFCN systems;

h) that frequency planning of MCFN in border areas will be based on coordination between national administrations in cooperation with their operators;

i) that different administrations may wish to adopt different approaches to cross-border coordination;

j) that administrations may diverge from the technical parameters, propagation models and procedures described in this Recommendation subject to bilateral or multilateral agreements;

k) that coordination is necessary between countries operating different technologies and different channel bandwidths in the same frequency band;

l) that in the case of operator arrangements approved by national administrations it is possible to deviate from this Recommendation;

m) that PCI coordination is necessary for LTE systems to avoid unnecessary signalling load and handover failures;

recommends

1 that co-ordination between MFCN systems in border areas shall be based on bilateral or multilateral agreements between administrations;

2 that bilateral or multilateral agreements should define coordination methods which encompass all MFCN systems present on each side of the border;

3 that coordination between MFCN systems should be based on the principles and the field strength levels provided in Annex 1 and the code groups provided in Annex 3 and Annex 5;

4 that if the levels in Annex 1 are exceeded coordination is required and the procedure detailed in Annex 6 should be used;

5 that interference field strength predictions should be made using one of the propagation models defined in Annex 2;

6 that coordination between neighbouring MFCN systems using UMTS technology in border areas should be agreed, where practicable, on preferential use of frequencies together with code coordination in line with the method as outlined in Annex 1;

7 that coordination between neighbouring MFCN systems using LTE technology in border areas should use the PCIs provided in Annex 5 when channel centre frequencies are aligned;

8 that other radio parameters for MFCN systems using LTE technology may need to be coordinated on a bilateral /multilateral basis based on the guidance provided in Annex 4;

9 that administrations should encourage and facilitate the establishment of arrangements between operators of different countries with the aim to enhance the efficient use of the spectrum and the coverage in the border areas,

10 that coordination in coastal areas is based on prediction of field strength levels at the coastline of the neighbouring country. Other principles for co-ordination in coastal areas may be agreed between the administrations concerned,

11 that administrations may diverge from the technical parameters and procedures described in this Recommendation subject to bilateral / multilateral agreements."

Note:

Please check the Office documentation database https://docdb.cept.org/ for the up to date position on the implementation of this and other ECC Recommendations.

ANNEX 1: PRINCIPLES AND FIELD STRENGTH LEVELS

A1.1 COORDINATION IN BORDER AREAS BETWEEN FDD SYSTEMS IS BASED ON THE FOLLOWING CONCEPT

1.1. Frequencies for MFCN FDD systems using preferential codes with centre frequencies aligned, or where centre frequencies are not aligned, may be used without coordination with a neighbouring country if the predicted mean field strength of each carrier produced by the base station does not exceed a value of **37 dBµV/m/5MHz** at a height of 3 m above ground at a distance of 6 km inside the neighbouring country **and** a value of **65 dBµV/m/5MHz** at a height of 3 m above ground at the borderline between countries.

1.2. Frequencies used at the border for MFCN FDD systems using non preferential codes with centre frequencies aligned may be used without coordination with a neighbouring country if the predicted mean field strength of each carrier produced by the base station does not exceed a value of **37 dBµV/m/5MHz** at a height of 3 m above ground at and beyond the border line between countries.

For field strength predictions the calculations should be made according to Annex 2. In cases of other frequency block sizes 10 x $\log_{10}$ (frequency block size/5 MHz) should be added to the field strength values.

A1.2 ADDITIONAL PREFERENTIAL USE OF FREQUENCIES FOR FDD SYSTEMS

For some cross-border situations, together with code coordination, it may be possible to agree on a frequency coordination based on preferential frequencies, while ensuring a fair treatment of different operators within a country. This could be implemented in the case when FDD mode in MFCN systems is used in following manner

1 Preferential frequencies (or preferential frequency bands) shall be agreed between Administrations concerned.

2 Preferential frequencies may be used without coordination with a neighbouring country if the predicted mean field strength of each carrier produced by the base station does not exceed a value of **75 dBµV/m/5 MHz** at a height of 3 m above ground at and beyond the border line between countries

3 Non-preferential frequencies may be used without coordination with a neighbouring country if the predicted mean field strength of each carrier produced by the base station does not exceed a value of **65 dBµV/m/5MHz** at a height of 3 m above ground at the borderline between countries and **37 dBµV/m/5MHz** at a height of 3 m above ground at a distance of 6 km inside the neighbouring country.

Systems operating on non-preferential frequencies have to accept interference from services in the neighbouring country using preferential frequencies.

An overview table with all relevant values can be found below.

Table 1: Overview table

Preference Frequency	Preference Code	Alignment of centre frequency	Concept dBµV/m @ km	Chapter of REC 01-01
FDD vs. FDD with code coordination only				
n.a.	Y	Y	65@0 & 37@6	Annex 1, 1.1
n.a.	Y	N	65@0 & 37@6	Annex 1, 1.1
n.a.	N	Y	37@0	Annex 1, 1.2
n.a.	N	N	65@0 & 37@6	Annex 1, 1.1
FDD vs. FDD with code coordination and add. preferential frequencies				
Y	Y/N	n.a.	75@0	Annex 1, 2
N	Y/N	n.a.	65@0 & 37@6	Annex 1, 3
Note: @ stands for “at a distance inside the neighbouring country”				

ANNEX 2: PROPAGATION MODEL

The following methods are proposed for assessment of anticipated interference inside neighbouring country based on established trigger values. Due to the nature and the complexity of radiowave propagation different methods are proposed to be considered by administrations and are included here for guidance purposes only.

It should be noted that following methods provide theoretical predictions based on available terrain knowledge. It is practically impossible to recreate these methods with measurement procedures in the field. Therefore only some approximation of measurements could be used to check compliance with those methods based on practical measurement procedures. The details of such approximation are not included in this recommendation and should be negotiated between countries based on their radio monitoring practices.

A2.1 PATH SPECIFIC MODEL

Where appropriate detailed terrain data is available, the propagation model for interference field strength prediction is the latest version of Recommendation ITU-R P.452 [3]. For the relevant transmitting terminal, predictions of path loss would be made at x km steps along radials of y km at z degree intervals. The values for those receiver locations within the neighbouring country would be used to construct a histogram of path loss - and if 10% of predicted values exceed the threshold the station shall be required to be coordinated.

Values or x, y and z to be agreed between the Administrations concerned.

A2.2 SITE GENERAL MODEL

If it is not desirable to utilise detailed terrain height data for the propagation modelling in the border area, the basic model to be used to trigger co-ordination between administrations and to decide, if co-ordination is necessary, is Recommendation ITU-R P.1546 [4], “Method for point to area predictions for terrestrial services in the frequency range 30 to 3000 MHz”. This model is to be employed for 50% locations, 10% time and using a receiver height of 3 m.

For specific reception areas where terrain roughness adjustments for improved accuracy of field strength prediction are needed, administrations may use correction factors according to terrain irregularity and/or an averaged value of the TCA parameter in order to describe the roughness of the area on and around the coordination line.

Administrations and/or operators concerned may agree to deviate from the aforementioned model by mutual consent[1].

A2.3 AREA CALCULATIONS

In the case where greater accuracy is required, administrations and operators may use the area calculation below.

For calculations, all the pixels of a given geographical area to be agreed between the Administrations concerned in a neighbouring country are taken into consideration.

For the relevant base station, predictions of path loss should be made for all the pixels of a given geographical area from a base station and at a receiver antenna height of 3 m above ground.

For evaluation,

- only 10 percent of geographical area between the borderline (including also the borderline) and the 6 km line itself inside the neighbouring country may be interfered by higher field strength than the trigger field strength value given for the borderline in Annex 1 at a height of 3 m above ground;

[1] e.g. as used by members of the HCM-Agreement [4]

- only 10 percent of the geographical area between the 6 km (including also 6 km line) and 12 km line inside the neighbouring country may be interfered by higher field strength than the trigger field strength value given for the 6 km line in Annex 1 at a height of 3 m above ground.

It is recommended that during area calculations not only detailed terrain data but also clutter data be taken into account. Use of correction factors for clutter is crucial in particular where the border area is 'open' or 'quasi-open' from the point of view of clutter or where the interfering base station is just a few kilometres from a borderline.

If the distance between a base station and a terrain point of a borderline is closer than or equal to 1 km, free space propagation model needs to be applied. Furthermore, if there is no terrain obstacle within the 1st Fresnel zone," also the free space propagation model should be applied.

If clutter data is not available, it is proposed to extend the usage of free space propagation model to a few kilometres, depending on the clutter situation in border areas.

For area type interference calculations, propagation models with path specific terrain correction factors are recommended (e.g. Recommendation ITU–R P.1546 [4] with the terrain clearance angle correction factor TCA, HCM method with the terrain clearance angle correction factor or Recommendation ITU–R P.1812 [6]).

As to correction factors for clutters 'open area' and 'quasi-open area', 20 dB and 15 dB should be used respectively. Recommendation ITU–R P.1406 [7] should be used if a finer selection of clutter is required. It must be noted that terrain irregularity factor Δh is not recommended to be used in area calculations. Administrations and/or operators concerned may agree to deviate from the aforementioned models by mutual consent.

ANNEX 3: PREFERENTIAL CODES FOR UTRA

The code groups defined for the FDD and TDD modes have no particular correlation properties and no particular organisation of the repartition is required.

Administrations should agree on a repartition of these code groups on an equitable basis.

In any case, apart from in the border areas, each country could use all code groups.

In border areas, the codes will be divided into 6 "code sets" containing each one sixth of the available code groups. Each country is allocated three code sets (half of the codes) in a bilateral case, and two code sets (one third of the codes) in a trilateral case.

Four types of countries are defined in a way such that no country will use the same code set as any one of its neighbours. The following lists describe the distribution of European countries:

Type country 1: BEL, CVA, CYP, CZE, DNK, E, FIN, GRC, IRL, ISL, LTU, MCO, SMR, SUI, SVN, UKR, AZE, SRB.

Type country 2: AND, BIH, BUL, D, EST, G, HNG, I, MDA, GEO.

Type country 3: ALB, AUT, F, HOL, HRV, POL, POR, ROU, S, MLT.

Type country 4: LIE, LUX, LVA, MKD, MNE, NOR, SVK, TUR.

(Note: Country type map can be found in the figure below).

For each type of country, the following tables and figure describe the sharing of the codes with its neighbouring countries, with the following conventions of writing:

■	Preferential code
	non-preferential code

1. FDD case:

For the FDD mode; 3GPP TS 25.213 defines 64 « scrambling code groups » in §5.2.3, numbered {0…63}, hereafter called « code groups ».

	Set A	Set B	Set C	Set D	Set E	Set F
Country 1	0..10	11..20	21..31	32..42	43..52	53..63
Border 1-2	■	■				■
Zone 1-2-3	■	■				
Border 1-3	■	■	■			
Zone 1-2-4	■					■
Border 1-4	■		■			■
Zone 1-3-4	■		■			

	Set A	Set B	Set C	Set D	Set E	Set F
Country 2	0..10	11..20	21..31	32..42	43..52	53..63
Border 2-1			■	■	■	
Zone 2-3-1			■	■		
Border 2-3		■	■	■		
Zone 2-1-4			■	■		
Border 2-4			■	■		■
Zone 2-3-4			■	■		

	Set A	Set B	Set C	Set D	Set E	Set F
Country 3	0..10	11..20	21..31	32..42	43..52	53..63
Border 3-2	■				■	■
Zone 3-1-2					■	■
Border 3-1				■	■	■
Zone 3-1-4					■	■
Border 3-4			■		■	■
Zone 3-2-4					■	■

	Set A	Set B	Set C	Set D	Set E	Set F
Country 4	0..10	11..20	21..31	32..42	43..52	53..63
Border 4-1		■		■	■	
Zone 4-1-2		■			■	
Border 4-2	■	■			■	
Zone 4-2-3	■	■				
Border 4-3	■	■		■		
Zone 4-3-1		■		■		

2. Notes

1 All codes are available in areas away from the border where the field strengths into the neighbouring country are below the relevant trigger levels.

2 For the other IMT-2000 CDMA radio interface (IMT-MC or cdma2000), preferential code allocation schemes are still to be developed.

3 A two countries code sharing should be applied or used by base stations that exceed the relevant trigger level (Annex 1) of only one neighbouring country. A three countries code sharing should be applied or used by base stations that exceed the relevant trigger level (Annex 1) of two neighbouring countries.

4 In certain specific cases (e.g. AUT/HRV) where the distance between two countries of the same Type number is very small (< few 10s km), it may be necessary to address the situation in bi/multilateral coordination agreements as necessary, and may include further subdivision of the allocated codes in certain areas.

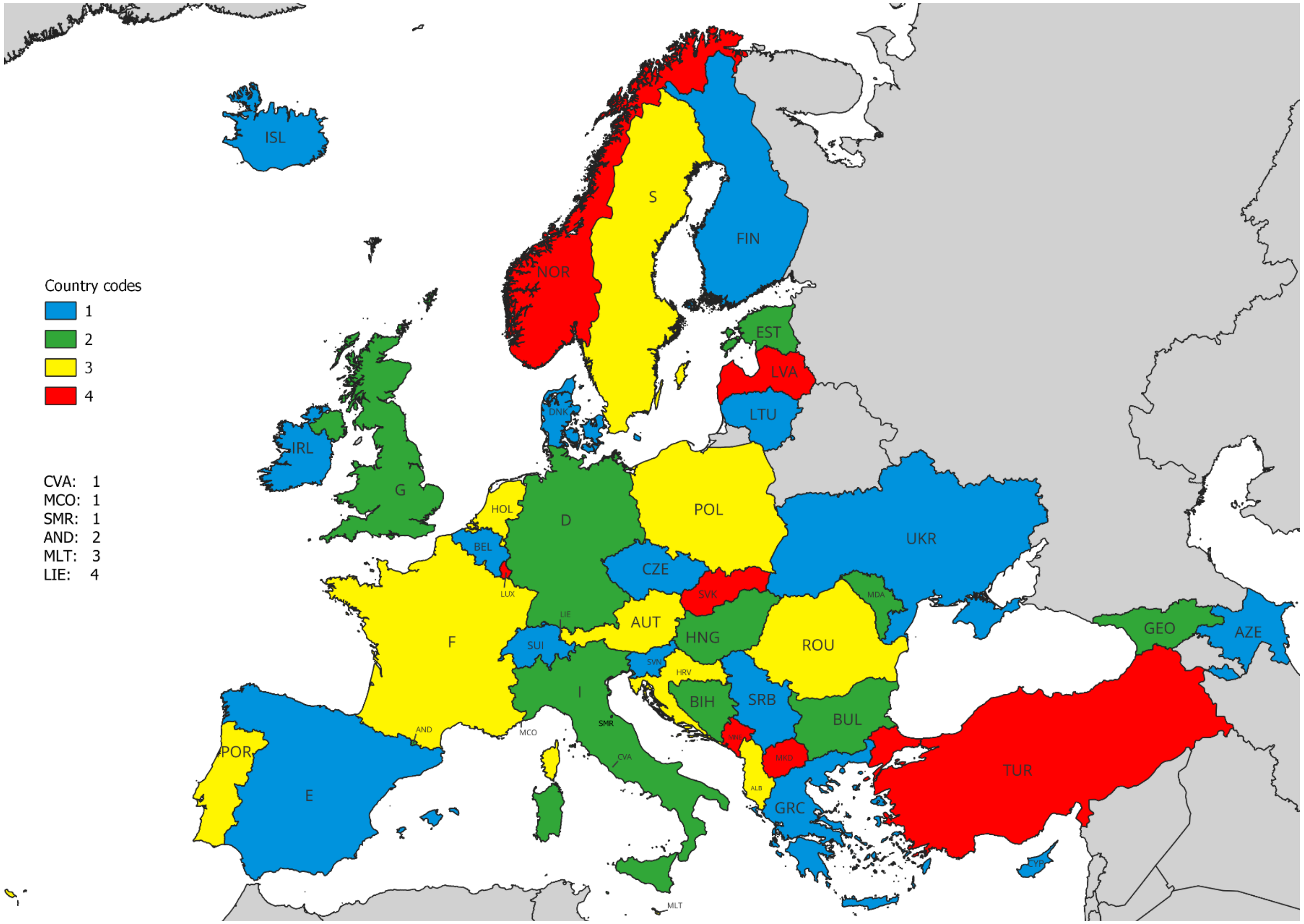

Figure 1: Recommended PCI distribution map

ANNEX 4: GUIDANCE ON THE CONSIDERATION OF LTE RADIO PARAMETERS FOR USE IN BILATERAL AND MULTILATERAL AGREEMENTS

This Annex is provided for guidance purposes for use in bi-lateral and multilateral discussions. For LTE, it may be beneficial to coordinate other radio parameters besides PCI (which is covered by the previous Annex) in order to minimise deteriorating effects of uplink interference.

The parameters described in this Annex are usually optimised during LTE radio network planning of an operator's network. The idea of optimization is to plan the parameters taking into account specific correlation properties of the uplink control signals which enable more stable and predictable operation of the network. In the cross-border scenario the optimization of parameters among neighbouring operators could provide better control of uplink interference. However because of the difference between intra-network and inter-network interference and due to limited experience in the LTE cross-border deployment it is difficult to assess the benefits of such optimisation. The following guidance provides the basis for operators to consider in border areas in case of high levels of uplink interference.

A4.1 DEMODULATION REFERENCE SIGNAL (DM RS) COORDINATION

Demodulation reference signals (DM RS) are transmitted in the uplink and used for channel estimation. There is a risk of intercell interference between neighbouring cells even in case of no frame synchronisation. That is why special measures for DM RS allocation between networks in neighbouring countries occupying the same channel may need to be applied.

The case of partial channel overlap has not been studied but due to DM RS occupying resource blocks of separate users there is a risk of DM RS collisions between neighbouring networks when the subcarriers positions coincide (the frequency offset between central carriers of neighbouring networks is multiple of 300 kHz). Some minor benefits from DM RS coordination in these particular cases could be expected.

There are a number of possible approaches to the coordination of DM RS:

- In basic planning procedure only 30 DM RS sequence groups with favourable correlation characteristics are available, numbered {0…29}. In this case each cell could be assigned one of the 30 DM RS sequence groups providing cluster size of 30;
- It is possible to extend each DM RS sequence group to generate up to 12 time shifted sequence groups by applying the cyclic shift parameter stated in ETSI TS 136 211 [8]. For example each tri-sector site could be assigned one DM RS sequence group with each co-sited cell having its own cyclic shift of 2π/3 which provides cluster size 30 only with 10 DM RS sequence groups. The latter case corresponds well to the case of DM RS sequence groups repartition between neighbouring countries when only limited number of groups is available for network planning. The drawback of DM RS sequence group cyclic shift is a loss of orthogonally of DM RS due to fading channels which has been found only recently during first trials of LTE and caused throughput loss as well as time alignment problems;
- Another approach for DM RS coordination is to implement dynamic DM RS sequence group allocation also called pseudo-random group hopping. In this method nearby cells are grouped into clusters up to 30 cells and within each cell cluster the same hopping-pattern is used. At the border of two clusters inter-cell interference is averaged since two different hopping patterns are utilised. There are 17 defined hopping patterns, numbered {0…16}, which leads to some minor unfairness in case of apportioning these patterns between neighbouring countries. Even in a trilateral case each operator will have at least 5 hopping patterns available near the border which should be enough for planning purposes. It should be noted the pseudo-random group hopping option could be absent in the first generations of LTE equipment.

The decision of which of these methods is used in cross-border coordination should be agreed by the interested parties. Specific DM RS sequence groups or hopping patterns repartition is not provided in the text of this Recommendation but could be deduced in a similar manner to the PCI repartition shown in the previous Annex.

A4.2 PHYSICAL RANDOM ACCESS CHANNEL (PRACH) COORDINATION

Another radio network parameter which is considered during radio network planning is prach configuration which is needed to distinguish random access requests addressed to different cells. prach resources are allocated by specifying the prach resource blocks time positions within the uplink frame, their frequency position within the lte channel bandwidth and by apportioning cell-specific root sequences. during radio network planning these parameters are usually used in the following way:

- time positions for PRACH resource allocations are usually used to create time collision of PRACH resources of co-sited/frame synchronised cells because PRACH-to-PRACH interference is usually less severe than PUSCH-to-PRACH interference;
- frequency positions within the LTE channel bandwidth is usually the same for all cells, again because PRACH-to-PRACH interference case is more favourable one;
- cell-specific root sequences are used to distinguish between PRACH requests addressed to different cells.

For cross-border coordination it is proposed to use frequency position offsets to exclude the possibility of so-called “ghost” PRACH requests caused by neighbouring networks. The PRACH is configured in LTE to use only 6 Resource Blocks or 1.08 MHz of the LTE channel bandwidth except in regions used by PUCCH. In case of overlapping or partially overlapping channel bandwidths of neighbouring networks it is enough to establish non-overlapping PRACH frequency blocks to perform coordination. Because it is difficult to establish an implementation dependent procedure for such allocation it will be the responsibility of operators to manage such frequency separation during coordination discussions.

In early implementation it is possible that very limited number of frequency positions will be supported by LTE equipment which will not be enough to coordinate in the trilateral case. In such cases root-sequence repartition could be used. There are 838 root sequences in total to be distributed between cells, numbered {0..837}. There are two numbering schemes for PRACH root sequences (physical and logical) and that only logical root sequences numbering needs be used for coordination. Unfortunately the process of root sequences planning doesn’t involve direct mapping of root sequences between cells because the number of root sequences needed for one cell is dependent on the cell range. The table showing such interdependency is presented below:

Table 2: PRACH root sequences and cell range

PRACH Configuration	Number of root seq. per cell	Cell Range (km)
1	1	0.7
2	2	1
3	2	1.4
4	2	2
5	2	2.5
6	3	3.4
7	3	4.3
8	4	5.4
9	5	7.3
10	6	9.7
11	8	12.1
12	10	15.8
13	13	22.7
14	22	38.7
15	32	58.7
0	64	118.8

Thus in the case of root sequence repartition it will be the responsibility of radio network planners to assign the correct number of root sequences in order to not to overlap with the root sequence ranges of other operators. It also should be noted that different root sequences have different cubic metrics and correlation properties which affect PRACH coverage performance and planning of so-called high-speed cells. For simplicity of cross-border coordination it is proposed to ignore these properties.

In summary it should be stipulated that frequency separation of PRACH resources should be used as the main coordination method. PRACH root sequences repartition should be avoided and used only in exceptional cases. Specific PRACH root sequences repartition is not provided in the text of Recommendation but could be deduced in a similar manner to the PCI repartition shown in the previous Annex.

ANNEX 5: PREFERENTIAL PHYSICAL-LAYER CELL IDENTITIES (PCI) FOR LTE

PCI coordination is only needed when channel centre frequencies are aligned independent of the channel bandwidth.

ETSI TS 136 211 [8] defines 168 “unique physical-layer cell-identity groups” in §6.11, numbered 0..167, hereafter called “PCI groups”. Within each PCI group there are three separate PCIs giving 504 PCIs in total.

Administrations should agree on a repartition of these 504 PCIs on an equitable basis when channel centre frequencies are aligned as shown in the Table below. It has to be noted that dividing the PCI groups or PCIs is equivalent. Each country should only use their own preferential PCIs close to the border and can use all PCIs away from the border. This transition distance between “close to the border” and “away from the border” should be agreed between neighbouring countries.

Administrations may wish to define different field strength levels (than those in Annex 1) for non-preferential PCIs.

As shown in the table below, the PCIs should be divided into 6 sub-sets containing each one sixth of the available PCIs. Each country is allocated three sets (half of the PCIs) in a bilateral case and two sets (one third of the PCIs) in a trilateral case.

Four types of countries are defined in a way such that no country will use the same code set as any one of its neighbours. The following lists describe the distribution of European countries:

Type country 1: BEL, CVA, CYP, CZE, DNK, E, FIN, GRC, IRL, ISL, LTU, MCO, SMR, SUI, SVN, UKR, AZE, SRB.

Type country 2: AND, BIH, BUL, D, EST, G, HNG, I, MDA, GEO.

Type country 3: ALB, AUT, F, HOL, HRV, POL, POR, ROU, S, MLT.

Type country 4: LIE, LUX, LVA, MKD, MNE, NOR, SVK, TUR.

(Note: Country type map can be found in the figure below).

For each type of country, the following tables and figure describe the sharing of the PCIs with its neighbouring countries, with the following conventions of writing:

	Preferential PCI
	non-preferential PCI

The 504 physical-layer cell-identities should be divided into the following 6 sub-sets when the carrier frequencies are aligned in border areas:

PCI	Set A	Set B	Set C	Set D	Set E	Set F
Country 1	0..83	84..167	168..251	252..335	336..419	420..503
Border 1-2	■	■				■
Zone 1-2-3	■	■				
Border 1-3	■	■	■			
Zone 1-2-4	■					■
Border 1-4	■		■			■
Zone 1-3-4	■		■			

PCI	Set A	Set B	Set C	Set D	Set E	Set F
Country 2	0..83	84..167	168..251	252..335	336..419	420..503
Border 2-1			■	■	■	
Zone 2-3-1			■	■		
Border 2-3		■	■	■		
Zone 2-1-4			■	■		
Border 2-4			■	■		■
Zone 2-3-4			■	■		

PCI	Set A	Set B	Set C	Set D	Set E	Set F
Country 3	0..83	84..167	168..251	252..335	336..419	420..503
Border 3-2	■				■	■
Zone 3-1-2					■	■
Border 3-1				■	■	■
Zone 3-1-4					■	■
Border 3-4			■		■	■
Zone 3-2-4					■	■

PCI	Set A	Set B	Set C	Set D	Set E	Set F
Country 4	0..83	84..167	168..251	252..335	336..419	420..503
Border 4-1		■		■	■	
Zone 4-1-2		■			■	
Border 4-2	■	■			■	
Zone 4-2-3	■	■				
Border 4-3	■	■		■		
Zone 4-3-1		■		■		

Notes

1 All PCIs are available in areas away from the border.

2 In certain specific cases (e.g. AUT/HRV) where the distance between two countries of the same type number is very small (< few 10s km), it may be necessary to address the situation in bilateral /multilateral coordination agreements as necessary, and may include further subdivision of the allocated codes in certain areas.

3 A country map can be found in Annex 3.

ANNEX 6: EXCHANGE OF INFORMATION

When requesting coordination the relevant characteristics of the base station and the code group number should be forwarded to the Administration affected. All of the following characteristics should be Included:

a) Carrier frequency [MHz];
b) name of transmitter station;
c) country of location of transmitter station;
d) geographical coordinates [latitude, longitude];
e) effective antenna height [m];
f) antenna polarisation;
g) antenna azimuth [deg];
h) antenna gain [dBi];
i) effective radiated power [dBW];
j) expected coverage zone or radius [km];
k) date of entry into service [month, year];
l) code group number used (for UMTS);
m) PCI numbers used (for LTE);
n) antenna tilt [deg].

The Administration affected shall evaluate the request for coordination and shall within 30 days notify the result of the evaluation to the Administration requesting coordination.

If in the course of the coordination procedure the Administration affected requires additional information, it may request such information.

If no reply is received by the Administration requesting coordination within 30 days it may send a reminder to the Administration affected. An Administration not having responded within 30 days following communication of the reminder shall be deemed to have given its consent and the code co-ordination may be put into use with the characteristics given in the request for coordination.

The periods mentioned above may be extended by common consent.

ANNEX 7: LIST OF REFERENCES

[1] ITU Radio Regulations, Edition of 2020

[2] ECC Decision (06)01: “ECC Decision of 24 March 2006 on the harmonised utilisation of the bands1920-1980 MHz and 2110-2170 MHz for mobile/fixed communications networks (MFCN) including terrestrial IMT, latest amended March 2019

[3] Recommendation ITU-R P.452: “Prediction procedure for the evaluation of interference between stations on the surface of the Earth at frequencies above about 0.1 GHz”

[4] Recommendation ITU-R P.1546: “Method for point-to-area predictions for terrestrial services in the frequency range 30 MHz to 3 000 MHz”

[5] HCM Agreement: http://www.hcm-agreement.eu/

[6] Recommendation ITU-R P.1812: “A path-specific propagation prediction method for point-to-area terrestrial services in the VHF and UHF bands”

[7] Recommendation ITU-R P.1406: “Propagation effects relating to terrestrial land mobile and broadcasting services in the VHF and UHF bands”

[8] ETSI TS 136 211: “LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation”