

Technical criteria and principles

agreed between the Electronic Communications Office of the Republic of Latvia and the State Supervisory Department for Telecommunications of the Republic of Belarus of Ministry of Communications and Informatization concerning the use of the frequency band 694-790 MHz for stations in the land mobile service and stations in the aeronautical radionavigation service in border areas

Minsk, 20 June 2019

Preamble

In accordance with Article 6 of the International Telecommunication Union Radio Regulations, the Electronic Communications Office of the Republic of Latvia (hereinafter referred to as Latvia) and the State Supervisory Department for Telecommunications of the Republic of Belarus of Ministry of Communications and Informatization (hereinafter referred to as Belarus), jointly referred to as the Parties, enter into this technical criteria and principles (hereinafter referred to as the Document) on coordination between Base Stations (BS), User Equipment (UE) operating in the Land Mobile Service (LMS) of Latvia and stations in the Aeronautical Radionavigation Service (ARNS) of Belarus in the frequency band 694-790 MHz (hereinafter referred to also as 700 MHz).

Coordination of LMS with the broadcasting service entries of the GE06 Agreement digital Plan with overlapping frequencies is outside the scope of this Document and shall be carried out additionally.

This Document covers coordination between LMS stations in Latvia and Belarus after transition period, and for base stations with no overlapping frequencies with GE06 Agreement digital Plan entries.

The principles, conditions and technical parameters specified in the corresponding Articles of this Document shall be used in the coordination¹ between LMS stations in Latvia and ARNS stations in Belarus in the frequency band 694-790 MHz.

The Parties recognize that LMS and ARNS stations may be used in accordance with Article 5 § 5.1.3 of the Regional Agreement Geneva, 2006 (GE06). If Latvia plans to use the LMS in the frequency band 694-790 MHz, it shall in advance inform Belarus about the start date of LMS use. From that date on, new ARNS stations in Belarus in the frequency bands 703-733 MHz and 738-788 MHz shall be coordinated with the LMS in Latvia in accordance with the procedures in this Document. From that date coordination of ARNS stations in Belarus with the broadcasting service of Latvia in accordance with the GE06 Agreement is no longer required and coordination of ARNS stations in Belarus with Latvia in the frequency bands in which this Document applies shall be deemed completed under GE06 Agreement.

Parties noted that the 700 MHz band in Latvia and Belarus currently is used for digital terrestrial television broadcasting (DTT) and ARNS systems in Belarus in accordance with the GE06 Agreement. In Latvia amendments to the National frequency allocation table are adopted that foresee the use of the 700 MHz band for LMS from 1 January 2022. From this date on continuation of DTT operations in the band is allowed until 30 June 2022 for re-channelling activities only.

Parties acknowledge that the use of different DTT or LMS services in neighbouring countries will lead to interference situations or require significant separation distance between the services in use. In order to cope with the issue the Belarussian Party agreed to make the utmost effort to align its roadmap for the change of the use of the 700 MHz band to LMS with the one adopted in Latvia. Special attention will be given to the timely re-channelling of the DTT stations operational in the frequency band foreseen for LMS uplink.

Parties agreed to exchange operative information regarding developments in the band, such as, change of any TV channel or suspension of operation of DTT or ARNS stations and terms of bringing into use of LMS, or other relevant information.

The Document cancels and replaces the „Technical criteria and principles concerning the use of the frequency band 694 - 790 MHz for stations in the land mobile service and stations in the aeronautical radionavigation service agreed by the Electronic Communications Office of the Republic of Latvia and the State Supervisory Department for Telecommunications of the Ministry of Communications and Informatization of the Republic of Belarus” (Geneva, 3 November 2015).

1. Principles

¹ Coordination achieved under this Document can be used by the Parties as an agreement obtained under RR No.9.21 procedure with respect to ARNS of Belarus.

- 1.1. This Document applies to LMS stations using the Frequency Division Duplex (FDD) mode, where the frequency band 703-733 MHz is used by UE (uplink), and the frequency band 758-788 MHz is used by BS (downlink).
 - 1.2. This Document also includes BS transmitting (supplemental downlink) in the 738-758 MHz frequency band.
 - 1.3. No coordination is required for UE in the frequency range 703-733 MHz, since that is covered by coordination of base stations.
 - 1.4. In case carrier aggregation is used in such a way that the uplink is in the frequency band 790-862 MHz band and is aggregated with the downlink in the frequency band 694-790 MHz, BS conditions of the «Technical Criteria and Principles concerning the use of the frequency band 790-862 MHz for terrestrial systems agreed by the Electronic Communications Office of the Republic of Latvia and the State Supervisory Department for Telecommunications of the Ministry of Telecommunications and Informatization of the Republic of Belarus» (Minsk, 13 October 2011) shall apply to BS operating in the frequency band 694-790 MHz with such carrier aggregation.
 - 1.5. In relation to ARNS service, these *Technical criteria and principles* apply to stations with parameters specified in Rec. ITU-R M.1830, i.e.:
 - 1.5.1. RLS 2 Type 2 stations (ground receivers) in the 736-744 MHz frequency range;
 - 1.5.2. RSBN stations (ground receivers) in the 786.5-789.5 MHz frequency range.
 - 1.6. This Document shall apply to stations operating in accordance with the Radio Regulations that are brought into use after the date when Latvia starts to use the 694-790 MHz band for LMS.
 - 1.7. LMS stations that do not meet the provisions in Articles 1.1 and 1.2 are not covered by this Document.
 - 1.8. This Document is based on the concept of coordination field strength levels for LMS base stations, allocation of preferential and non-preferential Physical Cell Identifiers (PCI) for LTE (given in Annex of this Document). This is in conformity with the ECC Recommendation (15)01 of 13 February 2015 “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” (amended 5 February 2016) (hereinafter referred to as ECC/REC/(15)01).
 - 1.9. In context of this Document the term “border” is understood as the international border line between the countries of the Parties.
 - 1.10. In context of this Document the term “transition period” shall be understood as time period starting from signing this Document and ending with suspension date of DTT in the 700 MHz band in Latvia and Belarus.
- 2. Technical conditions for coordination of stations in the land mobile service with stations in the aeronautical radionavigation service**
- 2.1. When a BS located in Latvia is operated in accordance with the principle in Article 1.1 such BS shall be deemed coordinated with ARNS stations located in Belarus if all of the following conditions are met:
 - The predicted mean field strength value doesn't exceed the threshold levels defined in Table 1 at the border and 6 km into the territory of Belarus.

Table 1. Field strength value threshold

Border (B) of Belarus, and 6 km into the territory of Belarus	Field strength value (E) at height of 3 m, dBμV/m in BW= 5 MHz	Field strength value (E) at height of 3 m, dBμV/m in BW= 1 MHz
B	59	52

6 km	41	34
Note: E can be calculated for other measurement bandwidths (BW) from these values by using the following formula $E_{new}=E+10\log(BW_{new}/BW)$, where BW_{new} is in MHz		

or if the following condition is met:

- the LMS BS is used in accordance with Article 5 § 5.1.3 of the GE06 Agreement.

2.2. If a BS located in Latvia operates in accordance with the principle in Article 1.2, such BS shall be deemed coordinated with ARNS stations located in Belarus if all of the following conditions are met:

- The predicted mean field strength value in the 738-748 MHz frequency range doesn't exceed the threshold levels defined in Table 2 at the border and 9 km into the territory of Belarus;
- The predicted mean field strength value in the 748-758 MHz frequency range doesn't exceed the threshold levels defined in Table 1 at the border and 6 km into the territory of Belarus.

Table 2. Field strength value threshold

Border (B) of Belarus, and 9 km into the territory of Belarus	Field strength value (E) at height of 3 m, dB μ V/m in BW= 5 MHz	Field strength value (E) at height of 3 m, dB μ V/m in BW= 1 MHz
B	41	34
9 km	6	-1
Note: E can be calculated for other measurement bandwidths (BW) from these values by using the following formula $E_{new}=E+10\log(BW_{new}/BW)$, where BW_{new} is in MHz		

or if the following condition is met:

- the LMS BS is used in accordance with Article 5 § 5.1.3 of the GE06 Agreement.

3. Technical conditions for coordination of stations in the aeronautical radionavigation service with stations in the land mobile service

An ARNS station of Belarus shall be deemed coordinated with LMS stations located in Latvia if the following conditions are met:

- The predicted mean field strength value of the ARNS station in the 703-733 MHz frequency range doesn't exceed 25 dB μ V/m/5 MHz at a height of 3 m above the ground at the border of Latvia;
- The predicted mean field strength value of the ARNS station in the 738- 748 MHz frequency range doesn't exceed 48 dB μ V/m/5 MHz at a height of 3 m above the ground at the border of Latvia;
- The predicted mean field strength value of the ARNS station in the 770- 788 MHz frequency range doesn't exceed 55 dB μ V/m/5 MHz at a height of 3 m above the ground at the border of Latvia;
- The ARNS station is located more than 100 km away from the common border.

or if the following condition is met:

- The ARNS station is used in accordance with Article 5 § 5.1.3 of the GE06 Agreement.

Note: Field strength value can be calculated for other measurement bandwidths (BW) from these values by using the following formula $E_{new}=E+10\log(BW_{new}/BW)$, where BW_{new} is in MHz.

4. Technical conditions for coordination of stations in the land mobile service

- 4.1. After transition period, or for a base station with no overlapping frequencies with GE06 Agreement digital Plan entries, Latvia and Belarus may use the frequency range 703-733 MHz / 758-788 MHz and 748-758 MHz for LMS base stations without coordination with other Party, if the predicted mean field strength value produced by a base station does not exceed 59 dB(μ V/m)/5MHz at a height of 3 m above ground at the border and 41 dB μ V/m/5MHz at a height of 3 m above ground at a distance of 6 km inside the neighbouring country.
- 4.2. For the frequency band 738-748 MHz threshold levels defined in Table 2 apply.
- 4.3. For LTE systems each Party may use all PCIs available in the frequency range 703-733 MHz / 758-788 MHz and 738-758 MHz if the predicted mean field strength produced by the base station cell does not exceed the value of 41 dB μ V/m/5 MHz at a height of 3 m above ground at the border. If the predicted mean field strength produced by the base station cell of LTE systems exceeds the value of 41 dB μ V/m/5 MHz at a height of 3 m above ground at the border each Party shall use only their own preferential PCIs according to the Annex of this Document
- 4.4. If frequency block size is other than 5 MHz, a correction, calculated by the formula $10 \times \log_{10}(\text{frequency block size} / 5 \text{ MHz})$, dB, shall be added to the field strength values indicated in Article 4.1, Article 4.3.

5. General

- 5.1. A new frequency assignment to a LMS BS that does not meet the conditions in Article 2, Article 4 of this Document shall be subject to coordination.
- 5.2. A new frequency assignment to ARNS that does not meet the conditions in Article 3 of this Document shall be subject to coordination.
- 5.3. The coordination procedure shall be performed in accordance with Article 6 of this Document.
- 5.4. If interference is caused by a station covered by this Document, a Report of harmful interference shall be presented in accordance with Appendix 10 to the Radio Regulations. Upon receipt of a Report of harmful interference the Party responsible for such station shall take all possible measures to eliminate the interference and inform the other Party accordingly.
- 5.5. Recommendation ITU-R P. 1546-5 "Method for point-to-area predictions for terrestrial services in the frequency range 30 MHz to 3 000 MHz" or its latest version shall be used, taking into account agreed terrain data and/or clearance angle for calculation of the field strength values created by the terrestrial stations. The field strength values in this Document are calculated for 10% of the time and 50% of the locations.
- 5.6. Technical characteristics required to perform coordination of BS and ARNS stations shall be provided. The information provided shall be taken into account.
- 5.7. The aggregated mean field strength of BSs should be calculated using the power sum method.
- 5.8. During coordination process the calculated aggregate field strength values in the locations of ARNS stations shall be compared with the field strength thresholds as defined in the Table 3 of the Document. If the calculated aggregate field strength value does not exceed the value defined in Table 3 for corresponding ARNS station(s) coordination of LMS station shall be normally accepted. If LMS stations are used in accordance with Article 5 § 5.1.3 of the GE06 Agreement, then for such case values produced by corresponding broadcasting stations or allotments already agreed in accordance to GE06 Agreement in the locations of ARNS shall be applied as limit for such LMS stations.

Table 3. Field strength value threshold

ARNS System Types	System Type Code	Aggregate field strength threshold (dB μ V/m)
RSBN	AA8	42 at 10 m in reference bandwidth 3 MHz
RLS 2 (Type 2) (ground receiver)	AA2	24 at 10 m in reference bandwidth 8 MHz

Note 1: The values in the table are the maximum allowed aggregate interference field strength in a shared channel.

Note 2: Field strength values can be calculated from the above values for other bandwidths, using the following formula: $E_{new} = E + 10 \log (BW_{new} / BW)$, where BW_{new} is in MHz.

6. Coordination Procedure

- 6.1. The Administration wishing to initiate the use of a frequency assignment to a station covered by this Document that does not meet the conditions in Article 2, Article 3 or Article 4 of this Document shall send to the other Administration a request to coordinate such frequency assignment. A request shall be sent by mail, fax, or email. If a request is sent by e-mail, the requesting Administration shall send a cover letter to the affected Administration by fax and obtain a receipt confirmation for the fax.
- 6.2. The affected Administration shall respond to such frequency assignment coordination request within 10 weeks from the date of the request receipt confirmation. If no response is received, an urgent reminder shall be sent. The Administration that does not respond within 2 weeks from the date when the urgent reminder is received, shall be deemed in agreement, except if the Administration whose consent is sought asks for additional time to review the request.
- 6.3. If the affected Administration refuses to satisfy a request for coordination, the requesting Administration shall provide to the affected Administration results of its calculations or propose new technical characteristics of the assignment.
- 6.4. If no response to the proposals referred to in Article 6.3 above is received from the affected Administration within 10 weeks from the date of the receipt of the proposal, an urgent reminder shall be sent. The Administration that does not respond within 2 weeks from the date when it receives the urgent reminder shall be deemed to accept the coordination proposals submitted.
- 6.5. The Administration that does not agree with a coordination request received shall propose a reasonable modification of such request, which shall provide for adequate protection of its existing and planned services and preserve the original objective of the coordination request as much as possible.
- 6.6. In case of controversies arising from application of this Document, the Administrations shall be guided by provisions and procedures of the Radio Regulations, as well as applicable international and bilateral agreements.

7. Revision and Termination

- 7.1. This Document may be terminated by either Party which shall give one year notice to the other Party. Such termination shall not affect the operation of stations already brought into use or coordinated under this Document.
- 7.2. After such termination, the Parties shall exchange lists of stations already brought into use or coordinated under this Document.
- 7.3. This Document may be revised or terminated without notice, if both Parties agree to do so.

8. Entry into force

- 8.1. This Document shall enter into force on the date of signing.
- 8.2. This Document is executed in the English language in two identical originals, one for the Republic of Latvia and one for the Republic of Belarus.

Minsk, 20 June 2019.

On behalf of the Electronic
Communications Office of the
Republic of Latvia

On behalf of the State Supervisory
Department for Telecommunications of the
Republic of Belarus of Ministry of
Communications and Informatization

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Allocation of preferential Physical Cell Identifiers (PCI) for LTE systems in the 703-733 MHz / 758-788 MHz and 738-758 MHz frequency bands between the Republic of Latvia and the Republic of Belarus²

Set	A	B	C	D	E	F
PCI	0...83	84...167	168...251	252...335	336...419	420...503
Set preferential to	LVA ³	LVA	BLR ⁴	BLR	LVA	BLR

² According to Annex 4 of ECC/REC/(15)01.

³ LVA – the Republic of Latvia.

⁴ BLR – the Republic of Belarus.