

Prot. No. xx/B/22

Pursuant to Article 3 paragraph 1) and 2), Article 9 paragraph 3.6), Article 10 paragraph 11) and 12), Article 45 paragraph 1) and 2), and Article 79 paragraph 1) and 2) of Law no. 04/L-109 on Electronic Communications (hereinafter referred to as "the Law" or "LEC") and the National Plan on Allocation of Radio Frequency Spectrum, the Board of the Regulatory Authority for Electronic and Postal Communications (hereinafter referred to as "RAEPC" or "Authority") with Decision no. 1943 (of 30.05.2022) approved the commencement of the public consultation process for;

PLAN ON ALLOCATION AND USE OF THE FREQUENCY BAND 3400-3800 MHZ FOR MOBILE/FIXED COMMUNICATIONS NETWORKS (MFCN)**1. GENERAL CONDITIONS**

1.1 This plan defines the allocation of the 3400-3800 MHz frequency band ("3.6 MHz band") for mobile radio communications service, division of the band into frequency radio channels, particular technical details, method of use, as well as the method of delivering radio frequencies for MFCN (Mobile/Fixed Communications Networks), according to the Plan for Use of Radio Frequencies.

1.2 The use of this band for mobile services is based on the following documents:

- ECC - Decision (11)06 of 26 October 2018 "Harmonized frequency arrangements and least restrictive technical conditions (LRTC) for mobile/fixed communications networks (MFCN) operating in the band 3400-3800 MHz";
- ECC/REC(15)01 of 14 February 2020 - Cross-border coordination for Mobile/Fixed Communications Networks (MFCN) in the frequency bands: 694-790 MHz, 1427-1518 MHz and 3400-3800 MHz;
- EC/Decision (2019/235/EU) of 24 January 2019 "as regards an update of relevant technical conditions applicable to the 3400-3800 MHz frequency band";
- CEPT Report 67 to the European Commission in response to the Mandate "to develop harmonized technical conditions for spectrum use in support of the introduction of next-generation (5G) terrestrial wireless systems in the Union";

- National Frequency Spectrum Allocation Plan, as approved by the Kosovo Assembly, according to the Decision no. 04-V-93, dated 23 June 2011 (The Kosovo Table of Frequency Allocation and Utilizations).

2. ALLOCATION AND USE OF THE 3400-3800 MHZ FREQUENCY BAND

2.1 The 3400-3800 MHz frequency band in Kosovo is used by mobile radio communications services for MFCN systems.

2.2 The frequency band 3400-3800 MHz with a bandwidth of 400 MHz where is foreseen that the division of the downlink with the uplink will be used with Time Division Duplex (TDD).

2.3 The allocation of the 3400-3800 MHz frequency band for the MFCN systems is presented graphically in Figure 1.

3400 MHz													3600 MHz																																																																		
L1	3400-3405	L2	3405-3410	L3	3410-3415	L4	3415-3420	L5	3420-3425	L6	3425-3430	L7	3430-3435	L8	3435-3440	L9	3440-3445	L10	3445-3450	L11	3450-3455	L12	3455-3460	L13	3460-3465	L14	3465-3470	L15	3470-3475	L16	3475-3480	L17	3480-3485	L18	3485-3490	L19	3490-3495	L20	3495-3500	L21	3500-3505	L22	3505-3510	L23	3510-3515	L24	3515-3520	L25	3520-3525	L26	3525-3530	L27	3530-3535	L28	3535-3540	L29	3540-3545	L30	3545-3550	L31	3550-3555	L32	3555-3560	L33	3560-3565	L34	3565-3570	L35	3570-3575	L36	3575-3580	L37	3580-3585	L38	3585-3590	L39	3590-3595	L40	3595-3600
TDD (40 bloqe me gjeresi 5 MHz)																																																																															
3600 MHz													3800 MHz																																																																		
L41	3600-3605	L42	3605-3610	L43	3610-3615	L44	3615-3620	L45	3620-3625	L46	3625-3630	L47	3630-3635	L48	3635-3640	L49	3640-3645	L50	3645-3650	L51	3650-3655	L52	3655-3660	L53	3660-3665	L54	3665-3670	L55	3670-3675	L56	3675-3680	L57	3680-3685	L58	3685-3690	L59	3690-3695	L60	3695-3700	L61	3700-3705	L62	3705-3710	L63	3710-3715	L64	3715-3720	L65	3720-3725	L66	3725-3730	L67	3730-3735	L68	3735-3740	L69	3740-3745	L70	3745-3750	L71	3750-3755	L72	3755-3760	L73	3760-3765	L74	3765-3770	L75	3770-3775	L76	3775-3780	L77	3780-3785	L78	3785-3790	L79	3790-3795	L80	3795-3800
TDD (40 bloqe me gjeresi 5 MHz)																																																																															

Figure 1 – Graphical presentation of the 790-862 MHz frequency band allocation, for MFCN systems

3. METHOD OF GRANTING THE RADIO FREQUENCES

3.1 Radio frequencies from the 3400-3700 MHz frequency band for MFCN systems are usually granted on an exclusive basis throughout the territory of Kosovo for the realization of public mobile electronic communications networks.

3.2 Authorization for the use of 3400-3700 MHz radio frequencies for MFCN systems is issued following the development of procedures for the assignment of radio frequencies. Radio-frequency assignment is done in one of the methods provided by the legislation in force.

3.3 Radio frequencies of 3700-3800 MHz band are assigned for use at the local level as required, after the development of the procedures for allocating radio frequencies.

The method of assigning for use these frequencies is presented in the table below:

Frequency band (MHz)	Area of use	Application
3400-3700	In the entire territory of the Republic of Kosovo	Mobile/fixed communications networks (MFCN) according to EU Decision - 2008/411/EC, Decision (EU) 2019/235, ECC Decision - ECC/DEC/(11) 06, CEPT Report 67, ECC Report 254, and ECC Report 296
3700-3800	For local level and application in industry - Closed networks	Mobile/fixed communications networks (MFCN) according to EU Decision - 2008/411/EC, Decision (EU) 2019/235, ECC Decision - ECC/DEC/(11)06, CEPT Report 67, ECC Report 254, and ECC Report 296

The frequency capacity in the right of use in the 3400-3700 MHz band planned for the National Level for Operators will be at a minimum of 80 MHz and at a maximum of 100 MHz ($80 \leq B \leq 100$ MHz).

The frequency capacity in the right of use in the 3700-3800 MHz band planned for the Local Level and Application in Industry will be at a minimum of 80 MHz and at a maximum of 100 MHz ($80 \leq B \leq 100$ MHz) per user.

4. ASSIGNMENT OF RADIO FREQUENCY CHANNELS

4.1 The 3400-3800 MHz frequency band is divided into 80 unpaired radio frequency blocks with a bandwidth of 5 MHz. Limits of radio frequency blocks are defined in Table 1.

Table 1 - Limits of radio frequency blocks for MFCN systems

Block sign	Block limits	Block sign	Block limits	Block sign	Block limits t	Block sign	Block limits	Block sign	Block limits
L1	3400-3405	L17	3480-3485	L33	3560-3565	L49	3640-3645	L65	3720-3725
L2	3405-3410	L18	3485-3490	L34	3565-3570	L50	3645-3650	L66	3725-3730
L3	3410-3415	L19	3490-3495	L35	3570-3575	L51	3650-3655	L67	3730-3735
L4	3415-3420	L20	3595-3500	L36	3575-3580	L52	3655-3660	L68	3735-3740
L5	3420-3425	L21	3500-3505	L37	3580-3585	L53	3660-3665	L69	3740-3745
L6	3425-3430	L22	3505-3510	L38	3585-3590	L54	3665-3670	L70	3745-3750
L7	3430-3435	L23	3510-3515	L39	3590-3595	L55	3670-3675	L71	3750-3755
L8	3435-3440	L24	3515-3520	L40	3595-3500	L56	3675-3680	L72	3755-3760
L9	3440-3445	L25	3520-3525	L41	3600-3605	L57	3680-3685	L73	3760-3765
L10	3445-3450	L26	3525-3530	L42	3605-3610	L58	3685-3690	L74	3765-3770
L11	3450-3455	L27	3530-3535	L43	3610-3615	L59	3690-3695	L75	3770-3775
L12	3455-3460	L28	3535-3540	L44	3615-3620	L60	3695-3700	L76	3775-3780
L13	3460-3465	L29	3540-3545	L45	3620-3625	L61	3700-3705	L77	3780-3785
L14	3465-3470	L30	3545-3550	L46	3625-3630	L62	3705-3710	L78	3785-3790
L15	3470-3475	L31	3550-3555	L47	3630-3635	L63	3710-3715	L79	3790-3795
L16	3475-3480	L32	3555-3560	L48	3635-3640	L64	3715-3720	L80	3795-3800

5. DEFINITION OF CERTAIN TERMS

As far as this Distribution Plan is concerned, some of the terms used have the following meanings:

1. *Active Antenna System (AAS)* - the base station and antenna system where the amplitude and/or phase between the antenna elements is continuously adjusted resulting in an antenna pattern that varies in response to short-term changes in the coverage area, due to which the diagram of the antenna is changed accordingly.
2. *Synchronized operation* - the operation of two or more different TDD networks in which the simultaneous transmission of the signal in the uplink and in the downlink never occurs, but at any time all networks transmit either the uplink signal or the downlink signal.
3. *Semi-synchronized operation* - operation of two or more different TDD networks in which part of the signal frame is consistent with the synchronized operation and the remaining part is consistent with the unsynchronized operation.
4. *Unsynchronized operation* - the operation of two or more different TDD networks in which at least one network in a given period of time transmits a signal in the uplink while the other networks transmit a signal in the downlink.

6. TECHNICAL CONDITIONS FOR BASE STATIONS

6.1. The technical conditions for MCFN system base stations are defined based on the Block Edge Mask (BEM). The BEM consists of several elements that are presented in Table 2. The in block power limit applies to the block given to the operator.

The out of block elements are as follows:

1. The baseline out of block power limit, intended to protect the spectrum of other operators, which applies in the case of synchronized networks and wireless broadband electronic communications services (WBB ECS)
2. The power limit in the transient zone, which allows the filter response to vary from the in block limit to the baseline out of block power limit, and
3. Limited baseline power limit applicable in the case of non-synchronized or semi-synchronized WBB ECS.

Additional baseline is out-of-band power limit used to protect radars operating below 3400 MHz and/or to protect fixed satellite service and fixed service above 3800 MHz.

Table 2 – BEM elements

BEM element	Definition
In block	Refers to the block for which BEM is performed.
Baseline	Spectrum within the frequency band 3400-3800 MHz, excluding the block assigned to the operator and the corresponding transitional zones.
Transitional zone	Spectrum from 0 to 10 MHz under and from 0 to 10 MHz over the block assigned to the operator. The transitional zone does not apply to TDD blocks assigned to other operators if the networks are synchronized. Transitional zones do not apply under 3400 MHz or over 3800 MHz.
Additional baseline	Spectrum under 3400 MHz and over 3800 MHz.

Limited baseline	Spectrum used for WBB ECS that are unsynchronized or semi-synchronized with the operator-specified block.
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BEM elements are applicable to base stations of different levels of radiated power (for example: macro, micro, pico, and femto base stations).

6.2. The characteristics of out of block BEM elements for non-active antenna systems (non-AAS) and active antenna systems (AAS) are defined in Table 3 and Table 4 in the case of synchronous operation, and Table 5 in the case of unsynchronized or semi-synchronized operation.

6.3. In Tables 3, 4, and 7, the power limit is determined according to the fixed upper limit according to the expression $\text{Min}(P_{\text{Max}} - A, B)$ which determines the lowest (or strictest) value of the two values:

1. P_{Max} - maximum P_{Max} carrier power reduced by relative displacement A and
2. B - fixed upper limit.

Table 3 - Out-of-block power limits for non-AAS and AAS in synchronized mode

Frequency range	Maximum EIRP limit for non-AAS	Maximum TRP limit for AAS
Distance under -10 MHz from the lower edge of the block Over 10 MHz distance from the upper edge of the block Within the range 3400-3800 MHz	$\text{Min}(P_{\text{Max}} - 43, 13)$ dBm/5 MHz per antenna ⁽¹⁾	$\text{Min}(P_{\text{Max}} - 43, 1)$ dBm/5 MHz per cell ^{(2) (3)}
⁽¹⁾ P_{Max} is the maximum mean carrier power in dBm for the base station measured as EIRP per carrier for the antenna. ⁽²⁾ P_{Max} is the maximum mean carrier power in dBm for the base station measured as TRP per carrier in the observed cell. ⁽³⁾ In the case of a multi-sector base station, the radiated power limit shall apply to each individual sector.		

6.4. The fixed upper limit of 13 dBm/5 MHz for non-AAS or 1 dBm/5 MHz for AAS represents the upper interference limit from the base station. When two TDD blocks are synchronized, there is no interference between base stations.

Table 4 - Out-of-block power limits for base station transitional zone for non-AAS and AAS in synchronized WBB ECS operation

Frequency range	EIRP limit for non-AAS	TRP limit for AAS
Distance from -5 to 0 MHz from the lower edge of the block or distance from 0 to 5 MHz from the upper edge of the block	$\text{Min}(P_{\text{Max}} - 40, 21)$ dBm/5 MHz per antenna ⁽¹⁾	$\text{Min}(P_{\text{Max}} - 40, 16)$ dBm/5 MHz per cell ^{(2) (3)}
Distance from -10 to -5 MHz from the lower edge of the block or distance from 5 to 10 MHz from the upper edge of the block	$\text{Min}(P_{\text{Max}} - 43, 15)$ dBm/5 MHz per antenna ⁽¹⁾	$\text{Min}(P_{\text{Max}} - 43, 12)$ dBm/5 MHz per cell ^{(2) (3)}
⁽¹⁾ P_{Max} is the maximum mean carrier power in dBm for the base station measured as EIRP per carrier for the antenna. ⁽²⁾ P_{Max} is the maximum mean carrier power in dBm for the base station measured as TRP per carrier in the		

observed cell.

(3) In the case of a multi-sector base station, the radiated power limit shall apply to each individual sector.

Table 5 - Limited base station power limit for non-AAS and AAS in operation with non-synchronized and semi-synchronized WBB ECS

Frequency range	EIRP limit for non-AAS	TRP limit for AAS ⁽¹⁾
Unsynchronized and semi-synchronized blocks below the lower block limit and above the upper block within the range 3400-3800 MHz	-34 dBm/5 MHz per cell ⁽¹⁾	-43 dBm/5 MHz per cell ⁽¹⁾
⁽¹⁾ In the case of a multi-sector base station, the radiated power limit shall apply to each individual sector		

6.5. Limited base power limit will be used in unsynchronized and semi-synchronized operation of base stations if geographical separation is not possible.

6.6. Operators assigned to adjacent blocks, which operate in an unsynchronized or semi-synchronized manner, with the prior approval of the Regulatory Authority for Electronic and Postal Communications (RAEPC), may agree to use different power limits from those set out in Table 5.

Table 6 - Additional base power limit for base stations (1) for non-AAS and AAS below 3400 MHz

Frequency range	EIRP limit for non-AAS	TRP limit for AAS
Under 3400 MHz	-50 dBm/MHz per antenna	-52 dBm/MHz per cell ⁽²⁾
⁽¹⁾ Additional measures may be imposed in special cases for the application of AAS indoors		
⁽²⁾ In the case of a multi-sector base station, the radiated power limit shall apply to each individual sector.		

Table 7 - Additional base power limit for non-AAS and AAS base stations over 3800 MHz ⁽¹⁾

Frequency range	EIRP limit for non-AAS	TRP limit for AAS
3800-3805 MHz	Min($P_{Max} - 40, 21$) dBm/5 MHz per antenna ⁽²⁾	Min($P_{Max} - 40, 16$) dBm/5 MHz per cell ⁽³⁾⁽⁴⁾
3805 -3810 MHz	Min($P_{Max} - 43, 15$) dBm/5 MHz per antenna ⁽²⁾	Min($P_{Max} - 43, 12$) dBm/5 MHz per cell ⁽³⁾⁽⁴⁾
3810-3840 MHz	Min($P_{Max} - 43, 13$) dBm/5 MHz per antenna ⁽²⁾	Min($P_{Max} - 43, 1$) dBm/5 MHz per cell ⁽³⁾⁽⁴⁾
Over 3840 MHz	-2 dBm/5 MHz per antenna ⁽²⁾	-14 dBm/5 MHz per cell ⁽³⁾⁽⁴⁾
⁽¹⁾ Implemented to enable uninterrupted operation of fixed satellite service and fixed service over 3800 MHz.		
⁽²⁾ P_{Max} is the maximum mean carrier power in dBm for the base station measured as EIRP per carrier for the antenna.		
⁽³⁾ P_{Max} is the maximum mean carrier power in dBm for the base station measured as TRP per carrier in the observed cell.		
⁽⁴⁾ In the case of a multi-sector base station, the radiated power limit shall apply to each individual sector.		

7. TECHNICAL CONDITIONS FOR TERMINAL STATIONS

7.1. The power limits within the terminal block are specified in Table 8, as follows:

Table 8 - Power limits within the terminal block

Maximum in-block power	28 dBm TRP
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7.2. The in-block radiated power limit for fixed/nomadic terminal stations may exceed the limit in Table 8 provided cross-border obligations are fulfilled. For such terminal stations mitigation measures to protect radar below 3 400 MHz may be necessary, for example, geographical separation or an additional guard band.

8. SYNCHRONIZATION FRAME

8.1. Authorization holders must comply with the specified synchronization conditions. In the event that an authorization holder deviates from the specified synchronization conditions, that authorization holder must meet the specified conditions for limiting the power of the limited base by applying a bandwidth within its specified block or reducing the power of the radiation in adjacent frequency blocks in connection with another authorization holder.

8.2. The conditions for the synchronized operation of TDD networks are defined by:

- a. The use of the frame structure described by Recommendation (20) 03 ECC - Frame A (DDDSU DDSU DDSU DDSU) with a duration of 10 ms or equivalent frame structure with approximated time frames for the uplink (UL transmission) and the downlink (DL transmission).
- b. The use of a common clock reference based on the GNSS system.

9. THE USE OF 3700-3800 MHz FREQUENCY BAND FOR APPLICATIONS AT THE LOCAL LEVEL

According to RAEPC, a part of this band with a capacity of 100 MHz, in the range of 3700-3800 MHz is planned to be given for use in limited spaces for local authorizations and application in industry, respectively closed networks, which do not provide public electronic communications services. The use of these frequency resources at the local level and application in industry implies the utilization of these radio frequencies for internal needs of the entrepreneur in industry, agriculture or other service systems of private activities, excluding the provision of electronic communications services for the public or networks of other operators.

Private networks will be closed communication networks in the provision of internal services of the Authorized entrepreneur's activity for the use of frequency resources within the band 3700-3800 MHz.

Any determination and criteria in issuing the Authorization in granting the right to use the frequency resources in the band 3700-3800 MHz will be part of the special treatment of each request and application of the radio frequency user and will be analyzed by the professional staff of ARKEP.

The holder of the authorization for local services is responsible to RAEPC for complying with the terms of the authorization for frequency division. This also applies if he temporarily transfers the exercise of

rights from his frequency division to a third party. Transfer of a divided frequency requires the approval of RAEPC.

Frequencies in the band 3700-3800 MHz are divided based on the principle of technological neutrality and the authorization holder is free to plan his network, but he must explain in detail the planning of base stations within the location of their use.

In the Authorization for use of this frequency band, RAEPC, upon reviewing the application and the request of the applicant, will determine the conditions and technical parameters of the use of frequency resources by determining the intensity of the field at the border of the frequency allocation area. However, the authorization holder is obliged to ensure the efficient and trouble-free use of his network and the planning and configuration of the network must be done in such a way that the frequency use interferences are reduced to a minimum.

Neighboring network entrepreneurs are required to reach a joint agreement for the optimal planning of their networks, for the harmonization of powers and other parameters for which RAEPC must be notified and it can accept them after the relevant operator agreements are submitted to RAEPC.

If no agreement can be reached between the entrepreneurs of the neighboring networks, RAEPC has set a limit value of the field intensity of 0 dB μ V/m/5 MHz at a height of 3 m at the boundary of the band allocation zone and beyond (based on ECC/REC recommendation (15) 01). The authorization holder bears the costs for any necessary network reconfiguration.

If several base stations are used indoors, then it is sufficient to specify only one base station in the application as a reference. This should be the base station with the highest transmission power. In addition, the application must specify the maximum target antenna height within the location (building). The coordinates of the location center (building) must be specified).

For frequency authorization holders for local users, RAEPC will assign frequencies for a limited period of up to 4 years, enabling the right to renew the Authorization to use the existing frequency resources after the expiration of the validity period of the Authorization. The time period of the application for the extension of the right to use the frequency resources is defined in the preliminary Authorization.

In the border areas of Kosovo, frequencies will be shared only to a limited extent due to the need for frequency coordination with neighboring countries. Necessary coordination is done based on agreements concluded by the Republic of Kosovo with neighboring countries.

Authorization holders are obliged to respect the limit values for the protection of people in the electromagnetic fields from transmission systems based on the values provided by ICNIRP or if the relevant local institutions of RAEPC determine them with their regulatory acts.

As 5G technologies are currently still in development, RAEPC reserves the right to monitor and review the regulatory requirements for the 3700-3800 MHz frequency band one year after the granting of the right of use in order to ensure efficient and uninterrupted use of utilization of radio frequencies in this band.

Based on the review and analysis of payments for these frequency resources, RAEPC considers that for the 3700-3800 MHz frequency band planned for use at the local level, application in industry and dedicated to closed networks only for the needs of entrepreneurs or frequency users, it will not determine the annual fees for supervision and this fee will be determined by the Regulation on "Annual payments for supervision and the right to use radio frequencies" approved by RAEPC.

Geographical area and other conditions are determined by the Individual Authorization for the use of the radio frequency spectrum in the 3700 - 3800 MHz frequency band.

10. ENTRY INTO FORCE

This distribution plan enters into force upon its approval by a decision of the Board of RAEPC.

Prishtina, xx/05/2022

Regulatory Authority of the Electronic and Postal Communications

Nazim Rahimi
Chairman of the Board