



Radiocommunication Bureau

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**Circular letter
6/LCCE/78**

11 May 2012

**To Administrations of Member States of the ITU, Radiocommunication
Sector Members, ITU-R Associates participating in the work of
Radiocommunication Study Group 6 and ITU-R Academia**

Subject: Questionnaire on spectrum requirements for terrestrial television broadcasting in connection with WRC-15 Agenda item 1.2

References: Administrative Circular CA/201

1 Consistent with the directives set forth by Administrative Circular [CA/201](#) and in accordance with the outcomes of the first session of the Conference Preparatory Meeting 15-1, ITU-R Working Party 6A seeks estimates from Members States and Sector Members of current and future spectrum requirements for terrestrial television broadcasting in Region 1 and Iran.

2 One particular question that will be addressed by the JTG 4-5-6-7 is to confirm the lower edge of the allocation to the mobile service made at WRC-12 from 694-790 MHz. As a result Working Party 6A realizes the JTG 4-5-6-7 needs to be fully informed about the implications to the broadcasting service consequential to that decision.

3 The following questionnaire, which is being sent to all Administrations and Sector Members in Region 1 and Iran, is designed to gather information on spectrum use in the band 694-790 MHz for television broadcasting.

4 Administrations and Sector Members are also invited to make more detailed inputs addressing the matter of current and future spectrum requirements for television broadcasting to the next meeting of WP 6A.

5 Administrations and Sector Members are requested to submit responses to brsgd@itu.int or rsg6@itu.int by 31 July 2012.

François Rancy
Director, Radiocommunication Bureau

At the request of the Chairman of Study Group 6 the attached questionnaire is published for consideration of the Administrations of Member States, Sector Members and Associates, as appropriate. The Radiocommunication Bureau does not make any engagement nor assume any responsibility with respect to the content of the attachment or any follow-up action as may be required.

Distribution:

- Administrations of Member States of the ITU and Radiocommunication Sector Members participating in the work of Radiocommunication Study Group 6
- ITU-R Associates participating in the work of Radiocommunication Study Group 6
- ITU-R Academia
- Chairman and Vice-Chairmen of Radiocommunication Study Group 6
- Secretary General of the ITU, Director of the Telecommunication Standardization Bureau, Director of the Telecommunication Development Bureau

QUESTIONNAIRE ON SPECTRUM REQUIREMENTS FOR TERRESTRIAL
TELEVISION BROADCASTING IN CONNECTION WITH
WRC-15 AGENDA ITEM 1.2

Name of the Administration/Sector Member:

Ministry of Foreign and Domestic Trade and Telecommunications, Republic of Serbia

For sector members please indicate the geographical area over which you operate:

Contact person: Prof Dr Irini Reljin

E-mail address: irini.reljin@digitalnaagenda.gov.rs

Telephone number: +381112020087

- 1
- a) What standards have you adopted for digital terrestrial television broadcasting?
 - b) Have you started introduction of digital terrestrial television services?
 - c) If yes, please provide further detail on the number of multiplexes in use, their technical specifications, the percentage of geographic area or population they are intended to cover and the total spectrum use to inform WP 6A.

A proposed format for detailed responses is provided in Annex 1.

Reply:

- a) ITU-T H.264/AVC (MPEG-4 part 10) shall be the technical standard for data compression within multiplexes. DVB-T2 shall be the technical standard for television signal broadcasting.
- b) The initial network concept has been introduced and explained. The transition to digital only terrestrial television commenced with the launch of the initial network for testing of digital TV signal broadcasting. This initial network will form an integral part of the final digital terrestrial television network after the transition to digital terrestrial broadcasting of television program is completed.
- c) Further details on the number of multiplexes in use, their technical specifications, the percentage of geographic area or population they are intended to cover and the total spectrum use are provided in Annex 1.

- 2
- a) Have you commenced analogue television switch-off?
 - b) If you have any such plans, when do you expect to have completed the analogue switch-off process?

Reply:

- a) The Serbian government adopted amendments to Strategy for the digital switchover on 1 March 2012. This involved a fundamental shift from a single switchover date, originally scheduled for 4 April 2012, to a more realistic phased region-by-region approach based on a timetable to be adopted and communicated by the government in due course. The DSO plan shall provide for the identification of switch-off windows of up to six months

for each switchover region. The government will communicate to the public the analogue signal switch-off date for each region at least nine months in advance. Due to the lack of suitable frequencies, it will not be possible to simulcast analogue and digital terrestrial television throughout the whole territory of the Republic of Serbia.

- b) The initial digital network was launched on 21 March 2012 and utilises over 50% of the IPA funded equipment. This network makes a digital test signal accessible to approximately 50% of citizens across Serbia. It is used for test purposes and serves as an incentive to importers and retailers to stock DVB- T2 compatible digital set top boxes and TV sets.

- 3**
- a) What is the percentage of viewer uptake of terrestrial television in your country, including those whose service provider uses terrestrial broadcast re-transmission (e.g. in cable networks)?
 - b) If possible, please also provide details of the number or proportion of users who receive television primarily by terrestrial means.

Reply:

- a) According to electronic communications market analysis provided by RATEL (Republic Agency for Electronic Communications) in 2010, the percentage of viewer uptake of terrestrial television was 57%. Considering terrestrial broadcast re-transmission in cable networks, the exact percentage is not available, but it is estimated to be around 5%.
- b) Taking into account the latest data, the percentage of users who receive television primarily by analogue terrestrial is 48% (of 2.7 mil households).

- 4**
- a) Indicate how many analogue television transmitters use channels in the frequency sub-band 694-790 MHz (as indicated in Resolution **232 (WRC-12)**).
 - b) How many are in the remaining part of the UHF band.

Reply:

- a) 110 analogue television transmitters use channels in the frequency sub-band 694-790 MHz.
- b) 228 analogue television transmitters use channels in the frequency sub-band 470-694 MHz and 75 analogue television transmitters use channels in the frequency sub-band 790-862 MHz.

- 5**
- a) What frequencies/channels are currently used or intended to be used by digital terrestrial television broadcasting in your country? Please distinguish between those in use and those intended to be used.
 - b) If allotments/SFNs are in use, a sketch map of frequency allocations could be included, with an accompanying table of allocations, as shown in Annex 2. Otherwise, it might be possible to show main transmitters and channels, grouped in layers, in a table.
 - c) Please indicate how many digital television assignments/allotments use channels in the frequency sub-band 694-790 MHz (as indicated in Resolution **232 (WRC-12)**), and
 - d) How many are in the remaining part of the UHF band.

Reply:

- a) Requested information is provided in Annex 2.
- b) Requested information is provided in Annex 2.
- c) 8 allotments use channels in the frequency sub-band 694-790 MHz (according to the table in Annex 2).
- d) 5 allotments are in the remaining part of the UHF band.

- 6**
- a) Are those frequency bands also shared with other primary services?
 - b) If yes, please give details of those systems and their spectrum use.

Reply:

- a) No
- b) -

- 7**
- a) Are those frequency bands also shared with secondary services such as PMSE (Programme Making and Special Events), radio astronomy or wind-profile radar?
 - b) If yes, please give details of those systems and their spectrum use.

Reply:

- a) Yes
- b) Secondary services that share those frequency bands, on the basis of the temporary licences, are: radio microphones according to ERC REC 70-03, portable and mobile and point-to-point audio links according to ERC REP 42.

- 8**
- a) Do you foresee the adoption or expansion of television services broadcast using second-generation systems such as DVB-T2?
 - b) If yes, please give indicative details of the planned transition, including any simulcast period.

Reply:

- a) Serbian government already adopted DVB-T2 as the technical standard for television signal broadcasting in July 2009.
- b) Due to the lack of suitable frequencies, it will not be possible to simulcast analogue and digital terrestrial television transmissions throughout the whole territory of the Republic of Serbia. The transition will be completed on a phased basis. The government will adopt the DSO plan that will determine the sequencing and timetable for the phased transition from analogue to digital in each DSO region.

- 9**
- a) Do you foresee a requirement for new and enhanced services, including HD and 3D television, on the terrestrial television platform?
 - b) If yes, please give indicative details of the number and nature of services planned, and if known, the expected timeframe for their introduction.

Reply:

- a) We will have HD and SD programmes within the same multiplexes. Also, HD programme is already one of the programmes broadcasted within the multiplex in the initial network for testing purposes.
- b) At this point we can expect up to 3 HD programmes. Other planned enhanced services include, for example, Pay TV, e-banking, e-shopping, services for disabled people (audio description for the blind or partially sighted as well as subtitles), and automatic network and service updates.

- 10**
- a) Are there plans in your country to launch more multiplexes in the future?
 - b) If yes, how many more and when? Please also indicate the expected timeframe for their introduction.

Reply:

- a) Two multiplexes shall be launched and filled during the transition process in accordance with the Strategy for the digital switchover. Additional multiplexes shall be launched and filled during the transition only if there is a market need and if it is financially feasible to do so. We do not expect more than 5 muxes in total.
- b) As stated above (replay 10 a)).

- 11**
- a) What is the amount of spectrum you foresee that will be required for terrestrial television broadcasting, if plans in Questions 8, 9 and 10 are to be supported, and services identified in Questions 6 and 7 are to be taken into account? Please indicate the modes of transmission that will be used, and timeframes.
If appropriate, a suggested form to express these requirements is shown in Annex 3.

Reply:

- a) Requested information is provided in Annex 3.

ANNEX 1

The number of multiplexes in use, their technical specifications, the percentage of geographic area or population they are intended to cover and the total spectrum use

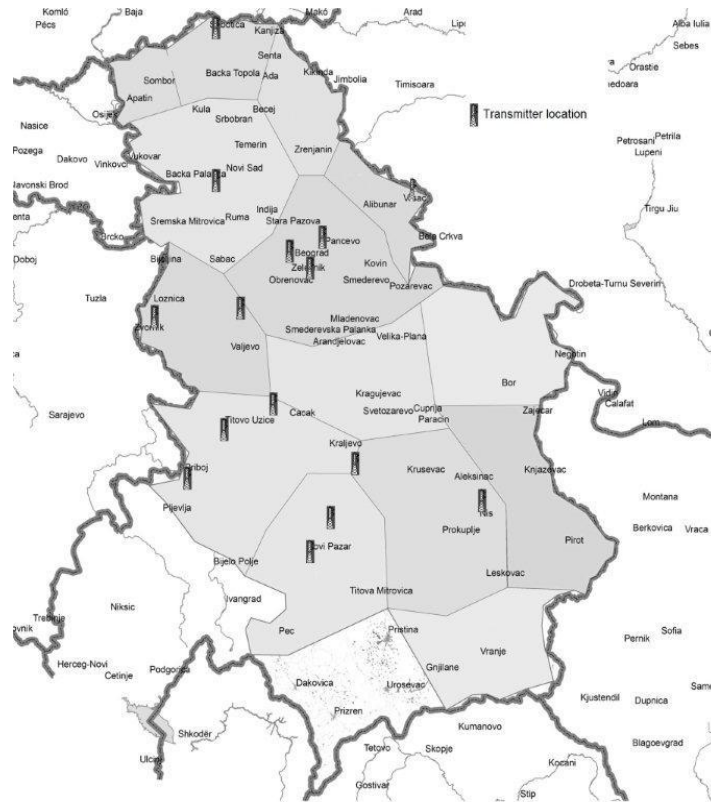
Country	No of multiplexes	System & modulation	FEC	GI	Reception mode ¹	Capacity per multiplex (Mb/s)	Current percentage population coverage	Intended percentage population coverage	Content per multiplex	Total capacity (Mb/s)	Total spectrum bandwidth used or intended for implementation (MHz) ²	Any additional comments (e.g. duration of licences)
Serbia	1	DVB-T2, 256-QAM	3/4	1/16	Fixed	41.43	52.8%		10 SD 1 HD MPEG4	41.43	320	National and Regional services multiplex
	3	DVB-T2, 256-QAM	3/4	1/8	Fixed	37.52	96.0%		[tbc]	112.56 plus two new muxes [tbc]		National, Regional and Local services multiplexes
	1	[DVB-T2, tbc]	[tbc]	[tbc]	[tbc]	[tbc]	[tbc]		[tbc]	[tbc]		Expected service multiplex (HD, Pay TV, 3D TV)
	1	[DVB-T2, tbc]	[tbc]	[tbc]	[tbc]	[tbc]	[tbc]		[tbc]	[tbc]		Expected service multiplex (HD, Pay TV, 3D TV)

¹ E.g. fixed, portable outdoor/mobile, portable indoor.

² Refer Sections 2 and 3 on page 1 of this circular.

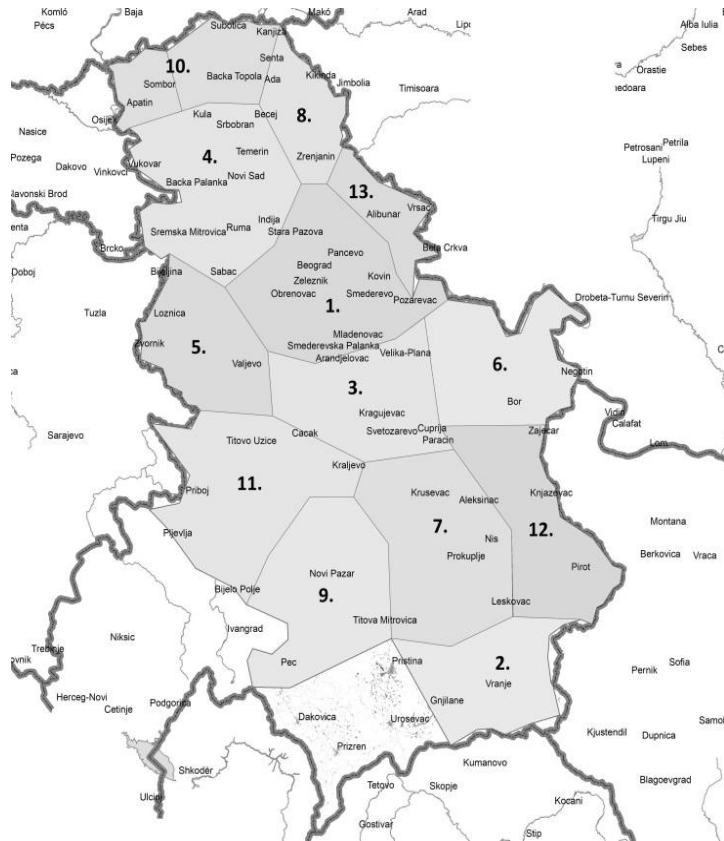
ANNEX 2

Frequencies/channels currently used by digital terrestrial television broadcasting



TV Channel	Transmitter Locations
27	Avala
31	Crveni Čot
26	Kruševac - Goč
27	Loznica - Gučevo
21	Niš - Gorica
32	Novi Pazar - Šutenovac
64	Ovčar
66	Priboj - Bić
47	Raška - Gradac
47	Subotica - Crveno selo
57	Užice - Zabučje
42	Valjevo - Pečina (Promaja)
54	Vršac - Vršački breg
27	Košutnjak - Avala
27	Stojičino brdo - Avala

Frequencies/channels intended to be used by digital terrestrial television broadcasting



Area	Layer 1	Layer 2	Layer 3[tbc]	Layer 4[tbc]	Layer 5[tbc]
1	22	28	33	45	57
2	35	39	43	49	54
3	26	29	35	40	46
4	24	30	41	48	54
5	32	34	37	42	47
6	24	41	43	52	59
7	27	33	38	42	45
8	29	31	51	55	59
9	24	32	34	41	51
10	40	43	34		
11	23	36	39	50	56
12	22	25	28	31	37
13	25	31	37	42	49

ANNEX 3

The minimum amount of spectrum that will be required for digital terrestrial television broadcasting in Bands IV & V

Country	No of multiplexes	System & modulation	FEC	GI	Reception mode ³	Capacity per multiplex (Mb/s)	Intended percentage population coverage	Content per multiplex	Total capacity (Mb/s)	Total spectrum bandwidth needed (MHz) ⁴	Any additional comments including time frames
Serbia	1	DVB-T2, 256-QAM	3/4	1/16	Fixed	41.43	52.8%	10 SD 1 HD MPEG4	41.43	320	In operation from 21 March 2012
	3	DVB-T2, 256-QAM	3/4	1/8	Fixed	37.52	96.0%	[tbc]	112.56		2 muxes until 2015 1 mux more from 2015
	1	[DVB-T2, tbc]	[tbc]	[tbc]	[tbc]	[tbc]	[tbc]	[tbc]	[tbc]		[tbc]
	1	[DVB-T2, tbc]	[tbc]	[tbc]	[tbc]	[tbc]	[tbc]	[tbc]	[tbc]		[tbc]

³ E.g. fixed, portable outdoor/mobile, portable indoor.

⁴ Refer Sections 2 and 3 on page 1 of this circular.