

# INTERNATIONAL TELECOMMUNICATION UNION



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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](mailto:brsgd@itu.int) or [rsg6@itu.int](mailto:rsg6@itu.int) by 31 July 2012.

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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

This questionnaire can be completed online at the following web page:

<https://extranet.itu.int/rsg-meetings/sg6/wp6a/Lists/DTTB%20Questionnaire/overview.aspx>

Login as: **Username:** (your TIES username)@ties.itu.int  
**Password:** (your TIES password)

NOTE - Electronic versions of Annexes 1, 2 & 2 can be found under QUESTIONNAIRE in the WP 6A Share Folder on the WP 6A Sharepoint site.

**Name of the Administration/Sector Member: Ministry of Transport, Construction and Regional Development of the Slovak Republic, Telecommunications Office of the Slovak Republic**

**For sector members please indicate the geographical area over which you operate: 1**

**Contact person: Milan Mizera, Pavol Gerhat**

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- 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) ETSI EN 302 296, EN 300 744 (DVB-T), EN 302 755 (DVB-T2), EN 302 304 (DVB-H)
  - b) Yes, the regular digital television terrestrial broadcasting in the Slovak Republic began in December 2009. Introduction of the DTT was allowed under the Digital Broadcasting Act No. 220/2007 Coll. which stipulates that regular digital television terrestrial broadcasting (DVB-T) shall begin no later than 31 December 2011 and analogue television terrestrial broadcasting shall be ceased no later than 31 December 2012.
  - c) See Annex 1. Beside 2 nationwide multiplexes, 27 local DVB-T multiplexes and one local DVB-H multiplex are in the operation in the Slovak Republic on 31 July 2012 (13 local transmitters use channels in the frequency sub-band 694-790 MHz).
- 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) Yes. The analogue switch-off process began in 2010 along with bringing digital multiplexes MUX2 (commercial) and VP MUX (public) into operation. In 2011 operation of all analogue television (TVA) transmitters of public broadcaster and operation of all TVA transmitters of one commercial broadcaster was ceased. Currently 7 low-power TVA transmitters remain in operation (3 transmitters of local broadcasters and 4 transmitters of commercial broadcaster).
- b) Expected date of analogue switch-off process completion: 31 December 2012.

**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) Estimated percentage of viewer uptake of terrestrial television:
  - Direct DVB-T terrestrial reception :
    - primary reception ..... 6,1 per cent of households
    - primary & secondary reception ..... 12,2 per cent of households
  - DVB-T reception by means of MATV systems ..... 19.5 per cent of households  
(ca 12 000 head-ends)
  - DVB-T reception in CATV head-ends ..... 24 per cent of households  
(ca 155 head-ends)

i.e. total estimated percentage ..... 55,7 per cent
- b) See item a).

**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) 4 TVA transmitters currently in operation use channels in the frequency sub-band 694-790 MHz. Based on the answer 2b) this information is not relevant for the Slovak Republic after 31 December 2012.
- b) 3 TVA transmitters which are currently in operation use channels from the remaining part of the UHF band. Based on the answer 2b) this information is not relevant for the Slovak Republic after 31 December 2012.

**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) See Annex 2
- b) See Annex 2
- c) 24 allotments use channels in the frequency sub-band 694-790 MHz
- d) 46 allotments use channels 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, the frequency bands 470 – 694 MHz and 694 -790 MHz are shared with secondary service PMSE.
- b) PMSE systems (wireless microphones) in the Slovak Republic are authorized based on individual authorization on case-by-case consideration. PMSE systems may be operated on non-interference/non-protected basis only with regard to broadcasting service. The license is issued with limited geographical extent and time duration.

- 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) Yes. Network operators have indicated interest in DVB-T2.
- b) In 2011, operator of nationwide DVB-T network conducted trial DVB-T2 operation. In the case of introducing television broadcasting in DVB-T2 system at nationwide level there might be a need to re-plan the digital terrestrial broadcasting service in Region 1 in the UHF band.

- 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) Yes.
- b) New and enhanced services depend on current public, network provider or broadcaster demand for latest technologies and advantages of multimedia environment (e.g. number of programs in HD resolution). Situation may accelerate following the provision of supplementary content services (e.g. electronic government) via terrestrial broadcasting networks.

- 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) Yes.
- b) Frequencies have been assigned for four nationwide multiplexes. 2 multiplexes (1 commercial and 1 public) are in operation. Bringing Multiplex 1 and Multiplex 4 into operation is expected in the near future. In the Slovak Republic there is a strong interest in local broadcasting on terrestrial platform. The Slovak Republic intends to provide further assignments of frequencies for local DVB-T broadcasters/network operators.

- 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) The whole UHF band 470-790 MHz will be required for DTT broadcasting if new and enhanced broadcasting services and new DTT systems are to be supported and secondary services (PMSE) are to be taken into account. By adopting Decision No. 2010/267/EU on harmonized technical conditions of use in the 790-862 MHz frequency band the Slovak Republic has lost approximately 1.5 GE06 layer. This loss in terms of national coverage / frequency positions is intended to be compensated by identification of frequency resources from the lower part of the UHF band and coordination of these frequencies with neighboring counties.

## ANNEX 1

Reply to Question 1: *What standards have you adopted for digital terrestrial television broadcasting? Have you started introduction of digital terrestrial television services? If yes, 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.*

Country	No of multiplexes	System & modulation	FEC	GI	Reception mode <sup>1</sup>	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) <sup>2</sup>	Any additional comments (e.g. duration of licences)
SVK	1	DVB-T, 64-QAM	2/3	1/4	Fixed	19,91	91.0 %	98,6 %	4 SD TV MPEG-2 and MPEG-4			Commercial multiplex - licensed until 2029
	1	DVB-T, 64-QAM	2/3	1/4	Fixed	19,91	0.0 %	61 %	-			Information about Current population coverage will be available after putting of DVB-T network into operation
	1	DVB-T, 64-QAM	2/3	1/4	Fixed	19,91	95.0 %	97,8 %	2 SD TV, 1 HD TV MPEG-2 and MPEG-4, 9FM			Public multiplex – licensed until 2029
	1	DVB-H, 4k, QPSK	1/2	1/8	Indoor portable	5,53			2 SD MPEG-4			Local multiplex
	27	DVB-T	-	-	-	-	-	-	-			Local multiplex

<sup>1</sup> E.g. fixed, portable outdoor/mobile, portable indoor.

<sup>2</sup> Refer Sections 2 and 3 on page 1 of this circular.

## ANNEX 2

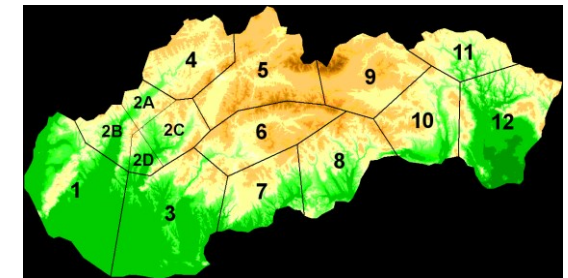
Reply to Question 5: *What frequencies/channels are currently used or intended to be used by digital terrestrial television broadcasting in your country? Please distinguish between those in use and those intended to be used.*

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.

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 how many are in the remaining part of the UHF band.

Area	MUX1 (assigned)	MUX2 – commercial MUX (in use)	VP MUX – public MUX (in use)	MUX4 (from 08/12)	MUX5 (intended)	MUX 6 (intended)	MUX 7 (intended)
1	44	<b>56</b>	27	39	37	<b>54</b>	
2A	<b>55</b>	<b>52</b>	<b>57</b>	23	38		
2B	<b>55</b>	<b>56</b>	<b>57</b>	23	38		
2C	<b>53</b>	<b>52</b>	<b>57</b>	23	43		
2D	<b>53</b>	<b>56</b>	<b>57</b>	23	43		
3	<b>50</b>	21	48	31	28	45	
4	35	<b>52</b>	32	39	30		
5	44	<b>59</b>	26	46	47	29	
6	<b>49</b>	<b>51</b>	33	40	30		
7	<b>49</b>	<b>60</b>	33	32			
8	<b>57</b>	27	<b>54</b>	22	47	<b>52</b>	
9	41	<b>55</b>	24	39	38	42	
10	<b>50</b>	<b>59</b>	25	21	23	37	
11	<b>49</b>	40	<b>54</b>	46	47	37	
12	<b>57</b>	<b>59</b>	25	22	23	30	



Note:

**Red bold** channels are channels from the frequency sub-band 694 – 790 MHz.



### ANNEX 3

Reply to Question 11: *What is the minimum amount of spectrum you foresee that will be required for digital terrestrial television broadcasting in Bands IV & V, 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.*

One example methodology showing how spectrum requirements can be calculated from the different parameters using a set of assumptions can be found in Doc. [6A/59](#) submitted to WP 6A and which is currently under debate in this Working Party.

A sample response is shown for guidance only.

Country	No of multiplexes	System & modulation	FEC	GI	Reception mode <sup>3</sup>	Capacity per multiplex (Mb/s)	Intended percentage population coverage	Content per multiplex	Total capacity (Mb/s)	Total spectrum bandwidth needed (MHz) <sup>4</sup>	Any additional comments including time frames

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<sup>3</sup> E.g. fixed, portable outdoor/mobile, portable indoor.

<sup>4</sup> Refer Sections 2 and 3 on page 1 of this circular.