



*Radiocommunication Bureau*  
(Direct Fax N°. +41 22 730 57 85)

**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.

François Rancy  
Director, Radiocommunication Bureau

---

Place des Nations  
CH-1211 Geneva 20  
Switzerland

Telephone +41 22 730 51 11  
Telefax Gr3: +41 22 733 72 56  
Gr4: +41 22 730 65 00

Telex 421 000 uitch  
Telegram ITU GENEVE

E-mail: [itumail@itu.int](mailto:itumail@itu.int)  
<http://www.itu.int/>

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:**

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

**Contact person/s:**

Name: **Jamal Abdullah Al-Mahrooqi**  
Title: **Manager of frequency Planning & Strategy Department**  
Organization: **Telecommunication Regulatory Authority**  
Tel.: **+968-24-574314**  
Fax: **+968-24-563640**  
E-mail: **jamal@tra.gov.om**

Name: **Abdullah Saleh Alaraimi**  
Title: **Director of Frequency Planning**  
Organization: **Public Authority for Radio and TV**  
Tel.: **+968-24-602494**  
Fax: **+968-24-604629**  
E-mail: **asalaraimi@omanet.om, asalaraimi@hotmail.com**

- 1 a) What standards have you adopted for digital terrestrial television broadcasting?  
**DVB-T2 (256-QAM)**
- b) Have you started introduction of digital terrestrial television services?  
**NO**
- 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:**

2 a) Have you commenced analogue television switch-off?

Not yet

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

**Reply:** 2015

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:** 20% or less.

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)**).

- 31 analogue television transmitters

b) How many are in the remaining part of the UHF band.

- 114 analogue television transmitters.

**Reply:**

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.

- Frequencies/channels are currently used: None

- Frequencies/channels are intended to be used: The bands 694-790 and 790-862 MHz that will be used for the mobile, except aeronautical mobile, service [IMT]. The band from 470-678 will be used for digital terrestrial television broadcasting and future broadcasting.

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.

- None allotments/SFNs are currently in use.

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

- The frequency sub-band 694-790 MHz is not to be used for broadcasting services, it is to be used for the mobile, except aeronautical mobile, service [IMT].

d) How many are in the remaining part of the UHF band.

- SFN: 305

- MFN: 35

**Reply:**

6 a) Are those frequency bands also shared with other primary services?

- No

b) If yes, please give details of those systems and their spectrum use.

**Reply:**

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?

470-678MHz will be used secondary services such as PMSE. There are no radio astronomy or wind-profile radar

b) If yes, please give details of those systems and their spectrum use.

**Reply:**

- 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:**

- Yes. We are going to start our project with DVB-T2. We expect to finish the first phase by 2015. The bands 694-790 and 790-862 MHz that will be used for the mobile, except aeronautical mobile, service [IMT]. The band from 470-678 will be used for digital terrestrial television broadcasting and future broadcasting.

- 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:**

- No

- 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:**

- No

- 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:**

- The bands 694-790 and 790-862 MHz that will be used for the mobile, except aeronautical mobile, service [IMT]. The band from 470-678 will be used for digital terrestrial television broadcasting and future broadcasting requirements.

## ANNEX 1

Suggested form of presentation of 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.*

A sample response is shown for guidance only.

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)
XX	2	DVB-T, 64-QAM	2/3	1/32	Fixed	24.10	98.0%	99.2%	9 SD MPEG2	169.7 plus two new muxes (tbc)	256	Public service multiplexes licensed until 2022
	1	DVB-T2, 256-QAM	2/3	1/128	Fixed	40.20	98.0%	99.2%	5 HD MPEG4			Public service multiplex licensed until 2022
	3	DVB-T, 64-QAM	3/4	1/32	Fixed	27.10	89.0%	92.0%	11 SD MPEG2			Licensed until 2024
	1	[DVB-T, tbc]	[tbc]	[tbc]	Fixed	[tbc]	[tbc]		[tbc]			Expected local multiplex
	1	[DVB-T2, tbc]	[tbc]	[tbc]	Fixed	[tbc]	[tbc]		[tbc]			Expected local multiplex
YY	1	DVB-T2, 64-QAM	2/3	1/4	Portable indoor	22.6	-	60%	3 HD MPEG4	22.6		From 2013

<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.



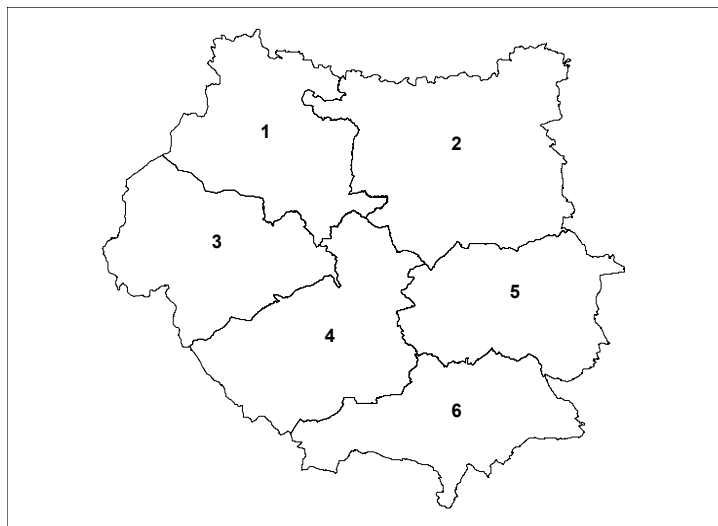
## ANNEX 2

Suggested presentation of 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	Layer 1	Layer 2	Layer 3	Layer 4	Layer 5	Layer 6	Layer 7
1	27	37	39	44	54	56	66
2	23	69	38	-	57	56	-
3	23	69	43	-	57	52	-
4	30	32	39	61	35	52	68
5	21	28	31	45	48	50	-
6	60	-	33	32	49	67	65

### ANNEX 3

Suggested form of presentation of 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
XX	6	DVB-T2, 256-QAM	2/3	1/128	Fixed	40.20	99.2%	7 HD MPEG4	187.0		1 now, 5 more from 2020
	2	DVB-T2, 16-QAM	1/2	1/8	Fixed	13.1	90%	2 HD MPEG4			1 in 2013, 1 more from 2020
YY	4	DVB-T2, 64-QAM	2/3	1/4	Portable indoor	22.6	60%	15 SD MPEG4	90.4		1 from 2013 2 more from 2015, 1 more from 2020
ZZ	4	DVB-T2, 256-QAM	2/3	1/128	Fixed	40.20	99.2%	7 HD MPEG4	160.8		1 from 2013 2 more from 2015, 1 more from 2020

<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.