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30TH WORLD RADIOCOMMUNICATION SEMINAR 24 – 28 October 2022 Geneva, Switzerland

GE06 Agreement for Other Primary Terrestrial Services (except broadcasting)

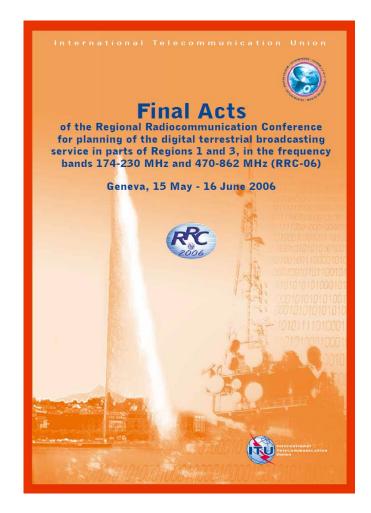
BR / TSD

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- 1. Introduction
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- 5. Practical considerations
- 6. Concluding remarks







GE06 Agreement

Plan for Digital terrestrial broadcasting

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 ✓ For Region 1 countries to west of 170E and to north of 40S except MNG including IRN

This Plan also includes the Other Primary Terrestrial Services (OPTS) in the frequency bands and area concerned.





Frequency bands, services and area

of OPTS subject to GE06 Agreement

Frequency from (MHz)	Frequency to (MHz)	Service	Countries
174	230	FIXED and MOBILE	IRN
174	223		Countries listed in RR 5.235 (D, AUT, BEL, DNK, FRO, E, CNR, FIN, F, MYT, REU, ISR, I, LIE, MLT, MCO, NOR, HOL, G, ASC, SHN, TRC, GIB, S and SUI)
216	225	AERONAUTICAL RADIONAVIGATION	Countries listed in RR 5.243 (SOM)
223	230	AERONAUTICAL RADIONAVIGATION	IRN and Countries listed in RR 5.247 (ARS, BHR, UAE, JOR, OMA, QAT and SYR)
470	862	FIXED and MOBILE	IRN
585	610	RADIONAVIGATION	IRN
645	862		Countries listed in RR 5.312 (ARM, AZE, BLR, BUL [*] , GEO, KAZ, UZB, KGZ, ROU, RUS (to west of 170E), TJK, TKM and UKR) [*] For BUL, 646-686 MHz, 726-753 MHz, 778-811 MHz and 822-852 MHz
694	867	MOBILE except Aeronauticam mobile	Region 1 countries to west of 170E and to north of 40S) except MNG
790	862	FIXED	Region 1 countries to west of 170E and to north of 40S) except MNG





List of assignments of OPTS in the Plan

- > Original List of frequency assignments to other primary terrestrial services (Annex 5 to the GE 06 Agreement)
 - \checkmark in the planning area and bands
 - ✓ <u>https://www.itu.int/en/ITU-R/terrestrial/fmd/Documents/fxm-</u> **GE06L-OPS.pdf**

174-230 MHz										
Total 5622										
adm	adm stn_cls cnt									
G	FB	2639								
G	ML	2784								
IRN	IRN FB 186									
IRN	FX	13								

470-862 MHz	ARS	FB	1
Total 5388	ARS	ML	1
	AZE	AL	
	BEL	FX	
	CTI	FB	
	ECV	N/1	

	adm	stn_cls	cnt	adm	stn_cls	cnt	adm	stn_cls	cnt
	ARS	FX	101	GEO	AL	7	KGZ	AM	5
MHz	ARS	FB	117	IRN	AL	1	MRC	FX	70
8	ARS	ML	121	IRN	FX	216	RUS	AL	726
	AZE	AL	3	IRN	FB	135	RUS	AM	187
	BEL	FX	4	ISR	ML	372	RUS	FX	507
	CTI	FB	14	JOR	ML	2017	TJK	AL	2
	EGY	ML	474	KAZ	AL	9	UAE	FX	4
	F	FB	250	KAZ	AM	9	UZB	AL	10
	G	AL	5	KGZ	AL	5	UZB	AM	17



List of assignments of OPTS in the Plan

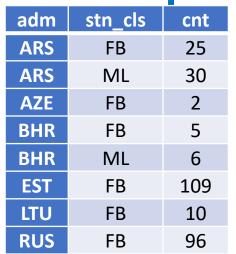
> Assignments recorded in the List after 2006 (Total 4093)

adm	stn_cls	cnt	adm	stn_cls	cnt	adm	stn_cls	cnt
BLR	FB	156	LVA	FB	106	SWZ	FB	57
EGY	FB	1542	LVA	ML	1	SWZ	ML	57
EGY	ML	1900	RUS	AL	100	UKR	AL	21
KAZ	FB	232	RUS	AM	195	UKR	AM	2
KAZ	ML	231	RUS	FB	511	UZB	FB	6
LTU	FB	32	RUS	ML	2	UZB	ML	229

Assignments under coordination process as of adm stn cls cnt

Oct. 2022 (Total 283)







Flowchart for the modification of the List of frequency assignments Other Primary Service stations in GE06 Agreement

<u>https://www.itu.int/en/ITU-R/terrestrial/fmd/Documents/fxm-GE06-Article4.pdf</u>

Flowchart for notification of the assignment which has been recorded in the Plan, for recording in MIFR (Mister International Frequency Register)

https://www.itu.int/en/ITU-R/terrestrial/fmd/Documents/fxm-GE06-Article5.pdf



See also <u>ITU Web-page</u> on GE06 Procedure and list

of GE06 Agreement Check if the publication	1, 2, 8, 4, 5	Seeks clarification if necessary Returns the notice if incomplete		
•	C			
is correct	6	Identifies affected ADMs and publish the notice in Part A of Special Section GE06L (No. 4.2.2.5, within 40 days from the reception of the notice)	6	Check if any proposed modification is agreeable or not.
	¢	If the request is justified, publishes addendum to the SS GE06L (Part A) with the name of affected No. 4.2.3.2, within 30 days from the request)	7, 8, 9, 10, 11, 12	Requests BR to remove/include its name from/in the list of affected ADMs (Nos. 4.2.27 and 4.2.3.1, within 40 days from the date of publication of Part A)



Proposing ADM	Step	BR	Step	Affected ADM
Check if the coordination information is correct	13, 14	If all required agreements were notified and publication is requested by proposing ADM and if there has been no request from affected ADMs to remove/include their name from/in the list of affected ADMs, publish the notice in Part B of SS GEO6L into 4.2.2.4, After 40 days from the date of publication of Part A)	13, 14	
		Requests ADMs that have not given their decision (No. 4.2.4.7, After 50 days from the date of publication of Part A)	15	Provides its decision
	16	Informs proposing ADM of the names of agreeing and non-replying ADMs (No. 4.2.4.7, After 75 days from the date of publication of Part A)		

Proposing ADM	Step	BR	Step	Affected ADM
Requests BR for assistance for reminder (No. 4.2.4.9)	17	Sends a reminder to non-replying ADMs	18	
		Informs proposing ADM of the coordination status (Nos. 4.2.4.9 and 4.2.4.10, After 40 days from the date of reminder)	19	Gives decisions (within 40 days from the date of reminder)
Requests BR for assistance for study (No. 4.2.4.12)	Note 1	Informs the requesting ADM of the study results and possible recommendation (No. 4.2.4.12, within 40 days from the date of request)	Note 1	Requests BR for assistance for study (No. 4.2.4.12)

4.2.4.10 If no decision is communicated to the *Bureau* within 40 days after the date of dispatch of the reminder under § 4.2.4.9, it shall be deemed that the administration which has not given a decision has agreed to the proposed new or modified assignment.







Proposing ADM	Step	BR	Step	Affected ADM
Sends final characteristics and the names of ADMs having agreed (No. 4.2.5.1, within 24 months and 75 days from the date of publication of Part A)	22, 23, 24, 25, 26, 27	If no information is received, lapse the proposals. (No. 4.2.5.1) If the final characteristics identifies new ADMs as affected, invites the proposing ADM to repeat the same procedure. (No. 4.2.5.2) Otherwise publishes the notice in Part B of SS GE06L (No. 4.2.5.3, Within 30 days from the date of reception of the new characteristics)	27	
Notifies the assignment under Article 5 (No. 4.2.5.4, Within 12 months from the date of publication of Part B)	28, 29 30	Publishes the notice in Part I of BR IFIC Examines the notice under Nos. 11.31 and 11.34 of the Radio Regulations and publish it In Part II of BR IFIC . (Nos. 5.2.2 and 5.2.3)		

4.2.5.4 The proposed new or modified assignment shall lapse if it is not notified under Article 5 within 12 months after the publication referred to in § 4.2.5.3.





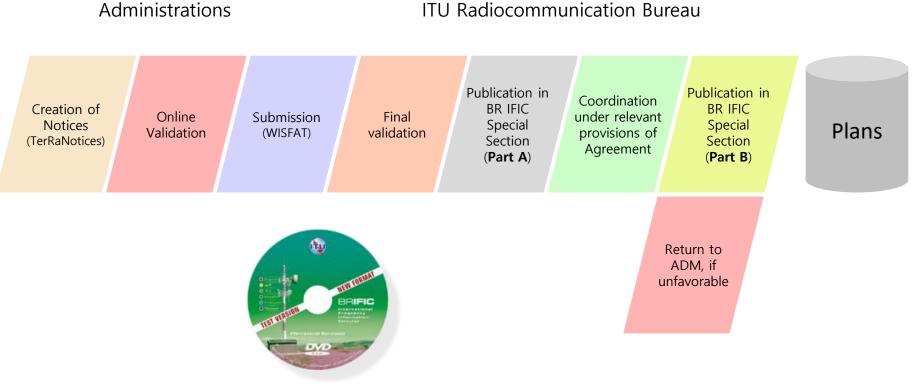
Proposing ADM	Step	BR	Step	Affected ADM
Resubmits the notice that was returned (No. 5.2.4)	29	Publishes the resubmitted notice in Part I of BR IFIC If the notice for resubmission includes a signed commitment by the notifying ADM, indicating that use of the assignment shall not cause unacceptable interference to, nor claim protection from, any station of the administration, publishes it in Part II of BR IFIC with that condition .	29	





3. Notification procedure

Notification for modification of a Plan







Notification procedure

- > In the frequency bands governed by a Plan or an Agreement
- > Preparation of a notice file using TerRaNotice (BR IFIC DVD)
- Validation of the notices using ITU web-page for validation
- Submission of the notice file through Web Interface for the Submission of Frequency Assignments/Allotments for the Terrestrial Services (WISFAT)
- > Publication of the notices in <u>BR IFIC (Special Section Part A)</u>
- Coordination through the BR
- > Publication of the notices in <u>BR IFIC</u> (Special Section Part B)









3. Notification procedure

Status of the other primary services in GE 06 Agreement

- https://www.itu.int/en/ITU-R/terrestrial/fmd/Documents/fxm-GE06report.pdf
- Notification Guide
 - https://www.itu.int/en/ITU-R/terrestrial/tpr/Documents/os_guide.pdf

Notice form and Example notices

✓ <u>https://www.itu.int/en/ITU-</u>

R/terrestrial/tpr/Pages/FXMNotices.aspx#OSNotices

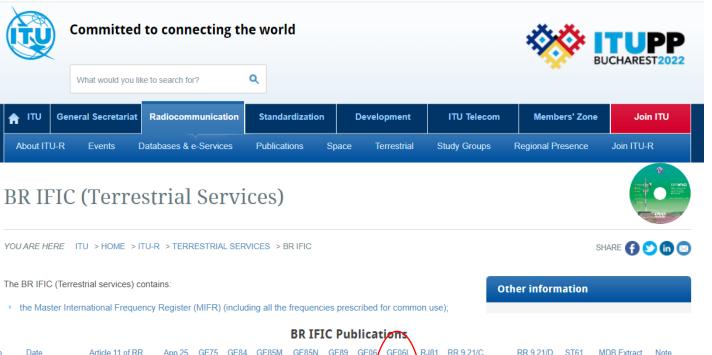




3. Notification procedure

- https://www.itu.int/ en/ITU-R/terrestrial/brific/ Pages/default.asp
 - <u>X</u>
 - ✓ SS GE06L/87 for Part A
 - ✓ SS GE06L/86 for Part B

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No.	Date	Article 11 of RR	App.25	GE75	GE84	GE85M	GE85N	GE89	GE06	GE06L	RJ81	RR.9.21/C	RR.9.21/D	ST61	MDB Extract	Note
2981	04/10/2022	Parts1/2/3			318								458		IFIC2981	ReadMe
2980	20/09/2022	Parts1/2/3							196	87		1015	457		IFIC2980	ReadMe
2979	06/09/2022	Parts1/2/3			317					86			456	1569	IFIC2979	ReadMe
2978	23/08/2022	Parts1/2		203					195						IFIC2978	ReadMe
2977	09/08/2022	Parts1/2/3/2B			316										IFIC2977	ReadMe
2976	26/07/2022	Parts1/2/3		202					194	85	/	1014			IFIC2976	ReadMe
										\ /						



Protection of Terrestrial Digital TV*

- ✓ For Propagation curves given in GE06 Agreement (Chapter 2 of Annex 2) for 1% of the time and for 50% of locations are used
- ✓ For air-to-ground, the free-space model should be used. The coordination contour is limited to a line-of-sight distance of 420 km.
- ✓ In the case of aeronautical services for airborne stations the height of the transmitting antenna above the ground is 10 000 m.

No. 5.2.1 of Section I of Annex 4

12.6 The *Transition period* shall end on 17 June 2015 at 0001 hours UTC. However, for the countries listed in footnote below⁷, for the band 174-230 MHz⁸, the *Transition period* shall end on 17 June 2020 at 0001 hours UTC. After the end of the applicable *Transition period*, the corresponding entries in the analogue Plan shall be cancelled by the *Bureau*, and



*



Coordination trigger field strength to protect DTV

TABLE A.1.10

Coordination trigger field strengths for the protection of the Plan from other primary terrestrial services

Broadcasting system to be		$\begin{array}{c} Trigger \ field \ strength \\ \left(dB(\mu V/m) \right)^{(1)} \end{array}$									
protected	Band III (174 -230 MHz)	Band IV (470-582 MHz)	Band V (582-718 MHz)	Band V (718-862 MHz)							
Analogue and digital ⁽²⁾	10	18	20	22							
Digital	17	21	23	25							

⁽¹⁾ The trigger field-strength values are related to the 7 or 8 MHz bandwidth of the system to be protected.

⁽²⁾ To be applicable during the transition period.



Appendix 1 to Section I of Annex 4



Protection of other primary terrestrial services

- ✓ Reference broadcasting station is used
- \checkmark total maximum radiated power 53 dBW.
- \checkmark maximum effective antenna height 600 m and mixed polarization.
- ✓ The maximum coordination distance for aircraft receivers is set at 500 km.
- ✓ Calculate from 1000 km reference point with 10 km steps, until the field strength is below the required threshold for the receiving station.

No. 5.2.2 of Section I of Annex 4





4. Coordination Criteria

Protection of other primary terrestrial services (MS)

TABLE A.1.3

Coordination trigger field-strength values to protect systems of the mobile service from DVB-T

System to be protected	System type code (see Annex 2, Chapter 4)	Frequency range	Trigger field strength (dB(µV/m)) ⁽¹⁾	Height of the receiving antenna (m)
Analogue private mobile radio, 12.5 kHz	NV	Band III	30 (base stations) 38 (mobile stations)	20 (base station) 1.5 (mobile station)
Land mobile system NR (radio microphone)	NR	790-862 MHz/Band III	58 (UHF)/50 (VHF)	1.5
Mobile system NS (OB link, stereo, non-companded)	NS	790-862 MHz/Band III	45 (UHF)/37 (VHF)	10
Mobile system NT (Talk-back)	NT	790-862 MHz/Band III	47 (UHF)/39 (VHF)	1.5





TABLE A.1.3 (end)

Protection of other primary terrestrial services (MS)

System to be protected	System type code (see Annex 2, Chapter 4)	Frequency range	Trigger field strength (dB(µV/m)) ⁽¹⁾	Height of the receiving antenna (m)
Digital land mobile system NA (e.g. CDMA)	NA	470-862 in Region 3, 790-862 MHz in accordance with RR No. 5.316	18 (base station)	20 (base station)
Generic mobile system NB	NB	174-230 MHz/ 470-862 MHz	See equation (A.1.1) and Table A.1.4 (base station) See equation (A.1.1) and Table A.1.5 (mobile station)	20.0 (base station) 1.5 (mobile station)
Land mobile system XN (VHF)	XN	Band III	38	1.5
Land mobile system YN (480 MHz)	YN	480 MHz	41	1.5
Land mobile system ZC (620 MHz)	ZC	620 MHz	43	1.5

⁽¹⁾ The trigger field-strength values are related to the DVB-T bandwidth.





Appendix 1 to Section I of Annex 4

4. Coordination Criteria

Protection of other primary terrestrial services (MS)

For the generic case (type code NB) in the mobile service, i.e. when there is no value of protection ratio available, the following equation must be used:

$$F_{trigger} = -37 + F - G_i + L_F + 10 \log(B_i) + P_o + 20 \log f + I/N$$
(A.1.1)

where:

- F: receiver noise figure of the mobile service base or mobile station receivers (dB)
- B_i : the bandwidth of the terrestrial broadcasting station (MHz)
- G_i : the receiver antenna gain of the station in the mobile service (dBi)
- L_F : antenna cable feeder loss (dB)
- *f*: centre frequency of the interfering station (MHz)
- P_o : man-made noise (dB) (typical value is 1 dB for the VHF band and 0 dB for the UHF band)
- *I/N*: interference to noise ratio, which must not exceed the threshold (margin) applicable when developing the Plan (I/N = -6 dB).

Appendix 1 to Section I of Annex 4



4. Coordination Criteria

TABLE A.1.4

Protection of other primary terrestrial services (MS)

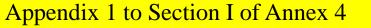
Typical values of the parameters when applying equation (A.1.1) to derive coordination trigger field-strength values to protect the base stations for the generic case (type code NB) of the mobile service from DVB-T

Frequency (MHz)	174	230	470	790	862
F(dB)	8	8	4	3	3
G_i (dBi)	6	8	12	17	17
$L_F(\mathrm{dB})$	2	2	2	4	4
P_o (dB)	1	1	0	0	0
$F-G_i+L_F+P_o$	5	3	-6	-10	-10

TABLE A.1.5

Typical values of the parameters when applying equation (A.1.1) to derive coordination trigger field-strength values to protect the mobile stations for the generic case (type code NB) of the mobile service from DVB-T

Frequency (MHz)	174	230	470	790	862
F(dB)	11	11	7	7	7
G_i (dBi)	0	0	0	0	0
$L_F(\mathrm{dB})$	0	0	0	0	0
P_o (dB)	1	1	0	0	0
$F-G_i+L_F+P_o$	12	12	7	7	7







Protection of other primary terrestrial services (MS)

- Trigger field strengths of an IMT station operating on 790 MHz are
 - 17 dB(µV/m) for a receiving base station
 - 36 dB(µV/m) for a receiving mobile station,

The parameters to be applied in the equation are listed below. They are derived from Report ITU-R M.2039-3 for IMT-2000 systems and Report ITU-R M.2292-0 for IMT-Advanced systems.

Parameters	Receiving base station (ML)	Receiving mobile station (FB)		
f(centre frequency, MHz)	470	470-862		
F (receiver noise figure, dB)	5	9		
G_i (receiver antenna gain, dBi)	15	-3		
L_F (antenna cable feeder loss, dB)	3	0		
P_o (man-made noise, dB)	0	0		
I/N (interference to noise ratio, dB)	-6			
B_i (bandwidth of TV station, MHz)	8			

The above parameters apply to stations operating on frequency 790 MHz. For other frequencies in the UHF band, the interpolation should be made by adding a correction factor of $10 \log (f/790)$.





>Example for receiving base station

BR ID: <u>122046472</u> Administration: BHR Administration's unique ID: MUHARRAQ_705.5 Fragment: GE06L Provision: GE06-4.2 Notice type: G13 / ADD Date Rcv: 20 Apr 2022 Date In Use: 06 Dec 2021 Stage: COORD Publication history: GE06L/A/82 Assigned frequency: 705.5 MHz Bandwidth: 5M00 Examination category: L06 System type(s): NA Class of station: ML Geographic area: BHR Site name: 1 Coordinates: 50°32'16"E - 26°9'34"N Coordinates: 50.5378° ; 26.1594°



Example for receiving base station

Calculation parameters for FXM TX sites	Calculation parameters for FXM RX sites	
ERP: -6 dBW	Vertical ERP: 50 dBW	
	Horizontal ERP: 50 dBW	
Polarization: U	Polarization: M	
Height above ground level: 1.5 m	Height above ground level: 600 m	
Site altitude: 1 m	Site altitude: 1 m	
Receiver type: Fixed broadcasting	Receiver type: Terrestrial (not airborne) OS	
Polar. discrimination: 16 dB	Polar. discrimination: 16 dB	
Percentage of time: 1%	Percentage of time: 10%	
Percentage of location: 50%	Percentage of location: 50%	
Trigger field strength: 23 dB(uV/m)	Trigger field strength: 18 dB(uV/m)	
Receiver antenna height: 10 m	Receiver antenna height: 0 m	

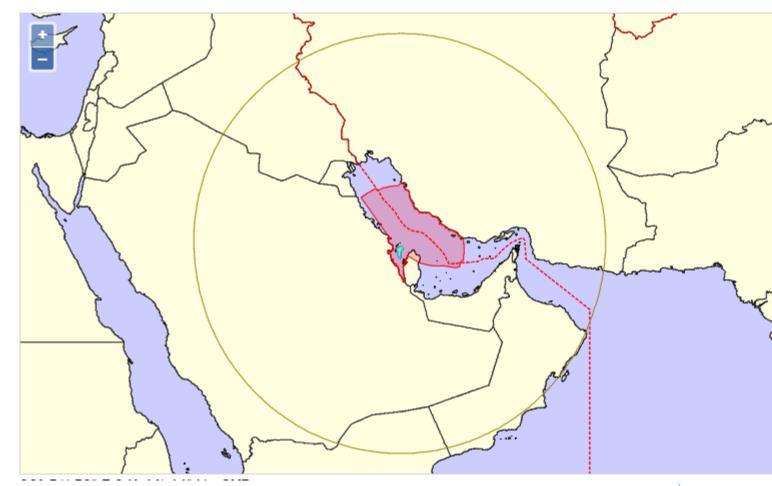




Example for receiving base station

- ✓ Administrations intersecting the 1000km contour: ARS, IRN, IRQ, KWT, OMA, QAT, UAE, YEM
- ✓ Geographical areas intersecting the coordination contour of TX: ARS, IRN, QAT

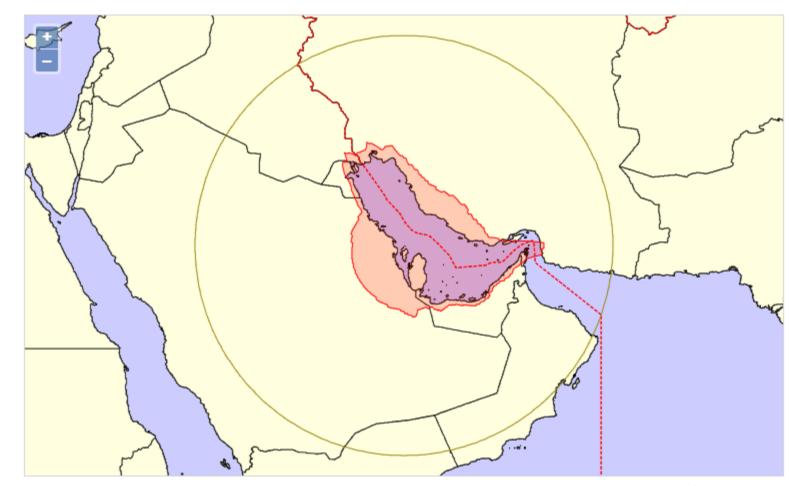
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Example for receiving base station

- ✓ Geographical areas intersecting the coordination contour of RX: ARS, IRN, IRQ, KWT, OMA, QAT, UAE
- Administrations identified as affected: ARS, IRN, IRQ, KWT, OMA, QAT, UAE
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Example for Transmitting base station

BR ID: <u>122046478</u> Administration: BHR Administration's unique ID: MUHARRAQ_760.5 Fragment: GE06L Provision: GE06-4.2 Notice type: G12 / ADD Date Rcv: 20 Apr 2022 Date In Use: 06 Dec 2021 Stage: COORD Publication history: GE06L/A/82 Assigned frequency: 760.5 MHz Bandwidth: 5M00 Examination category: L06 System type(s): NA Class of station: FB Geographic area: BHR Site name: BHR Coordinates: 50°32'10"E - 26°9'26"N Coordinates: 50.5361° ; 26.1572°





Example for Transmitting base station

Calculation parameters for FXM TX sites	Calculation parameters for FXM RX sites		
ERP: 16 dBW	Vertical ERP: 50 dBW		
	Horizontal ERP: 50 dBW		
Polarization: V	Polarization: M		
Height above ground level: 92 m	Height above ground level: 600 m		
Site altitude: 0 m	Site altitude: 1 m		
Receiver type: Fixed broadcasting	Receiver type: Terrestrial (not airborne) OS		
Polar. discrimination: 16 dB	Polar. discrimination: 0 dB		
Percentage of time: 1%	Percentage of time: 10%		
Percentage of location: 50%	Percentage of location: 50%		
Trigger field strength: 25 dB(uV/m)	Trigger field strength: 18 dB(uV/m)		
Receiver antenna height: 10 m	Receiver antenna height: 20 m		

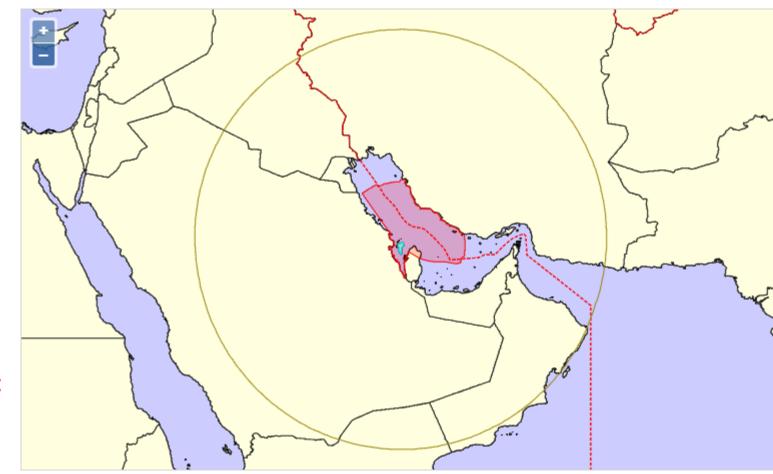




Example for transmitting base station

- ✓ Administrations intersecting the 1000km contour: ARS, IRN, IRQ, KWT, OMA, QAT, UAE, YEM
- ✓ Geographical areas intersecting the coordination contour of TX: ARS, IRN, IRQ, KWT, OMA, QAT, UAE

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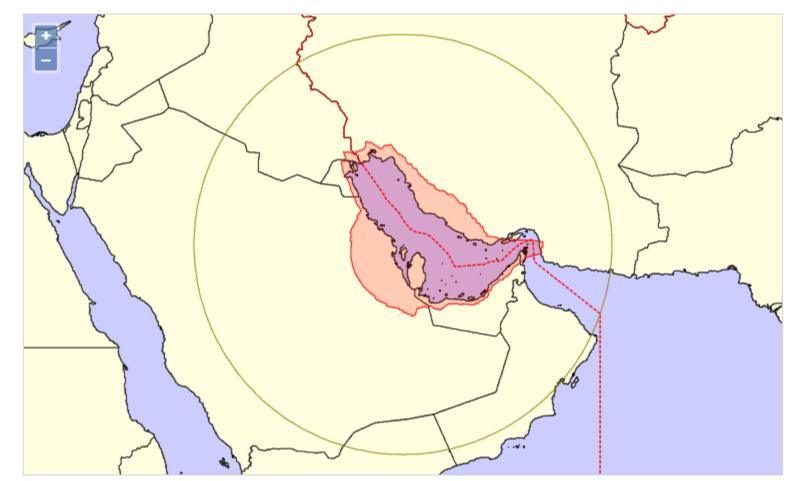




Example for receiving base station

- ✓ Geographical areas intersecting the coordination contour of **RX**: ARS, IRN, IRQ, KWT, OMA, QAT, UAE
- Administrations
 identified as affected:
 ARS, IRN, IRQ, KWT,







> Specific cases

✓ Cases where RR 9.21 coordination procedure should be precedent for the allocation is activated

RR No.	Freq. Band	Service	Coordination criteria	Area
5.312A	694-790 MHz	MOBILE except aeronautical mobile	RoP 5.312A Res. 760 (Rev.WRC-19)	XR1 countries within 450 km from countries listed in No. 5.312 (ARM, AZE, BLR, BUL, GEO, KAZ, KGZ, RUS, TJK, TKM, UKR, UZB):
5.316B	790-862 MHz		RoP 5.316B Res. 749 (Rev.WRC-19)	ALB, ARM, AUT, AZE, BIH, BLR, BUL, CZE, D, DNK, EST, FIN, GEO, GRC, HNG, HRV, I, IRQ, KAZ, KGZ, LTU, LVA, MKD, MDA, MNE, MNG, NOR, POL, ROU, RUS, S, SRB, SVK, SYR, TJK, TKM, TUR, UKR and UZB



Concluding remarks

GE06 Agreement is not only for DTV Plan but also for Other Primary Terrestrial Services

✓ It is important to note that the frequency assignments recorded in the Plan have the right to international recognition

> For proposing ADMs,

- \checkmark It is critical to provide BR with name of the agreed ADMs within 24 months + 75 days
- ✓ It is also important to notify under Article 11 of the RR the assignments which have published in Part B of SS GE06L, within 12 months (If not, they are lapsed.)
- ✓ In some countries, it is important to apply RR9.21 coordination procedure together with GE06L modification procedure

> For affected ADMs,

✓ It is critical to reply to the reminder within 40 days (If not, it is considered as agreed)







30TH WORLD RADIOCOMMUNICATION SEMINAR 24 – 28 October 2022 Geneva, Switzerland

Thank you!

ITU – Radiocommunication Bureau Questions to <u>brmail@itu.int</u> or <u>brfmd@itu.int</u>



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