



ITUEvents

## 4<sup>th</sup> ITU Regional Frequency Coordination Meeting for Central America and the Caribbean Region

*On the use of the VHF and UHF bands*

11 - 14 September 2018

Belize City, Belize

[www.itu.int/go/belize](http://www.itu.int/go/belize)



# Methodology for seeking of DTT channels for requirements

Broadcasting Services Division

ITU Radiocommunication Bureau



Organized with the support of:



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# Overview

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- Tools to be used
- Frequency bands and TV channels
- Procedure diagram
- CA Display tool



# Tools to be used



**eBCD 2.0**  
Broadcasting Online



**TerRaQ**  
**TerRaNotices**

**CA Display**

**WISFAT**



# Frequency bands and TV channels

✓ Frequency bands: VHF (174 – 216 MHz) and UHF (470 – 698 MHz)

✓ TV channels (assigned frequencies) – Doc. INFO-1:

- 6 MHz raster: 7 (177 MHz) – 13 (213 MHz)

14 (473 MHz) – 51 (695 MHz), **excl. ch.37 (611 MHz)**

- 8 MHz raster: 5 (178 MHz) – 9 (210 MHz)

21 (474 MHz) – 48 (690 MHz), **excl. ch.38 (610 MHz)**

- special case (“flexible channel”):

- 6 MHz raster:

For VHF band - ch82 (881 MHz)

For UHF band - ch83 (887 MHz)

- 8 MHz raster:

For VHF band – ch68 (850 MHz)

For UHF band – ch69 (858 MHz)

*“flexible channel” – means that during compatibility analysis calculations, the software will scan all available channels in the frequency bands mentioned above and show electromagnetic situation on each channel*



# Find a frequency channel process diagram

At the end of the coordination meetings, submit officially to the BR using WISFAT





# Creation/Modification of a T02 notice

TerRaNotices 1.2 (BR IFIC 2852) - [G\_VRG\_Road Town\_flex\_nf.txt\* - T02\*]

File Tools View Language Options Window Help

Notice browser

Notice type	Description
G_VRG_Road Tow...	
Head section	G - 02/08/2016
✓ T02 ADD	AIA_ANGUILLA 1
✓ T02 ADD	AIA_ANGUILLA 2
✓ T02 ADD	AIA_ANGUILLA 3
✓ T02 ADD	AIA_ANGUILLA 4
✓ T02 ADD	BER_HAMILTON 1
✓ T02 ADD	BER_HAMILTON 2
✓ T02 ADD	BER_HAMILTON 3
✓ T02 ADD	BER_HAMILTON 4
✓ T02 ADD	CYM_Georges Town 1
✓ T02 ADD	TCA_Cockburn Town 2
✓ T02 ADD	TCA_Lorimers 1
✓ T02 ADD	TCA_Lorimers 2
✓ T02 ADD	CYM_Georges Town 2
✓ T02 ADD	CYM_Georges Town 3
✓ T02 ADD	CYM_Georges Town 4
✓ T02 ADD	TCA_Cockburn Town 1
✓ T02 ADD	MSR_RICHMOND HILL 1
✓ T02 ADD	MSR_RICHMOND HILL 2
✓ T02 ADD	MSR_RICHMOND HILL 3
✓ T02 ADD	MSR_RICHMOND HILL 4
✓ T02 ADD	VRG_Road Town 1
✓ T02 ADD	VRG_Road Town 2
<b>T02 ADD*</b>	<b>VRG_Road Town 3</b>
✓ T02 ADD	VRG_Road Town 4

Date of notification  
2 8 2016

ID1/ Assignment's unique identifier  
VRG\_Road Town 3

Fragment:  Article 11    Notification intended for:  Addition

GE89     Modification ...

ST61

Assignment characteristics    **Antenna characteristics**

Station information

4A/ Antenna site name  
Road Town

4C/ Longitude  
64° 37' 28" W

9EA/ Altitude of site above sea level  
192 m

3A1/ Call sign

4B/ Geographic area  
VRG

Latitude  
18° 25' 8" N

3A2/ Station identification

Emission characteristics

1A/ Assigned frequency  
887 MHz

7C1/ TV system  
T7

8BH/ Horizontal e.r.p.  
30 dBW

7AB/ Bandwidth  
6000 kHz

1EO/ Offset  
0 kHz

7A1/ Frequency stability

9D/ Polarization  
H

8BV/ Vertical e.r.p.  
 dBW

7A/ Class of emission  
X7FXF

Antenna characteristics

9/ Antenna directivity  
ND

9EB/ Maximum Effective Antenna Height  
242 m

9E/ Height of Antenna Above Ground Level  
50 m

Coordination successfully completed with the following administrations

Available administrations

AFG

AFS

AGL

ALB

ALG

Selected administrations

Add >    < Remove    << Clear

13C/ Notified remarks

**T02**



# Validation and Submission of the notice file to eBCD

- ✓ Validate and save the notice file
- ✓ Go to eBCD web-portal - eTools: <https://www.itu.int/ITU-R/eBCD/MemberPages/eCalculations.aspx> and select the **CA\_compat** calculation type
- ✓ Browse and upload the notice file together with the notice files of neighboring countries to eBCD web-portal
- ✓ Label your job and click on Submit



# Getting Compatibility Analysis results

- ✓ **Click on Back to calculation history**
- ✓ **Wait for results**
- ✓ **Save and unzip .mdb file on your local disk**
- ✓ **Launch CA Display and open the .mdb file to view the results**



# CA Display (example)

- ✓ File -> Open compatibility results file **G\_VRG\_Road Town\_flex.mdb**
- ✓ View -> Channel distribution statistics
- ✓ Check appropriate boxes and set a default margin
- ✓ Select Administration and click Refresh
- ✓ Select item of interest and click on the blue number
- ✓ List of requirements will appear
- ✓ Select the requirement of interest and click on it

The screenshot shows two windows from a software application. The top window, titled "Channel Distribution Statistics", has a menu bar with "File", "Edit", "View", "Preferences", and "Help". It features a dropdown menu for "Administration" set to "G" and a "Refresh" button. Below these are three checkboxes: the first is checked and labeled "Show assignable channels if the maximum acceptable margin (dB) is:" followed by a text box containing the number "4"; the second is unchecked and labeled "Show assignable channels if ignoring incompatibilities between requirements where both have a range of available frequencies"; the third is unchecked and labeled "Do not consider interference to the wanted requirement". To the right of the second checkbox is another unchecked checkbox labeled "Ignore self incompatibilities". Below the checkboxes is a section titled "Channel Distribution Statistics" with four columns: "Submitted" (value 24), "No available channel or frequency block" (value 0), "No assignable channel or frequency block" (value 0), and "Having an assignable channel or a frequency block" (value 24). The bottom window, titled "Channel Distribution Details Digital assignments", has tabs for "UHF Channel Distribution" and "VHF Channel Distribution". It contains a table with the following data:

No.	Adm	Geo Area	Adm Ref Id	Not.Type	Site/Allot Name	SFN Id	Ch/block	Avail. Ch/block	Assignable Ch/block
20	G	TCA	TCA_LORIMERS 2	T02	Lorimers		20	20	20
21	G	VRG	VRG_ROAD TOWN 3	T02	Road Town		14-51	14-16,18-22,24-51	14,16,19,21-22,25,27-29,31-33,35-39,41,45,47,49-51
22	G	VRG	VRG_ROAD TOWN 2	T02	Road Town		16	16	16
23	G	VRG	VRG_ROAD TOWN 4	T02	Road Town		21	21	21
24	G	VRG	VRG_ROAD TOWN 1	T02	Road Town		25	25	25



# Analysis of the results: List of affected ATV assignments

File Edit View Preferences Help

Administration G

Administration Unique Identifier

**VRG\_ROAD TOWN 3**

Site/Allotment Name

Road Town

Show multi-channel reqs.

Details Colours Frequencies Symbols

Geographical area VRG

Notice Type T02

Not linked

Acceptable Channel/Frequency Block

14.51

Digital Interferers	Digital Affected	Analogue TV Interferers	<b>Analogue TV Affected</b>	No.	Adm	Geo Area	Adm Ref Id	BR Id	Site Name	Analog Ch.	Interf. Dig. Ch.	8BH (dBW)	8BV (dBW)	Distance (km)	NFS (dB(uV/m)	Margin (dB)	Relation
				1	USA	VIR		093002444	CHARLOTTE AMALIE	17	17	48.8	10.5	95	7.07		Interference
				2	USA	VIR		088002432	CHRISTIANSTED	23	23	39.4	19.1	85.8	20.44		Interference



# Analysis of the results: List of interfering ATV assignments

File Edit View Preferences Help

Administration G Administration Unique Identifier  
 VRG\_ROAD TOWN 3  
 Site/Allotment Name  
 Road Town  
 Show multi-channel reqs.

Details Colours Frequencies Symbols

Geographical area VRG  
 Notice Type T02  
 Not linked

Acceptable Channel/Frequency Block  
 14.51

Tx Rx

Digital Interferers Digital Affects **Analogue TV Interferers** Analogue TV Affected

No.	Adm	Geo Area	Adm Ref Id	BR Id	Site Name	Analog Ch.	Aff. Dig. Ch.	8BH (dBW)	8BV (dBW)	Distance (km)	CNFS (dB(uV/	Margin (dB)	Relation
1	USA	PTR		093002437	SAN JUAN	15	15	45.9	197.9	57.2	6.14	Interference	
2	USA	VIR		093002444	CHARLOTTE AMALIE	17	17	48.8	76.7	88.5	36.19	Interference	
3	USA	PTR		080617959	S JUAN	18	18	58.8	154.7	82.8	30.53	Interference	
4	USA	VIR		093002444	CHARLOTTE AMALIE	17	18	48.8	76.7	53.5	3.65	Interference	
5	USA	PTR		080617959	S JUAN	18	19	58.8	154.7	47.8	1.33	Interference	
6	USA	PTR		080618009	PONCE	20	20	50	263.3	49.1	1.71	Interference	
7	USA	VIR		088002431	CHRISTIANSTED	21	21	29.5	117.7	52.9	3.35	Interference	
8	USA	VIR		088002432	CHRISTIANSTED	23	23	39.4	120.2	63.9	11.94	Interference	
9	USA	PTR		088002408	S JUAN	24	24	57.3	167.6	74.9	22.67	Interference	
10	USA	PTR		088002409	PONCE	26	26	56.4	263.3	55.8	5.14	Interference	
11	USA	PTR		080618246	S JUAN	30	30	64.2	191.7	71.2	18.94	Interference	
12	USA	PTR		093002438	FAJARDO	34	34	47	160.3	66.7	14.62	Interference	
13	USA	PTR		088002413	FAJARDO	40	40	53.2	159.8	75	22.75	Interference	
14	USA	PTR		093002439	YAUCO	42	42	61.8	243.8	64.7	12.72	Interference	
15	USA	PTR		093002440	GUAYAMA	46	46	61.8	167.6	75.5	23.25	Interference	



# Analysis of the results: List of affected DTV assignments

File Edit View Preferences Help

Administration G Administration Unique Identifier VRG\_ROAD TOWN 3 Site/Allotment Name Road Town  Show multi-channel reqs.

Details Colours Frequencies Symbols

Geographical area VRG Notice Type T02 Not linked

Acceptable Channel/Frequency Block 14-51 Available Channel/Frequency Block 14-16,18-22,24-51

Digital Interferers **Digital Affected** Analogue TV Interferers Analogue TV Affected

No.	Adm	Geo	Not	Adm Ref Id	Site/Allot Name	Ch/block	Avail. Ch/block	Assigned Ch/bl	8BH (dBW)	8BV (dBW)	Wanted	Interf.	Distance (km)	CNFS (dB(uV)	Margin (dB)	Relation
1	G	VRG	T02	VRG_ROAD TO	Road Town	16	16		30		16	16				Tx inside
2	G	VRG	T02	VRG_ROAD TO	Road Town	21	21		30		21	21				Tx inside
3	USA	VIR	T02	USA_106021588	CHRISTIANSTED	23	23	23	47		23	23	12.1	75	20.97	Interference
4	G	VRG	T02	VRG_ROAD TO	Road Town	25	25		30		25	25				Tx inside
5	USA	VIR	T02	USA_106021593	CHARLOTTE AMALIE	43	43	43	47		43	43	11.1	77.8	24.46	Interference



# Analysis of the results: List of interfering DTV assignments

File Edit View Preferences Help

Administration G

[Administration Unique Identifier](#)

VRG\_ROAD TOWN 3

Site/Allotment Name  
Road Town

Show multi-channel reqs.

Details Colours Frequencies Symbols

Geographical area VRG

Notice Type T02

Not linked

Acceptable Channel/Frequency Block  
14-51

Available Channel/Frequency Block  
14-16,18-22,24-51

Tx Rx

**Digital Interferers** Digital Affected Analogue TV Interferers Analogue TV Affected

No.	Adm	Geo	Not	Adm Ref Id	Site/Allot Name	Ch/block	Avail. Ch/block	Assigned ch/bl	8BH (dBW)	8BV (dBW)	Wanted	Interf.	Distance (km)	CNFS (dB(uV)	Margin (dB)	Relation
1	G	VRG	T02	VRG_ROAD TO	Road Town	16	16		30		16	16				Tx inside
2	USA	VIR	T02	USA_106021587	CHRISTIANSTED	20	20	20	56.6		20	20	120.2	83.6	31.3	Interference
3	G	VRG	T02	VRG_ROAD TO	Road Town	21	21		30		21	21				Tx inside
4	USA	VIR	T02	USA_106021588	CHRISTIANSTED	23	23	23	47		23	23	118.6	70.3	18.13	Interference
5	G	VRG	T02	VRG_ROAD TO	Road Town	25	25		30		25	25				Tx inside
6	USA	VIR	T02	USA_106021593	CHARLOTTE AMALIE	43	43	43	47		43	43	76.6	70.7	18.44	Interference
7	USA	VIR	T02	USA_106021594	CHARLOTTE AMALIE	44	44	44	53		44	44	77.4	97.2	44.94	Interference
8	USA	VIR	T02	USA_106021596	CHARLOTTE AMALIE	48	48	48	53		48	48	77.4	97.1	44.79	Interference



# Summary of the compatibility analysis on a channel-by-channel basis in the UHF band (Tx inside, Overlaps or the highest calculated margins)

File Edit View Preferences Help

Administration G  
 Administration Unique Identifier  
 VRG\_ROAD TOWN 3  
 Site/Allotment Name  
 Road Town  
 Show multi-channel reqs.

Details Colours Frequencies Symbols  
 Geographical area VRG  
 Notice Type T02  
 Not linked

Acceptable Channel/Frequency Block  
 14-51  
 Available Channel/Frequency Block  
 14-16,18-22,24-51  
 Assigned Channel/Frequency Block

Coord Completed

Tx  
 Rx  
 xls

Digital Interferers Digital Affected Analogue TV Interferers Analogue TV Affected

No.	Adm	Geo Area	Not.Type	Adm Ref Id	Site Name	Channel	Avail. Ch	Assigned Ch	8BH (dBW)	8BV (dBW)	Wanted chann	Interf. channel	Distance (km)	CNFS (dB(uV)	Margin (dB)	Relation
1	G	VRG	T02	VRG_ROAD TO	Road Town	16	16		30	16	16					Tx inside
2	USA	VIR	T02	USA_106021587	CHRISTIANSTED	20	20	20	56.6	20	20	20	120.2	83.6	31.3	Interference
3	G	VRG	T02	VRG_ROAD TO	Road Town	21	21		30	21	21					Tx inside
4	USA	VIR	T02	USA_106021588	CHRISTIANSTED	23	23	23	47	23	23	23	118.6	70.3	18.13	Interference
5	G	VRG	T02	VRG_ROAD TO	Road Town	25	25		30	25	25					Tx inside
6	USA	VIR	T02	USA_106021593	CHARLOTTE AMALIE	43	43	43	47	43	43	43	76.6	70.7	18.44	Interference
7	USA	VIR	T02	USA_106021594	CHARLOTTE AMALIE	44	44	44	53	44	44	44	77.4	97.2	44.94	Interference
8	USA	VIR	T02	USA_106021596	CHARLOTTE AMALIE	48	48	48	53	48	48	48	77.4	97.1	44.79	Interference



## Summary of the compatibility analysis on a channel-by-channel basis in the UHF band (Tx inside, Overlaps or the highest calculated margins)

Channel No	Fr_assign (MHz)	DTV Interferer	DTV Affected	ATV Interferer	ATV affected	
14	473					
15	479			6.14		
16	485	Tx inside	Tx inside			
17	491			36.19	7.07	
18	497			30.53		
19	503			1.33		
20	509	31.3		1.71		
21	515	Tx inside	Tx inside	3.35		
22	521					
23	527	18.13	20.97	11.94	20.44	
24	533			22.67		
25	539	Tx inside	Tx inside			
26	545			5.14		
27	551					
28	557					
29	563					
30	569			18.94		
31	575					
32	581					
33	587					
34	593			14.62		
35	599					
36	605					
37	611	Not used				
38	617					
39	623					
40	629			22.75		
41	635					
42	641			12.72		
43	647	18.44	24.46			
44	653	44.94				
45	659					
46	665			23.25		
47	671					
48	677	44.79				
49	683					
50	689					
51	695					



# Outcome of the analysis of the compatibility results on ch 19 (503 MHz)

## Conclusions:

- 1) Calculated margins in both directions (for incoming and outgoing interference) do not exceed the established margin, therefore channel **19** (assigned frequency 503 MHz) can be assigned to this site.
- 2) To fix this, it is necessary to modify the initial notice containing flexible channel **83** (887 MHz) by assigning channel **19** (503 MHz).



# Overall results of the compatibility analysis

For this site, it can be noticed that channels:  
14, 16\*, 19, 21\*-22, 25\*, 27-29, 31-33, 35-39  
(except ch 37), 41, 45, 47, 49-51 can also be  
assigned.

\*Those channels are already assigned

Other channels for this site are considered as  
non-compatible.



***Thank you for your attention!***

***Questions?***

**[brbcd@itu.int](mailto:brbcd@itu.int)**