

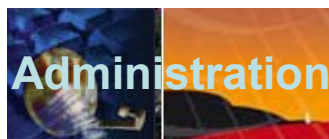


# Exercise on validation of a notice with a correction to common incorrectly submitted parameters in SpaceCap

Presented by: Álvaro de Vega  
(BR/SSD/SNP)



# Treatment of Article 4 Submissions



ITU-BR



Submission of validated Appendix 4 data  
(8 years before planned date of bringing into use)

Fail

Validation Check



OK

Acknowledgement by  
telefax



Publication of the submitted information as received  
(BR IFIC & SNL Part C <http://www.itu.int/ITU-R/go/space/snl/en/> )

# Outline

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## Observation on some submitted Appendix 4 data for Appendices 30/30A Article 4 Notices

### Exercise on Correction to AP30/30A Article 4 Notices

Exercise 1: Correction to a R1&3 BSS submission (Appendix 30)  
(file: **R13\_BSS.mdb**)

Exercise 2: Correction to a R1&3 BSS Feeder-link submission (Appendix 30A)  
(file: **R13\_BSS\_FL.mdb**)

Exercise 3: Correction to a Region 2 submission (Appendices 30 and 30A)  
(file: **R2.mdb**)

Annex1- Gains at two most Western and Eastern points visible from the GSO satellite

Annex 2 - SpaceVal

# Observation on some submitted Appendix 4 data for AP30/30A Article 4 Notices



## Forms of Notice PLAN - WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)

Notice

Beam

Attachments

Coordination

Notice Id: 199999999 Plan: WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30) Status: 01

Date of Receipt: DD.MM.YYYY Administration Serial Number

19.11.2010

A1f1. Notifying Administration

SUI

A1f3. Intergovernmental Satellite

### Notice Submitted under

- 4.1.12 Part B Submission
  - 4.1.23 List Suppression
  - 4.1.26 New Adm
  - 4.1.27 Replacement in Plan
  - 4.1.3
  - RS548 Resolution 548 (Part B)
- Part A submission  
 A13c  
 Part A suppression

✓ Shall be in conformity with the orbital position limitations of Annex 7 to Appendix 30.

✓ Part of Annex 7 compliance validated by SpaceVal.

4.1.3

A4a1. Nominal Orbital Longitude

9.00°

E

A1a. Identity of the Satellite Network

ITU\_SAT

A4a2. Longitudinal tolerance

b. West

0.1°

a. East

0.1°

List of Available Beams

Beam INT

A11. Regular Hours of Operation

a. start

0

b. end

24

# Observation on some submitted Appendix 4 data for AP30/30A Article 4 Notices(Continued)



Forms of Notice PLAN - WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)

Notice	Beam	Group	Attachments	Coordination
--------	------	-------	-------------	--------------

Notice Id: 199999999 Satellite Network: ITU\_SAT Nominal Orbital Longitude: 9 Administration: SUI

Characteristics of the Beam

B2.  Receiving Beam  Transmitting Beam

Shape of the Beam  
 Elliptical  Other Shape

B3d. Pointing Accuracy: 0.1 °

B3a1. Co-polar gain: 31.44 dB

B1a. Beam Designation: INT

B1b. Steerable/Reconfigurable Beam:

B3c. Radiation Pattern: R123FR ==> APSRR\_402V01

B3f2a. Rotation Accuracy (\*): 1 ° Beamlet: 0.6

B3f2b. Major Axis Orientation: 60 °

B3f2. Axis at half-power beamwidth  
c. Major: 5 ° d. Minor: 4 °

B3f1. Boresight  
Longitude: 13.75 ° E Latitude: 48.64 ° N

List of Available Groups  
Group 16983

spacecap  
Co-polar antenna gain not equal to  $10 \cdot \text{LOG}(27843 / (\text{minor axis} * \text{major axis})) = 31.44$   
OK

**A pattern is required. If it is a fast roll-off pattern, the beamlet shall be provided. Minimum beamlet for R1&3 is 0.6° and 0.8° for Region 2.**

**For an elliptical beam, Co-polar gain should be equal to the value suggested by SpaceCap (antenna efficiency of 55% is assumed).**

(\*): The letters “FR” at the end of the radiation antenna pattern indicates “Fast Roll-off”.

# Observation on some submitted Appendix 4 data for AP30/30A Article 4 Notices(Continued)



Forms of Notice PLAN - WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)

Notice	Beam	Group	Attachments	Coordination
--------	------	-------	-------------	--------------

Notice Id: 199999999 Satellite Network: ITU\_SAT Nominal Orbital Longitude: 9 Administration: SUI

Characteristics of the Beam

B2.  Receiving Beam  Transmitting Beam

Shape of the Beam:  Elliptical  Other Shape

B1a. Beam Designation: INT

B1b. Steerable/Reconfigurable Beam

B3a1. Co-polar gain: 31.44 dBi

B3a2. Cross-polar Gain: 5 dBi

B3b1. Co-polar antenna gain contours. See Attachment No.

B3b2. Cross-polar antenna gain contours. See Attachment No.

B3f1. Aim point: Longitude 13.75 ° E Latitude 48.64 ° N

List of Available Groups: Group 16983

For a steerable beam, the 0 dB relative gain isoline contour(s) shall also be submitted.

The derived minimum co-polar and cross-polar absolute antenna gain should not be normally less than -10 dBi. (\*)

-For a shaped beam, co-polar and cross-polar antenna gain contours shall be provided.  
-Mandatory gain contours are -2, -4, -6, -10 and -20 dB.  
-Related information in SPS and Attachment shall be consistent to avoid confusion.  
- Gain contours in GXT or GIMS shall be validated with the latest GIMS.

(\*): co-polar absolute antenna gain= co-polar maximum antenna gain + co-polar relative antenna gain (calculated with GIMS gain contours)

# Observation on some submitted Appendix 4 data for AP30/30A Article 4 Notices(Continued)



Forms of Notice PLAN - WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)

Notice

Beam

Group

Attachments

Coordination

Notice Id: 199999998 Satellite Network: ITU\_SAT Nominal Orbital Longitude: 9 Administration: SUI

Characteristics of the Beam

B2.

Receiving Beam  Transmitting Beam

Shape of the Beam

Elliptical  Other Shape

B3a1. Co-polar gain 31.44 dBi

B3a2. Cross-polar Gain 2 dBi

B1a. Beam Designation E001

Rename Beam

B1b. Steerable/ Reconfigurable Beam

B3b1. Co-polar antenna gain contours. See Attachment No.

B3b2. Cross-polar antenna gain contours. See Attachment No.

B3e. Antenna Gain toward GSO. See Attachment No.

B3f1. Aim point

Longitude 13.75 ° E Latitude 48.64 ° N

List of Available  
Group 1

- Required for feeder-link non-elliptical beams in 17 GHz and downlink non-elliptical beams in 12.5 -12.7 GHz.
- Not required for elliptical beams.
- Not required for feeder-link non-elliptical beams in 14 GHz.
- Related information in SPS and Attachment shall be consistent to avoid confusion.
- See [Annex 1](#) for the gains at two most Western and Eastern points visible from the GSO satellite.

# Observation on some submitted Appendix 4 data for AP30/30A Article 4 Notices(Continued)



Forms of Notice PLAN - WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)

Coordination

Beam Group Emissions/Frequencies Srv Area/Assoc Earth Stn

SAT Beam Id INT E Group Id: 16983 Split Grp Id:

to a Group of Frequencies General Characteristics

C3a. Assigned frequency bandwidth  
33000 (kHz)

C15a. MSPACE Group code 80 (\*)

C4a. Class of Station  
EB EV

C.6 Polarization  
a. Type CL Circular Left (Indirect)  
b. Electric Vector Angle

BR Data

Remarks

Shall be equal to the necessary bandwidth captured in the "Emissions/Frequencies" data entry form of the same "Group".

C3a. Assigned frequency bandwidth  
33000 (kHz)

C15a. MSPACE Group code 80 (\*)

C4a. Class of Station  
EB EV

C.6 Polarization  
a. Type CL Circular Left (Indirect)  
b. Electric Vector Angle

- Used to avoid a high level of mutual interference of the same network and/or with other Plan, List assignments of the same Administration.
- Multiple MSPACE grouping for a specific assignment is not possible.
- Grouping of networks separated by more than 0.4° is not allowed (See relevant ROP).

- Only EB and EV are valid for the downlink. However, EB should not stand alone as it is for sound broadcasting.

(\*): For more information about grouping in BSS and feeder-link, see Art 10 and 11 of AP30 and Art 9 and 9A of AP30A



# Observation on some submitted Appendix 4 data for AP30/30A Article 4 Notices(Continued)



Forms of Notice PLAN - WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)

Assoc Specific Earth Stn	Attachments	Coordination	Emissions/Frequencies	Srv A
Notice	Beam	Group		

Notice: 199999998 Satellite Network: ITU\_SAT Beam Id: E001 R Group Id: 17037

### Characteristics Common to a Group of Frequencies

C3a. Assigned frequency bandwidth: 33000 (kHz)

C4a. Class of Station: EC

C5a. Receiving System Noise Temperature: 600 Kelvins (\*)

C6 Polarization: a. Type: L Linear Polarization b. Electric Vector Angle: 90 °

Indicates whether the group can contain 14GHZ or 17GHz frequencies.  
 WRC-00 14 GHz  WRC-00 17 GHz

BR Data

If linear polarization, the polarization angle shall be provided.

Only EC is valid for the feeder-link.

- For R1&3:  
• For 17 GHz, a value of 600K or better should be provided.  
• For 14 GHz, a value of 750K or better should be provided.  
- For Region 2: a value of 600K or better should be provided.

(\*): See §3.8 of Annex 3 of AP30A

# Observation on some submitted Appendix 4 data for AP30/30A Article 4 Notices(Continued)



Forms of Notice PLAN - WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)

Attachments	Coordination	Group	Emissions/Frequencies	Srv Area/Assoc Earth Stn
Notice	Beam	Group	Emissions/Frequencies	Srv Area/Assoc Earth Stn

Notice: 1999999999 Satellite Network: ITU\_SAT Beam Id: INT E Group Id: 16983 Split Grp Id:

**Characteristics Common to a Group of Frequencies** | **General Characteristics**

A3a. Operating Administration or Agency  
9999 ... Other

A3b. Responsible Administration  
XX ... Other

To apply information to other groups in the beam or to other beams in this notice

Apply to current group only     Apply to all groups in this beam     Apply to all groups in this notice

**In the case of submission of a new entry (9999), the name, telefax number and the address of the operating administration or agency shall be submitted in the fax or email corresponding to the submission.**

**In the case of a submission for a new entry (XX), the name, telefax number and the address of the responsible administration shall be submitted in the fax or e-mail corresponding to the submission.**

# Observation on some submitted Appendix 4 data for AP30/30A Article 4 Notices(Continued)



Forms of Notice PLAN - WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)

Attachments | Coordination | Notice | Beam | Group | Emissions/Frequencies | Srv Area/Assoc Earth Stn

Notice Id: 1999999999 | Satellite Network: ITU\_SAT | Beam Id: INT E | Group Id: 16983 | Mspace Grp Code: AA

C8 Power Characteristics of the transmission					
C7a. Designation of Emission	C9. Modulation Char	b1. Total Power (dBW)	b2. Maximum Power Density	h. Maximum Power Density over Bandwidth	
33M0G7W--	mpdchar	15.7	-59.5	-59.5	
27M0G7W--	mpdchar	15.7	-58.6	-58.6	

• For digital emissions, the maximum power density default value (assuming uniform distribution of the power over the necessary bandwidth) is calculated once the total power is entered using the following formula:

$$pwr-10*\log(B).$$

• Default values should be used in submissions for digital emissions.

• As defined in Appendix 1.  
 • Only digital modulation may be submitted under Article 4 in Regions 1 and 3.

Shall be captured for each emission. (next slide)

• For Regions 1 and 3 downlink:  
 - `total_pow+co_pol_ant_gain` shall be in conformity with e.i.r.p. limitations of Annex 7 to Appendix 30, and;  
 - the PFD level produced by the total e.i.r.p./ 27MHz shall not exceed the limit of -103.6 dB(W/m<sup>2</sup>. 27 MHz)) of § 1 of Annex 1 to Appendix 30.  
 • For Regions 1 and 3 feeder-link: the PFD level produced by the total e.i.r.p. of `pow_dens_27MHz+ co_pol_ant_gain` shall not exceed the limit of -76 dB(W/m<sup>2</sup>. 27 MHz)) of § 4 of Annex 1 to Appendix 30A.  
 • See also relevant Rules of Procedure.



# Observation on some submitted Appendix 4 data for AP30/30A Article 4 Notices(Continued)



Modulation Characteristics

Current Designation of Emission 33M0G7W--

C9a. Modulation Characteristics

1) Type of modulation QPSK

3c) Multiplexing type TDM

7) Energy dispersal type Carrier always spread by digital stream

9) TV standard DVB-S

Apply these characteristics to all emissions in this notice with the same designation of emission

Apply these characteristics to the current emission

OK CANCEL

A12. Range of automatic gain control 15 dB (\*)

List of proposed values

- Required only for the feeder-link.
- The value must be in the range 0 to 15 dB.

A12. Range of automatic gain control 15 dB (\*)

(\*): Range of automatic gain control is used at the satellite to increase the gain of the receiver when some additional attenuation is introduced

# Observation on some submitted Appendix 4 data for AP30/30A Article 4 Notices(Continued)



Forms of Notice PLAN - WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)

Assoc Specific Earth Stn      Attachments      Coordination  
Notice      Beam      Group      Emissions/Frequencies      Srv Area/Assoc Earth Stn

Notice Id: 199999998    Satellite Network: ITU\_SAT    Beam Id: E001 R    Group Id: 17037    Mspace Grp Code: AA



C8 Power Characteristics of the transmission

C7a. Designation of Emission	C9. Modulation Char	b1. Total Power (dBW)	b2. Maximum Power Density	h. Maximum Power Density over Bandwidth	i. Power Control (dB) (*)
33M0G7W--	modchar	28.0	-47.2	-47.2	5.0
27M0G7W--	modchar	27.0	-47.3	-47.3	5.0

C2a. Assigned Frequencies

Channel	Frequency in MHz
1	17327.48000
3	17365.84000
5	17404.20000
7	17442.56000
9	17480.92000
11	17519.28000
13	17557.64000
15	17596.00000
17	17634.36000
19	17672.72000
21	17711.08000
23	17749.44000

- Required for feeder-link only.
- For Regions 1 and 3 power control value shall be in the range 0 to 10 dB.
- For Region 2, see §4.5 and § 4.10 of Annex 3 to AP30A for power limits.

(\*): Power control is commonly used in the ground antenna to increase the EIRP transmitted in case of rain attenuation

# Observation on some submitted Appendix 4 data for AP30/30A Article 4 Notices(Continued)



Forms of Notice PLAN - WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)

Assoc Specific Earth Stn | Attachments | Coordination | Emissions/Frequencies | Srv Area/Assoc Earth Stn

Notice | Beam | Group

Notice Id: 199999998 | Satellite Network: ITU\_SAT | Beam Id: E001 R | Group Id: 17037 | Mspace Grp Code: AA

C8 Power Characteristics of the transmission

C7a. Designation of Emission	C9. Modulation Char	b1. Total Power (dBW)	b2. Maximum Power Density	h. Maximum Power Density over Bandwidth	i. Power Control (dB)
33M0G7W--	modchar	28.0	-47.2	-47.2	5.0
27M0G7W--	modchar	27.0	-47.3	-47.3	5.0

C2a. Assigned Frequencies

Channel	Frequency in MHz
1	17327.48000
3	17365.84000
5	17404.20000
7	17442.56000
9	17480.92000
11	17519.28000
13	17557.64000
15	17596.00000
17	17634.36000
19	17672.72000
21	17711.08000
23	17749.44000

- Assigned Frequencies together with corresponding assigned frequency bandwidths shall be in conformity with Article 2 and/or Annex 7 of Appendix 30.
- Automatic calculation of channel number from frequency or frequency from channel number.

# Observation on some submitted Appendix 4 data for AP30/30A Article 4 Notices(Continued)



Forms of No... Appendix 30)

Emissions/Frequencies Srv Area/Assoc Earth Stn

Group Id: 16983 Mspace Grp Code: 80

Contour

C11a1. Service Area No. 1 C11a3. Service Area Diagram. See Attachment No.

C11a4. Service Area Name INT\_SA\_D C11a5e. Minimal Elevation Angle

Associated Typical Earth Station Antenna Characteristics

C10d3. Maximum Isotropic Gain in dBi	C10d4. Half-power beamwidth in degrees	C10d5a. Radiation pattern	C10d8. Equivalent Diameter in meters
35.50	2.86	FERR_007V01	0.60

Apply these to all groups  
 Apply these to the Current  
 Overwrite Clin

Bands 12.2 - 12.5 GHz and 14.5 -14.8 GHz:  
 ✓ Test points and service area corresponding to the band 12.2-12.5 GHz shall not be inside Region 3.  
 ✓ In the case of 14.5-14.8 GHz band, test points and service area shall not include the territories of European countries. (\*)

Longitude degrees E	Latitude degrees N	Antenna Altitude (m)	Climatic Zone	C. Zone in db
-8.59	57.81	0	F	F
-8.47	51.90	0	F	F
-8.40	43.37	0	H	H
-4.50	48.38	0	F	F
-3.00	35.17	0	K	K

• **Test points:**  
 ✓ should not be located at sea;  
 ✓ location shall be visible from the satellite;  
 ✓ should be located within its service area.

• **Up to 20 test points within a service area.**

**Service area:**  
 ✓ The service area of a Region 2 Article 4 network shall not overlap with the Regions 1 or 3 and vice versa;  
 ✓ The service area “Number” and “Name” shall be identical to the data submitted in the corresponding GXT file. If only one service area is submitted for a specific beam, the number 1 should be assigned to it;

(\*): See Footnote 2 of AP30A

# Observation on some submitted Appendix 4 data for AP30/30A Article 4 Notices(Continued)



Forms of Notice PLAN - WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)

- ✓ Maximum Gain and 3dB beamwidth should be consistent with submitted antenna diameters.
- ✓ The minimum feeder-link antenna diameter for the Region 2 is 2.5 m.
- ✓ Radiation pattern shall contain both co-polar and cross-polar patterns.
- ✓ Gain and 3dB beamwidth are stored with 2 digits after decimal.

Attachments Coordination

Group Emissions/Frequencies Srv Area/Assoc Earth Stn

Beam Id: INT E Group Id: 16983 Mspace Grp Code: 80

Service area contour

C11a1. Service Area No. 1 C11a3. Service Area Diagram. See Attachment No.

C11a4. Service Area Name INT\_SA\_D C11a5e. Minimal Elevation Angle

Associated Typical Earth Station Antenna Characteristics

C10d3. Maximum Isotropic Gain in dBi	C10d4. Half-power beamwidth in degrees	C10d5a. Radiation pattern	C10d8. Equivalent Diameter in meters
35.50	2.86	MODRES ==> APERR_007V01	0.60

C.10.d.5 reference pattern	maximum gain Default Value
DBLTVROI0001	$\leq 42.228 + 25 * \log(D)$
DBLTVROC0001	47
MODRES	$35.5 + 20 * \log(D/0.6)$
R13RES	$38.43 + 20 * \log(D/0.9)$
R2RES	$40.24 + 20 * \log(D)$
R13TES MODTES	14GHz: $57 + 20 * \log(D/6)$ 17GHz: $57 + 20 * \log(D/5)$
R2TES	$57.4 + 20 * \log(D/5)$

C.10.d.5 reference pattern	3dB beamwidth Default Value
DBLTVROI0001	1.58/D
DBLTVROC0001	0.66
MODRES	$2.86 * 0.6 / D$
R13RES	$2.0 * 0.9 / D$
R2RES	$1.7 * 1 / D$
R13TES MODTES	14GHz feeder-link: $\leq 0.25$ 17GHz feeder-link: $\leq 0.25$
R2TES	if $G_{max} > 59$ dBi: $\leq 0.2$ if $G_{max} \leq 59$ dBi: $2 * 10^{((39 - G_{max})/20)}$



# Observation on some submitted Appendix 4 data for AP30/30A Article 4 Notices(Continued)



Forms of Notice PLAN - RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)

Notice Beam **Strapping** Attachments Coordination

Required for Region 2 only

Notice Id.: 199999999 Satellite: ITU\_SAT Nominal Orbital Longitude: 47.5 Administration: SUI

Network:

Group Combination		Frequency Combination		Channel Combination	
Uplink Group	Downlink Group	Uplink Frequency (MHz)	Downlink Frequency (MHz)	Uplink Channel	Downlink Channel
14269	14271	17338.58000	12238.58000	2	2
14269	14271	17367.74000	12267.74000	4	4
14269	14271	17396.90000	12296.90000	6	6
14269	14271	17426.06000	12326.06000	8	8
14269	14271	17455.22000	12355.22000	10	10
14269	14271	17484.38000	12384.38000	12	12
14269	14271	17513.54000	12413.54000	14	14
14269	14271	17542.70000	12442.70000	16	16
14269	14271	17571.86000	12471.86000	18	18
14270	14268	17324.00000	12224.00000		1
14270	14268	17353.16000	12253.16000	3	3
14270	14268	17382.32000	12282.32000	5	5
14270	14268	17411.48000	12311.48000	7	7
14270	14268	17440.64000	12340.64000	9	9
14270	14268	17469.80000	12369.80000	11	11
14270	14268	17498.96000	12398.96000	13	13

Strap Wizard

Validate

Use Strap Wizard to connect downlink and feeder-link assignments.

After finishing, the "Validation" button should be pressed to verify that all assignments have been strapped.

# Most common errors in AP30/30A Article 4 Notices



Issue	Regions	Link	Layer	Value
Orbital position	1, 2, 3	UL & DL	Notice	Annex 7 of Appendix 30
Co-polar gain	1, 2, 3	UL & DL	Beam	Suggested value SpaceCap (Eff=55%)
Beamlet (fast roll-off)	1, 3	UL & DL	Beam (elliptical)	≥0.6
	2			≥0.8
Co-polar & cross-polar antenna gain contours	1, 2, 3	UL & DL	Beam (non-elliptical)	Required
Antenna Gain toward GSO	1, 2, 3	UL (17 GHz) DL (12.5-12.7 GHz)	Beam (non-elliptical)	Required
Assigned frequency bandwidth	1, 2, 3	UL & DL	Group	Necessary BW in "Emissions/Frequencies"
Class of Station	1, 2, 3	DL	Group	EB and EV valid. EB should not stand alone
MSPACE Group code	1, 2, 3	UL & DL	Group	Optional
Class of Station	1, 2, 3	UL	Group	Only EC is valid
Electric Vector Angle	1, 2, 3	UL & DL	Group	Is required if linear polarization
Noise temperature	1, 3	UL (17 GHz)	Group	≤600K
		UL (14 GHz)		≤750K
	2	UL		≤600K
New ADM, Op.ADM or Agency	1, 2, 3	UL & DL	Group	Telefax number and address included in the submission
Designation of Emission	1, 3	UL & DL	Emissions/Frequencies	Only digital modulation
	2			Analog & digital modulation (digital modulation recommended)

# Most common errors on AP30/30A Article 4 Notices (Cont.)



Issue	Regions	Link	Layer	Value
Modulation Char	1, 2, 3	UL & DL	Emissions/Frequencies	Required
Total Power	1, 2, 3	DL	Emissions/Frequencies	- Annex 7 of Appendix 30 - § 1 of Annex 1 to Appendix 30 - § 4 of Annex 1 to Appendix 30A - Rules of Procedure
Maximum Power Density	1, 2, 3	UL & DL	Emissions/Frequencies	$pwr-10*\log(BW)$
Range or automatic gain control	1, 2, 3	UL	Modulation Characteristics (Emissions/Frequencies)	Between 0 to 15 dB
Power Control	1, 3	UL	Emissions/Frequencies	Optional (less than or equal to 10 dB)
	2			§4.5 and § 4.10 of Annex 3 to AP30A
Assigned frequencies	1, 2, 3	UL & DL	Emissions/Frequencies	- Article 2 of Appendices 30 & 30A - Annex 7 of Appendix 30
Test points	1, 2, 3	UL & DL	Srv Area/Assoc Eathr Stn	- Up to 20 test points - Not located at sea - Visible from satellite - Located within its service area
Service area	1, 2, 3	UL & DL	Srv Area/Assoc Eathr Stn	- R2 Srv Area not overlapping with R1&3 and vice versa - Srv Area "Number" and "Name" identical to GXT file
Maximum Gain / Half-power beamwidth	1, 2, 3	UL & DL	Srv Area/Assoc Eathr Stn	Consistent with submitted antenna diameters
Strapping	2	UL & DL	Strapping	Required for R2 only

## You are now requested to do the following exercises:

Exercise 1: Correction to a R1&3 BSS submission  
(file: **R13\_BSS.mdb**)

Exercise 2: Correction to a R1&3 BSS Feeder-link submission  
(file: **R13\_BSS\_FL.mdb**)

Exercise 3: Correction to a Region 2 submission  
(file: **R2.mdb**)

Annex 1: Gains at two most Western and Eastern points visible from the GSO satellite

Annex 2: SpaceVal

# Step by step to do exercise



## 1. Find submissions with error under:

Name	Size	Type
Solution		File Folder
R2.mdb	2,176 KB	Microsoft Office Access Database
R13_B55.mdb	2,132 KB	Microsoft Office Access Database
R13_B55_FL.mdb	2,180 KB	Microsoft Office Access Database

USB-KEY : “\\BR\_SEMINAR\WRS-14\Space Workshop\SpacePlans\1\_A30\_30A submission exercise\Exercise”

## 2. Run SpaceVal on selected submission to identify problems (see [Annex 2](#))

## 3. Open SpaceCap Software with the selected submission to correct the problems ( see slides [25-35](#) for Exercise 1, [36-45](#) for Exercise 2 and [46-61](#) for Exercise 3 for step by step correction)

## 4. Items to be corrected:

- *Orbital position to comply with Annex 7*
- *Co-polar gain for an elliptical beam*
- *Assigned frequency bandwidth; Class of station; Linear polarization Angle*
- *Emission and associated power densities; power control for Feeder-link*
- *Modulation characteristics; automatic gain control for Feeder-link*
- *Earth station antenna gain and beamwidth*
- *Strapping for Region 2.*

## 5. Run SpaceVal again to see if there are any remaining problems.

# Example of a SpaceVal report before correction



(Notice is NOT ready to be submitted to the Bureau)

**SNS Validation Errors**

Rule
 Report
 First
 Prev
 Next
 Last
 Space Rules
 Earth Rules
 Plan Rules
 Items
 Summary
 Fatal
 Export

Validation Report for 199999999 User DEVEGA created on 21.11.14 15:07:39 with SpaceVal 7.1.5  
 C:\DATA\Seminar\WRS-14\Exercise on submission AP30\_30A\Exercise\test\R13\_BSS.mdb  
 Ntc ID: 199999999 Adm: SUI Sat Name: ITU\_SAT Orb Pos: 10 Action:A Status:01 D\_RCV: 19.11.10  
 Fatal Errors: **5** Warnings: **66**

Beam	E/R	Grp id	Table	Field	Value	Row no	Val er	Rule	Severit	Ap4_Ref	Text
			geo	sat_name	ITU_S AT		100	2	W	A1a	sat_name not found in ref table
				long_nom	10		101	3	W	A4a1	sat_name not found in ref table
				long_nom	10		101	4.2	F	A4a1	Orbital position not in accordance with Annex 7 of Appendix 30
INT	E	16983	s_beam	gain	35		504	3	W	B3a1	difference between co-polar and default value > 0.1 dB
				e_as_stn	gain	36.5	1	694	4	W	C10d3
			e_as_stn	bmwidth	2.96	1	695	3	W	C10d4	Value should be equal to the calculated value (1.91)
				ant_diam	0.9	1	710	3	W	C10d7/d8	The default reference antenna diameter is 0.6 metres
			e_as_stn	gain	36.5	2	694	4	W	C10d3	Value should be equal to the calculated value (39.02)
				bmwidth	2.96	2	695	3	W	C10d4	Value should be equal to the calculated value (1.91)
			e_as_stn	ant_diam	0.9	2	710	3	W	C10d7/d8	The default reference antenna diameter is 0.6 metres
				gain	36.5	3	694	4	W	C10d3	Value should be equal to the calculated value (39.02)

# SpaceVal report after correction

*Notice is now ready to be submitted to the Bureau)*

**SNS Validation Errors**

Rule
Report
First
Prev
Next
Last

Space Rules
Earth Rules
Plan Rules
Items
Summary
Fatal
Export

Validation Report for 199999999 User DEVEGA created on 21.11.14 15:08:59 with SpaceVal 7.1.5  
 C:\DATA\Seminar\WRS-14\Exercise on submission AP30\_30A\Exercise\test\Solution\R13\_BSS\_OK.mdb

**Ntc ID: 199999999 Adm: SUI Sat Name: ITU\_SAT Orb Pos: 9 Action:A Status:01 D\_RCV: 19.11.10**  
 Fatal Errors: **0** Warnings: **25**

Beam	E/R	Grp id	Table	Field	Value	Row no	Val err	Rule	Severit	Ap4_Ref	Text
			geo	sat_name	ITU_SAT		100	2	W	A1a	sat_name not found in ref table
				long_nom	9		101	3	W	A4a1	sat_name not found in ref table
				long_nom	9		101	4.2	W	A4a1	PFD hard limit of -138dB(W/(m2 . 27 MHz)) of note 1 to Tb. 1 and 2 of Annex
INT	E	16983	e_as_stn	ant_diam	0.9	1	710	3	W	C10d7/d8	The default reference antenna diameter is 0.6 metres
				ant_diam	0.9	2	710	3	W	C10d7/d8	The default reference antenna diameter is 0.6 metres
				ant_diam	0.9	3	710	3	W	C10d7/d8	The default reference antenna diameter is 0.6 metres
				ant_diam	0.9	4	710	3	W	C10d7/d8	The default reference antenna diameter is 0.6 metres
				ant_diam	0.9	5	710	3	W	C10d7/d8	The default reference antenna diameter is 0.6 metres
				ant_diam	0.9	6	710	3	W	C10d7/d8	The default reference antenna diameter is 0.6 metres
				ant_diam	0.9	7	710	3	W	C10d7/d8	The default reference antenna diameter is 0.6 metres
				ant_diam	0.9	8	710	3	W	C10d7/d8	The default reference antenna diameter is 0.6 metres
				ant_diam	0.9	9	710	3	W	C10d7/d8	The default reference antenna diameter is 0.6 metres



Any question?

E-mail: [alvaro.devega@itu.int](mailto:alvaro.devega@itu.int)

International Telecommunication Union

WORLD  
RADIOCOMMUNICATION  
SEMINAR 2014

GENEVA, 8-12 DECEMBER 2014

[www.itu.int/go/ITU-R/WRS-14](http://www.itu.int/go/ITU-R/WRS-14)

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The poster features a photograph of a fountain in Geneva, Switzerland, with the city and mountains in the background. The ITU logo is prominently displayed in the center, overlaid on a red background. The text provides details about the seminar, including the location, dates, and website. Logos for the 150th anniversary of the ITU and the ITU World Radiocommunication Seminar are also present.





# Exercise 1: Correction to a R1&3 BSS submission (Cont.)



SpaceCapture V7 - [Set Notice Template]

File Edit Tools Template Window Help

CR/NOTIF API RAST PLAN R549/552

SpaceCap Start Page - Please select the type of plan from the list

**Database to open**

Look in: Exercise

- Solution
- R2.mdb
- R13\_BSS.mdb
- R13\_BSS\_FL.mdb

File name:

Files of type: Access mdb

Open as read-only

Open Cancel

Select file R13\_BSS.mdb and click Open

Functions	Notice Count
	1
pendix 30A)	0
	0
	0

# Exercise 1: Correction to a R1&3 BSS submission (Cont.)



SpaceCapture V7 - [Set Notice Template]

File Edit Tools Template Window Help

CR/NOTIF API RAST PLAN RS49/552

Start Page - PLAN - WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)

Transaction Id:

Transaction ID input field

Double click on "00DN"

Plan / List / Pending Plan / List / Notification Space Operation Functions

PLAN ID	Description	Notice Count
00DN	WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)	1
00UP	WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)	0
30_2	RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)	0
A30B	WRC07 FSS Plan 6/4 AND 13/10-11 GHz Band (Appendix 30B)	0

Select a Plan

Plan/List/Pending notices (Status above 01) read-only mode

# Exercise 1: Correction to a R1&3 BSS submission (Cont.)



SpaceCapture V7 - [Set Notice Template]

File Edit Tools Template Window Help

CR/NOTIF API RAST PLAN RS49/552

SpaceCap

Start Page

Notice Explorer

Open Notice

New Notice

Search

Notice Explorer PLAN - WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)

Notice id.	Type	Adm./Org.	Orb. Pos.	Station name	Date rcv.	Status
List of notices <span>Count=1</span>						
199999999[A]	G	SUI/	10E	ITU_SAT	19.11.2010	01

Control Box

- Show
- Clone
- Export
- Delete
- To SNS
- SpaceVal
- Esub

Select the notice and click Show

# Exercise 1: Correction to a R1&3 BSS submission (Cont.)



Forms of Notice PLAN - WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)

Notice	Beam	Attachments	Coordination
--------	------	-------------	--------------

Notice Id: 199999999 Plan: WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30) Status: 01

Date of Receipt: DD.MM.YYYY: 19.11.2010 Administration Serial Number: [ ]

A1f1. Notifying Administration: SUI A1f2. Notice submitted on behalf of these administrations: [ ] + x

A1f3. Intergovernmental Satellite: [ ]

Notice intended for:

- 4.1.3
  - Part A submission
    - A13c
  - Part A suppression
  - 4.1.26 (new ADM)
  - 4.1.27 Replacement in Plan
- 4.1.12 (Part B submission)
- Resolution 548 (Part B)
- 4.1.23 (List Suppression)

A4a1. Nominal Orbital Longitude: 10.00° E

A1a. Identity of the Satellite Network: ITU\_SAT

A4a2. Longitudinal tolerance:  
b. West: 0.1°  
a. East: 0.1°

List of Available Beams:  
Beam INT

A11. Regular Hours of Operation:  
a. start: 0 b. end: 24

**Find another position as 10°E is violating Annex 7. (e.g 9°E)**

# Exercise 1: Correction to a R1&3 BSS submission (Cont.)



Forms of Notice PLAN - WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)

Notice      Beam      Group      Attachments      Coordination

Notice Id: 199999999    Satellite Network: ITU\_SAT    Nominal Orbital Longitude: 10.00    Administration: SUI

Characteristics of the Beam

B2.  Receiving Beam     Transmitting Beam

Shape of the Beam  
 Elliptical     Other Shape

B3d. Pointing Accuracy: 0.1 °

B3a1. Co-polar gain: 35 dBi

B1a. Beam Designation: INT    Rename Beam    B1b. Steerable/Reconfigurable Beam:

Space Station Antenna  
B3c. Radiation Pattern: R123FR ==> APSRR\_402V01

B3f2a. Rotation Accuracy: 1 °    Beamlet: 0.6

B3f2b. Major Axis Orientation: 60 °

B3f2. Axis at half-power beamwidth  
c. Major: 5 °    d. Minor: 4 °

B3f1. Boresight  
Longitude: 13.75 ° E    Latitude: 48.64 ° N

List of Available Groups  
Group 16983  
Group 16984

**spacecap**  
Co-polar antenna gain not equal to  $10 \cdot \text{LOG}(27843 / (\text{minor axis} * \text{major axis})) = 31.44$   
OK

**Enter a value of 31.44 instead of 35**

# Exercise 1: Correction to a R1&3 BSS submission (Cont.)



Forms of Notice PLAN - WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)

Group | Emissions/Frequencies | Srv Area/Assoc Earth Str

Beam Id: INT E | Group Id: 16983 | Split Grp Id:

Characteristics Common to a Group of Frequencies | General Characteristics

C3a. Assigned frequency bandwidth: 27000 (kHz)

C15a. MSPACE Group code:

C4a. Class of Station: EB

C.6 Polarization: a. Type: L Linear Polarization; b. Electric Vector Angle:

BR Data

Remarks:

**Enter 33000 instead of 27000 as highest necessary bandwidth for this group is 33000 kHz.**

**Capture a code if required.**

**Capture also EV code as EB is for sound broadcasting.**

**Capture polarization angle for Linear polarization. (e.g 90 degrees)**

# Exercise 1: Correction to a R1&3 BSS submission (Cont.)



Forms of Notice PLAN - WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)

Attachments	Coordination			
Notice	Beam	Group	Emissions/Frequencies	Srv Area/Assoc Earth Stn

Notice: 1999999999 Satellite Network: ITU\_SAT Beam Id: INT E Group Id: 16983 Split Grp Id:

Characteristics Common to a Group of Frequencies | General Characteristics

A2a. Date of bringing into use  
01.09.2015

A3a. Operating Administration or Agency  
9999 ... Other

A3b. Responsible Administration  
XX ... Other

To apply this information to other groups, select the beam of interest.

Apply to current group only  Apply to all groups in this beam  Apply to all groups in this notice

Please remember to attach to the submission, the name, telefax number and the address of operating administration or agency and the responsible administration.



# Exercise 1: Correction to a R1&3 BSS submission (Cont.)



Forms of Notice PLAN - WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)

Attachments Coordination  
Notice Beam Group Emissions/Frequencies Srv Area/Assoc Earth Strn

Notice Id: 199999999 Satellite Network: ITU\_SAT Beam Id: INT E Group Id: 16983 Mspace Grp Code:

C7a. Designation of Emission		C9. Modulation Char	C8 Power Characteristics of the transmission		
			b1. Total Power (dBW)	b2. Maximum Power Density	h. Maximum Power Density over Bandwidth
33M0F7W--		modchar	15.7	-58.6	-58.6
23M0G7W--		modchar	15.7	-58.6	-58.6

C2a. Assigned Frequencies	
Channel	Frequency in MHz
1	11727.48000
3	11765.84000
5	11804.20000
7	11842.56000
9	11880.92000
11	11919.28000
13	11957.64000
15	11996.00000
17	12034.36000
19	12072.72000
21	12111.08000
23	12149.44000

Use 33M0G7W- instead of 33M0F7W for digital modulation for R1&3 submissions.

Use default value of -59.5 instead of -58.6.

Capture modulation for every emission.



# Exercise 1: Correction to a R1&3 BSS submission (Cont.)



Forms of Notice PLAN - WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)

Attachments Coordination

Notice Beam Group Emissions/Frequencies Srv Area/Assoc Earth Stn

Notice Id: 199999999 Satellite Network: ITU\_SAT Beam Id: INT E Group Id: 16983 Mspace Grp Code:

C11a. Test Points (maximum 20)

Longitude degrees E	Latitude degrees N	Antenna Altitude (m)	Climatic Zone	C. Zone in db
-8.59	57.81	0 F	F	F
-8.47	51.90	0 F	F	F
-8.40	43.37	0 H	H	H
10.22	36.85	0 K	K	K
11.33	44.50	0 K	K	K
11.58	48.13	0 H	H	H
12.40	55.70	0 E	E	E
14.24	40.83	0 K	K	K
14.50	35.90	0 K	K	K
15.23	44.12	0 K	K	K
15.30	47.60	0 K	K	K
18.25	49.83	0 H	H	H
19.82	41.33	0 K	K	K
25.90	45.40	0 K	K	K
29.35	37.20	0 K	K	K

Service area contour

C11a1. Service Area No. 1 C11a3. Service Area Diagram. See Attachment No.

C11a4. Service Area Name INT\_SA\_D C11a5e. Minimal Elevation Angle

Associated Typical Earth Station Antenna Characteristics

C10d5a. Radiation Pattern MODRES ==> APERR\_007V01

C10d3. Maximum Isotropic Gain in dBi 36.5 (\*)

C10d4. Half-power beamwidth in degrees 2.96

C10d8. Equivalent Diameter in meters 0.9

Note: These associated typical earth station antenna characteristics are valid for each test point.

Apply these characteristics to all groups in this beam Apply these characteristics to the Current Characteristics to

Overwrite Climatic Zones in db with ID'WM Climatic Zones Clone Test Points

For MODRES with 0.9 meters, use a value of 39.02 instead of 36.50 for maximum antenna gain.

For MODRES with 0.9 meters, use a value of 1.91 instead of 2.96 for 3dB beamwidth.

(\*): For MODRES:

- $G_{max} = 35.5 + 20 \cdot \log(D/0.6)$
- $3dB \text{ Beamwidth} = 2.86 \cdot 0.6/D$

# Exercise 2: Correction to a R1&3 BSS Feeder-link submission



SpaceCapture V7 - [Set Notice Template]

File Edit Tools Template Window Help

CR/NOTIF API RAST PLAN R549/552

Start Page - Please select the type of plan from the list

Transaction Id:

1. Set Template to PLAN

2. Set Notice type

3. Uncheck read-only mode

4. Open Database

Plan / List / Pending    Plan / List Notification    Space Operation Functions

PLAN ID	Description	Notice Count
00DN	WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)	1
00UP	WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)	0
30_2	RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)	0
A30B	WRC07 FSS Plan 6/4 AND 13/10-11 GHz Band (Appendix 30B)	0

Plan/List/Pending notices (Status above 01) read-only mode

# Exercise 2: Correction to a R1&3 BSS Feeder-link submission (Cont.)



SpaceCapture V7 - [Set Notice Template]

File Edit Tools Template Window Help

CR/NOTIF API RAST PLAN R549/552

SpaceCap Start Page - Please select the type of plan from the list

### Database to open

Look in: Exercise

- Solution
- R2.mdb
- R13\_BSS.mdb
- R13\_BSS\_FL.mdb

File name:

Files of type: Access mdb

Open as read-only

Open Cancel

Select file R13\_BSS\_FL.mdb and click Open

on Functions	Notice Count
	1
pendix 30A)	0
	0
	0

# Exercise 2: Correction to a R1&3 BSS Feeder-link submission (Cont.)



SpaceCapture V7 - [Set Notice Template]

File Edit Tools Template Window Help

CR/NOTIF API RAST PLAN RS49/552

Start Page - PLAN - WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)

Transaction Id:

SpaceCap

- Start Page
- Notice Explorer
- Open Notice
- New Notice
- Select a Plan
- Search

Plan / List / Pending    Plan / List Notification    Space Operation Function

PLAN ID	Description	Notice Count
00DN	WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)	1
00UP	WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)	0
30_2	RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)	0
A30B	WRC07 FSS Plan 6/4 AND 13/10-11 GHz Band (Appendix 30B)	0

Plan/List/Pending notices (Status above 01) read-only mode

Double click on "00UP"

# Exercise 2: Correction to a R1&3 BSS Feeder-link submission (Cont.)



SpaceCapture V7 - [Set Notice Template]

File Edit Tools Template Window Help

CR/NOTIF API RAST PLAN RS49/552

SpaceCap

Start Page

Notice Explorer

Open Notice

New Notice

Search

Notice Explorer PLAN - WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)

Notice id.	Type	Adm./Org.	Orb. Pos.	Station name	Date rcv.	Status
List of notices <span>Count=1</span>						
199999998[A]	G	SUI/	9E	ITU_SAT	19.11.2010	01

Control Box

- Show
- Clone
- Export
- Delete
- To SMS
- SpaceVal
- Esub

Select the notice and click Show

# Exercise 2: Correction to a R1&3 BSS Feeder-link submission (Cont.)



Forms of Notice PLAN - WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)

Notice

Beam

Attachments

Coordination

Notice Id: 199999998 Plan WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A) Status 01

Date of Receipt: DD.MM.YYYY Administration Serial Number

19.11.2010

A1f1. Notifying Administration

SUI

A1f3.

Intergovernmental Satellite

### Notice Submitted under

- 4.1.12 Part B Submission
  - 4.1.23 List Suppression
  - 4.1.26 New Adm
  - 4.1.27 Replacement in Plan
  - 4.1.3
  - RS548 Resolution 548 (Part B)
- Part A submission
  - A13d
  - Part A suppression

For the same network, use the same position as that for BSS.

A4a1. Nominal Orbital Longitude

9.00°

E

A1a. Identity of the Satellite Network

ITU\_SAT

A4a2. Longitudinal tolerance

b. West 0.1°

a. East 0.1°

List of Available Beams

Beam E001

A11. Regular Hours of Operation

a. start 0 b. end 24



# Exercise 2: Correction to a R1&3 BSS Feeder-link submission (Cont.)



Forms of Notice PLAN - WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)

Notice | Beam | Group | Attachments | Coordination

Notice Id: 199999998 | Satellite Network: ITU\_SAT | Nominal Orbital Longitude: 9.00 | Administration: SUI

Characteristics of the Beam

B2.  Receiving Beam  Transmitting Beam

Shape of the Beam:  Elliptical  Other Shape

B3d. Pointing Accuracy: 0.1 °

B3a1. Co-polar gain: 35 dBi

B1a. Beam Designation: E001 | Rename Beam

B1b. Steerable/Reconfigurable Beam:

Space Station Antenna

B3c. Radiation Pattern: MODRSS ==> APSRR\_404V01

B3f2a. Rotation Accuracy: 0 °

B3f2b. Major Axis Orientation: 0 °

B3f2. Axis at half-power beamwidth: c. Major 5 °, d. Minor 4 °

B3f1. Boresight: Longitude 13.75 ° E, Latitude 48.64 ° N

List of Available Groups: Group 17037

spacecap: Co-polar antenna gain not equal to  $10 \cdot \text{LOG}(27843 / (\text{minor axis} * \text{major axis})) = 31.44$

OK

Enter a value of 31.44 instead of 35

# Exercise 2: Correction to a R1&3 BSS Feeder-link submission (Cont.)



Forms of Notice PLAN - WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)

Coordination

Group Emissions/Frequencies Srv Area/Assoc Earth Stn

Beam Id: E001 R | Group Id: 17037

Characteristics Common to a Group of Frequencies | General Characteristics

C3a. Assigned frequency bandwidth: 27000 (kHz)

C15a. MSPACE Group code: [ ]

Indicate whether the group can contain 14GHz or 17GHz frequencies.  
 WRC-00 14 GHz  WRC-00 17 GHz

C4a. Class of Station

EC
ED

C6 Polarization

a. Type: L Linear Polarization

b. Electric Vector Angle: [ ]

C5a. Receiving System

Noise Temperature: 1000 Kelvins

Remarks: [ ]

Enter 33000 instead of 27000 as highest necessary bandwidth for this group is 33000 kHz.

Capture polarization angle for Linear polarization. (e.g 90 degrees)

C3a. Assigned frequency bandwidth

C4a. Class of Station

C6 Polarization

C5a. Receiving System

Capture a code if required.

ED shall be removed as only EC is valid.

For 17GHz, a value of 600K or lower should be used.

# Exercise 2: Correction to a R1&3 BSS Feeder-link submission (Cont.)



Forms of Notice PLAN - WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)

Assoc Specific Earth Stn Attachments Coordination  
Notice Beam Group Emissions/Frequencies Srv Area/Assoc Earth Stn

Notice Id: 199999998 Satellite Network: ITU\_SAT Beam Id: E001 R Group Id: 17037 Mspace Grp Code:

C8 Power Characteristics of the transmission					
C7a. Designation of Emission	C9. Modulation Char	b1. Total Power (dBW)	b2. Maximum Power Density	h. Maximum Power Density over Bandwidth	i. Power Control (dB)
33M0G7W--	modchar	28.0	-47.2	-47.2	
27M0F7W--	missing	27.0	-47.0	-47.0	

C2a. Assigned Frequencies	
Channel	Frequency in MHz
1	17327.48000
3	17365.84000
15	17596.00000
17	17634.36000
19	17672.72000
21	17711.08000
23	17749.44000

**Use 27M0G7W- instead of 27M0F7W for digital modulation for R1&3 submissions.**

**Capture modulation for every emission. (next slide)**

**Use default value of -47.3 instead of -47.0.**

**If used, a value less than or equal to 10 should be captured.**

# Exercise 2: Correction to a R1&3 BSS Feeder-link submission (Cont.)



**Modulation Characteristics**

Current Designation of Emission 33M0G7W--

C9a. Modulation Characteristics

1) Type of modulation QPSK

3c) Multiplexing type TDM

7) Energy dispersal type Carrier always spread by digital stream

9) TV standard DVB-S

A value between 0 and 15 dB shall be used. (e.g 15)

Apply these characteristics to all emissions in this notice with the same designation of emission

Apply these characteristics to the current emission

OK CANCEL

A12. Range of automatic gain control 20 dB

# Exercise 2: Correction to a R1&3 BSS Feeder-link submission (Cont.)



Forms of Notice PLAN - WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)

Assoc Specific Earth Stn	Attachments	Coordination	Emissions/Frequencies	Srv Area/Assoc Earth Stn
Notice	Beam	Group		

Notice Id: 199999998 Satellite Network: ITU\_SAT Beam Id: E001 R Group Id: 17037 Mspace Grp Code:

C11a. Test Points (maximum 20)

Longitude degrees E	Latitude degrees N	Antenna Altitude (m)	Climatic Zone	C. Zone in db
-8.59	57.81	0	F	F
-8.47	51.90	0	F	F
8.49	42.27	0	H	H
10.22	36.85	0	K	K
11.33	44.50	0	K	K
11.58	48.13	0	H	H
12.40	55.70	0	E	E
14.25	40.84	0	K	K
14.50	35.90	0	K	K
15.23	44.12	0	K	K
15.30	47.60	0	K	K
18.25	49.83	0	H	H
19.82	41.33	0	K	K
25.90	45.40	0	K	K
29.35	37.20	0	K	K

Service area contour

C11a1. Service Area No. 1 C11a3. Service Area Diagram. See Attachment No.

C11a4. Service Area Name E001\_SA C11a5e. Minimal Elevation Angle

Associated Typical Earth Station Antenna Characteristics

C10d5a. Radiation Pattern MODTES ==> APERR\_010V01

C10d3. Maximum Isotropic Gain in dBi 54 (\*)

C10d4. Half-power beamwidth in degrees 0.3

C10d7. Antenna Diameter in meters 4.5

Note: These associated typical earth station antenna characteristics are valid for each test point.

Apply these characteristics to all groups in this beam / Apply these characteristics to the Current Group

Overwrite Climatic Zones / DWM Climatic Zones / Clone Test Points

For MODTES with 4.5 meters, use a value of 56.08 instead of 54.00 for maximum antenna gain.

For MODTES with 4.5 meters, use a value of 0.25 instead of 0.30 for 3dB beamwidth.

(\*): For MODTES (17 GHz):  
 -  $G_{max}=57+20*\log(D/5)$   
 -  $3dB\ Beamwidth \leq 0.25$

# Exercise 3: Correction to a Region 2 submission



The screenshot shows the SpaceCapture V7 interface. The title bar reads "SpaceCapture V7 - [Set Notice Template]". The menu bar includes "File", "Edit", "Tools", "Template", "Window", and "Help". The toolbar contains various icons, with a yellow folder icon highlighted by a purple box and a purple callout box labeled "4. Open Database". The main window title is "Start Page - Please select the type of plan from the list". Below this is a "Transaction Id:" field. A purple callout box labeled "1. Set Template to PLAN" points to the "PLAN" button in the top toolbar. A purple callout box labeled "2. Set Notice type" points to the "Plan / List / Pending" button. A purple callout box labeled "3. Uncheck read-only mode" points to the checkbox labeled "Plan/List/Pending notices (Status above 01) read-only mode".

PLAN ID	Description	Notice Count
00DN	WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)	1
00UP	WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)	0
30_2	RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)	0
A30B	WRC07 FSS Plan 6/4 AND 13/10-11 GHz Band (Appendix 30B)	0

3. Uncheck read-only mode

# Exercise 3: Correction to a Region 2 submission (Cont.)



SpaceCapture V7 - [Set Notice Template]

File Edit Tools Template Window Help

CR/NOTIF API RAST PLAN R549/552

SpaceCap Start Page - Please select the type of plan from the list

### Database to open

Look in: Exercise

- Solution
- R2.mdb
- R13\_B55.mdb
- R13\_B55\_FL.mdb

File name:

Files of type: Access mdb

Open as read-only

Open Cancel

Select file R2.mdb and click Open

on Functions	Notice Count
	1
pendix 30A)	0
	0
	0

# Exercise 3: Correction to a Region 2 submission (Cont.)



SpaceCapture V7 - [Set Notice Template]

File Edit Tools Template Window Help

CR/NOTIF API RAST PLAN RS49/552

SpaceCap

Start Page

Notice Explorer

Open Notice

New Notice

Select a Plan

Transaction Id:

Start Page - PLAN - RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)

Plan / List / Pending    Plan / List Notification    Space Operation Function

PLAN ID	Description	Notice Count
00DN	WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)	0
00UP	WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)	1
30_2	RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)	0
A30B	WRC07 FSS Plan 6/4 AND 13/10-11 GHz Band (Appendix 30B)	0

Plan/List/Pending notices (Status above 01) read-only mode

Double click on "30\_2"



# Exercise 3: Correction to a Region 2 submission (Cont.)



SpaceCapture V7 - [Set Notice Template]

File Edit Tools Template Window Help

CR/NOTIF API RAST PLAN RS49/552

SpaceCap

Start Page

Notice Explorer

Open Notice

New Notice

Search

Notice Explorer PLAN - RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)

Notice id.	Type	Adm./Org.	Orb. Pos.	Station name	Date rcv.	Status
List of notices <span>Count=1</span>						
199999999[A]	G	USA/	40W	ITU_SAT_R2	19.11.2010	01

Control Box

- Show
- Clone
- Export
- Delete
- To SNS
- SpaceVal
- Esub

Select the notice and click Show

# Exercise 3: Correction to a Region 2 submission (Cont.)



Forms of Notice PLAN - RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)

Notice | Beam | Strapping | Attachments | Coordination

Notice Id: 199999999 Plan RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A) Status 01

Date of Receipt: DD.MM.YYYY Administration Serial Number  
19.11.2010

A1f1. Notifying Administration USA  
A1f3. Intergovernmental Satellite

**Notice Submitted under**  
 4.2.16 Part B Submission  
 4.2.24 Plan Suppression  
 4.2.6  
 RES42 Resolution 42

Part A submission  
 A1b  
 Part A suppression

4.2.6

A4a1. Nominal Orbital Longitude 40° W  
A1a. Identity of the Satellite Network ITU\_SAT\_R2

A4a2. Longitudinal tolerance  
b. West 0.1°  
a. East 0.1°

List of Available Beams  
Beam R2R  
Beam R2T

A11. Regular Hours of Operation  
a. start 0 b. end 24

Find another position as 40°W is violating Annex 7. (e.g 47.5°W)

# Exercise 3: Correction to a Region 2 submission (Cont.)



Forms of Notice PLAN - RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)

Coordination | Notice | Beam | Group | Strapping | Attachments

Notice Id: 199999999 Satellite Network: ITU\_SAT\_R2 Nominal Orbital Longitude: 40 Administration: USA

Characteristics of the Beam

B2.  Receiving Beam  Transmitting Beam

Shape of the Beam:  Elliptical  Other Shape

B3d. Pointing Accuracy: 0.1 °

B3a1. Co-polar gain: 37 dBi

B1a. Beam Designation: R2R   B1b. Steerable/Reconfigurable Beam

Space Station Antenna

B3c. Radiation Pattern: R123FR ==> APSRR\_402V01

B3f2a. Rotation Accuracy: 1 ° Beamlet: 0.8

B3f2b. Major Axis Orientation: 60 °

B3f2. Axis at half-power beamwidth: c. Major: 5 ° d. Minor: 4 °

B3f1. Boresight: Longitude: -60 ° E Latitude: 0 ° N

List of Available Groups: Group 14269

**Enter a value of 31.44 instead of 37**

spacecap  
Co-polar antenna gain not equal to  $10 \cdot \text{LOG}(27843 / (\text{minor axis} \cdot \text{major axis})) = 31.44$   
OK

# Exercise 3: Correction to a Region 2 submission (Cont.)



Forms of Notice PLAN - RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)

Coordination

Notice

Beam

Group

Strapping

Attachments

Notice Id: 199999999 Satellite Network: ITU\_SAT\_R2 Nominal Orbital Longitude: -40 Administration: USA

Characteristics of the Beam

B2.

Receiving Beam  Transmitting Beam

Shape of the Beam

Elliptical  Other Shape

B3d. Pointing Accuracy 0.1 °

B3a1. Co-polar gain 37 dBi

B1a. Beam Designation R2T

Rename Beam

B1b. Steerable/ Reconfigurable Beam

Space Station Antenna

B3c. Radiation Pattern R123SS ==> APSRR\_401V01

B3f2a. Rotation Accuracy 1 °

B3f2b. Major Axis Orientation 60 °

B3f2. Axis at half-power beamwidth c. Major 7 ° d. Minor 6 °

B3f1. Boresight

Longitude -60 ° E Latitude 0 ° N

List of Available Groups  
Group 14268

Enter a value of 28.21 instead of 37

# Exercise 3: Correction to a Region 2 submission (Cont.)



Forms of Notice PLAN - RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)

Enter 24000 instead of 23000 as the necessary bandwidth for this group is 24000 kHz.

Receiving Beam

Attachments

Coordination

Group

Emissions/Frequencies

Srv Area/Typical Antenna

Beam Id: R2f R

Group Id: 14269

Split Grp Id:

Characteristics Common to a Group of Frequencies

General Characteristics

C3a. Assigned frequency bandwidth

23000 (kHz)

C15a. MSPACE Group code

C4a. Class of Station

EC

ED

C.6 Polarization

a. Type: CL Circular Left (Indirect)

b. Electric Vector Angle

C5a. Receiving System

Noise Temperature: 1000 Kelvins

For 17GHz, a value of 600K or lower should be used.

Capture a code if required.

ED shall be removed as only EC is valid.

Remarks

# Exercise 3: Correction to a Region 2 submission (Cont.)



Forms of Notice PLAN - RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)

Coordination  
Group

Emissions/Frequencies  
Srv Area/Typical Antenna

Beam Id: R21 **E** Group Id: 14268 Split Grp Id:

Characteristics Common to a Group of Frequencies

General Characteristics

C3a. Assigned frequency bandwidth  
23000 (kHz)

C15a. MSPACE Group code

C4a. Class of Station  
EB

C.6 Polarization  
a. Type CR Circular Right (Direct)  
b. Electric Vector Angle

BR Data

Remarks

**Enter 24000 instead of 23000 as the necessary bandwidth for this group is 24000 kHz.**

**Transmitting Beam**

**Capture a code if required.**

**Capture also EV code as EB is for sound broadcasting.**

# Exercise 3: Correction to a Region 2 submission (Cont.)



Forms of Notice PLAN - RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)

Strapping

Attachments

Coordination

Notice

Beam

Group

Emissions/Frequencies

Srv Area/Typical Antenna

Notice: 199999999 Satellite Network: ITU\_SAT\_R2 Beam Id: R2T E Group Id: 14268 Split Grp Id:

Characteristics Common to a Group of Frequencies

General Characteristics

A3a. Operating Administration or Agency

9999 ... Other

A3b. Responsible Administration

XX ... Other

To apply information to other groups, select the beam group.



Apply to current group only

Apply to all groups in this beam

Apply to all groups in this notice

Please remember to attach to the submission, the name, telefax number and the address of operating administration or agency and the responsible administration.

# Exercise 3: Correction to a Region 2 submission (Cont.)



Forms of Notice PLAN - RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)

Assoc Earth Station	Strapping	Attachments	Coordination	
Notice	Beam	Group	Emissions/Frequencies	Srv Area/Typical Antenna

Notice: 199999999 Satellite Network: ITU\_SAT\_R2 Beam Id: R2R R Group Id: 14269 Split Grp Id:

**Characteristics Common to a Group of Frequencies** | **General Characteristics**

A3a. Operating Administration or Agency  
9999 ... Other

A3b. Responsible Administration  
XX ... Other

To apply information to other notices, select the beam group option.

Apply to current group only    Apply to all groups in this beam    Apply to all groups in this notice

**Please remember to attach to the submission, the name, telefax number and the address of operating administration or agency and the responsible administration.**



# Exercise 3: Correction to a Region 2 submission (Cont.)



Forms of Notice PLAN - RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)

Strapping Attachments Coordination  
Notice Beam Group Emissions/Frequencies Srv Area/Typical Antenna

Notice Id: 199999999 Satellite Network: ITU\_SAT\_R2 Beam Id: R2R R Group Id: 14269 Mspace Grp Code:

C8 Power Characteristics of the transmission

C7a. Designation of Emission	C9. Modulation Char	b1. Total Power (dBW)	b2. Maximum Power Density	h. Maximum Power Density over Bandwidth	i. Power Control (dB)
24M0G7W-	modchar	25.0	-47.8	-47.8	

C2a. Assigned Frequencies

Channel	Frequency in MHz
2	17338.58000
4	17367.74000
16	17542.70000
18	17571.86000

**Capture modulation for every emission.**

**Use default value of -48.8 instead of -47.8.**

**If used, in accordance with section §4.5 and 4.10 of Annex 3 to Appendix 30A**

# Exercise 3: Correction to a Region 2 submission (Cont.)



Forms of Notice PLAN - RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)

Strapping Attachments Coordination  
Notice Beam Group Emissions/Frequencies Srv Area/Typical Antenna

Notice Id: 199999999 Satellite Network: ITU\_SAT\_R2 Beam Id: R2T E Group Id: 14268 Mspace Grp Code:

C8 Power Characteristics of the transmission				
C7a. Designation of Emission	C9. Modulation Char	b1. Total Power (dBW)	b2. Maximum Power Density	h. Maximum Power Density over Bandwidth
24M0G7W--	modchar	19.0	-54.0	-54.0

C2a. Assigned Frequencies	
Channel	Frequency in MHz
1	12224.00000
3	12253.16000
5	12282.32000
7	12311.48000
9	12340.64000
11	12369.80000
13	12398.96000
15	12428.12000
17	12457.28000
19	12486.44000

Capture modulation for every emission.

Use default value of -54.8 instead of -54.0.

# Exercise 3: Correction to a Region 2 submission (Cont.)



Forms of Notice PLAN - RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)

Assoc Earth Station	Strapping	Attachments	Coordination
Notice	Beam	Group	Emissions/Frequencies
			Srv Area/Typical Antenna

Notice Id: 199999999 Satellite Network: ITU\_SAT\_R2 Beam Id: R2R R Group Id: 14269 Mspace Grp Code:

C11a. Test Points (maximum 20)

Longitude degrees E	Latitude degrees N	Antenna Altitude (m)	Climatic Zone	C. Zone in db
-113.00	33.00	0 E	E	
-100.00	20.00	0 M	M	
-100.00	40.00	0 K	K	
-70.00	-54.00	0 D	D	
-70.00	-10.00	0 N	N	
-70.00	55.00	0 C	C	
-65.00	-40.00	0 E	E	
-65.00	-25.00	0 K	K	
-55.00	0.00	0 P	P	
-50.00	-25.00	0 N	N	
-50.00	-10.00	0 P	P	
-40.00	-10.00	0 N	N	

Service area contour

C11a1. Service Area No. 1 C11a3. Service Area Diagram. See Attachment No.

C11a4. Service Area Name REG 2 C11a5e. Minimal Elevation Angle

Associated Typical Earth Station Antenna Characteristics

C10d5a. Radiation Pattern R2TES ==> APERR\_011V01

C10d3. Maximum Isotropic Gain in dBi 57.4 (\*)

C10d4. Half-power beamwidth in degrees 0.24

C10d7. Antenna Diameter in meters 7

Note: These associated typical earth station antenna characteristics are valid for each test point.

For R2TES with 7 meters, use a value of 60.32 instead of 57.40 for maximum antenna gain.

For R2TES with 7 meters, a value less than or equal to 0.2 shall be used for 3dB beamwidth.

(\*): For R2TES:  
 -  $G_{max}=57.4+20*\log(D/5)$   
 -  $3dB \text{ Beamwidth}(G_{max}\geq 59dBi)\leq 0.2$

# Exercise 3: Correction to a Region 2 submission (Cont.)



Forms of Notice PLAN - RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)

Strapping

Attachments

Coordination

Notice

Beam

Group

Emissions/Frequencies

Srv Area/Typical Antenna

Notice Id: 199999999

Satellite Network: ITU\_SAT\_R2

Beam Id: R2T E

Group Id: 14268

Mspace Grp Code:

C11a. Test Points (maximum 20)

Longitude degrees E	Latitude degrees N	Antenna Altitude (m)	Climatic Zone	C. Zone in db
-113.00	33.00	0	E	E
-100.00	20.00	0	M	M
-100.00	40.00	0	K	K
-70.00	-54.00	0	D	D
-70.00	-10.00	0	N	N
-70.00	55.00	0	C	C
-65.00	-40.00	0	E	E
-65.00	-25.00	0	K	K
-55.00	0.00	0	P	P
-50.00	-25.00	0	N	N
-50.00	-10.00	0	P	P
-40.00	-10.00	0	N	N



Service area contour

C11a1. Service Area No. 1

C11a3. Service Area Diagram. See Attachment No.

C11a4. Service Area Name REG 2

C11a5e. Minimal Elevation Angle

Associated Typical Earth Station Antenna Characteristics

C10d5a. Radiation Pattern R2RES ==> APERR\_008V01

C10d3. Maximum Isotropic Gain in dBi 33.3 (\*)

C10d4. Half-power beamwidth in degrees 4

C10d8. Equivalent Diameter in meters 0.6

Note: These associated typical earth station antenna characteristics are valid for each test point.

Apply these characteristics to all groups in this beam

Apply these characteristics to the Current

Overwrite Climatic Zones in db with IDWM Climatic Zones

Clone Test Points

For R2RES with 0.60 meters, use a value of 35.8 instead of 33.30 for maximum antenna gain.

For R2RES with 0.6 meters, use a value of 2.83 instead of 4 for 3dB beamwidth.

(\*): For R2RES:

- $G_{max} = 40.24 + 20 \cdot \log(D)$
- $3dB \text{ Beamwidth} = 1.7/D$

# Exercise 3: Correction to a Region 2 submission (Cont.)



Forms of Notice PLAN - RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)

Notice	Beam	Group	Emissions/Frequencies	Srv Area/Typical Antenna
Strapping	Attachments	Coordination		

Notice Id: 199999999 Satellite Network: ITU\_SAT\_R2 Nominal Orbital Longitude: 40 Administration: USA

Group Combination		Frequency Combination		Channel Combination	
Uplink Group	Downlink Group	Uplink Frequency (MHz)	Downlink Frequency (MHz)	Uplink Channel	Downlink Channel
14269	14271	17338.58000	12238.58000	2	2
14269	14271	17367.74000	12267.74000	4	4
14269	14271	17396.90000	12296.90000	6	6
14269	14271	17426.06000	12326.06000	8	8
14269	14271	17455.22000	12355.22000	10	10
14269	14271	17484.38000	12384.38000	12	12
14269	14271	17513.54000	12413.54000	14	14
14269	14271	17542.70000	12442.70000	16	16
14269	14271	17571.86000	12471.86000	18	18

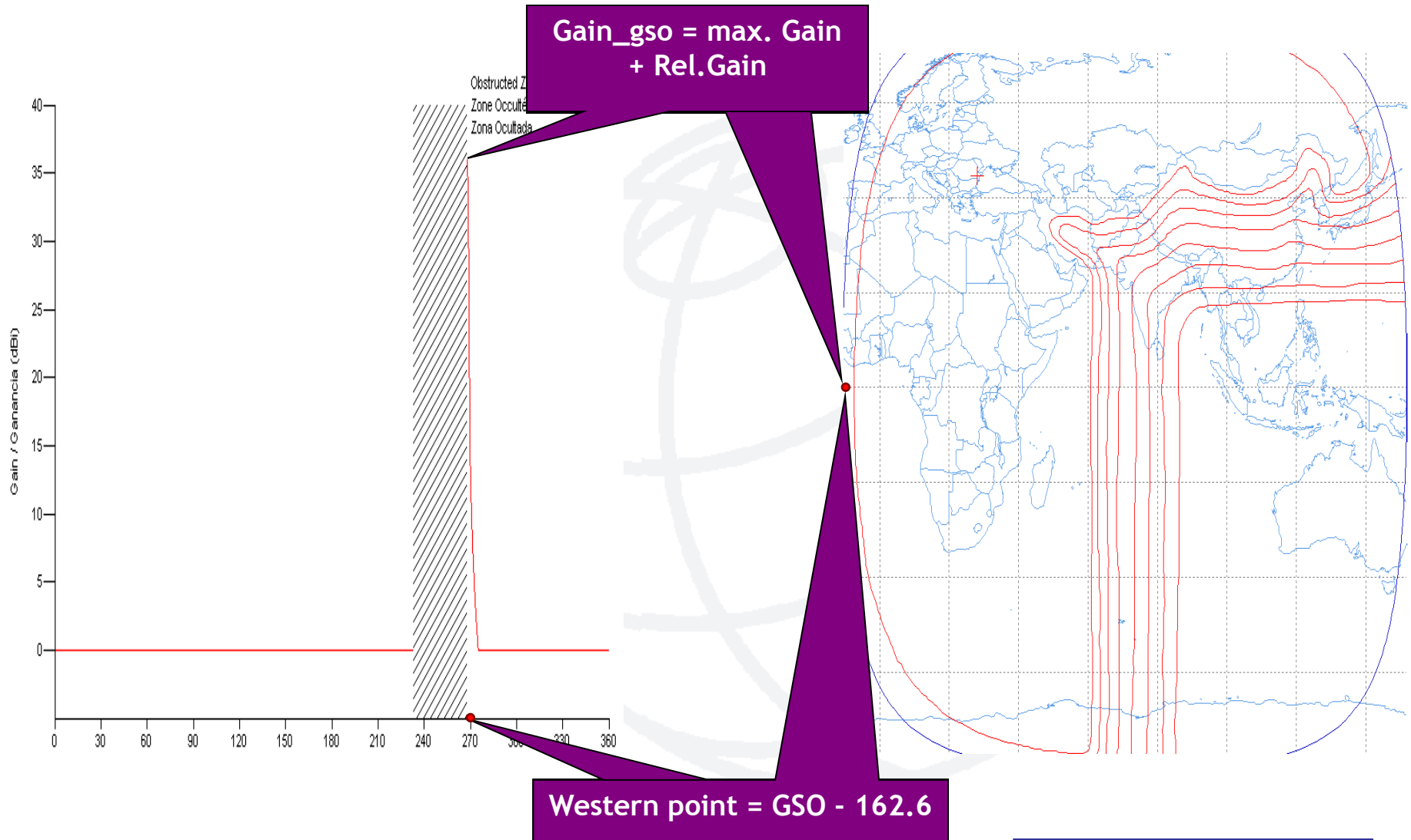
Strap Wizard

Validate

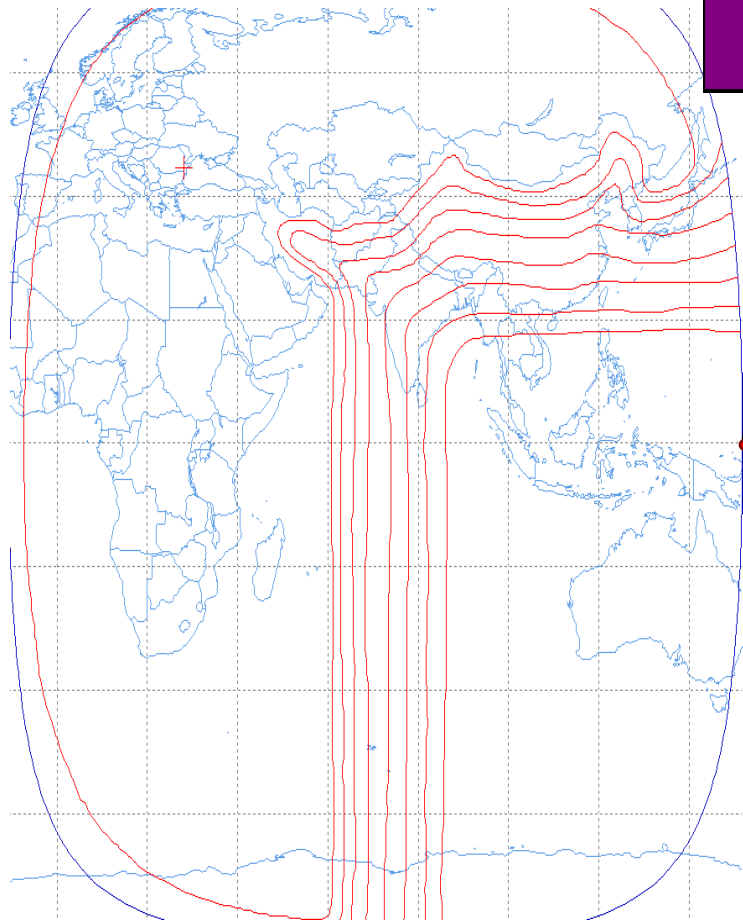
Use Strap Wizard to connect downlink and feeder-link assignments.

After finishing, the "Validation" button should be pressed to verify that all assignments have been strapped.

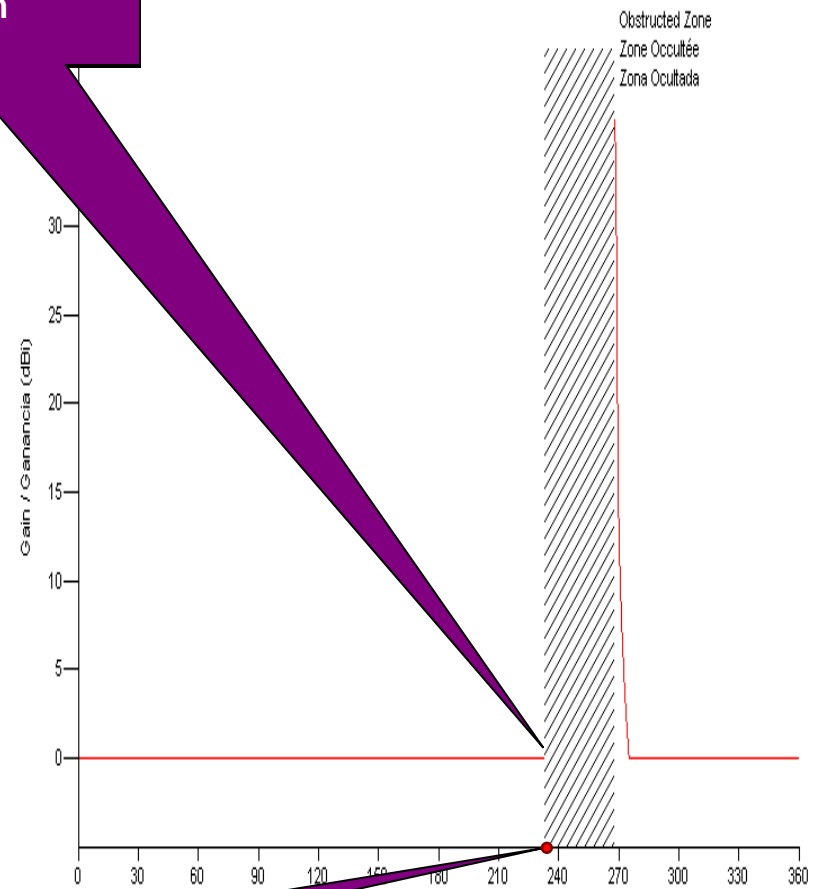
# Annex1-Gains at two most Western and Eastern points visible from the GSO satellite



# Annex1-Gains at two most Western and Eastern points visible from the GSO satellite



Gain\_gso = max. Gain + Rel.Gain



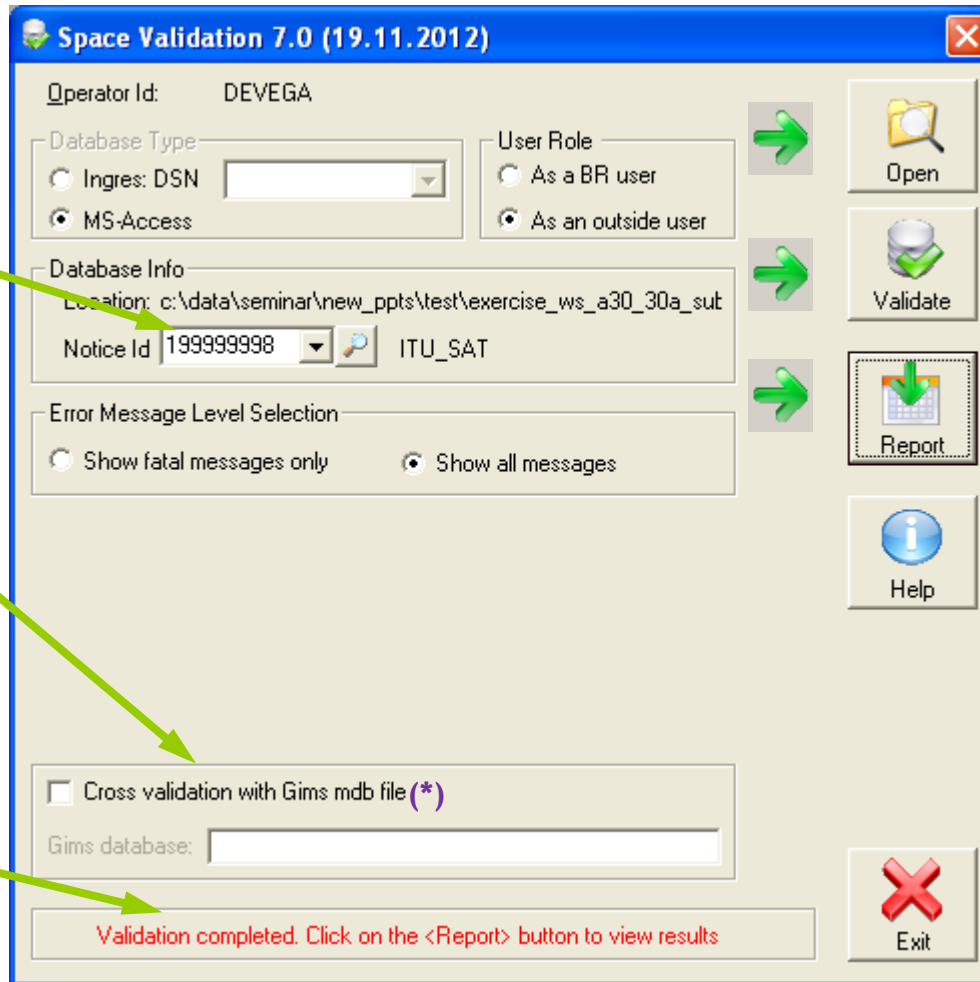
Eastern point = GSO + 162.6

[Go back](#)

2. Select the notice Id. to be validated

For exercises keep cross validation unchecked!

4. Check validation message



1. Browse to Select/open the database to be validated

3. Start the validation process

5. Show validation results with SpaceQry

Exit SpaceVal

[Go back](#)