

# Capture, Validation and Submission of Earth Stations

*Presented by :*

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*BR-Space Services Department*

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**ITSO/ITU Workshop on Satellite Communications  
AFRALTI, Nairobi-KENYA, 8-12 August 2016**

# Two steps to be followed



## Coordination

- Submission of Appendix 4 data to affected ADM's



## Notification

- Submission of Appendix 4 data to BR

# Coordination of earth stations

- 9.29 Requests for coordination under 9.15 to 9.19 shall be sent by the requesting administration to the identified administrations, together with the appropriate information listed in Appendix 4 to the Radio Regulations



# Notification of an Earth station

- Any frequency assignment to a transmitting station and to its associated receiving stations shall be notified to the Bureau if (No.11.2)
  - Assignment is capable of causing harmful interference; or
  - Assignment is used for international radiocommunication; or
  - Assignment is subject to a world or regional frequency allotment or assignment plan which does not have its own notification procedure; or
  - if that assignment is subject to the coordination procedure of Article 9; or
  - It is desired to obtain international recognition; or
  - Non conforming assignment seeking to be recorded for information purposes only
- Similar requirements for receiving earth station (No.11.9)



# Guidance for Notification of Earth stations



- Capture file by using SpaceCap
- Validate the file
- Launch SpaceVal/Click on Open/Browse and select the database
- select the correct notice ID/Click Validate/Click Report

# SpaceCap

Notification of earth stations

Notice Id:  AP4/II and AP4/III (Appendix 4 - Annex 2A)    22.11.2012    Status

**Notice submitted under:**

<input checked="" type="radio"/> <b>No. 11.2 Notification</b> <input type="radio"/> First Notification <input type="radio"/> Resubmission	<input type="radio"/> RR1488 Notification
<input type="radio"/> <b>No. 9.6 Coordination</b> <input type="checkbox"/> No. 9.11A Applies	<input type="radio"/> RR1060 Request for Coordination <input type="checkbox"/> RS46 Applies
<input type="radio"/> <b>No. 9.7A Specific Receive GSO FSS Earth stn Coordination</b>	<input type="radio"/> RR1107 Request for Coordination
<input checked="" type="radio"/> <b>No. 9.17 Coordination amongst Administrations</b>	<input type="radio"/> RR1610 Agreement Under Art. 14


Date: DD.MM.YYYY     Administration Serial Nbr

A1f1. Notifying Administration     A1f2. Notice submitted on behalf of these administrations.  +  
A1f3. Intergovernmental Satellite System      x

Notice intended for  
 Addition  
 Modification  
 Suppression  
BR Identification No. of Station to be modified/suppressed

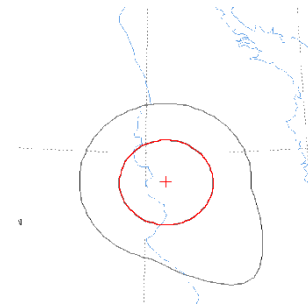
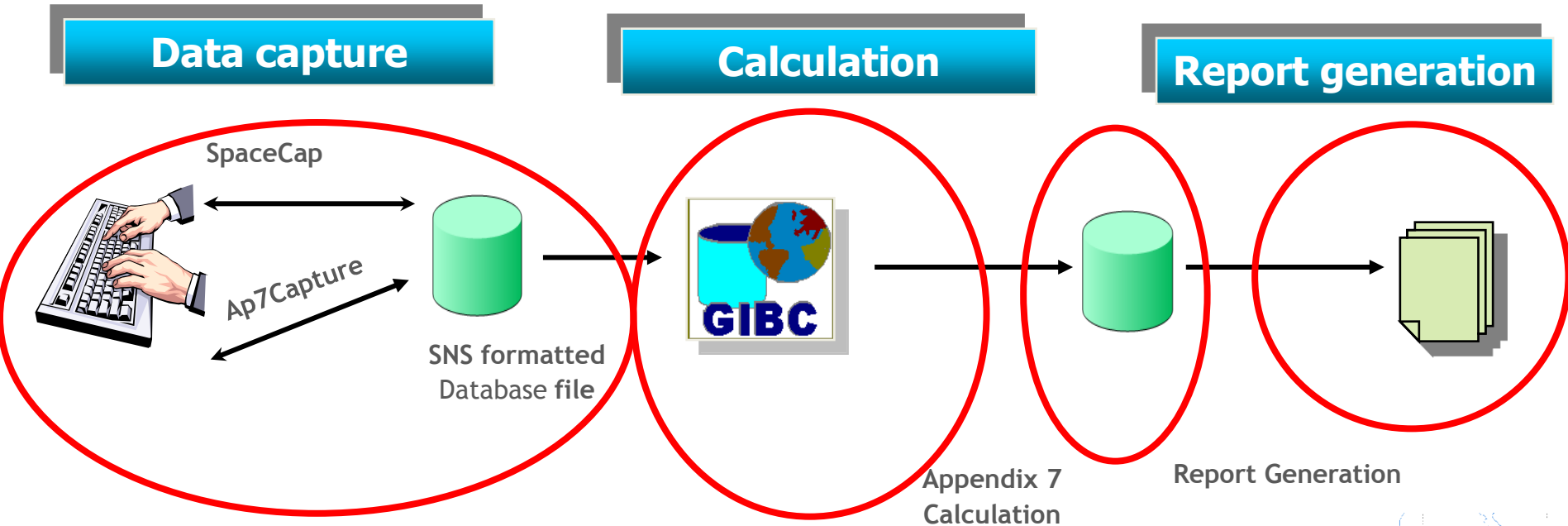
Type of Satellite Network or Earth Station

<input type="radio"/> <b>GeoStationary Satellite Network</b>	<input type="radio"/> <b>Specific Earth Station</b>
<input type="radio"/> <b>NonGeoStationary Satellite Network</b>	<input type="radio"/> <b>Typical Earth Station</b>

 More...

Coordination of earth stations

# AP7 data capture/calculation

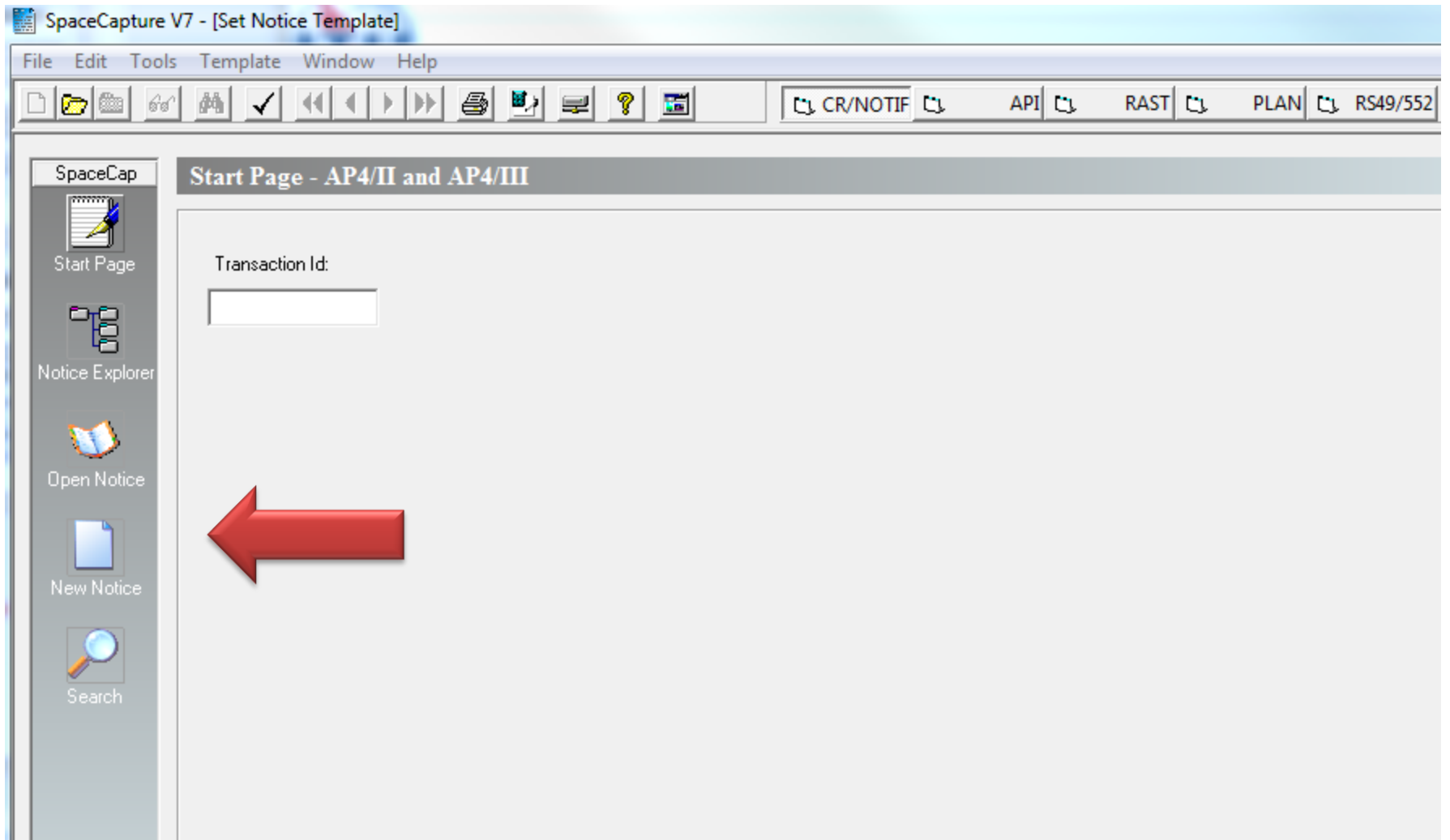


Data capture and storage in the SNS formatted database  
Extract all required information from the database  
Perform Appendix 7 calculation  
Save the results in an ESCC formatted database file  
Produce report document in RTF format

# Capturing Exercise

Coordination





Specific Earth Station Notice:1

- Notice
- Station
- Beam
- Attachments

Notice Id: 1 AP4/II and AP4/III (Appendix 4 - Annex 2A) 21.11.2014 Status 01

Notice submitted under:

- No. 9.6 Coordination
- No. 11.2 Notification
- First Notification
- Resubmission

- No. 9.11A Applies
- Bands 21.4 to 22 GHz
- Bands 21.4 to 22 GHz Special Procedure

- No. 9.7A Specific Receive GSD FSS Earth stn Coordination
- No. 9.17 Earth Station Coordination amongst Administrations

Date: DD.MM.YY 21.11.2014 Administration Serial Nbr

A1f1. Notifying Administration MLT  
A1f3. Intergovernmental Satellite System  
A1f2. Notice submitted on behalf of these administrations.

Notice intended for  
 Addition  
 Modification  
 Suppression  
BR Identification No. of Station to be modified/suppressed

Type of Satellite Network or Earth Station

- GeoStationary Satellite Network
- Specific Earth Station
- NonGeoStationary Satellite Network
- Typical Earth Station



Notice **Station** Beam Attachments

Notice Id: 1 Administration: MLT Status: 01 Date: 21.11.2014

A1e1. Type of Station  
 Typical  Specific

A1e2. Earth Station Name: MLT-11

A1e3a. Country: MLT

A1e3b. Geographical Coordinates

Longitude: Degrees 14 E/W E Min 25 Sec 0


Latitude: Degrees 35 N/S N Min 55 Sec 0

A4c1. Associated Space Station: INTELSAT8 359E

A4c2. Nominal Orbital Longitude (if geostationary): 1 W E/W

A7b1. Min Elevation Angle (GSO): 35 °

[A7e. Table of Minimum Antenna Elevation Angles \(NGSO\)](#)



A16b Commitment to meet PFD limits (applicable bands 13.75-14 GHz)  Yes  No  N/A

A18a Commitment of aircraft earth station (applicable bands 14-14.5 GHz)  Yes  No  N/A

A7d. Altitude: 30 Metres

A7c. Operating Azimuthal Angles (GSO)

1. From: 110 °

2. To: °



[A7a. Table of Horizon Elevation/Distance](#)

A7a. Horizon Elevation Diagram attached. See Attachment No.

List of Available Beams

- Beam 9H2

**A7a. Table of Horizon Elevation Angles**

Azimuth	A7a1 Elevation Angle °	A7a2 Distance km (optional)
0	.0	
90	.0	
180	.0	
270	.0	

Copy Rows  
Paste Rows

Close

Specific Earth Station

Notice

Notice

A4  
IN

A1  
(ap

.11.2014

35 N/S N Min 55 Sec 0

A7b1. Min Elevation Angle (GSO)  °

[A7e. Table of Minimum Antenna Elevation Angles \(NGSO\)](#)

A7e

aircraft earth station  
-14.5 GHz)  Yes  No  N/A

A7d. Altitude

A7c. Operating Azimuth

1. From  °

2. To

 **A7a. Table of Horizon Elevation/Distance**

A7a. Horizon Elevation Diagram attached. See Attachment No.

List of Available Beams

- Beam 9H2



Specific Earth Station Notice:1

Notice

Station

Beam

Group

Attachments

Notice Id: 1 Administration: MLT Station Name: MLT-11

Characteristics of the Antenna

- Receiving Earth Station
- Transmitting Earth Station

B1 a. Beam Designation: 9H2 [Assoc. Satellite Receiving Beam Designation](#)  
Old Beam Designation (if changed)

- Add of the Antenna
- Mod
- Sup



B5. Earth Station Antenna Characteristics

a. Maximum Isotropic Gain

+/- dBi  
44

b. Beamwidth

Degrees  
1

A7f. Antenna Diameter (meters) (only for 13.75-14GHz)

A10a. E Stn Coordination diagram. See Attachment

d. Dgso (meters)

Antenna Radiation Pattern

[REC-465-5 ==> APEREC013V01](#)

Diagram attached. See Attachment no.:

List of Available Groups  
Group 1 Page No.

Specific Earth Station Notice:1

- Coordination Notice
- Special Section Station
- Attachments Beam
- Group**
- Emissions
- Frequencies

Notice: 1 Station Name: MLT-11 EAnt Id: 9H2 E Group Id: 1 Split Grp Id:

3. Observed Frequencies and Related Characteristics  
 Add  Mod  Sup of the group BR Identification of the Group to be modified/suppressed Page No. BR Data

Characteristics Common to a Group of Frequencies General Characteristics

C3a. Assigned Frequency Bandwidth  
10000 (kHz)

C4a. Cls Strn	C4b. Nat Srv
TC	CP

C2c. compliance with No. 4.4 of the Radio Regulations

C6. Polarization  
Type: M Mixed Polarization  
If linear, provide angle: °

C8g1. Maximum Aggregate Power  
dBW

C8g2. Aggregate Bandwidth  
(kHz)

C8g3. Bandwidth Corresponds to Aggr Bandwidth

Remarks

SpaceCapture V7 - [Specific Earth Station Notice:1]

File Edit Tools View Window Help

CR/NOTIF API RAST PLAN RS49/552

Special Section Notice Attachments Station Beam **Group** Emissions Frequencies Coordinatic

Notice: 1 Station Name: MLT-11 EAnt Id: 9H2 E Group Id: 1 Split Grp Id:

3. Observed Frequencies and Related Characteristics

Add  Mod  Sup of the group BR Identification of the Group to be modified/suppressed Page No. BR Data

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

C3a. Assigned Frequency Bandwidth: 10000 (kHz)

C2c. compliance with No. 4.4 of the Radio Regulations

C4a. Cls Stn	C4b. Nat Srv
TC	CP

C6. Polarization Type: M Mixed Polarization

If linear, provide angle: °

C8g1. Maximum Aggregate Power: dBW

C8g2. Aggregate Bandwidth: (kHz)

C8g3. Bandwith Corresponds to Aggr Bandwidth

Remarks:

Specific Earth Station Notice:1

Coordination Notice    Special Section Station    Attachments Beam    Group    **Emissions**    Frequencies

Notice Id: 1 Adm: MLT Station Name: MLT-11 EAnt Id: 9H2 E Group Id: 1

Emissions Applicable to the Assigned Frequencies

C7a. Designation of Emission	C8a1/C8b1. Total Peak Power (dBW)	C8a2/C8b2. Maximum Power Density (dBW/Hz)	C8c1. Minimum Peak Power (dBW)	C8c3. Minimum Power Density (dBW/Hz)	C8c2. Atch No. Pep	C8c4. Atch No. Mpd	Emission of Type C8b
▶ 10M0G7W--	18.0	-52.5	-5.0	-53.0			<input type="checkbox"/>
							<input type="checkbox"/>
							<input type="checkbox"/>
							<input type="checkbox"/>
							<input type="checkbox"/>
							<input type="checkbox"/>
							<input type="checkbox"/>
							<input type="checkbox"/>
							<input type="checkbox"/>
							<input type="checkbox"/>



Specific Earth Station Notice:1

- Coordination Notice
- Special Section Station
- Attachments Beam
- Group
- Emissions
- Frequencies**

Notice Id: 1 Adm: MLT Station Name: MLT-11 EAnt Id: 9H2 E Group Id: 1

C2a1. Assigned Frequencies		k/M/GHz
▶	5970.00000	M



Specific Earth Station Notice:1

Notice Coordination	Station <b>Special Section</b>	Beam Attachments	Group	Emissions	Frequencies
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Notice Id: 1 Adm: MLT Station Name: MLT-11 EAnt Id: 9H2 E Group Id: 1

Information Common to List of Groups in this Beam

A13.

Special Section AR11/A (RR1042)	1056
Special Section AR11/C (RR1060)	2462
Special Section ART. 14 (RR1610)	
Special Section API/A (9.1)	
Special Section CR/C (9.6)	
Special Section AP30-30A/F/C	

Reference	Number

To apply Special Section data to other groups, select the beam or notice option.

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

SpaceCap

- Start Page
- Notice Explorer
- Open Notice
- New Notice
- Search

Notice Explorer - AP4/II and AP4/III

Notice id.	Type	Adm./Org.	Orb. Pos.	Station name	Date rcv.	Status
<div style="display: flex; justify-content: space-between;"> <span>List of notices</span> <span>Count=1</span> </div>						
000000001[A]	S	MLT/		MLT-11	21.11.2014	01

Control Box

- Show
- Clone
- Export
- Delete
- To SNS
- CFEX
- SpaceVal
- Esub
- RS49/552



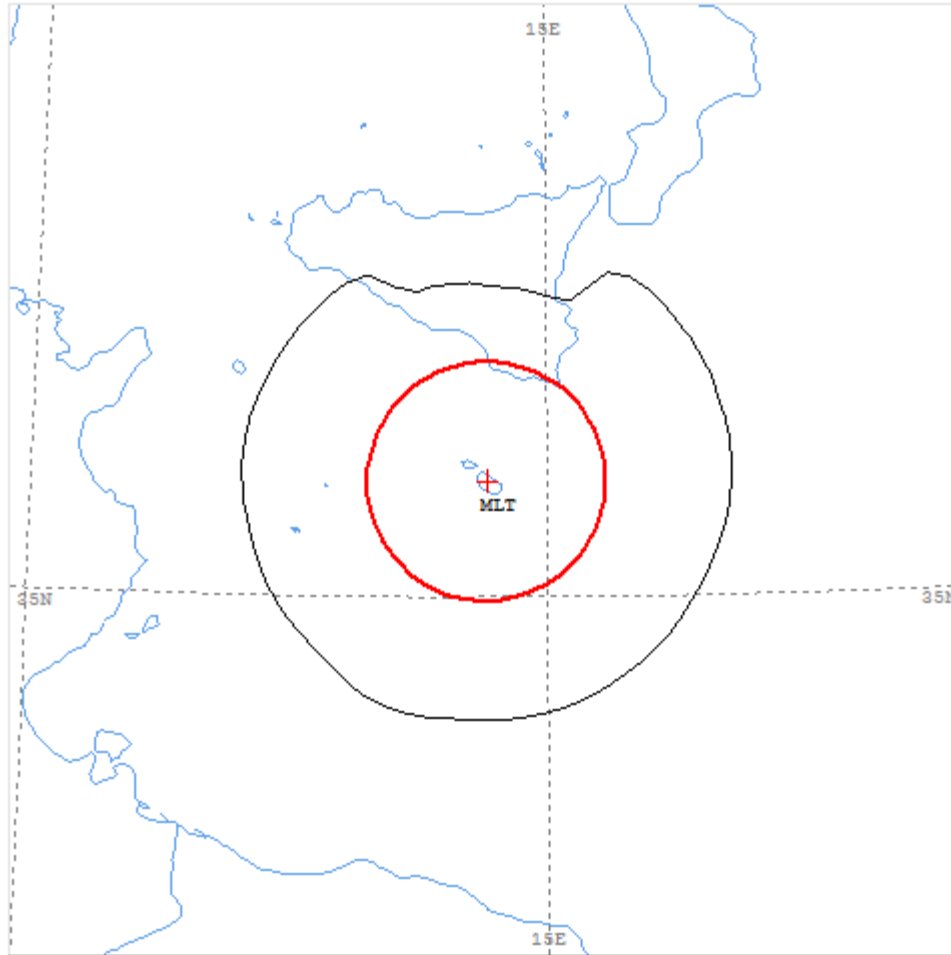
# Generate coordination area diagrams with AP7 software

vna30v:2.1.0.1appendix 7/wlr-2.0.0.4/rm-2.0.0.1/Cic-2.0.0.0/exp1.2.0.0/Sm-2.0.0.0/awlr-2.0.0.0/waf-2.0.0.1

Diagram 1: 2.1\_TABLE7. TRANSMITTING GSO ES in FIXED-SATELLITE SERVICE W.R.T. RECEIVING TERRESTRIAL STATIONS. TS: fixed, mobile

Notice ID: 1  
Administration/Geographical area: MLI/MLI  
Satellite orbital position: -1.00  
Frequency band: 5965.00-5975.00 MHz

Earth station name: MLI-11  
Earth station position: 014N250035W5500  
Satellite name: INTELSAT'S 35WE



Scale: 419.00 Km (default)

+ ES position  
— Main Model  
— Main Model2



# Contacting Affected Administrations

- Cover Letter
- Email attachment containing:
  - ESName.mdb
  - Coordination contour diagrams generated using AP7 software
  - Any other attachments or notes in Word or PDF format



# Capturing Exercise

Notification

Notice Id: 1 AP4/II a 4/III (Appendix 4 - Annex 2A) 21.11.2014 Status 01

Notice submitted under:

No. 9.6 Coordination  No. 11.2 Notification  First Notification  Resubmission

No. 9.11A Applies  Bands 21.4 to 22 GHz  Bands 21.4 to 22 GHz Special Procedure

No. 9.7A Specific Receive GSO FSS Earth stn Coordination

No. 9.17 Earth Station Coordination amongst Administrations

Date: DD.MM.YY 21.11.2014 Administration Serial Nbr

A1f1. Notifying Administration MLT

A1f2. Notice submitted on behalf of these administrations.

A1f3. Intergovernmental Satellite System

Notice intended for

Addition

Modification

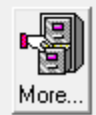
Suppression

BR Identification No. of Station to be modified/suppressed

Type of Satellite Network or Earth Station

GeoStationary Satellite Network  Specific Earth Station

NonGeoStationary Satellite Network  Typical Earth Station



Notice Id:  Adm:  Station Name:  EAnt Id:  Group Id:

A5/A6. Coordinated Obtained or Agreement Requested														
	Provision	Status	Adm/Org	Adm/Org	Adm/Org	Adm/Org	Adm/Org	Adm/Org	Adm/Org	Adm/Org	Adm/Org	Adm/Org	Adm/Org	Adm/Org
▶	9.17	Obtain	I											

To apply coordination to other groups, select the beam or notice option.



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



Specific Earth Station Notice:1

- Coordination Notice
- Special Section Station
- Attachments Beam
- Group**
- Emissions
- Frequencies

Notice: 1 Station Name: MLT-11 EAnt Id: 9H2 E Group Id: 1 Split Grp Id:

3. Observed Frequencies and Related Characteristics  
 Add  Mod  Sup of the group BR Identification of the Group to be modified/suppressed Page No. BR Data

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

A2a. Date Bringing into use  
10.12.2015

A3a. Operating Administration or Agency  
003 ... DIRECTOR OF CIVIL AVIATION

A3b. Responsible Administration  
A ... MALTA COMMUNICATIONS AUTHORITY

To apply this information to other groups, select the beam or notice option.  
 Apply to current group only  Apply to all groups in this beam  Apply to all groups in this notice

# Before submitting the notification

Check the following:

- –Associated space station must already be notified
- –Provide the correct name used in BR databases
- –Check also the beam names/ if the frequency bands are covered by the bands used by the space station

Use Spacecap to convert the notice from No.9.17 to No.11.2

Use Spacecap to update the status of coordination of the earth station

Run Spaceval to ensure that there are no fatal errors



# Common Errors

- Space station name/beam name/frequency band not covered
- Missing horizon elevation angle
- Missing minimum angle of elevation
- Missing coordination area diagram
- Missing antenna diameters when required
- Missing antenna radiation patterns
- Missing coordination agreements



# Validation report

QuickQuery Result for Network(s): 112505900

Validation Report for Network: 112505900 On: 23.11.2012 @ 12:38:18 By Operator: FALLOUDIN (notif\_seminar\_es\_with\_errors.mdb)

Network ID: 112505900 Adm: HOL Station name: SEMINAR\_ES Satellite name: ITUSAT Orbital Pos: 7.00°

Validation Message Counts: Total: 9, FataIs: 5, Warnings: 3; Message Option: All

Beam Name	E / R	Group ID	Row No	Item Number	Rule ID	Severity Code	Table Name	Field Name	Field Value	Validation Error Message
				0		A				VALIDATION COMPLETED; v7.0; ERRORS F/W:
				1000	2	W	e_stn	stn_name	EMINAR_E	Invalid earth station name (not in reference table)
				1011	2	W	e_stn	sat_name	ITUSAT	Invalid Value (not in reference table)
				1014	4	F	e_stn	elev_min		Value missing for station-type = S (geo) or R
KR1	E			1037	3	F	e_ant	atrch_e		Value missing and item 1045 not provided
KR1	E			1045	3	F	e_ant	pattern_id		Value missing and item 1037 not provided
KR1	E	1		1603	3.2	W	grp	d_inuse	05.12.1994	For <N> filing, date < date-of-receipt - 3 months
KR1	E	1	1	1621	2	F	provn	coord_prov	9.7	Invalid value
KR1	E	1	1	1623	3	F	provn	adm		Value missing; incompatible with item 1621

# Rules concerning receivability

- Associated space station must already be notified
- Provide the correct name used in BR databases
- Check also the beam names/ if the frequency bands are covered by the bands used by the space station



# Common Receivability Issues

- Frequencies of S/S should match

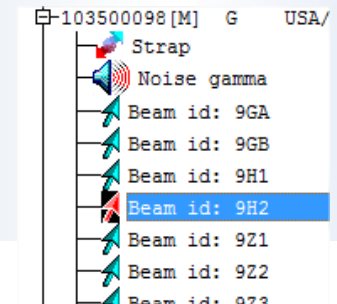
## INTELSAT8 359E

...

5929.00000 .. 6425.00000

...

- Beam names of E/S should match those of the S/S in the opposite direction





## Part I-S

- When notice is found to be complete, it will be published in Part I-S, which will constitute the acknowledgement to the notifying administration of receipt of its notice (No.11.28).

## Part II-S

- Assignments, after detailed technical and regulatory examination, that are found to be favourable will be published in a Part II-S and recorded in the MIFR.

## Part III-S

- Assignments, after detailed technical and regulatory examination, that are found to be unfavourable will be published in a Part III-S.

# Reasons for unfavorable findings (Part III-S)

## Examples of paragraphs

### Notes for return of notices for earth station

Provision	Examples of paragraphs	Resubmission Within 6 months
<p><b>A N - X/9.17[X]</b></p>	<p>With respect to the frequency assignment groups Nos. (...) of your earth station (...), it is noted that the <u>coordination procedure under No. 9.17 has not been shown as completed with the Administrations of (...) since the coordination area of your earth station includes the territories of those Administrations</u> (see coordination contours attached). Thus, an unfavorable finding with respect to <b>No. 11.32</b> has been reached and the notice in question is being returned to you in conformity with <b>No. 11.37</b>.</p> <p>Should the notice <u>be resubmitted with the indication that coordination has been successfully completed with the Administration(s) mentioned above</u>, a favorable finding might result.</p> <p>However, these being frequency assignments for reception, your Administration may be prepared to accept the interference resulting from existing and future terrestrial stations of the countries concerned. In this event, should your Administration resubmit the notice concerned and insist upon its reconsideration, the assignment will be recorded in the Master Register; symbol "H" will be inserted in Column 13B2 as well as <b>AP5 PARA 6E(III)</b> in the column reserved for coordination information.</p>	<p>Yes</p>
<p><b>A N - X/9.7[X]</b></p> <p><b>No SS (subject to coord.)</b></p>	<p>With regard to the frequency assignment groups Nos. (...) of your earth station (...), it is noted that the <u>corresponding frequency assignments of the associated space station (...) have not yet been communicated to the Radiocommunication Bureau</u> for recording. Thus, these frequency assignments have been given an <u>unfavourable finding with respect to No. 11.32</u> (see paragraph 2.1.2.1 of the Rules of Procedure relating to <b>No. 11.32</b>) and the notice in question is being returned to you in conformity with <b>No. 11.37</b>.</p> <p>Once the corresponding assignments of the associated space station have been notified and recorded in the Master Register, it will be possible to examine again your earth station notice.</p>	<p>Yes</p>
<p><b>A N - X/9.7[X]</b></p> <p><b>Outside SA</b></p>	<p>With respect to the frequency assignments groups Nos. (...) of your earth station (...), it is noted that the <u>station is outside the service area of the transmitting/receiving beam (...) of the associated space station (...)</u>. Consequently, your earth station frequency assignments have been given an unfavorable finding with respect to <b>No. 11.32</b> (see paragraph 2.1.3 of the Rules of Procedure relating to <b>No. 11.32</b>) and the notice in question is being returned to you in conformity with <b>No. 11.37</b>.</p>	<p>Yes</p>
<p><b>N</b></p> <p><b>X/ROP RCV4.4</b></p>	<p>With regard to the frequency assignments groups Nos. (...) of your earth station (...), it is noted that the <u>associated space station (...) does not have any valid publication in the Radiocommunication Bureau</u>.</p> <p>As stated in paragraph 2.1.2.1 of Rules of Procedure relating to <b>No. 11.32</b>, starting from the principle that the leading element of a space network is the space station and that it would be misleading to record in the Master Register earth stations for which a space station (network) is not recorded, the Radio Regulation Board decided that an earth station cannot be recorded in the Master Register before its associated space station.</p> <p>In view of the above, according to <b>Rules of Procedure, paragraph 4.4</b> of "Rules concerning the <u>Receivability</u> of forms of notice generally applicable to all notified assignments submitted to the <u>Radiocommunication Bureau</u> in application of the Radio Regulatory Procedures relating to space services" the subject notice is not receivable.</p>	<p>Yes</p>





# Submission to the Bureau

- Create a zip file ADM\_ESName.zip containing
  - ESName.mdb
  - Coordination contour diagrams generated using AP7 software
  - Any other attachments or notes in Word or PDF format
- Rename the zip file to ADM\_ESName.itu
- Send email with attachment ADM\_ESName.itu to [BRMAIL@ITU.INT](mailto:BRMAIL@ITU.INT)
- Send confirmation telefax to BR at +41 22 730 5785 **within seven days** from the email submission

**Questions?**