


# Generation of Coordination Contours for Earth Stations (GIBC AP7 application)

Omar KA  
(omar.ka@tu.int)

Space Services Department  
Radiocommunication Bureau






Union internationale des télécommunications



UIT - UAT SÉMINAIRE RÉGIONAL  
DES RADIOCOMMUNICATIONS  
POUR L'AFRIQUE

**NIAMEY, NIGER**  
**20-24 AVRIL 2015**

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



Organisé par:

© 2015 Union internationale des télécommunications



# Earth Station Coordination

- **Determination of the Coordination Area Around an Earth Station based on Appendix 7**
- **Tools :**
  - SpaceCap**
  - GIBC – Appendix 7**

# AP7 data capture/calculation

## Data capture

## Calculation

## Report generation

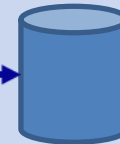


SpaceCap

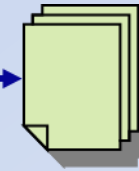
Coordination Data  
(mdb)



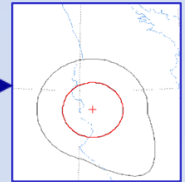
AP7 Calculation



Results  
(mdb)



Report  
(rtf)



Print Report

Data capture and storage in the SNS formatted database.

Extract information to perform Appendix 7 calculation. Save the results in an ESCC formatted database.

Produce report document in RTF format.



# In this workshop...

## SpaceCap Capture tool

- Software installation
- Browse an existing database
- Modify parameters
- Save into the existing database

## GIBC Appendix 7 Calculation

- Software installation
- Select input database
- Appendix 7 calculation
- Generate Report
- Include Auxiliary Contours

## Proposed Exercises:

- To generate Coordination Contours for FSS Transmitting and Receiving Earth Station in the C band
- To repeat the calculations to see the effect of the horizon elevation angles on the coordination contours



# Installation

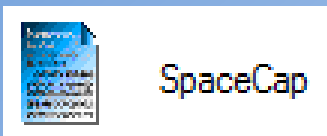
**SpaceCap** and **GIBC** software can be installed from the ITU-R website ( [ITU-R/space-software](http://ITU-R/space-software)).

Each edition of the BR International Frequency Information Circular (BR IFIC) contains the SRS database.



Install GIBC & Open the application

Install SpaceCap and open the application





# Proposed Exercises

## ➤ 1<sup>st</sup> exercise

**Generate Coordination Contours for FSS Transmitting and Receiving Earth Station in the C band**

## ➤ 2<sup>nd</sup> exercise

**Repeat the calculations to see the effect of the horizon elevation angles on the coordination contours**

Input database: **RRS\_15-ES-Coordination.mdb**

ES name: **NGR-1**

ES Notice ID: **1**



# Exercise 1

# SpaceCap

## Browse an existing database



The screenshot shows the SpaceCapture V7 application window titled "SpaceCapture V7 - [Set Notice Template]". The interface includes a menu bar (File, Edit, Tools, Template, Window, Help) and a toolbar with various icons. The main workspace is titled "Start Page - AP4/II and AP4/III" and contains a "Transaction Id:" label followed by a text input field containing the number "11". A yellow arrow points from the text "To select a Notice by the Notice ID" to this input field. On the left side, there is a vertical navigation pane with icons and labels: "Start Page", "Notice Explorer", "Open Notice", "New Notice", and "Search". A yellow arrow points from the text "To open a Notice" to the "Open Notice" icon. At the bottom of the window, a status bar displays "Current DB : C:\WRS-14\WRS\_14-ES-Coordination.mdb" and "Click on Notice Explorer to see a list of Notices, or New Notice to create one." The bottom right corner of the status bar shows "4:1".



# Exercise 1

# SpaceCap

## Browse an existing database



The screenshot shows the SpaceCapture V7 software interface. The main window is titled "SpaceCapture V7 - [Set Notice Template]". The menu bar includes File, Edit, Tools, Template, Window, and Help. The toolbar contains various icons for file operations and data management. The main area is titled "Notice Explorer - AP4/II and AP4/III" and displays a table of notices. The table has columns for Notice id, Type, Adm./Org., Orb. Pos., Station name, Date rcv., and Status. A "List of notices" folder is expanded, showing two entries. A "Control Box" on the right side of the table contains buttons for Show, Clone, Export, Delete, To SNS, CFEX, SpaceVal, Esub, and RS49/552. The status bar at the bottom shows the current database path, time, and date.

Notice id	Type	Adm./Org.	Orb. Pos.	Station name	Date rcv.	Status
000000001 [A]	S	SUI/		GVA-1	03/11/2014	01
000000011 [A]	S	MLT/		MLT-11	03/11/2014	01

Control Box:

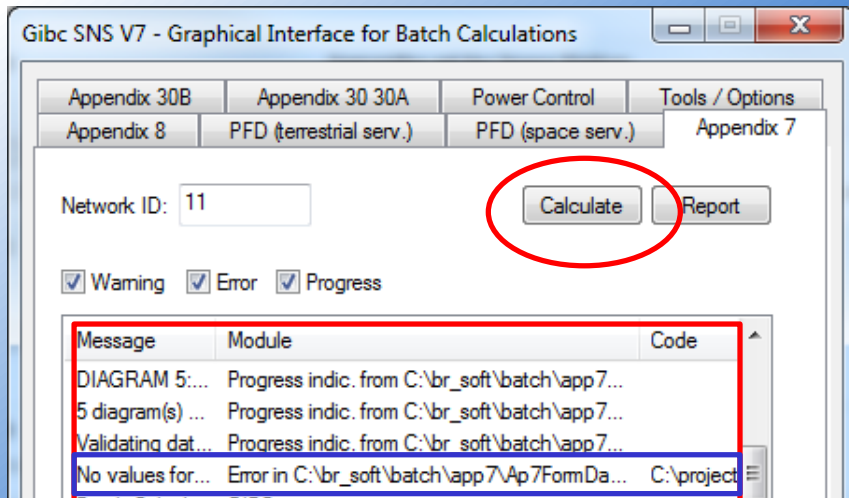
- Show
- Clone
- Export
- Delete
- To SNS
- CFEX
- SpaceVal
- Esub
- RS49/552

Current DB : C:\WRS-14\WRS\_14-ES-Coordination.mdb 5:36 PM 12/11/2014



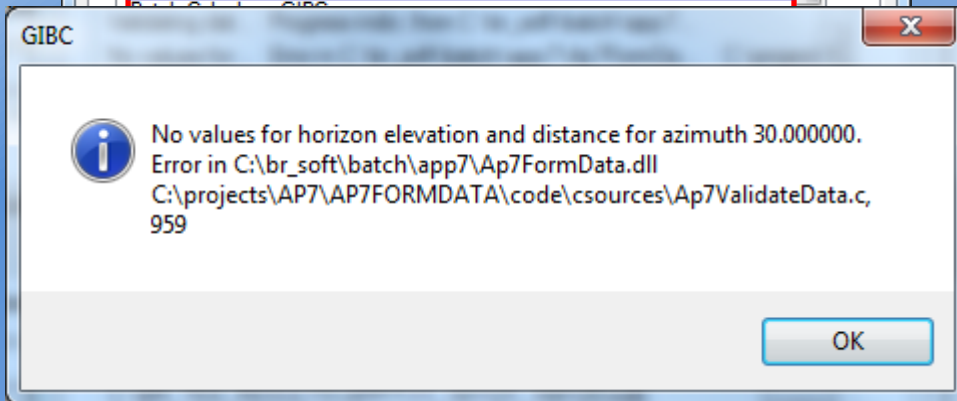


## GIBC - AP7 Calculation



### Selecting a database:

- Go to **Tools/ Options** page
- Use the **Browse** button to select the MS-Access file with coordination data



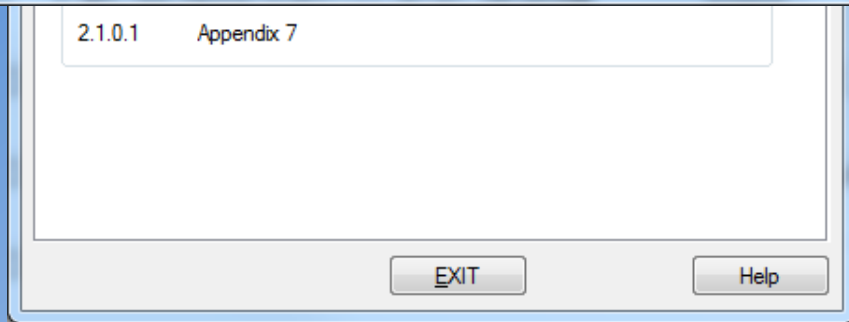
### Calculation:

- Go to **Appendix 7** page
- Enter ES **Network ID**

### To check progress of calculation:

Select **Warning \ Error \ Progress**

- Press **Calculate**





## Report Generation

Gibc SNS V7 - Graphical Interface for Batch Calculations

Appendix 30B	Appendix 30 30A	Power Control	Tools / Options
Appendix 8	PFD (terrestrial serv.)	PFD (space serv.)	Appendix 7

Network ID:

Warning  Error  Progress

Message	Module	Con
Probably affected c...	Progress indic. from C:\br_soft\batch\app7...	
Diagram #5: 'Diagra...	Progress indic. from C:\br_soft\batch\app7...	
Probably affected c...	Progress indic. from C:\br_soft\batch\app7...	
Store ntc_jd = 11 in ...	Progress indic. from C:\br_soft\batch\app7...	
Batch Calculation fi...	GIBC	

Calculation Output

Out DB:

RTF Report Generation

C:\BR\_TEX\_RESULTS\APP7\11\_141121\_145616.mdb

Print Auxiliary: Scale (km)

Version

2.1.0.1 Appendix 7

After each calculation, results automatically saved in a separate MS-Access file.

Results Directory:

**C:\BR\_TEX\_RESULTS\APP7**

Naming Convention:

**NetworkID\_Date\_Time.mdb**

Report Generation:

- Press **Report** button



# Exercise 1

## Report Generation – Tx ES

GIBC AP7

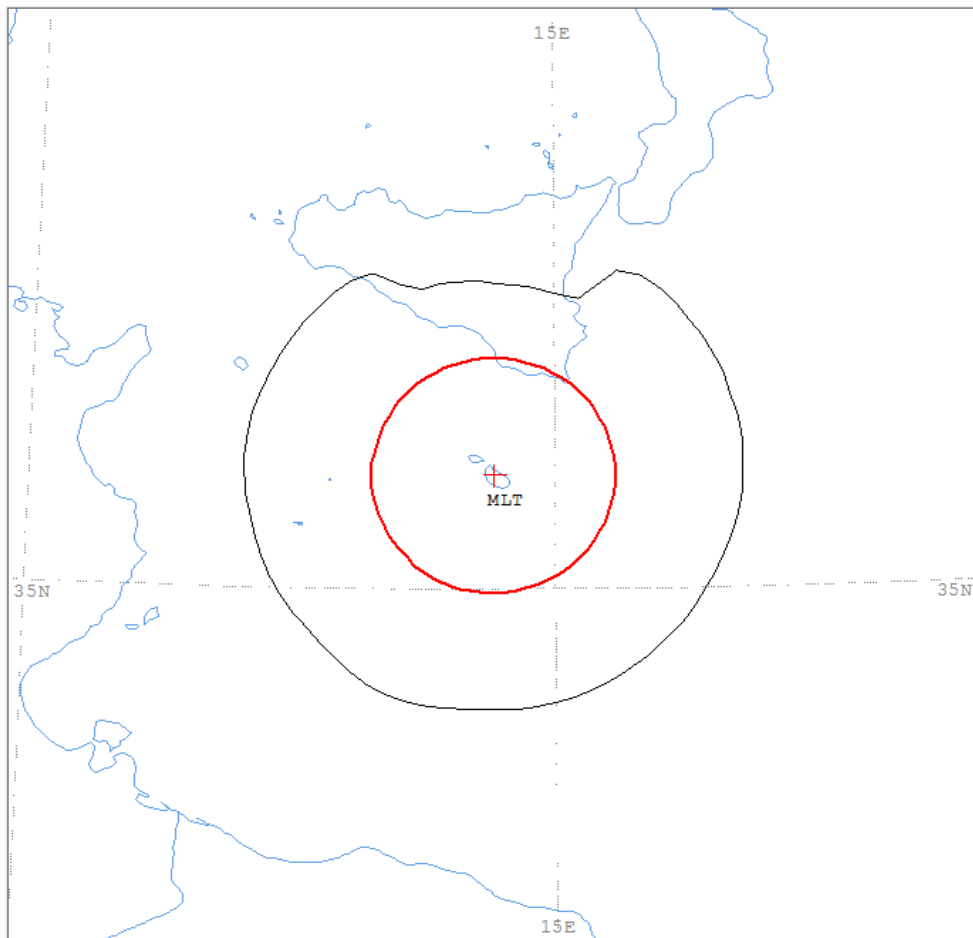


VERSION:2.1.0.1Appendix 7 Pack/Plt-2.0.0.4/Frm-2.0.0.1/Clc-2.0.0.0/Prp-1.2.0.0/SMS-2.0.0.0/AP7F-2.0.0.0/Ref-2.0.0.1

Diagram 4: 2.1\_TABLE7. TRANSMITTING GSO ES in FIXED-SATELLITE SERVICE W.R.T. RECEIVING TERRESTRIAL STATIONS. TS: fixed, mobile

Notice ID: 11  
Administration/Geographical area: MLT/MLT  
Satellite orbital position: -1.00  
Frequency band: 5965.00-5975.00 MHz

Earth station name: MLT-11  
Earth station position: 014E250035N5500  
Satellite name: INTELSAT8 359E



### Report-Graphics

Contains diagrams displaying:

- Title
- Details
- Coordination Contours
  - Main Mode 1 and Mode 2
  - Auxiliary Contours
- Country codes
- Legend

+ ES position  
— Main Mode1  
— Main Mode2



## Report Generation – Tx ES



ANALYSIS DATE AND TIME: 2014-11-20 10:01:13  
 VERSION: 2.1.0.1Appendix 7 Pack/Plt-2.0.0.4/Frm-2.0.0.1/Clc-2.0.0.0/Prp-1.2.0.0/SNS-2.0.0.0/AP7F-2.0.0.0/Ref-2.0.0.1

Diagram 4: 2.1\_TABLE7. TRANSMITTING GSO ES in FIXED-SATELLITE SERVICE W.R.T. RECEIVING TERRESTRIAL STATIONS. TS: fixed, mobile

NOTICE ID: 11 EARTH STATION NAME: MLT-11 EARTH STATION POSITION: 014E250035N5500PHASE: D  
 ADM/GEO AREA: MLT/MLT RAIN CLIMATICAL ZONE: K  
 SATELLITE NAME:INTELSAT8 359E SATELLITE ORBITAL POSITION: -1.00 DEG  
 ANTENNA AZIMUTH: 205.18 DEG ANTENNA ELEVATION: 45.22 DEG  
 FREQUENCY BAND:5965.00-5975.00 MHZ ASSIGNED FREQUENCY: 5970.00 MHZ PERCENTAGE OF TIME: 0.0050 %  
 MAXIMUM ANTENNA GAIN: 44.0 DBI MAXIMUM POWER DENSITY:-52.5 DBW/HZ NOISE TEMPERATURE: - K  
 ANTENNA PATTERN: APERECO25V01  
 2.1\_TABLE7 Model: PLM\_DUCTING

TRANSMISSION LOSS MODE 1: 160.5 DB (DOES NOT INCLUDE HOR. CORR. AND ANT. GAIN)  
 TRANSMISSION LOSS MODE 2: 114.5 DB

AZIMUTH	0	5	10	15	20	25	30	35	40	45	50	55	60
OFF-AXIS	129.6	131.4	132.8	133.9	134.5	134.8	134.6	134.0	132.9	131.5	129.7	127.7	125.6
HOR.ELEV.	-	-	-	-	-	-	-	-	-	-	-	-	-
HOR.CORR.	-	-	-	-	-	-	-	-	-	-	-	-	-
ANT.GAIN	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0
COORDINATION DISTANCE (KM)													
MODE 1													
0.0 DB	170	170	170	170	170	173	211	218	219	219	217	217	216
MODE 2													
0.0 DEG	104	104	104	104	104	104	104	104	104	104	104	104	104
AZIMUTH	120	125	130	135	140	145	150	155	160	165	170	175	180
OFF-AXIS	86.6	83.1	79.6	76.2	72.8	69.5	66.3	63.2	60.2	57.4	54.8	52.5	50.3
HOR.ELEV.	-	-	-	-	-	-	-	-	-	-	-	-	-
HOR.CORR.	-	-	-	-	-	-	-	-	-	-	-	-	-
ANT.GAIN	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0
COORDINATION DISTANCE (KM)													
MODE 1													
0.0 DB	208	208	208	208	208	208	209	209	210	210	210	211	210
MODE 2													
0.0 DEG	104	104	104	105	105	105	105	105	105	105	105	105	104
AZIMUTH	240	245	250	255	260	265	270	275	280	285	290	295	300
OFF-AXIS	54.7	57.2	60.0	63.0	66.1	69.3	72.6	75.9	79.4	82.8	86.4	89.9	93.4
HOR.ELEV.	-	-	-	-	-	-	-	-	-	-	-	-	-
HOR.CORR.	-	-	-	-	-	-	-	-	-	-	-	-	-
ANT.GAIN	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0
COORDINATION DISTANCE (KM)													
MODE 1													
0.0 DB	212	212	212	212	212	213	214	214	214	214	213	213	212
MODE 2													
0.0 DEG	105	105	105	105	105	105	105	105	104	104	104	104	104

PROBABLY AFFECTED COUNTRIES: I

### Report-Details

- Coordination distances at 72 azimuths (0-355 degrees in 5° steps)
- Calculation details
- Intermediate data
- List of affected countries

## Report Generation – Rx ES

Diagram 3: 2.1\_TABLE8. RECEIVING GSO ES in FIXED-SATELLITE SERVICE W.R.T. TRANSMITTING TERRESTRIAL STATIONS. TS: fixed, mobile

Notice ID: 11

Administration/Geographical area: MLT/MLT

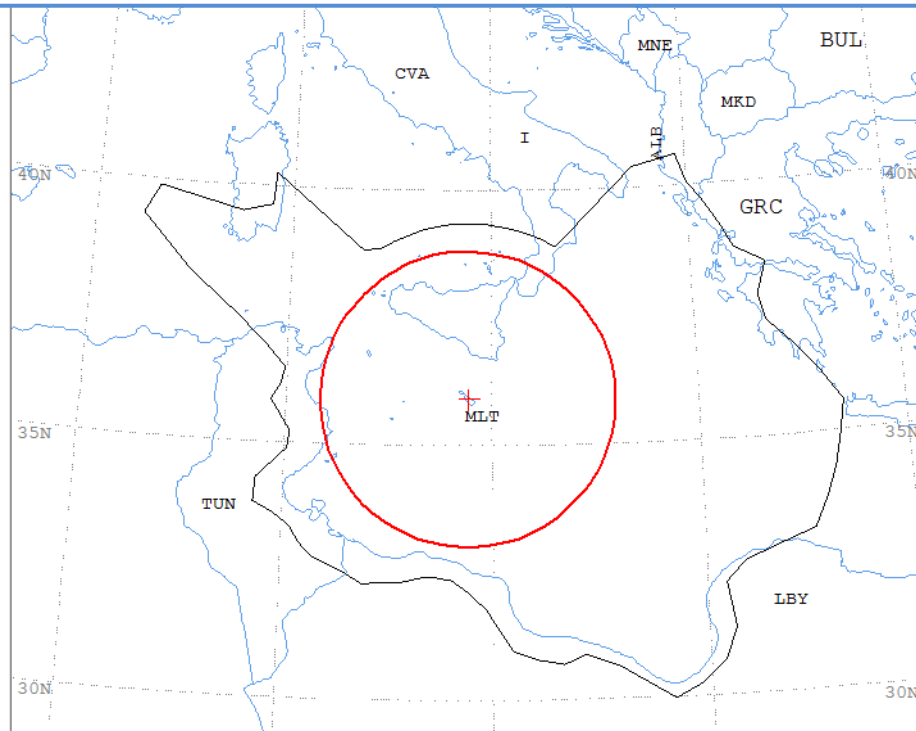
Satellite orbital position: -1.00

Frequency band: 4045.00-4055.00 MHz

Earth station name: MLT-11

Earth station position: 014E250035N5500

Satellite name: INTELSAT8 359E



Scale: 1019.00 Km (default)

- ES position
- Main Model1
- Main Mode2



# Exercise 1



## Report Generation – Rx ES

ANALYSIS DATE AND TIME: 2014-11-20 10:01:13  
 VERSION: 2.1.0.1Appendix 7 Pack/Plt-2.0.0.4/Frm-2.0.0.1/Clc-2.0.0.0/Prp-1.2.0.0/SNS-2.0.0.0/AP7F-2.0.0.0/Ref-2.0.0.1

Diagram 3: 2.1\_TABLE8. RECEIVING GSO ES in FIXED-SATELLITE SERVICE W.R.T. TRANSMITTING TERRESTRIAL STATIONS. TS: fixed, mobile

NOTICE ID: 11 EARTH STATION NAME: MLT-11 EARTH STATION POSITION: 014E250035N5500PHASE: D  
 ADM/GEO AREA: MLT/MLT RAIN CLIMATICAL ZONE: K  
 SATELLITE NAME:INTELSAT8 359E SATELLITE ORBITAL POSITION: -1.00 DEG  
 ANTENNA AZIMUTH: 205.18 DEG ANTENNA ELEVATION: 45.22 DEG  
 FREQUENCY BAND:4045.00-4055.00 MHZ ASSIGNED FREQUENCY: 4050.00 MHZ PERCENTAGE OF TIME: 0.0017 %  
 MAXIMUM ANTENNA GAIN: 44.0 DBI MAXIMUM POWER DENSITY: - DBW/HZ NOISE TEMPERATURE: 150.0 K  
 ANTENNA PATTERN: APEREC015V01  
 2.1\_TABLE8 Model: PLM\_DUCTING

TRANSMISSION LOSS MODE 1: 203.2 DB (DOES NOT INCLUDE HOR. CORR. AND ANT. GAIN)  
 TRANSMISSION LOSS MODE 2: 161.2 DB

	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115												
AZIMUTH	129.6	131.4	132.8	133.9	134.5													107.7	107.4	104.1	100.6	97.2	93.6	90.1												
OFF-AXIS	-	-	-	-	-													-	-	-	-	-	-	-	-											
HOR.ELEV.	-	-	-	-	-													-	-	-	-	-	-	-	-											
HOR.CORR.	-	-	-	-	-													-	-	-	-	-	-	-	-											
ANT.GAIN	-10.0	-10.0	-10.0	-10.0	-10.0													10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0											
COORDINATION DISTANCE (KM)																																				
MODE 1																		770	819	818	816	812	810	748												
0.0 DB	382	382	382	382	382																															
MODE 2																		322	322	322	322	323	323	323												
0.0 DEG	321	321	321	321	321																															
AZIMUTH	120	125	130	135	140													205	210	215	220	225	230	235												
OFF-AXIS	86.6	83.1	79.6	76.2	72.8													45.2	45.4	46.0	47.1	48.5	50.3	52.3												
HOR.ELEV.	-	-	-	-	-													-	-	-	-	-	-	-	-											
HOR.CORR.	-	-	-	-	-													-	-	-	-	-	-	-	-											
ANT.GAIN	-10.0	-10.0	-10.0	-10.0	-10.0													-9.4	-9.4	-9.6	-9.8	-10.0	-10.0	-10.0	-10.0											
COORDINATION DISTANCE (KM)																																				
MODE 1																		795	671	615	616	590	560	460	422	398	398	405	425	442	466	466	474	485	484	481
0.0 DB	702	691	768	799	804																															
MODE 2																		324	324	324	324	324	324	324	324	324	324	324	324	324	324	324	324	324	324	324
0.0 DEG	323	323	323	323	323																															
AZIMUTH	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355												
OFF-AXIS	54.7	57.2	60.0	63.0	66.1	69.3	72.6	75.9	79.4	82.8	86.4	89.9	93.4	96.9	100.4	103.8	107.2	110.5	113.7	116.8	119.8	122.6	125.2	127.5												
HOR.ELEV.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
HOR.CORR.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
ANT.GAIN	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0											
COORDINATION DISTANCE (KM)																																				

Save the Report (rtf file) with a specific name.  
 Ap7Print.rtf file is rewritten each time.  
 If the file is locked you will get an error message.

PROBABLY AFFECTED COUNTRIES: ALB GRC I LBY TUN

382  
322



# Exercise 2

SpaceCap

## Effect of the Horizon elevation angles



The screenshot shows the SpaceCapture V7 software interface. The window title is "SpaceCapture V7 - [Set Notice Template]". The menu bar includes "File", "Edit", "Tools", "Template", "Window", and "Help". The toolbar contains various icons for file operations and navigation. Below the toolbar, there are several buttons labeled "CR/NOTIF", "API", "RAST", "PLAN", and "RS49/552".

The main workspace is titled "Start Page - AP4/II and AP4/III". On the left side, there is a vertical toolbar with icons and labels for "SpaceCap", "Start Page", "Notice Explorer", "Open Notice", "New Notice", and "Search".

In the main workspace, there is a label "Transaction Id:" followed by a text input field containing the value "11".

At the bottom of the window, there is a status bar with the text "Current DB : C:\WRS-14\WRS\_14-ES-Coordination.mdb", a message "Click on Notice Explorer to see a list of Notices, or New Notice to create one.", and a page number "10".





# Exercise 2

## GIBC – AP7 Calculation

## GIBC AP7



Gibc SNS V7 - Graphical Interface for Batch Calculations

Appendix 30B    Appendix 30 30A    Power Control    Tools / Options  
Appendix 8    PFD (terrestrial serv.)    PFD (space serv.)    Appendix 7

Network ID:        

Warning     Error     Progress

Message	Module	Code
Probably affected countries for diagram #4:...	Progress indi...	
Diagram #5: 'Diagram 5: 2.1_TABLE8' bein...	Progress indi...	
Probably affected countries for diagram #5:...	Progress indi...	
Store ntc_id = 11 in ESCC database...	Progress indi...	
Batch Calculation finished OK at 15:10:47 ...	GIBC	

Calculation Output

Out DB: C:\NBR\_TEX\_RESULTS\APP7\11\_141121\_151046.mdb

RTF Report Generation

C:\NBR\_TEX\_RESULTS\APP7\11\_141121\_151046.mdb   

Print Auxiliary    Scale (km)

Version

2.1.0.1    Appendix 7





# Exercise 2

# GIBC AP7

## Report Generation – Tx ES

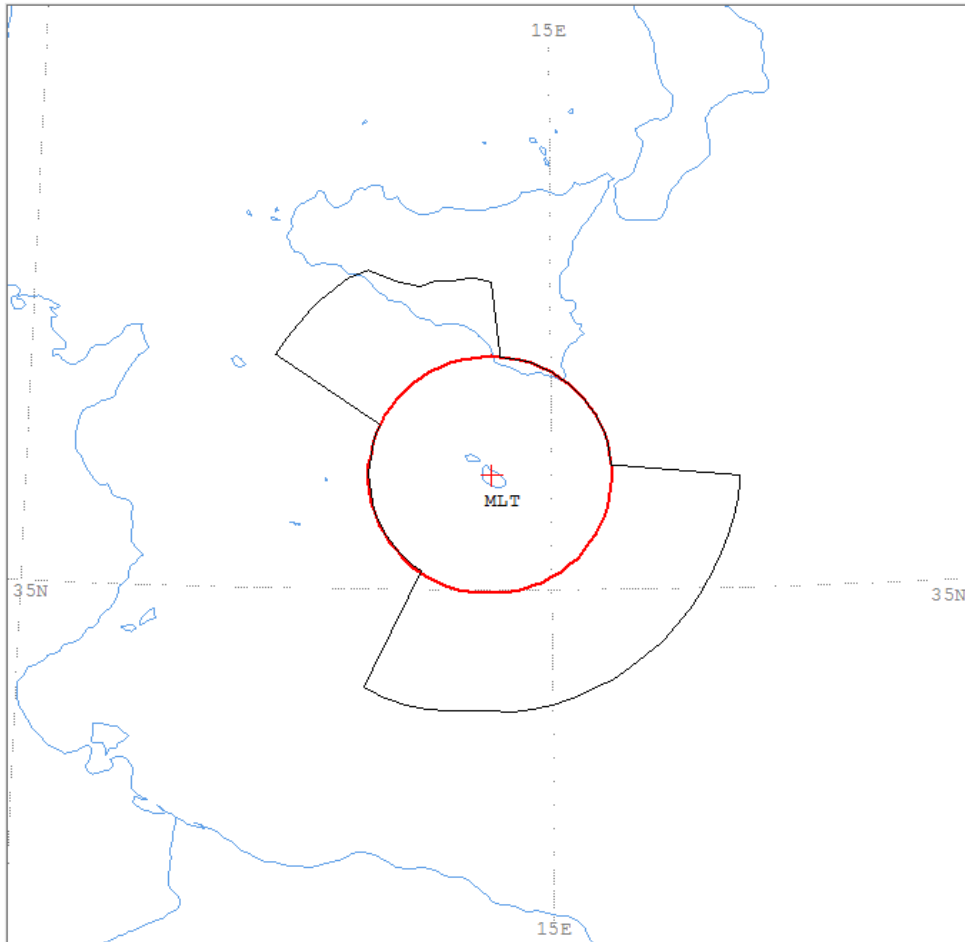


VERSION:2.1.0.1Appendix 7 Pack/Plt-2.0.0.4/Frm-2.0.0.1/Cic-2.0.0.0/Prp-1.2.0.0/SNS-2.0.0.0/AP7F-2.0.0.0/Ref-2.0.0.1

Diagram 4: 2.1 TABLE7. TRANSMITTING GSO ES in FIXED-SATELLITE SERVICE W.R.T. RECEIVING TERRESTRIAL STATIONS. IS: fixed, mobile

Notice ID: 11  
Administration/Geographical area: MLT/MLT  
Satellite orbital position: -1.00  
Frequency band: 5965.00-5975.00 MHz

Earth station name: MLT-11  
Earth station position: 014E250035N5500  
Satellite name: INTELSAT8 359E



+ ES position  
— Main Mode 1  
— Main Mode 2



## Report Generation – Tx ES

ANALYSIS DATE AND TIME: 2014-11-20 10:50:38  
 VERSION: 2.1.0.1Appendix 7 Pack/Plt-2.0.0.4/Frm-2.0.0.1/Clc-2.0.0.0/Prp-1.2.0.0/SNS-2.0.0.0/AP7F-2.0.0.0/Ref-2.0.0.1

Diagram 4: 2.1\_TABLE7. TRANSMITTING GSO ES in FIXED-SATELLITE SERVICE W.R.T. RECEIVING TERRESTRIAL STATIONS. TS: fixed, mobile

NOTICE ID: 11 EARTH STATION NAME: MLT-11 EARTH STATION POSITION: 014E250035N5500PHASE: D  
 ADM/GEO AREA: MLT/MLT RAIN CLIMATICAL ZONE: K  
 SATELLITE NAME:INTELSAT8 359E SATELLITE ORBITAL POSITION: -1.00 DEG  
 ANTENNA AZIMUTH: 205.18 DEG ANTENNA ELEVATION: 45.22 DEG  
 FREQUENCY BAND:5965.00-5975.00 MHZ ASSIGNED FREQUENCY: 5970.00 MHZ PERCENTAGE OF TIME: 0.0050 %  
 MAXIMUM ANTENNA GAIN: 44.0 DBI MAXIMUM POWER DENSITY:-52.5 DBW/HZ NOISE TEMPERATURE: - K  
 ANTENNA PATTERN: APEREC025V01  
 2.1\_TABLE7 Model: PLM\_DUCTING

TRANSMISSION LOSS MODE 1: 160.5 DB (DOES NOT INCLUDE HOR. CORR. AND ANT. GAIN)  
 TRANSMISSION LOSS MODE 2: 114.5 DB

AZIMUTH	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115		
OFF-AXIS	129.6	130.8	131.5	131.9	132.9	133.4	133.6	132.3	130.7	128.7	127.6	126.2	124.5	121.6	118.6	115.4	112.9	110.2	107.4	104.1	100.6	97.2	93.6	90.1		
HOR.ELEV.	0.0	0.7	1.3	2.0	1.7	1.3	1.0	1.7	2.3	3.0	2.3	1.7	1.0	1.3	1.7	2.0	1.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0		
HOR.CORR.	0.0	19.6	26.3	30.9	28.7	26.3	23.4	28.7	32.3	33.0	32.3	28.7	23.4	26.3	28.7	30.9	26.3	19.6	0.0	0.0	0.0	0.0	0.0	0.0		
ANT.GAIN	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0		
COORDINATION DISTANCE (KM)																										
MODE 1	0.0 DB	170	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	214	213	212	210	209	208		
MODE 2	0.0 DEG	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104		
AZIMUTH	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235		
OFF-AXIS	86.6	83.1	79.6	76.2	72.8	69.5	66.3	63.2	60.2	57.4	54.8	52.5	50.4	48.6	47.2	46.1	45.5	45.2	45.4	45.7	46.4	47.6	49.0	50.8		
HOR.ELEV.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7	1.0	1.3	1.7		
HOR.CORR.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.0	19.6	23.4	26.3	28.7		
ANT.GAIN	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-9.8	-9.6	-9.4	-9.4	-9.4	-9.5	-9.7	-9.9	-10.0	-10.0		
COORDINATION DISTANCE (KM)																										
MODE 1	0.0 DB	208	208	208	208	208	209	209	210	210	210	211	209	210	212	214	216	217	217	104	104	104	104	104		
MODE 2	0.0 DEG	104	104	104	105	105	105	105	105	105	105	105	105	105	105	106	106	106	106	106	106	105	105	105		
AZIMUTH	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355		
OFF-AXIS	52.9	55.3	57.9	60.6	63.5	66.5	69.6	73.5	77.5	81.4	85.4	89.4	93.4	96.9	100.4	103.8	107.2	110.5	113.7	116.8	119.8	122.6	125.2	127.5		
HOR.ELEV.	2.0	2.3	2.7	3.0	3.3	3.7	4.0	3.3	2.7	2.0	1.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
HOR.CORR.	30.9	32.3	32.7	33.0	33.3	33.7	34.0	33.3	32.7	30.9	26.3	19.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
ANT.GAIN	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0		
COORDINATION DISTANCE (KM)																										
MODE 1	0.0 DB	104	104	104	104	104	104	104	104	104	104	104	212	212	212	212	212	212	208	187	176	177	174	174		
MODE 2	0.0 DEG	105	105	105	105	105	105	105	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104		

PROBABLY AFFECTED COUNTRIES: I



# Exercise 2

# GIBC AP7

## Report Generation – Rx ES

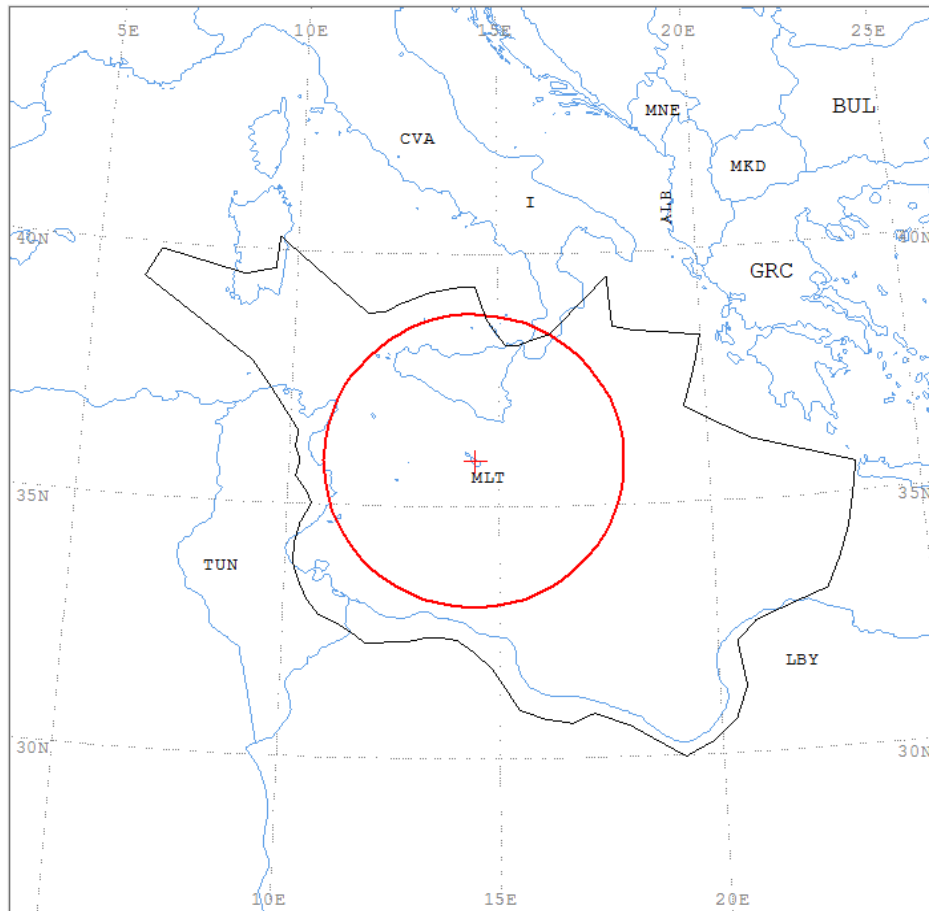


VERSION:2.1.0.1Appendix 7 Pack/Plt-2.0.0.4/Frm-2.0.0.1/Clc-2.0.0.0/Prp-1.2.0.0/SNS-2.0.0.0/AP7F-2.0.0.0/Ref-2.0.0.1

Diagram 3: 2.1\_TABLE8. RECEIVING GSO ES in FIXED-SATELLITE SERVICE W.R.T. TRANSMITTING TERRESTRIAL STATIONS. TS: Fixed, mobile

Notice ID: 11  
Administration/Geographical area: MLT/MLT  
Satellite orbital position: -1.00  
Frequency band: 4045.00-4055.00 MHz

Earth station name: MLT-11  
Earth station position: 014E250035N5500  
Satellite name: INTELSAT8 359E



+ ES position  
— Main Mode1  
— Main Mode2



# Exercise 2

# GIBC AP7

## Report Generation – Rx ES



ANALYSIS DATE AND TIME: 2014-11-20 10:50:38  
 VERSION: 2.1.0.1Appendix 7 Pack/Plt-2.0.0.4/Frm-2.0.0.1/Clc-2.0.0.0/Prp-1.2.0.0/SNS-2.0.0.0/AP7F-2.0.0.0/Ref-2.0.0.1

Diagram 3: 2.1\_TABLE8. RECEIVING GSO ES in FIXED-SATELLITE SERVICE W.R.T. TRANSMITTING TERRESTRIAL STATIONS. TS: fixed, mobile

NOTICE ID: 11 EARTH STATION NAME: MLT-11 EARTH STATION POSITION: 014E250035N5500PHASE: D  
 ADM/GEO\_AREA: MLT/MLT RAIN CLIMATICAL\_ZONE: K  
 SATELLITE NAME:INTELSAT8 359E SATELLITE ORBITAL POSITION: -1.00 DEG  
 ANTENNA AZIMUTH: 205.18 DEG ANTENNA ELEVATION: 45.22 DEG  
 FREQUENCY BAND:4045.00-4055.00 MHZ ASSIGNED FREQUENCY: 4050.00 MHZ PERCENTAGE OF TIME: 0.0017 %  
 MAXIMUM ANTENNA GAIN: 44.0 DBI MAXIMUM POWER DENSITY: - DBW/HZ NOISE TEMPERATURE: 150.0 K  
 ANTENNA PATTERN: APEREC015V01  
 2.1\_TABLE8 Model: PLM\_DUCTING

TRANSMISSION LOSS MODE 1: 203.2 DB (DOES NOT INCLUDE HOR. CORR. AND ANT. GAIN)  
 TRANSMISSION LOSS MODE 2: 161.2 DB

AZIMUTH	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115
OFF-AXIS	129.6	130.8	131.5	131.9	132.9	133.4	133.6	132.3	130.7	128.7	127.6	126.2	124.5	121.6	118.6	115.4	112.9	110.2	107.4	104.1	100.6	97.2	93.6	90.1
HOR.ELEV.	0.0	0.7	1.3	2.0	1.7	1.3	1.0	1.7	2.3	3.0	2.3	1.7	1.0	1.3	1.7	2.0	1.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0
HOR.CORR.	0.0	18.0	24.5	28.8	26.8	24.5	21.6	26.8	30.6	33.0	30.6	26.8	21.6	24.5	26.8	28.8	24.5	18.0	0.0	0.0	0.0	0.0	0.0	0.0
ANT.GAIN	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0

COORDINATION DISTANCE (KM)

MODE 1	0.0 DB	382	310	281	260	269	292	321	495	450	420	447	494	558	523	492	467	521	598	819	818	816	812	810	748
MODE 2	0.0 DEG	321	321	321	321	321	321	321	321	321	321	321	322	322	322	322	322	322	322	322	322	322	323	323	323

AZIMUTH	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235
OFF-AXIS	86.6	83.1	79.6	76.2	72.8	69.5	66.3	63.2	60.2	57.4	54.8	52.5	50.4	48.6	47.2	46.1	45.5	45.2	45.4	45.7	46.4	47.6	49.0	50.8
HOR.ELEV.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7	1.0	1.3	1.7
HOR.CORR.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.6	18.0	21.6	24.5	26.8
ANT.GAIN	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-9.8	-9.6	-9.4	-9.4	-9.4	-9.5	-9.7	-9.9	-10.0	-10.0

COORDINATION DISTANCE (KM)

MODE 1	0.0 DB	702	691	768	799	804	795	671	615	616	590	560	460	422	398	398	405	425	442	466	460	466	475	471	461
MODE 2	0.0 DEG	323	323	323	323	323	324	324	324	324	324	324	324	324	324	324	324	324	324	324	324	324	324	324	324

AZIMUTH	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355
OFF-AXIS	52.9	55.3	57.9	60.6	63.5	66.5	69.6	73.5	77.5	81.4	85.4	89.4	93.4	96.9	100.4	103.8	107.2	110.5	113.7	116.8	119.8	122.6	125.2	127.5
HOR.ELEV.	2.0	2.3	2.7	3.0	3.3	3.7	4.0	3.3	2.7	2.0	1.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HOR.CORR.	28.8	30.6	32.3	33.0	33.3	33.7	34.0	33.3	32.3	28.8	24.5	18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ANT.GAIN	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0

COORDINATION DISTANCE (KM)

MODE 1	0.0 DB	450	429	398	362	368	385	376	386	383	416	463	523	816	816	641	601	646	398	380	380	380	381	381	382
MODE 2	0.0 DEG	324	324	324	324	324	324	323	323	323	323	323	323	323	323	322	322	322	322	322	322	322	322	322	322

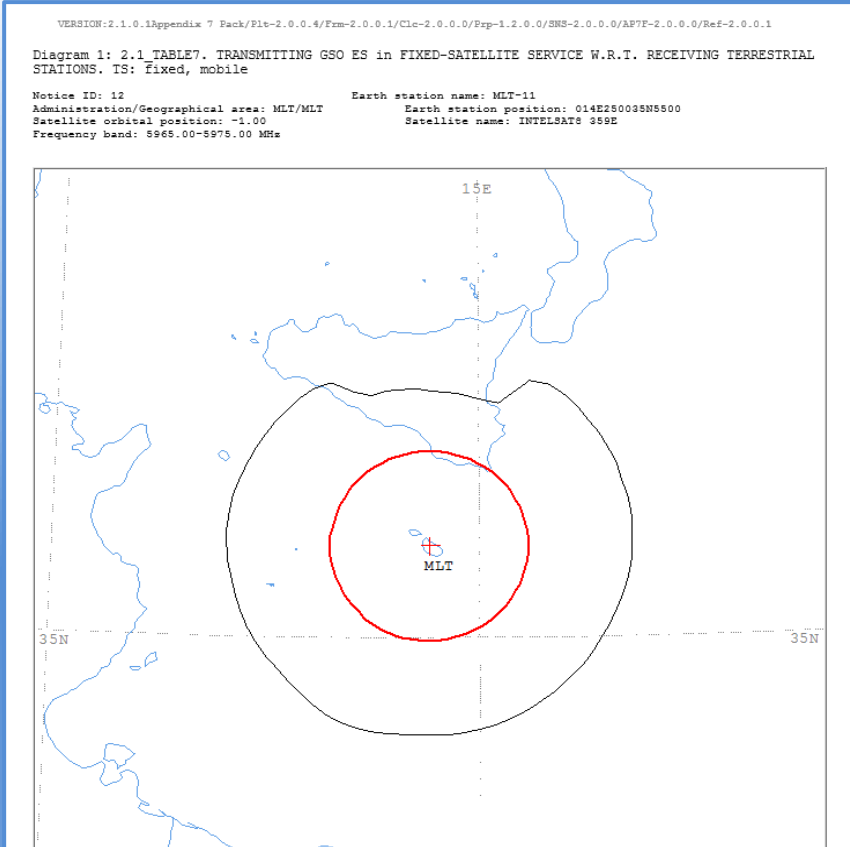
PROBABLY AFFECTED COUNTRIES: I LBY TUN



# Compare the results - Tx ES in C-band



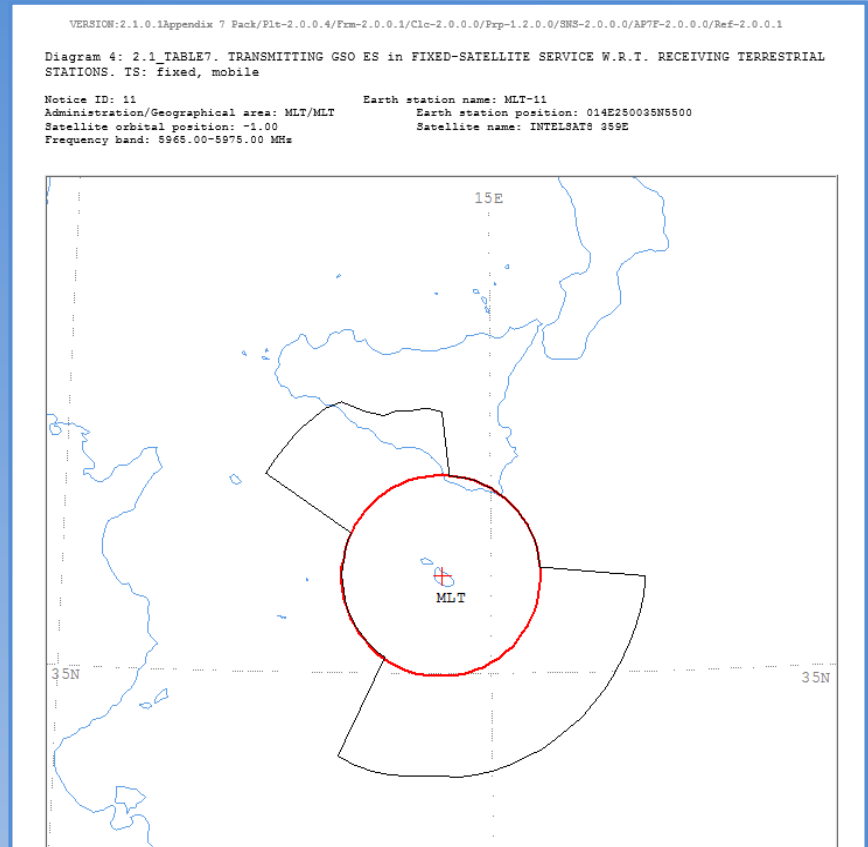
TRANSMITTING GSO ES in FIXED-SATELLITE SERVICE W.R.T.  
RECEIVING TERRESTRIAL STATIONS. TS: fixed, mobile



**With zero degree horizon elevation angle**

PROBABLY AFFECTED COUNTRIES:

I



**With non-zero degree horizon elevation angle**

PROBABLY AFFECTED COUNTRIES:

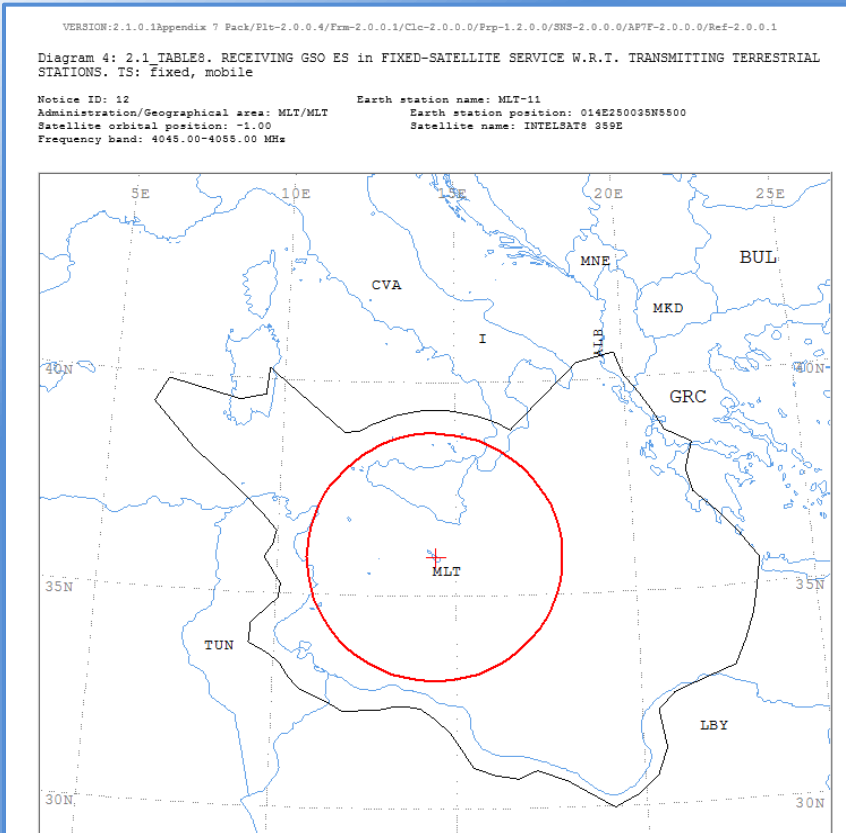
I



# Compare the results – Rx ES in C-band



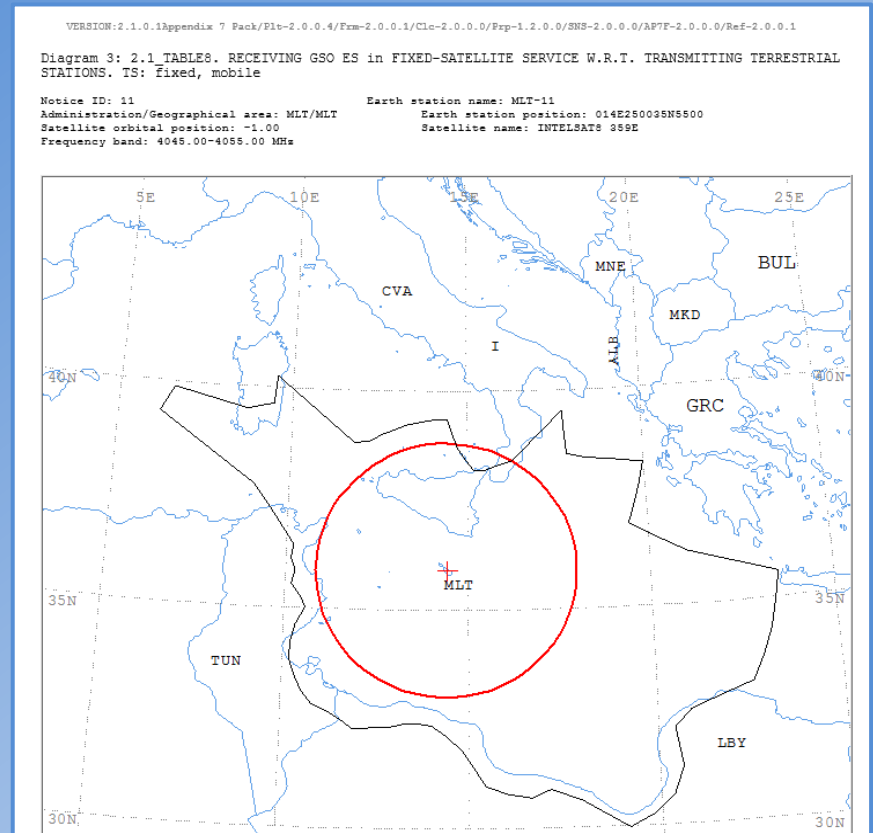
## RECEIVING GSO ES in FIXED-SATELLITE SERVICE W.R.T. TRANSMITTING TERRESTRIAL STATIONS. TS: fixed mobile



**With zero degree horizon elevation angle**

PROBABLY AFFECTED COUNTRIES:

ALB GRC I LBY TUN

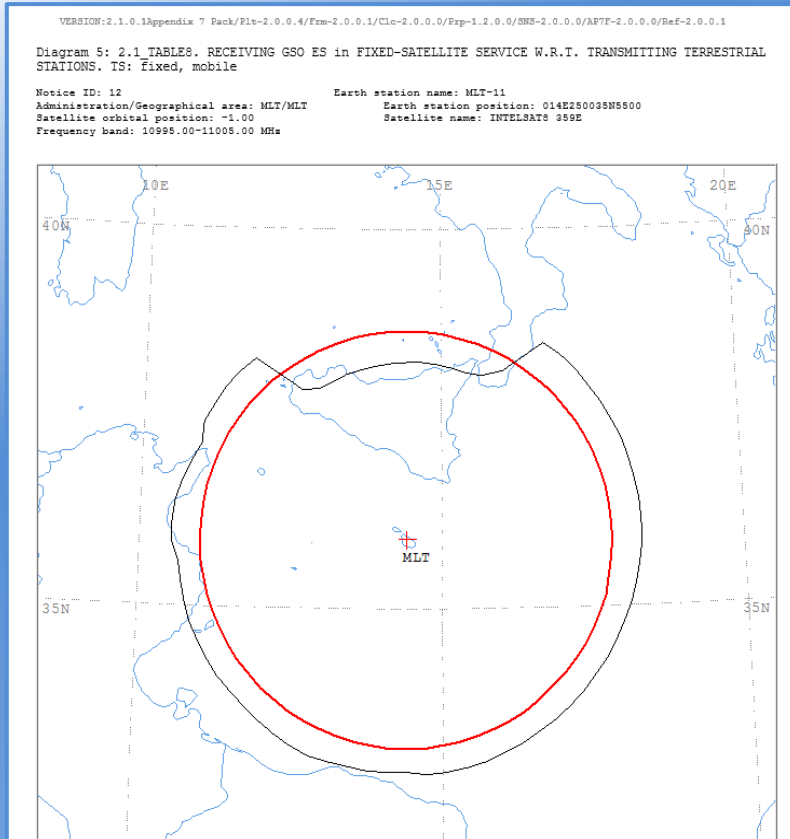


**With non-zero degree horizon elevation angle**

PROBABLY AFFECTED COUNTRIES:

I LBY TUN

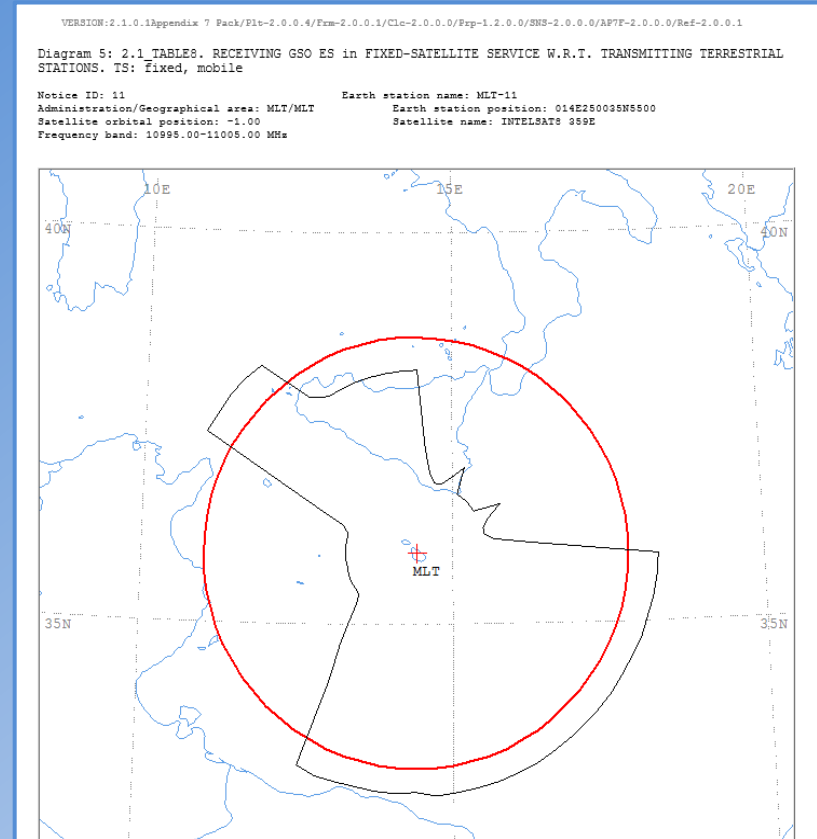
RECEIVING GSO ES in FIXED-SATELLITE SERVICE W.R.T.  
TRANSMITTING TERRESTRIAL STATIONS. TS: fixed mobile



**With zero degree  
horizon elevation angle**

PROBABLY AFFECTED COUNTRIES:

I TUN



**With non-zero degree  
horizon elevation angle**

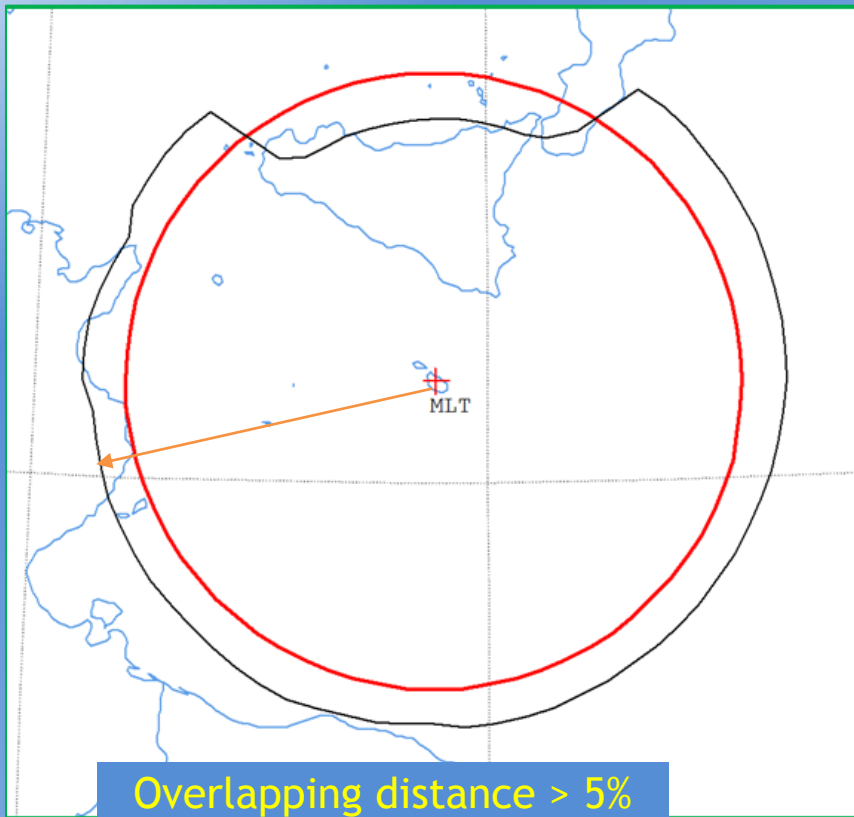
PROBABLY AFFECTED COUNTRIES:

I TUN

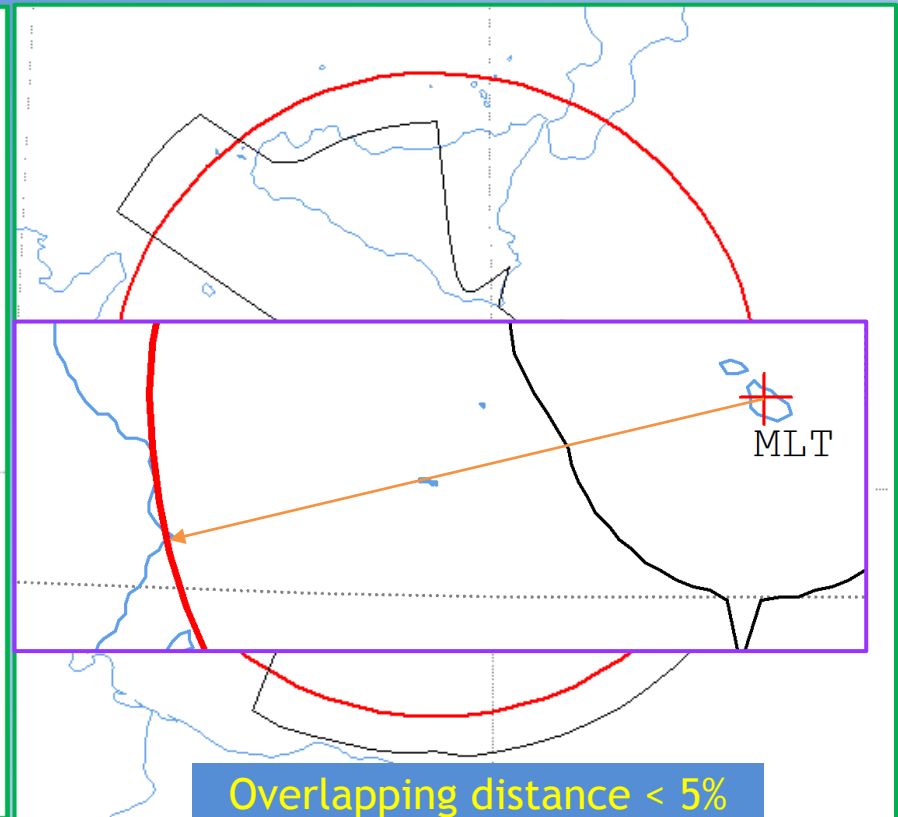


## Rules of Procedure (Appendix 7):

No coordination is required when the overlapping distance is less than 5% of the coordination distance.



Overlapping distance > 5%  
0-elevation angle



Overlapping distance < 5%  
Non 0-elevation angle

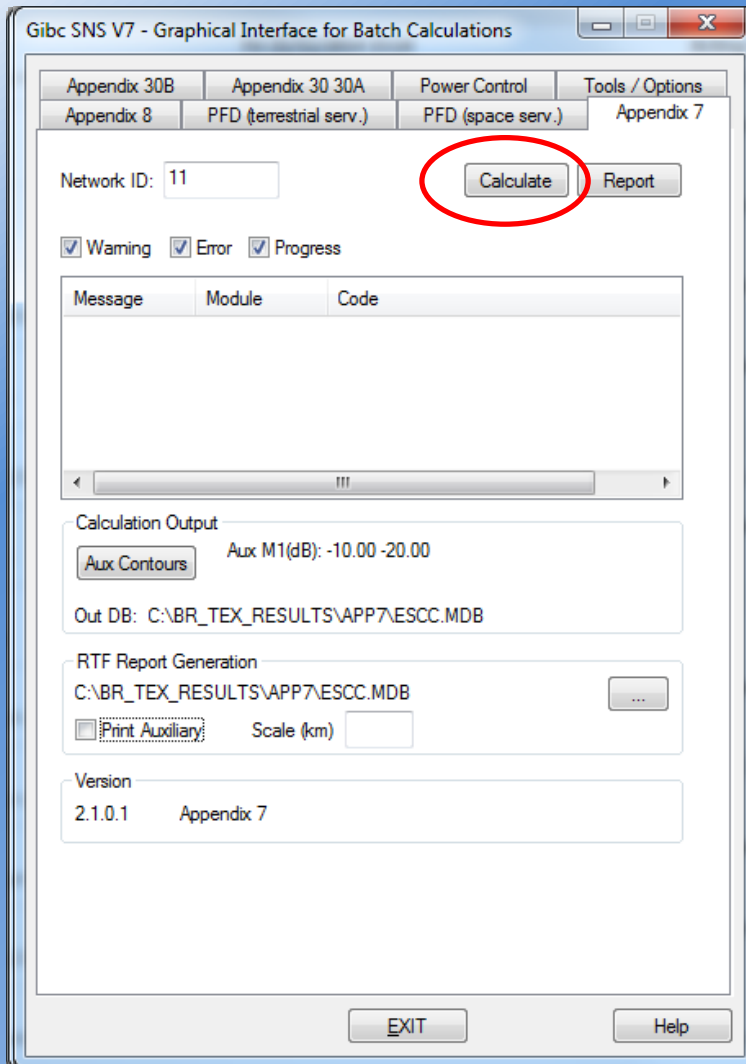


## Auxiliary Contours



Auxiliary Mode 1 : Reduced required loss expressed in dB

Auxiliary Mode 2 : Angular offset between beams expressed in degrees



Gibc SNS V7 - Graphical Interface for Batch Calculations

Appendix 30B   Appendix 30 30A   Power Control   Tools / Options  
 Appendix 8   PFD (terrestrial serv.)   PFD (space serv.)   Appendix 7

Network ID: 11   **Calculate**   Report

Warning    Error    Progress

Message	Module	Code

Calculation Output

**Aux Contours**   Aux M1(dB): -10.00 -20.00

Out DB: C:\BR\_TEX\_RESULTS\APP7\ESCC.MDB

RTF Report Generation

C:\BR\_TEX\_RESULTS\APP7\ESCC.MDB   ...

Print Auxiliary   Scale (km)  

Version

2.1.0.1   Appendix 7

EXIT   Help

### Producing auxiliary contours:

- Go to **Tools/ Options** page
- Select **WRS\_14 – ES -Coordination** database
- Go to **Appendix 7** page
- Select the **Network ID 11**
- Press **Aux Contours** button
- Enter the values in the lists:
  - Mode 1 (dB)**
  - 10 dB
  - 20 dB
- Press **Calculate**



# Auxiliary Contours - Printing

# GIBC AP7



Gibc SNS V7 - Graphical Interface for Batch Calculations

Appendix 30B   Appendix 30 30A   Power Control   Tools / Options  
Appendix 8   PFD (terrestrial serv.)   PFD (space serv.)   Appendix 7

Network ID:    Calculate   Report

Warning    Error    Progress

Message	Module	Code
Calling batch print at 15:43:19...	GIBC	
Batch printing finished OK at 15:43:20 from...	GIBC	

Calculation Output  
   Aux M1(dB): -10.00 -20.00  
Out DB: C:\BR\_TEX\_RESULTS\APP7\11\_141121\_153931.mdb

RTF Report Generation  
C:\BR\_TEX\_RESULTS\APP7\11\_141121\_153931.mdb     
 Print Auxiliary   Scale (km)

Version  
2.1.0.1   Appendix 7

## Printing Auxiliary contours:

- Select **Print Auxiliary**
- Press **Report**



# Auxiliary Contours

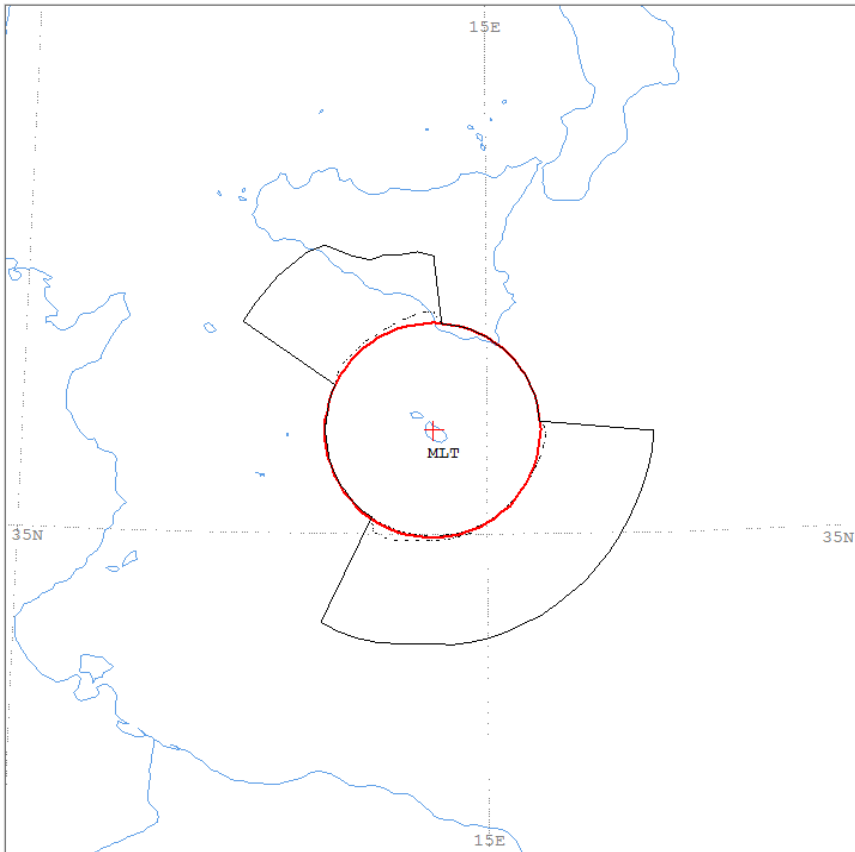
# GIBC AP7



VERSION:2.1.0.1Appendix 7 Pack/Flt-2.0.0.4/Frm-2.0.0.1/Clc-2.0.0.0/Prp-1.2.0.0/SNS-2.0.0.0/AP7F-2.0.0.0/Ref-2.0.0.1

Diagram 4: 2.1\_TABLE7. TRANSMITTING GSO ES in FIXED-SATELLITE SERVICE W.R.T. RECEIVING TERRESTRIAL STATIONS. TS: Fixed, mobile

Notice ID: 11 Earth station name: MLT-11  
 Administration/Geographical area: MLT/MLT Earth station position: 014E250035N5500  
 Satellite orbital position: -1.00 Satellite name: INTELSAT8 359E  
 Frequency band: 5965.00-5975.00 MHz



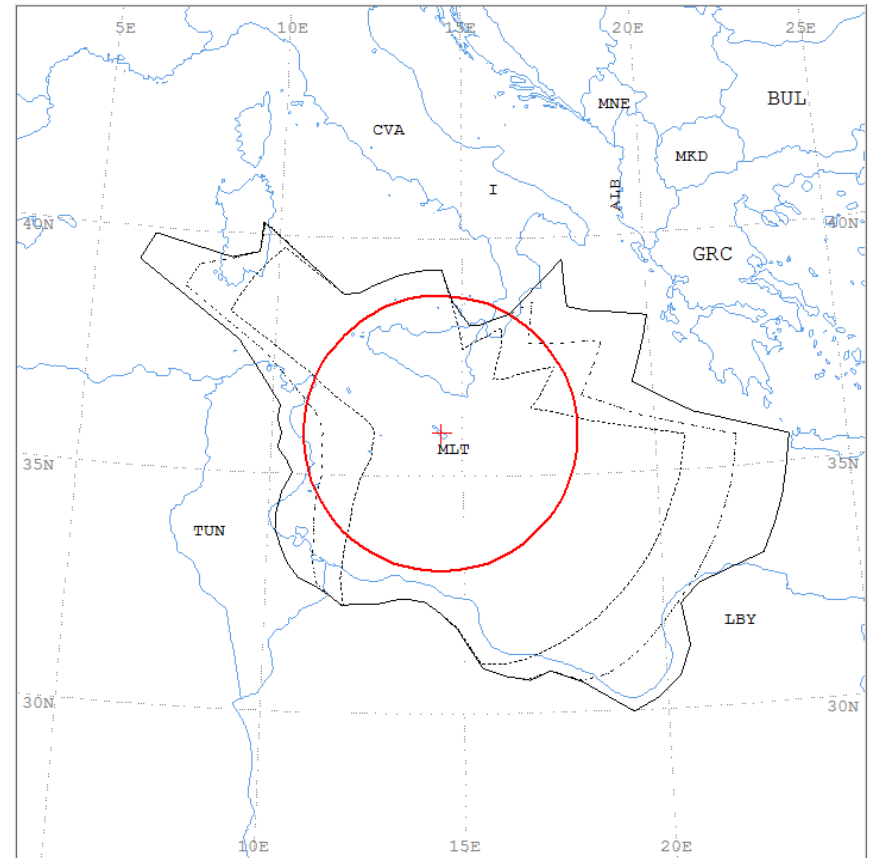
Scale: 417.00 Km (default)

+ ES position  
 — Main Model  
 — Main Mode2  
 - - - - - Aux. Model -10.0dB  
 - - - - - Aux. Model -20.0dB

VERSION:2.1.0.1Appendix 7 Pack/Flt-2.0.0.4/Frm-2.0.0.1/Clc-2.0.0.0/Prp-1.2.0.0/SNS-2.0.0.0/AP7F-2.0.0.0/Ref-2.0.0.1

Diagram 3: 2.1\_TABLE8. RECEIVING GSO ES in FIXED-SATELLITE SERVICE W.R.T. TRANSMITTING TERRESTRIAL STATIONS. TS: Fixed, mobile

Notice ID: 11 Earth station name: MLT-11  
 Administration/Geographical area: MLT/MLT Earth station position: 014E250035N5500  
 Satellite orbital position: -1.00 Satellite name: INTELSAT8 359E  
 Frequency band: 4045.00-4055.00 MHz



Scale: 1019.00 Km (default)

+ ES position  
 — Main Model  
 — Main Mode2  
 - - - - - Aux. Model -10.0dB  
 - - - - - Aux. Model -20.0dB



# Questions?

