

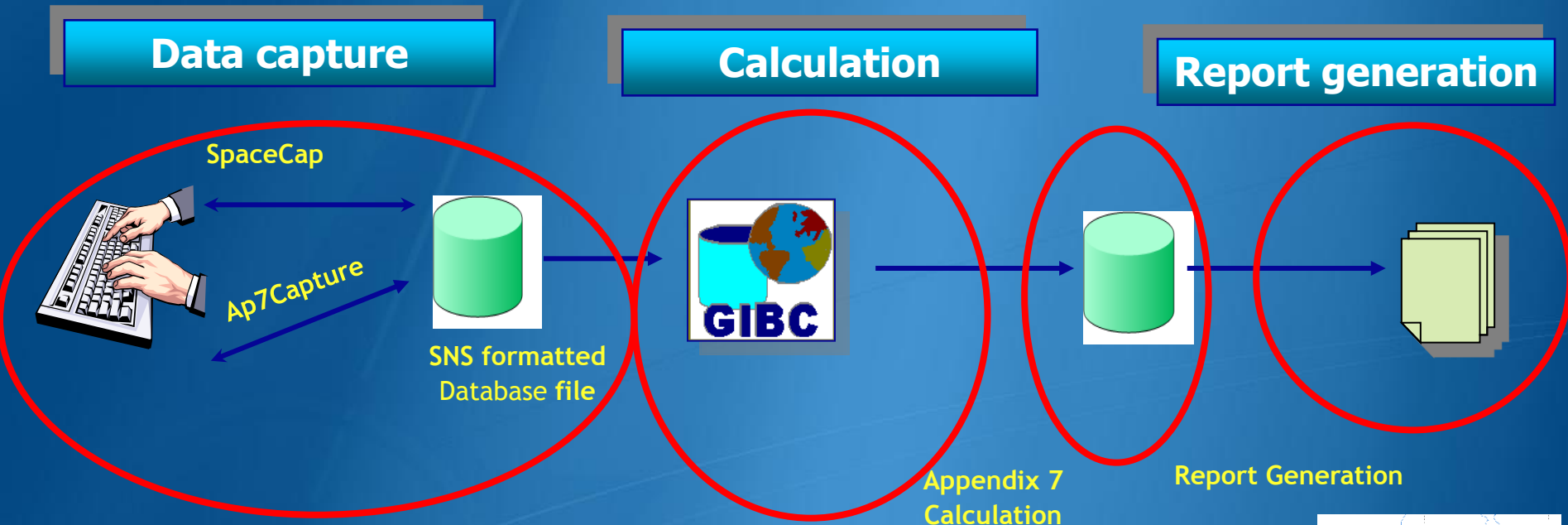


How to Create Coordination Contours around Earth Stations ?

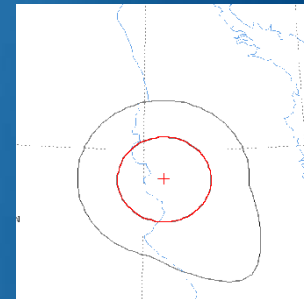
Earth Station Coordination

- Determination of the Coordination Area Around an Earth Station based on AP7
- 2 Tools :
 - Appendix 7 Capture
 - GIBC Appendix 7 Calculation

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



In this workshop....



Appendix 7 Capture tool

- **Software Installation**
- **Select or create a database**
- **Browse an existing database**
- **Create a copy of an ES**
- **Modify parameters**
- **Create new ES**
- **Save into existing database**
- **Save into a new database**

GIBC Appendix 7 Calculation

- **Software Installation**
- **Select input database**
- **Appendix 7 calculation**
- **Generate report document**
- **Report re-generation**
- **Include Auxiliary Contours**
- **Change Printing Options**

Proposed Exercises:

- To generate Coordination Contours for
 - FSS Transmitting and Receiving Earth Station in the 6/4 GHz band
 - FSS Transmitting Earth Station in the 8 GHz band
- To repeat the calculations to see the effect of the horizon elevation angles on the coordination contours

Installation

GIBC and *Ap7Capture* software can be installed from the ITU-R website
(ITU-R/software)

As of January 2012, the Space Radiocommunications Stations (SRS) on DVD-ROM is replaced by the BR International Frequency Information Circular (BR IFIC) - Space Service.

Each edition of the BR IFIC Space Services will contain the SRS database.



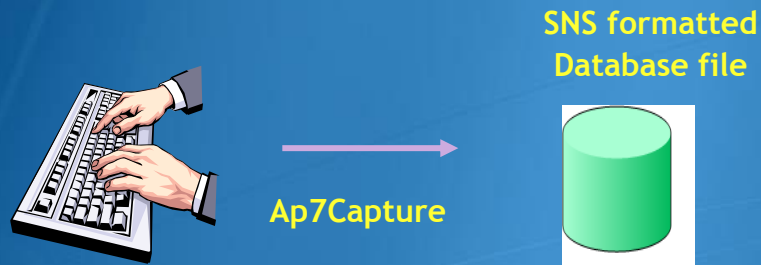
Install GIBC & Open
the application

Install Ap7Cap & Open
the application

AP7 Capture Tool



- Enter AP7 data for a new earth station
- Modify parameters of an existing earth station
- Create a copy of an existing earth station entry



In addition, Ap7 Capture tool provides:

- o Search for an earth station by Notice ID
- o Basic validation of AP7 input parameters
- o Deletion of earth stations from AP7 input database
- o User friendly interface!



- Open Ap7capture tool
- Select the database

AP7 Capture Tool

AP7 Input Capture

File Edit Help

Open Database

New AP7 Input

Please type in a Notice ID or Station name and press Display:

Notice ID:

Station name:

Display

Select an Earth Station

ntc_id	stn_name	adm	ntwk_org	cty	long_deg	long_ew	long_min	long_sec	lat_deg
104500148	SOCHI/STELLA-111	RUS		RUS	39	E	54	0	43

Edit Earth Station

Clone Earth Station

New Earth Station

Delete Earth Station

1 earth station found.

AP7 Capture Tool

AP7 Input Capture [Window Title Bar]

File Edit Help

Open Database

New AP7 Input

Please type in a Notice ID or Station name and press Display:

Notice ID:

Station name:

Display

Select an Earth Station

ntc_id	stn_name	adm	ntwk_org	ctry	long deg	long_ew	long_min
105500430	WPG_KA56	CAN		CAN	97	W	2
105500431	VAN_KA56	CAN		CAN	123	W	5
99500214	GOOSE BAY LEOL...	CAN		CAN	60	W	28
99500210	OTTAWA LEOLUT	CAN		CAN	75	W	53
103500113	GUADALAJARA 23	E		E	3	W	1
106500122	LENINSK/SKYSTAR	RUS		RUS	45	E	11
104500148	SOCHI/STELLA-111	RUS		RUS	39	E	54
104500375	ESRANGE ETX	S		S	21	E	3


8 earth stations found.

Edit Earth Station

Clone Earth Station

Create a New Earth Station

Delete an Earth Station



AP7 Capture Tool – New Input

AP7 Input Capture

File Edit Help

AP7 CAPTURE

Open Database

New AP7 Input

Please type in a Notice ID or Station name and press Display:

Notice ID:

Station name: Display

ntc_id	stn_name	adm	ntwk_org	ctry	long_deg	long_ew	long_min	long_sec	lat_deg
--------	----------	-----	----------	------	----------	---------	----------	----------	---------

No database currently open. Please use the file menu to open a database.

AP7 Capture Tool – New Input

Earth Station Parameters

AP7 Input Capture

File Edit Help

AP7 CAPTURE

New Earth Station: Earth Station Parameters:

Specific Earth Station Name:

 Typical

Date Rcv: Adm: Ctry: Deg: E/W: Min: Sec: Deg: N/S: Min: Sec:

 06.10.2010 Long: Lat:

Satellite Name: Long nom: GSO/Non-GSO

	Satellite Beam Name	E/R	Gain	Cls of Stn	Min freq in MHz	Max freq in MHz	Noise Temp	Pwr ds max	Antenna pattern	Co
▶					0.00000	0.00000				
*										

Please select an Antenna Pattern from this list.

- 0 :: None
- 50 :: ABCDphi1 ::coefa 19 ::coefb 25 ::coefc 32 ::coefd 2
- 51 :: ABCDphi1 ::coefa 25 ::coefb 29 ::coefc 25 ::coefd 3
- 52 :: ABCDphi1 ::coefa 25 ::coefb 29 ::coefc 32 ::coefd 2
- 53 :: ABCDphi1 ::coefa 29 ::coefb 25 ::coefc 32 ::coefd 2
- 54 :: ABCDphi1 ::coefa 29 ::coefb 25 ::coefc 32 ::coefd 2
- 55 :: A-25*LOG(FI) ::coefa ::coefb ::coefc ::coefd ::phi
- 56 :: A-25*LOG(FI) ::coefa 27 ::coefb ::coefc ::coefd ::p

Save

Back to List

Close

A7a. Horizon Elevation

Row No	Azimuth	Elevation Angle	Distance km
▶			
*			

1 Horizon Elevation rows

AP7 Capture Tool – New Input

AP7 Input Capture [Window Title Bar]

File Edit Help

NttRsn: N Earth Station Id: 104500148 Earth Station Parameters:

Specific Earth Station Name: **SOCHI/STELLA-111**

Typical

Date Rcv: 06.04.2004 Adm: RUS Ctry: RUS Long: 39 E 54 0 Lat: 43 N 29 0

Satellite Name: **INTELSAT7 66E** Long nom: 66 GSO

Satellite Beam Name	E/R	Gain	Cls of Stn	Min freq in MHz	Max freq in MHz	Noise Temp	Pwr ds max	Antenna pattern	Co
S1R	E	49.20	TC	14,089.00...	14,161.00...		-54.1	REC-580	
*									

A7a. Horizon Elevation

Row No	Azimuth	Elevation Angle	Distance km
1	0.0	0.0	
2	180.0	0.0	
3	360.0	0.0	
*			

3 Horizon Elevation rows

A7e. Min Antenna Elevation

Row No	Azimuth	Elevation Angle
*		

Save

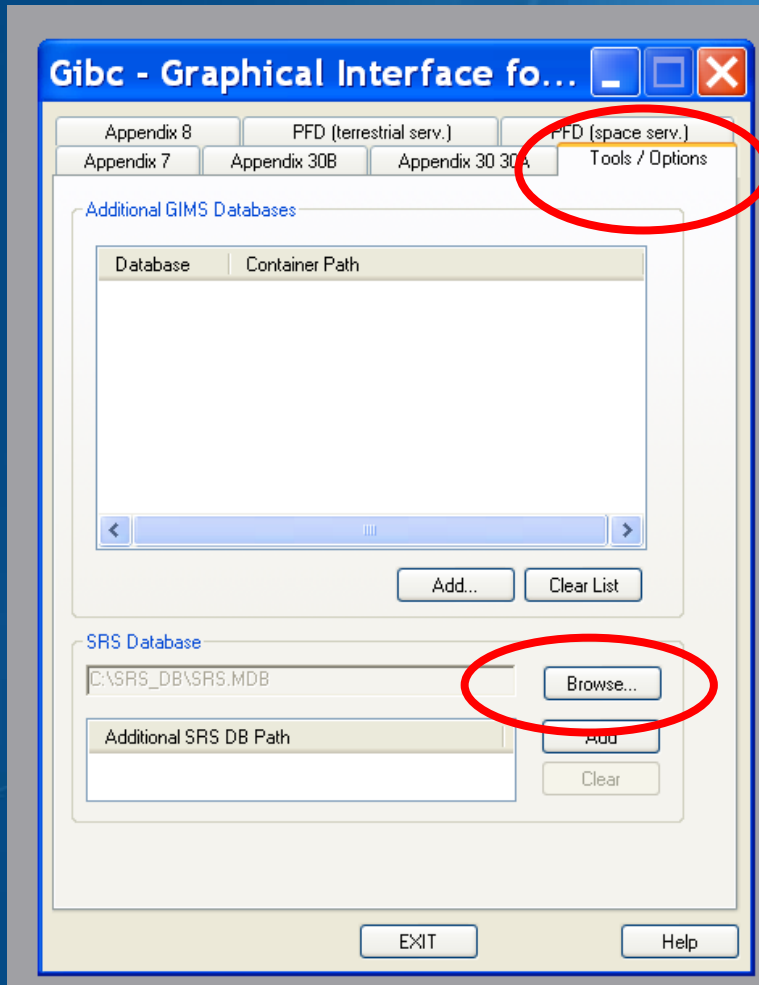
Save As

Back to List

Close

GIBC/ AP 7- Input Database

Database file location- Tools/ Options page



Use the **browse** button to:

- select the srs.mdb from the latest BR-IFIC (in the DVD drive)
- select a different input database file

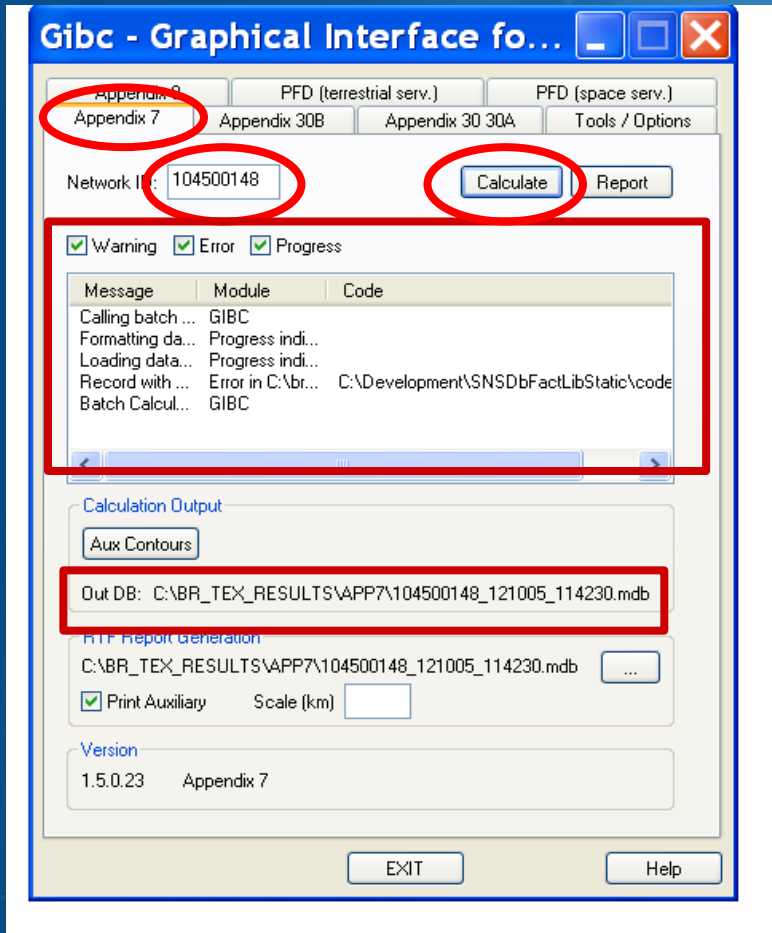


Select the **Tools & Options** tab

Check the **SRS** database file location

Select the **input** WRS12-Workshop_srs.MDB file

GIBC/AP 7- Calculation



How to Proceed?

- Select the Appendix 7 tab
- Enter ES Network ID
- Press Calculate

Check Progress of Calculation

Select type of messages :
Warning \ Error \ Progress

Results in MS-Access file

Each calculation in a separate file
Results Directory:

C:\BR_TEX_RESULTS\APP7

Naming convention:

NetworkId_Date_Time.mdb



Select the Appendix 7 tab

Enter the Network Id of the earth station (test case 104500375)

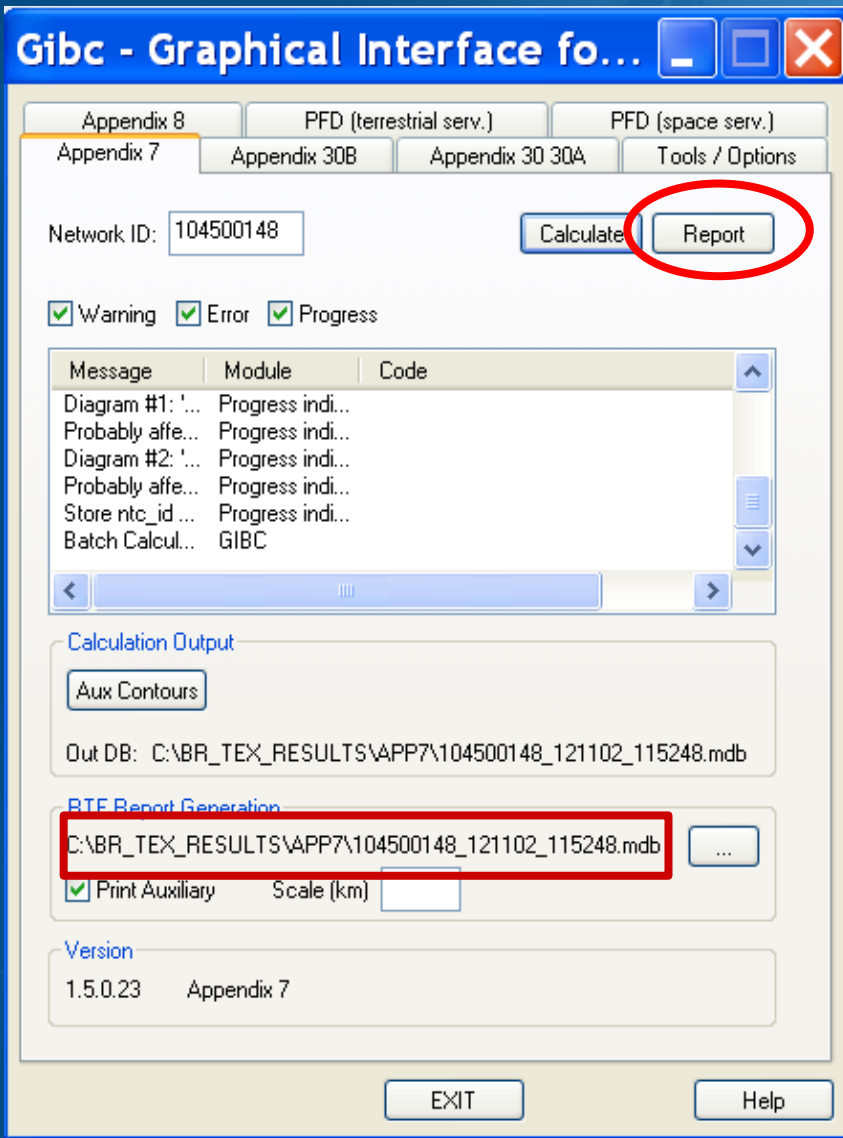
Press Calculate



Appendix 7
Calculation



GIBC/AP 7- Generate Report



Ap7print.rtf



After an Appendix 7 calculation...

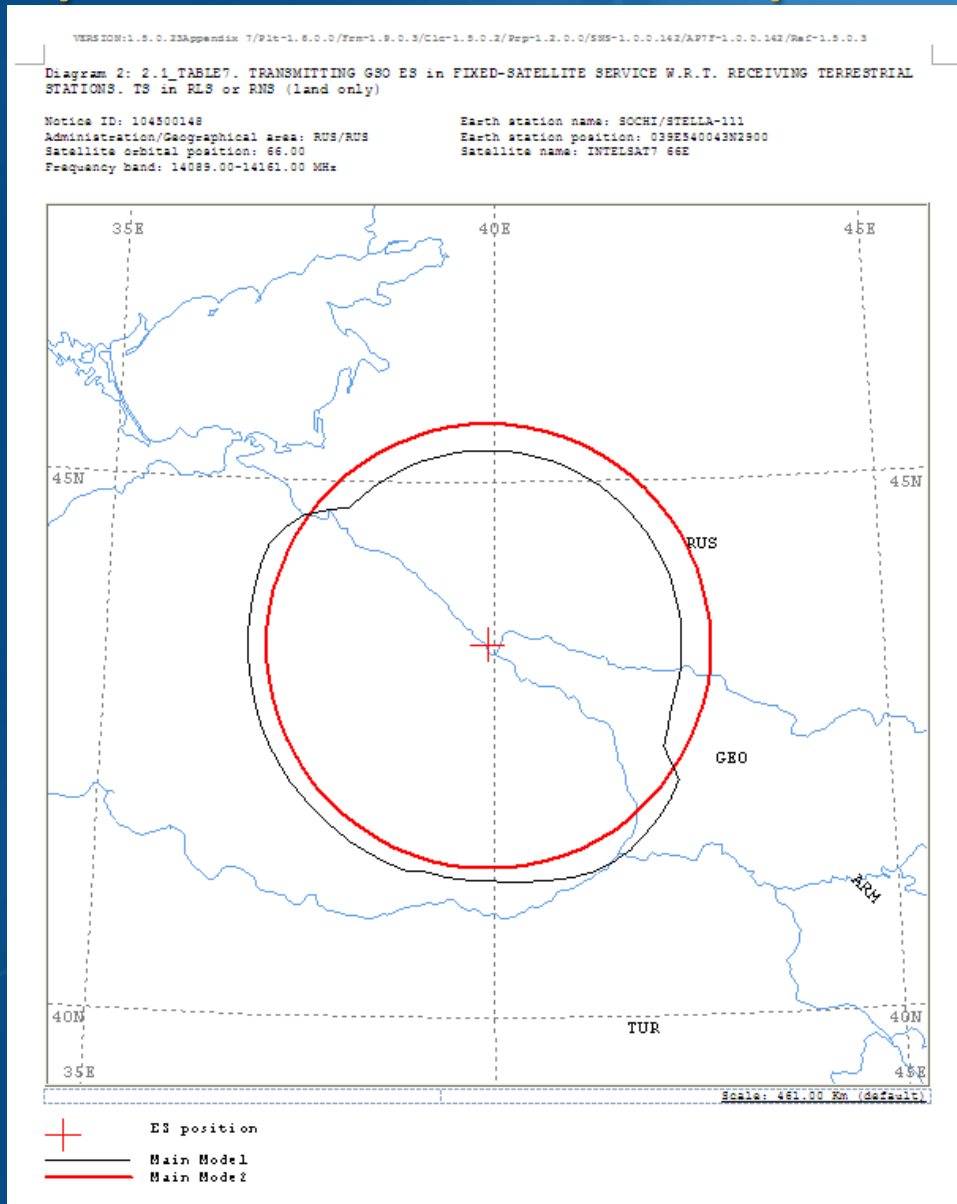
■ **Just Press the Report button**

Note!

**Ap7Print.RTF is rewritten each time!!!
If the file is locked you will get an error message.**

Generate report

Report Document- Graphics



Ap7Print.RTF Document

Graphics:

Contains diagrams displaying:

- Title
- Details
- Coordination Contours
 - Main Mode I and II
 - Auxiliary Contours
- Country codes
- Legend



Edits the Ap7Print.RTF file in the C:\br_tex_results\ap7 folder

Report Document- Details

ANALYSIS DATE AND TIME: 2012-11-02 11:52:49
 VERSION: 1.5.0.23Appendix 7/Plt-1.6.0.0/Frm-1.9.0.3/Clc-1.5.0.2/Prp-1.2.0.0/SNS-1.0.0.142/AP7F-1.0.0.142/Ref-1.5.

Diagram 2: 2.1_TABLE7. TRANSMITTING GSO ES in FIXED-SATELLITE SERVICE W.R.T. RECEIVING

NOTICE ID: 104500148 EARTH STATION NAME: SOCHI/STELLA-111 EARTH STATION PO
 ADM/GEO AREA: RUS/RUS RAIN CLIMATICAL ZONE: K
 SATELLITE NAME: INTELSAT7 66E SATELLITE ORBITAL POSITION: 66.00 DEG
 ANTENNA AZIMUTH: 144.55 DEG ANTENNA ELEVATION: 33.42 DEG
 FREQUENCY BAND: 14089.00-14161.00 MHZ ASSIGNED FREQUENCY: 14125.00 MHZ
 MAXIMUM ANTENNA GAIN: 49.2 DBI MAXIMUM POWER DENSITY: -54.1 DBW/HZ
 ANTENNA PATTERN: APEREC004V01
 2.1_TABLE7 Model: PLM_DUCTING

TRANSMISSION LOSS MODE 1: 182.9 DB (DOES NOT INCLUDE HOR. CORR. AND ANT. GAIN)
 TRANSMISSION LOSS MODE 2: 146.9 DB

AZIMUTH	0	5	10	15	20	25	30	35	40	45	50	55	60	65
OFF-AXIS	132.8	129.4	125.8	122.1	118.3	114.3	110.3	106.2	102.1	98.0	93.8	89.6	85.5	81.3
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	-10.0
COORDINATION DISTANCE (KM)														
MODE 1														
0.0 DB	202	202	202	202	202	202	202	202	202	202	202	202	202	202
MODE 2														
0.0 DEG	229	229	229	229	230	230	230	230	230	230	230	231	231	231

AZIMUTH	120	125	130	135	140	145	150	155	160	165	170	175	180	185
OFF-AXIS	40.6	38.1	36.1	34.6	33.7	33.4	33.8	34.8	36.4	38.5	41.1	44.0	47.2	50.6
HOR. ELEV.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HOR. CORR.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANT. GAIN	-8.2	-7.5	-6.9	-6.5	-6.2	-6.1	-6.2	-6.5	-7.0	-7.7	-8.3	-9.1	-9.8	-10.0
COORDINATION DISTANCE (KM)														
MODE 1														
0.0 DB	211	243	248	252	256	260	261	260	257	253	250	248	244	245
MODE 2														
0.0 DEG	232	232	233	233	233	233	233	233	233	232	232	232	232	232

AZIMUTH	240	245	250	255	260	265	270	275	280	285	290	295	300	305
OFF-AXIS	94.5	98.7	102.8	107.0	111.0	115.0	119.0	122.8	126.5	130.1	133.4	136.6	139.4	141.9
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
COORDINATION DISTANCE (KM)														
MODE 1														
0.0 DB	249	249	249	249	249	249	249	249	249	249	249	249	243	234
MODE 2														
0.0 DEG	230	230	230	230	230	230	230	229	229	229	229	229	229	229

PROBABLY AFFECTED COUNTRIES: GEO TUR

- Coordination distances at 72 azimuths
- (0-355degrees at 5 deg steps)
- Details of the calculation
- Intermediate data
- List of affected countries

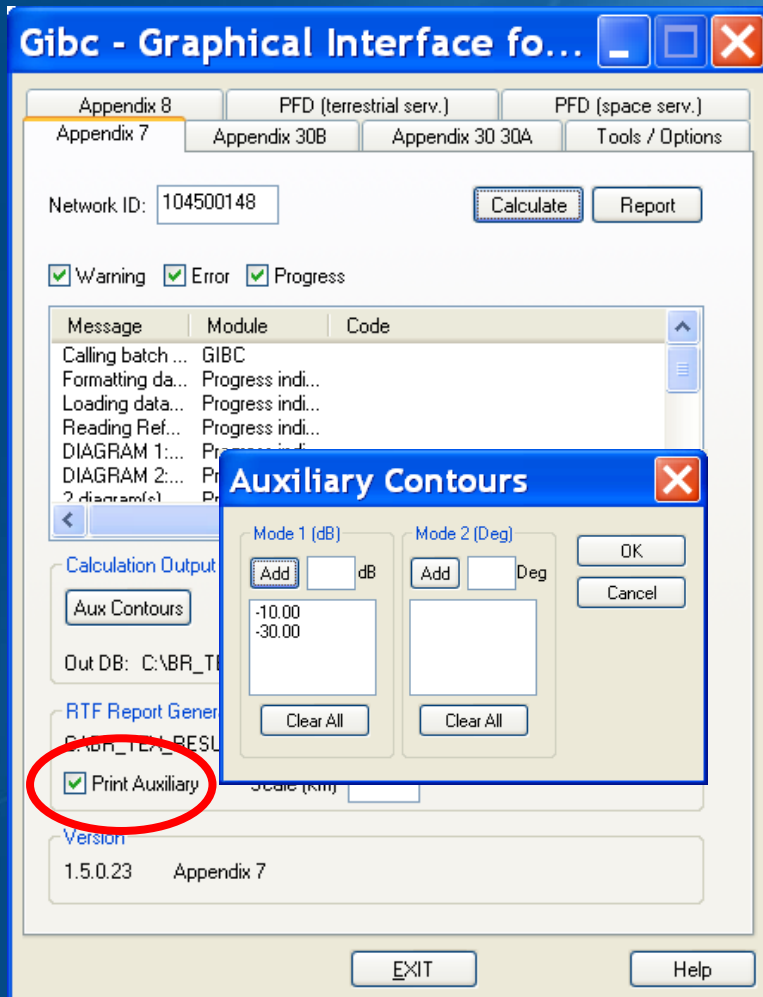


Print the Report Document

Auxiliary Contours

Auxiliary Mode 1 : **Reduced required loss expressed in dB**

Auxiliary Mode 2 : **Angular offset between beams expressed in degrees**



How to produce auxiliary contours?

- Press **Auxiliary Contours** button
- Enter the values in the list
 - Mode 1 (dB) (negative values)
 - Mode 2 (deg)
- Perform the Calculation



To add Mode 1 aux contours press the **Auxiliary Contours** button.

Add Mode 1 Contours (-10dB, -30dB)

Perform Calculation

Perform Report Generation

Printing Options

Print Auxiliary

Check **Print Auxiliary** (if auxiliary contours information exists).

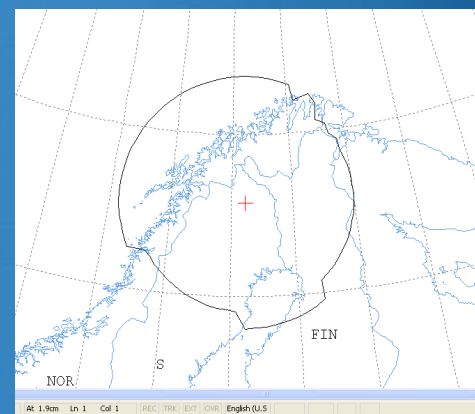
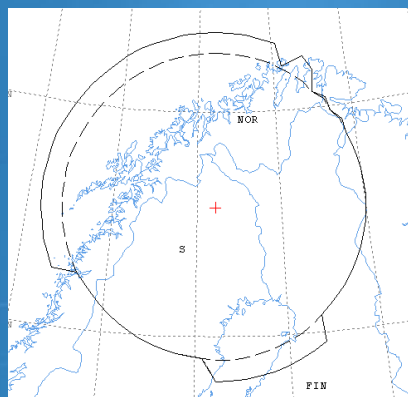
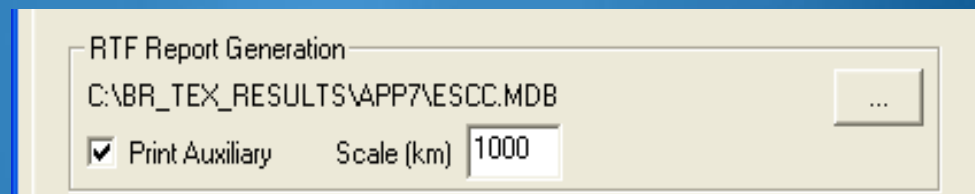
This option is without effect if there is not any auxiliary contours information in the database.

Distance\Scale

Size of the window of the map (expressed in Km).

By default automatic value is selected that accommodates the diagram.

Useful in comparing results from two different earth stations.



Uncheck the **Print Auxiliary Contours** option

Specify 1000Km

Perform Report Generation

Check the report file

Proposed Exercises

Generation of coordination contours:

➤ 1st exercise: FSS Transmitting and Receiving ES in the 6/4 GHz band

-Input example database (SNS format):

[Tx&RxEarthStation@6&4GHz.mdb](#)

-ES name: **HELSINKI TEHTAANKATU**

-ES Notice ID: **Ex.1.1 112505404**(with non-zero deg. horizon elevation angles)

Ex.1.2 112505405(with zero deg. horizon elevation angles)

➤ 2nd exercise: FSS Transmitting ES in the 8 GHz band

-Input example database (SNS format):

[TxEarthStation@8GHz.mdb](#)

-ES name: **VERONA**

-ES Notice ID: **Ex. 2.1 107500164**(with non-zero deg. horizon elevation angles)

Ex. 2.2 107500165(with zero deg. horizon elevation angles)



Exercise 1

FSS Transmitting and Receiving ES in the 6/4 GHz band

Input database (SNS format):

Tx&RxEarthStation@6&4GHz.mdb

ES name: **HELSINKI TEHTAANKATU**

Ex. 1.1 ES notice id: **112505404** (non-zero deg. horizon elevation angles)

- Ex. 1.2 ES notice id: **112505405** (zero deg. horizon elevation angles)



Folder Solution_Ex_1.1
Folder Solution_Ex_1.2
File Tx&RxEarthStation@6&4GHz.mdb

Exercise 1- AP7 Capture/View

AP7 Input Capture

File Edit Help

Open Database

New AP7 Input

Please type in a Notice ID or Station name and press Display:

Notice ID:

Station name:

Display

Select an Earth Station

ntc_id	stn_name	adm	ntwk_org	cty	long deg	long_ew	long_min	long_sec	lat deg
112505404	HELSINKI TEHTA...	FIN		FIN	24	E	57	13	60
112505405	HELSINKI TEHTA...	FIN		FIN	24	E	57	13	60

Edit Earth Station

Clone Earth Station

Select an earth station from the list

View/Edit 1st Earth Station

2 earth stations found.

C:\BR_SOFT\Data\TxRxEarthStation@64GHz.mdb

Exercise 1- AP7 Capture/View

AP7 Input Capture

File Edit Help

IntRsn: D Earth Station Id: 112505404 Earth Station Parameters:

Specific Earth Station Name: **HELSINKI TEHTAANKATU**
 Typical

Date Rcv: 12.11.12 Adm: FIN Ctry: FIN Deg: 24 E Min: 57 Sec: 13 Lat: 60 N Min: 9 Sec: 31
Long: Long nom: -11 GSO

Satellite Name: EXPRESS-3

Satellite Beam Name	E/R	Gain	dgso	Cls of Stn	Min freq in MHz	Max freq in MHz	Noise Temp	Pwr ds max	Antenna pattern
OGE	E	38.00		TC	6'241.44000	6'242.44000		-51.0	A-25*LOC
ZER	R	34.30		TC	3'941.26000	3'942.26000	400		A-25*LOC
*									

Save Save As Back to List Close

A7a. Horizon Elevation

Row No	Azimuth	Elevation Angle	Distance km
1	0.0	5.0	
2	5.0	5.0	
3	10.0	2.0	

A7e. Min Antenna Elevation

Row No	Azimuth	Elevation Angle
*		

Back to the List

Back to the List

C:\BR_SOFT\Data\TxRxEarthSta

Horizon Elevation Angles (non-zero deg.)

Exercise 1- AP7 Capture/View

AP7 Input Capture

File Edit Help

Open Database

New AP7 Input

Please type in a Notice ID or
Station name and press Display:

Notice ID:

Station name:

Display

Select an Earth Station

ntc_id	stn_name	adm	ntwk_org	ctry	long deg	long_ew	long_min	long_sec	lat_deg
112505404	HELSINKI TEHTA...	FIN		FIN	24	E	57	13	60
112505405	HELSINKI TEHTA...	FIN		FIN	24	E	57	13	60

Edit Earth Station

Clone Earth Station

View/Edit 2nd Earth Station

2 earth stations found.

C:\BR_SOFT\Data\TxRxEarthStation@64GHz.mdb

Exercise 1 - AP7 Capture/View

AP7 Input Capture

File Edit Help

NTfRsn: D Earth Station Id: 112505405 Earth Station Parameters:

Specific Earth Station Name: **HELSINKI TEHTAANKATU**
 Typical

Date Rcv: 12.11.12 Adm: FIN Ctry: FIN Deg: 24 E Min: 57 Sec: 13 Lat: 60 N 9 31
Long: 24 E 57 13 Lat: 60 N 9 31

Satellite Name: EXPRESS-3 Long nom: -11 GSO

	Satellite Beam Name	E/R	Gain	dgso	Cls of Stn	Min freq in MHz	Max freq in MHz	Noise Temp	Pwr ds max	Antenna pattern
▶	OGE	E	38.00		TC	6'241.44000	6'242.44000		-51.0	A-25*LO
	ZER	R	34.30		TC	3'941.26000	3'942.26000	400		A-25*LO
*										

Save Save As Back to List **Close**

A7a. Horizon Elevation

Row No	Azimuth	Elevation Angle	Distance km
▶ 1	0.0	0.0	
2	5.0	0.0	
3	10.0	0.0	

A7e. Min Antenna Elevation

Row No	Azimuth	Elevation Angle
▶		
*		

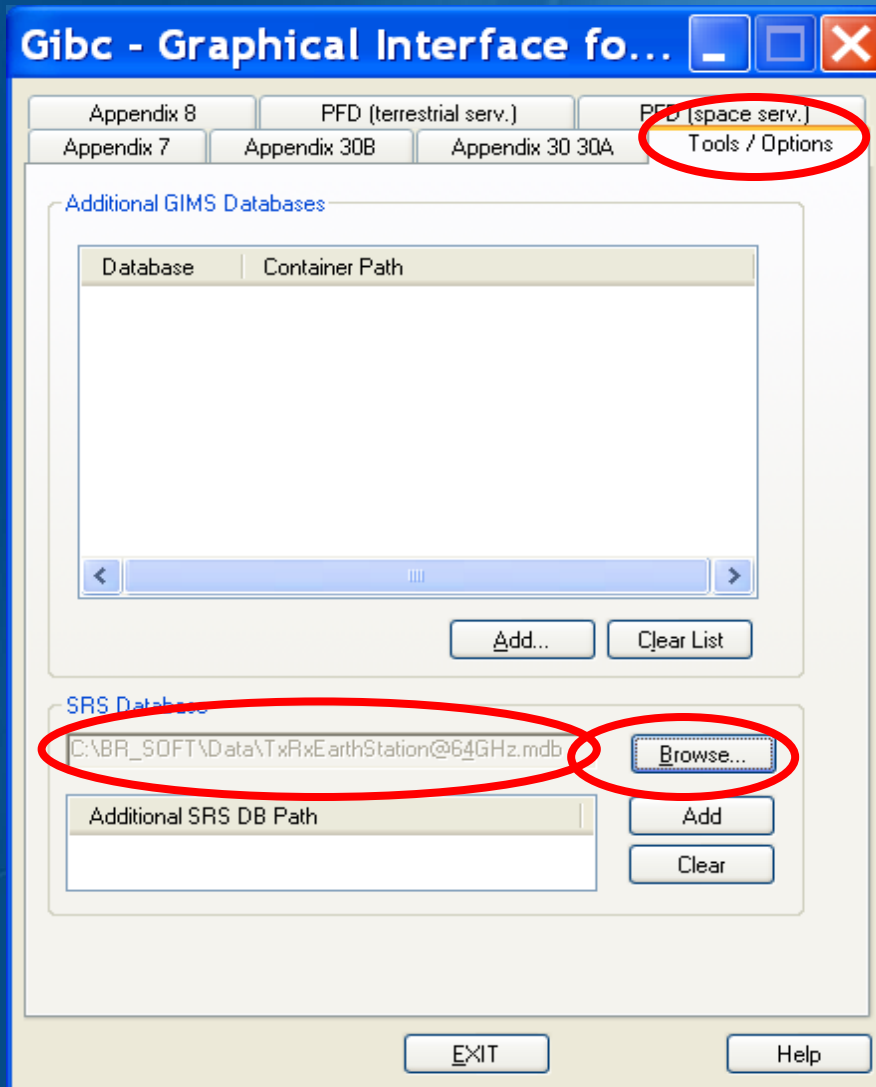
14 Horizon Elevation

Close AP7 Capture

Zero degree Horizon Elevation Angles

C:\BR_SOFT\Data\TxRxEarthStator...

Exercise 1 - GIBC – Open input Database

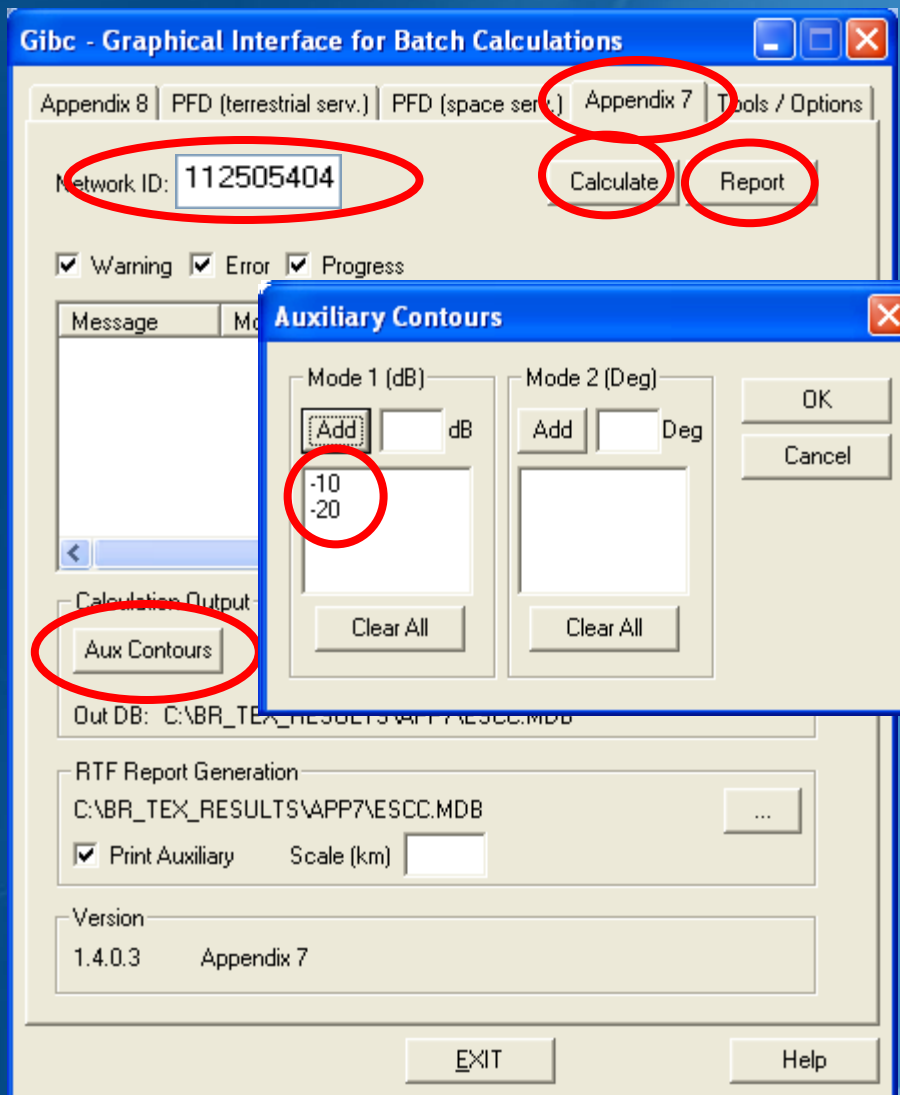


- Run GIBC
- Select the Tools & Options tab
- Change the SRS database reference input file:

⇒ Browse and Select the following file from the Workshop directory

Tx&RxEarthStation@6&4GHz .mdb

Exercise 1 - GIBC – Calculate



- Select the **Appendix 7** tab
- Enter the 1st Earth Station notice Id. (Ex. 1.1 Non-Zero deg horizon elevation angle):

112505404

- Select the values for generating Auxiliary Contours :
 - 10 dB and -20 dB for mode 1
- Calculate
- Create and Open the Report

GIBC –Results –Exercise 1.1(Tx)

Diagram 1: 2.1_TABLE7. TRANSMITTING GSO ES in FIXED-SATELLITE SERVICE W.R.T. RECEIVING TERRESTRIAL STATIONS. TS in FS or MS

Notice ID: 112505404

Administration/Geographical area: FIN/FIN

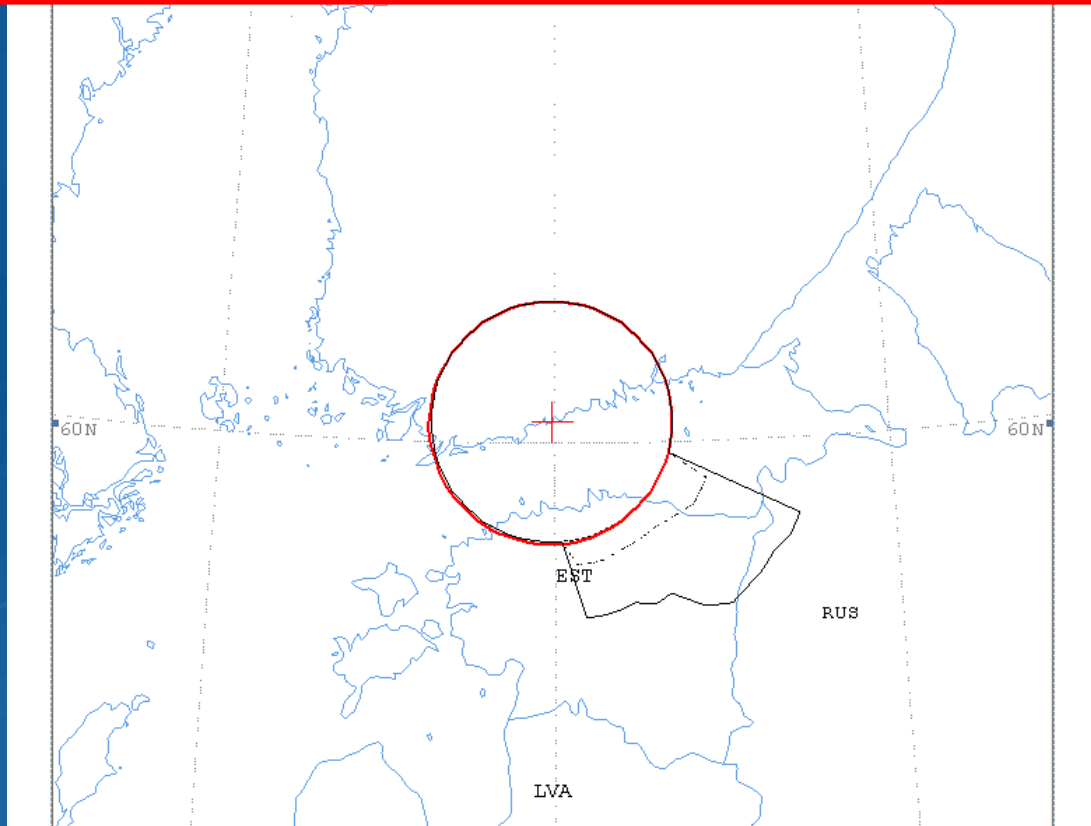
Satellite orbital position: -11.00

Frequency band: 6241.44-6242.44 MHz

Earth station name: HELSINKI TEHTAANKATU

Earth station position: 024E571360N0931

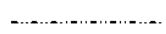
Satellite name: EXPRESS-3



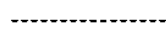
Scale: 419.00 Km (default)



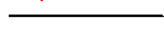
ES position



Aux. Model -10.0dB



Aux. Model -20.0dB



Main Model1



Main Mode2

GIBC –Results –Exercise 1.1 (Tx)

Diagram 1: 2.1_TABLE7. TRANSMITTING GSO ES in FIXED-SATELLITE SERVICE W.R.T. RECEIVING TERRESTRIAL STA

```

NOTICE ID:      112505404      EARTH STATION NAME:    HELSINKI TEHTAANKATU      EARTH STATION POSITION:    024E571360
ADM/GEO_AREA:  FIN/FIN      RAIN CLIMATICAL ZONE:  E
SATELLITE NAME:    EXPRESS-3      SATELLITE ORBITAL POSITION:  -11.00 DEG
ANTENNA AZIMUTH:   219.90 DEG      ANTENNA ELEVATION:      15.38 DEG
FREQUENCY BAND:    6241.44-6242.44 MHZ      ASSIGNED FREQUENCY:      6241.94 MHZ      PERCENTAGE OF TIM
MAXIMUM ANTENNA GAIN: 38.0 DBI      MAXIMUM POWER DENSITY:  -51.0 DBW/HZ      NOISE TEMPERATURE
ANTENNA PATTERN:   APENST806V01
2.1_TABLE7 Model: PLM_DUCTING

TRANSMISSION LOSS MODE 1:    162.0 DB (DOES NOT INCLUDE HOR. CORR. AND ANT. GAIN)
TRANSMISSION LOSS MODE 2:    116.0 DB
    
```

AZIMUTH	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	
OFF-AXIS	135.5	139.9	145.7	149.9	153.7	157.2	160.1	162.0	162.6	161.9	160.0	157.1	153.6	149.7	145.5	141.2	136.7	132.	
HOR.ELEV.	5.0	5.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.	
HOR.CORR.	35.0	35.0	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.	
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.	
COORDINATION DISTANCE (KM)																			
MODE 1																			
0.0 DB	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
-10.0 DB	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
-20.0 DB	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
MODE 2																			
0.0 DEG	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
AZIMUTH	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	
OFF-AXIS	99.5	94.7	89.9	85.1	80.3	75.5	70.7	65.9	61.1	56.3	51.6	46.6	41.9	37.3	31.9	27.5	23.2	19.	
HOR.ELEV.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0	3.0	3.0	3.0	3.	
HOR.CORR.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.6	23.6	23.6	33.0	33.0	33.0	33.	
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	-8.6	-7.0	-5.1	-3.	
COORDINATION DISTANCE (KM)																			
MODE 1																			
0.0 DB	213	213	212	213	199	174	174	165	166	166	166	100	100	100	100	100	100	100	
-10.0 DB	136	131	127	123	122	121	121	121	122	122	121	100	100	100	100	100	100	100	
-20.0 DB	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
MODE 2																			

PROBABLY AFFECTED COUNTRIES: EST RUS

GIBC – Results – Exercise 1.1 (Rx)

Diagram 2: 2.1_TABLE8. RECEIVING GSO ES in FIXED-SATELLITE SERVICE W.R.T. TRANSMITTING TERRESTRIAL STATIONS. TS in FS or MS

Notice ID: 112505404

Administration/Geographical area: FIN/FIN

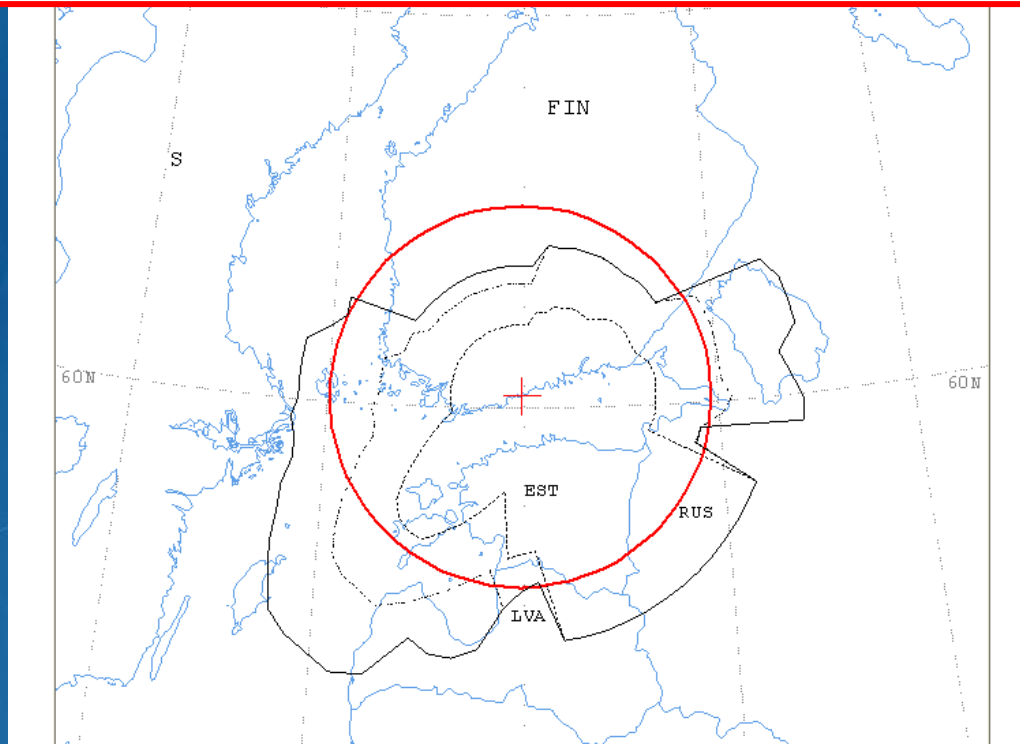
Satellite orbital position: -11.00

Frequency band: 3941.26-3942.26 MHz

Earth station name: HELSINKI TEHTAANKATU

Earth station position: 024E571360N0931

Satellite name: EXPRESS-3



Scale: 679.00 Km (default)



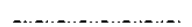
ES position



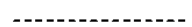
Main Model1



Main Model2



Aux. Model -10.0dB



Aux. Model -20.0dB

GIBC – Results – Exercise 1.1 (Rx)

Diagram 2: 2.1_TABLE8. RECEIVING GSO ES in FIXED-SATELLITE SERVICE W.R.T. TRANSMITTING TERRESTRIAL STATIONS. TS in FS or MS

NOTICE ID: 112505404 EARTH STATION NAME: HELSINKI TEHTAANKATU EARTH STATION POSITION: 024E571360N0931 PHASE: D
 ADM/GEO_AREA: FIN/FIN RAIN CLIMATICAL_ZONE: E
 SATELLITE_NAME: EXPRESS-3 SATELLITE_ORBITAL_POSITION: -11.00 DEG
 ANTENNA_AZIMUTH: 219.90 DEG ANTENNA_ELEVATION: 15.38 DEG
 FREQUENCY_BAND: 3941.26-3942.26 MHZ ASSIGNED_FREQUENCY: 3941.76 MHZ PERCENTAGE_OF_TIME: 0.0017 %
 MAXIMUM_ANTENNA_GAIN: 34.3 DBI MAXIMUM_POWER_DENSITY: - DBW/HZ NOISE_TEMPERATURE: 400.0 K
 ANTENNA_PATTERN: APENST806V01
 2.1_TABLE8 Model: PLM_DUCTING

TRANSMISSION LOSS MODE 1: 198.9 DB (DOES NOT INCLUDE HOR. CORR. AND ANT. GAIN)
 TRANSMISSION LOSS MODE 2: 156.9 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	135.5	139.9	145.7	149.9	153.7	157.2	160.1	162.0	162.6	161.9	160.0	157.1	153.6	149.7	145.5	141.2	136.7	132.1	127.5	122.8	118.1	113.4	109.2	104.4
HOR.ELEV.	5.0	5.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	0.0
HOR.CORR.	35.0	35.0	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	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	184	184	216	216	222	223	226	226	226	231	231	231	389	402	402	402	371	383	401	401	259	257	354	354
-10.0 DB	159	159	216	216	222	223	226	226	226	231	231	231	285	286	286	286	283	285	298	286	258	256	354	354
-20.0 DB	101	101	122	122	134	137	142	143	143	155	165	171	172	171	173	187	190	190	190	190	190	187	354	354
MODE 2																								
0.0 DEG	269	269	269	269	269	268	268	268	268	268	268	268	269	269	269	269	269	269	269	269	270	270	270	270
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	99.5	94.7	89.9	85.1	80.3	75.5	70.7	65.9	61.1	56.3	51.6	46.6	41.9	37.3	31.9	27.5	23.2	19.2	15.8	13.3	12.4	13.4	15.9	19.3
HOR.ELEV.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
HOR.CORR.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.5	21.5	21.5	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0
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	-8.6	-7.0	-5.1	-3.1	-0.9	0.9	1.7	0.9	-1.0	-3.2
COORDINATION DISTANCE (KM)																								
MODE 1																								
0.0 DB	354	354	354	354	354	354	354	354	354	354	354	354	265	280	303	367	386	391	380	457	479	476	479	439
-10.0 DB	354	354	354	354	354	354	354	354	354	354	354	354	265	280	303	252	271	292	315	340	363	360	361	323
-20.0 DB	354	354	354	354	354	354	354	354	354	354	354	354	222	226	232	138	156	177	201	225	249	252	244	202
MODE 2																								
0.0 DEG	270	271	271	271	271	271	272	272	272	272	272	272	273	273	273	273	273	273	273	273	273	273	273	273
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	23.3	27.6	32.1	36.7	41.4	46.1	50.5	55.3	60.1	64.9	69.5	74.3	79.1	84.0	88.8	93.6	98.4	103.1	107.9	112.6	117.3	121.9	126.6	131.1
HOR.ELEV.	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
HOR.CORR.	33.0	33.0	33.0	33.0	33.0	33.0	34.0	34.0	34.0	34.0	34.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
ANT.GAIN	-5.2	-7.0	-8.7	-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	413	383	364	336	328	328	316	316	316	316	289	272	280	185	184	184	184	184	184	184	184	184	184	184
-10.0 DB	293	264	245	219	213	213	202	202	202	202	179	178	178	161	159	159	159	159	159	159	159	159	159	159
-20.0 DB	172	145	126	104	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101

PROBABLY AFFECTED COUNTRIES: EST LVA RUS S |

GIBC –Results - Exercise 1.1

Ap7Print [Read-Only] [Compatibility Mode] - Microsoft Word

VERSION: Test Pack
SPACEAPT/2.0.0.0/Fls-2.0.0.0/Fm-2.0.0.0/Clc-2.0.0.0/Exp-1.2.0.0/SNS-2.0.0.0/APTF-2.0.0.0/Ref-2.0.0.0

1 TABLE7. TRANSMITTING GSO ES in FIXED-SATELLITE SERVICE W.R.T. RECEIVING TERRESTRIAL in FS or MS

OS404
Geographical area: FIM/FIN
Earth station name: HELSINKI TEHTAANKATU
Earth station position: 024E571060W0931
Satellite name: EXPRESS-3
al position: -11.00
6241.44-6242.44 MHz

LVA

Scale: 419.00 Km (default)

- Remember to save this file with a Specific Name
- Otherwise it will be rewritten at next run!
- We did it for you, in the solutions folder, with the following file name:

112505404(6&4GHz, Non-0-elev).rtf

GIBC – Report re-generation – Exercise 1.2



Gibc - Graphical Interface for Batch ...

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

Network ID:

Warning Error Progress

Message	Module	Code
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Calculation Output

Out DB: C:\BR_TEX_RESULTS\APP7\ESCC.MDB

RTE Report Generation

Print Auxiliary

Version
1.5.0.7 Appendix 7

- Run GIBC

- Select the Appendix 7 page

- Enter the 2nd Earth Station notice Id.
(Ex.1.2 Zero deg horizon elevation angle):

112505405

- Select resulting database

112505405(6&4GHz, 0-elev).mdb

- Disable print of auxiliary contours

- Enter a value for the scale

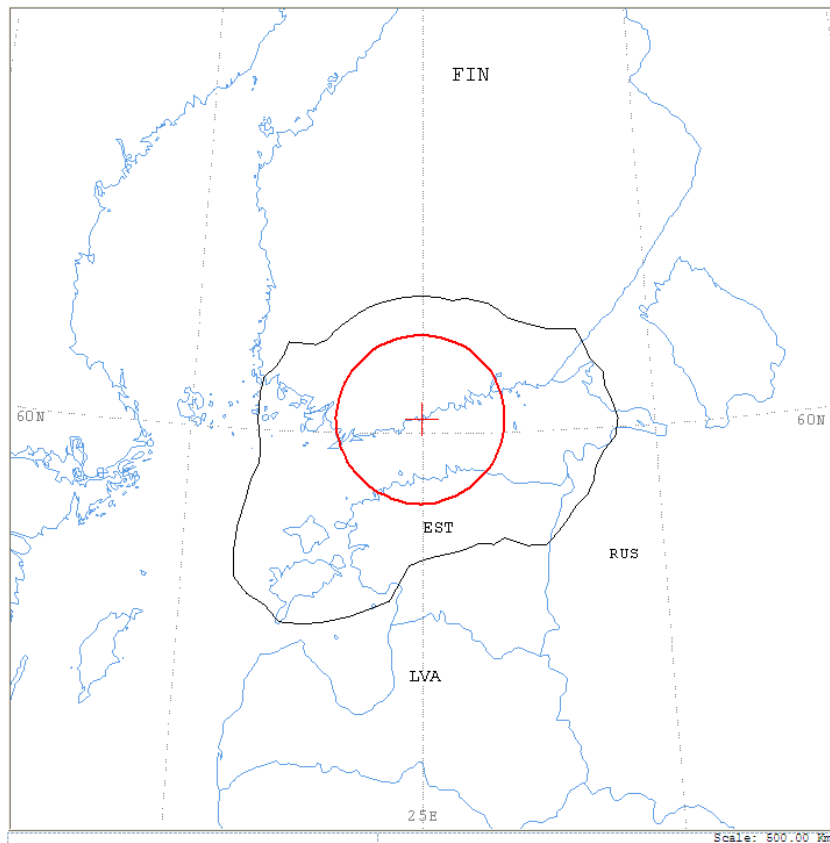
- Re-create the output Report

GIBC –Results - Exercise 1.2

Diagram 1: 2.1_TABLE7. TRANSMITTING GSO ES in FIXED-SATELLITE SERVICE W.R.T. RECEIVING TERRESTRIAL STATIONS. TS in FS or MS

Notice ID: 112505405
 Administration/Geographical area: FIN/FIN
 Satellite orbital position: -11.00
 Frequency band: 6241.44-6242.44 MHz

Earth station name: HELSINKI TEHTAANKATU
 Earth station position: 024E571360N0931
 Satellite name: EXPRESS-3

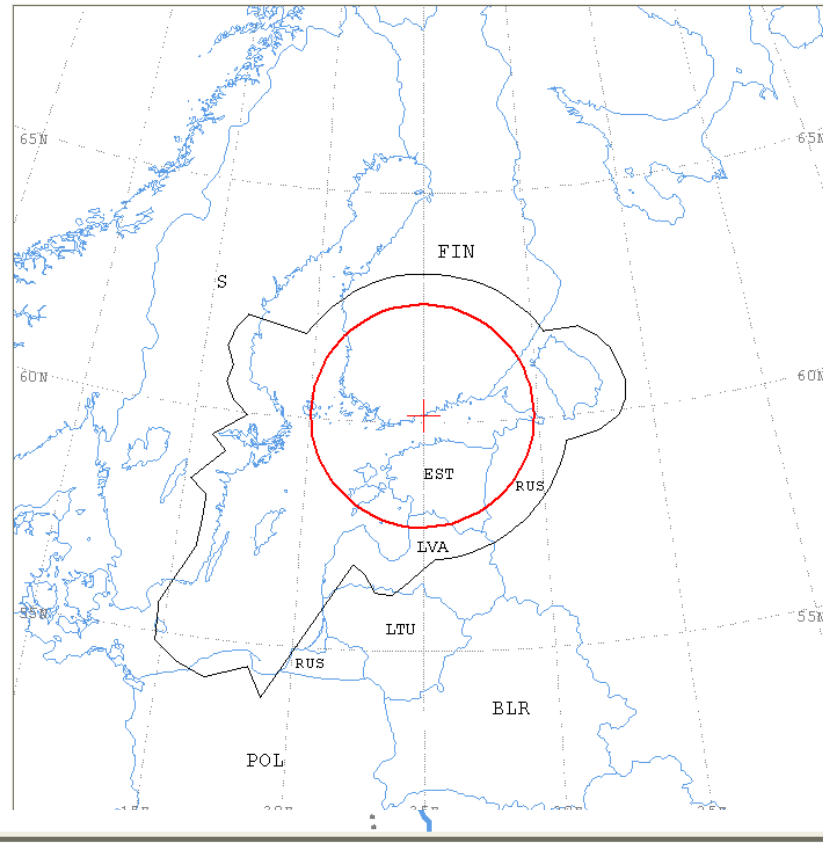


+ ES position
 — Main Model
 — Main Mode2

Diagram 2: 2.1_TABLE8. RECEIVING GSO ES in FIXED-SATELLITE SERVICE W.R.T. TRANSMITTING TERRESTRIAL STATIONS. TS in FS or MS

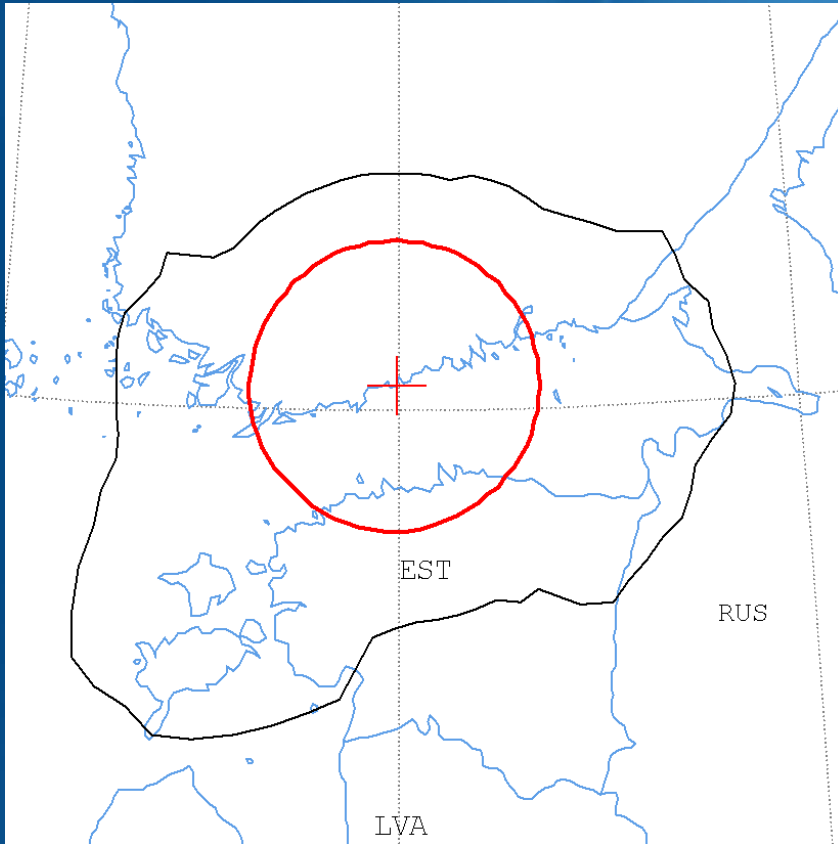
Notice ID: 112505405
 Administration/Geographical area: FIN/FIN
 Satellite orbital position: -11.00
 Frequency band: 3941.26-3942.26 MHz

Earth station name: HELSINKI TEHTAANKATU
 Earth station position: 024E571360N0931
 Satellite name: EXPRESS-3



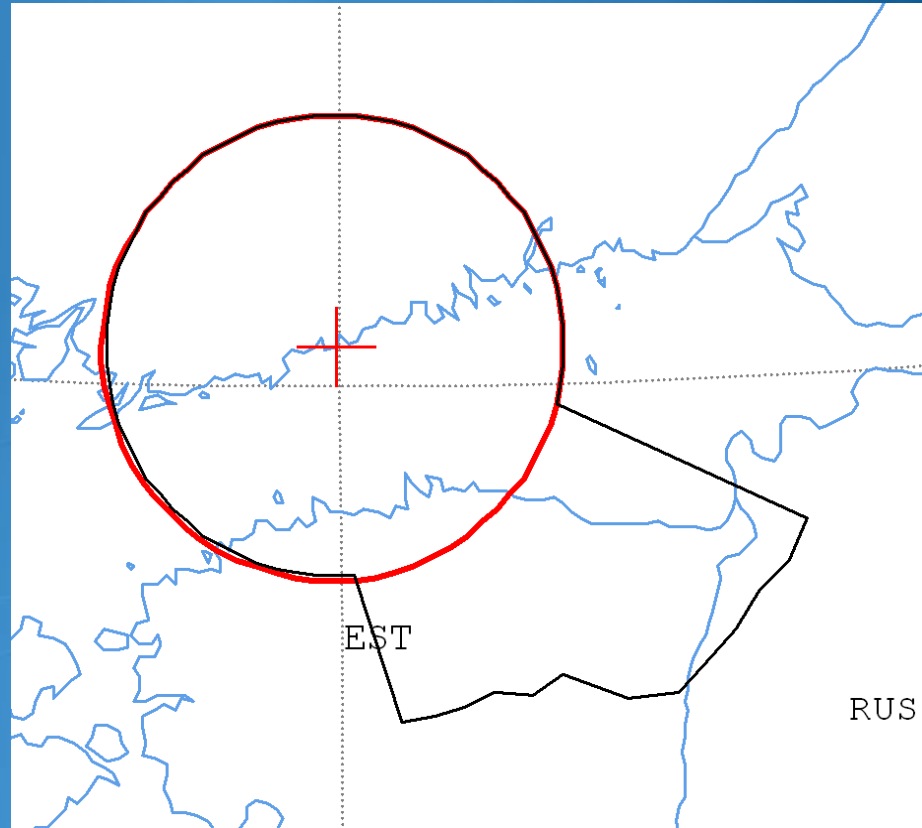
Scale: 1049.00 Km (default)

Exercise 1 – GIBC – Compare Results (Tx)



Zero-degree horizon elevation angles

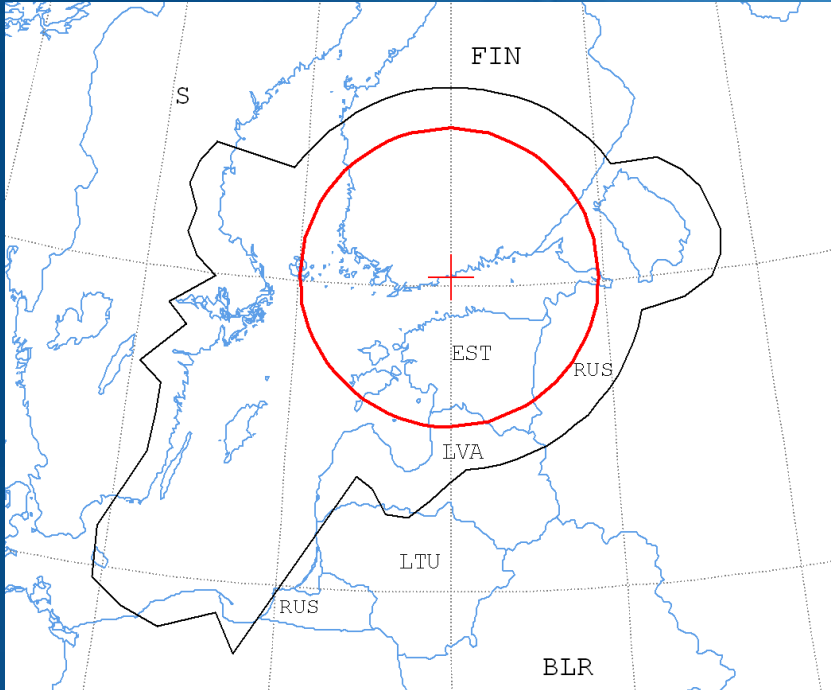
PROBABLY AFFECTED COUNTRIES:
EST RUS



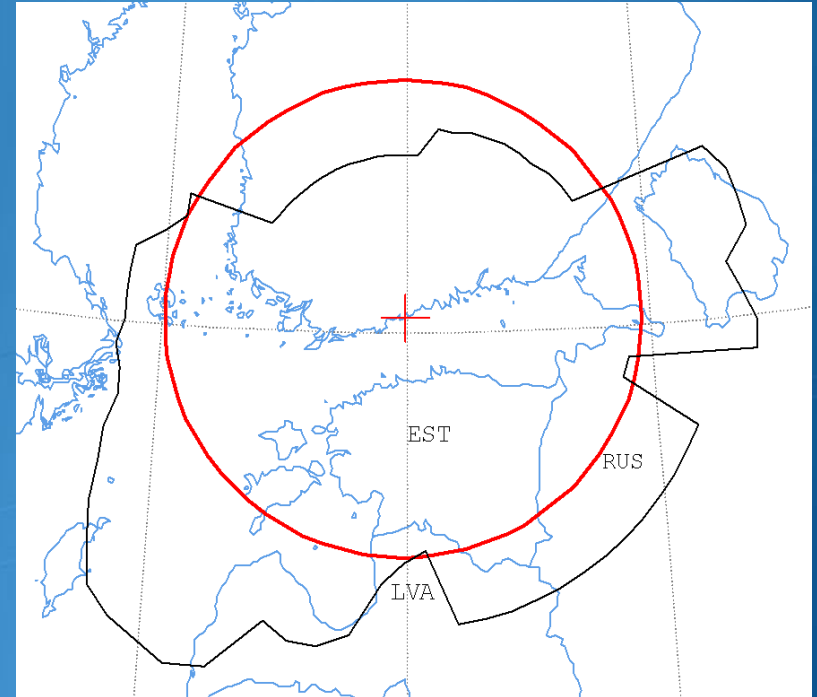
Non-zero-degree horizon elevation angles

PROBABLY AFFECTED COUNTRIES:
EST RUS

Exercise 1 – GIBC – Compare Results (Rx)



Zero-degree horizon elevation angles



Non-zero-degree horizon elevation angles

PROBABLY AFFECTED COUNTRIES:
DNK EST LTU LVA POL RUS S

PROBABLY AFFECTED COUNTRIES:
EST LVA RUS S

Exercise 2

FSS Transmitting ES in the 8 GHz band




Input example database (SNS format):

TxEarthStation@8GHz.mdb

ES name: **VERONA**

- Ex. 2.1 ES Notice Id: **107500164** (non-zero deg. horizon elevation angles)
- Ex. 2.2 ES Notice Id: **107500165** (zero deg. horizon elevation angles)



 Solution_Ex_2.1
 Solution_Ex_2.2
 TxEarthstation@8ghz.mdb

Exercise 2 – GIBC – Results



- FSS Transmitting Earth Station in 8 GHz band
- Input database file:

TxEarthStation@8GHz.mdb

- Results in following files:

- For Ex. 2.1 with non-zero-degree horizon elevation angle:

107500164(Tx8GHz, Non-0-elev).rtf

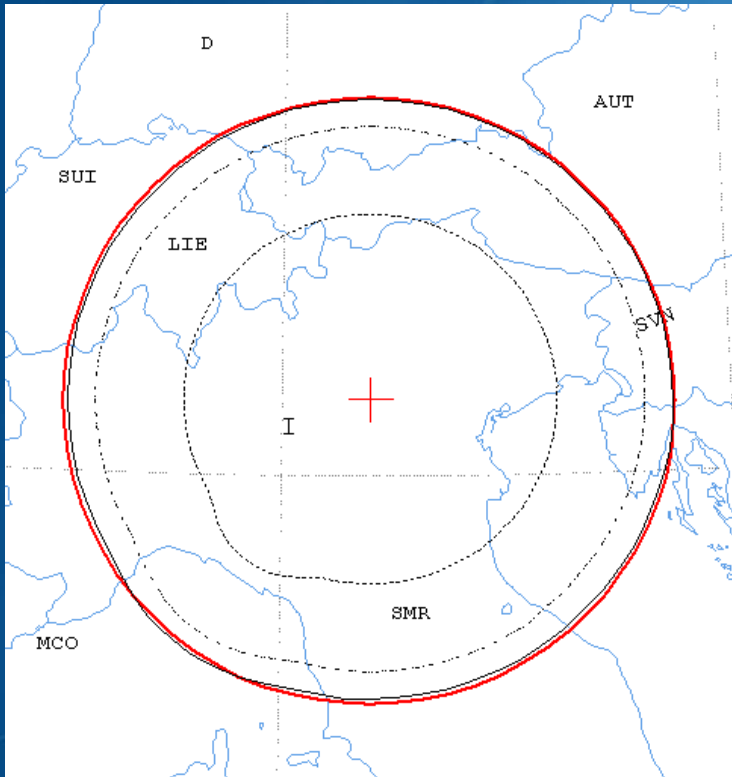
- For Ex. 2.2 with zero-degree horizon elevation angle:

107500165(Tx8GHz, 0-elev).rtf

Exercise 2 – GIBC – Results

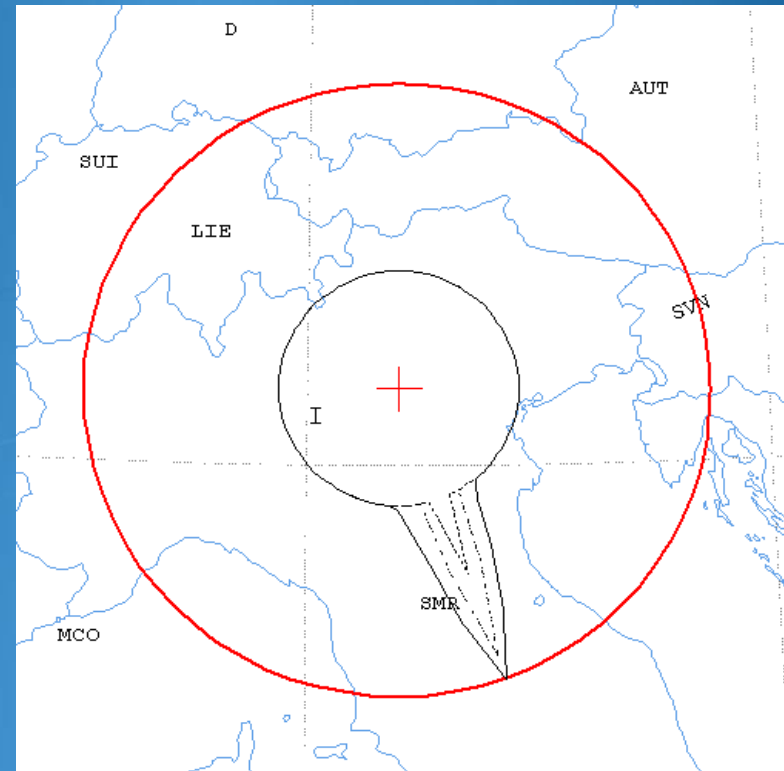
Diagram 1: 2.1_TABLE7.

TRANSMITTING GSO ES in FIXED-SATELLITE SERVICE W.R.T.
RECEIVING TERRESTRIAL STATIONS. TS in FS or MS



With zero-degree
horizon elevation angles

PROBABLY AFFECTED COUNTRIES:
AUT D HRV LIE SMR SUI SVN



With non-zero-degree
horizon elevation angles

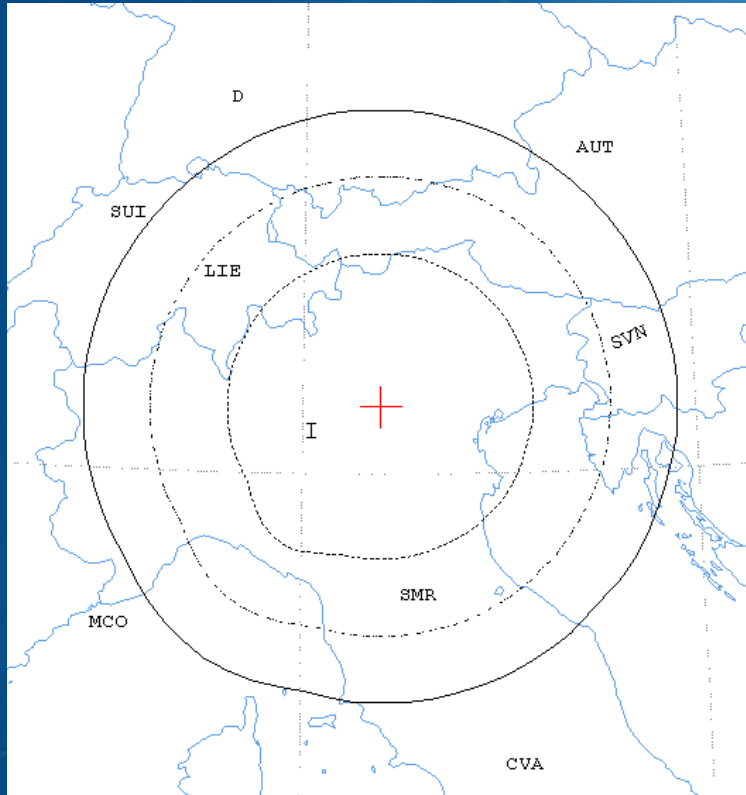
PROBABLY AFFECTED COUNTRIES:
AUT D HRV LIE SMR SUI SVN

Exercise 2 – GIBC – Results

Diagram 2: 3.2.1_TABLE9.

TRANSMITTING GSO ES in FIXED-SATELLITE SERVICE W.R.T.

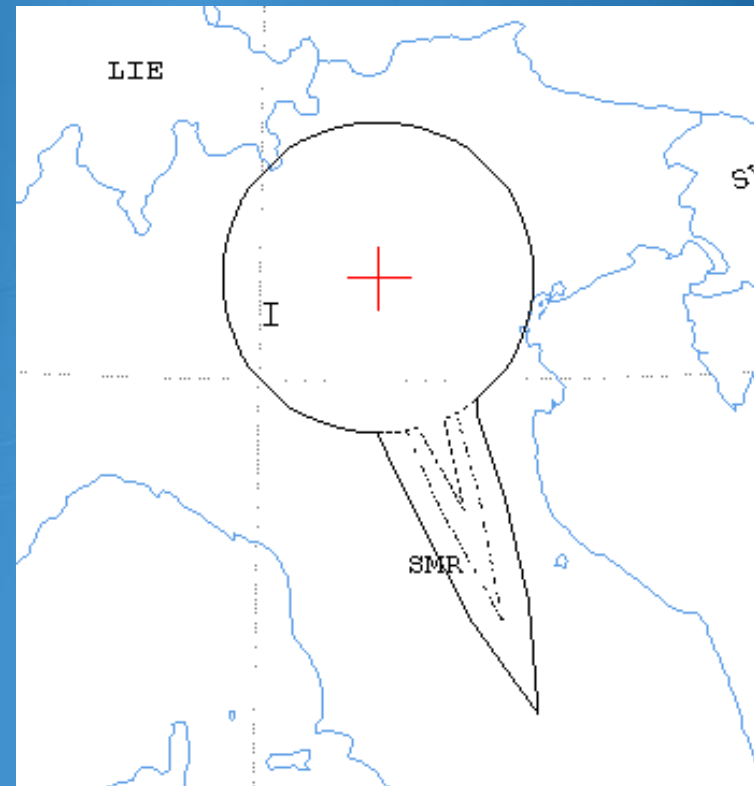
RECEIVING NGSO ES in EARTH EXPLORATION SATELLITE SERVICE



With zero-degree
horizon elevation angles

PROBABLY AFFECTED COUNTRIES:

AUT D HRV LIE SMR SUI SVN



With non-zero-degree
horizon elevation angles

PROBABLY AFFECTED COUNTRIES:

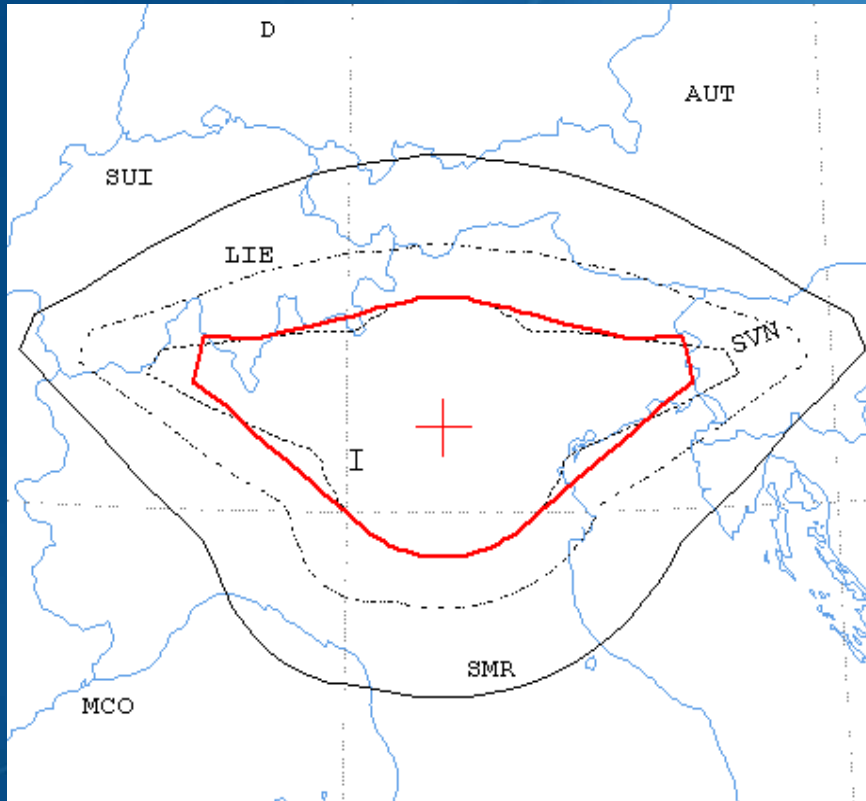
SUI

Exercise 2 – GIBC – Results

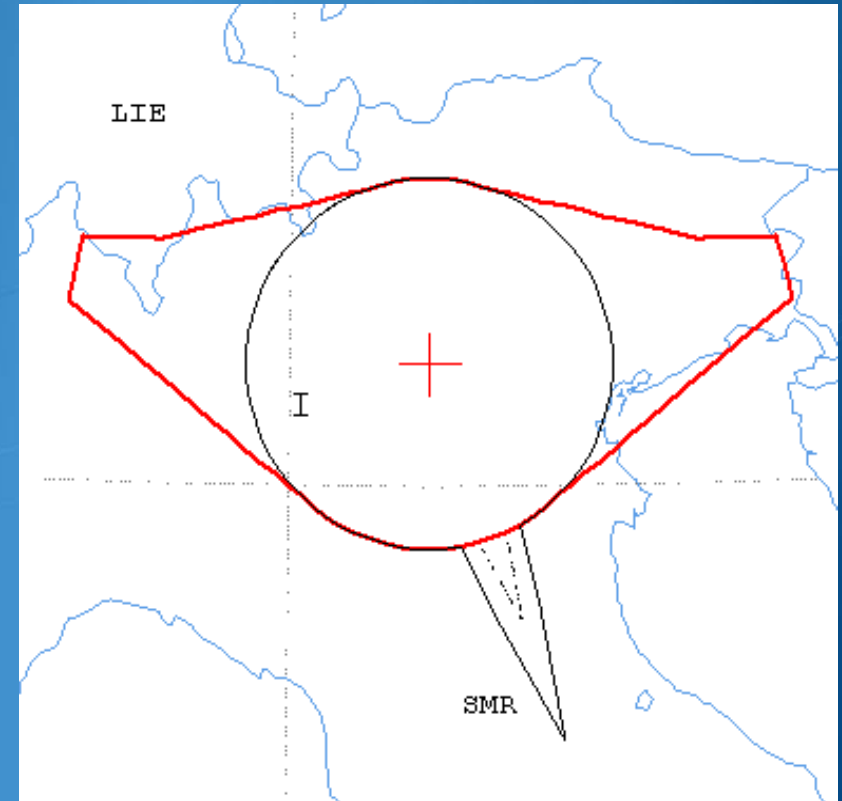
Diagram 3: 3.1_TABLE9.

TRANSMITTING GSO ES in FIXED-SATELLITE SERVICE W.R.T.

RECEIVING GSO ES in EARTH EXPLORATION SATELLITE SERVICE



With zero-degree
horizon elevation angles



With non-zero-degree
horizon elevation angles

PROBABLY AFFECTED COUNTRIES:
AUT D F HRV LIE SUI SVN

PROBABLY AFFECTED COUNTRIES:
SUI SVN