How to Create Coordination Contours around Earth Stations ?

BR-SSD e-Learning Center

Earth Station Coordination

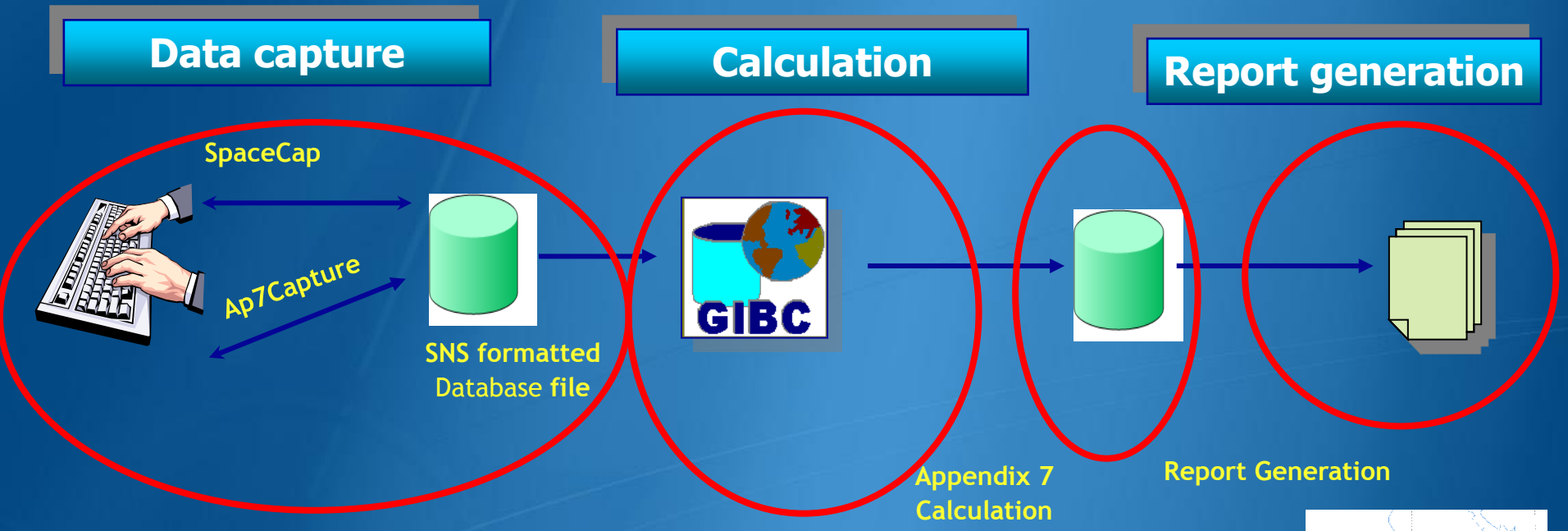
- Determination of the Coordination Area Around an Earth Station based on AP7

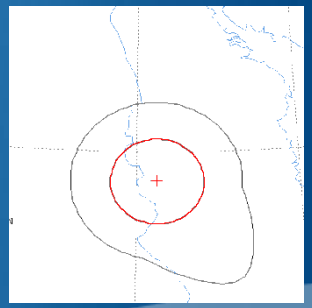
- 2 Tools :

  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

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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

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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

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AP7 Capture Tool

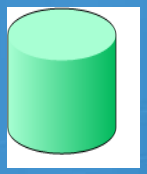
Enter AP7 data for a new earth station

Modify parameters of an existing earth station

Create a copy of an existing earth station entry

Ap7Capture

SNS formatted Database file



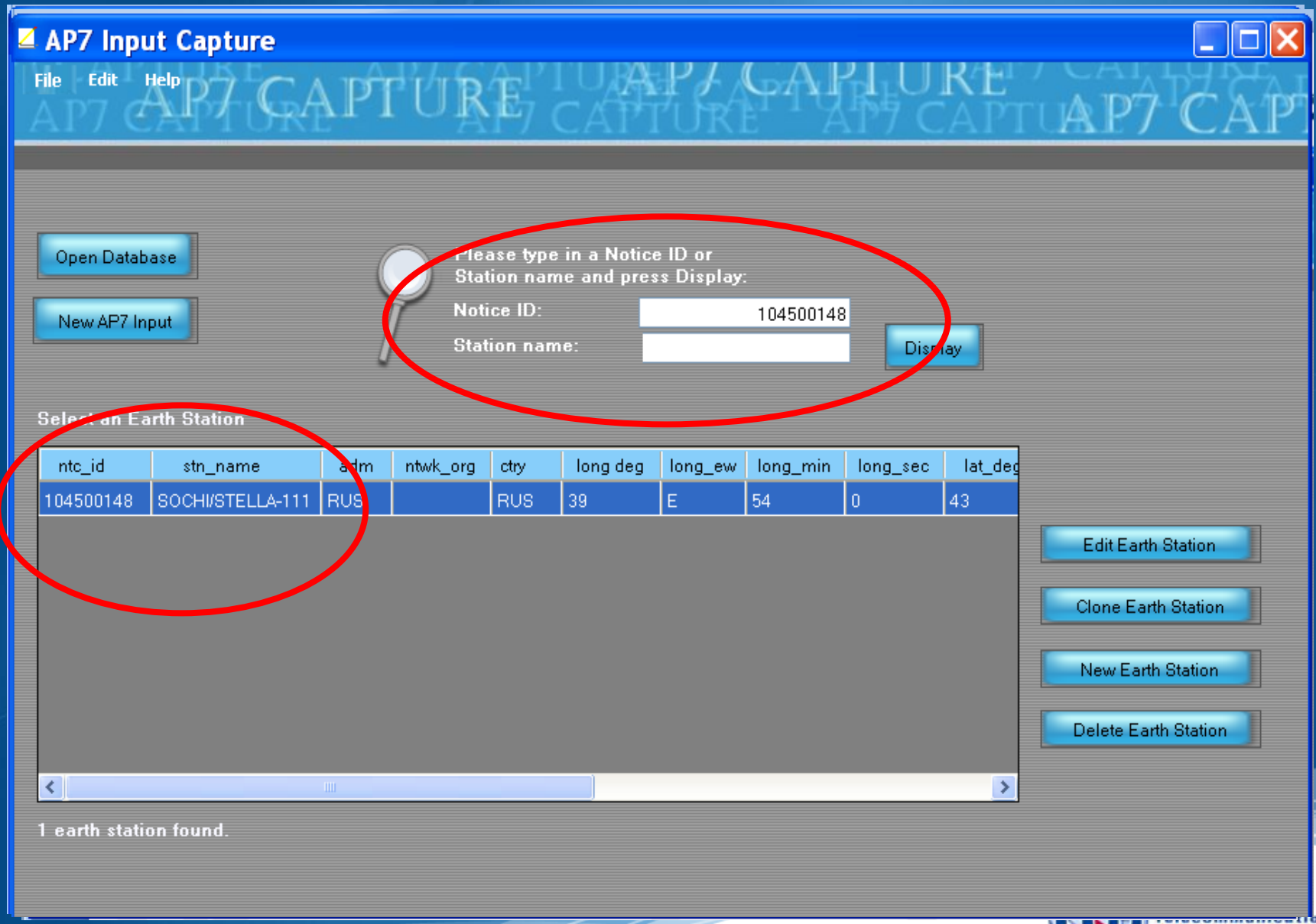
In addition, Ap7 Capture tool provides:

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

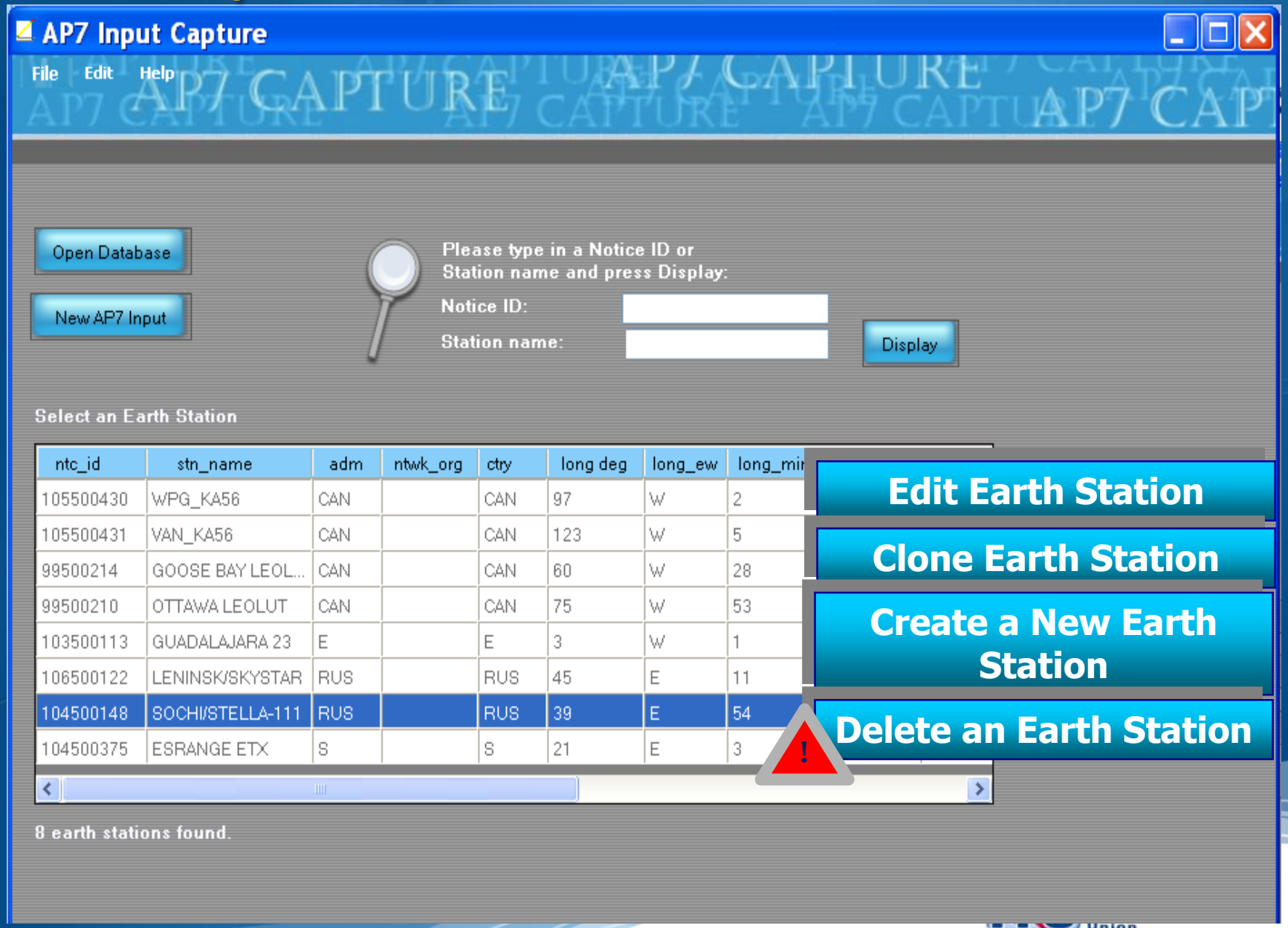
Open Ap7capture tool

Select the database

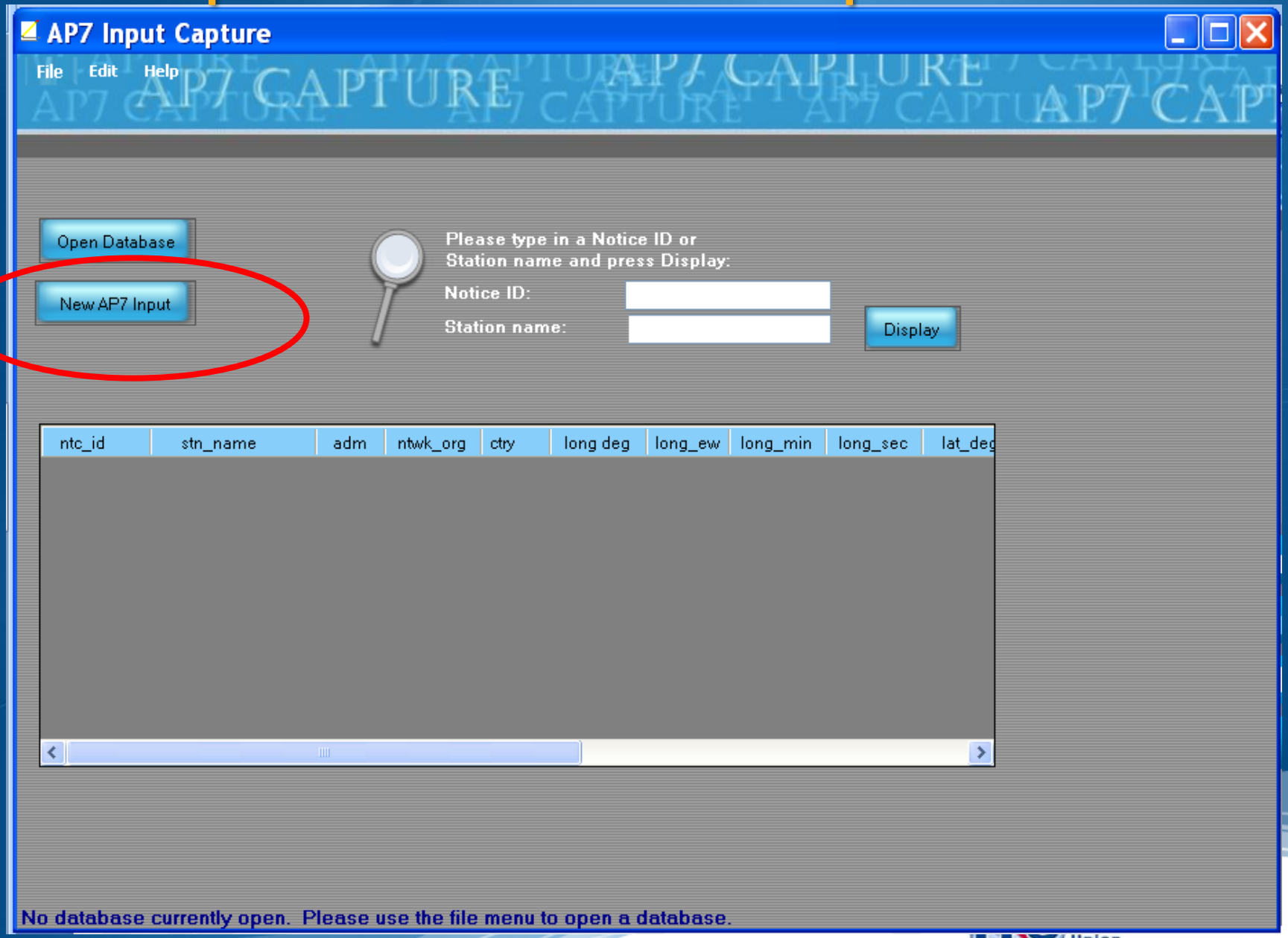
AP7 Capture Tool



AP7 Capture Tool

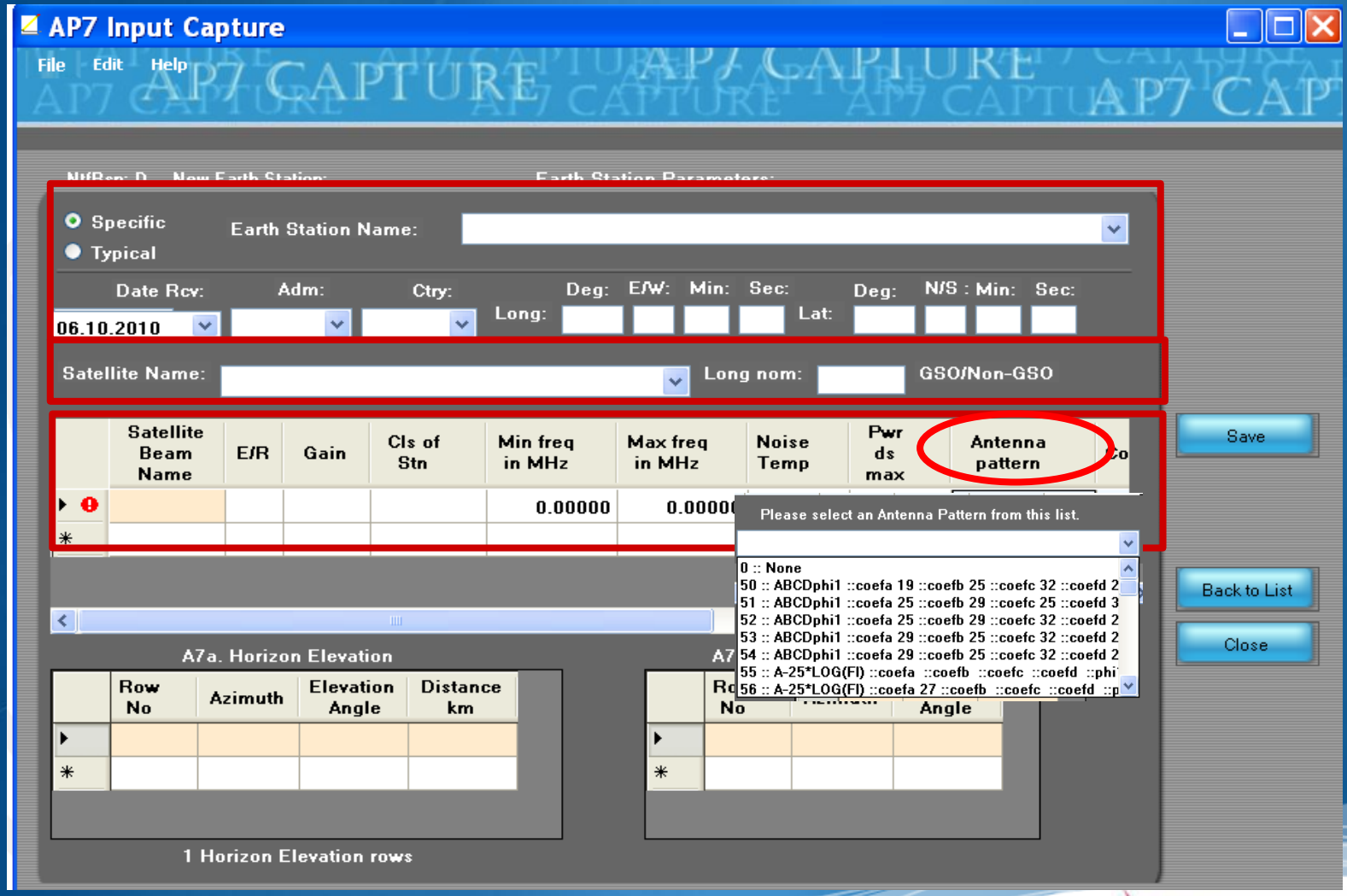


AP7 Capture Tool – New Input

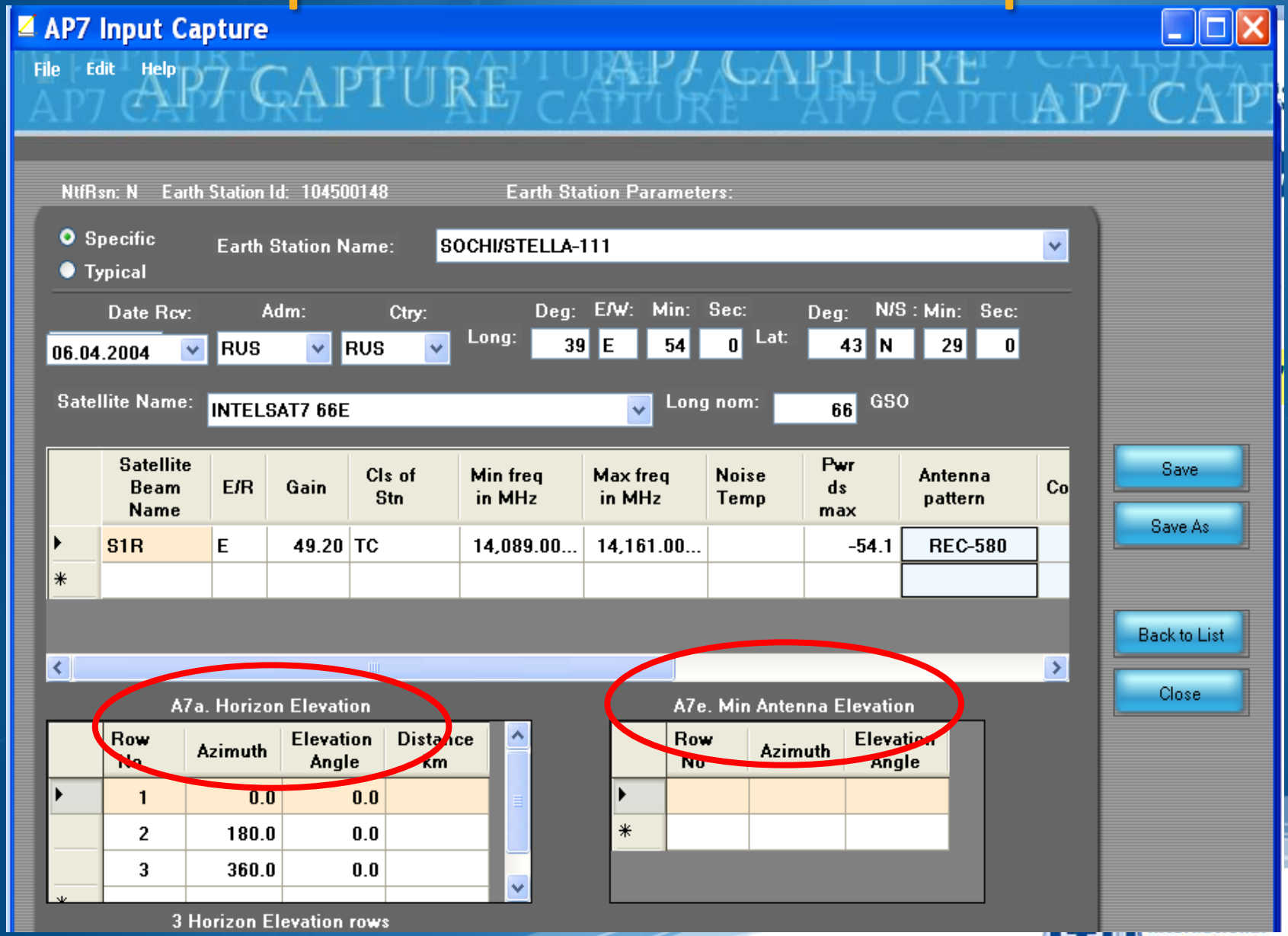


AP7 Capture Tool – New Input

Earth Station Parameters

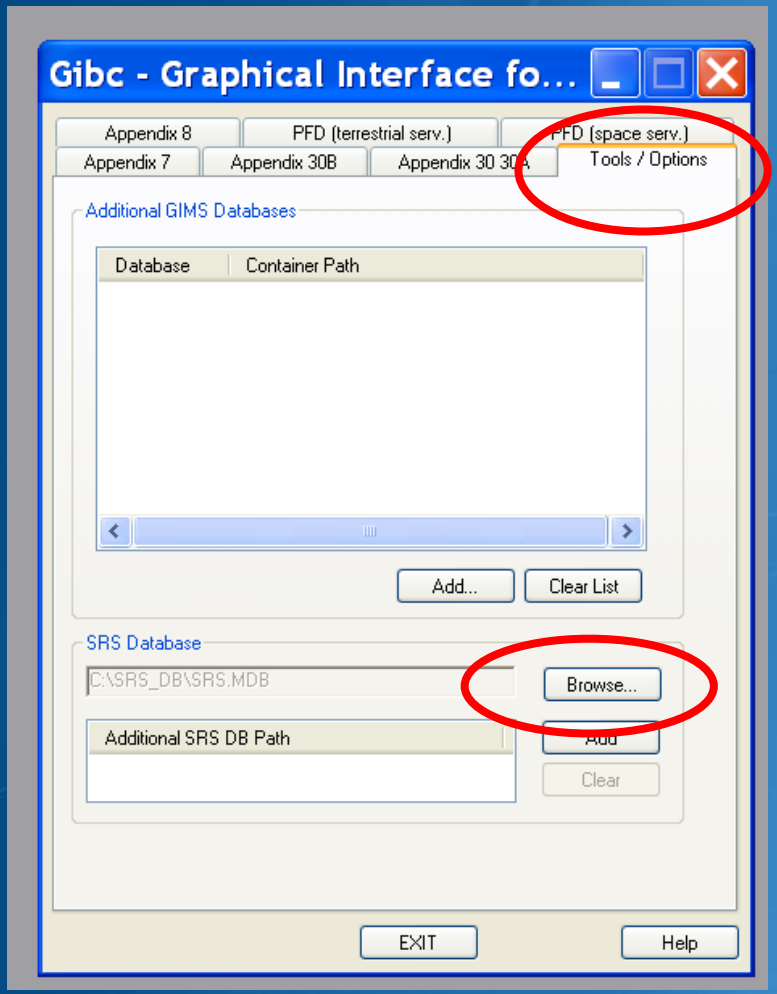


AP7 Capture Tool – New Input



GIBC/ AP 7- Input Database

Database file location- Tools/ Options page



Use the browse button to:

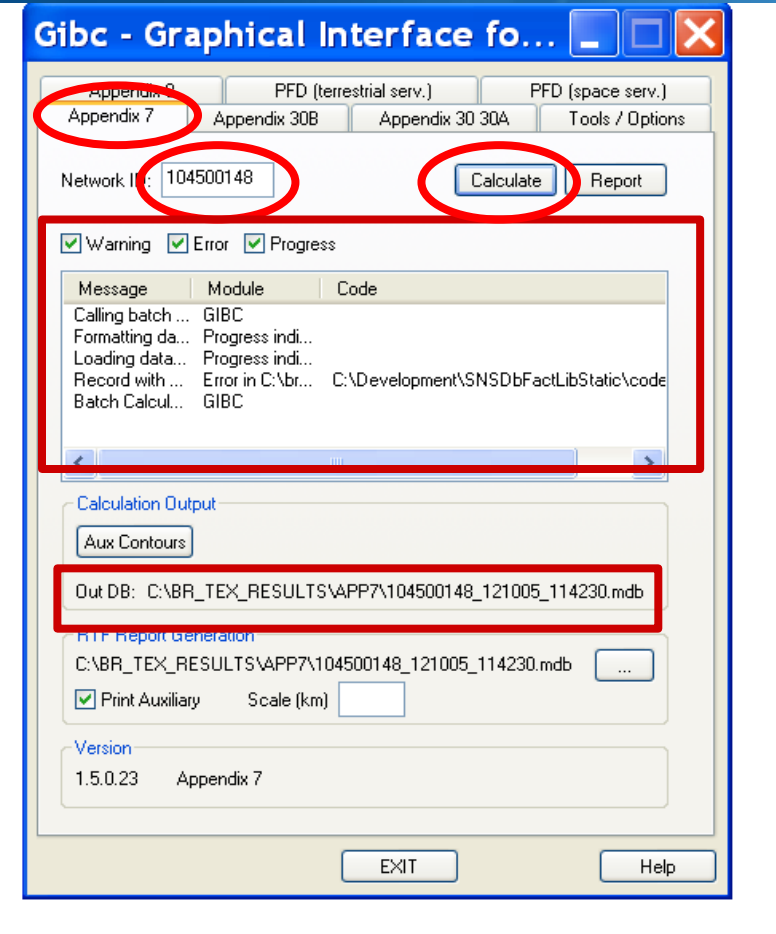
- select the srs.mdb from the latest BR-IFIC (in the DVD drive)
- select a different input database file

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

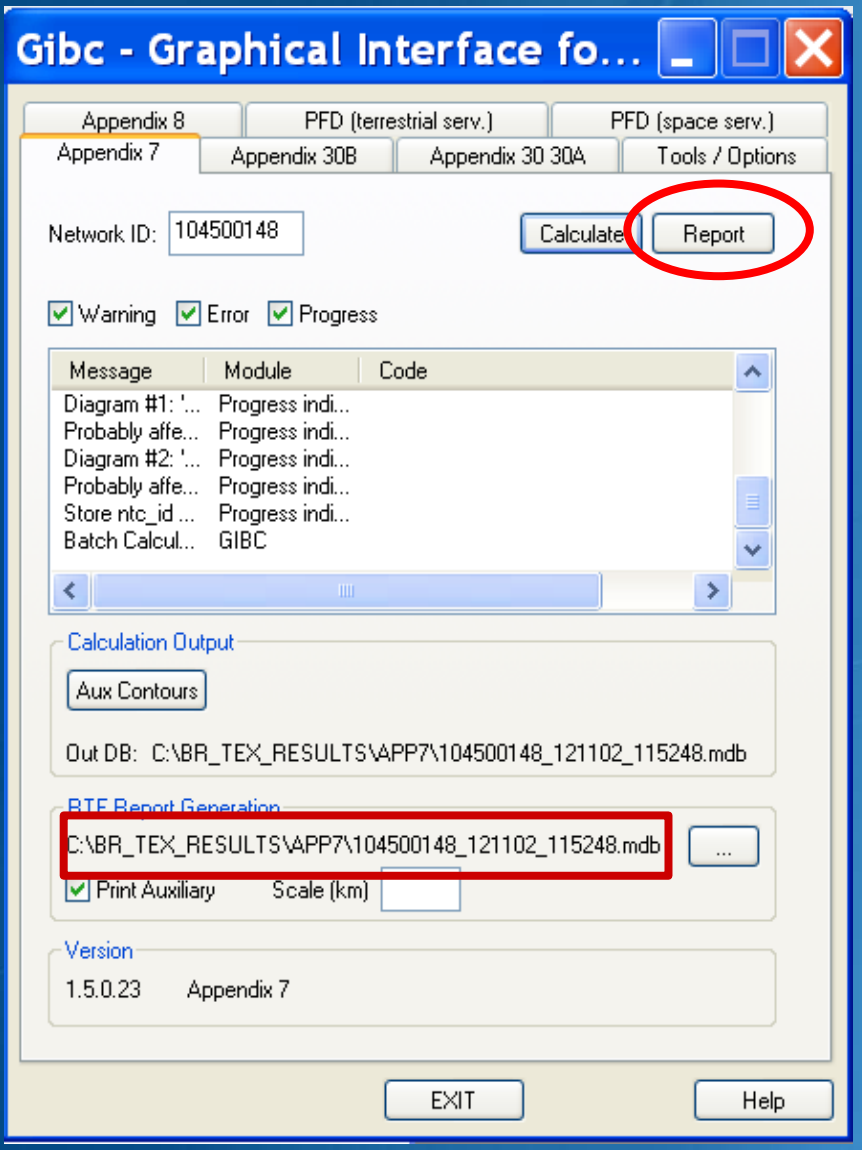
Naming convention:
NetworkId_Date_Time.mdb

Select the **Appendix 7** tab

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

Press **Calculate**

GIBC/ AP 7- Generate Report



Report Generation

Ap7print.rtf

After an Appendix 7 calculation…

- **Just Press the Report button**

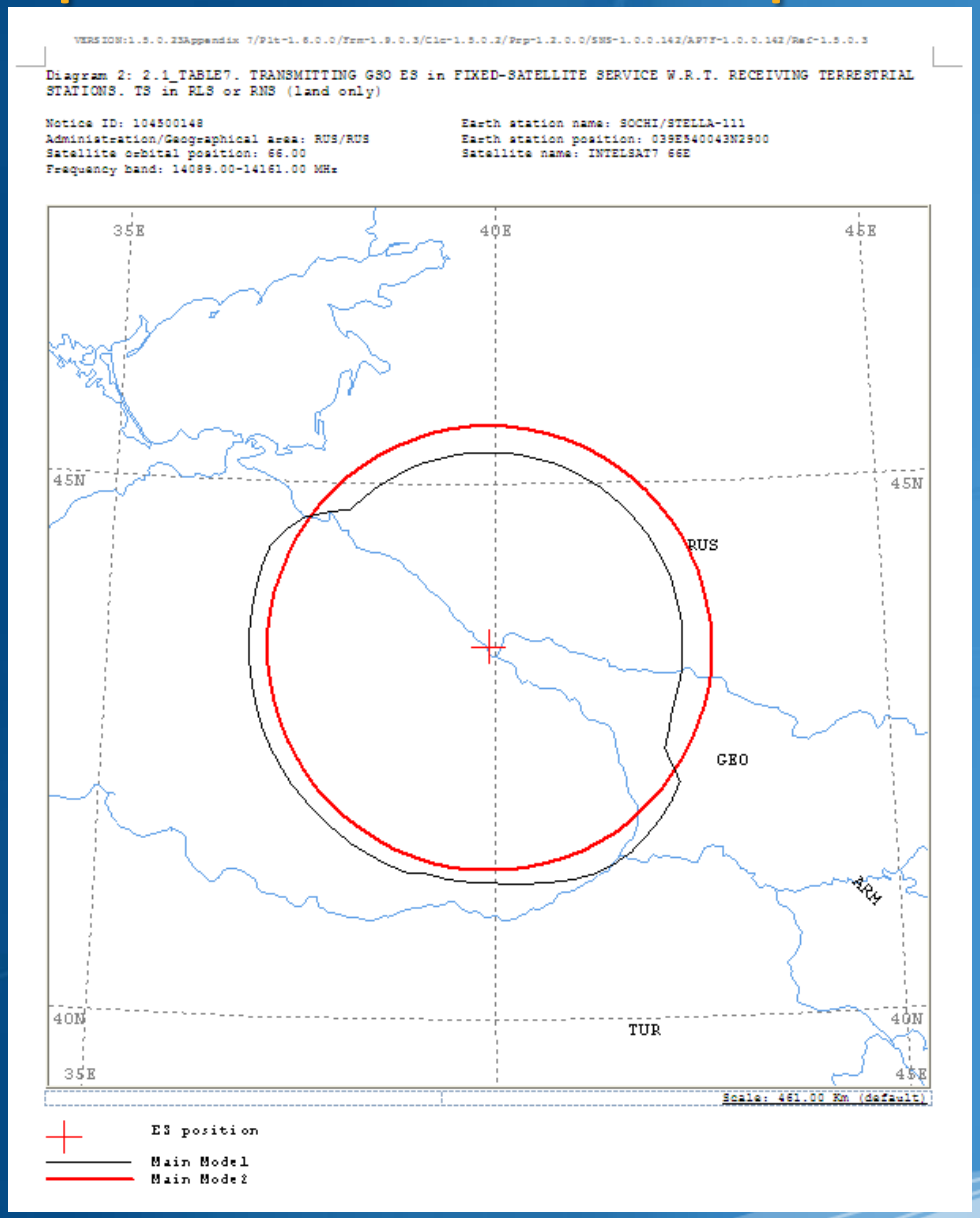
Note!

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

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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

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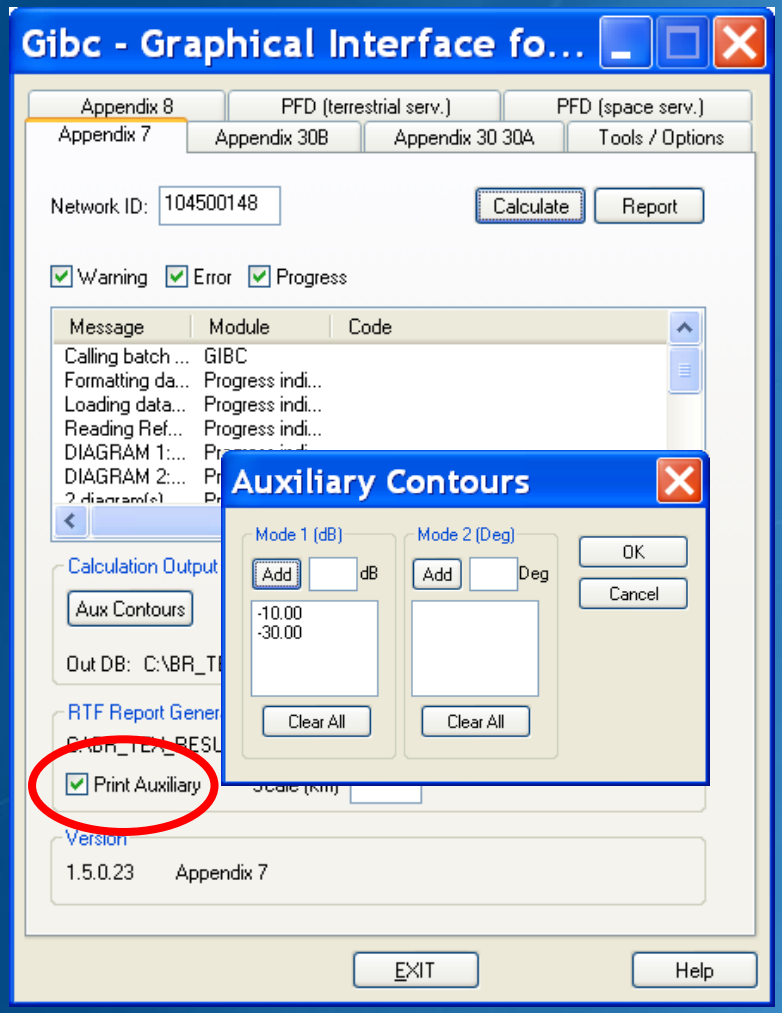
Auxiliary Contours

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

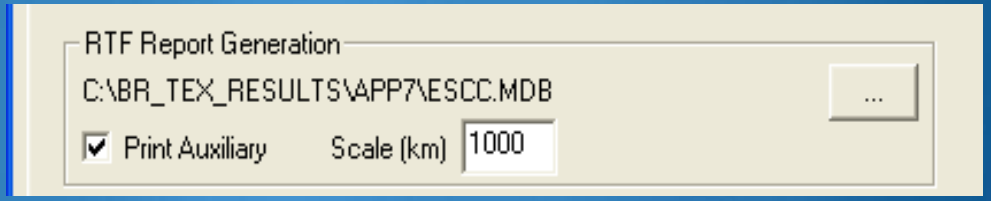
Perform Report Generation

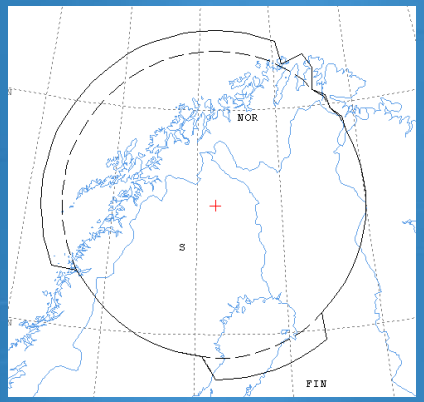
Printing Options

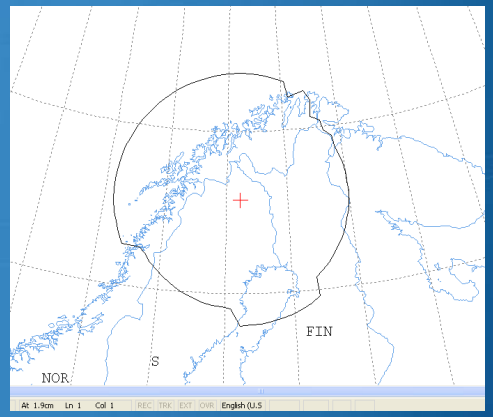
Print Auxiliary

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)

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Exercise 1

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

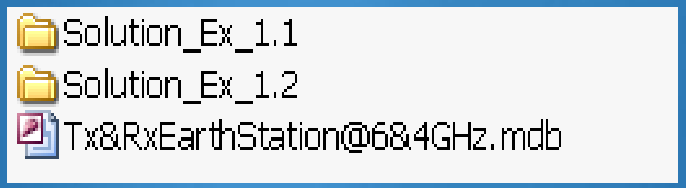
Input database (SNS format):

Tx&RxEarthStation@6&4GHz.mdb

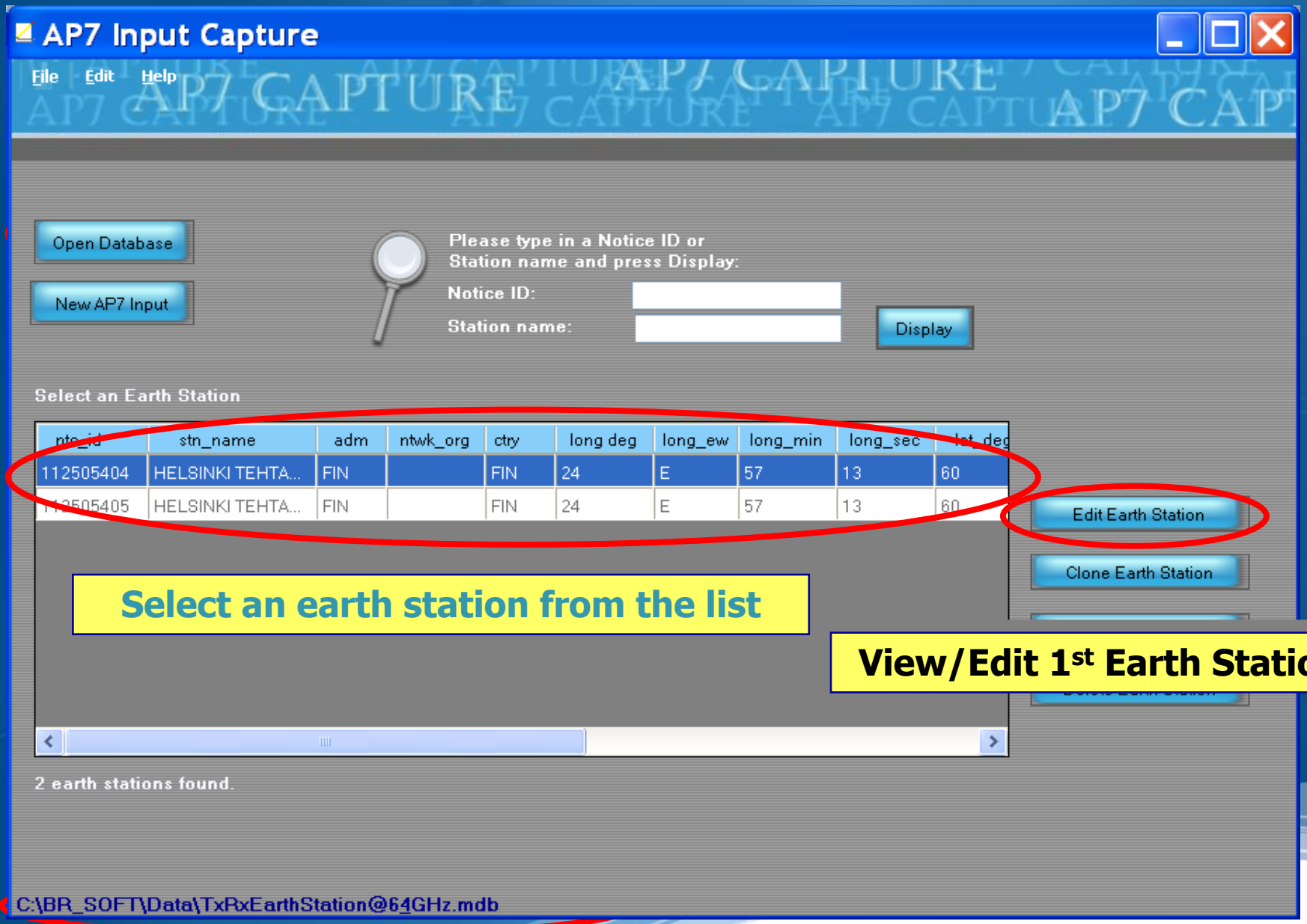
ES name: **HELSINKI TEHTAANKATU**

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

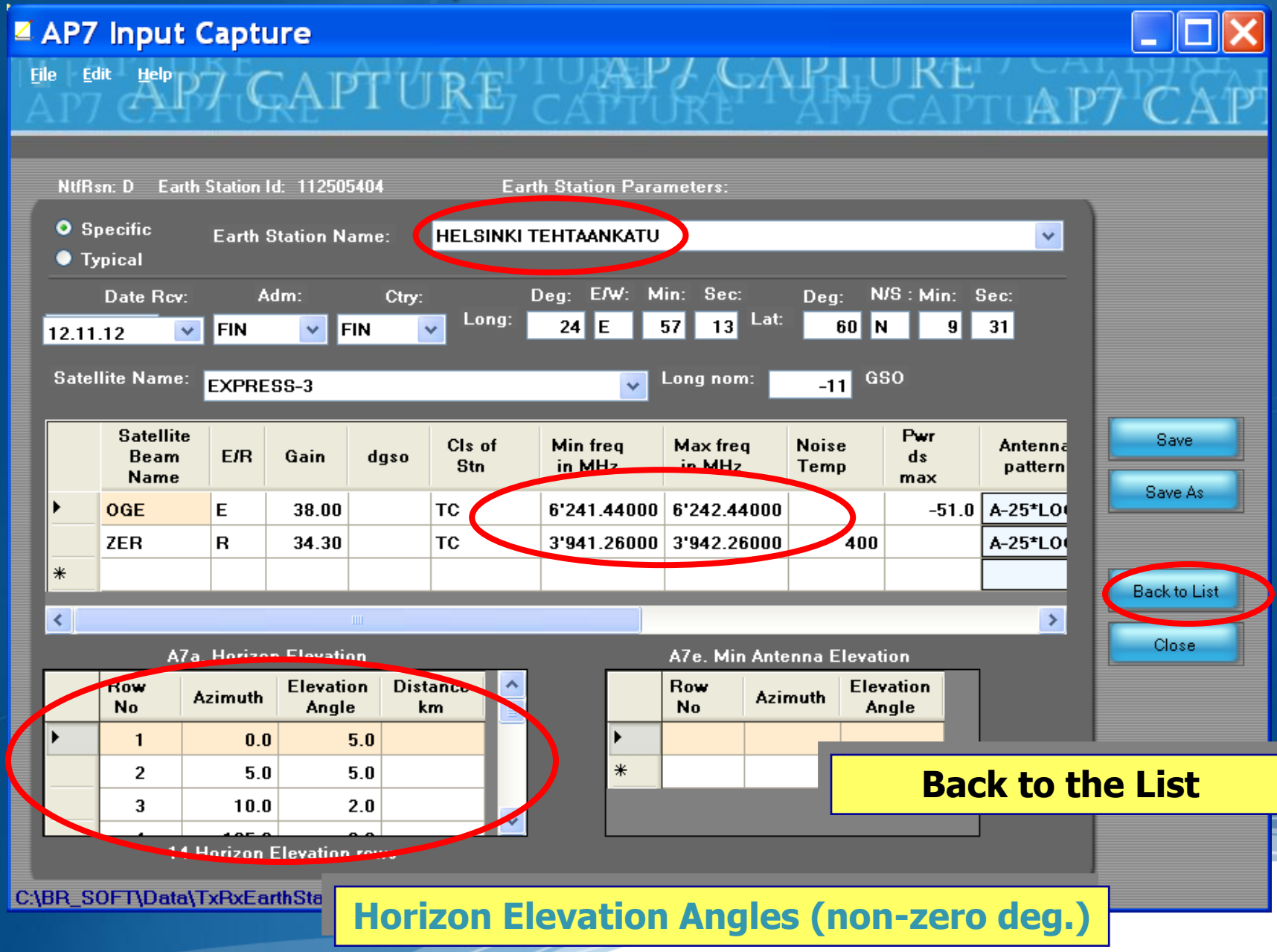
- Ex. 1.2 ES notice id: **112505405** (zero deg. horizon elevation angles)



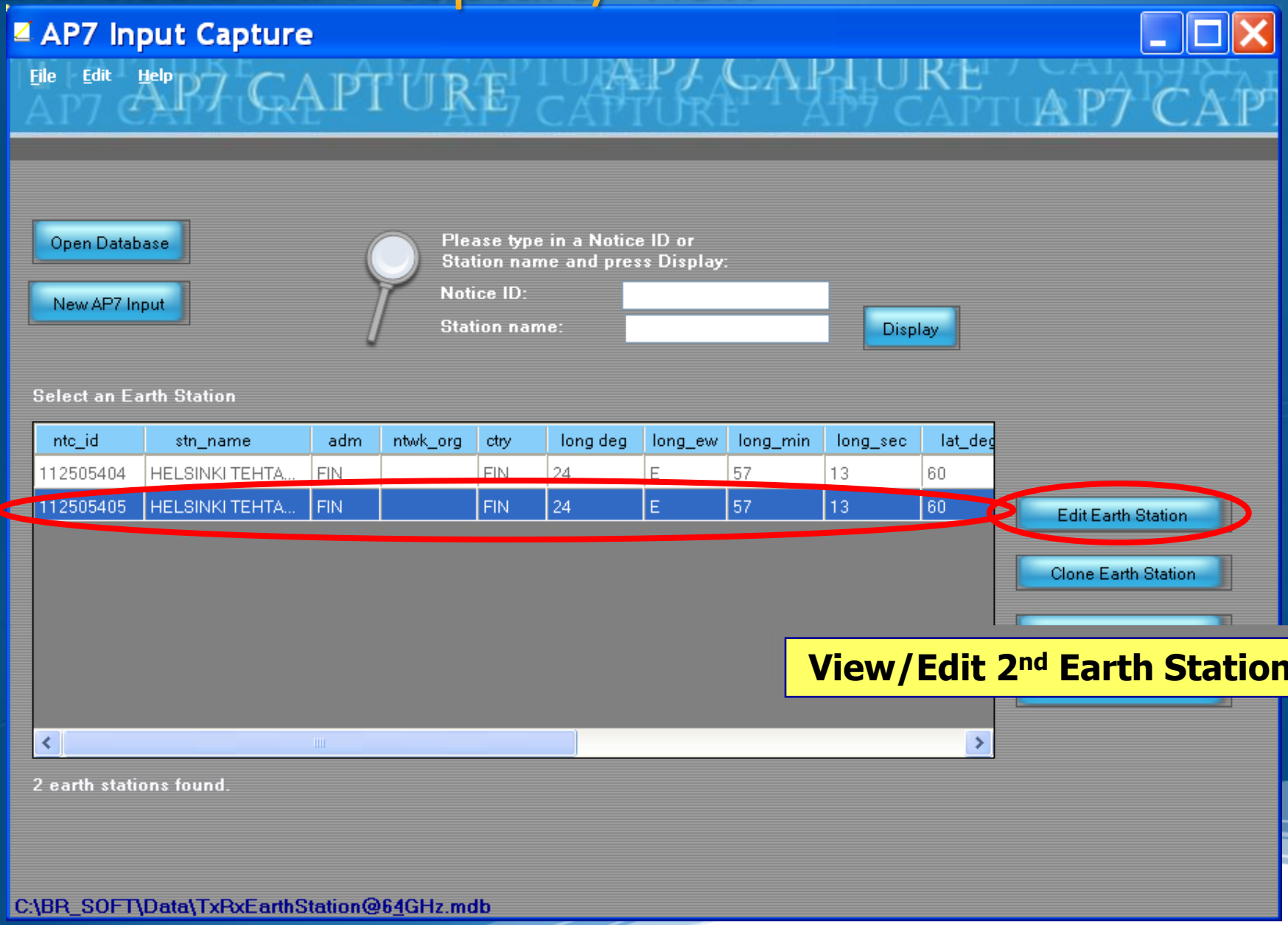
Exercise 1- AP7 Capture/ View



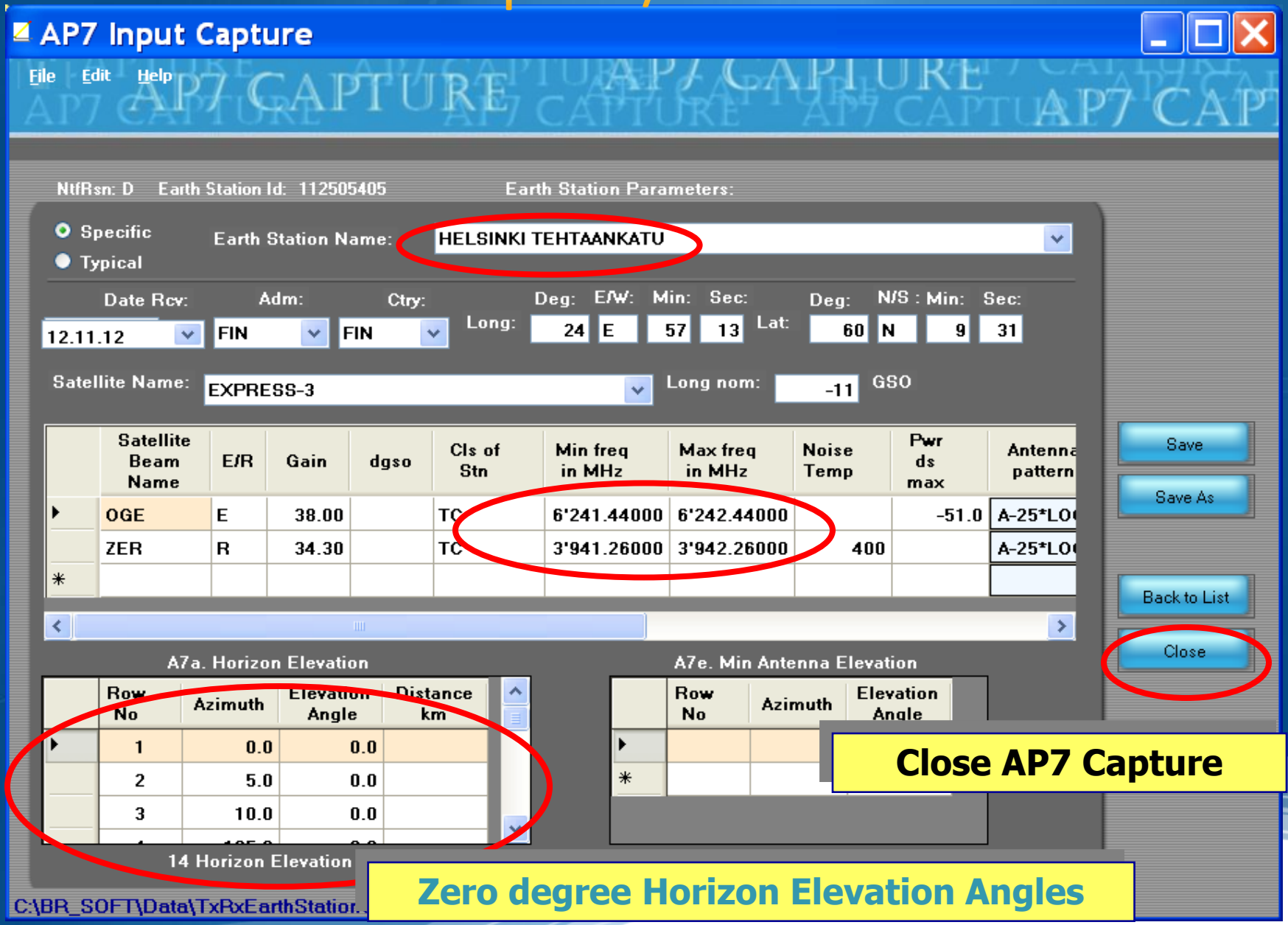
Exercise 1- AP7 Capture/ View



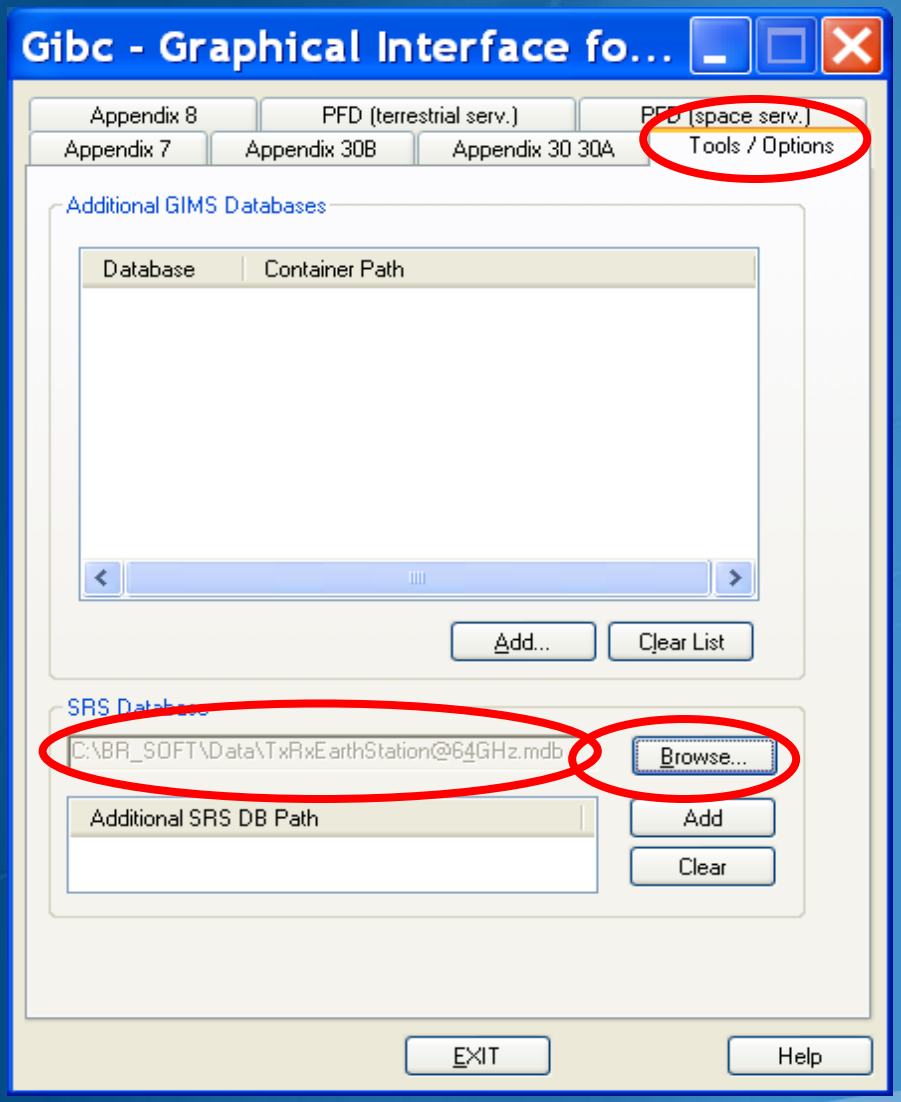
Exercise 1- AP7 Capture/ View



Exercise 1 - AP7 Capture/View



Exercise 1 - GIBC – Open input Database

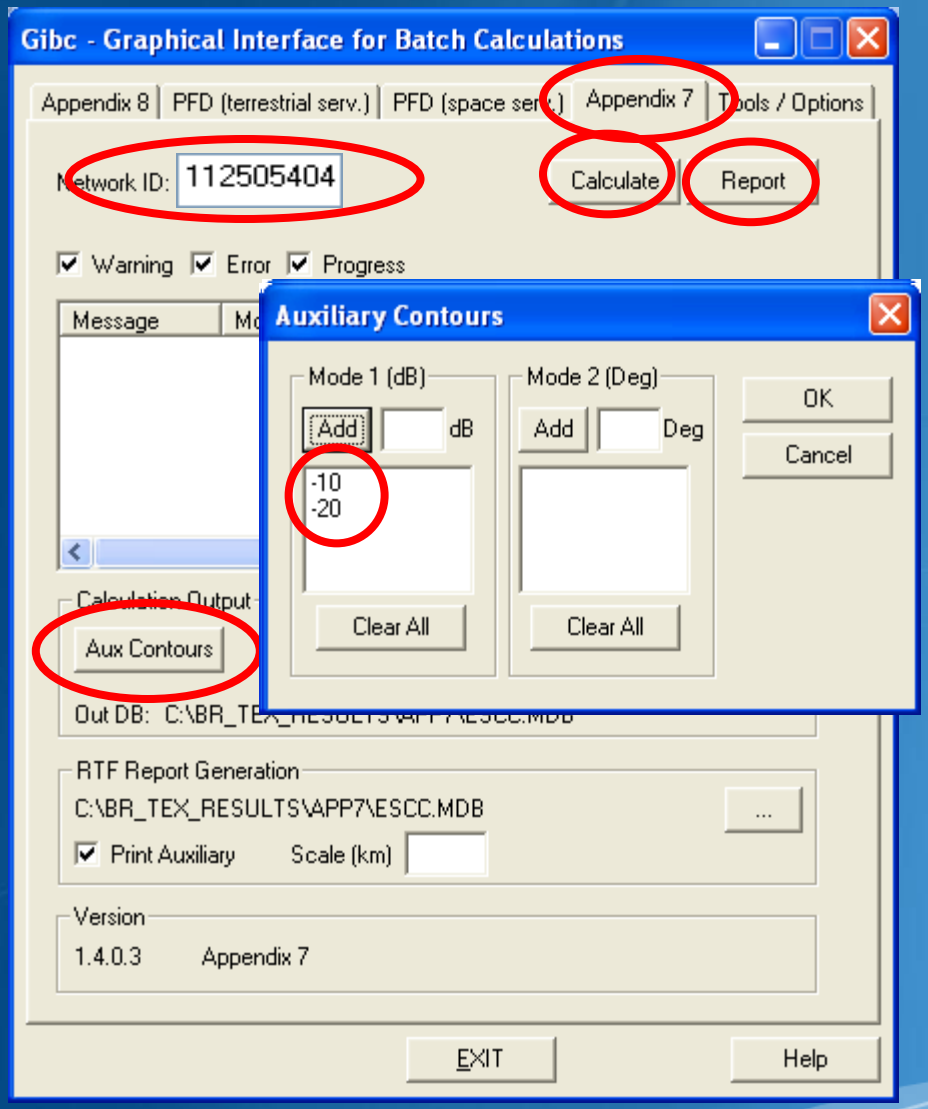


- Run GIBC
- Select the **Tools & Options** tab
- Change the SRS database reference input file:

⇒ 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

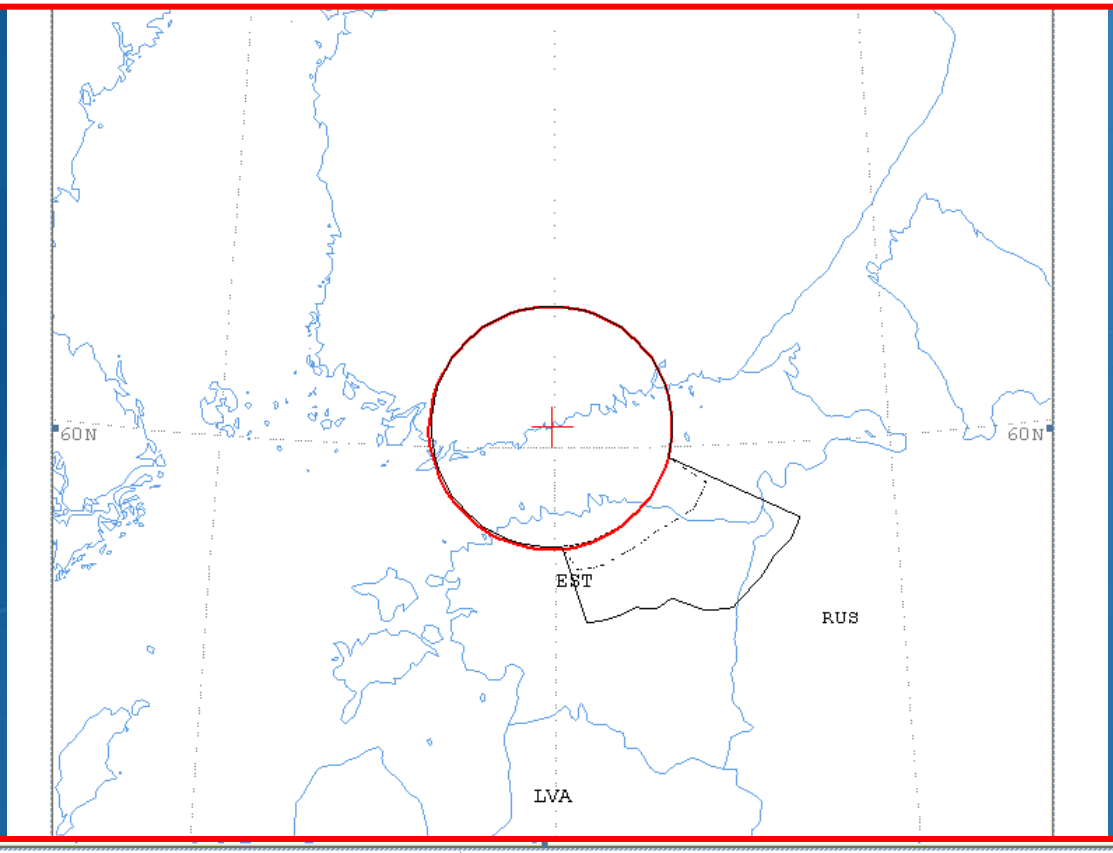
- Calculate
- Create and Open the Report

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
Main Mode1
Main Mode2
Aux. Mode1 -10.0dB
Aux. Mode1 -20.0dB

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	8
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	10
-10.0 DB	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	10
-20.0 DB	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	10
MODE 2																		
0.0 DEG	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	10

AZIMUTH	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	20
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	10
-10.0 DB	136	131	127	123	122	121	121	121	122	122	121	100	100	100	100	100	100	10
-20.0 DB	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	10
MODE 2																		

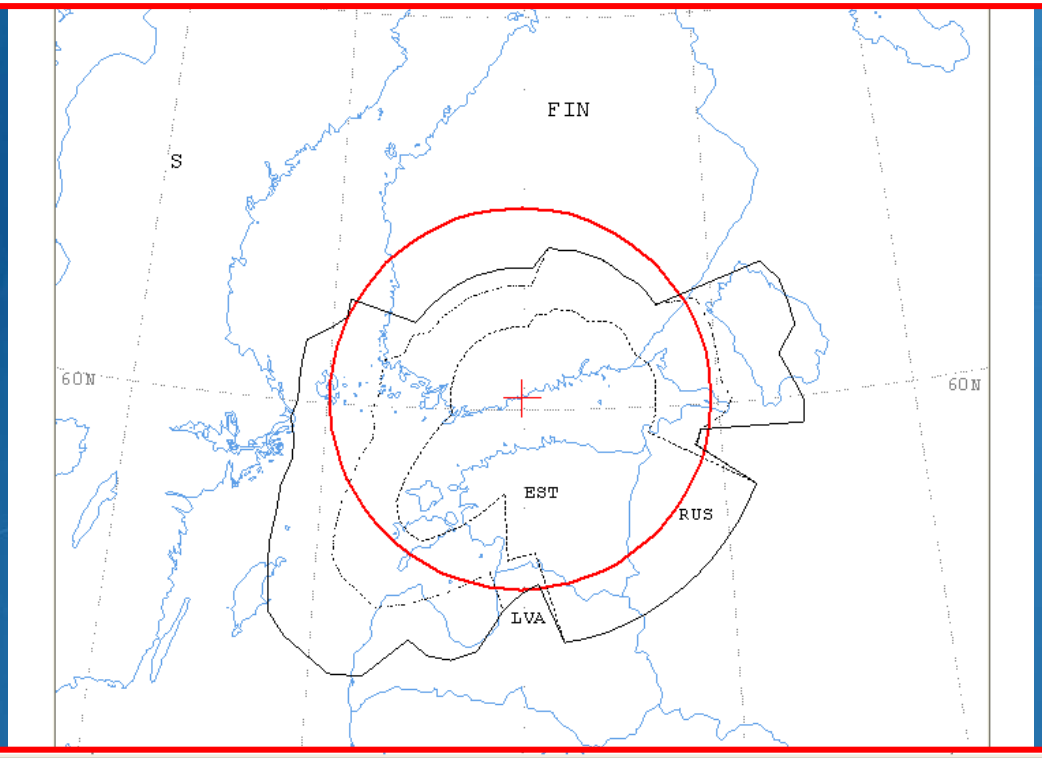
PROBABLY AFFECTED COUNTRIES: EST RUS

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 Mode1
Main Mode2
Aux. Mode1 -10.0dB
Aux. Mode1 -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

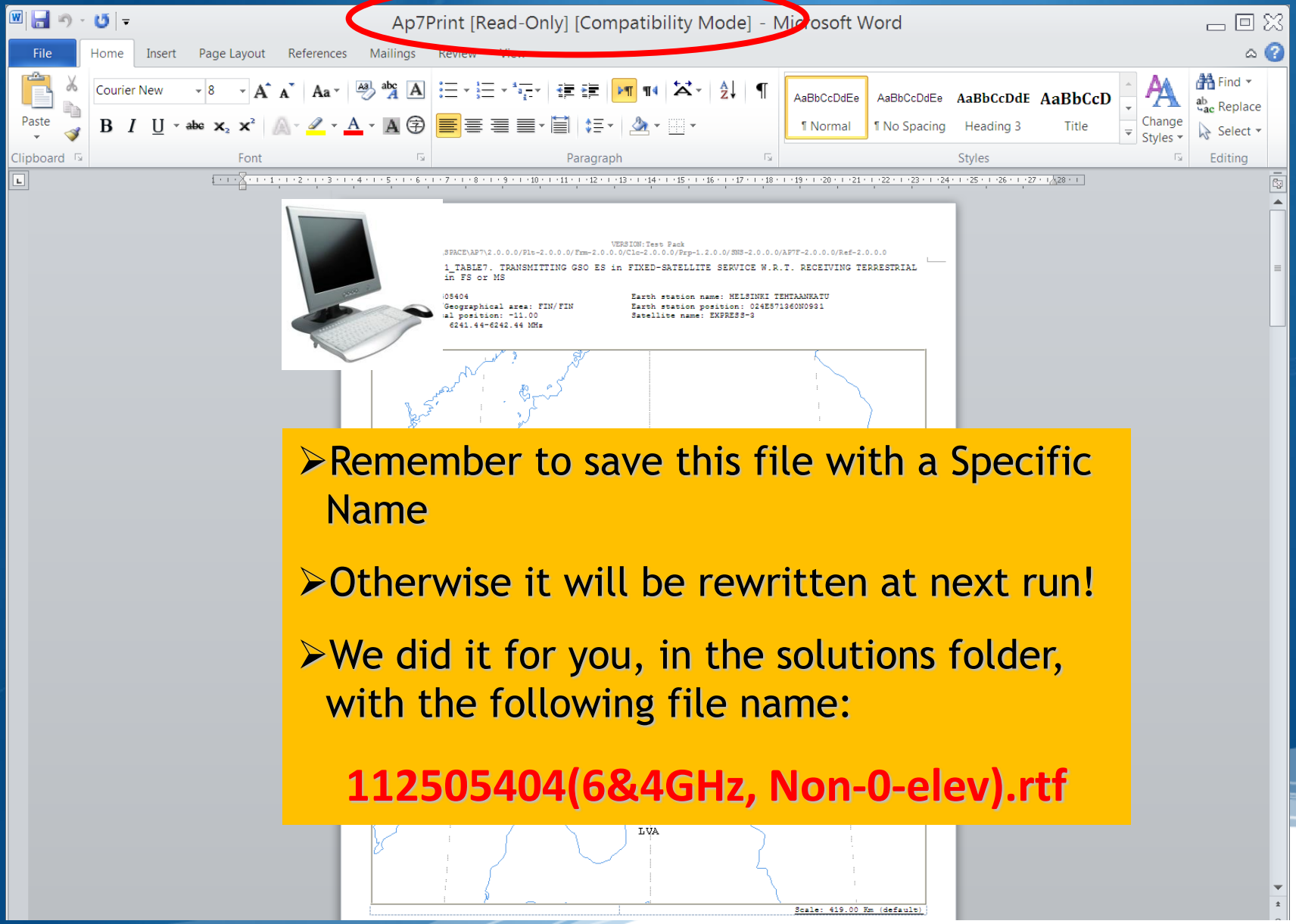
AZIMUTH	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115
OFF-AXIS	135.5	139.9	145.7	149.9	153.7	157.2	160.1	162.0	162.6	161.9	160.0	157.1	153.6	149.7	145.5	141.2	136.7	132.1	127.5	122.8	118.1	113.4	109.2	104.4
HOR.ELEV.	5.0	5.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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	265	280	303	367	386	391	380	457	479	476	479	471	439
-10.0 DB	354	354	354	354	354	354	354	354	354	354	354	265	280	303	252	271	292	315	340	363	360	361	351	323
-20.0 DB	354	354	354	354	354	354	354	354	354	354	354	222	226	232	138	156	177	201	225	249	252	244	231	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	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
HOR.CORR.	33.0	33.0	33.0	33.0	33.0	33.0	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	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

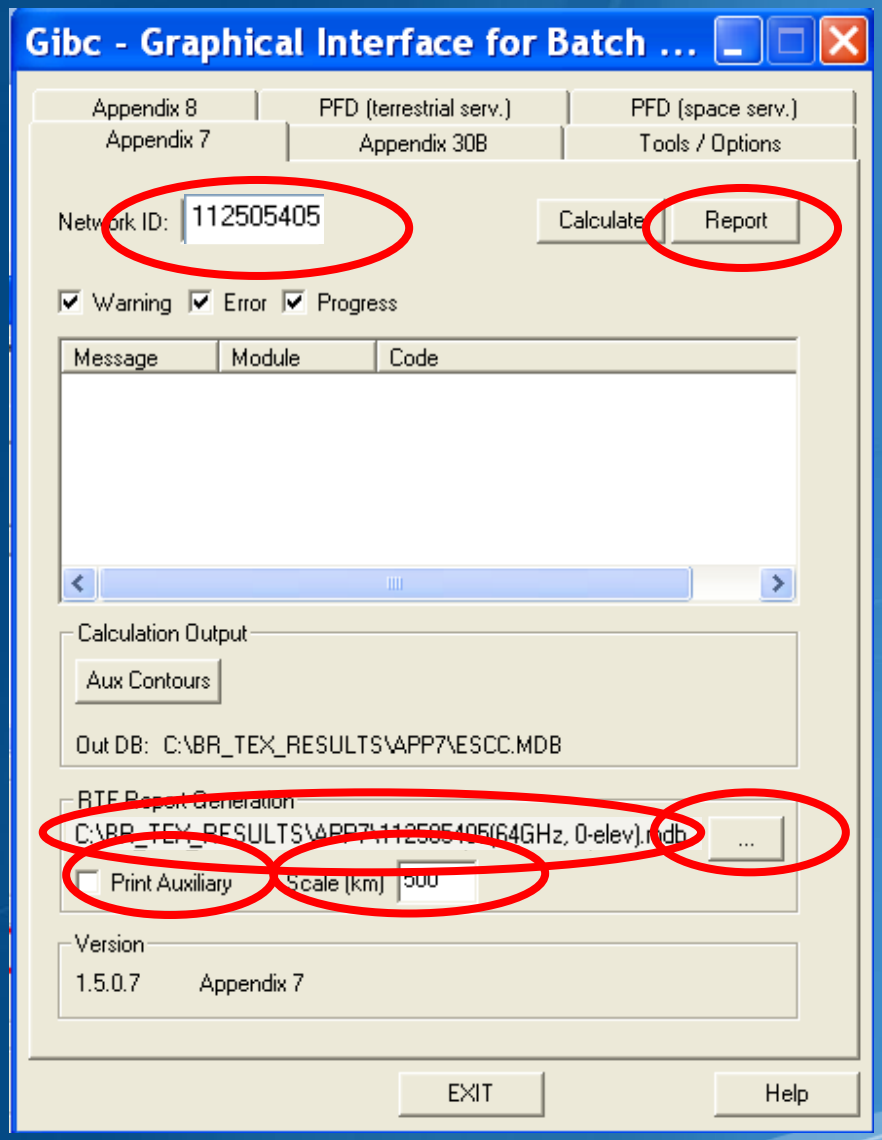
GIBC –Results - Exercise 1.1



- 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

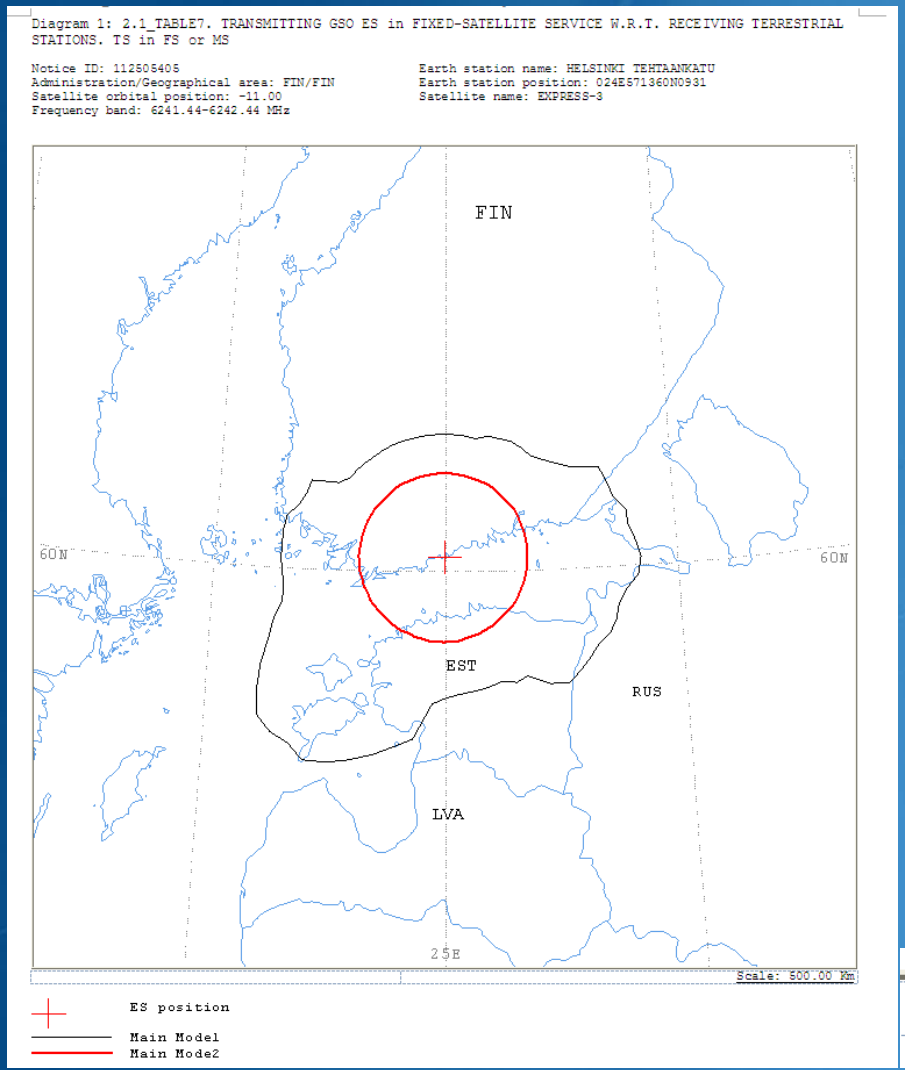


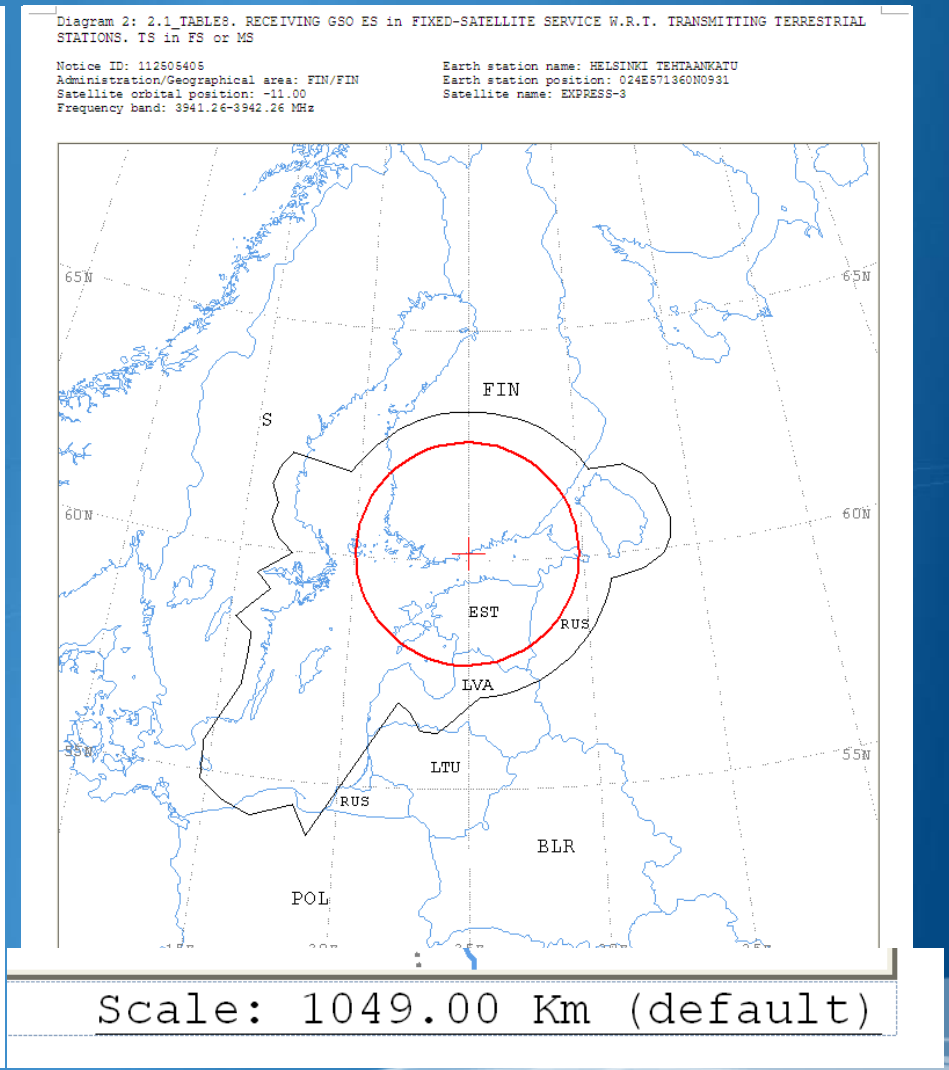
- Run GIBC
- Select the **Appendix 7** page
- Enter the 2nd Earth Station notice Id. (Ex.1.2 Zero deg horizon elevation angle):

  112505405
- Select resulting database

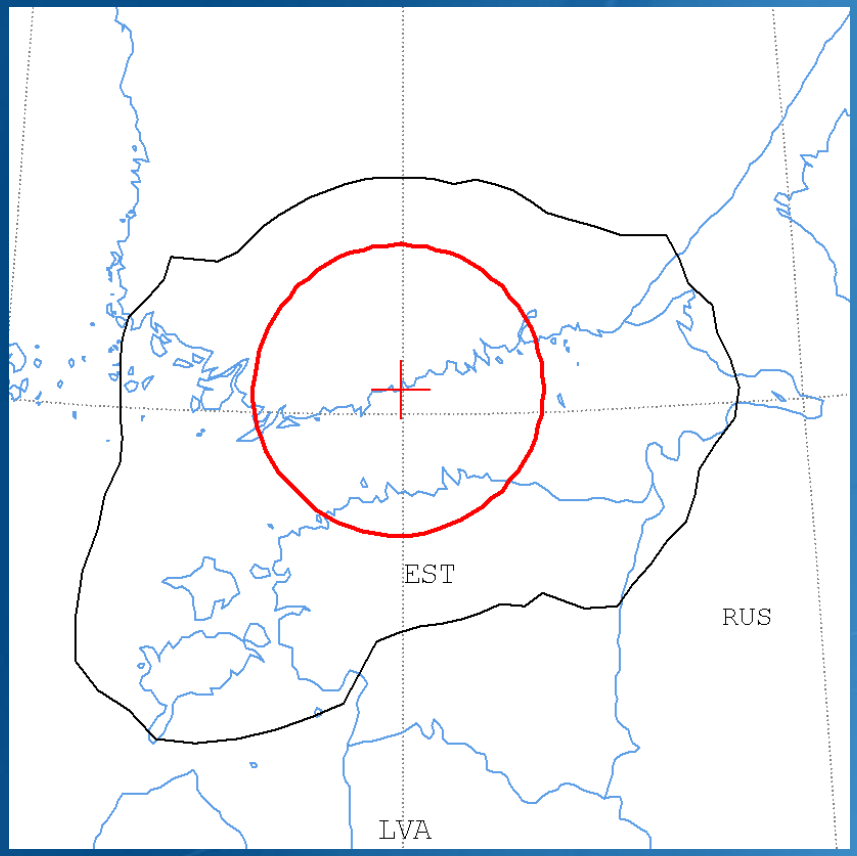
  112505405(6&4GHz, 0-elev).mdb
- Disable print of auxiliary contours
- Enter a value for the scale
- Re-create the output Report

GIBC –Results - Exercise 1.2

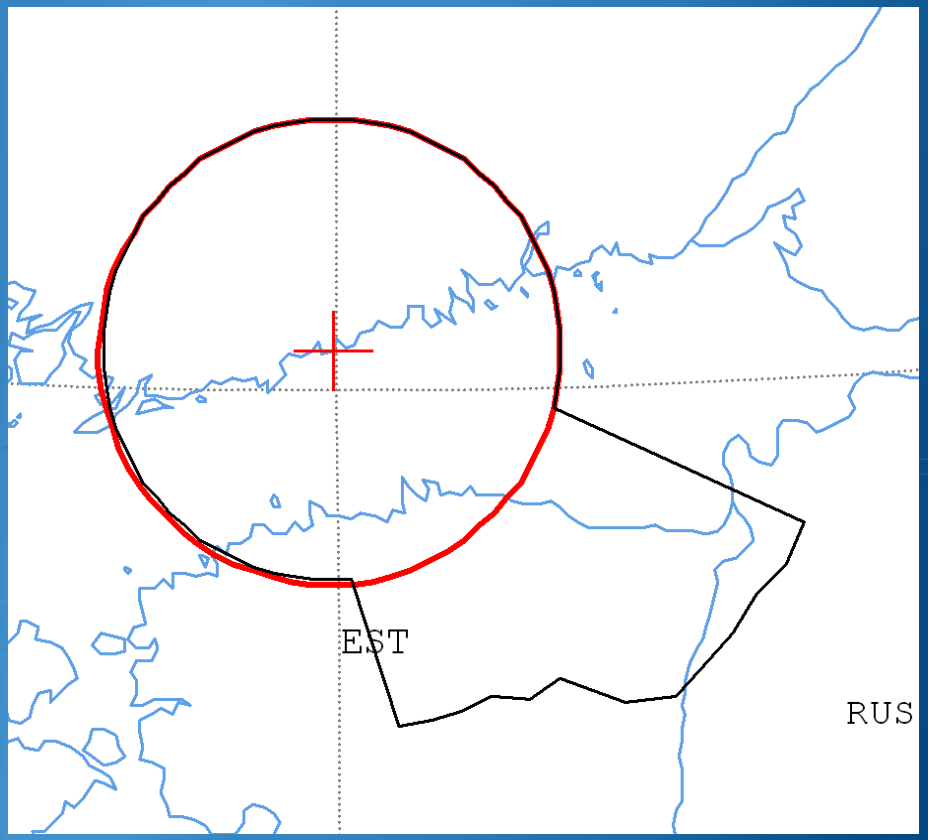




Exercise 1 – GIBC – Compare Results (Tx)



Zero-degree horizon elevation angles

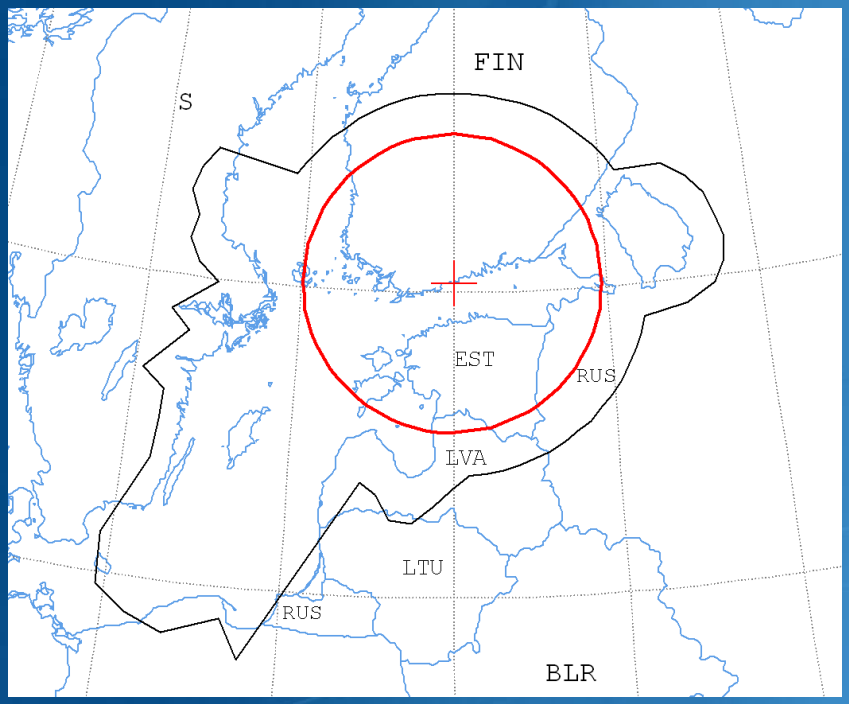


Non-zero-degree horizon elevation angles

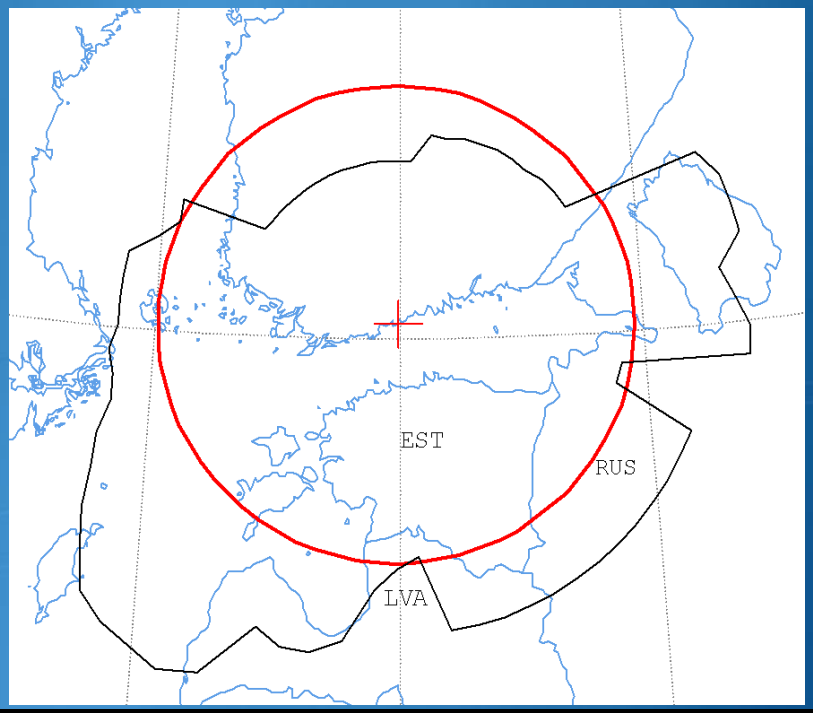
PROBABLY AFFECTED COUNTRIES:
EST RUS

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

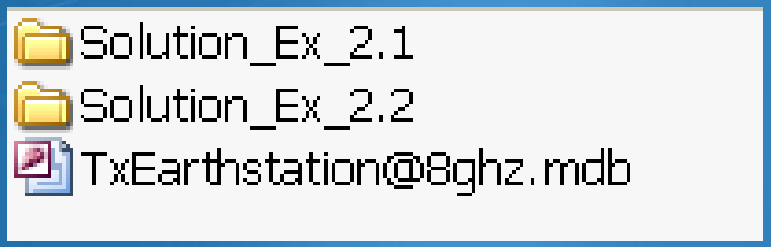
FSS Transmitting ES in the **8 GHz band**

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)



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:

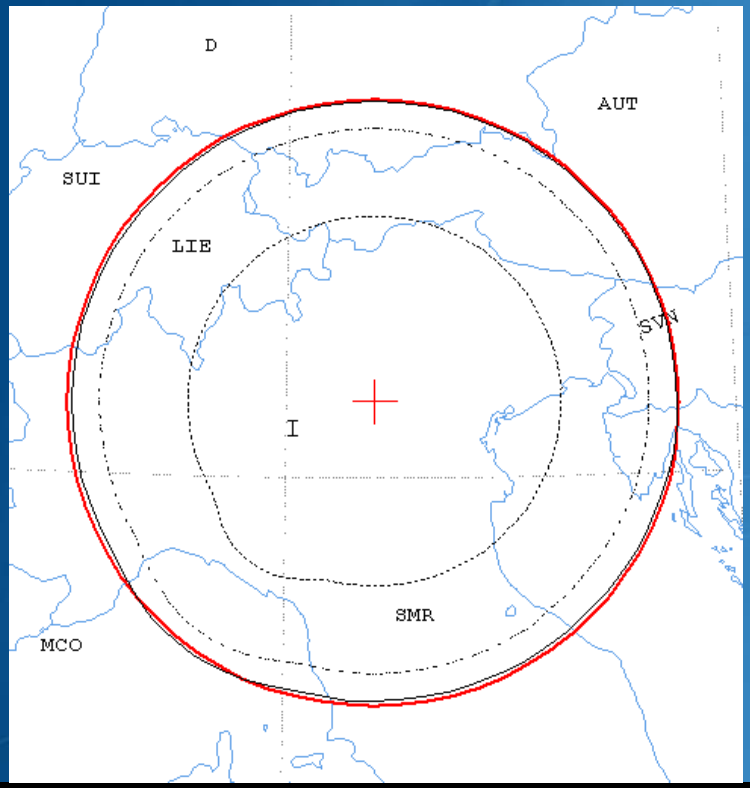
107500164(Tx8GHz, Non-0-elev).rtf

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

107500165(Tx8GHz, 0-elev).rtf

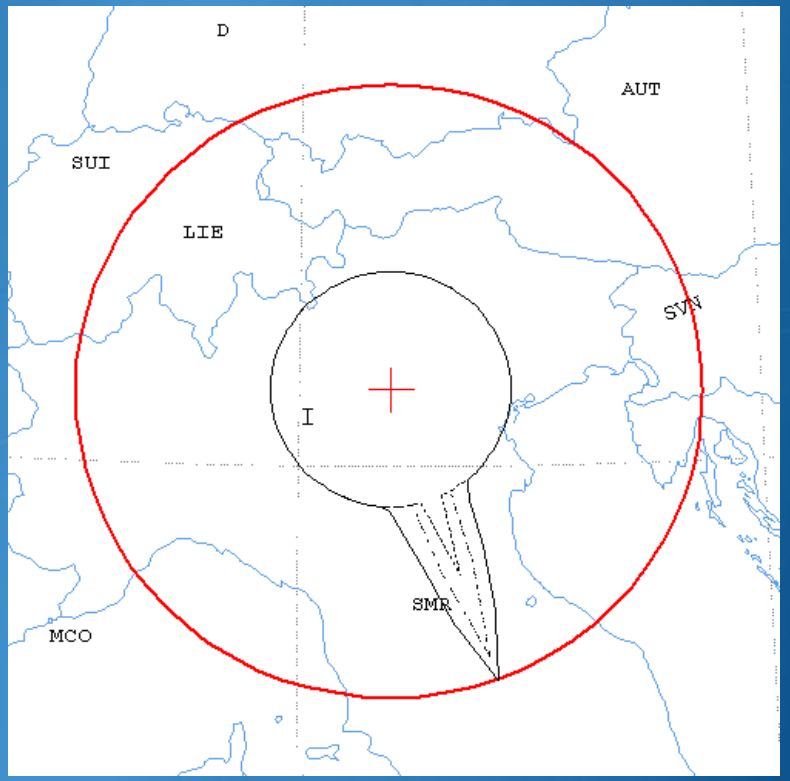
Exercise 2 – GIBC – Results

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

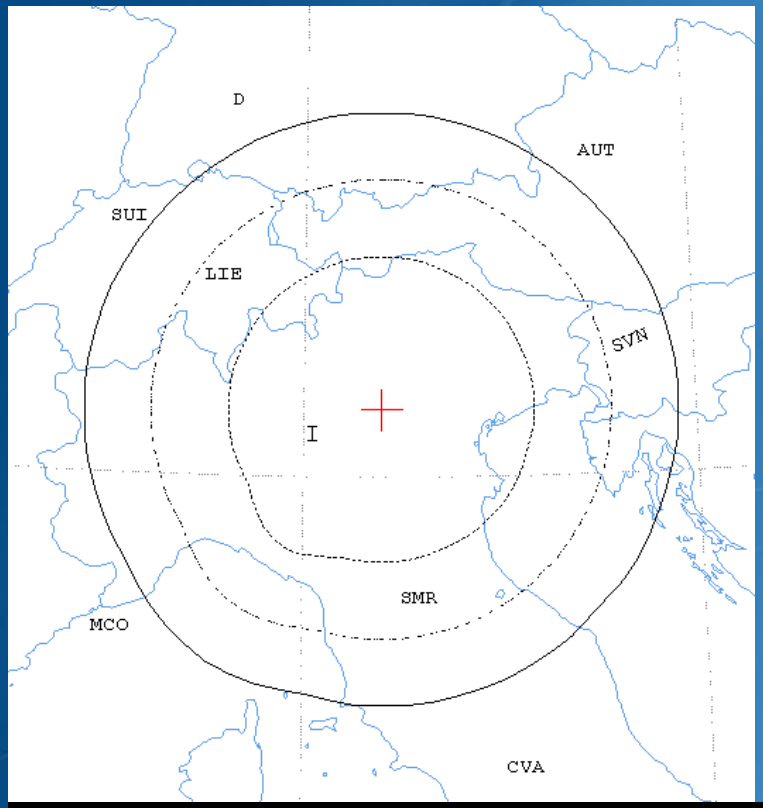


With non-zero-degree horizon elevation angles

PROBABLY AFFECTED COUNTRIES:
AUT D HRV LIE SMR SUI SVN

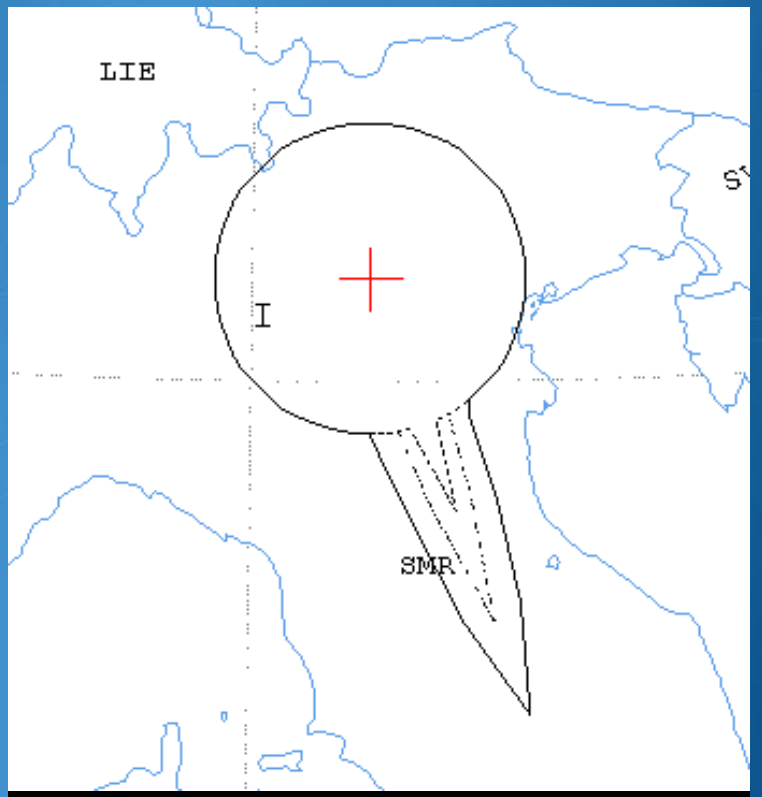
Exercise 2 – GIBC – Results

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

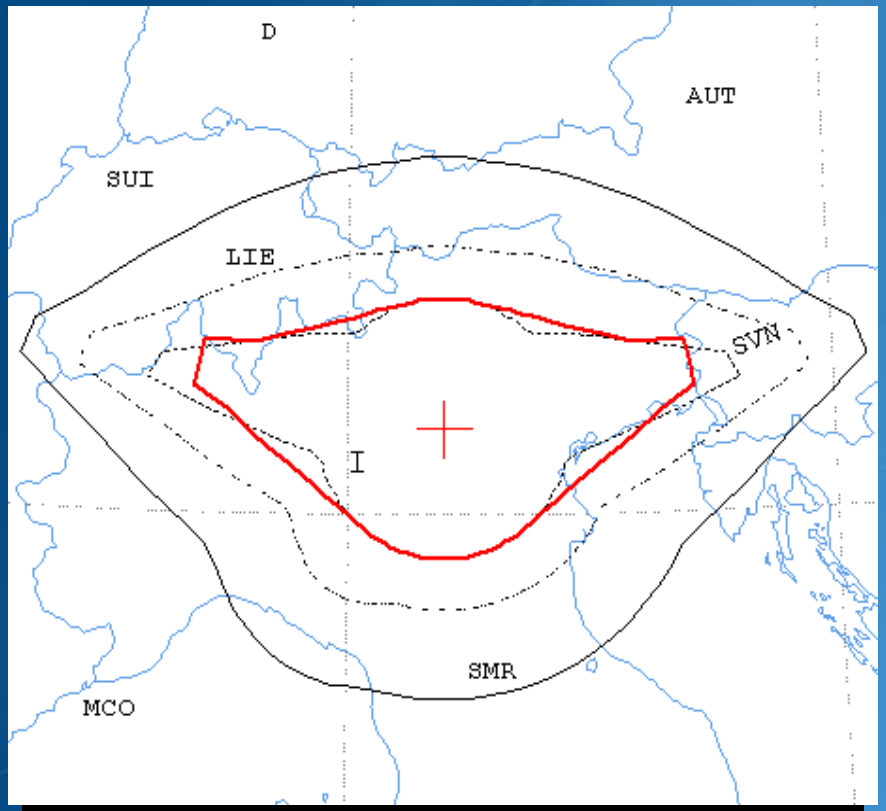


With non-zero-degree horizon elevation angles

PROBABLY AFFECTED COUNTRIES:
SUI

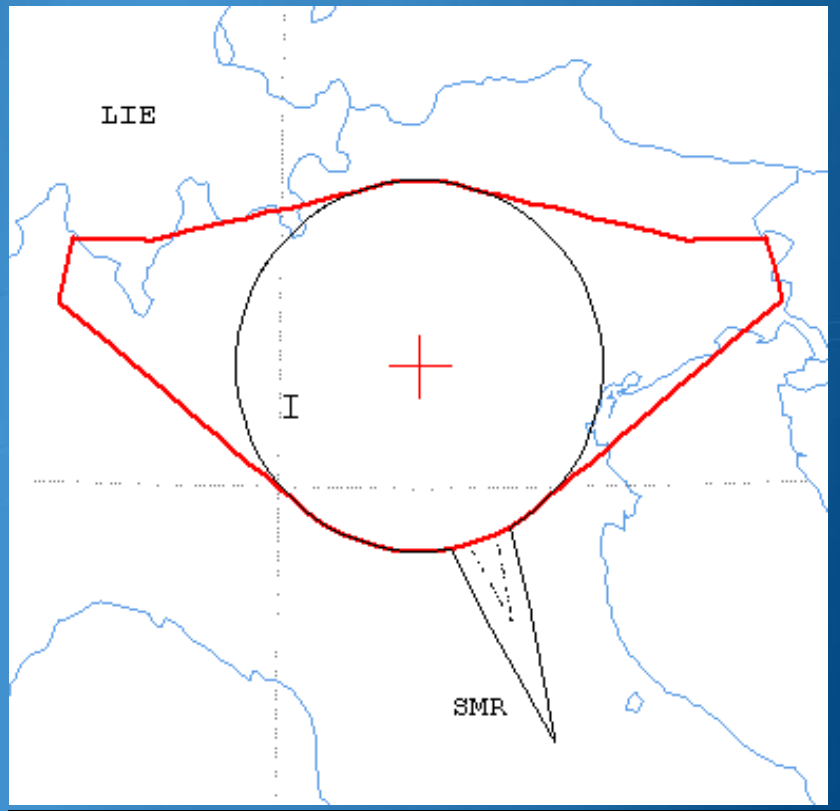
Exercise 2 – GIBC – Results

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

PROBABLY AFFECTED COUNTRIES:
AUT D F HRV LIE SUI SVN



With non-zero-degree
horizon elevation angles

PROBABLY AFFECTED COUNTRIES:
SUI SVN