Visualyse GSO

Tour of the Demonstration Version

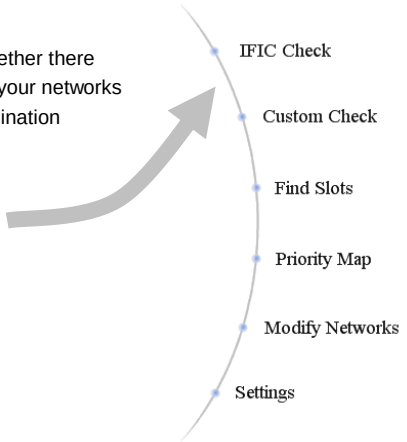
Contents

1 Quick Overview

If you've only got 5 minutes to spare, then this is the section to read. Once you have installed the software (see enclosed install instructions) run it up. The rest of this section provides a quick overview of the software and what it can do.

1.1 Coordination Check

The main purpose of the software is to look at whether there might be a requirement for coordination between your networks and networks in an ITU IFIC. We call this a Coordination Check.



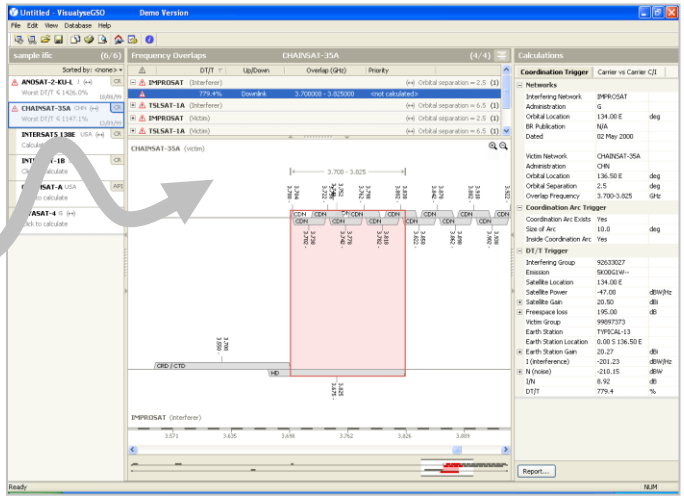
To create a Coordination Check:

1. Click IFIC Check.
2. Select the demo IFIC "sample ific.mdb"

1.2 Analysis

Visualyse GSO will load the IFIC and read and analyse each of the networks. These networks are shown in a list on the left-hand side of the application. A red warning triangle indicates that coordination may be required

The analysis may take a few minutes, but as soon as the calculations for a particular network are complete you can click on it to see the results without waiting for all the other networks to finish.



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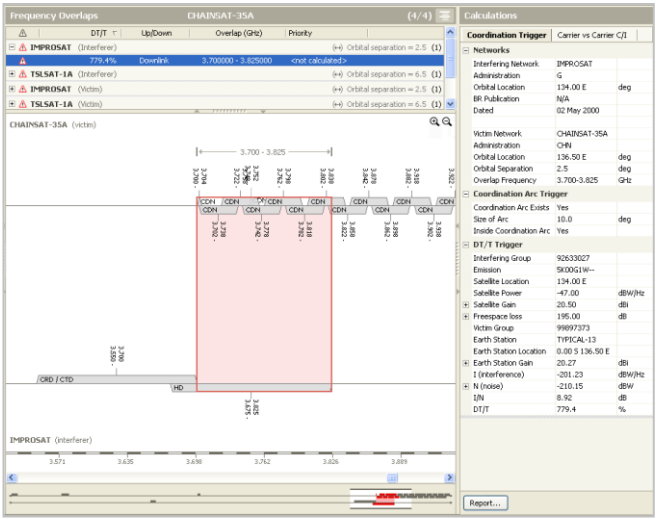
1.3 Results

When you click on a network, the right-hand side of the application changes to show the results of the analysis.

Frequency overlaps between networks are shown in the middle section of the application.



Coordination trigger and C/I calculations for the selected overlap are shown on the right-hand side.

1.4 Coordination Trigger

The software makes it easy to determine whether coordination is required. Results can be examined in detail making verification a simple process

Data can be easily copied and pasted into other applications.

An instant formatted report can be obtained at the click of a button

Each components of the calculation can be examined in detail.

Coordination Trigger | Carrier vs Carrier C/I

Networks		
Interfering Network	TSLSAT-1A	
Administration	G	
Orbital Location	130.00 E	deg
BR Publication	N/A	
Dated	02 May 2000	
Victim Network	CHAINSAT-35A	
Administration	CHN	
Orbital Location	136.50 E	deg
Orbital Separation	6.5	deg
Overlap Frequency	3.725-4.198	GHz
Coordination Arc Trigger		
Coordination Arc Exists	Yes	
Size of Arc	10.0	deg
Inside Coordination Arc	Yes	
DT/T Trigger		
Interfering Group	123456781	
Emission	90K0V7W--	
Satellite Location	130.00 E	
Satellite Power	-57.50	dBW/H
Satellite Gain	43.00	dBi
Freespace loss	195.13	
Victim Group	99897373	
Earth Station	TYPICAL-13	
Earth Station Location	0.00 S 136.50 E	
Earth Station Gain	9.90	dBi
I (interference)	-199.73	dBW/Hz
N (noise)	-210.15	dBW
I/N	10.42	dB
DT/T	1102.3	%

Coordination Arc and DT/T triggers are calculated and displayed for each overlap between networks.

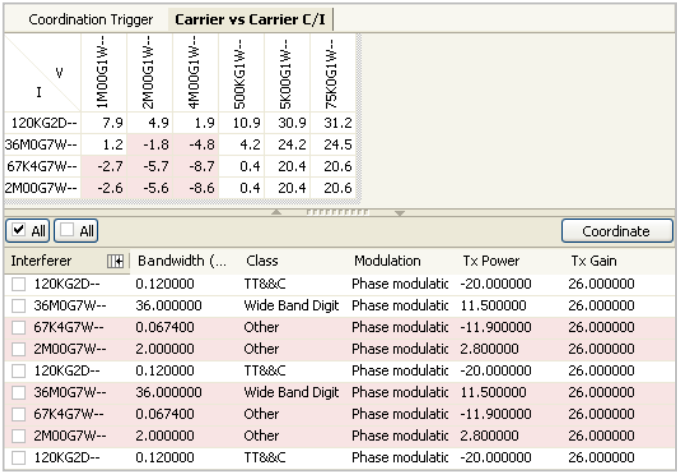
References to the original IFIC data are provided.

1.5 Carrier vs Carrier C/I

Switch to C/I analysis to examine coordination issues in more detail. The worst C/I is calculated for all possible carrier pairs. This is then compared to defined thresholds to see where interference levels are too high.

Carrier pairs with unacceptable C/I levels are hilighted.

The top-level components of the C/I calculation are shown for each carrier pair.



Coordination Trigger | **Carrier vs Carrier C/I**

I \ V	1M00G1W--	2M00G1W--	4M00G1W--	500KG1W--	5K00G1W--	75K0G1W--
120KG2D--	7.9	4.9	1.9	10.9	30.9	31.2
36M0G7W--	1.2	-1.8	-4.8	4.2	24.2	24.5
67K4G7W--	-2.7	-5.7	-8.7	0.4	20.4	20.6
2M00G7W--	-2.6	-5.6	-8.6	0.4	20.4	20.6

☑ All ☐ All Coordinate

Interferer	Bandwidth (...	Class	Modulation	Tx Power	Tx Gain
120KG2D--	0.120000	TT&&C	Phase modulatic	-20.000000	26.000000
36M0G7W--	36.000000	Wide Band Digit	Phase modulatic	11.500000	26.000000
67K4G7W--	0.067400	Other	Phase modulatic	-11.900000	26.000000
2M00G7W--	2.000000	Other	Phase modulatic	2.800000	26.000000
120KG2D--	0.120000	TT&&C	Phase modulatic	-20.000000	26.000000
36M0G7W--	36.000000	Wide Band Digit	Phase modulatic	11.500000	26.000000
67K4G7W--	0.067400	Other	Phase modulatic	-11.900000	26.000000
2M00G7W--	2.000000	Other	Phase modulatic	2.800000	26.000000
120KG2D--	0.120000	TT&&C	Phase modulatic	-20.000000	26.000000

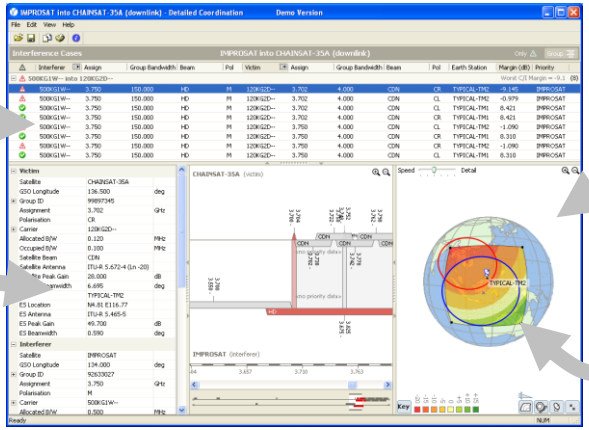
1.6 Detailed Coordination

In order to coordinate, instances of excess interference can be investigated in more detail. Simply check the box next to the carrier pair(s) you are interested in and click the Coordinate button.

All possible combinations of emission, earth station and beam are shown for each carrier pair

Full breakdown of the selected C/I calculation. Parameters can be changed to see how they affect the results.

In particular, satellite gain patterns can be specified



Satellite beams, boresights and earth stations are displayed in 3-D

Move the reference Earth station to see how this affects the

Show a plot ofC/I over part of the service area. Instantly see where the C/I fails to meet the threshold.

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2 Visualyse GSO

Visualyse GSO Version 2.0 is a software tool that controls and guides the process of coordination between geostationary satellite networks that share the same frequency bands.

The coordination process is split into two parts:

1. Determine which systems you need to coordinate with
2. Support for the technical coordination process.

The number of networks that are submitted to the ITU each month complicates the first part. New networks are published once every two weeks in a database known as the International Frequency Information Circular (IFIC), which replaced the paper and microfiche formats of the Weekly Circular (WIC) and Special Sections with effect from 1 January 2000. Network parameters are also published in the Space Radio communications Stations (SRS) database, updated approximately every 6 months.

Visualyse GSO works seamlessly with both these databases, automatically flagging filed networks that may need to be coordinated. This removes a large amount of the tedious work needed to screen the publications.

The coordination triggers used are based on worst case $\Delta T/T$ calculations and coordination arc definitions. Both or either measure can, in certain situations, trigger detailed coordination.

Further analysis is performed in terms of C/I ratios. C/Is are calculated and compared to a threshold value – the resulting margin is displayed and the C/I calculation can be inspected in detail.

2.1 About this Document

This document is an introduction to Visualyse GSO. It shows the features by walking through the demonstration version and highlighting the various options, tools, and views available.

It is by nature only a taster of what the product can do, and you should feel free to explore the product and try out features not explicitly covered. More information is available in the User Guide.

If you have any further questions please do not hesitate to contact us.

2.2 Limitations of the Demo

The demo version of the software is subject to the following restrictions:

- While you can edit or redefine you own network assets, these changes can not be saved
- You are limited to the use of the demonstration data provided for your networks. However, you can use any IFIC or the SRS database.
- The satellite antenna gains in the supplied demonstration files are un-realistic. This results in many DT/T levels being much lower than worst case analysis would indicate.
- You will not be able to save or print.
- You will not have access to certain additional features such as the Priority Map tool.

Apart from these limitations, the demo version shows as much as possible of the complete program.

3 Guided Tour

This section is a brief tour of the main features of Visualyse GSO. It is based upon the scenario of a spectrum manager who is responsible for two Fixed Satellite Service (FSS) GSO satellite networks:

- IMPROSAT, located at 134°E
- TSLSAT, located at 130°E

In this document, and in the software, these will be referred to as "My Networks"

3.1 Scenario

Both of these satellites are currently under coordination and have not been brought into use. Once a month the manager must check that other systems, notified to the BR and then distributed on the IFIC, would not cause a problem:

either: by being likely to cause unacceptable interference into the manager's networks

or: by being likely to suffer unacceptable interference from the manager's networks

A key aspect in assessing what should be done in these situations is to know which network (the spectrum manager's or those in the IFIC) has regulatory priority. This is typically based upon which network was filed first. This is far from a clear-cut decision because, while the original submission might have priority, modifications could have been made at a later stage. In this situation, some beams (or IFIC Groups) will have priority while others don't.

One powerful aspect of the software that will be demonstrated is the ability to deal with Regulatory Priority and the automatic detection of cases where coordination may be needed.

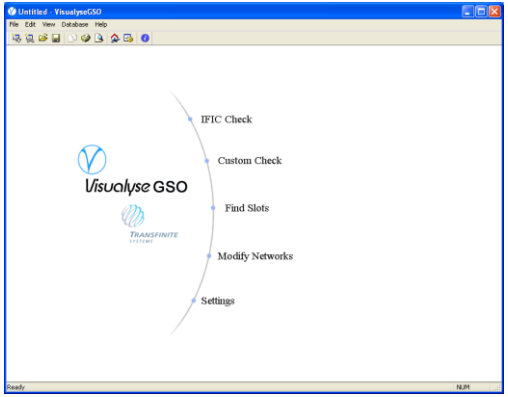
In addition, Visualyse GSO could be used for other tasks involved in GSO satellite spectrum management, for example:

- during design phase, to check the complexity of coordination and hence feasibility of a proposed new system, including searching the GSO arc for suitable locations
- when submitting Advance Publication Information (API), to determine which administrations are likely to flag they have an interest in protecting their system
- when submitting Coordination Requests (CR), to determine which administrations for which coordination will be required
- to check other systems during the API or CR phase, to ensure they will not cause an interference problem, and that any necessary regulatory steps are made to register interests where required
- when detailed coordination is required, to perform the analysis based upon C/I calculations, including tools to show the impact of varying specific system parameters in the ability to share, and where each system has priority.

3.2 Start Screen

When you start Visualyse GSO from scratch you are presented with five options. These are:

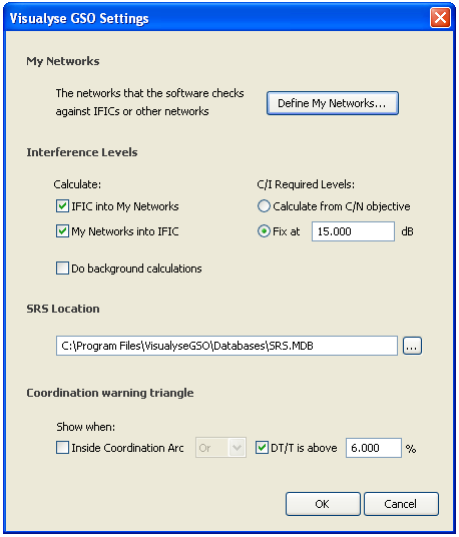
- **IFIC Check** – runs a check against any IFIC or SRS database looking for networks that have frequency overlap with your own (user defined) networks. Where overlap is found, worst case DT/T and C/I analysis is performed.
- **Custom Check** – performs the same job as the IFIC check, but allows you to define filters (or queries) on the data. For example, you can filter by network, administration, frequency range, orbital location and notification type. Both the IFIC Check and Custom Check allow you to select overlaps to carry forward into detailed coordination.
- **Find Slots** – this tool searches for unused frequency blocks. Searching can be subject to user defined constraints such as orbital arc, frequency range etc.
- **Settings** – here you define some program defaults that affect how coordination checks are performed and select which networks to use as your networks in the analysis.



3.3 Settings

If you select the "Settings" option, the Visualyse GSO Settings dialog will appear. The key thing to spot is the default directions of interference. Visualyse GSO can be used to calculate interference:

- From systems in an external data source such as IFIC into My networks
- From My networks into those in an external data source such as IFIC



In this example, we will be analysing the former, namely interference into our networks.

Our networks can be configured by clicking on the "Define my networks" button, which goes to the same options as the start screen's "Modify Networks" option. We will look at this at a later stage.

The settings should not be changed at this point, though it is useful to identify what defaults could be changed. Close this dialog to return to the start screen.

4 Coordination Check

This part of Visualyse GSO is used to determine whether coordination is required, based upon one of two forms of coordination trigger:

- DT/T, with threshold typically 6%
- Coordination arc, that examines the difference in longitudes between GSO satellites

This section describes how Visualyse GSO can be used to perform a coordination check.

4.1 Selecting a data source

To undertake a coordination check you need a data source, and in Visualyse GSO there are two options:

1. IFIC - in this case select "IFIC Check" from the Start Screen
2. A subset of networks selected from a data source that could be an IFIC or the SRS - in this case select "Custom Check" from the Start Screen

In the demo version, you should select “IFIC Check” and choose the file "sample ific.mdb". Visualyse GSO will then examine each network in this sample IFIC against both of the two networks defined in My Networks.

Note:
All data in the sample IFIC and those in "My Networks" has been created for this demo and does not have any particular significance.

4.2 Calculation of DT/T

The DT/T is calculated from the data in the IFIC or SRS using standard ITU-R approaches such as identified in Appendix 8 of the Radio Regulations. The DT/T is calculated separately for the uplink and downlink.

Often with complex filings there are a large number of possible combinations of beams, groups, designations of emissions and receiver gains and temperatures that could be considered. To calculate every permutation takes a significant amount of computer memory and processing power, and therefore a two-stage process is used.

In both cases a worst case geometry is used - however in the detailed coordination phase described later, specific earth station locations and geometries are considered.

4.2.1 Stage 1: Worst case

When the networks are first examined, the worst set of parameters for each are selected. So for the interfering network it is the emission with the highest e.i.r.p spectral density, and for the victim network it is the highest receive gain and lowest noise temperature. These are used to calculate the DT/T that will not be exceeded.

This allows the network that need not be considered further (because there is no overlap or there is no chance of a significant DT/T) to be identified quickly.

4.2.2 Stage 2: Network to Network

When a pair of networks has been selected, then detailed DT/T calculations are performed on each combination of groups (gains, emissions, temperature etc). This can produce a DT/T that is equal to or lower than that for the worst case, but not greater than. It will be less than if the worst combination of parameters is not feasible as (for example) they do not overlap.

The calculations will show the worst case combination of interferer to victim. The Detailed Coordination tool allows even further analysis based upon consideration of each combination using the C/I method.

4.3 Examining a network

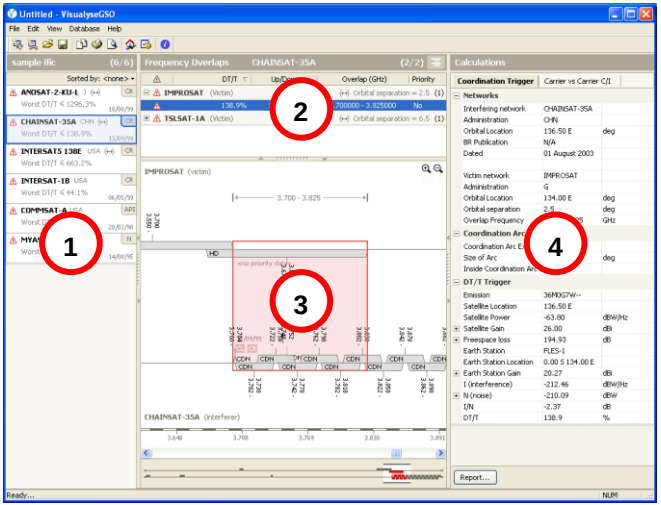
As soon as calculations are complete on a network it is possible to examine the results. When "CHAINSAT 35A" is complete, select it to show the coordination details, as in the figure below.

The view is broken into a number of windows:

1. Network List
2. Overlap List
3. Overlap Diagram
4. Calculations

Note:

The sizes of each window can be changed by selecting and dragging the dividing lines



4.3.1 Network List

This shows the 7 networks in the IFIC, and identifies the worst case DT/T (as described above), whether they are in the coordination arc, their date, and their status (API, CR, N). The list can be sorted by those parameters or by administration code. Selecting a network updates windows (2), (3) and (4) with information related to that network.

It can be seen that for this IFIC, ΔT/Ts range between nothing (no overlap) to over 100,000%, and therefore further examination would be required of these problem networks.

4.3.2 Overlap List

This window shows the interference paths between My Networks and the network selected from the network list window. In this case we defined two network, only one of which overlaps with CHAINSAT 35A, namely IMPROSAT.

The My Networks lists window shows the directions (up/down) for which there is a problem, the DT/T, the frequency overlaps, the difference in longitudes, and what the relative priority of dates is. In this case the priority is mixed, in other words it varies depending upon whether it comes from an original CHAINSAT 35A filing or its modification at a later date after the filing date of IMPROSAT.

Where there are multiple cases (either satellites or directions) then you can select the one to examine further in the frequency overlap and calculations windows. When you select a network Visualyse GSO undertakes the full DT/T analysis, and it is possible the value will change.

Note:

Remember that in this demo we are examining interference only **from** the systems in the IFIC **into** My Networks. We could equally be examining interference into the systems in the IFIC.

4.3.3 Overlap Diagram

This window shows the overlap between the two networks selected in the My Networks list window. You can:

- zoom in and out to get more detail / overview
- scroll left and right to select the frequencies to examine
- move the frequency window tool at the bottom of the window to highlight the required area
- select a block of overlaps to update the calculations on the right

The window shows the beams, polarisations, and priority dates.

Note:

The calculation window shows the worst case for the block of overlaps selected: it does not update based upon a specific beam.

4.3.4 Calculations

This window is split into two forms of calculation, reflecting its two uses.

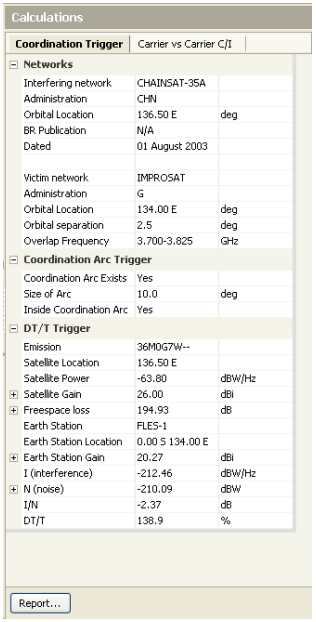
4.3.4.1 Coordination Trigger

The first window shows more information about the Coordination Trigger, giving more information about the networks concerned, the coordination arc, and the calculation of DT/T. It shows how the DT/T levels displayed were calculated based on the parameters of the selected networks.

So for the selected example we see the following:

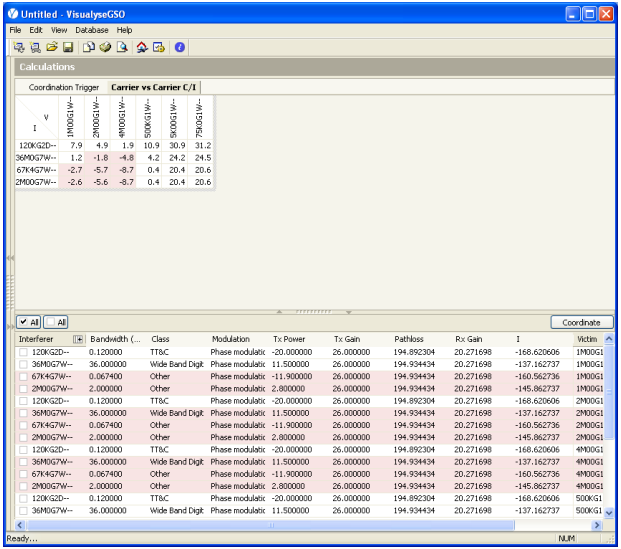
Interfering network:	CHAINSAT-35A
Victim network:	IMPROSAT
Orbital separation:	2.5°
Inside coordination arc:	yes
DT/T:	138.9%

From both triggers we see that coordination would be required. It is therefore useful to proceed to the next tab, to consider C/I.



4.3.4.2 Carrier to Carrier C/I

The second window shows the results of C/I calculations, based upon the matrix of emission codes. All pairs of victim and interfering designations are considered, so in this example we have 4 x 6 = 24 types to consider, as in the figure below.



Each entry in the matrix is represented by a row in the table underneath, which gives details of the C/I calculation. The level of detail can be varied by expanding or rolling up information about the "Interferer", "Victim" and "C/I Margin".

The matrix codes each cell as one of:

- C/I above threshold (white background)
- C/I below threshold (shaded background)
- combination of emissions not feasible (cross)

If there is still a problem (as is the case here) then the next step would

be to enter detailed coordination.

This shows how Visualyse GSO can be used for different types of task:

- Coordination Check - to see what systems require further examination
- Detailed Coordination - when in discussions with another satellite operator

Information on particularly sensitive combinations of carriers can be transferred from the Coordination Check stage to the Detailed Coordination stage using the list of check boxes below.

Click on each of the cells for which the C/I = -13.7, and then click on the check box (see the figure above for an example). You can then click on the "Coordinate" button to start the Detailed Coordination tool.

Note:

Each cell in the matrix could represent a significant number of combinations of groups in the underlying data - as will be shown later in the Detailed Coordination section. The value shown is the worst C/I derived over these permutations. This later section will also describe the how the C/Is were derived.

4.3.5 Output

You can output the contents of any window by selecting "Copy" from the menu or the toolbar. You will then be given a choice of the four windows, and by clicking on any one its contents are copied to the clipboard.

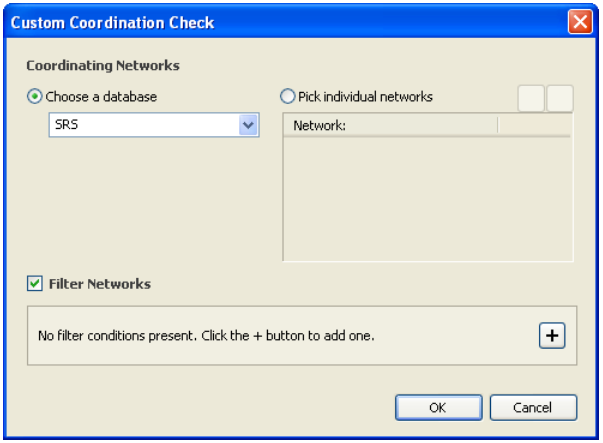
If you then start an application such as Excel you will be able to paste data in for further analysis, if required.

4.4 Selecting specific networks

The "Custom Check" option from the Start Screen provides greater flexibility in selecting the networks to examine. Other databases, such as the SRS, can be opened, and networks selected by either:

- individual selection
- search by frequency, administration, orbital location, frequency band or date

The dialog opposite shows the various options.



5 Detailed Coordination

5.1 Requirements

The previous section described how to identify which networks require coordination, by considering the DT/T and the coordination arc. This can be used by operators and administrations to decide which notices they could have an issue with and hence which require that letters are sent requesting coordination to the BR and other operators and administrations.

Having entered into detailed coordination with another operator another approach is required – not looking at a range of systems in an IFIC or SRS, but considering one or a small number of systems in detail, to see how interference could be managed so that both could operate. This will involve negotiation between the parties, which must take into account which network has regulatory priority. However there is a provision in Article 9.53 that both parties should make every possible mutual effort to overcome any difficulties, which is intended to facilitate the entry of the newer system.

These negotiations must take account of details of each system, their beams, service areas, polarisations, emission codes, e.i.r.p.s, frequencies, and earth station characteristics. Detailed discussions therefore must consider a large number of combination of wanted to victim carriers and link characteristics for each in great detail.

Success in negotiations requires a good understanding of where the main problems are, why there are problems, what could be done to facilitate sharing, and where the real “bottom line” is. This can be achieved using Visualyse GSOs Detailed Coordination tool.

5.2 Calculation of C/I

The basis of our Detailed Coordination tool is the C/I between the victim and the wanted network. This will depend upon the values in the Group pair selected – such as frequency, polarisation and associated earth station. The C/I threshold can either be directly entered or is derived based upon a calculated C/N, using the approach given in ITU-R Rec.S.741-2:

$$C/I = C/N + 12.2$$

By default the C/I calculations use the worst case geometry. However during analysis specific locations can be included, and hence the antenna directivity used to decrease interference.

More detail on the C/I calculation is given in the User Guide.

5.3 Examining a network in detail

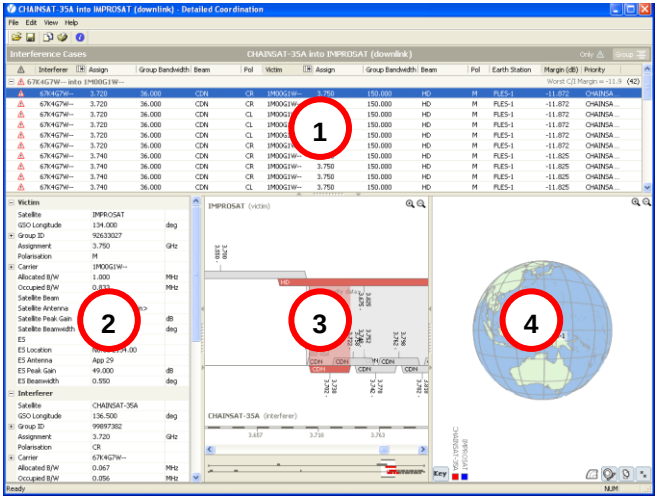
The figure below shows the Detailed Coordination tool examining two pairs of carriers, the two that appeared to result in a C/I which was 13 dB below the required threshold.

The windows are:

1. Interference Cases
2. C/I Calculation
3. Overlap Diagram
4. Earth View

Note:

The sizes of each window can be changed by selecting and dragging the dividing lines.



5.3.1 Interference Cases

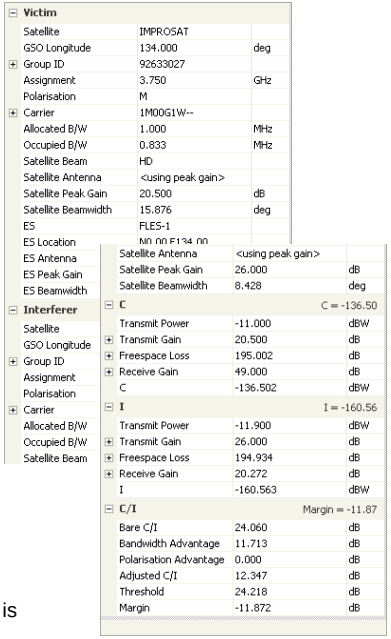
This window lists all the pairs of emissions selected during the Coordination Trigger examination and exported to the Detailed Coordination tool. Under each pair are listed all the combinations of beams, polarisations, frequencies and earth stations that can be extracted from the group tables for each network. Often there can be seen duplication between groups.

Each row gives details of the calculation, and the columns can be sorted by clicking on the title. When you select a row the details are transferred into the C/I calculation window.

	Interferer	Assign	Group Bandwidth	Beam	Pol	Victim	Assign	Group Bandwidth	Beam	Pol	Earth Station	Margin (dB)	Priority
+	67K4G7W-- into 1M00G1W--												Worst C/I Margin = -11.9 (42)
−	2M00G7W-- into 1M00G1W--												Worst C/I Margin = -11.8 (42)
	2M00G7W--	3.720	36.000	CDN	CR	1M00G1W--	3.750	150.000	HD	M	FLES-1	-11.848	CHAINSA ...
	2M00G7W--	3.720	36.000	CDN	CR	1M00G1W--	3.750	150.000	HD	M	FLES-1	-11.848	CHAINSA ...
	2M00G7W--	3.720	36.000	CDN	CL	1M00G1W--	3.750	150.000	HD	M	FLES-1	-11.848	CHAINSA ...
	2M00G7W--	3.720	36.000	CDN	CL	1M00G1W--	3.750	150.000	HD	M	FLES-1	-11.848	CHAINSA ...
	2M00G7W--	3.720	36.000	CDN	CL	1M00G1W--	3.750	150.000	HD	M	FLES-1	-11.848	CHAINSA ...
	2M00G7W--	3.720	36.000	CDN	CR	1M00G1W--	3.750	150.000	HD	M	FLES-1	-11.848	CHAINSA ...
	2M00G7W--	3.740	36.000	CDN	CR	1M00G1W--	3.750	150.000	HD	M	FLES-1	-11.801	CHAINSA ...
	2M00G7W--	3.740	36.000	CDN	CR	1M00G1W--	3.750	150.000	HD	M	FLES-1	-11.801	CHAINSA ...
	2M00G7W--	3.740	36.000	CDN	CR	1M00G1W--	3.750	150.000	HD	M	FLES-1	-11.801	CHAINSA ...
	2M00G7W--	3.740	36.000	CDN	CL	1M00G1W--	3.750	150.000	HD	M	FLES-1	-11.801	CHAINSA ...
	2M00G7W--	3.740	36.000	CDN	CL	1M00G1W--	3.750	150.000	HD	M	FLES-1	-11.801	CHAINSA ...

5.3.2 C/I calculation

This is the heart of the detailed coordination, and gives the link budgets for the victim and interfering carriers in detail. This allows their examination and any alterations that would facilitate sharing to be identified. An example of the link budget is shown opposite.



Victim		
Satellite	IMPROSAT	
GSO Longitude	134.000	deg
Group ID	92633027	
Assignment	3.750	GHz
Polarisation	M	
Carrier	1M00G1W--	
Allocated B/W	1.000	MHz
Occupied B/W	0.833	MHz
Satellite Beam	HD	
Satellite Antenna	<using peak gain>	
Satellite Peak Gain	20.500	dB
Satellite Beamwidth	15.876	deg
ES	FLES-1	
ES Location	00.00 E134.00	
ES Antenna		
ES Peak Gain		
ES Beamwidth		
Interferer		
Satellite		
GSO Longitude		
Group ID		
Assignment		
Polarisation		
Carrier		
Allocated B/W		
Occupied B/W		
Satellite Beam		
Satellite Antenna	<using peak gain>	
Satellite Peak Gain	26.000	dB
Satellite Beamwidth	8.428	deg
C		C = -136.50
Transmit Power	-11.000	dBW
Transmit Gain	20.500	dB
Freespace Loss	195.002	dB
Receive Gain	49.000	dB
C	-136.502	dBW
I		I = -160.56
Transmit Power	-11.900	dBW
Transmit Gain	26.000	dB
Freespace Loss	194.934	dB
Receive Gain	20.272	dB
I	-160.563	dBW
C/I		Margin = -11.87
Bare C/I	24.060	dB
Bandwidth Advantage	11.713	dB
Polarisation Advantage	0.000	dB
Adjusted C/I	12.347	dB
Threshold	24.218	dB
Margin	-11.872	dB

Changes can be made to the parameters by clicking on the associated value. The link budget will update automatically. Pretty much any parameter can be entered manually – the gain pattern, peak gain, beamwidth, transmit powers, path losses, occupied bandwidths, adjustments for bandwidths and polarisation, the threshold, and even the signal strengths themselves. Any changes can be reversed by selecting “Undo” from the Edit menu.

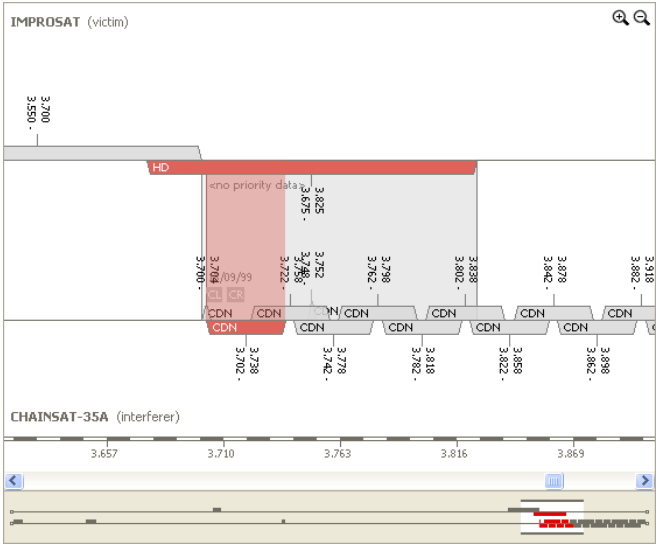
For example, change the following:

- Interfering signal – beam – antenna: change the gain pattern from the drop down list
- C/I – polarisation advantage: enter 3 dB

As values are entered you will see the margin change from negative to positive, showing that actually this link can be operated without problem.

During negotiations these parameters can be varied until the required degree of protection is obtained. An additional area that can be changed is the earth station locations, as will be discussed in the section on the

5.3.3 Overlap Diagram



This shows the overlaps between the wanted and victim carriers for the pair of emissions and groups selected.

This operates in a similar way to that in the Coordination Trigger tool, and you can:

- zoom in and out to get more detail / overview
- scroll left and right to select the frequencies to examine
- move the frequency window tool at the bottom of the window to highlight the required area

The window shows the beams, polarisations, and filing dates, which is required to determine who has priority.

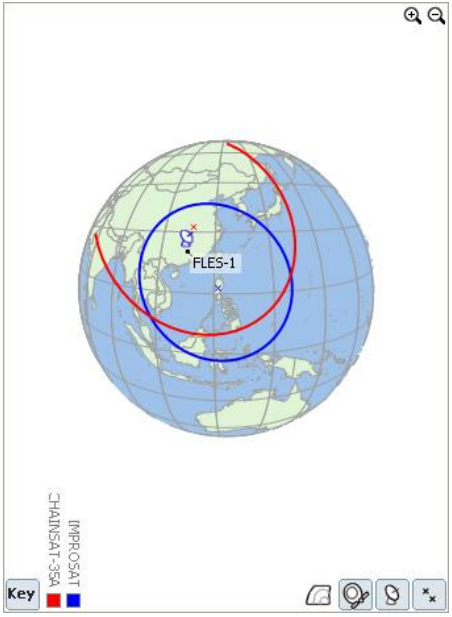
5.3.4 Earth View

The earth view can be used to:

- show the satellite beam footprints
- contour the C/I across the service area
- show the location of earth stations
- allow earth stations to be moved
- show the location of satellite antenna boresights
- allow the satellite antenna boresights to be moved

You can move the view by clicking on it with the right mouse button and while the button is down moving the mouse:

- up/down – moves the view in latitude
- left/right – moves the view in longitude



To get the picture above the following steps were required (try similar ones):

- On the Calculations window, the victim and interfering satellite beams were selected from GXT files extracted from the SRS database
- On the Graphical window the C/I contour was switched off and the Earth rotated until the beams were visible

These tools can be used during detailed coordination to identify where geographically there could be problems and suggest possible resolutions to difficult issues.

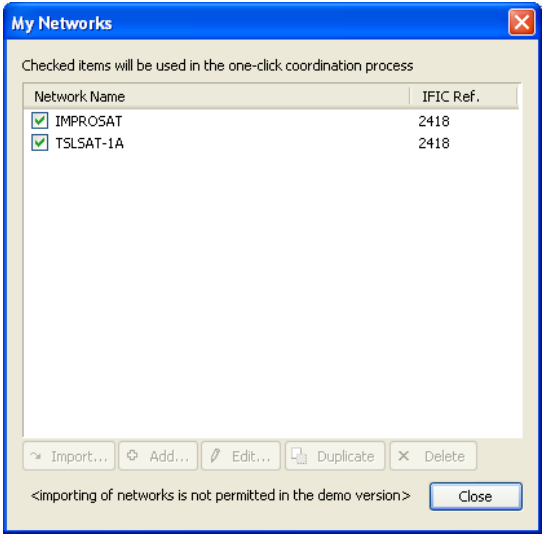
6 Defining a Network

There are two ways to get your networks into the software. You can either import them from an existing ITU format database (an IFIC or the SRS) or you can enter your data using the network editor.

With both methods the first step is the same. From the Database menu select Define My Networks. You can also click the My Networks button on the toolbar.

The My Networks dialog will be displayed. The dialog shows all the networks you have created or imported into your database. In the case of imported networks, the IFIC reference is also shown.

Each network has a check box next to it. Checked networks will be included in the IFIC and Custom coordination checks.



6.1.1 Importing from an ITU Format Database

To import a network from an ITU format database such as an IFIC or the SRS, open the My Networks dialog and click the Import button. This will open the Import Networks dialog.

Creating and Editing Networks

Networks can be created and edited in the Visualyse GSO demonstration version – but changes will not be saved. On the “My Networks” dialog, select “IMPROSAT” and then click “Edit” to open the network editor, as shown in the figure below.

6.1.2 Editing Networks

Networks can be edited in the Visualyse GSO demo version but changes will not be saved. You can of course create your networks from scratch using the Network Editor. You can also use the network editor to modify networks that you have imported from other databases. These features are not available in the demo version.

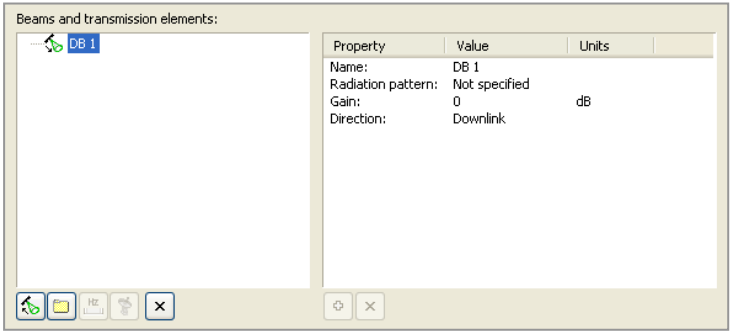
On the “My Networks” dialog, select “IMPROSAT” and then click “Edit” to open the network editor. The Network Editor dialog will appear. Click on the name of the network to change it. Orbital longitude and administration can also be set.

The main part of the editor shows the beams, groups, emissions, assignments and earth stations that make up the network.

The first thing you can do is add a beam. Click the button. A beam will be added to the list. If you click on the beam, you'll see the parameters for it in the list to the right.

To change any of these parameters all you need to do is click on them, then when the cursor appears, type a new value.

Some parameters will have a limited set of options. These will have drop-down lists for you to choose a value from.



To add a Group to a beam, click button. A group will be added to the selected beam. The group must have a unique id within the network and one is allocated for you. Again, clicking on the group will display its properties in the window opposite.

Click the button to expand the group and you'll see its contents. Click Frequencies and the assignments will be shown in the right hand list. To add or remove assignments click the and buttons. When you add a frequency, you will be able to type in its value. Frequencies can be edited in the same way as other parameters are edited, by clicking on them.

Earth stations and emissions can be added to a group by selecting the group and clicking the and buttons. To delete any element from the network, select it and click the button.

At the bottom of the network editor is the frequency plan preview window. This provides a simple graphical representation of your network as you create it.

Both uplink and downlink frequency lines are shown. When you click on a frequency related element of the network, the relevant section will be highlighted in the preview. So if you select a beam, all frequencies for that beam will be highlighted. If you click on a group, all frequencies for that group will be highlighted.

7 Conclusions

We have shown how Visualyse GSO can be used to:

- Examine an IFIC to automatically determine the need for coordination
- Analyse in more detail whether coordination is required
- Undertake detailed coordination with another network looking at C/I, changing parameters as required before, after, and during a coordination meeting
- Import data and edit network parameters
- Output data to other programs such as Excel and Word

Two other tools are supplied with the software. The Slot Finder searches for slots along segments of the GSO arc and gives an indication of how much coordination may be required at each slot. Certain features of this tool are disabled in the demo version, but you can still try it out.

Another tool, not available in the demonstration version, is the Priority Map. This provides a graphical representation of which networks have priority for each frequency overlap. More information about this can be found in the user guide.

8 Contact Information

Q. How do I contact Transfinite Systems Ltd?

A. You can contact us at:

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We want to hear from you

If you have any suggestions about this document or Visualyse GSO, please do not hesitate to contact us.

Transfinite Systems reserves the right to change features without notice. Contents of the demo CD including system parameters might vary from those described in this document.

9 Acronyms and Abbreviations

BSS	Broadcast Satellite Service
BR	Radiocommunication Bureau (of the ITU)
CD	Compact Disk
CR	Coordination Request
e.i.r.p.	Equivalent Isotropic Radiated Power
FSS	Fixed Satellite Service
GSO	Geostationary Orbit
IFIC	International Frequency Information Circular
ITU	International Telecommunication Union
MSS	Mobile Satellite Service
PC	Personal Computer
PDF	Portable Document Format
SNS	Space Network System
SRS	Space Radiocommunication Stations