

■ White Paper
Dec. 2004

International coordination in
ICS manager *nG*
and ICS telecom *nG*

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Introduction

Frequency coordination is the technical coordination of frequencies conducted by the authorities who are planning the radio communication networks, on the basis of the Radio Regulation (RR) enacted by the International Telecommunication Union (ITU), in order to prevent the frequencies radio communication networks from causing harmful interference to the networks of foreign countries.

Each new station created or modified must be the subject of a coordination request for coordination to the administrations concerned.

So, international coordination of frequencies is probably one of the most important missions of a Regulation Authority, as only the coordinated frequencies are truly protected against interference caused by foreign countries.

The regulator must then be able to manage the administrative part of the coordination, which includes the creation and the follow-up of the in-coordination and out-coordination, as well as the technical part, including calculation of coordination areas and the interferences analysis, depending on the service considered.

Regarding this purpose, ATDI offers through ICS manager *nG* and ICS telecom *nG* different processes, to manage the different aspects of the international coordination.

Coordination in ICS manager *nG*

Coordination is a part of the administrative process of the Spectrum Management in ICS manager *nG*, as notifications or frequency assignments are.

ICS manager *nG* provides different features to ease the treatment of this administrative procedure, which is often complex, involves massive quantities of data and must be done within a very short time.

- Automate the generation of unique references for the letters.

- Manage and customize the reminders, the acknowledgements and the delays, and generate warnings when the delays are overtaken.
- Manage several contacts per service and administration.
- Fully manage the Vienna Agreement for the mobile service (data structure, import/export, references system, process).
- Manage the modification and the suppression of the previous coordination...

Interface with national data

The coordinated data is automatically generated from the national data, on user's demand.

A.Name of site	A.Longitude	A.Latitude	A.Tx frequency	B.Name of site	B.Lc
SCHUEPFHEIM	8° 04' 50" E	46° 59' 51.47" N	18.72375 GHz		
DOTTERNSHAUSEN B	8° 46' 46" E	48° 13' 35" N	22.533 GHz		
GEMPENACH	7° 11' 14" E	46° 56' 29" N	12.9225 GHz		
OBERTOURINGEN B	9° 26' 40" E	47° 44' 24" N	23.4675 GHz		
KÄNDERSTEG SCHRE	7° 40' 37" E	46° 30' 11.99" N	1451 MHz		
FUERENALP BAHNST	8° 28' 09" E	46° 48' 07.99" N	1451 MHz		
SEPEY	7° 03' 11" E	46° 21' 46.01" N	12.9435 GHz		
FRIEDRICHSHAFEN O	9° 25' 22" E	47° 40' 40.01" N	22.4875 GHz		
HUEFINGEN B	8° 30' 25" E	47° 56' 07" N	38.0975 GHz		
FRIBOURG CORDAST	7° 09' 41" E				
GEISSBERG	8° 10' 11" E				
FERDEN	7° 45' 22" E	46° 23' 37" N	1451 MHz		
LAUSANNE CHUV	6° 38' 39" E	46° 31' 32.99" N	38.5665 GHz		
ERSIGEN	7° 36' 17" E	47° 06' 13" N	38.5805 GHz		
ERMATINGEN	9° 04' 17" E	47° 41' 26.99" N	12.9505 GHz		

Figure 1: Creation of a coordination request from the national level

In Coordination

There is in-coordination when a close administration makes a request for coordination to your administration for its assignments, and your administration must answer.

ICS manager *nG* makes it possible to manage in-coordination request in the following way:

If an electronic file of recognized format is attached to the in-coordination request, this one can be imported. If it's not the case, the input can be done by using the configurable forms.

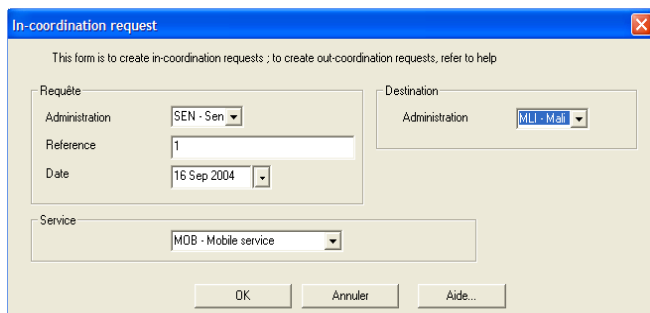


Figure 2: In-coordination request

Once the answer is input, ICS manager *nG* makes it possible to print the letter giving for each assignment appearing in the request, the answer brought by the administration.

Out-Coordination

There is an out-coordination when your administration makes a request for coordination to a close administration in order to protect its assignments.

ICS manager *nG* makes it possible to manage out-coordination requests in the following way.

- For each assignment, the list of the countries with which it is necessary to coordinate is input, and then the operator decides to launch the process of coordination for one or more assignments.
- Coordination requests will be automatically generated for each country concerned. Each one of these requests will refer to one or more assignments.

The possible operations on the coordination requests are:

- The printing of the initial request or of the recall/
- The follow-up (reception of acknowledgement of delivery...).
- The input of the partial or complete answer.

De-coordination

ICS manager *nG* also manages the letters of de-coordination. The user selects a group of national assignments to cancel, and the letters of de-coordination bound for each administration (having

given in the past its agreement to one of the cancelled assignments) are generated. Then you just have to print these letters and to send them.

Interface with notification

The notified data is automatically generated from the coordinated data, on user's demand.

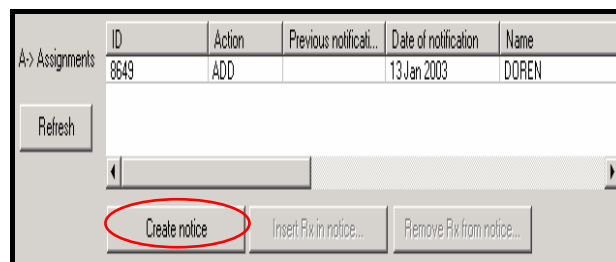


Figure 3: Creation of a T11 notice from the coordination level

The countries with which the coordination has been successfully performed are also mentioned in the notified data.

Paper forms and electronic forms

By using the report editor of ICS manager *nG*, the user fully automates the generation of the coordination letters, either for a coordination request or for an answer to a coordination request. These letters can be sent automatically by e-mail.

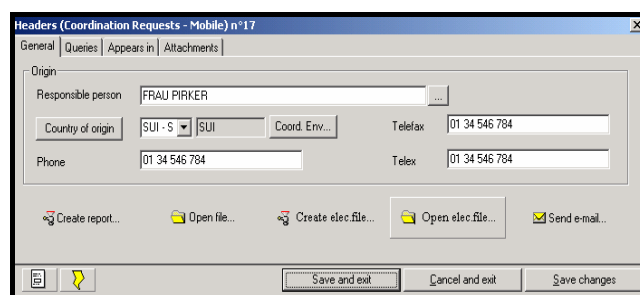


Figure 4: Generation and sending of the coordination files

The user can also import and export the different standard formats of coordination (Vienna Agreement, ITU-R, SRS, TVA, TVD, and DACAN). These letters can be sent automatically by e-mail



Coordination in ICS telecom nG

In the process of frequency assignment, ICS telecom nG is used to find a frequency which is compatible with the assignments in service of the country, and with the assignments coordinated by the close countries.

ICS telecom nG also highlights the countries with which it will be necessary to coordinate according to international agreements (GE 84, 89, Stock 61...).

ICS telecom nG makes it possible to calculate the impact of the assignment suggested by the close countries on all the coordinated national assignments.

Interface with ICS manager nG

Interface between ICS manager nG and ICS telecom nG allow the user to switch easily from the administrative process to the technical analysis.

Coordination for broadcast services

ICS telecom nG makes it possible to work on coordination for the analogue broadcast services and for the digital broadcast services by taking into account the different agreements. For international coordination the FM signals depend on the Geneva 84 agreement, and the TV signals depend on the Geneva 89 or Stockholm 61.

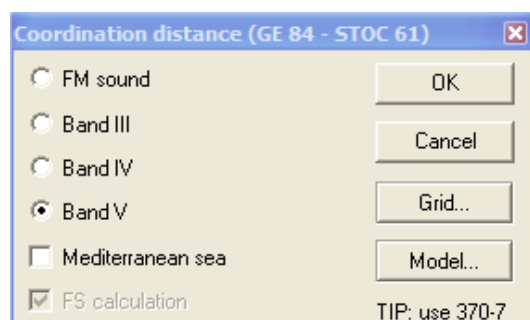


Figure 5: Coordination distance calculation based on Geneva and Stockholm agreements

The digital broadcast includes DAB and DVB-T signals. The arrival of Digital Terrestrial Television in Europe has highlighted the urgent need to establish fast and efficient border coordination procedures.

To help meet this need, ATDI has updated its ICS telecom nG and ICS manager nG software with the different rules for coordination specified in the Chester Agreement and applied to the border coordination of DVB-T in Europe:

- Propagation model (ITU-R P.370-7, ITU-R P.1546-1).
- Test points.
- Protection ratios.
- Receiver thresholds.
- Receiver antennas.
- Nuisance field strengths.
- Usable field strengths.
- Standard file formats for electronic exchange.

In addition to the software implementation of these rules, a complete working methodology has been established in order to allow the Broadcasting Regulation Authorities to work in the fastest and most automated way, without sacrificing the rigor required in border coordination.

Coordination for mobile services

Coordination calculations for mobile services depend on the Vienna agreement. ICS telecom nG provides a module making it possible to define the technical analysis according to this agreement.

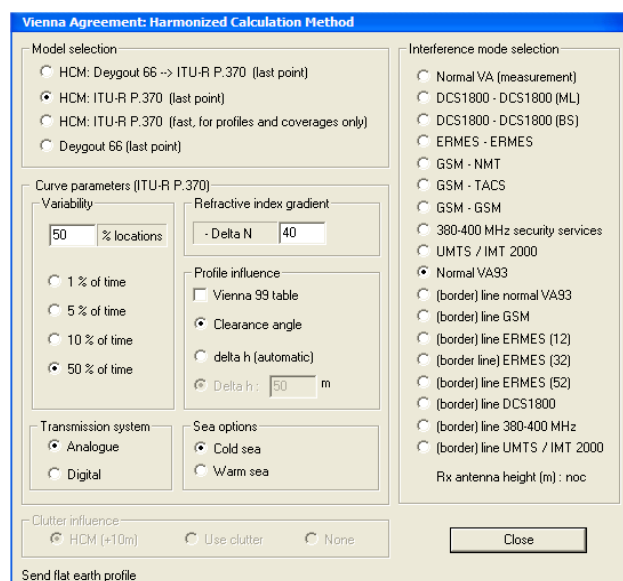


Figure 6: Calculation module for mobile services



Coordination for Earth stations

The zone of coordination of the Earth stations is directly calculated in ICS manager nG.

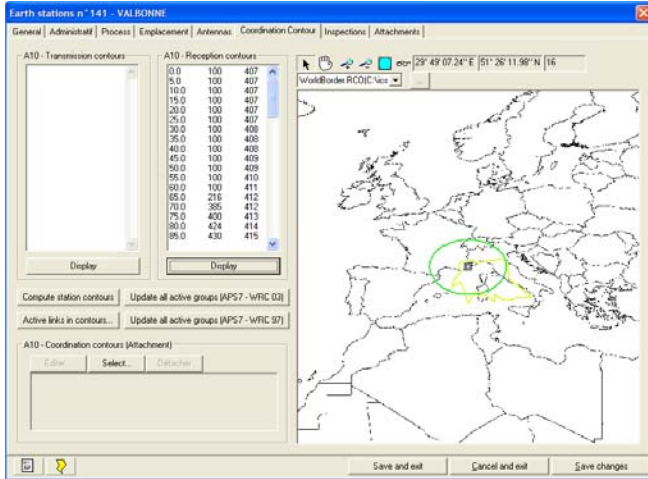


Figure 7: Coordination contour of an Earth station

One or several microwave links are then selected if one of the stations of the link is inside the envelope of all coordination contours of the Earth stations and if the frequencies of the link and of the Earth station are sufficiently close to each other (five channels).

The Earth stations and the extracted microwave links can then be exported to ICS telecom nG for an interferences analysis.

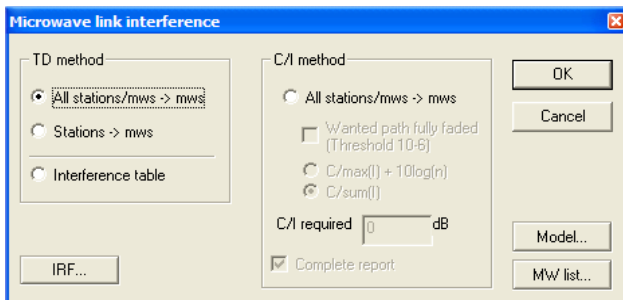


Figure 8: Microwave link interference analysis

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