

# Planning Tools for Frequency Coordination and Spectrum Management Tasks



Heiko Ross  
LS telcom AG



Regional Seminar on evolving network infrastructures to NGN and related  
Planning Strategies and Tools, for the CEE, CIS and Baltic States

Belgrade, Serbia and Montenegro, 20-24 June 2005

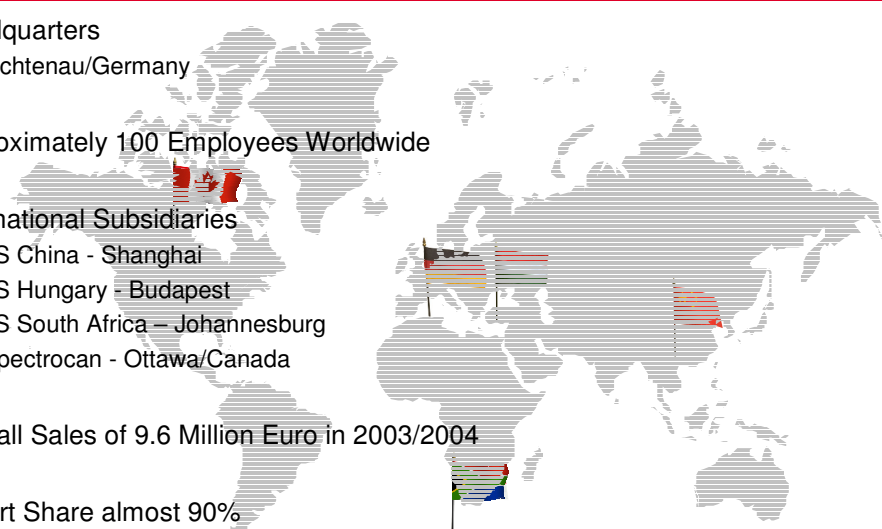
## Agenda

1. Brief Company Introduction
2. Product Portfolio/Relevant Markets
3. Why Frequency Coordination is Required?
4. Keys for Efficient Frequency Coordination
5. International Frequency Coordination Agreements
6. Frequency Coordination and Spectrum Management Solutions

## 1. Company Introduction



- Headquarters
  - Lichtenau/Germany
- Approximately 100 Employees Worldwide
- International Subsidiaries
  - LS China - Shanghai
  - LS Hungary - Budapest
  - LS South Africa – Johannesburg
  - Spectrocan - Ottawa/Canada
- Overall Sales of 9.6 Million Euro in 2003/2004
- Export Share almost 90%



## 2. Product Portfolio



LS telcom Provides Superior Software and Consulting Solutions  
Covering Frequency Planning/Coordination and Spectrum Management

Addressing the Needs and Requirements of

**Regulation Authorities**



**Air Traffic Control Centers**



**Military Organizations**



**Broadcast Operators**



**System Suppliers**



**Telecom Operators**



### 3. Why is Frequency Coordination Required?

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***Coordination with neighbors is essential for a long term interference free situation. Only on this basis the huge infrastructure investments for modern networks can be rectified and preserved.***

***It is also a modern type of country protection: Loosing frequency space is a loss of resources which may not be usable for one generation or more. As a result, loss of revenue for the operators and less fees for the regulators will occur.***

### 4. Keys for Efficient Frequency Coordination

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- Good and Up-to-Date Database
  - ▶ Transmitter Data, Receiver Data, Digital Terrain Data, ...
- Technical Analysis Tools
  - ▶ Automated, Computerized Coordination Processing
- Appropriate Administrative Response Times
  - ▶ Quick Response Times Required from Involved Parties
- Management of Coordination Records
  - ▶ Storing of Coordination Details for Later Usage
- Coordination Database is Source for Radiomonitoring Purposes in Case of Disturbance

## 5. International Frequency Coordination Agreements

### Radio Service Specific Coordination Agreements

- Coordination of Landmobile and Fixed Service
- Coordination of Broadcasting Services
- Coordination of Other Services like Satellite Services, Aeronautical Services, ...



## 5. Coordination of Landmobile and Fixed Services

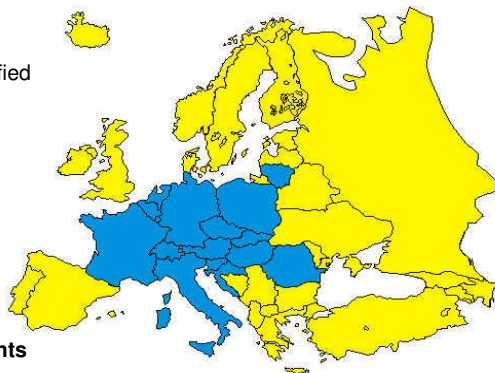
### Berlin Agreement – 17 member countries

Coordination of frequencies between 29.7 MHz and 39.5 GHz for the fixed service and the land mobile service.

Technical and Administrative Procedures are Specified in Terms of

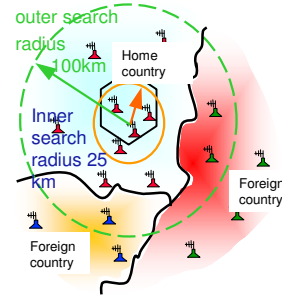
- Calculation Algorithm (HCM) and DTM
- Data Exchange Format
- Response Times
- ...

### Bilateral/Multilateral, Country Specific Agreements

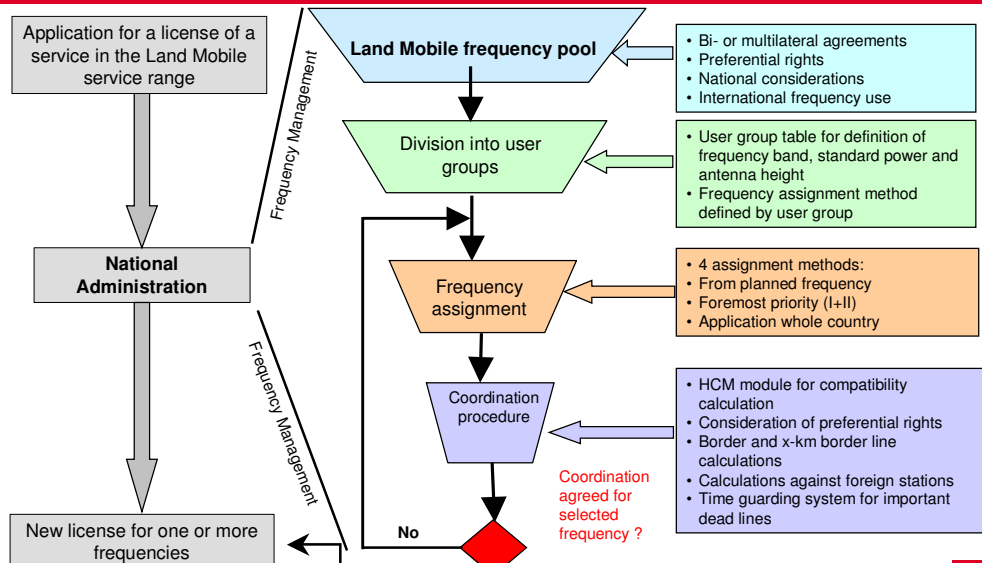


## 5. Coordination of Landmobile Services

- Foreign Requests:
  - ▶ Protect you Border Area
  - ▶ Protect your Stations
  - ▶ Evaluate the Situation
  - ▶ Agree or Reject
  
- Domestic / Foreign Stations:
  - ▶ Pre- Check the Situation
  - ▶ Protect your Receiving Stations
  - ▶ If Necessary Apply for Coordination
  - ▶ Exchange Data with Neighboring Countries



## 5. Coordination of Landmobile Services: Part of Spectrum Management



## 5. Coordination of Broadcasting Services

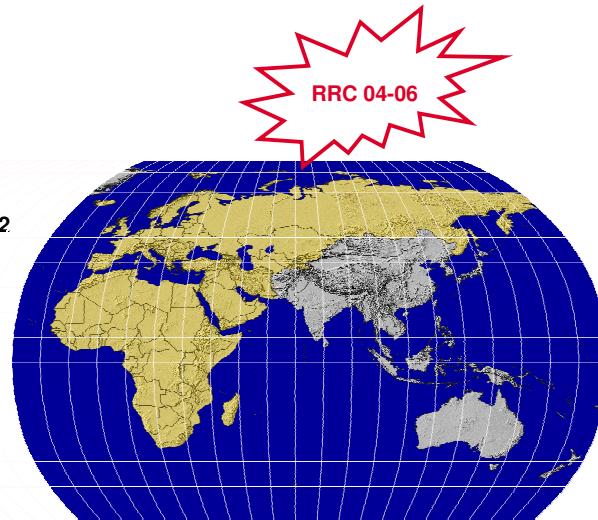
**Geneva 84 Plan**  
FM Radio Services

**Stockholm 61 Plan /Geneva 89 Plan**  
Analogue Television Services

**Wiesbaden 95/Bonn 96/Maastricht 2002**  
T-DAB Services (VHF/L-Band)

**Chester 97/RRC 04-06 Plan**  
T-DAB (VHF) and DVB-T Services

**Geneva 75 Plan**  
Long and Medium Wave Services



## 5. RRC 04/06 for Digital Broadcasting

- Initial Session was held in May 2004
- Data of National Digital Network Requirements to Be Submitted to the ITU by End of February 2005
- First Planning Exercise by the ITU before IPG Meeting in July 2005
- Deadline for Last Data Submission is End of October 2005
- Second Planning Exercise Beginning in 2006 Will Produce Draft Plan
- Second Session to Be Held in May/June 2006

## 5. Coordination of Other Services

### Satellite Services

#### AP 7 – Global Application

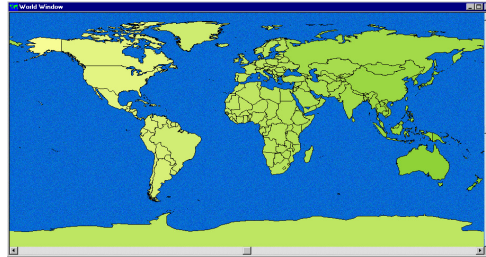
Coordination of earth stations via ITU.

#### AP 8 – Global Application

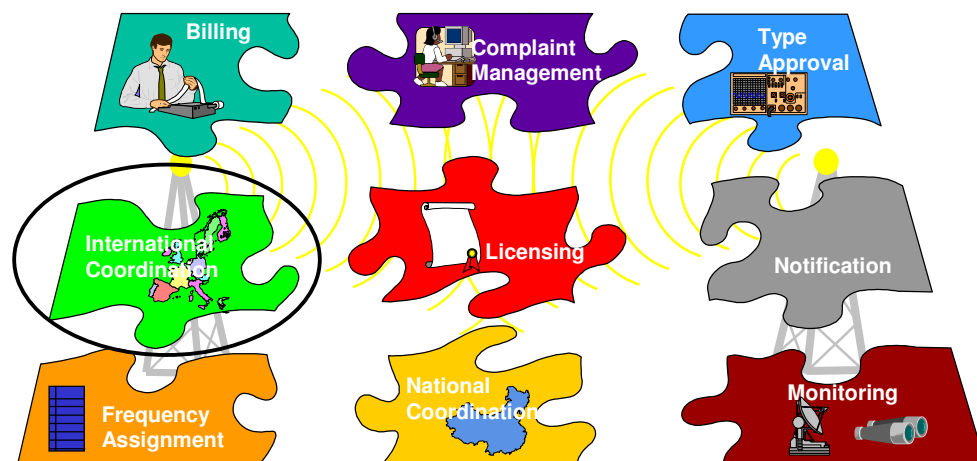
Coordination of satellite networks via ITU.

### Aeronautical Services

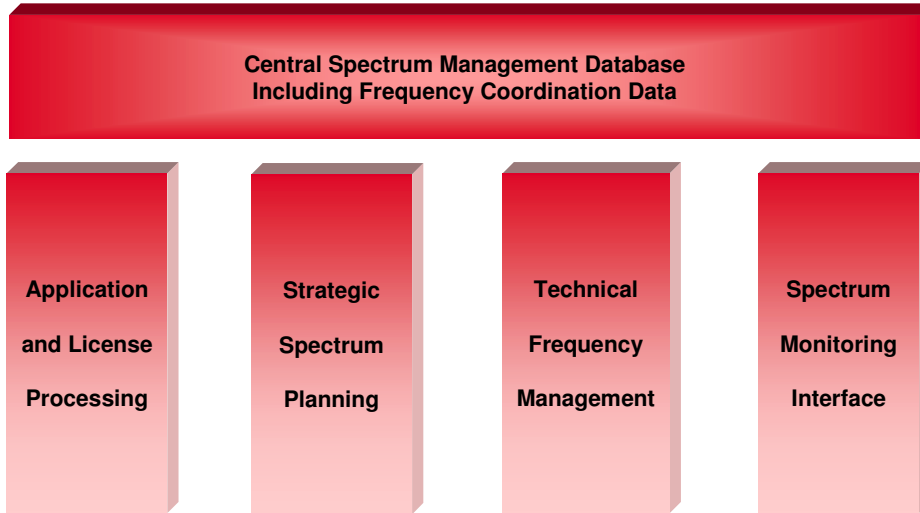
Being Coordinated through ICAO.



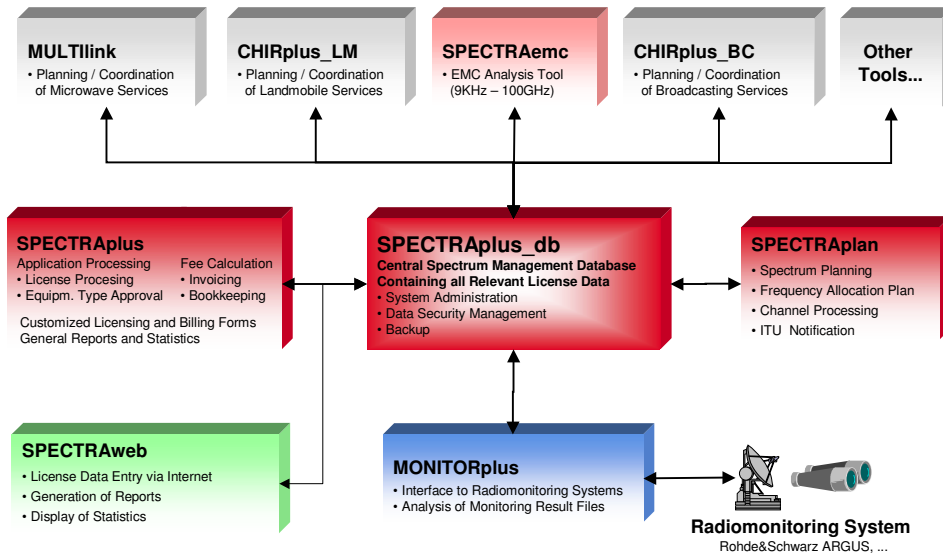
## 6. Frequency Coordination and Spectrum Management Solutions



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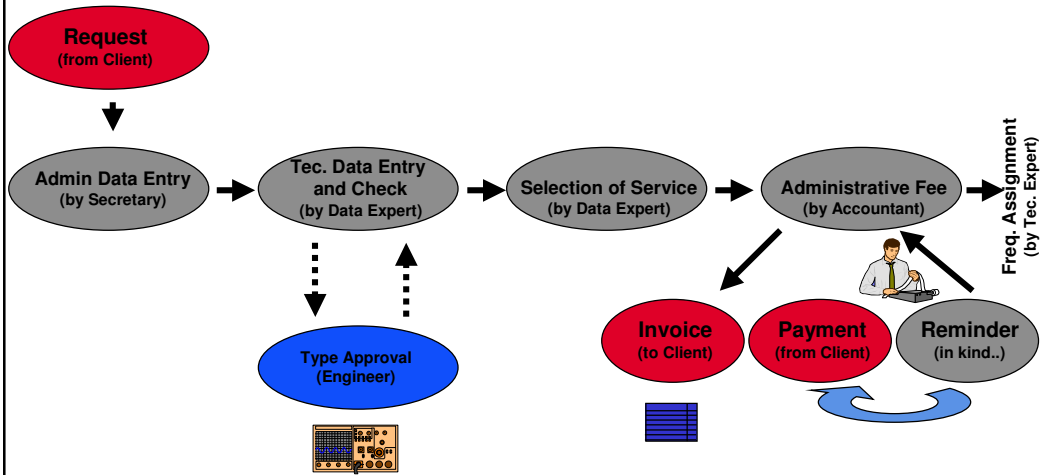


## 6. Frequency Coordination and Spectrum Management Solutions

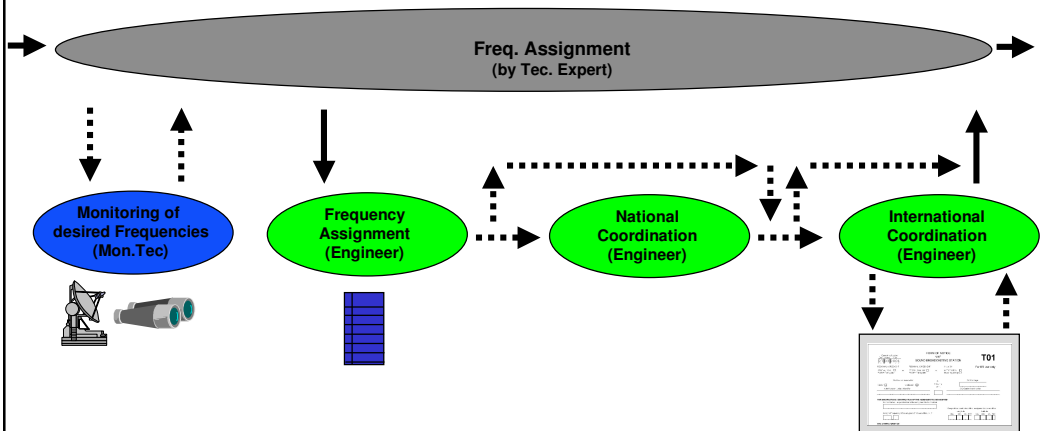




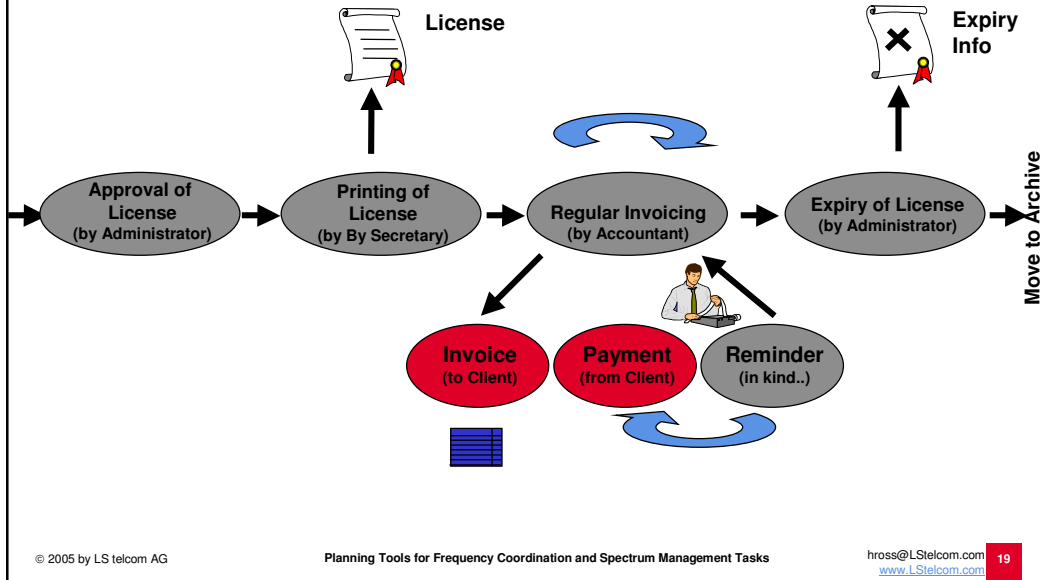
## Exemplary Workflow (1)



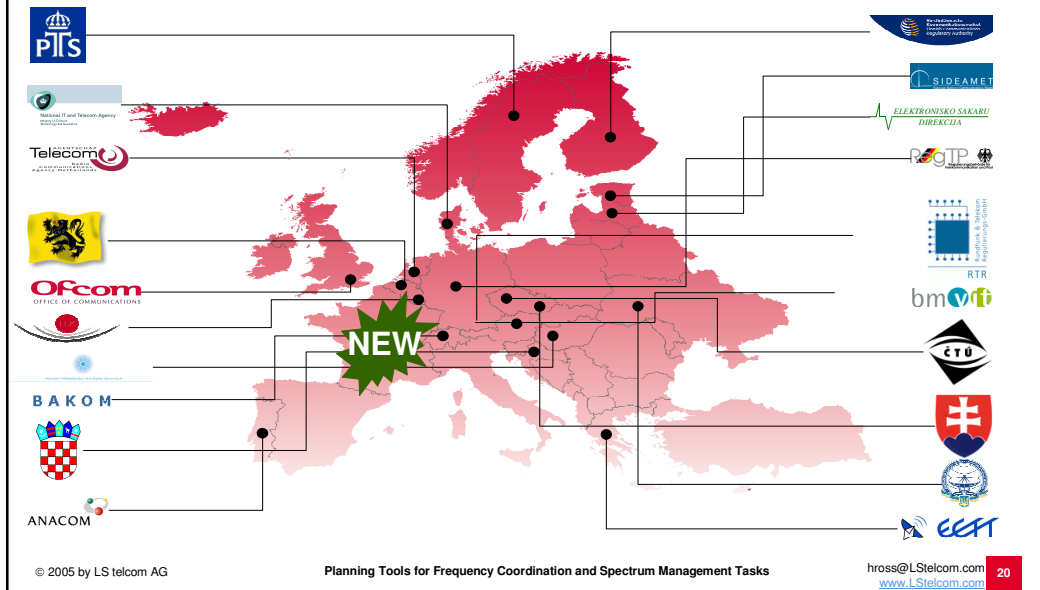
## Exemplary Workflow (2)



### Exemplary Workflow (3)



### European References / Regulation Authorities



**Thank you for your attention !**

For more information:



**Heiko Ross**  
 Phone: +49 (0) 7227 9535 600  
 Email: [HRoss@LStelcom.com](mailto:HRoss@LStelcom.com)  
 Web: [www.LStelcom.com](http://www.LStelcom.com)

**Application and License Processing – SPECTRAplus**

- Radio Service Specific License Processing
- Workflow Management via Action Control
- User Role Management
- Deadline Management
- Generation of Reports and Statistics
- Printing of Client Specific Documents
- E-Licensing via Internet



**Number of requests per service**

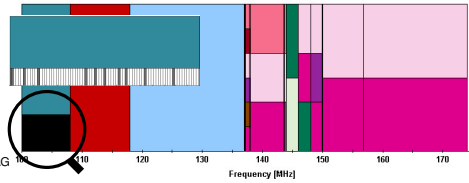
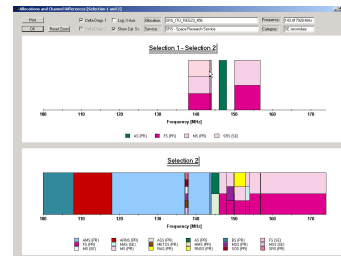
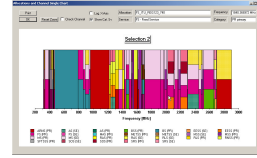
Service	Number of requests
Administrative	106
Administrative/Technical	67
Technical	106
Class Service	36
Class Service/Technical	67
Technical/Class Service	36
Technical/Technical	106
Class Service/Class Service	36
Class Service/Technical	67
Technical/Class Service	36
Technical/Technical	106

**Possible Actions**

- Complete Request
- Copy
- Duplicate Request
- Grant License
- Modify official in charge
- Print Info Letter
- Print Inquiry
- Print License
- Print Reminder
- Print Report "Vienna Agreement"
- Print Request
- Send to Archive
- Start Invoicing Admin Fee
- Start Invoicing Frequency Usage
- Start Recurring Invoicing
- View Request

# Strategic Spectrum Planning – SPECTRAplan

- Generation and Administration of Frequency Plans, Allocations and Channel Allotments
- Management of International Frequency Plans (WRC 2000/2003, CEPT, ...)
- Comparison of Frequency Plans
- Graphical Display of Frequency Allocations



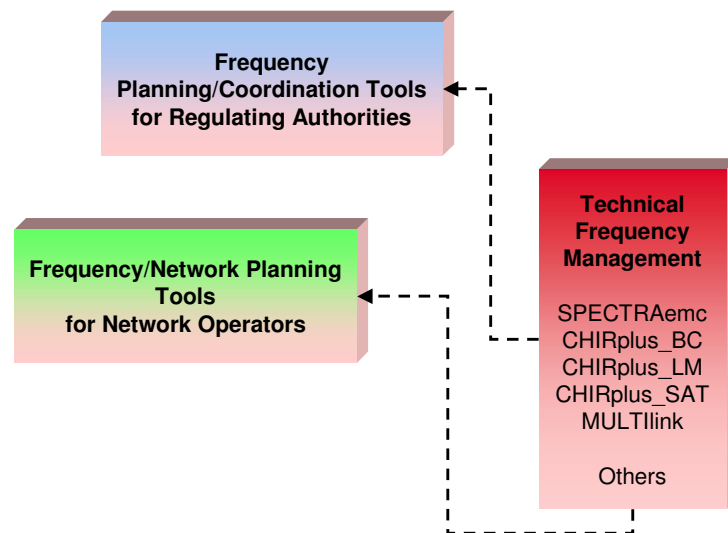
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Frequency [MHz]

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# Technical Frequency Management



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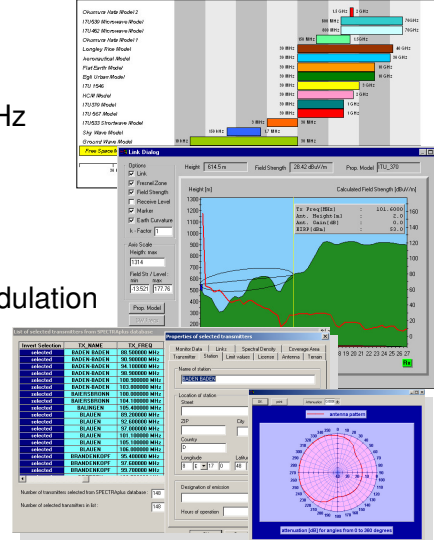
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# Technical Frequency Management – SPECTRAemc



## Electromagnetic Compatibility Tool

- Wave Propagation from 9KHz to 100GHz
- Contour and Area Calculations
- Interference Analysis including Intermodulation
- Fully Automated Macro Functions



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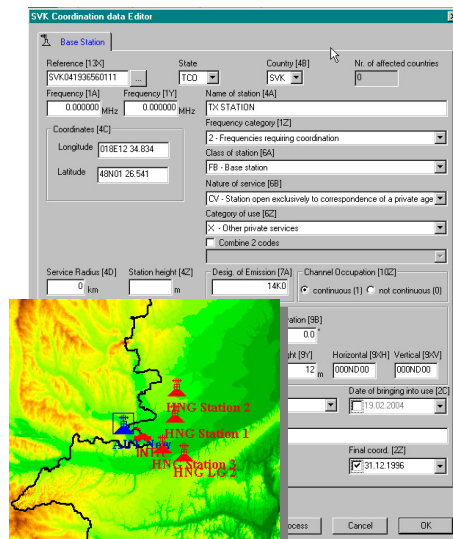
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# Technical Frequency Management - CHIRplus\_LM/MULTIlink



## Coordination Tools for Fixed and Landmobile Services

- Fully Integrated Harmonized Calculation Module (HCM)
- Guidance Through Frequency Coordination Process
- Time Guarding System Managing Response Times
- Support of Data Exchange Format



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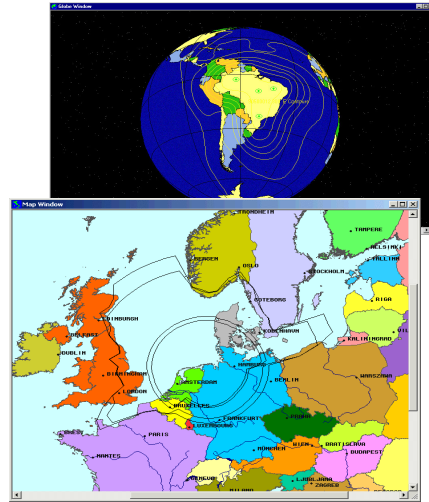
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## Technical Frequency Management - CHIRplus\_SAT



### Coordination Tools for Satellite Communication Services

- Coordination for Earth Stations and Satellite Networks
- Support in the Notification Process of Space Services
- Database 100% Compatible to ITU Database
- Direct Access to ITU SRS CD-ROM



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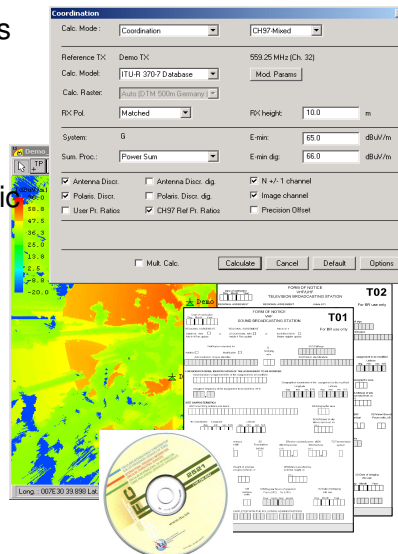
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## Technical Frequency Management - CHIRplus\_BC



### Coordination Tools for Broadcasting Services

- Interface to BR IFIC CD-ROM
- Support of T01/02/03 Forms and Electronic Notification Format ITU TerRaSys
- Fully Integrated Coordination Macros According to International Agreements
- Stating Whether Coordination Is Possible
- Guidance/Proposal How to Solve it



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# Coordination Solutions for Broadcasting Services



## Preparatory Workshop for Regional Radiocommunications Conference 04/06

- Individual workshop for each interested country!
- Review of the sets of data issued initially by 28th February 2005
- Review of the DVB-T plan of the country
- Generating the modified input data for submission
- Filling up the frequency coordination data forms which should be sent to the neighbouring countries



# Radiomonitoring Interface – MONITORplus



- Generation of Monitoring Orders
- Import of Monitoring Data
- Comparison and Linking of Monitoring Data with License Data
- Detection of Unlicensed Transmitters

