

LS telcom supports AIBD/ITU/VTV Workshop on Digital Terrestrial TV Broadcasting (DTTB)

A regional workshop on Digital Terrestrial TV Broadcasting (DTTB) and its Frequency Planning was held in Hanoi, Vietnam. The workshop was organized by the Asia-Pacific Institut for Broadcasting Development AIBD, the Vietnam Television VTV and the International Telecommunication Union ITU.

Mr. Carsten Dethloff and LS telcom co-worker Mr. Markus Morgen were the consultants who held this 4-day workshop.

Seventeen senior engineers from Cambodia, Laos, Thailand, Mongolia, Indonesia, Myanmar and Vietnam took part in this workshop hosted by the Vietnam Television (VTV) in its Training Centre in Hanoi. All participants were engineers involved in Frequency Planning with at least 5 years practical experience on frequency planning.

The workshop's content of the first two days was designed to enable the participating engineers to improve their knowledge of basics in digital television from the digitalization of video signals up to digital transmission standards.

The second two days were devoted to frequency planning procedures, regulations and tools. The participants were also exposed to the introduction of DTTB in Europe and other parts of the world. This know-how will enable them to assess the situation in their own countries and will help them to develop a migration scenario to digital television.

Overall the workshop's intention was to enable the participating engineers from different broadcast organizations to improve their knowledge, learn about planning principals and possible problems they may face during the implementation process and to gain hands-on experience on some of the DTTB frequency planning modules.

This workshop was the third workshop on DTTB organized in collaboration with the ITU. Mr. Carsten Dethloff and Mr. Markus Morgen were also the consultants for similar workshops in Brunei (2002) and Tehran (2003).

A follow-up activity is already being discussed with ITU.



Participants of the Workshop on Digital Terrestrial TV Broadcasting in Vietnam.

Dear Readers,

Proudly we look back to a successful LS Summit 2004 which took place almost a year ago and brought more than 130 telecommunication experts from 26 countries to the LS telcom headquarter in Lichtenau/Germany.

With this issue of LS telcom's customer news magazine, it is again time to invite our customers, partners and friends to the 10th anniversary of our annual seminar day, guaranteeing an interesting seminar program with high-level speakers.

Enjoy the presentations, inform yourself about the latest trends and developments and meet communication and spectrum management experts - we invite you to be our guest at the LS Summit 2005!



Roland Götz,
Member of the Board

Subjects of this issue

- TV planning conforming to RRC-04
- ARABSAT Satellite Training
- Advanced multiple frequency Assignment with **SPECTRAemc**
- Software customization projects
- HCM 7 in **CHIRplus_LM**
- 10th LS Summit on 8th June 2005
- LS supports ITU Centre of Excellence
- Usergroup conference

TV planning conforming to RRC-04 using CHIRplus_BC

Already in parallel to the RRC-04, LS telcom was able to demonstrate some of the new functionalities. Even if not visible before officially released, there is busy working behind the scene for database restructuring to better match new RRC definitions, which were still partly undergoing changes and had not been released by the end of the RRC-04 while other functionality is already available off-the-shelf.

Wave Propagation Model according to RRC-04

Besides the wave propagation according to ITU-R Recommendation P.1546 respectively P.1546-1 there is now also the choice of the RRC-modification of Recommendation P.1546-1, which was decided for use of the Conference – both, in the “official” and operational version, as the issue of mixed land-sea path (interpolation factor) is still not settled yet.

The version “P.1546-RRC” addresses to features decided at the RRC-04, such as a clipping at 0.55 degrees in the terrain clearance angle correction to avoid some anomalies, revised propagation curves (mainly to avoid anomalies in mixed land-sea propagation), the distinguishing of cold or warm sea with the 50% time curves and the introduction of pre-defined values for the vertical refractivity gradient, dN, for the different zones.

The necessity to work with propagation zones was given as the RRC is also a follow-up of the Geneva 89 plan for Africa and adjacent countries which defined different propagation zones.

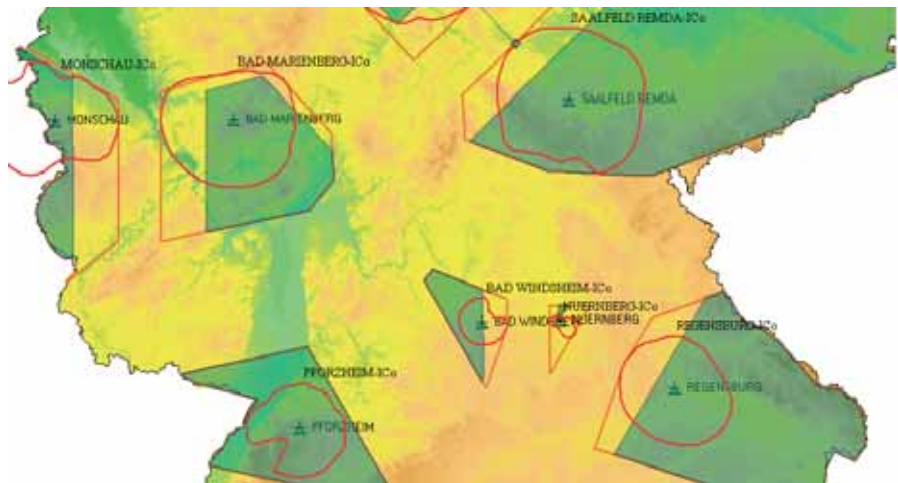
Most of these features introduced on the RRC-04 will also be included in the Recommendation P.1546-2 which is not yet in force.

The potential area algorithm

A means for “conversion” of analog assignments to digital allotments without change of frequencies is the “potential area approach”, described in chapter 5 of the RRC Report. This is a geometrical procedure to define areas which can be converted to allotments. Consequently, allotments are since even before the RRC enabled in **CHIRplus_BC** for DVB-T as well as it used to be for T-DAB.

requirements for the RRC-06 is possible. And there is only electronic notification defined for those requirements.

There are five notice types for the RRC-06 requirements defined: DS1 and DS2 for T-DAB assignments respective allotments, DT1 and DT2 for DVB-T assignments respective allotments and DA1 for the description of the allotment test points which form the area of the allotment and of which up to 9 can be connected with the allotment.



Potential Area Algorithm

RRC exchange formats

The RRC defined new data fields for the notification of digital (T-DAB, DVB-T) assignments and allotments. The necessary specification to do this a data format was given with Circular Letter CR/215 of the ITU-R Radiocommunication Bureau about six weeks after the end of the RRC-04. **CHIRplus_BC** had allowed for the notification in the electronic “TerRaSys” format of the ITU before and now the electronic notification of

As the customers need emerged, LS telcom was able to respond in a flexible way and was also able to provide an import function for a less standardized format which was used for allotment data exchange between numerous European administrations which also had an Arc-View® GIS. The import to allotments as in the **CHIRplus_BC** database is now possible, so to visualize inside **CHIRplus_BC** and to enhance compatibility calculations.

ARABSAT Satellite Training



ARABSAT, the leading provider of satellite communications to the Arab World, is one of the new customers of LS telcom software. Five engineers from the technical coordination department attended a comprehensive training course at LS telcom headquarters in Lichtenau, covering all topics from basic satellite

communication theory up to international coordination rules. The training also included a one day visit of the teleport in Usingen, Germany.

In addition, ARABSAT received the newly developed module of **CHIRplus_SAT** for coordination of geo-stationary satellite networks in the unplanned bands, together with an intensive training. Based on the successful completion of the project, both parties agreed on strengthening their relations.



Advanced multiple frequency assignment for SPECTRAemc

Significant further development of frequency assignment algorithms have been recently ordered by DFS (Deutsche Flugsicherung GmbH) for the **SPECTRAair_emc** module. The existing frequency assignment algorithm based on the ICAO compatibility rules was extended to cover also the case of simultaneous multiple assignments.

When considering existing networks of stations, which have been coordinated by the same compatibility rules either nationally or internationally, there are two possibilities of assignment of frequencies to multiple new stations in the future:

- sequential single frequency assignment to one station after the other
- simultaneous multiple assignment of frequencies on block to multiple stations

Most frequently the procedure a) is applied because of its simplicity, especially in case of already existing big operational networks. The problem with this approach is, that most probably the final assignment will not be the optimal solution in terms of efficient usage of spectrum. From a mathematical point of view, the multiple frequency assignment can be considered as optimisation problem, which can be solved only numerically. Depending on the number of frequencies to be assigned simultaneously in one block, the search space for the optimum solution may increase exponentially in dimension. Taking also into account, that the calculation of the quality of a single configuration based on the ICAO compatibility rules is quite

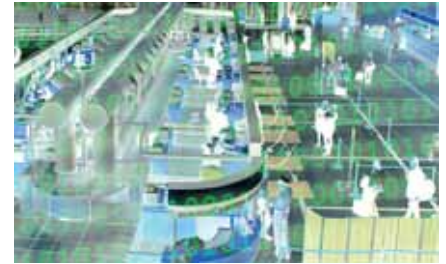
complex, it is clear, that this problem cannot be solved in a straight forward way with today's and also future computer performance in reasonable time.

The famous and in comparison to the frequency assignment quite simple travelling sales man problem (find the shortest way for visiting n cities) is a good example to illustrate the previous statement. For 10 cities, the problem can be solved exactly in approximately two minutes on a modern computer. But when the number of cities is increased only to 20, the problem cannot be solved exactly anymore on any computer within its lifetime.

Simulated annealing has been proven to be a very efficient algorithm for the solution of various complex numerical optimisation problems. For example good solutions for the travelling sales man problem described above can be found easily within seconds for 50 cities.

For this reason simulated annealing will be introduced as the basis for multiple frequency assignments in aeronautical services based in ICAO rules into **SPECTRAair_emc** and as the next step also into **SPECTRAemc** based on general interference calculations into **SPECTRAemc**.

Algorithms like that, box algorithm etc. were already available in other LS telcom tools. Even if there is no guarantee to find the absolute optimum solution of the problem, it is most likely that the simulated annealing algorithm will find a solution, which is superior to the process of sequential single frequency assignments.



Customization Projects successfully Completed

NHH - Hungary

In Spring 2004 the National Communications Authority of Hungary NHH signed a software customization agreement with LS telcom. The main goals of this development Project are functional customization and enhancement of the Frequency Management System modules. Both parties worked jointly to implement the software. The modified system has been successfully put into operation beginning of 2005.

CTO - Czech Republic

A follow-up customization project has also been started with the Czech regulator CTO in September 2004. The main objective of this project was to introduce a new radio service into the existing Frequency Management system. This project has been successfully completed and put into operation in February 2005.

Both projects demonstrate the long-term partnership between LS telcom and its customers after the successful implementation of LS telcom software packages.

Be prepared for the future - be prepared for HCM 7

Although for the mobile services still HCM 6 is the official version in 2005 to be used by the administrations having signed the Berlin Agreement, the spring release of LS telcoms Land Mobile Coordination tool **CHIRplus_LM** will already provide an interface to the brand new HCM 7 module.

In addition in **Chirplus_LM**'s 10th anniversary release this spring the interface to the HCM 6 and HCM 7 modules have been improved making it easy to switch between different HCM versions.

HCM 6.01 ● HCM 6.02 ● HCM 6.03 ●

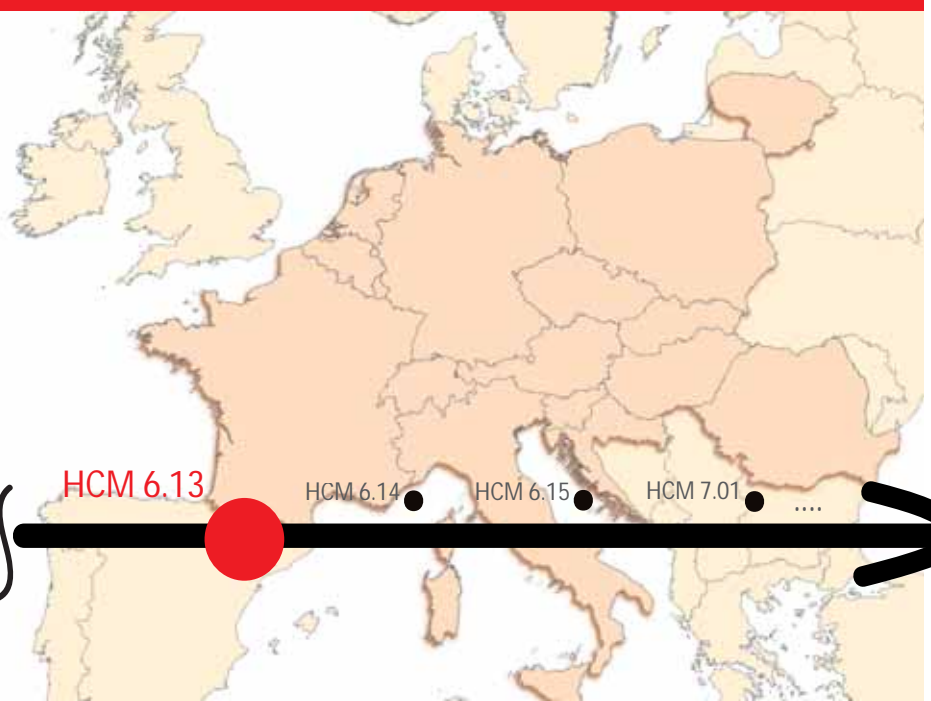
HCM 6.13 ●

HCM 6.14 ●

HCM 6.15 ●

HCM 7.01 ●

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10th LS Summit 2005

LS summit 2005

10th Annual Seminar Day

On 8th June 2005 the telecommunication conference LS Summit will be taking place for the 10th time.

Just as in previous years we will take care for an interesting seminar program. More detailed information regarding the program can be found on our homepage www.LStelcom.com within the next weeks.

As in the years before, numerous experts of the world of wireless communication and spectrum management will discuss perspectives and way pointing new technologies on this day.



Impressum

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LS telcom supports ITU Centre of Excellence

A Workshop on spectrum monitoring and spectrum management was organized by the ITU – BDT as part of its Centre of Excellence (CoE) activities for Eastern Europe. The Slovak Regulating Authority TUSR this time hosted the workshop.

LS telcom presented in Bratislava practical examples of the **MONITORplus** software that allows visualization of measurement data and cross-check with license data. Further functionalities demonstrated were the creation of monitoring orders or management of interference complaints.

The EUR/CIS branch of the Centres of Excellence addresses to regulatory issues for Central / Eastern European countries, South-eastern Europe and Baltic states. Previous workshops took place in Skopje and Sofia.

It is already a nice tradition that, besides the official agenda, a social event is organised. This time LS telcom sponsored a cocktail reception at the end of the workshop.



Link to ITU Centers of Excellence:
<http://www.itu.int/ITU-D/hrd/coe/index.asp>

Spot on

Berlin Agreement Supported by MULTilink

For easy exchange of coordination data in between Regulation Authorities, **MULTilink** – LS telcoms' microwave planning and coordination tool - does now support import/export of coordination data according to the Berlin Agreement.

The corresponding coordination algorithm is currently also under implementation and will be available within the next update.

LS telcom supports broadcasters preparing for RRC06

Besides the implementation of new functionalities into the broadcast planning tool, LS telcom supports regulators and broadcasters preparing for RRC-06 with customers-tailored planning and consultancy services. Ongoing successful projects encouraged LS telcom to set-up special "RRC workshops" and planning capabilities to assist broadcasters during the next busy months.

New General User Interface Editor for SPECTRAplus

Within the ongoing process to further optimize the user-friendliness of **SPECTRAplus**, a **SPECTRAplus** proprietary GUI editor has just been released.

By using the GUI editor, the user is able to configure his own data entry masks and display only the information that is of interest to the respective user.

Usergroup Conference on 6th/7th June 2005

Two days prior to this year's LS Summit the LS telcom Usergroup holds its annual conference in Lichtenau. The Usergroup is comprised exclusively of LS telcom customers. Its mandate is to provide an interactive platform for the ongoing exchange of new ideas, information and improvement suggestions specific to LS telcom software products and services. The primary vehicle for this is the annual Usergroup Conference, which is hosted by LS telcom.

The Usergroup is open for all institutions that have purchased one or more LS telcom software tools. If you would like to know more about the Usergroup, please contact its chairman, Mr. Aljo van Dijken, via e-mail at: aljo.vdijken@at-ez.nl

