

**Latest**

## Finnish Operator Digita decides for CHIRplus Software Tool Suite from LS telcom after thorough Benchmarking

*The Finnish digital terrestrial television network operator Digita acquired the complete software tool suite CHIRplus.*

CHIRplus includes licences for the planning and optimisation of broadcast (CHIRplus\_BC) and transmission networks (CHIRplus\_FX) as well as software for the generation and conversion of mapping data. Digita selected CHIRplus from LS telcom after a

rigorous four-month evaluation period of several providers and software for broadcast network planning. Besides the software, the contract covers training, maintenance and support. Digita will use the software to plan and optimise the nationwide network

of 36 main broadcasting stations, 151 substations, and dozens of transmission link stations for fixed and mobile reception. ←

## Thai Regulator NBTC acquires advanced Broadcast Planning Software CHIRplus\_BC



*For the introduction of Digital TV and Digital Radio Broadcasting Services in Thailand, the broadcast department of the Thai Regulator NBTC has contracted LS telcom to deliver its advanced broadcast network planning solution CHIRplus\_BC.*

Besides the installation of the full-range suite of CHIRplus\_BC spanning all analogue and digital services, including DVB-T2, the project covers user training and the integration of existing digital mapping data into the software. With the acquisition of CHIRplus\_BC

NBTC responds to market demands and needs for digital broadcast services and complements its current spectrum management system, also delivered by LS telcom. ←

## LS telcom assists in solving LTE Interference on DTT Networks

*With the 'digital dividend' spectrum reorganisation in Europe, Digital Terrestrial Television (DTT) services in the 470-790MHz band will become close neighbours with the new mobile services in the adjacent 800MHz band (791-862MHz).*

With only a 1 MHz guard band separation, those households which receive their television signal in near-by LTE channels will be susceptible to loss of DTT coverage due to interference from the adjacent-frequency LTE base stations.

There are two main types of interference that are the problem with this reorganisation. Out of band interference, when unwanted adjacent channel LTE signals interfere with the DTT receiver, preventing it from decoding the DVB-T signal correctly; and blocking, when a strong unwanted signal prevents the receiver from detecting a wanted signal, by pushing the receiver closer to saturation. Blocking is likely to occur only in close proximity to the LTE base station. The UK government, for example, has committed €216 million to fund solutions to mitigate TV interference

caused by new 4G mobile services.

Mobile operators, broadcast providers and regulatory authorities have to deal with the issue to find the best economic and technical solution for their customers and consumers. Whether technical or economic advice or training is needed, LS telcom has over 20 years of experience in both broadcast, as well as mobile network planning, and offers strategic consulting, engineering services and training to all involved parties. LS telcom experts help regulators to calculate the potential impact that new LTE networks will have on DTT services, they can provide solutions



for the best mitigation techniques and also assist regulators in conditioning LTE licences, countrywide or in regions particularly vulnerable to interference. LTE network operators can benefit from LS telcom's expertise in assessing the interference potential of different LTE network scenarios and different mitigation techniques to find the most cost-effective network solution within the operator's budget constraints.

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## LS telcom assists in solving LTE Interference on DTT Networks

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### CHIRplus\_BC to calculate LTE Interference on DTT

The leading software CHIRplus\_BC calculates and pinpoints the interference from LTE on DTT services. It plots the zones where out-of-band interference and blocking could occur. The software features standard planning processes for all digital broadcast technologies, considers other services in the interference calculation and includes, in particular, an LTE/DTT interference prediction model and field strength dependent protection ratios.

Many helpful extras, such as data entry and visualisation assistants, make the use of the software very convenient for both broadcasters and

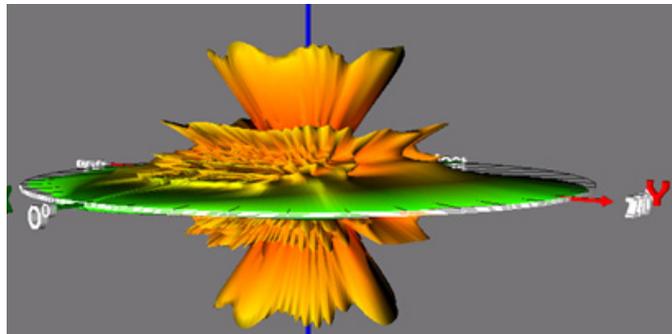
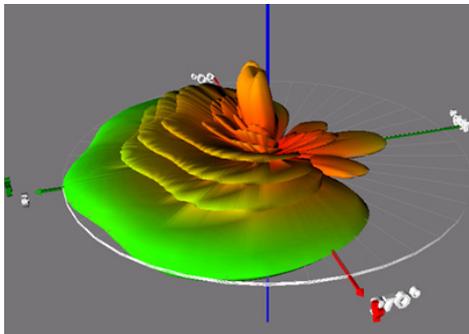
mobile network planners. The field strength, for example, can be displayed in dBµV/m for broadcasters, or in dBm, which is more common in mobile planning. For easy mobile base station data import the software supports the Land Mobile Harmonised Calculation Method (HCM) format which is a widely used data exchange format in countries which are part of the HCM agreement.

### More New Features in CHIRplus\_BC

- Antenna formats can now be visualised in a more uniform way in CHIRplus\_BC. All commonly used antenna types, from simple formats used in

international coordination to very complex antenna descriptions with multiple elevation diagrams can now be displayed and used for calculations. 3D representations for all formats, starting from medium and short wave antennas up to the VHF and UHF bands, help to better understand the antenna influence.

- As always, CHIRplus\_BC is one step ahead: the ITU-R Recommendation P.1812-2 is already integrated in CHIRplus\_BC and so is the preliminary Recommendation 1546-5.
- CHIRplus\_BC's integrated macro capabilities are another great benefit not available in other software trying to fulfil the same tasks. The software user can pre-define and automate reiterative processes, which makes the planning much more comfortable for the planner and accelerates the planning process considerably. ←



3D antenna diagrams

## Tender support in Malaysia: LS telcom provides Detailed DVB-T2 Network and Coverage Planning

*LS telcom performed a detailed nationwide DVB-T2 network and coverage planning in Malaysia to support Puncak Semangat Sdn Bhd (PSSB) in the second stage of bidding for the tender to build up the nationwide digital terrestrial television broadcasting (DTTB) infrastructure. The bid winner will be the Common Integrated Infrastructure Provider (CIIP) for all digital public and commercial broadcasters.*

The detailed nationwide DVB-T2 network analysis results in a final coverage which is even better than the existing analogue coverage. 98% of the Malaysian population benefits from the improvements offered by the new DTT services planned by LS telcom. In the first step different potential DVB-T2 systems were analysed to determine the most suitable T2-system with respect to the number of programs (SD and HD), coverage, SFN size, and to minimise self interference. The study included nationwide fixed coverage planning and the planning of

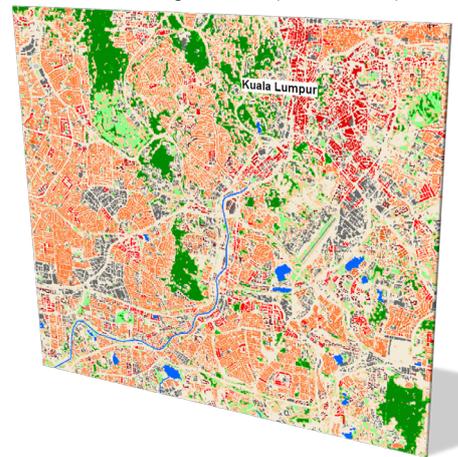
portable reception for six conurbations. The outcome of the initial planning which was made for the first stage of the bidding was the basis for the following detailed analyses.

Site surveys were carried out for all existing broadcast sites in Peninsular (West Malaysia) and Sabah & Sarawak (East Malaysia).

LS telcom also assisted the site survey teams in the elaboration of the site survey reports. Kathrein was entrusted by LS telcom to elaborate detailed antenna realisation designs for each site of the intended network roll out. Based on the real site data and the antenna designs, the detailed DVB-T2 nationwide network planning was performed using topographical and land usage information data with a resolution of 20m.

Different simulation approaches such as additional sites, antenna down tilts

Land usage data excerpt of Kuala Lumpur in 20m resolution



or the increase of radiated power (ERP) were used to improve the indoor coverage in dense urban areas.

To assure a quick DVB-T2 network roll out with minimum RF interference to the existing analogue TV, comprehensive spectrum analyses were conducted taking into account all currently operating TV stations in Malaysia.

LS telcom was contracted for this project by Wamata Solutions Sdn. Bhd., its local partner in Malaysia for the last 15 years. PSSB and two other companies submitted their bid to the Malaysian Communications and Multimedia Commission on 3rd June, 2013. ←



The picture shows the team, which was working for PSSB on the tender documents at a workshop, held in Port Dickson in April.

# Know your Antennas Inside Out...from a Distance: Cost-effective Radio Frequency Measurements and Mast Inventory Audits with Remotely Piloted Aircrafts (RPA)

*For the first time ever, broadcast and telecommunications operators and regulators will be in the position to determine in an easy, quick and cost-effective way, the true onsite radiation characteristics of their RF transmission installations, and will be able to have high resolution video and photographic recordings of the ground facilities and the mast. These records are extremely useful to determine the technical quality of installations on the mast and to establish an inventory of equipment and mounting space on the mast.*

## The service

LS telcom offers this as a turnkey service solution. It is made possible by means of remotely piloted aircrafts, which include either a measurement and sensor system or a camera onboard. The remotely piloted aircraft circles the antenna to measure the radiated energy in the azimuth and elevation planes at specific distances from the radiating antennas. While the measurement flights are recorded on board in high definition wide angle video format, a separate RPA specifically equipped with appropriate HD photographic equipment is also available for such recordings.

## How it works

The complete solution consists of the latest remotely piloted aircraft (RPA) technology which is adapted to carry the measurement sensor, high resolution position and orientation sensors, an autopilot, a high powered processor and storage unit and a telemetry system. The measurement and navigational data is stored on board and also streamed to the ground control station in real time. The RPA flies semi-remote controlled and in accordance with a pre-programmed flight path. Several safety features are built into the system amongst which is a 'return to take-off point' in the unlikely event of remote control failure.

The distance at which the RPA circles the antenna varies from 50m to 600m depending on the site, the type of measurement, the type of antenna installation and bands to be measured. Flight path distances are typically 3km long.

This RPA-measurement-service is obviously much more cost-effective than carrying out measurements in an actual manned helicopter. It is also safer to fly, especially in confined spaces, as it has an accurate flight path on all axes. Any deviations from

the flight path are immediately detected and compensated for in the end result.

In addition to broadcast facility measurements, this makes it the ideal solution for GSM sites also. Such measurements cannot be carried out by a conventional helicopter at all. This would be simply too dangerous, as you have to measure close the mast.

## Final tests completed

While this is a brilliant and simple idea which seems easy to realise for the layman, there is a huge number of parameters to consider to produce accurate results. These include parameters for calibration, stabilisation, navigation, positioning, data streaming and the quality and repeatability of the actual measurements. All of this needs to function flawlessly in extreme RF radiating areas and under challenging environmental conditions such as on high mountain tops.

This is why, after the proof of concept last year following a five-year research and development period, the system has undergone another series of extensive tests and now guarantees reliable results as well as high stability and safety.

The flight stability was deliberately tested while measuring in the face of an approaching thunderstorm with wind gusts of up to 15m per second at ground level. The results under these conditions were surprisingly good, although the flight was part of an endurance test and would not normally be carried out under such conditions.

A genius idea for more stability: the measuring antenna is gimbal-mounted\*, which helps to equilibrate any roll or pitch variation, thereby minimising the required measurement corrections. A separate custom designed gimbal is also used on the photographic copter to stabilise and point the video camera.

Another challenge was the installation of a reliable telemetry and measuring data transmission system to operate in harsh RF environments and over distances. The problem is solved by deploying self-configuring mesh network modules in the flight area. This solution has proven to be highly deployable to match the shape of any required flight area.

## The deliverables

The deliverables of the in-flight measurement service include horizontal (HRP) and vertical radiation patterns (VRP) and effective radiated power (ERP) per service. The performance of the transmission system can thus be accurately quantified. The results may be used, in turn, to determine coverage deviations from the design intention.

The measurements for all programmes for a single transmission technology can be carried out in one flight. To confirm the absolute reliability of the results, all flights are duplicated and the results overlaid for the benefit of the customer.

The deployment of the photographic RPA brings great additional value by providing details for mast inventory, such as antenna type, height, status of paint work and rust on the mast. It enables desktop assessment of the installation and infrastructure, before and/or after the work of installation and maintenance teams. This is especially convenient and advantageous where climbing up the mast is cost-intensive and normally requires downtime of the transmitter for inspection.

## The advantages in brief

The advantages for network operators of this revolutionary service are two-fold: not only can they optimise network coverage and guarantee expected service level to their customers in a cost-effective way; they will also be able to reduce their infrastructure maintenance cost.

This equipment inventory service also allows operators to easily and quickly quantify any possibly available space for rental to third parties.

Interest in this service offering was received worldwide. The most recent measurements/recordings were done in Kenya for the huge Pan-African DVB-T2 network operator Multi-Choice. ←

*\*device that permits a body to incline freely in any direction or suspends it so that it will remain level when its support is tipped*



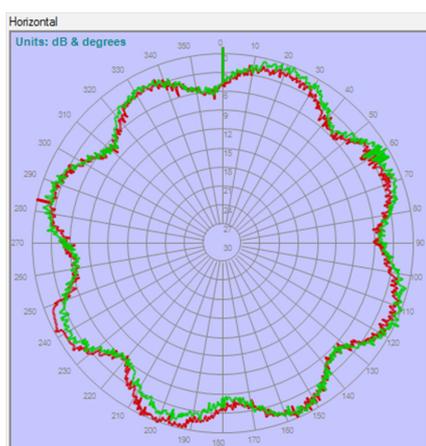
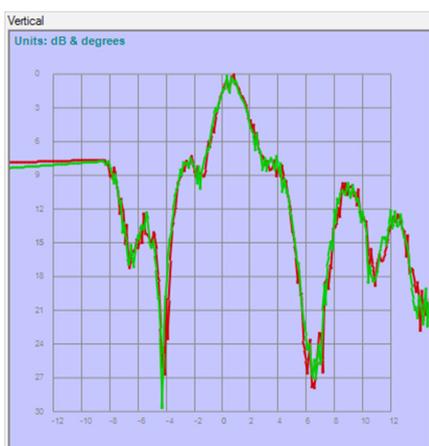
The UAV with the measurement payload



Lightning strike erosion on the lightning arrester



Condition of VHF antenna panels and covers  
Pictures taken with the UAV imagery solution ↑



Typical raw measurements results of an 8 tier 4 bay UHF antenna duplicated and overlaid

Visit us at  
our Booth...

**IBC Amsterdam,  
Netherlands**  
13<sup>th</sup> - 17<sup>th</sup> September 2013

**ITU Telecom World,  
Bangkok, Thailand**  
18<sup>th</sup> - 21<sup>st</sup> November 2013

**Save the date for the  
LS Summit 2014  
Lichtenau, Germany**  
2<sup>nd</sup> July 2014

## Turnkey Transmission Shelter Production and Equipment Installations for worldwide Delivery

LS telcom produces shelterised container solutions for the broadcast and telecommunications environment. The containers can be used for the following applications:

- Broadcast transmitter installations
- GSM/3G/4G/PMR transmission equipment installations
- Mobile generator installations complete with fuel tank, AVR & isolation transformer and control panel
- RF screened containerised solutions
- FM portable studio solutions
- Data centres and data storage units

LS telcom offers full turnkey solutions which include site preparation, project management, transmission equipment deployment as well as mast and antenna installation. ←



### The units offer the following advantages.

They are:

- easily transportable
- ruggedised
- equipped with air-conditioning to suit application
- and can be insulated in accordance with specification.



### Further advantages of the service:

- installation and installed equipment commissioning/pre-commissioning at factory
- quick deployment of pre-installed equipment on site
- equipment outlay in accordance with specification
- competitive pricing

## Training and Seminar Courses

Our complete Training Calendar can be downloaded from our website: [www.LStelcom.com](http://www.LStelcom.com)

Alternatively you may contact Ms Sabrina Kautz by email to [SKautz@LStelcom.com](mailto:SKautz@LStelcom.com) or by phone: +49 (0) 7227 9535 488 for further information on our seminars or for our customised training programmes

## LS telcom present at major Broadcast Events

LS telcom shared its expert advice in broadcast at several major events in Asia and Eastern Europe in March, April and May this year. Advanced planning methods and use of modern tools for the prediction of LTE-DVB-T2 interference as well as the planning of SFN and MFN implementation, DAB+ coverage planning, and elements of modern frequency and network planning were the topics covered in the presentations and workshops by the LS telcom experts. ←

Picture: At the ABU Digital Broadcasting Symposium (DBS), Kuala Lumpur, in March: the speaker Milos Pavlovic, LS telcom, with the other speakers



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