SaskTel Turns to Tektronix RSA306B USB-Based Spectrum Analyzer to Track Down Interference from European DECT Wireless Handsets

Customer Solution Summary

CHALLENGE

SaskTel, the leading information and communications technology provider in Saskatchewan, faced interference problems from DECT wireless handsets coming over from Europe – they overlap with 10 MHz of SaskTel's licensed spectrum. Trying to find these handsets proved to be very difficult for the provider's interference hunters using a swept-tuned spectrum analyzer.

SOLUTION

SaskTel's team of interference hunters adopted the Tektronix RSA306B USB-based real-time spectrum analyzer, because it allows them to immediately see signals from the rogue European-spec DECT phones and quickly eliminate a frequent source of interference.

BENEFITS

Interference is a major problem for cell providers because it shrinks the footprint of a cell site, leading to a snowball effect and overall degraded service for customers. With the RSA306B on hand, SaskTel can now quickly track down interference sources and maintain high-quality service levels.

Interfering DECT phones

DECT stands for Digital Enhanced Cordless Technology, although some might suggest that the "E" actually stands for European. And, in fact, the DECT standard for cordless telephone systems did originate in Europe. Due in part to this development path, there are slight differences in the frequency ranges for European DECT phone and their North American counterparts. The differences may be slight, but they are significant if you are an information and communications technology (ICT) provider like SaskTel.

Like other cell service providers across North America, SaskTel faces ongoing problems with European DECT phones. When people move from Europe to the Canadian province of Saskatchewan where SaskTel supports more than 614,000 cell service customers, they often bring their DECT phones with them. From a consumer perspective, the phones work fine and they generally have no idea that approximately 10 MHz of the unlicensed spectrum used by their wireless handsets overlaps with SaskTel's licensed spectrum.

For SaskTel and its customers, however, it's a different story.

"Interference shrinks the footprint of a cell site, it degrades the download and the upload speeds, and when it shrinks the footprint of the site, it's kind of a snowball effect," says John Davidson, a Technical Assistant in SaskTel's Technology Division. "In some cases the phones have to transmit with more power to get back to the site, and that in turns affects more and more phones in the area. And it might not just affect one site, depending on the number of phones in the area it might affect a number of sites in a city setting. The ability to track down the source of interference and do it quickly and in a timely fashion is important."

By monitoring changes in receive total wideband power (RTWP) at its cell sites, SaskTel can see when interference is occurring and the general location using a tool called splunk. They then dispatch Davidson or other engineers and technicians with test equipment and vehicles to start the hunt. The vehicles are typically equipped with traditional swept tune spectrum analyzers along with a variety of directional antennas. In other words, a typical set up for interference hunting applications.

But when it came to European DECT phones, tracking down interference sources was hardly quick or timely using this equipment. The problem, according to Davidson, was that "if the phone was not transmitting at the time your spectrum analyzer sweeps across that frequency, you wouldn't know that it was there.

"The issue is that DECT phones change frequencies. You could zoom in on what you thought was interfering frequency and it could change frequencies," Davidson explains. "We would lose a lot of time that way trying to figure out exactly where the DECT phone was, and why it wasn't on the frequency we thought it was. On top of it, if there was SaskTel phone in close proximity to the DECT phone, it would actually switch frequencies."

In one case a couple of years ago, Davidson was able to ascertain that interference was coming from an apartment building near a hospital, but from there found that it was impossible to pinpoint the location of the European DECT phones. "So I ended up getting into the apartment building and knocked on every door which was very time consuming," Davidson recalls.

"The real-time spectrum analyzer makes it easy to find DECT phones because you can see in real time what the phone is doing as opposed to just recording or seeing the signal when your spectrum analyzer happens to sweeps through it. The real-time spectrum analyzer is a real benefit to tracking these down easily,"

John Davidson, Technical Assistant in SaskTel's Technology Division

Happy hunting

Looking for a better solution, Davidson and some colleagues attended a show in nearby Saskatoon where they attended a presentation on the new Tektronix RSA306B USB-based real-time spectrum analyzer. This disruptive instrument combines high performance in a compact package. It runs in conjunction with the powerful SignalVu-PC software application on a laptop or tablet and offers industry leading real-time signal acquisition and analysis.

"We were impressed with it (the RSA306B), especially the price point," Davidson says. "In our business, we don't need desktop spectrum analyzers anymore. We have a lab and we can of course take our equipment in there, but mostly we travel around. The size is good and the price is good."

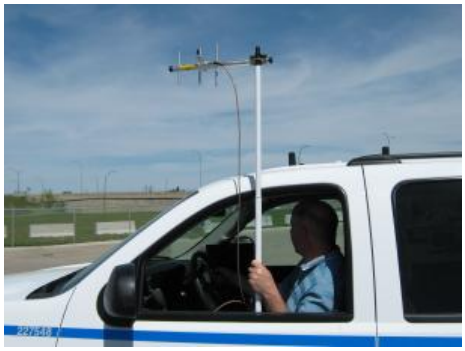
Davidson was even more impressed once he added an RSA306 to his interference hunting arsenal. "The real-time spectrum analyzer makes it easy to find DECT phones because you can see in real time what the phone is doing as opposed to just recording or seeing the signal when your spectrum analyzer happens to sweeps through it. The real-time spectrum analyzer is a real benefit to tracking these down easily," he says.

Gone too are the days of knocking on apartment doors. "Now we can tell by the graphs from the RTWP and splunk that interference is coming from a European DECT phone and you just get in the truck and basically drive right up to it."

Going back to the hospital example, Davidson says the RSA306B would have saved him many hours. "If I would have had the real-time spectrum analyzer at the time, it would have been real obvious where the signal was coming from. I could have then gotten access to the apartment building and gone right up to the apartment where it was coming from. At that point we didn't have one and it took a long time."

Other applications

Adding the RSA306B with useful displays like DPX and spectrograms has also helped Davidson track down other sources of interference that were previously hard to spot. One example was an intermodulation effect that was created when a couple of antennas in town were updated. "It wasn't nearly as obvious on a regular spectrum analyzer as it was on the real-time spectrum analyzer," Davidson adds.



"Broom stick" antenna used for directional interference chasing and hooked up to the Tektronix RSA306B spectrum analyzer.

SaskTel is in the process of equipping more members of its interference hunting team with RSA306s, and from Davidson's perspective it can't happen fast enough: "We also use the RSA306 for other forms of interference which could be anything from cellular amplifiers, internet cameras to garage door openers. We currently have two units, one here in Saskatoon and one in the south. For the price of them, it would be nice for everyone to have one."

For Further Information
Tektronix maintains a comprehensive, constantly expanding collection of application notes, technical briefs and other resources to help engineers working on the cutting edge of technology. Please visit **www.tektronix.com**

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