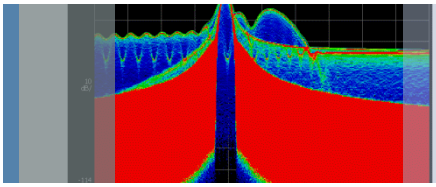

Off-air Spectrum Measurements

10 Factors to Consider

1 New wireless technologies utilize time varying signals and are fitted into an increasingly crowded spectrum.

Many of these new technologies, like Wi-Fi and Bluetooth, utilize time-varying signals in their designs to compensate for crowded spectrums and reduce interference problems. Traditional test tools such as swept-tuned spectrum analyzers are not optimized for these new technologies. Skilled operators/technicians are required to use the traditional tools. Performing spectrum mapping and chasing down interference signal needs to be done quickly. Having to go back and load data into a map takes time.

2 A wide dynamic range is critical as strong interferers can block reception and overload A/D converters.

One important attribute of spectrum management equipment is to have sufficient dynamic range and selectivity to avoid jamming from interferers closely located to the desired frequency. Strong interferers can saturate Analog-to-Digital Converters (ADCs), blocking the reception of a desired weak signal. Strong interferers can also create intermodulation products in an analyzer that prevent successful analysis of the desired signal. Having sufficient dynamic range allows the signal analyzer to separate weak signals in the presence of strong signals.

3 Some phase noise is always present and excessive noise can hide signals.

An analyzer's internal phase noise can also be an important attribute for many signal interception applications. Even with outstanding dynamic range, if the analyzer's Local Oscillator (LO) phase noise is not sufficiently low, some signals may be impossible to receive. The LO in the analyzer's receiver can obscure the desired weak signal. Once obscured, the demodulator can no longer see the two signals and resolve one from the other, and the weaker signal is lost.

4 Locating signals is critical.

Using a directional antenna, the signal strength function can enable you to define a specific signal within a band of interest. As the level increases, the audible tones can allow you to maximize the line of bearing. Entries can be made on the touch screen display directly onto an imported map.

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Off-air Spectrum Measurements

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5 Built-in GPS receiver ≠ Built-in GPS mapping.

Trying to figure out where a signal or noise is coming from can take a long time. Geo-referenced measurements provide situational data. With a GPS trigger engine, how often a signal occurs and WHERE it occurs can be determined.

6 Signal identification can sometimes be challenging.

A database can be used to identify signals based on their frequency, occupied bandwidth and spectrum signature. Use the built in library of signals and even customize it by adding your own signals.

7 Once you do a site survey, customizing your own site survey signal database will save you time.

Trying to identify a specific signal in a forest of spectrum is challenging. The Signal Database provides signal identification as well as the means to inventory your spectrum information. You can mark and identify your spectrum so that unknown emitters can be easily detected.

8 Interference troubleshooting requires sophisticated new tools.

New wireless technologies are bursting and hopping faster and faster. Traditional tools cannot reliably detect and display signals for modern communication. Some technologies like Bluetooth and GSM switch frequencies at less than 1 ms, while other systems switch frequencies in microseconds. The discovery of wireless communication requires new methods of detection.

9 Real-Time analysis with DPX insures that you don't miss randomly occurring events.

Real-time technology is specified by the rate at which the output can keep up with the input. The spectrum update rate and the minimum event duration are the key parameters. The performance is key to being able to see low-level signals as well as signals within a crowded spectrum; being able to discern spectrums and signals from one another. DPX spectrum displays can process more than 10,000 spectrum updates per second, assuring reliable discovery of short-duration events.

10 DPX Density triggering is an efficient use of captured memory for time correlation of events.

While the target signal is absent, the density measurement characterizes the "normal" signals. When the target signal finally appears, the density value increases. The trigger system monitors the density measurement and activates a trigger whenever the density value exceeds the adjustable threshold. The instrument can automatically set this threshold to a level somewhere between the normal density readings and the density due to the trouble-making signal. DPX density triggering allows you to trigger on very small signals even in a dense spectrum environment.

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