

Network Operator Interference Detection and Geo-Location Challenges

Providing Spectrum Assurance

Billions of dollars are paid by operators at government auctions for additional spectrum. The goal is to meet customer demand, while providing higher throughput, 24/7 uptime and a higher quality of service. This goal is jeopardized by impairments in the spectrum caused by interference. It's critical that operators and DAS vendors be proactive in maintaining a clear spectrum environment, eliminating problems that could negatively impact the user experience. Spectrum Assurance is about guaranteeing that signal integrity, solving problems in the network quickly, efficiently and with minimal disruption of service.

Today's Challenges:

Minimizing Network Problems and maintenance costs	Traditional methods for interference mitigation have involved use of skilled technicians to monitor, find and eliminate interference. Often trial and error methods are used to verify the problems and locate the signal. This can result in a degraded user experience if interference cannot be validated and quickly eliminated.
Troubleshooting the Problem	Disruptions in service can often be caused by many problems. These include PIM, equipment malfunctions, firmware problems or interference. When a trouble ticket is entered due to problems such as dropped calls or slow data rates, the technician must often visit the BTS site to diagnose the problem. Often the problem can be intermittent, further complicating the troubleshooting process.
Categorizing the Problem	In some cases interference signals may exist only at certain times of the day, or certain days of the week. Sometimes an interference signal will cause a severe problem in the network for several hours, only to appear again months later. These issues can be impossible to eliminate unless historical information about the signal of interest is stored.
Finding the Problem	If interference is suspected, personnel are usually sent to the sector location to search for the problem signal. When using Yagi or other directional antennas, successive approximations are often used to geo-locate the interference. This process is often time-consuming and difficult to accomplish in high multi-path environments. If the interference signal is not stationary or is intermittent, finding the signal source may not be possible.



Interference mitigation has often been labor intensive, requiring on-site BTS visits to investigate the problem.

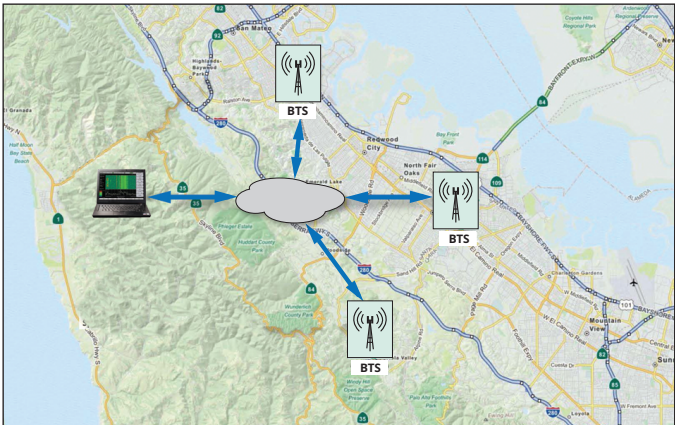
Application Brief

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Anritsu Spectrum Monitoring System Provides Spectrum Assurance

Anritsu’s spectrum monitor system provides the operator and DAS vendor with an efficient and automated method for identifying, detecting and geo-locating problem signals in the network environment. The MS27103A with its 12 or 24 RF In ports is the ideal solution for monitoring multiple carriers on multiple sectors. These monitors can be positioned at the BTS to measure the receive (uplink) paths of the network to quickly identify the presence of unwanted signals. Used with the optional Vision™ application software, the MS27103A can store spectrum history, provide threshold alarm triggering and geo-locate the source of interference quickly and accurately.



Anritsu Remote Spectrum Monitoring System

Feature	Benefit
Fast measurement speeds	Anritsu’s spectrum monitors use FFT technology to achieve sweep speeds up to 24 GHz/second. This is essential for finding intermittent or pulsed interference signals.
Continuous Operation	The MS27103A uses an on-board hardware watchdog timer to insure the monitor stays on-line at all times. In case of a power outage, the instrument remembers all settings and restores the unit to its original state once power is restored. Testing continues from the time when power was disrupted.
Immediate Trouble-shooting Diagnosis	When network quality is degraded, no longer will technicians need to visit the BTS site to investigate the problem. Personnel located anywhere in the world can immediately view the spectrum and determine whether interference is present.
Finding the Problem	For difficult to find signals that are mobile or intermittent, logging spectrum history can help identify patterns of the interference signal. Spectrum history can show not only the signals of interest, but also when they occurred. Identifying when signals of interest are present is an important tool to hunting and finding interference.