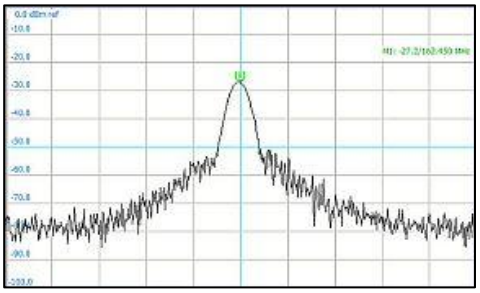
Noise Analysis and Monitoring

TX RX Systems Inc – Field Services

DO YOU KNOW HOW NOISY YOUR ANTENNA SITES ARE?

Noise Analysis and Monitoring (NAM) has been shown to be a useful tool for gaining a more complete understanding of the RF environment prior to, during and following the construction of communication sites. Design of advanced digital communications systems requires awareness of RF noise levels at a site and their potential to degrade communications. In the past site noise was either not considered in the system design or estimated based on previous experience. Noise Analysis and Monitoring (NAM) is a process that allows the engineer to have accurate, up to date information regarding noise degradation and its impact on system performance. The process of Noise Analysis and Monitoring collects RF noise data over a 24-hour or greater time period. The data, once collected, is analyzed to determine the level of external noise and interference present on the infrastructure receive frequencies and its impact on system operation. Noise Analysis and Monitoring is useful in Pre-Sale, Post-Sale and Post-Installation situations to insure accurate coverage predictions, interference mitigation, spectrum investigations and all phases of RF hardware and system design. Noise Analysis and Monitoring is a process that provides the powerful tools needed to find the appropriate solutions to today's problems.



WHY IS NOISE ANALYSIS AND MONITORING SO VALUABLE TO YOU?

RISK REDUCTION: A pre-design site noise measurement analyzes the interference impact on the RF hardware performance based on real world site conditions that may exist. In a constantly shifting RF environment, system design has to include a reasonable margin for maintaining "satisfactory" performance in the face of varying degradation over both the long and short term.

ISOLATES AND REPORTS ONLY EXTERNAL RF NOISE: Often, when attempts are made to measure external noise at communication sites, noise generated within the system receive network and test equipment is measured along with the external noise. If these noise values are input into a coverage prediction program, inaccurate coverage estimates are likely. During the Noise Monitoring process, all internal noise is removed from the measurements so that only external noise is reported.

DETAILED REPORTING: Massive amounts of data are collected for each frequency monitored. The data is summarized into two reports, the Spectrum Noise Report and the Frequency Noise Report. The Spectrum Noise Report details the measured noise summarized to show noise power across the spectrum during the monitoring period and how it changes over time. The Frequency Noise Report details the measured noise power over the monitoring period for each frequency.

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Proactively Control the Risk of RF Interference

RAPID, RELIABLE AND COST-EFFECTIVE NOISE MEASUREMENT: Noise Analysis and Monitoring provides you with the invaluable information you need in as little as 24 hours. Knowledge of the infrastructure's noise environment and the utilization of that information when doing coverage predictions can save much time and money later during system validation and coverage testing. During the coverage testing is a very bad time to realize that you underestimated the site noise and over stated the coverage. Today, we extend to you an opportunity to ensure a reliable communications system and continual growth when it matters most.

HOW DOES IT WORK?

• **STEP 1 – DATA COLLECTION:** Using a crystal filter, a computer controlled spectrum analyzer and proprietary software; Noise Analysis and Monitoring measures the noise power within each receive channel's bandwidth continuously over the monitoring period typically 24-hours. Many thousands of samples are taken to obtain a statistically valid result.

• **STEP 2 - ANALYZE DATA & GENERATE REPORTS:** The data is analyzed and professional reports (hardcopy and/or softcopy) are produced and reviewed by knowledgeable RF engineers for all identified customer frequencies.

Noise Spectrum Report: The Noise Spectrum Report displays the measured noise power for each frequency as a bar graph to allow the engineer to see how the noise levels change across the system frequencies. A graph also details the average degradation for each channel.

Noise Frequency Reports: The Noise Frequency Report details the site noise plotted as amplitude vs. time over the monitoring period. The measured external noise is plotted in several forms including Maximum Noise, Minimum Noise and Median Noise.

Effective Receiver Sensitivity (ERS): The measured external noise is recombined with the system noise and the Static Carrier to Noise ratio for the specified modulation type (normally digital) to determine the expected Effective Receiver Sensitivity.

Degradation: The amount of anticipated degradation compared to a benchmark system sensitivity of -119 dBm.

Noise Standard Deviation: Standard deviation is a statistical value that shows how the noise level changes throughout the monitoring period.

Noise Relative to KTB: The site noise for each frequency as well as the overall system median noise is also provided as dB above the theoretical noise floor (KTB). This is generally accepted as the preferred way of inserting site noise into a coverage prediction program

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