

What's Up?

Don't forget to visit our web site. We recently added an online demo for our Spectrum Master, as well as a number of e-learning courses that make it more convenient than ever to learn about topics such as line sweeping, IP settings, RF essentials, and WiMAX systems.

Of course, we're still offering our face-to-face training courses as well. Contact us at us-training@anritsu.com to schedule a private course at your facility or register for one offered by an Anritsu authorized distributor throughout the U.S.



Have a colleague who wants to get this newsletter?

Just send us the name, address, company name, and e-mail, and we'll add your colleague to the mailing list. He or she can also join Master Users Group at www.us.anritsu.com/masters

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insite

Anritsu's Master Users Group newsletter that delivers solutions to today's field and maintenance challenges

Key Measurements for LMR Systems

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Land mobile radio (LMR) systems differ from traditional cellular systems in that they began as push to talk radio systems. Understanding the two main LMR standards – P25 and TETRA – is the first step to determining what measurements are necessary to ensure their performance.

P25 is designed to provide secure communications between local, state and federal agencies, and to improve the overall spectral efficiencies. It has two phases. Phase I is a 12.5 kHz analog, digital or mixed mode that uses C4FM modulation. Phase II is even more spectral-efficient, operates in a 6.25 kHz bandwidth, and uses a CQPSK modulation.

TETRA, or Terrestrial Trunked Radio, is an open digital standard. Modulation is TDMA-based on a 25 kHz carrier and it squeezes four time slots into that bandwidth with a total throughput of 28.8 kbps. It operates in the VHF and UHF band, and works well in crowded spectrums.

For LMR applications, it is imperative to make spectrum-analyzed measurements. Some key measurements include ACPR, channel power, occupied bandwidth, field strength, and spectrum monitoring. Both ACPR and emission spectrums are recommended for P25 signals to ensure that the signal does not interfere with or degrade the performance of coexistent analog channels.

Another key measurement is interference analysis. There are only so many frequencies for LMR applications and the spectrum is only getting more congested. An interference analyzer can be used to locate intermittent problems, while a preamplifier will allow measurements to be made down to -130 dBm or lower.

When analyzing LMR systems, two-port measurements and power measurements also need to be conducted. Two-port measurements are used to tune filters, duplexers, transmitters, combiners, tower top amplifiers, and to make antenna isolation measurements. It's important to monitor power for site optimization.

The Site Master™ cable and antenna analyzers (figure 1) are excellent tools for measuring LMR systems. The S311D goes from 2 MHz to 1,600 MHz and it caps the frequency, so it covers all LMR frequencies. A spectrum analyzer is available to give users a 1,600 MHz VNA and 1,600 MHz spectrum analyzer. For higher frequencies, the S331D goes up to 6 GHz and the S332D conducts cable sweeps to 6 GHz and spectrum sweeps to 3 GHz.

To learn about making LMR measurements, visit the online seminar section of www.us.anritsu.com.



Question: I use Handheld Software Tools to retrieve measurement saved in my Site Master, Spectrum Master™ and Cell Master™. Can I use Master Software Tools to do the same?

Answer: Yes, Master Software Tools version V2.00 and higher can be used to capture saved measurements from S331D, S332D, S311D, S312D, S325D, S810D, S820D, MS2711D and MT8212B. Download the latest Master Tools from <http://www.us.anritsu.com/mastersoftwaretools>.

The Master Software Tools Help menu contains a Migration Document and some instructional videos to help you transition to Master Software Tools from Handheld Software Tools.

Question: Are CDMA measurements supported in the Anritsu BTS Master?

Answer: Yes, CDMA measurements are supported in the BTS Master MT8222A as well as the Cell Master MT8212B and the Spectrum

Masters, MS2721B, MS2723B and MS2724B. Additionally, all these instruments also support EVDO measurements.

Question: Is there a way to erase all of the setups and plots from the Site Master or MS2711x?

Answer: Yes, for the 'B' and 'C' units, and MS2711/A/B. While the instrument is off, hold down the SYS key and turn the unit on. As soon as the screen starts to display, release the SYS key.

The display should show ERASING SETUPS FROM EPROM, ERASING CALS FROM FLASH, ERASING ALL SWEEPS. (NOTE: This will also erase the InstaCal information from the S113C, S114C, S331C and S331C models.)

Test Tip:

As a signal travels through the transmission path, some of its energy will be dissipated in the cable and components. A cable loss measurement is usually made at the installation phase to ensure that the cable loss is within the manufacturer's specification.

Tools of the Trade

Anritsu has enhanced its Site Master and Cell Master handheld analyzers so they address the testing challenges of next-generation networks. The enhancements include faster sweep speed, optical DTF measurement capability, advanced post analysis tools, and a ruggedized phase stable cable with reinforced handgrip.

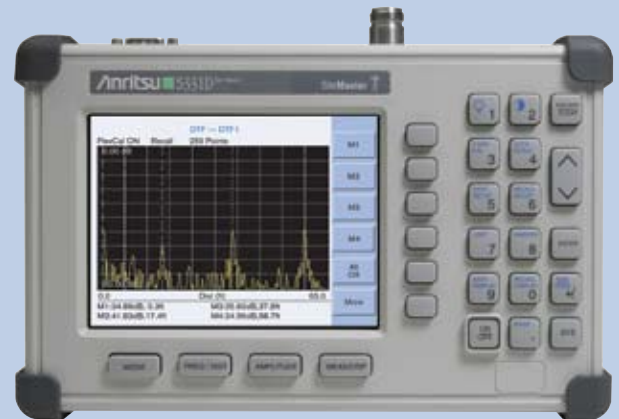
Site Master now has improved firmware that allows users to make cable and antenna sweeps 30% faster, for more efficient field operations. Complementing the improved speed is the analyzers' high accuracy, which eliminates costly "false fails" and increases measurement confidence.

The ODTF-1 Optical DTF module transforms the Site Master into a portable fiber tester ideal for remote radio head applications. Developed to address the need to measure fiber between the main tower and remote unit, fiber to the premise, and military platforms, the ODTF-1 allows fiber measurements to be displayed in an identical format as traditional RF tests, making it easy for technicians to conduct both measurements.

Enhancements to the Master Software Tools greatly simplify and expedite cable and antenna post-sweep analysis. A new Trace Rename feature enables users to rename hundreds of traces in minutes rather than hours. Additionally, a Group Edit function can take markers and limit lines from a single trace and copy them to hundreds of other traces in seconds.

The enhancements are compatible with the Site Master S311D, S312D, S331D, and S332D, and the Cell Master MT8212B.

For more, visit www.us.anritsu.com.



VNA Master Travels to the Last Frontier

Alaska is often referred to as the Last Frontier and Art Chase has seen a lot of that frontier as a TID for the Federal Aviation Administration. Thankfully, Chase has been able to lighten his load while making his journey across the largest state in the union since the FAA purchased two MS2036A VNA Masters™.

The beautiful scenery of Alaska is often referred to as breathtaking. Prior to using the VNA Master, the terrain took Chase's breath away for another reason. "Before we had the MS2036A, we had to haul around four pieces of test equipment that weighed about 300-400 pounds," he explained. "Where I work, that can take a lot out of you and can result in a lot of shipping costs."

Size – or lack there of – has had other benefits for Chase. Because it is lightweight, Chase is able to carry it everywhere. "It's saved my bacon a few times. For example, I was in a very remote area and I just happened to have it with me. I was able to use the spectrum analysis and phase measurement tools to measure equipment that I had not originally planned on testing. Because I was able to do it right on the spot, it saved time for the general flying public."

Spectrum analysis and phase measurements are just two of the many tests that Chase is conducting with the MS2036A. He takes advantages of the VNA Master's power meter analysis from 10 Hz to 6 GHz, as well as its ability to conduct vector corrected 1-port and 1-path 2-port measurements to precisely measure cables.

Chase is using the VNA Master to ensure the performance of the FAA's navigation systems at nearly 20 airports. Some of the equipment he evaluates are Instrument Landing Systems (ILS); Low Power Distance Measuring Equipment (LPDME), a component of instrument landing capability; and Very High Frequency Omni-Directional Range (VOR), a ground-based electronic system.

Of course, when you're talking about Alaska, you have to mention the cold. Chase has used the VNA Master in temperatures as low as -20° F. Despite this extreme cold, the instrument has yet to let him down.

Another thing that hasn't let him down is the support he's received from ARVA & Associates, Anritsu's manufacturer's rep. Based in Washington, Mark Zamalloa of ARVA has been right there whenever Chase has had a question. "He's been exceptional. Whatever I've needed, Mark has been right on top of it."



A localizer at Kotzebue, Alaska. Temperature is a cool -32° F at 10 a.m. It will not get any sunnier on this day. The MS2036A VNA Masters help keep these systems running year round.

Have any great user stories you'd like to share?

Send your story to Marketing-Communications@anritsu.com. If we select it for one of our upcoming newsletters, we'll send you a backpack made specifically for your handheld instrument. Made from Denier ballistic nylon and polyester, the backpack has two large compartments to accommodate a laptop and instrument, and includes shock-absorbent shoulder straps and air-flow back padding for added comfort.

