Welcome to AntennaSelect™ Volume 22 – October 2015

Welcome to Volume 22 of our newsletter, AntennaSelect™. Each month we will be giving you an "under the radome" look at antenna and RF technology. If there are subjects you would like to see covered, please let us know what you would like to see by emailing us at: info@micronetixx.com

In this issue:

Micronetixx supplying RF systems for EMRE complex

Micronetixx has been selected for a major role, working with Prime Contractor for the U.S. Military, TMC Design Corporation of Las Cruces, NM, in a complete up-grade and refurbishment program for the Electromagnetic Radiation Effects, (EMRE), Complex, at the White Sands Missile Range. This facility is designed to test the vulnerability and tolerance of complex military hardware to very high-power RF and Microwave radiation. In order to do this, the EMRE Complex must utilize extremely high power RF and microwave amplifiers and transmission lines, (including instrumentation and switch gear), along with high-power, specifically-designed antenna systems.

Continued on next page

This facility will purposely expose the sensitive military equipment that is under test to super-high power RF and microwave field levels, testing its tolerance and resistance to high-magnitude electromagnetic fields, likely to be encountered in an E-Bomb or nuclear attack situation.

This is testimony of Micronetixx Engineers' ability to engineer, design and manufacture highly reliable antennas and transmission systems that do precisely what they are designed to do, and to do it cost-effectively. In the case of the EMRE Application, this is done at extraordinarily high RF and Microwave power levels.

LPFM – grounding for multi bay antennas

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Unlike their higher power FM antenna cousins, which use hard line feed systems, LPFM antenna use jacketed coax. The LPFM antennas are often mounted on outrigged poles that are 2 to 3 inches in diameter. The feed line system is wrapped around the outrigged pole between the bays. The most common LPFM antenna is the two bay model. The feed from each bay is connected to a “tee” connector in the center of the array.

Since the feed line is so close to the antenna bays, it is excited with RF energy when in operation. While the outer conductor of the feeders is at DC ground, at RF it is not. The feed system becomes part of the antenna array. Between the outer conductor and the mounting pole there is capacitance. This capacitance changes with weather. When the feedline is wet, the capacitance between the outer conductor and mounting pole changes. Since the feedline is radiating energy, the overall tuning of the antenna may vary slightly.

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To minimize this effect, the feedline should be grounded just as it exits the input tee. Using a grounding kit, firmly bond the lead wire to the outrigged pole. The lead wire should be short as possible. The grounding will help to reduce the radiation coming from the outer conductor of the feed system. In addition it will provide more protection from lightning.

In many cases the outrigged pole is several feet off of a tower face or leg. A second place to use a ground kit is where the transmission line comes in contact with the tower. Firmly bond the grounding kit to the tower, making the lead wire as short as possible.

In larger antenna arrays where full wave spacing is used, placing grounding kits between the bays helps keep the feed system outer conductors at RF ground. Also ensure that the outrigged pole system is also firmly bonded to the tower. This also helps to reduce the chance of lightning damage and possible PIM formation.

High Band VHF – summing it up

In the past few issues of AntennaSelect, we have taken a look at High Band VHF transmission. There have been a number of reports that high band just does not work. The old model of the 12 bay transmitting antenna and the viewer having an outdoor antenna has faded away. Now we have digital, and the viewers have to deal with the cliff effect it creates. Instead of a viewer having a few dB of antenna gain on the rooftop, they now have negative gain indoor antennas, inside loss ridden Faraday shield home environment. UHF transmissions also do not work as well. So with the possible move to VHF, here is what we have seen that works.

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Elliptical Polarization – In our opinion the best way to ensure viewers get your signal. Elliptical polarization reduces cross polarization losses up to 20 dB. This is very important in indoor receiving antenna environments.

Lower Gain Transmitting Antennas – We looked at one case in our April newsletter that used a 12 bay antenna. With the reduced ERP of digital, some areas in the core of the city were only seeing an effective ERP of 57 Watts. With much less use of outdoor antennas and loss ridden indoor antennas, the blue screen of death was almost a given. The transmitters on the market today, are more efficient and have lower price points as compared to 15 years ago. A well planned lower gain VHF antenna can put up to 20 dB more of signal into an urban core where the viewers are. 4 to 6 bay antennas should be the new model.

Micronetixx TPV-SFN Antenna Technology – Our half wave spaced VHF antennas have higher elevation gains than standard antennas. One the average they have about 15% more gain. So instead of needing a 6 bay model, a 5 bay model with a wider main lobe will do. These antennas also have the ability to produce better first null fill. In urban locations many times viewers are located in the first null. The TPV-SFN designs also produces superior elliptical and circularized signals. More signal = more viewers = better ratings = more revenue. See what our antennas can do for you.

Be on the lookout for the next volume of AntennaSelect™ coming out in December

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