Welcome to AntennaSelect™ Volume 48 –February 2020

Welcome to Volume 48 of our Newsletter, AntennaSelect™. Every two months 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

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DTV Over-The-Air Reception – Part 1

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We are writing several articles about over-the-air DTV reception that will be in future issues of AntennaSelect.

Part 1 – The TV Preamp: Back in the good old analog days to get more and better reception, most would buy a bigger outdoor antenna, and a high-gain preamp. Popular models were available that had gains up to 30 dB. Combining that with a large high-gain antenna was the solution to get the most channels.

Back then many viewers had maybe 7 or so over-the-air choices in any given market. Usually there were 3 VHF channels, and 4 or so UHF channels. People living in areas like Princeton, New Jersey

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with a good antenna, rotor and preamp could view stations both in the New York, and Philadelphia markets.

At that time the TV spectrum went out to channel 69, and most stations were spaced 6 channels apart on the UHF band. Even between markets, adjacent channels were not that common. So the high-gain preamp with 30 dB of gain worked. But in some cases there could be some intermodulation introduced by the amplifier on a channel or two, but the picture usually did not look too bad.

Now we are in the digital era and with the repack, many areas have a station on almost every channel. Earlier, there were no class A stations, butting up next to higher-power operations. With digital when there is high enough intermodulation with a given station, the sigal just will not lock, or will lock on and off quickly. That is worse than it was back in the analog days when there were usually just background lines crawling across the screen.

So the 30 dB hot preamp can cause more problems in some cases than it can solve. So are preamps even needed in the digital age? If you use an outdoor antenna with a short cable, the answer is probably no, if that signal is going to a single TV set. A 50 foot run of good RG-6 cable will have less than 3 dB of loss at 600 MHz. If you use a two-way splitter to feed two sets, add another 3.5 dB of loss, a four-way splitter adds about 7 dB of loss. A preamp with much lower gain could be of help if you have several weak stations. So how much gain is needed? A good rule of thumb is 6 dB more than the transmission system total losses (cable and splitters). Anything above that just ups the chance for intermodulation products to pop up. If more gain is needed for a weak signal, look at using a higher gain antenna

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So using a 50 foot run of transmission line and a two-way splitter would need about 12 to 14 dB of preamp gain. That would take a single stage of amplification. Higher gains use multiple amplifier stages or small wideband chips. The intermodulation performance really drops with cheap, higher gain units.

Another problem pops up with the repack. As wireless carriers build out the 600 MHz spectrum, older preamps that have response out to 800 MHz are also amplifying the wireless signals. This greatly ups the chances of intermodulation and the DTV signals not locking properly. Hopefully the remaining TV antenna manufacturers will lower the high end of their frequency band response. A single stage UHF preamp with 12 dB of gain, a very low noise figure, and high intercept point is not hard or expensive to build. Maybe we can publish a design for some of the do it yourself folks.

In the next issue of AntennaSelect, we will discuss UHF receive antenna design. With the repack, new antenna models will really help with reception..

Stainless Steel Antennas?

Why do we build our FM antennas out of stainless steel? We build a lot of products out of stainless steel, so the guys in our shop floor are experts working with this material. Stainless is also very strong. Building an FM antenna that will take a 150 M.P.H storm is not a hard task. With stainless there is no corrosion as with copper or bronze. How many transmitter sites have small areas of blue/green on the ground below the FM antenna? As for RF performance, stainless works just as well as copper at 100 MHz Our FMP, and FMM Antenna models, along with our THV high band VHF antennas are all stainless steel..

2020 Vote – Elliptical Polarization Wins!

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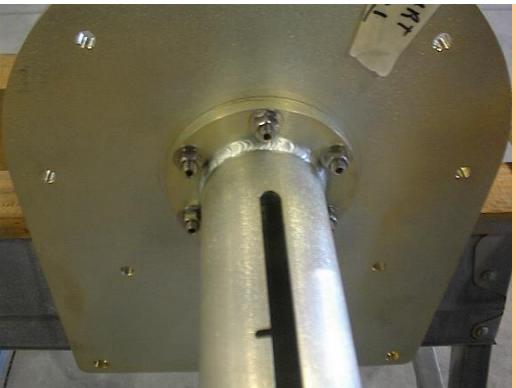
The voting in 2020 is already happening… Elliptical-Polarization is winning so far by a wide margin. The trend holds true for both VHF high band and UHF slotted antennas. Why?

Elliptical-Polarization works well in all environments from densely populated areas to the most rural parts of the country. Since the days of everyone having a roof-mounted antenna are gone, receiving the signal indoors or on a mobile device is becoming commonplace.

Without having a fixed directional receive antenna, problems associated with Faraday rotation of signals will go way up. With Faraday rotation, a linearly-polarized signal can suffer an impairment of up to 20 dB. …Low power operators take notice.

So what level of Elliptical-Polarization is needed to make things work well? The rule of thumb we use is a 70/30 power split. No matter what angle the signal reaches the receiving device at, there will always be at least 42% of field. If you do not have the transmitter power available, even a 75/25 or 80/20 power split will work magic!

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



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