Welcome to AntennaSelect™ Volume 48 – December 2019

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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Our SFN Antennas and the SFN Name

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Back in the fall of 2003 when ATSC was still a "baby" there was discussion on using multiple low power sites for broadcasting instead of a single high power transmitter site. One of the may problems was finding space for these low power sites, which included some need to be mounted on rooftops, and short towers. RFR levels had to be contained, as a roof stop site might have to be shut off every time the roof had workers on the site. A part time transmitter site would not work. And if there were already multiple RF emitters installed, the new guy could not in many cases add very much RF energy

So we started some design work to see how low we could suppress RF energy at high depression angles. It took a few months and we used several of our Technologies we had on our shelf.

The result is a slotted antenna design with up to 25 dB less radiation at high depression angles, as compared to similar sized slot antennas. Measured suppression at -90 degrees below the horizon has been measured up to 45 dB.

We called this Technology our SFN Antenna Technology. Well distributed transmission did not take off as hoped, however there were plenty of applications for this low-downward RFR Technology was to be used. Fast forward 16 years later, and several hundred of these antennas that we manufactured are in service. We carried out our original design efforts at UHF, and then adapted it with the same great characteristics to high band VHF.

So the question quickly came up; can you do an elliptically-polarized version of this antenna? YES. C/P? YES again. There is also a side benefit with our SFN design. A standard slot antenna has an elevation gain of 1.02 to 1.06 per bay (in a multi-bay configuration). So a 12 bay antenna would have a gain of 12.50 or so. Any bay count of that slot antenna would also have a grazing lobe in the range of 65 to 80 degrees above and below the horizon. With the SFN antenna, that set of lobes is cancelled, hence the gain per slot bay increases to 1.08 to 1.19 per bay.

With the SFN Design the same 12-bay antenna would have a higher elevation gain – in the range of 13.6 to 14.0. The extra gain could allow the use of a smaller bay-count antenna. When you are paying by the foot for tower space, this design could save you even more money in the long term.

So when distributed transmission begins to blossom, our SFN Technology is time-tested and ready to make your system really work. Ask us for the details.

FM Reception – Some Notes and Ideas…

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We get asked from time to time about improving FM reception either at the station or at home. So here is a little holiday season reading:

A well-designed FM tuner needs about 25 to 30 uV of signal to produce a 50 dB (un-weighted) quieting while operating in stereo. Many low-end tuners, or tuners in an AV receiver may need 50 to 100 uV of signal for the same quieting. Even at this level there may be a very small amount of audible background noise.

So let's look at some common listening environments. Many of you use a simple twin lead tee antenna indoors. Depending on how it is mounted or hung, the gain may go from unity down to -10 dB or so. Any nearby metallic objects in the room can cause loss of signal on one or more stations. The loss of signal from the house itself can drop signals from 10 to 25 dB. Newer houses with low E glass window and metallic backed sheet insulation can almost act like Faraday cages, blocking reliable reception.

Placing an antenna outside, be it an Onmi-Directional ring, a whip or dipole can deliver 20 dB or so more signal to the tuner. The higher the better is a good rule. Placing an antenna less than 10 feet from a metal roof can quickly cause signal loss. Is there an advantage in going to an attic mount versus outside mounting for the antenna? Since the attic is higher than the tuner's location, you will generally see an increase in signal level. Depending on the composition of the roofing material, the signal attention can still be 10 to 15 dB higher than an outdoor mount,

Still need more signal level or directivity at your location? A multi-element directional antenna is your answer. One problem: Nobody makes a consumer grade FM antenna anymore. You can find professional Yagi and log periodic models starting at $500.

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An all-channel (2 to 51) outdoor antenna may have a little gain (1 to 3 dB) on FM. Most of the gain would be at the low end of the FM band. We have had reports that the Winegard 8200 antenna has OK gain and directivity over most of the FM band.

From time to time discontinued FM antennas, such as the Antennacraft/Radio Shack FM 6 and FM-only Winegard model appear on auction listings. The Radio Shack model has an average gain of about 3.5 (5.4 dB). Well-mounted outdoors, this scheme would deliver 25 to 30 dB more signal than an indoor dipole.

So here is a question: How many of you are looking for a decent FM antenna and are handy at cutting aluminum tubimg? We have designs for easy to build outdoor (or attic) mounted FM antennas. The mounting boom is easy to find; 1 inch square tube, while the elements are either 3/8” or 7/16” thin wall tubing. These antennas have about 6 dB of gain and 15 dB front to back ratio.

Holiday Schedule – Seasons Greetings

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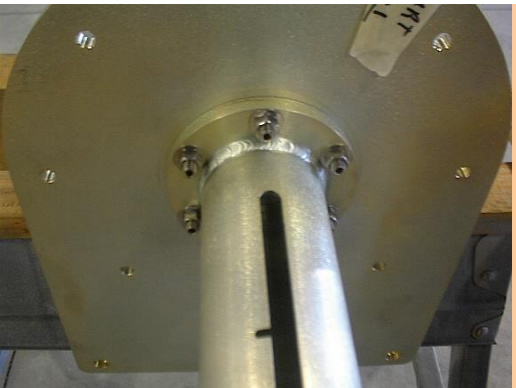
The best of Seasons Greetings to you and your family! May 2020 bring in peace and prosperity for all. We will be closed on Christmas, and a number of our elves will be taking off a day or two between then and the New Years Day.

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



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