

ARRL EMC Committee Report – Doc. #16

July 7, 2024

**for the ARRL Board of Directors Meeting
July 19 and 20, 2024**

**Submitted by Carl Luetzelschwab K9LA
Chair, ARRL EMC Committee
Director, Central Division**



Meetings

January 18 (the Thursday before the January 2024 Board Meeting) – W1GKS, W1EMI, W1RFI, W1DRF (ARRL Lab Digital RF Engineer), K3ZJ and K9LA met to discuss the Shortwave Modernization Coalition petition (SMC, a.k.a. HFT), illegal transmitters and Part 15 devices not meeting emission limits.

SMC – W1DRF and W1RFI planned to visit sites in the New England area.

Illegal transmitters – K3ZJ believed that the FCC had acted on this issue years ago. K9LA researched and found the news item in the September 1993 QST in which the FCC issued a Notice of Apparent Liability (NAL) to three dealers for marketing transceivers capable of operation outside the amateur bands. Based on arguments by the ARRL's FCC counsel at the time, the NALs were not issued.

Part 15 devices – W1EMI reported that he is looking into the FCC's Consumer Complaint Portal to report Part 15 devices that don't meet their emission limits.

April 25 – The full EMC Committee met. There were 16 attendees. The minutes from this meeting, along with any current updates, follow.

July 18 – W1GKS, W1EMI, W1RFI, W1DRF, K3ZJ and K9LA are meeting on Thursday July 18 (the day before the July 2024 Board Meeting) to further discuss SMC/HFT, illegal transmitters, WPT-EV, additional USA ENAMS units and any other issues that need attention.

ARRL Lab Efforts – by Steve Anderson W1EMI

Item 1 - Lab Issues - W1EMI reports that he had more than 32 RFI cases in the first half of 2024. These cases consisted mostly of the usual suspects - power line noise and solar installations. There also was a heat pump issue.

Item 2 – SMC/HFT – W1DRF reported that he visited two sites and W1RFI visited two other sites in the New England area. Of these four sites, only one site is believed to be transmitting burst-type HFT signals. We need more visits to the many sites.

Item 3 - RFI Teams - K1UI reported on efforts to resolve a noise issue at W1WEF's QTH using the mobile S-meter reading method developed by W4DD. WA6MEM reported on a wideband noise source in his area. He will take a screenshot of the noise and forward to the Lab. K3EW reported on resolving an electric fence noise issue at K2FW's QTH.

Item 4 - Standards - N6TPT reported that CISPR will meet in July. W1EMI reported that C63 will meet in May. In a personal e-mail, KI6LGY reported that IEEE-P1613, IEEE-PC37.90.1, IEEE-PC37.90.2 and IEEE-PC37.90.3 are all complete. KI6LPY also reported that he received the IEEE EMC Society's Cumming Award in 2022 for his 10-year effort with these four standards, and he thanked W1RFI for his contributions to IEEE-C37.90.2 (immunity to radiated RF fields). KI6LPY has been selected to talk about this work at the upcoming IEEE EMC Symposium in Phoenix in a half-day tutorial on Smart Grid EMC, and he intends to acknowledge the support of W1RFI and the ARRL during this lecture. In a February e-mail, W1EMI reported that NAB's AM Improvement Workgroup (AIWG) is also interested in WPT-EV efforts. For more on WPT-EV, see Item 7.

Item 5 - IARU Region 2 - W1EMI is now the new EMC Coordinator for IARU Region 2.

Item 6 - ENAMS and IARU Region 1 - K9LA reported that IARU Region 1 sees many of the same types of EMI as does the ARRL Lab and the RFI teams. See Appendix A titled "ENAMS in North America.docx" for more details on the three ENAMS units in North America.

Item 7 - WPT-EV - K9LA reported that JRC (the Joint Research Centre) in Italy made measurements on a WPT-EV system and concluded that there wasn't a problem with noise. The IARU Region 1 EMC Committee challenged that conclusion in six areas. Additionally, Detroit, Purdue University and Utah State University are implementing test strips for WPT-EV, and K9LA needs to get involved.

Item 8 - VM program - K4ZDH reported that VMs are looking for HFT stations, but nothing seen yet. He also reported that VMs can work with the Lab to visit HFT sites.

Item 9 - Safety Issues - N9GL reported no issues.

Item 10 - Illegal Transmitters and Part 15 Devices - We need to further discuss how to get the FCC much more involved with the illegal transmitter issue. This discussion will occur on the Thursday before the July 2024 Board Meeting. W1EMI reported that he is using the FCC's Consumer Complaint Portal to report any Part 15 devices that don't meet their emission limits. W1EMI also reported that Laura Smith at the FCC helped with a recent Part 15 device problem.

APPENDIX A

ENAMS in North America

Carl Luetzelschwab K9LA ~~April 29, 2024~~ Rev A May 13, 2024

ENAMS is Electrical Noise Area Measurement System. It is a project in the NMC (Noise Measurement Campaign – a sub-working group within the IARU Region 1 EMC Committee).

There are 68 systems worldwide. Most of them are in Europe. Each system measures noise from 66 KHz to 31 MHz in a 300 Hz bandwidth at six times per hour. The resulting noise levels are plotted and compared to ITU noise measurements in the 1970s for a rural environment, a residential environment and a city environment.

There are three ENAMS in North America. One is at W1RFI's QTH in CT, which is a rural environment. A second one is at KN4KL's QTH in VA, which is a residential environment. The third one is at K9LA's QTH in IN, which is a rural environment. The ARRL paid for ENAMS at W1RFI and at K9LA.

IARU Region 1 is considering producing more ENAMS units. The ballpark estimate for each unit is around \$1000. Finding money for these additional units could be a problem in today's financial environment. One avenue to explore for North American units (suggested at the ARRL EMC Committee meeting on April 25, 2024) is a grant from ARDC (Amateur Radio Digital Communications).

Here are images of the ENAMS unit (on the left) and the antenna (on the right). All you do is assemble the antenna, plug in an Ethernet cable into ENAMS unit, connect the coax from the antenna to the ENAMS unit and plug the ENAMS unit into 110V AC. Operation and data reporting is automatic.



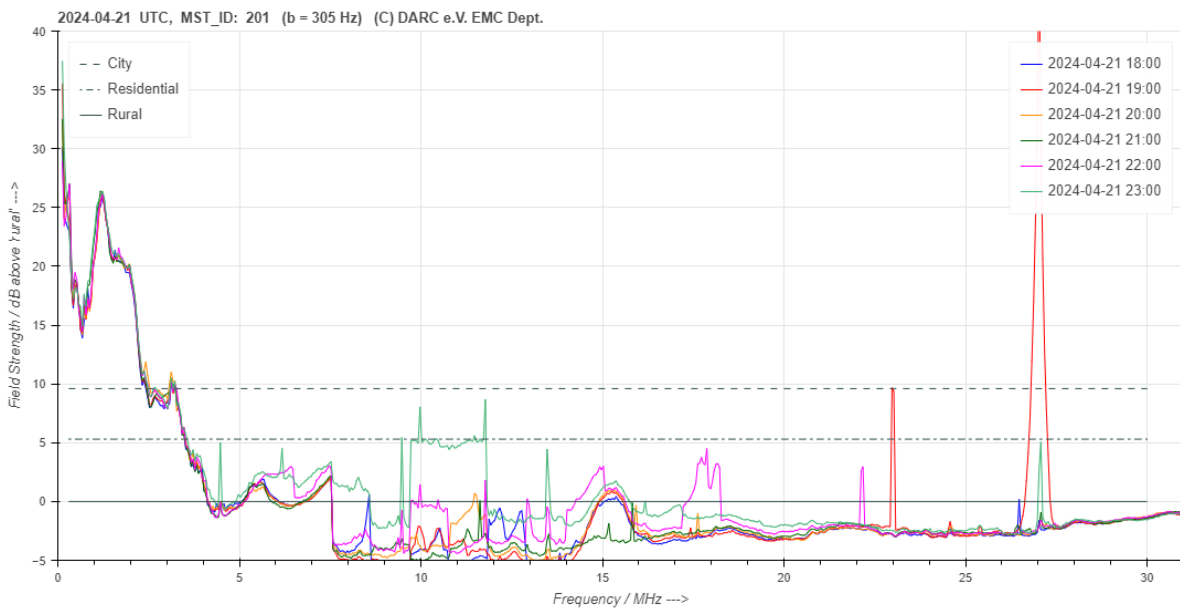
The following three pages are brief overviews of the three ENAMS in North America.

#201 – Burlington, CT at WIRFI's QTH



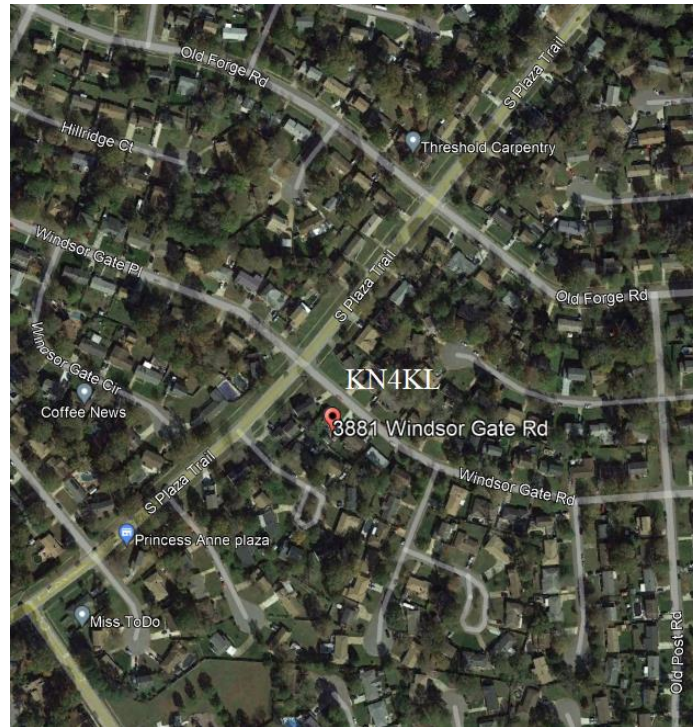
This ENAMS is in a rural environment. The noise level is expected to be low.

Here are ENAMS noise curves on April 21, 2024 from 1800-2300 UTC (2 PM to 7 PM local).



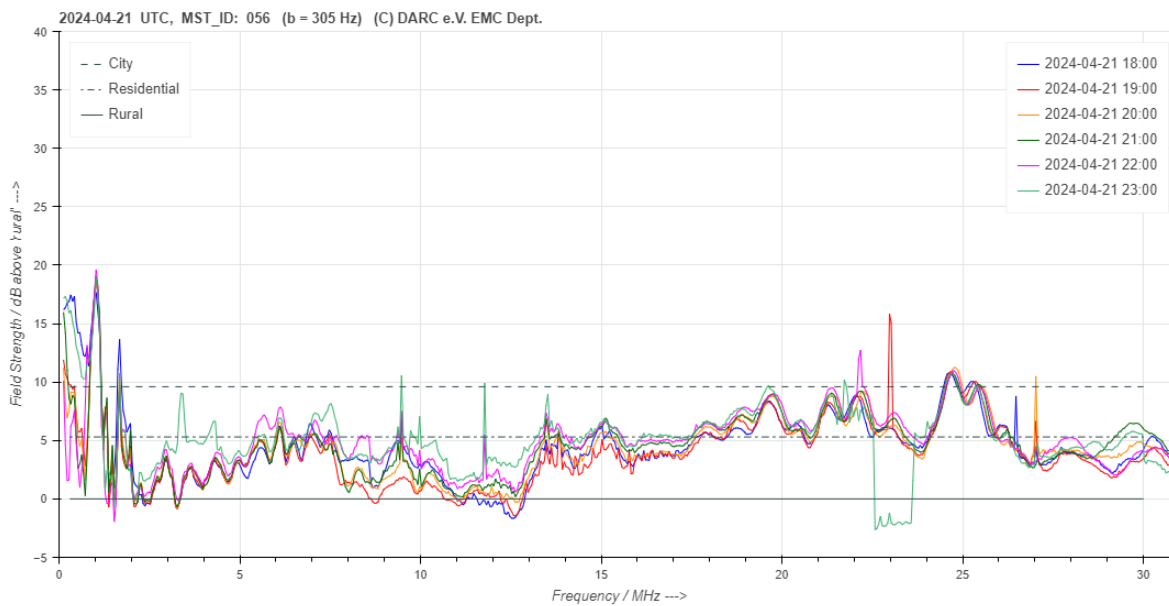
The three horizontal lines are referenced to the ITU city, residential and rural noise environments

#056 – Virginia Beach, VA at KN4KL's QTH

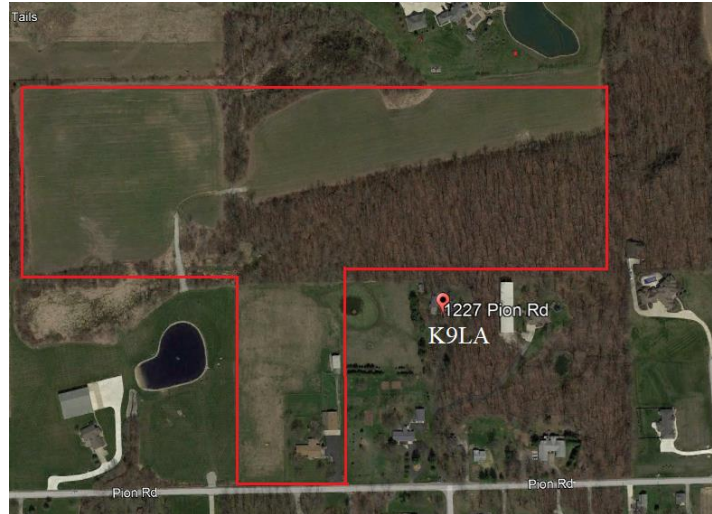


This ENAMS is in a residential environment. Additionally, there is an industrial area about 1 km to the south. The noise level is expected to be higher than rural.

Here are ENAMS noise curves for April 21, 2024 from 1800-2300 UTC (2 PM to 7 PM local).



#202 – Fort Wayne, IN at K9LA's QTH



This ENAMS is in a rural environment. But a developer bought the area in red, and plans to put 33 houses in the area bounded by the red lines. These will be one-acre lots. Underground utilities are expected. This ENAMS will eventually be very near a residential area, and the noise is expected to increase when this project is complete.

Here are ENAMS noise curves for April 21, 2024 from 1800-2300 UTC (2 PM to 7 PM local).

