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Informal Comments of

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In the matter of ET Docket Number 16-191

I am an RF, Microwave, and Antenna Engineer at a federally-funded research and development center (FFRDC) affiliated with NASA. I have forty years of electronic engineering experience in both the aerospace and broadcast sectors. I hold FCC General Radiotelephone, Radiotelegraph, and Amateur Extra Class licenses. I write as a private citizen.

Questions 2.b and 2.c relate to the spatial and temporal variations of noise in the radio spectrum. I would urge that measurement criteria be established which can quantify the extreme variability of objectionable RF noise sources so as to provide a worst-case measurement envelope in addition to the more traditional aggregated mean RF noise determinations. Three examples of egregious RF noise sources with which I am intimately familiar are:

> Radiated emissions from lamp ballasts used at so-called marijuana "grow houses". These emissions are especially troublesome when the lamps are first striking an arc and stabilizing, emitting noise at 7.1 MHz 20 dB to 30 dB above their steady-state emissions, which is itself 10 dB and more above the suburban ambient background RF noise level. The lamps in grow houses are ignited at sunset and burn through the nighttime hours. Data must be taken in areas, typically suburban, with marijuana growing operations and over measurement intervals that encompass when the lamps are powered.
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> Radiated emissions from metal halide lamps used for street lighting. Again, these emissions are particularly disruptive when the lamp is striking its arc which, as the lamp reaches its end of life, occur repetitively throughout the night. The ubiquity of street lighting with metal halide lamps and their inevitable noise emissions as they wear out makes quantification of their deleterious effects essential.
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> Radiated emissions from electrified light rail catenary wiring. The Los Angeles County Metropolitan Transportation Authority Gold Line is a prominent noise source. For approximately 100 m on either side of its right of way, AM broadcast reception is severely impaired, particularly when a train is on a nearby track segment. As the Gold Line runs down the middle of Interstate 210, car radio reception is directly impacted. Such a spatial hot spot of RF noise needs to be included in the data set due to the great number of unsuspecting commuters impacted.

These are but three examples of how really crippling RF noise can be masked if "hot spots" in time and space are avoided, by ignorance or intentionally, or are diluted by averaging. Measurements which do not capture the extreme RF noise events like these experienced by users of the RF spectrum will mislead policymakers and yield inadequate regulatory mitigation.

Question 4.d.ii addresses measurement parameters. It is possible to "game" the current radiated emissions test criteria. Intentional dithering of clock frequencies to smear discrete spectral lines into a broadband background is a common masking trick used by circuit designers in lieu of actually suppressing the noise problem at its source. The measurement process must therefore preclude such evasions by also quantifying the integrated noise power over appreciable bandwidths (*e.g.* over an octave centered at each spot frequency) in addition to the traditional spectrum analyzer measurements using a resolution bandwidth comparable to the necessary bandwidth of communications commonplace in that frequency range.

Respectfully submitted,

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