
From: "George Tannahill" <George.Tannahill@fcc.gov>
To: "Curtis-Straus Certification Dept." <certification@curtis-straus.com>
Sent: Tuesday, November 23, 2004 8:50 AM
Subject: RE: Section 90.210 Question - Regarding your answer

Hello Yunus,

Per the first paragraph of 90.210 measurements may be expressed in peak or average values as long as the powers are expressed in the same parameters as those used to specify the unmodulated carrier. As long as the applicant is using an average detector to determine the level of the unmodulated carrier then average measurements can be used to show compliance with the 90.210 "D" mask.

Best Regards
George Tannahill

-----Original Message-----

From: Curtis-Straus Certification Dept. [mailto:certification@curtis-straus.com]
Sent: Monday, November 22, 2004 11:24 AM
To: George Tannahill
Subject: RE: Section 90.210 Question - Regarding your answer

Hello George,

I wanted to clarify an issue regarding the emission mask requirement of 90.210. I am reviewing an application for Part 90 and the applicant has forwarded an e-mail to me, that includes an answer from you about that section. The e-mail is below.

My question is;

If the applicant must meet emission mask D in that section, can they use average detector to show compliance with this mask? As you know, 90.210(d) specifically requires "peak" detector to be used. The applicant is trying to use your answer as a permission to use "average" detector at this point. I wanted to verify if their assumption is correct or not.

I would be grateful if you could answer at your earliest convenience.

Thank you in advance...

Best Regards,
Yunus Faziloglu
Reviewing Engineer
Curtis-Straus TCB

----- Original Message -----

From: "George Tannahill" <George.Tannahill@fcc.gov>
To: <rhaller@frci.com>
Cc: "Henry Solomon" <HSOLOMON@gsblaw.com>; "Michael Sherman" <msherman@aes-intellinet.com>; "Stanley Lyles" <Stanley.Lyles@fcc.gov>
Sent: Friday, November 05, 2004 11:43 AM
Subject: [SPAM] - RE: Section 90.210 Question - Bayesian Filter detected spam

Ralph,

For measurements under 90.210 peak or average measurements may be used. Be careful to measure the unmodulated carrier reference level using the same measurement process (i.e. peak or average). For example if the unmodulated carrier level is measured as an average then the spurious and harmonics may also be average measurements.

For the emission mask, the rulemaking addressed having a specific emission mask to protect the adjacent channels. At 12.5 KHz from the center frequency applying mask 90.210(d)(2) requires an attenuation of almost 70 dBc and applying mask 90.210(d)(3) for a one watt unit will require an attenuation of 50 dBc. To the best of my knowledge this was the intent of the rule. Any deviation from meeting the standard would require a waiver from the Wireless Bureau.

Regards

George Tannahill

-----Original Message-----

From: Ralph A. Haller [mailto:rhaller@frci.com]

Sent: Friday, November 05, 2004 11:17 AM

To: George Tannahill

Cc: 'Henry Solomon'; 'Michael Sherman'

Subject: Section 90.210 Question

George,

Thanks for returning my call. Here is the question by email, as you requested.

Basically, for power levels of less than 100 watts, the above rule section requires a very odd shaped emission mask. My client wants to produce a transmitter that operates at less than one watt, but for this example, I will use the one watt level.

Section 90.210(d)(2) requires application of a formula that has no relation to power. It merely requires attenuation levels based on the frequency displacement from the center channel. However, Section 90.210(d)(3) provides an attenuation formula that is based on power. For transmitters of 100 watts or more, the two sections produce a continuous curve at 12.5 kHz displacement of 70 dB.

For a transmitter of one watt, Section 90.210(d)(3) requires only 50 dB attenuation at displacements at or greater than 12.5 kHz. But, Section 90.210(d)(2) requires attenuations of greater than 50 dB from 9.8 kHz displacement to 12.5 kHz displacement. Thus, at 12.5 kHz displacement, there is a discontinuity between 70 dB and 50 dB.

>From a practical standpoint, it makes no sense to require attenuation greater than 50 dB at any point in the mask for one watt transmitters. Perhaps said more broadly, Section 90.210(d)(3) should set the maximum attenuation required for any displacement. Other masks, like Section

90.210(c)(2) do provide for a maximum attenuation. I believe that there may actually be a flaw in the wording of Section 90.210(d)(2), but it is what it is.

This can also be looked at from an interference potential to adjacent channel stations. Take for example a 500 watt transmitter. At 12.5 kHz displacement, the transmitter would be allowed to radiate -13 dBm (57 dBm - 70 dB = -13 dBm) into the adjacent channel at 12.5 kHz. On the other hand, a one watt transmitter would be limited to -40 dBm (30 dBm - 70 dB = -40 dBm). This suggests that a 500 watt transmitter would be allowed to cause 27 dB more interference in the adjacent channel. This does not seem rational from an interference standpoint.

>From our conversation, I understand that the introductory paragraph of Section 90.210 would allow use of peak or average measurements, as long as the reference level is consistent, eg use of average power would require establishing an average maximum reference level. Section 90.210(d)(4) relates to spectrum analyzer settings only, and does not require use of peak power measurements. Could you please confirm that this understanding is correct?

I believe use of average power may solve the immediate problem for my client, but the curve shape continues to be of concern.

Thank you.

Ralph

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