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September 7, 1999

To: Federal Communications Commission
Experimental Radio Service
P.O. Box 358320
Pittsburgh, PA 15251-5320

Gentlemen/Mesdames:

This exhibit will include the NECESSARY BANDWIDTH DESCRIPTION, which consists of the calculation for the indicated frequency listed on file number 0212-EX-PL-1999.

The frequencies from the specification sheets of the devices that we will be using in our radar were used to calculate the radar's frequency, f_{xmit} , and bandwidth (BW).

$$f_{\text{stalo}} = 1440 \text{ MHz} \pm 10 \text{ MHz (tunable band)}$$

$$f_{\text{coho}} = 60 \text{ MHz}$$

$$\text{BW}_{\text{effective}} = \text{instantaneous bandwidth} + \text{stalo's tunable band}$$

$$\begin{aligned} \text{BW}_{\text{effective}} &= 1/\tau + \text{BW}_{\text{stalo}} \\ &= 100 \text{ MHz} + 20 \text{ MHz} \\ &= 120 \text{ MHz} = (\pm 60 \text{ MHz}) \end{aligned}$$

$$f_{\text{xmit}} = f_{\text{stalo}} + f_{\text{coho}} + \text{BW}_{\text{effective}} = 1440 \text{ MHz} + 60 \text{ MHz} \pm 60 \text{ MHz} = 1500 \text{ MHz} \pm 60 \text{ MHz}$$

f_{stalo} is the frequency for the stable oscillator that we will use, and f_{coho} is the frequency for the coherent oscillator. $\tau = 10 \text{ nsec}$ is the shortest pulsewidth. **Our necessary bandwidth is 120 MHz.**

Your favorable consideration of this application for an experimental license is requested. Thank you.

Sincerely,

Eddie Hughes, Technical Manager
XonTech, Inc.
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