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| **MEETING MINUTES – Sponsor Meeting** |
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| OWNER: Julia Kim |

Meeting with Pete Stenger 03/04

Present: Joshua Cushion, Julia Kim

Time: 5:15 p.m. – 6:05 p.m.

As of now, Josh will put a pad at the output of the power amplifier and do more testing for that after the break. Josh will also try to get on the finalized design of the level-shift circuit within the next few days. He wanted to discuss contingency plans just in case we don’t get the entire system set up and working on time. Pete said that the contingency plans is to start the transmit path, then the receive path, then the LO path. And after that we can do transmit/receive with a horn, then we can add on depending on the time. He is asking because in terms of the standpoint of our final grade that actually reflects the progress that we made and not that we have the complete system. So that our advisors know that we’re working on the project and making progress with the whole system and that we have Pete’s support on the contingency plans.

He fully supports the contingency plans that we came up with together as he can see that we’re working on the project. He knows that the bar is set high and that we already discussed that we would need some contingency for the project development. What he would like to do with the transmit chain is to have a pulse coming through that and that has the 20 ns pulse width. The source we’re getting can generate that by itself. So with the transmit path, show a radar pulse. When we get that analyzed, we’ll get fancy data, such as the spectrum, power level, etc. He wants to address each problem and show systemically how we solved it. For the receive, we would put the receive path together and show that we get the gain and the noise figure. We could have like a minimum guideline for what we’re graded on and have stretch objectives that we can get credit on. Pete wants to see incremental progress where we are not rushing last minute, which is what he’s seeing with us. If we can verify the functionality on the transmit and receive, and if Mark can get the components mounted on the plate and get them interconnected, then that would be a good time for Pete to come and get the full thread.

According to the schedule, the mechanical structure should be completed by this week. However, we’re not sure of the status so we would need to get the update from the MEs. If we can get all the components mounted on the plate, then we can do the breadboard testing and all the bench testing. So we would need to find out about the plates from Mark and then he would need to put the holes in them.

For the power loss calculation, the period we talked about was 60 ns, so the only frequency to be calculated is 1/60, 2/60, 3/60, etc. One over the pulse width is the sin(x) over x envelope. The energy is at multiples of one over the period. The spectral energy is in 1/60, 2/60, 3/60. Follow the contour of one over the pulse width, which is 20 ns. The amplitude of the energy is at the frequencies of multiples of one over the period. One over the 20 ns envelope is the contour of the sinc function. One over the period is where the spectrum energy is and what frequencies they are. And the amplitude is the form of that envelope that you get from one over the 20 ns. Trace out the sin(x)/x function and then the nulls are at the pulse width, which is one over 20 ns. The energy is going to be multiples of one over 60 ns. The nulls are at 1/20, then you know if it’s 1/60, then it’s going to be 1/3 of that. Between the center and where the null is, the third of the way from the center is where that amplitude corresponds to that energy of the spectral component. If you have a repeating square wave, one over the pulse width of the square wave then goes positive, that plots out a sinc function in terms of spectrum. Then how often the pulses are together in terms of the period of the pulse determines where the spectrum energy is, what the frequency is underneath that sin(x)/x envelope. Just start by plotting out a sinc(x) function in radians and you should see nulls in the response when you take the log of it. Just make x go from 1 to 10 and plot out that function. Don’t worry about frequency right now. Then take the log of it since it goes to zero and you’ll see the sin(x)/x lobe. Plot it out linearly but also do 20 times log of it.