**[Programmable Communication Group](https://sites.google.com/a/temple.edu/programmable-communication-group/)**

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| Date | Friday, August 31, 2013 | | |
| Advisor | Dr. Silage | | |
| Members | Cedric Destin | Brandon Keith | Brian Thibodeau |

Headline: First SD1 meeting with Dr. Silage. We now have access to Rm. 702 (keycode: 5-3-2-4)

Topics to discuss

* Re-introduce SD project to Dr. Silage
  + Re-designing KD2BD 1200 bps BPSK Pacsat modem using FPGA
  + Comparing modem performance between two different carrier extraction circuits: KD2BD and Costas loop
  + Progressing from Matlab/Simulink simulation to HDL implementation on hardware
  + Implementing loop-back from demodulator output to modulator input
  + (Optional) Using partial configuration to swap carrier extraction implementations while other sections of modem is still operating.
  + Interface modem loop-back to TS-2000 radio and spectrum analyzer
* Provide status
  + Almost done Maltlab/Simulink simulation of KD2BD modem and Costas loop
* Tools we need access to
  + System Generator for DSP
  + Xilinx ISE Design Suite or Vivado Design Suite
    - Chipscope (with spectrum analyzer?)
    - (optional) Partial configuration support
  + Avnet LX-9 Microboard or (optional) Microzed
  + Pmod DAC and ADC

Dr. Silage feedback

* Implement loopback from digital side (interface with laptop via USB)
* Implement AFC control for Doppler shift correction
* Purchase LX-9 Microboard (considering resource availability with LX9 part)
* Dr. Sullivan is Departmental Coordinator and can reimburse purchase
* Chipscope and System Generator are supposedly available in Silage’s lab
* Silage is okay with Costas loop performance comparison
* Partial configuration seems to be a no-go atm due to us not seeming to go the Zynq-7000 route

Want to bring up next time

* Hardware-in-the-loop support for Spartan 6 LX-9
* (Optional but important) Do we need to use Microsoft Project for SD1

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| **Engineer** | **Status** |
| Brian Thibodeau | * Completed carrier extraction and phase detection simulation using square and divide by 2 method * Researching and investigating Doppler shift correction * Replacing high level Simulink blocks with hardware realistic Simulink blocks * Tuning carrier extraction and phase detection filters to account for AWGN |
| Cedric Destin | * Looking into the FFT of the BPSK (SSB)   + It is a lower side band LSB   + Questions: What are the benefits and how does the modulated signal looks like? Why? * Started looking at the AFC   + Looked at the XR-2211 used by John for correcting the Doppler Shift * Line up the Modulator with the Demodulator |
| Brandon Keith | * Switched to TortoiseSVN as source control client for Github; Github for Windows is now deprecated * Combined demodulator parts from Brandon and Brian to start system-level Simulink model of KD2BD modem. |