Lab 08, Experiment 2(f)

The file AMsignal_005.bin is a binary file that contains the I and Q components of several radio signals in the frequency range from 0 to 120 kHz. The sampling rate of the file is F s = 240 kHz and the bandwidth allowed for each station is 10 kHz. Use this file as input from a File Source in the GNU Radio Companion (GRC). Build a flowgraph in the GRC for tuning to and demodulating AM-DSB-SC and, more generally QAM signals (i.e., the sum of two AM-DSB-SC signals at the same carrier frequency, one with a cosine and one with a sine carrier). Find all radio signals in AMsignal_005.bin and characterize their properties, such as f c , θ c , AM-DSB vs QAM, stability of f c , interference between different stations, etc. Try to demodulate the signals as cleanly as possible. Here is an example of a flowgraph that can be used to analyze the different signals. Note that some parameters are left blank and you have to decide (and make the case) for the best (or at least a good) choice. In the QT GUI Sink consider looking at the Constellation Display in addition to the Frequency and Time Domain Displays to distinguish between AM-DSB and QAM signals (why?).

Below is the GNU radio flow-graph: