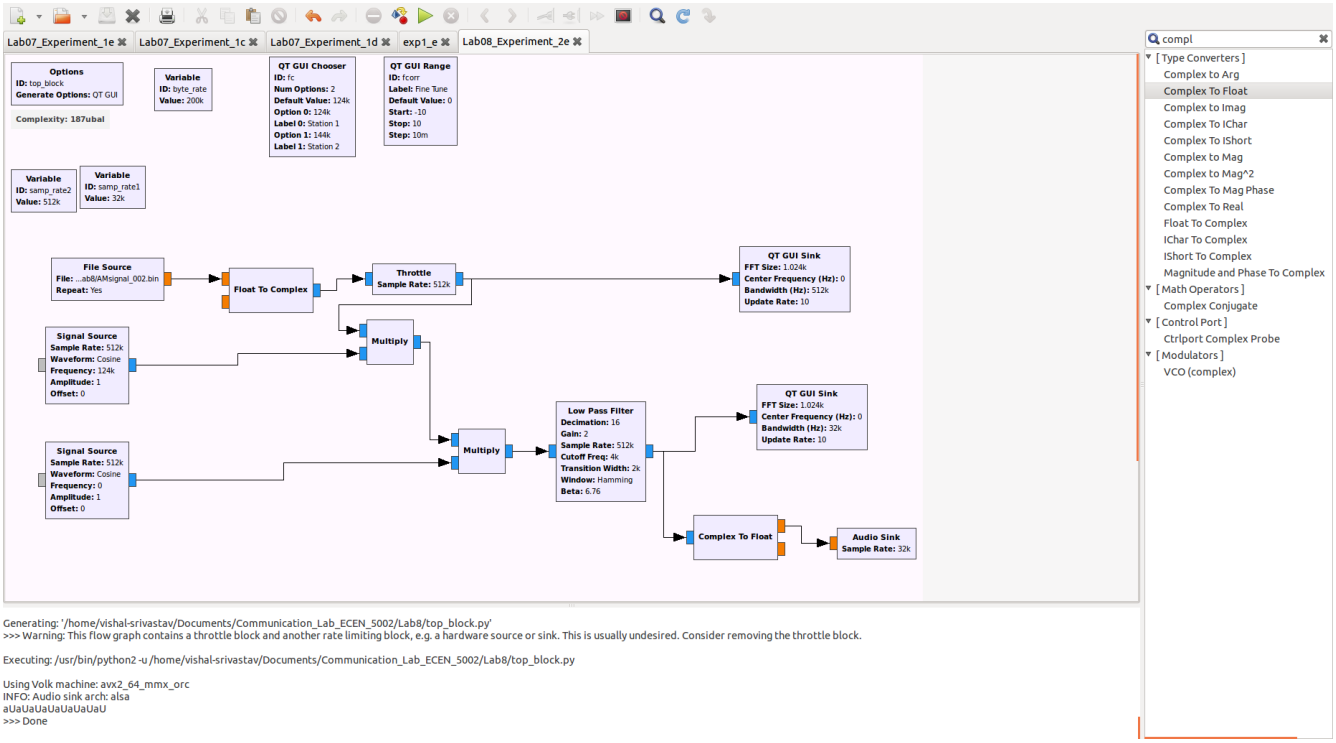
# Lab 08, Experiment 2(e)

Complex-valued AM demodulator for AM-DSB-SC signals in GNU Radio.
Build the GNU Radio flowgraph shown below to demodulate the two AM-DSB-SC signals in the file AMsignal_002.bin. The file was recorded using a sampling rate of 512 kHz and each sample is a 32-bit (real) floating point number. The nominal carrier frequencies of the two signals are f c1 = 124 kHz and f c2 = 144 kHz, but
the transmitters were off a little bit (within ±10 Hz) from the nominal values. The receiver attempts to demodulate the signals with the nominal carrier frequency values, followed by fine tuning in the range from -10 to +10 Hz. The goal of this experiment is to find out how successful that strategy is when working with complex-valued signal processing and to discuss its advantages and shortcomings. Compare also to E1g.

Below is the GNU radio flow-graph:



For station 1:

It's very hard to synchronize the receiver to the music signal but this is better than the real valued signal. The best fc found is: 12400-4.68 = 12395.32. Below is the snapshot:

For station 2:
Station 2 receiver is synchronized to the news signal. The best fc found is: 14400-0.2 = 14400.2. Below is the snapshot: