

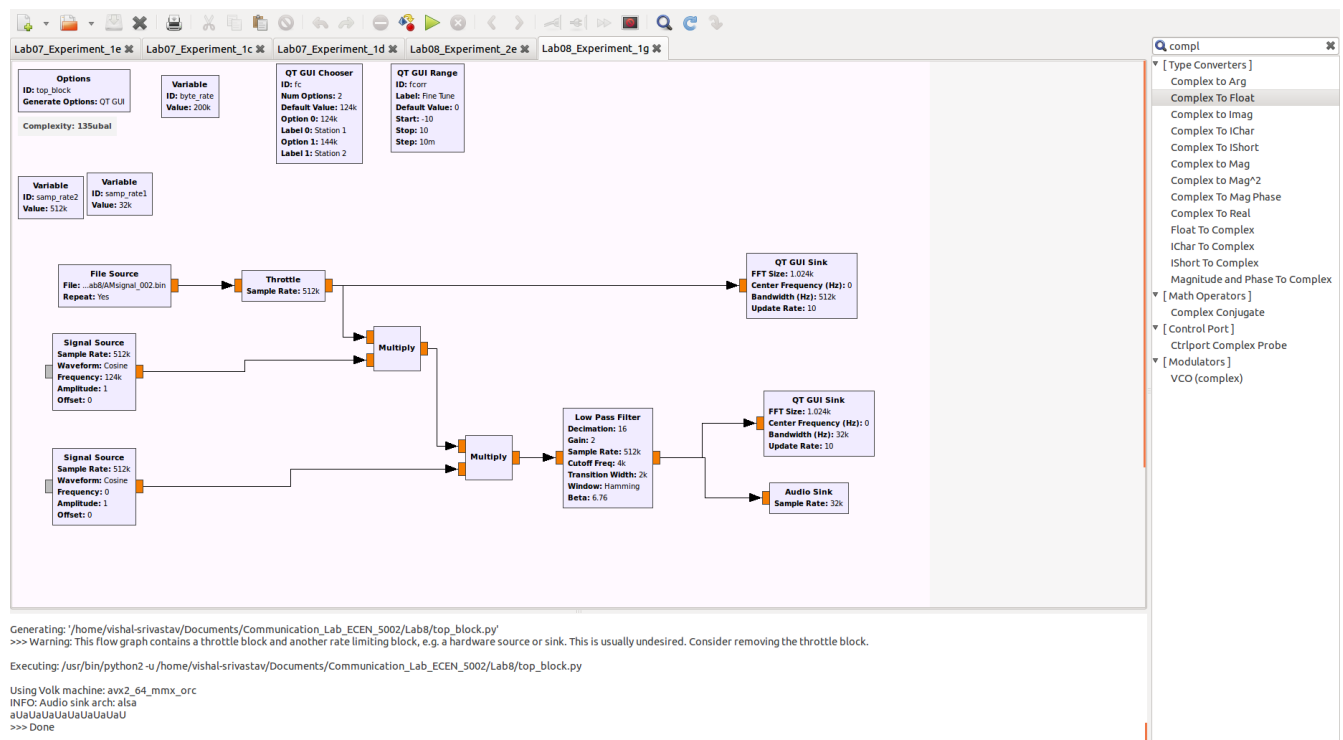
## Lab 08, Experiment 1(g)

### Real-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  $\pm 10$  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 real-valued signal processing and to discuss its advantages and shortcomings.

Below is the GNU radio flow-graph:



For station 1:

It's very hard to synchronize the receiver to the music signal. The best  $f_c$  found is:  $12400 - 4.84 = 12399.16$ . Below is the snapshot:



For station 2:

Station 2 receiver is synchronized to the news signal. The best fc found is:  $14400 - 0.07 = 14400.7$ .

Below is the snapshot:

