9 Using GNU Radio and RTL-SDR for FM reception

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1. In class review of how RTL-SDR works.
   - What is the output from an RTL-SDR?
   - Review of complex baseband, passband sampling and IQ data.
   - A good read - https://www.dsprelated.com/showarticle/192.php
   - Another one - http://whiteboard.ping.se/SDR/IQ
2. In this lab, you will continue your exploration of GNU Radio and its use with a specific software defined radio receiver called RTL-SDR.
   - It is essential that you have finished the last lab, installed GNU Radio with support for RTL-SDR
   - Every batch should get an RTL-SDR from the lab staff/instructor which should be returned at the end of the lab in proper condition, along with any additional equipment (e.g., antennae)
   - You will also need to download FM-Demonstration.zip file containing FM_0.grc, . . . , FM_6.grc for this lab.
3. Your first task is to listen to any FM station using the FM_0.grc file. Attach the RTL-SDR device to your laptop and use FM_0.grc. How will you change the channel/station that you are listening to? How many channels can you listen to? You should report the channel frequency value as well as perceived quality (understandable, gibberish etc.) in a table.
4. Make a signal flow diagram corresponding to the flowgraph in FM_0.grc and write down what each of the blocks do.
5. You should use FM_1.grc for this task. Open and run the flowgraph. What do you observe? Make a signal flow diagram corresponding to the flowgraph in FM_1.grc and write down what each of the blocks do.
6. You should use FM_5.grc for this task. Open and run the flowgraph.What do you observe? Make a signal flow diagram corresponding to the flowgraph in FM_5.grc and write down what each of the blocks do.
7. You should use FM_6.grc for this task. Open and run the flowgraph.What do you observe? Make a signal flow diagram corresponding to the flowgraph in FM_6.grc and write down what each of the blocks do.
8. In the above tasks, your observations should be backed with plots of spectra of signals which you think are important to your observations.