



Laboratory: AM radio station demodulation

1 Objective

Objectives of the lab:

- To get familiar with the GNURadio software and the concepts of software defined radios.
- To demodulate a real AM radio signals using the USRP1 SDR.

2 Requirements

Note: This lab requires some preparation, in terms of theoretical background as well as the use of the tools (use of the B-Lab, GNURadio Companion, Matlab/Octave, the m-files, etc.). Students who are unable to do the lab because they have not prepared will be asked to leave.

Instructions, source material and preparation required:

- Group work is encouraged in this laboratory. A maximum of 3 group members per group is allowed.
- Each group must devise and bring with one antenna that is going to be used to receive the Radio signals.
- Each group must provide a laptop running the Ubuntu operating system and with Gnuradio Companion installed.
- You are required to present the block diagram of the AM receiver that you are going to test before you are allowed to enter the lab. For this, you need to go through Tutorial 3 on the webpage http://www.csun.edu/~skatz/katzpage/sdr_project/sdrproject.html. Ensure that you can demodulate more than one station with the file provided. You must also be able to explain each component in the block diagram.

Report: The report will take the form of the following group of files which should all be attached to a single email:

- An answer sheet (PDF format) with your name and your lab partners' names and student numbers, the date and experiment name, and your results.
- All the GRC-files used in the lab.
- All additional files (such as m files) used for the report.
- Your report should include an introduction, as well as a conclusion section. In the report briefly explain all important components of your receiver, as well as stating the main results.

3 Outcomes

1. AM Receiver

- 1.a. Adapting the code of Tutorial 3 from http://www.csun.edu/~skatz/katzpage/sdr_project/sdrproject.html, implement an AM receiver that is capable of receiving stations in the frequency band 0 MHz to 30 MHz (Note that this includes a portion of the commercial AM band).
- 1.b. Assessment will be as follows: The group(/s) that is able to find the most stations will obtain 100%. The rest of the groups will be marked on a sliding scale. If a group is not able to demodulate a single station, the group will get zero for this laboratory. In order to get 50%, a group needs to be able to demodulate at least one station.
- 1.c. The weighting of this laboratory is 60% for the demonstration, and 40% for the report. Note that if you are not marked down for the actual demonstration, you will obtain zero for the report.