Before Lab: Simulate ADE-1 Frequency Mixer using the LTspice template shown in class and illustrated in the ADE-1 LTspice screen shot on the web page. Download the ADE-1 data sheet to determine the pin connections, and note the more detailed connections described in class and in the LTspice simulations.

Lab 1 Task for the week of April 7-11 2013. Examine the underside of the ADE-1 under a microscope. Be careful, as the diodes are somewhat ESD sensitive. Then solder the ADE-1 down to the daughterboard using the techniques shown in class. Plug the ADE-1 daughterboard into the solderless breadboard and make connections as suggested in class.

In the Lab week 1
Connect the ADE-1 using BNC clip lead cables to two signal generators, with wires to the prototyping strip for the IF port circuitry as discussed in class. Design or select a simple Low-Pass filter as shown in the screen shot and in class. Observe the IF port waveform with and without the low-pass filter. Observe the variation in IF output signal while varying the frequency and amplitude the input signals connected to the RF port of the ADE-1. Note the complete symmetry inside the package: RF and LO inputs are interchangeable.

Capture a screen shot of the measured output waveform and an LTspice simulation using the same frequencies and amplitudes to compare simulation and measurements. Have the Lab TA check off the simulation and measurement by Friday April 18.

In the Lab week 2
With one signal generator, a T Connector, and a long cable, measure the phase detector sensitivity using the technique discussed in class. Compare results with LTspice simulations.

Lab Progress Report Due Friday April 25:
Include Block Diagrams showing all of your lab setups, the schematic of the inside of the ADE-1 and your Low-Pass filter design, screen shots of your LTspice simulations of the ADE-1 as a frequency mixer and phase detector. This first lab report will be graded and commented, and you will need all of this information to proceed with the second lab.