Tasks for this week:
In class Homework discussion session. Bring your work to class.


The language and terminology of Filter design. Introduction to Modern Filter Theory, a quick overview of the theory from low-pass prototype to top-coupled narrow bandbass filter.

Introduction to RF simulation: The Spice Model Vector Network Analyzer, S11 S12 S21 and S22.

The importance of S11 in Filter Design.

Study Material with links on the class web page:

IEEE Paper “HF-VHF-UHF IQ Mixer with a Single SPDT Switch”
European Microwave Week Paper “Project-Based RF/Microwave Education”
MicroR1 Receiver Description
Instrumentation Receiver Description
Quartz Crystal basics
Commercial IC Example: Basic Radio IC
2Q4 all-pass prototype

Homework--Half Lattice Crystal Filter Design

Using the quartz crystal model with values shown in class, simulate a half-lattice crystal filter with various bandwidths. Be sure to start the homework before this Wednesday class, as we will discuss preliminary results and share information for more advanced topologies. Next week we will have a class whiteboard discussion of our filter design results.

Final class project. We will design and build individual contributions to the block diagram receiver. The final report will be a 4 page description, including design strategy, circuit details, measured results, and integration into the complete class project, with field testing. There will be as many blocks as students in the class, and they may be interconnected LEGO fashion into different receivers.