Quote of the week: “Some problems that require intelligence and education aren’t all that hard, and some problems that don’t require much education or intelligence are very hard.”

Readings for this week: Basic Transistor connections and multiplier circuits. Textbook sections: pages 915 ff. and pp. 1205-1213.

Tasks for this week: Add a PN junction varactor diode to an oscillator to make a voltage controlled oscillator (VCO). Define Kvco.

Introduction to Direct Digital Synthesizers. The exclusive OR gate as a phase detector.

Sketch the schematic and construction details for powering up the POS-100 VCO in the lab kit and looking at the output on the Oscilloscope and Spectrum analyzer with a 50 ohm load.

How Third Week topics apply to Course Outcomes:

A catalog of sinusoidal waveform generators
Electronic multiplier/phase detector: Gilbert Cell, Diode Ring, and Exclusive OR
Applying Electronics Engineering course work to open-ended projects
Introduction to Electronic Prototyping

This week in lab: Continuing Laboratory 1--introduction to the diode ring mixer/multiplier using the MiniCircuits SBL-1

Graded Homework Exercise -- Oscillators -- due in class April 25

Starting with the basic math, write a one-page description of how a Direct Digital Sinewave generator works. Draw schematics of a practical Hartley Oscillator with J310, including all the component values for an oscillation frequency of 7 MHz. More details in class, and a simple one transistor crystal oscillator.