Transformers. Didn’t they make a movie about that?

Tasks for this week. Exploring a trifilar transformer, analysis, simulation, and in the lab. The classic Hybrid Coil circuit.

Textbook: Read quickly through pages 1006 to 1014

On Line: Read the Hybrid Coil discription here: http://en.wikipedia.org/wiki/Hybrid_coil

Simulations: Simulate a 1:1:1 turns ratio trifilar transformer as a hybrid coil. Do a web search on FT 37-43 ferrite toroid to find out how many turns you need for 10 uH each winding. In class we use 6 or 7 turns. What is the expected inductance?

In Lab: Wind a trifilar toroid using three colors of wire, and connect it as a 2:1 turns ratio center-tapped transformer, using the methods shown in class. Measure the frequency response using the lab signal generator and oscilloscope, both open-circuited and with a 200 ohm resistor termination. Use two 100 ohm resistors in series so you have access to both the transformer center tap and the termination resistor center tap. Ground the resistor center tap. Then reconnect the transformer as a common mode hybrid coil, driving the transformer center tap.

Save the trifilar transformer--this will be used in lab two to build the oscillator.

Ungraded exercise. Due in class Thursday April 16. Turn in two pages including a simulation of a trifilar hybrid coil and a measurement of the bandwidth and losses of your hybrid transformer in the lab. This is an ungraded exercise, and you are encouraged to work together, but turn in individual assignments. Note that hybrid coil operation and the bandwidth of a trifilar toroid built with a given number of turns on an FT 37-43 core are important concepts that rate big double rectangles in the lecture notes.

Sociology. Wait...what!?? Hey, you are University students, and not all of your education is how to connect the blue wire to the red wire after plugging some data into a MATLAB routine. In our class you will note that some students are seriously out of sequence--they have already successfully designed and built some very cool electronics stuff. Start the networking that will follow you through your career, and spend some time thinking about what you can contribute.