Quote of the Week, from Phil Bolger, boat designer

“It’s apparently a basic human instinct, when presented with something that does one thing very well, to instantly want to use it for something else...”

Tasks for this week:

Justify using a moderately low noise amplifier for signal conditioning between a sensitive electret microphone (e.g. Knowles EK3132) and an ADC, power amplifier, or modulator. Design a 2 stage signal conditioning amplifier using a dual op-amp, including the effect of each resistor and capacitor in the design. Sketch the schematic with component values. Simulate the design using LTspice. Sketch a circuit layout using a construction method of your choice that will allow you to build and measure the circuit in the lab. Sketch a layout for a prototype using surface-mount components that may be built in the PSU Electronics Prototyping Lab (EPL).

Homework:

Network within the class, discovering the skills and interests of other students and extended community. Collaborate on LTspice simulations, access to the EPL, NEAR Lab and IEEE store, wireless experience and licenses, favorite construction techniques, etc. Design the op-amp circuit, justifying your decisions to each other.

Study Material:

Use the web, lecture material, Op-Amp literature by Jung et al. and each other as resources for the low-frequency analog signal conditioning circuit design.

Next Class Event

Monday January 21, a focused session in the EPL on the design and fabrication of a one-off prototype using surface-mount components and construction.

Next Graded Exercise

Wednesday January 23 we will hold an in-class Design Review for the interface circuit. Come prepared to contribute.