**Step Attenuator Design**

We need a step attenuator capable of going from 5mV, zero to peak, to 1uV RMS or maybe 0.5uV RMS, to test our radio receivers using the Analog Discovery 2 boards from Digilent. You should [download and install the Waveforms](https://store.digilentinc.com/waveforms-download-only/) program. You can run it before you receive your Analog Discovery 2 board and see that the lowest output from the board is 5mV, zero to peak.

It is important that you realize the stray capacitance and mutual inductance can bypass your attenuator if you don’t design it correctly. We need these attenuators to work to at least 30MHz. I suggest using at least five stages, and 0.1” headers and jumpers for the switches needed. Model your design in LTSpice for the highest attenuation at 30 MHz to make sure it will work. If you have trouble, contact me, and I can help. I have only done a very quick approximation to be fairly certain this should be possible. Then design the PCB in Kicad. As you do, try to make the traces have a characteristic impedance, Z0 of fifty ohms. There is a calculator in Kicad that will help you with that problem. You can choose if you want surface mount or through hole components. We are sending you soldering irons, but they probably are not as good as the school’s irons, so soldering surface mount components may be more difficult for you.