Two quick experiments to get up and running with Picoscope: Circuits fall 2022

(compiled JE 19 Oct 2022).

1. Generate and directly measure sine wave
2. Voltage divider example. Drive circuit with sine wave from AWG. Measure Vin and Vout on channels A and B to visualize relationship thereof.

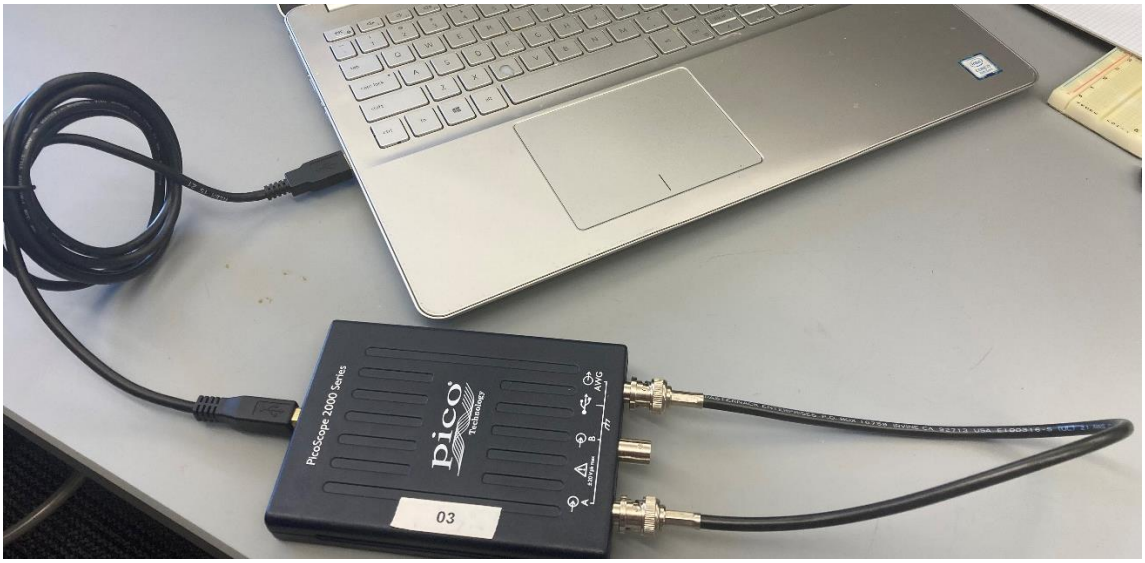

Figure 1. Connections for Generating a wavefrom and measuring it directly. The output waveform (AWG) is connected directly to input chan A with a coax cable. The picoscope is connected to the laptop via USB.

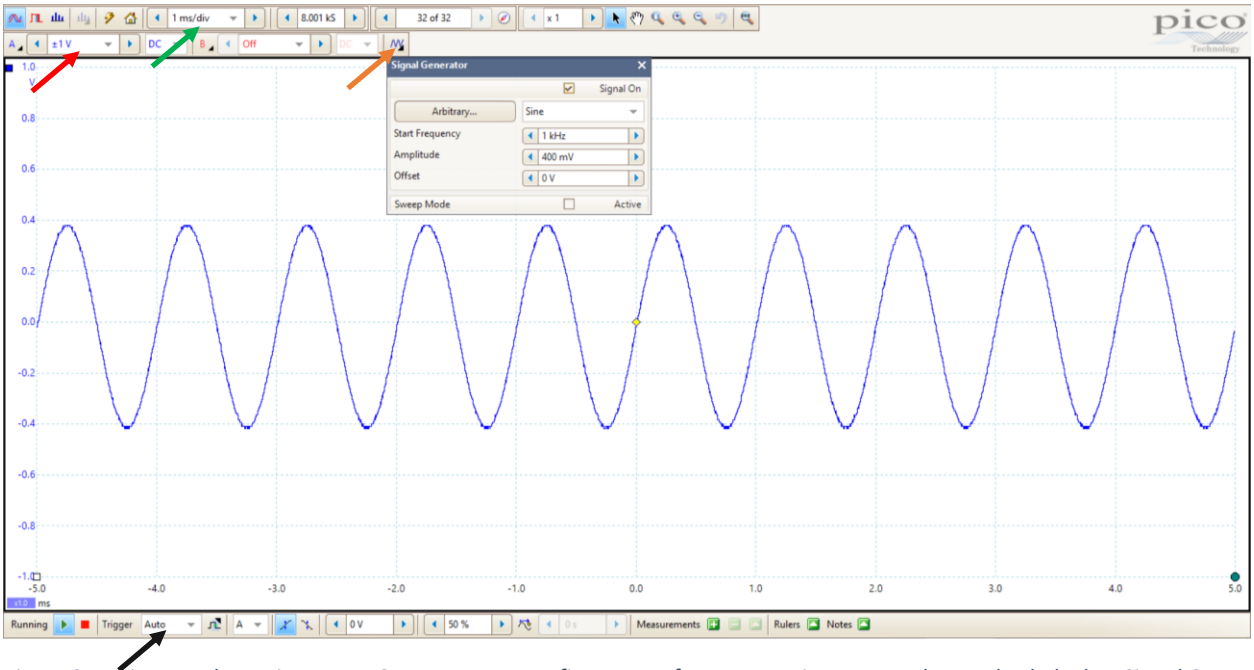

Figure 2. Basic controls on picoscope. Orange arrow: configure waveform generation. Remember to check the box Signal On to actually generate the wave! Green arrow: set timebase. 1 'div' (division) is one dotted box worth of time. 1 ms/div makes sense here because it is well-matched ot the 1 kHz frequency wave being generated. Red arrow: adjust voltage scale. Black arrow: trigger settings help stabilize the phase of wave at which plot is generated. 'Auto' generally works well.

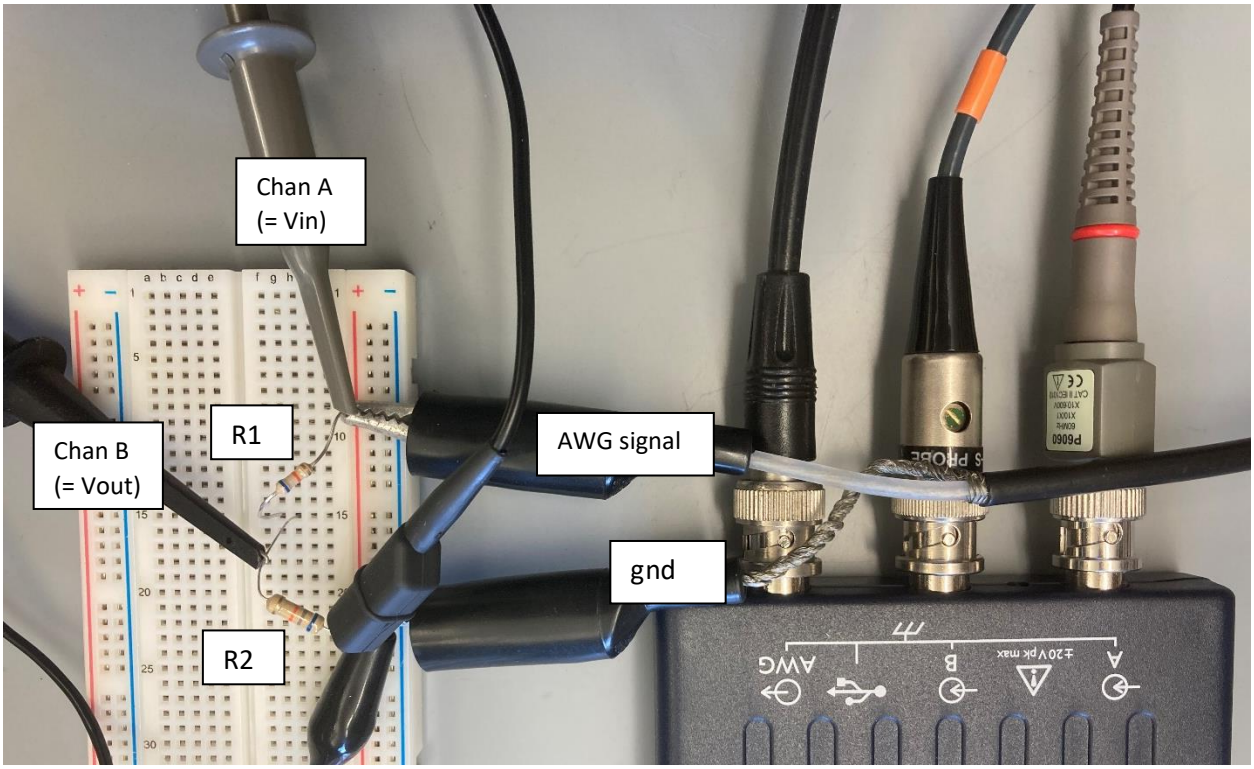

Figure 3. Typical connections for generating a wave, measuring input-output relationship. Voltage divider (68k and 68k) on breadboard. Note the ground clips all contacting the 'bottom' leg of R2. AWG is configured to generate a sine wave at desired amplitude and frequency. Connection is made to the voltage divider via a coax-to-alligator clip cable. Standard coax probe cables are used to measure inputs A and B.

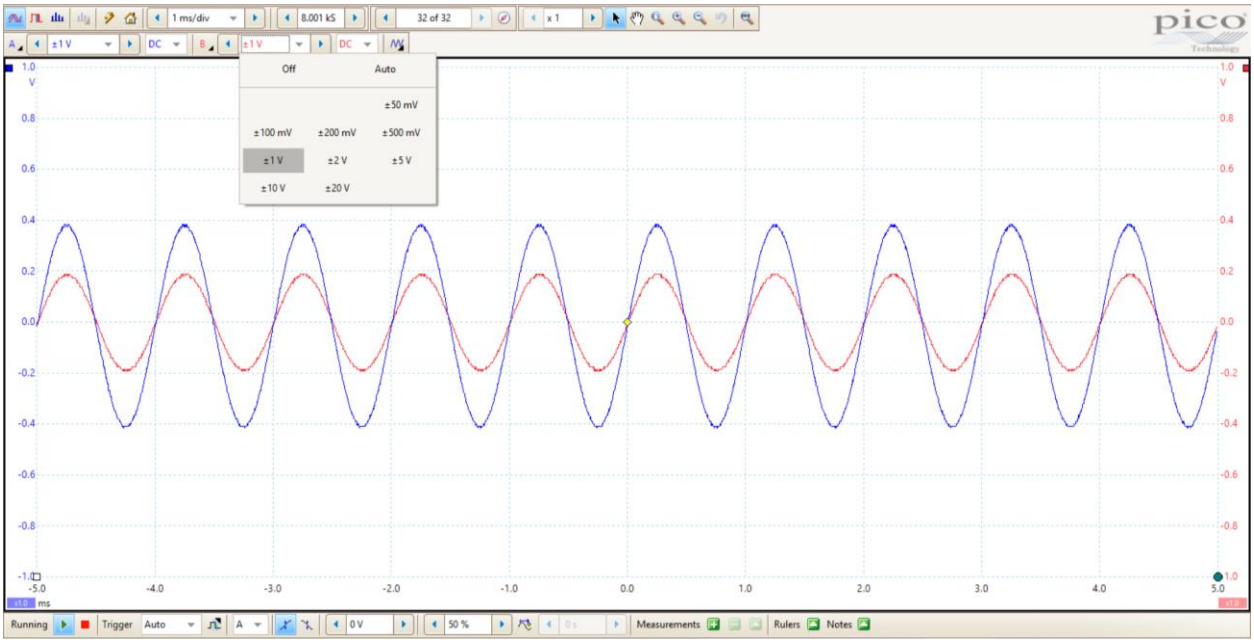

Figure 4. Visualizing two waves simultaneously, chan A (blue) and chan B (red). Remember to turn on channel B to visualize the wave (default is typically 'off'). Note the voltage division in action (Vout = ½ Vin, in this case because we have 2x 68k resistors)

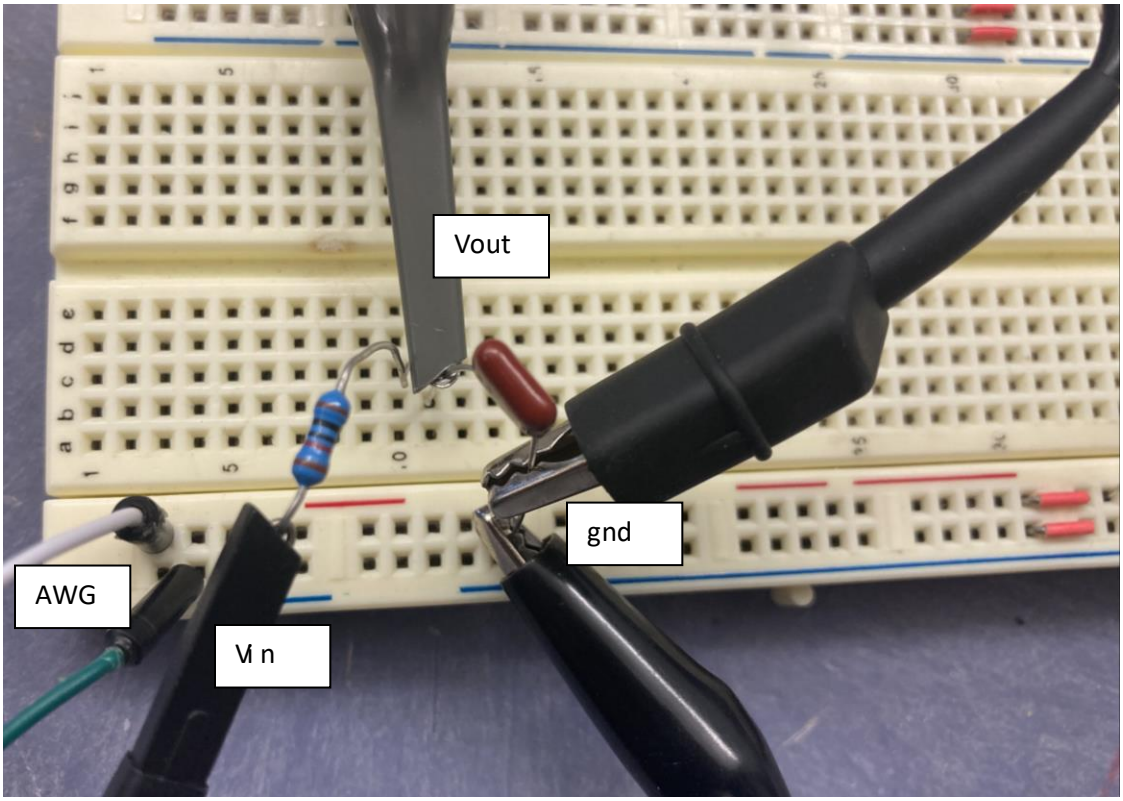

Figure 5. We can make the same Vin and Vout measurements for RC filters!. This time AWG is interfaced using 'quick connect' wires (white = signal wire connected to red power rail; green = GND on blue power rail). Note, this is a 1-stage LPF above.