EE 230 design - Signal generator

Build a circuit that generates three periodic signals – a square wave, a symmetric triangle (ramp) and sine wave. All three signals are available simultaneously as three separate outputs. The three signals will oscillate at the same frequency. The operating frequency can be tuned over the range of 500 Hz to 5 kHz.

- The circuit has no inputs – it should begin oscillating on its own as soon as power is applied.
- The frequency is tunable over the indicated range with a single potentiometer used to adjust the frequency.
- The square wave will oscillate between +5 V and –5V. The triangle wave will ramp up and down with peak values of +2 V and –2 V. The sine wave will have a minimum amplitude between of 1 V at any frequency. (It can be bigger.)
- You can use two DC power supplies (up to +/- 15 V) to power the circuit.

Testing / Reporting

- Your lab supervisor will inspect your completed circuit. Be prepared to show the three different waveform at the indicated voltage levels, and the tunability of the frequency.
- Record oscilloscope traces of the waveforms at 3 different frequencies (one high, one low, and one in the middle.)
- Hint: Depending on your approach, you may to to amplify the sine wave somewhat in order to meet the minimum amplitude requirement.
- Write a short report that includes: (One report for the group.)

    1. a circuit diagram,
    2. a photo of your circuit
    3. a written description of the design of the circuit,
    4. the oscilloscope traces.
    5. any additional comments about the performance (or lack thereof) of your circuit.