ECE 321 - Homework #1

Op Amp Amplifiers & Mixers. Due Wednesday, April 7th

Please make the subject "ECE 321 HW#1" if submitting homework electronically to Jacob_Glower@yahoo.com (or on blackboard)

For all problems, assume you are using

- MCP602 Op Amps (2.7V - 6.0V, max current = 22mA)
- 2SC6144 transistors
- β = 200, 10A max, |Vbe| = 0.7V

555 Timer

Problem 1) Design a circuit using a 555 timer so that it outputs a 500hz triangle wave

Problem 2) Verify your design in CircuitLab

Problem 3) Build this circuit in hardware and verify its operation

- DC voltage, AC voltage, frequency

Voltage Amplfier & Mixer:

Problem 4) Design a circuit to mix two audio signals

- A = the output of your 555 timer: (1.66Vpp triangle wave, 500Hz)
- B = the output of your cell phone (1Vpp, 20-20kHz sine wave)

$$Y = 2A + 5B$$

Problem 5) Verify the operation of your mixer in CircuitLab

Problem 6) Verify the operation of your circuit in hardware

- Use an 8 Ohm speaker in series with a 220 Ohm resistor for the output
- 5V @ 228 Ohms = 22mA