

APPLICATION PROJECT-1 (AUDIO AMPLIFIER) - 2 WEEKS

Procedure to perform the experiment of Audio Amplifier:

- 1- Read the Audio amplifier (Audio-amplifier.pdf) and Microphone amplifier (Microphone-amplifier.pdf) documents uploaded on moodle as well as the course webpage.

(Ref: Audio-amplifier: <http://www.ece.ucsb.edu/Faculty/rodwell/Classes/ece2c/labs/Lab%201a%20-%202C%202007.pdf>

Microphone amplifier: <http://www.ece.ucsb.edu/Faculty/rodwell/Classes/ece2c/labs/Lab1b-2C2007.pdf>

- 2- **Refer “Audio-amplifier.pdf” document.** Wire up the “Summing network” (removing R1-C1 and R2-C2) in fig-1-9, Section 1.4 and “Tone-control circuit” in fig. 1-10, Section 1.5.

Feed the output of the summing network to the input of the tone control circuit. Measure its frequency response from 50 Hz to 20 kHz for the two extreme positions and at the centre position of the wiper of the pot (R11 in fig. 1-10). Use sinusoidal input voltage of 100 mV (peak-to-peak). Connect the input at the Aux input (of the summing network). Plot gain (in dB) versus frequency (log scale), and verify that your plot shows all the features of fig. 1-10 (b).

- 3- Wire up the LM-386 based amplifier circuit given in fig. 1-7, Sec 1.3. Test the circuit with a sine wave (0.2V amplitude, 1 kHz). Sweep the frequency to determine the lowest and highest audible tones, and record the values.

- 4- Apply a 1 kHz, 100 mV peak, sine input. **Observe the output (before the capacitor)** and record the gain as well as DC bias at the output. Comment on why there is a DC bias at the output.

- 5- Connect the output of the tone-control circuit to the LM386 power amplifier input. Now, use the test audio signals provided to you as the input signal (instead of sinusoidal signal) to verify that the tone-control circuit enhances bass or treble output depending on the pot wiper position. Adjust the volume-control pot to proper audible level.

(Use the audio jacks (male-female) given to you. Connect the input signal from the PC or laptop to the tone-control circuit and listen to the audio at the power amplifier output by using the female audio jack and connecting headphone to it).

- 6- **Refer “Microphone-amplifier.pdf” document.** Now, wire up the microphone bias and pre-amplifier circuit in fig. 1-5 and fig. 1-6, Sec 1.2. **(Don’t connect ‘Level Adjust’ circuit given in Fig. 1-1).**

Now test the microphone circuit by observing the output signal on the oscilloscope. Try whistling into the microphone, you should be able to produce a pretty nice sine-wave. Connect the output of microphone pre-amplifier to audio-amplifier stage wired in (5) **with and without the tone-control circuit.**

(Check the effect of test audio signal (given through pc/ laptop using headphone) coupled to microphone and the voice input to the microphone. Listen to the music/ voice on the speaker/ headphone).