

Union College
ECE-101
The Joy of Electronics
Project 1 Assignment 1

Due: The first class of next week for each section.

1. For project 1 we will be building an audio amplifier based on the LM386 amplifier chip. The schematic diagram is given in figure 1 below

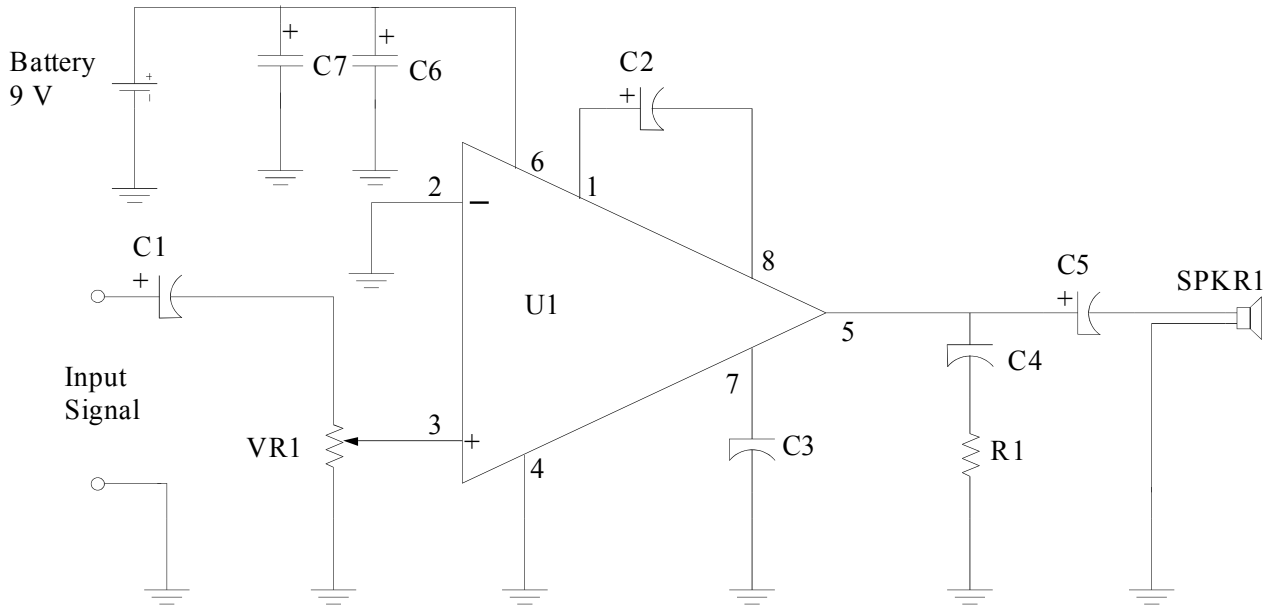


Figure 1
Schematic for an LM386 Audio Amplifier

2. Sketch the parts layout you will be using to build your amplifier on the prototyping board. Use the picture of a prototyping board on the last page. Make sure your parts layout is neat with component leads as short as possible and not crossing or touching. Create power and ground buses on both sides of the chip.
3. Download the data sheet for the LM386 integrated Audio Amplifier from the ECE101 WEB page. The URL is logopolis.union.edu/ece101. Use the data sheet to answer the following questions:
 - a) What component(s) determine the gain of the amplifier.
 - b) Given the part values we are using what is the gain of the amplifier?
 - c) What is the purpose for using C3 and R1?

4. The volume control used changes resistance logarithmically not linearly. Why?
5. The volume control we are using has an on/off switch attached to the back of the control. Indicate the way that the on/off switch will be added to the circuit by adding the symbol for an on/off switch to the schematic diagram in figure 1.
6. If a short develops in the circuit components and wires can be damaged. Use the WEB to investigate fuses and recommend a part number for a fuse that could be added to the circuit. Indicate the way that the fuse switch will be added to the circuit by adding the symbol for a fuse to the schematic diagram in figure 1.
7. Describe a way that you can measure the output power of the amplifier.
8. Complete the following parts list by finding a distributor for each part (there is a list of popular distributors on the ECE101 WEB site) and then entering required information in the table for each part.

Designation	Description	Distributor	Distributor Part Number	Cost
C1, C2, C7	10uf 16 V electrolytic Capacitor			
C3, C6	.1 uF capacitor			
C4	.047 uF capacitor			
C5	220 uF 16 V electrolytic capacitor			
R1	10 Ohm ¼ watt resistor			
VR1	50 k Ohm Audio taper rotary potentiometer			
U1	LM386N-3 amplifier			
SPKR1	8 Ohm 700 mW speaker			

7. Calculate the total parts cost to build the amplifier. Use the parts distributors listed on the WEB site.

