

Lab Project - Audio Amplifier

classmate

- Aditi Dure (ee23Btech14046)

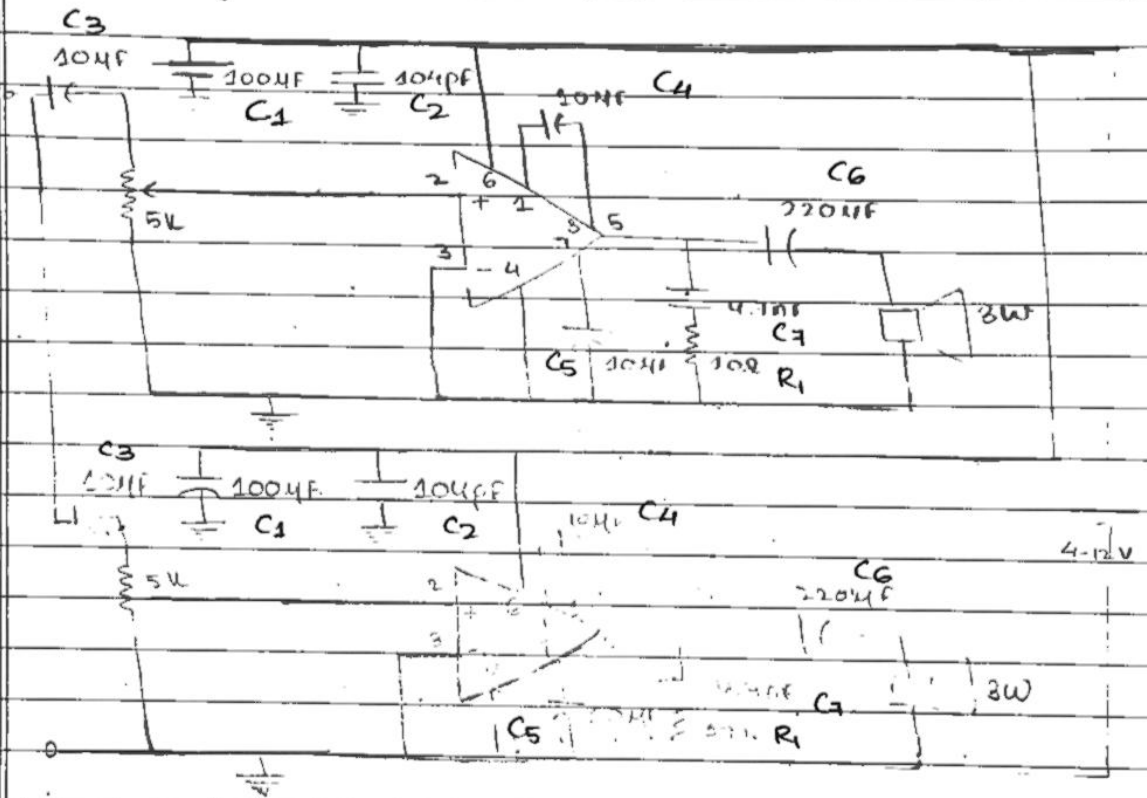
Date

Aim:- To make an audio amplifier using LM386 (stereo)

Apparatus:-

LM386(2), Breadboard, Speakers(2), audiojack(1), resistors (10 Ω) (2), capacitors (10 μ F)(6), 100 μ F(2), 104pF(2), 4.7 μ F(2), 5k potentiometer, connecting wires.

Circuit Diagram:-



Theory: Audio amplifier is a device that converts electrical signal to an acoustic signal. It takes input as low strength audio signal and generates a signal of high strength value.

Components of Circuit:

LM386 (IC): P10.

Gain	1	8	Gain
- input	2	4	Bypass
+ input	3	6	Vs
GND	4	5	Vout

It is the main component of audio amplifier. It amplifies the audio signal received at the input and outputs it with increased power to

drive a speaker or headphone.

Pin 1 & Pin 8 : Gain Control Pins : The gain is typically set to 20 but it can be increased to a maximum of 200 by using $10\mu\text{F}$ (C_4) capacitor i.e here.

Pin 2 & Pin 3 : Input Pins : Pin 2 is -ve input pin and is connected to ground here. Pin 3 is +ve input pin. In this circuit it is connected through two components i.e potentiometer and a capacitor (C_3). Potentiometer is used as a volume knob. Capacitor is used to avoid DC voltage from input source.

Pin 4 & Pin 6 : Power supply : Pin 4 is connected to ground and pin 6 is connect to 5-12V voltage supply through 2 capacitors (C_1 and C_2) in parallel. C_1 works as high pass filter and C_2 as ^{also} ~~low~~ ^{high} pass filter. This ~~combination~~ allows to avoid fluctuations in power supply.

Pin 5 : Output pin : It is connected ^{through} to a capacitor (C_6) and a 'crossover network' to speaker. C_6 removes the DC component from output signal, since it cannot be fed by speakers. Whereas 'crossover network' which includes a capacitor (C_7) & a resistor (R_1) in series to remove sudden high frequency oscillations or noise.

Pin 7 : Bypass : It is grounded using a capacitor (C_5). This pin has direct access to signal input, used to remove power supply noise. (avoiding noise from being amplified).

Procedure:

- Connect all the components of the circuit as shown in the figure.
- Connect your phone through the audio jack and give power supply.
- try varying the resistance of the potentiometer in order to get the best audio (i.e. least noise).

Observations:

- By changing value in the potentiometer, we intend to reduce the noise in the output.
- During playing music, current through the circuit varies according to the frequency of the music.
- By changing the value of capacitance between pins 8 (C4), you can vary the loudness of sound.

Conclusion:

The project experiment successfully achieved its objectives by designing and constructing a variable audio amplifier (circuit).