Homework 3

Mansi Uniyal
19EE10039

__/__/____

PWM audio:

(Pulse Width Modulation).

It is used for simulating analog signal using digital o/p. The amount of power depends on duty cycle of signal, to vary the output while maintaining a constant freq. It generates audio signals with a speaker, while freq. is varried to generate various tones.

Varrying duty cycle creates useful timbral vibrations. Some synthesizers have duty cycle trimmers for square wave outputs. 50% point (square wave) is distinctive as even no. harmonic disappears at 50%.

Pulse waves {50%, 25%, 12.5% duty ratio} makes up soundtracks of classic vidio games.

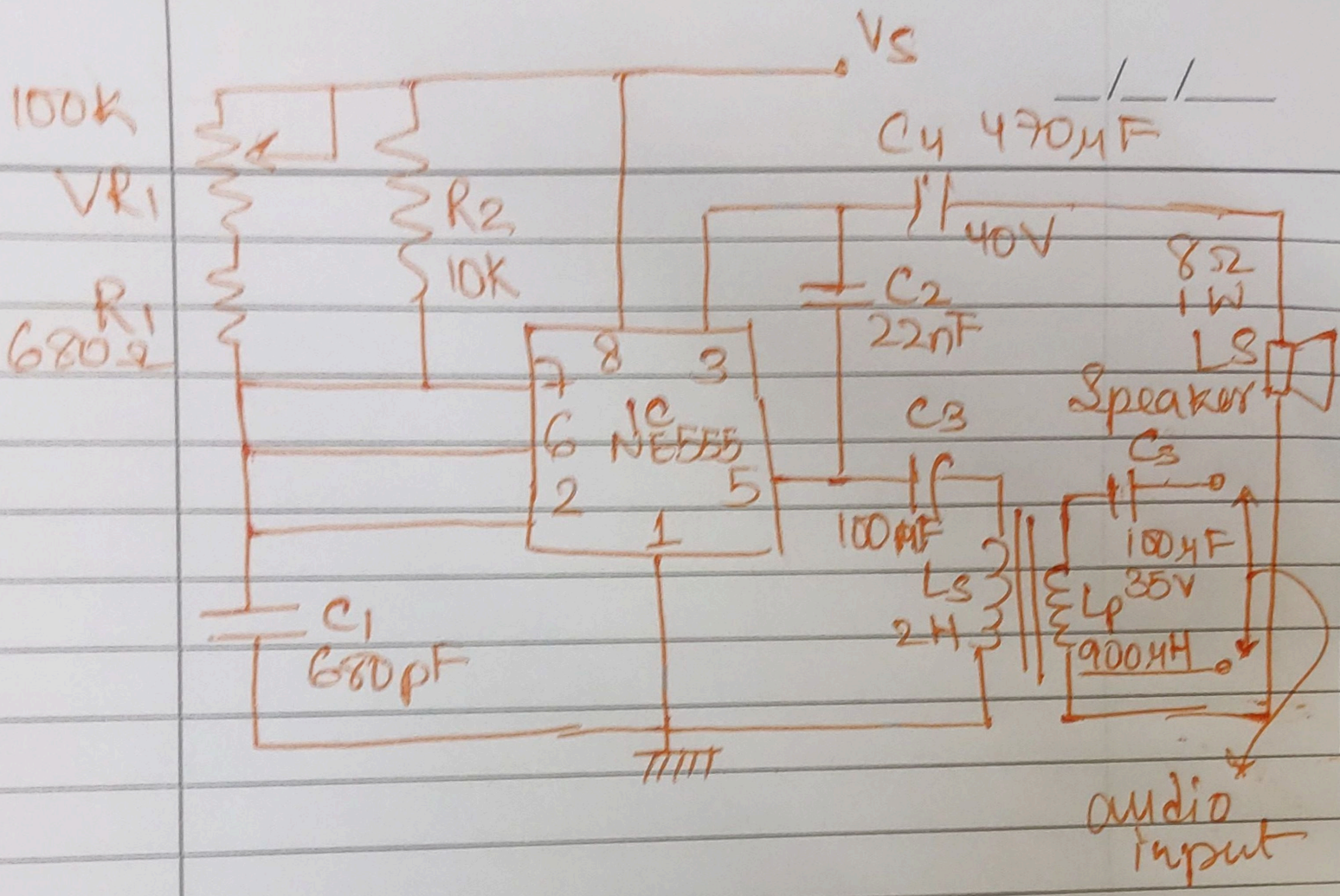
555 Timer PWM Audio Amplifier is one of its application:

__/__/____

There is astable multivibrator. The ubiquitous 555 timer IC handles audio signals in its own pulse width modulation way. It works in astable mode. Switching freq can be varied from 65 & 188 kHz. Selection of PWM freq. depends on amplitude of input signal and load impedance. The carrier freq's pulse width varies as a func" of amplitude of input audio signal. Feedback capacitor C_2 ensures reproduction of audio signal. Output LC filter is common approach for reasonable rejection of carrier freq. Speaker respond to avg DC modulated with audio signal.

Input impedance mateing transformer match headphones output to input of TES amp. 8Ω, 1W speaker is load.

PWM gives similar performance to convential amplifier with higher efficiency & effortless bass.


Vs
100k
VR1
R1
680Ω
R2
10K
C1
680pF
IC
NE555
8
3
7
6
2
5
1
C2
22nF
C4 470μF
40V
C3
100nF
Ls
2H
Lp
900μH
35V
C5
100μF
8Ω
1W
LS
Speaker
audio
input