

EE-1005 Digital Logic Design
Semester Project Report
PIANO KEYBOARD USING NE 555 TIMER IC



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Section: 3A

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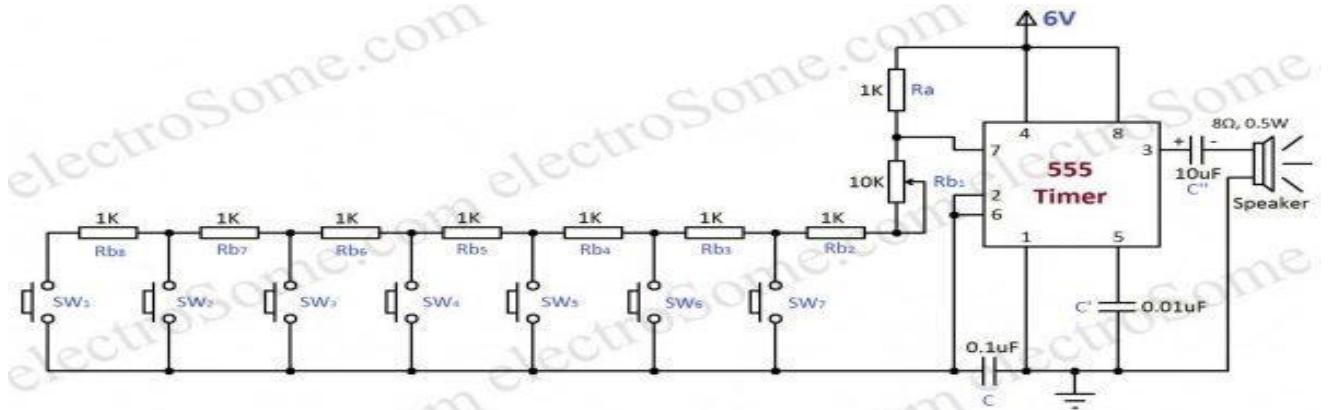
Contents

Project Overview	1
Connection	1
Working and Explanation	1
Components	1
Future Work /Recommendations	1
References	1

Project overview

Piano is an instrument used to create musical sounds at different frequency. It can be constructed by using a 555 timer IC which behaves as an Astable multivibrator. The IC is also used in a variety of timer, pulse generation, and oscillator applications. In this project it is mainly used in the astable mode. It is a simple illustration of a piano that is able to produce sounds at different frequencies.

CIRCUIT DIAGRAM



Connection

1. Connect all the Pushbuttons with the 10K Resistors as shown in the circuit.
2. Place the 555 timer IC on the breadboard and connect **Pin 4** and **Pin 8** to VCC and **Pin 1** to GND.
3. Connect the **Pin 2** and **Pin 6** to the 100nF Capacitor.
4. Connect the **Pin 7** to the Wiper of Potentiometer.
5. The other terminals of the potentiometer will be connected to the network of pushbuttons and resistors and to the VCC.
6. Connect the output **pin 3** to the 10nF Capacitor and Speaker.

Working and Explanation

In this circuit, the 555 timer IC will work as an Astable multivibrator producing a square wave of different frequencies at the output. The speaker will produce different sounds depending upon the frequency of the signal. To change the frequency of the output signal, vary the total resistance of the circuit by pressing different switches. So every time you press a button a different amount of resistance gets connected to generate a different frequency square wave and the speaker will produce different tones.

Pin 6 and Pin 2 will allow retriggering of 555 Timer IC after every timing cycle. So we will connect these pins together to the ground through a capacitor. The output pin 3 is connected to the speaker through a 10uF capacitor and the fourth pin is connected to the VCC to avoid any sudden resets.

Components

- 555 Timer IC – 1
- Speaker 8Ω , 0.5W – 1
- Resistor 1K – 8
- Variable Resistor 10K – 1
- Electrolytic Capacitor $10\mu F$ – 1
- Ceramic Capacitor $0.1\mu F$ – 1
- Ceramic Capacitor $0.01\mu F$ – 1
- Push Button or Micro Switch – 7

Future Work /Recommendations

- The future work is to improve the sound quality and to improve the frequency of sound so that the sound becomes more accurate.

References

<https://electrosome.com/electronic-piano-555-timer/#:~:text=A%20simple%20electronic%20toy%20piano%20particles%20of%20the%20medium.>