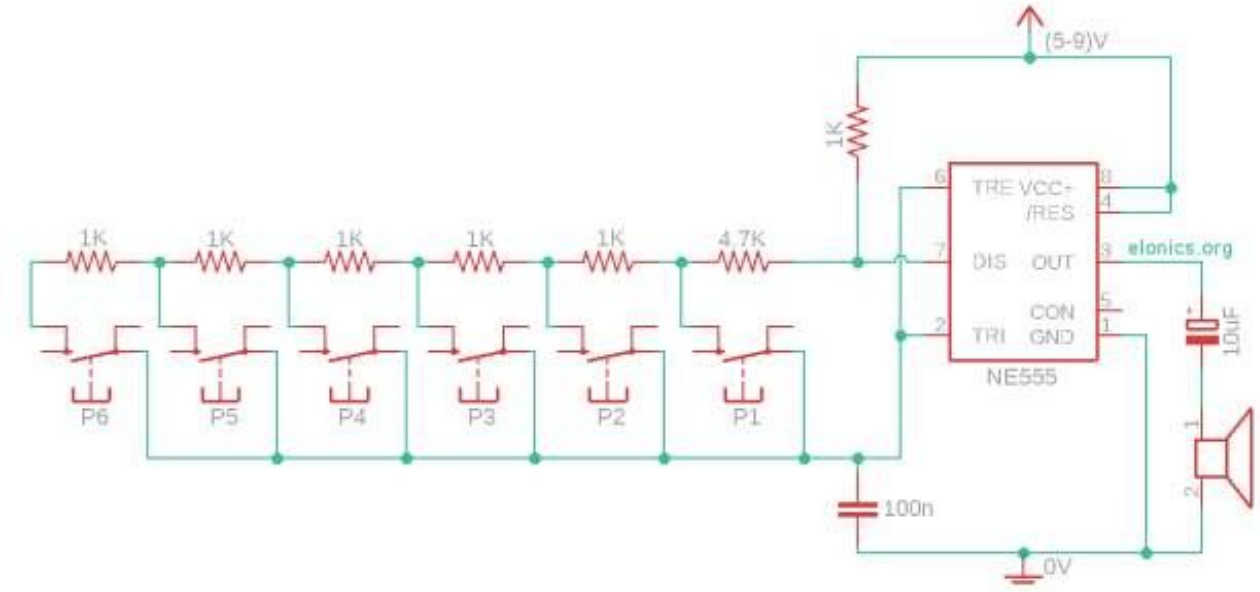
PROJECT NAME: **Electric Piano Circuit using 555 timer IC**

ABSTRACT: This report discusses the design, operation, and implementation of an electric piano circuit using the 555-timer integrated circuit (IC). The circuit is capable of producing distinct musical notes corresponding to keys on the piano. This report covers the principles of the 555 timers in a stable mode, the methodology for generating audio frequencies, and practical applications of the electric piano circuit.

CIRCUIT DIAGRAM:



ELECTRIC PIANO CIRCUIT

DESCRIPTION OF THE COMPONENTS USED IN THE PROJECT:

1.555 Timer IC:

1. The 555 timer has a flip-flop, voltage divider, and comparator.
2. It generates accurate timing pulses for operating devices and components.
3. The output depends on the amplitude of the external trigger pulse applied to the trigger pin.
4. It can function as a square-wave generator, oscillator, and time delay provider.

2.Resistors:

In electronic circuits, resistors are used to reduce current flow, adjust signal levels, to divide voltages, bias active elements, and terminate transmission lines, among other uses.

3.Capacitors:

A capacitor is an electronic component that stores and releases electrical energy. It consists of two conductive plates separated by an insulating material (dielectric). In

this circuit, capacitors are used for timing in the RC network, which determines the oscillation frequency of the 555 timers, and for decoupling to stabilize the power supply and reduce noise.

4.Push-button switches:

A push button switch is a mechanical device used to control an electrical circuit in which the operator manually presses a button to actuate an internal switching mechanism. They come in a variety of shapes, sizes, and configurations, depending on the design requirements

5.Speaker (8 ohms):

an 8-ohm speaker is considered a relatively low-impedance speaker. This means that it's capable of drawing more power from the amplifier, resulting in a louder and more efficient sound. However, it also means that the speaker requires more current from the amplifier, which can be challenging for some amplifiers to provide.

6.Power supply:

- The power supply is an electric instrument that used to deliver electrical energy to the electrical load connected with it.

- The basic operation of a power supply is that it transforms electrical current received from the input source to such level of current, voltage and frequency that can operate load.

CIRCUIT OPERATION OF THE PROJECT:

- The 555 timer generates square waves at specific frequencies depending on the resistance and capacitance values in the RC network.
- When a push-button switch is pressed, it introduces a specific resistance into the circuit, causing the 555 timers to oscillate at a frequency corresponding to a musical note.
- The output from the 555 timer is amplified and fed into the speaker, producing sound.

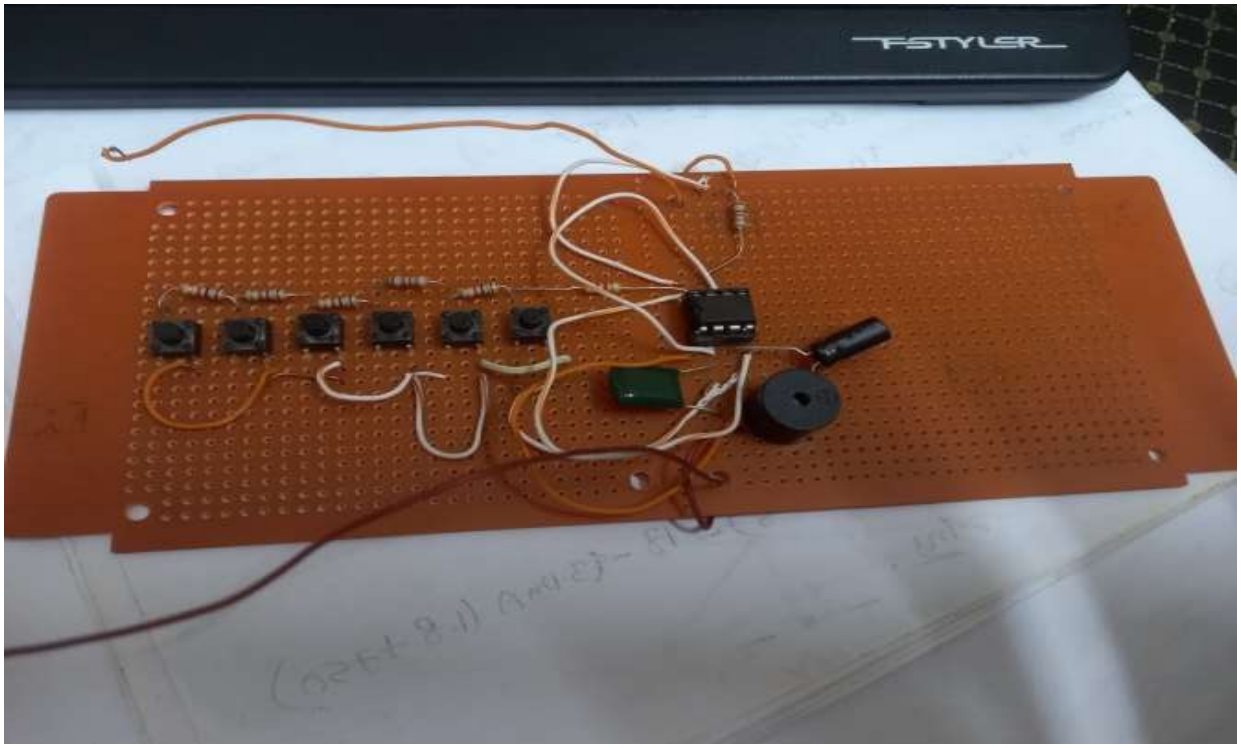
APPLICATIONS:

- Educational tool for learning electronics.
- Low-cost toy piano for children.
- Demonstration of the 555 timer's versatility in sound generation.

COST CALCULATION:

555 TIMER IC: 40 TK
RESISTORS (1K,4.7K) :15 TK
CAPACITOR (100nF,10nF): 2 TK
PCB BOARD (BIG): 50 TK
POWER SUPPLY (9V): 60 TK
SPEAKER: 35 TK
PUSH BUTTON SWITCH: 15 TK
CONNECTING WIRE: 30 TK
TOTAL: - 247 TK

PICTURE OF THE PROJECT:



DISCUSSION:

The electric piano circuit using a 555 timer IC demonstrates the practical application of basic electronic components to create a functional device. By varying the resistance and capacitance, distinct musical notes can be generated, showcasing the flexibility of the 555 timers. This project not only serves as an educational tool but also provides insight into sound generation and frequency modulation.