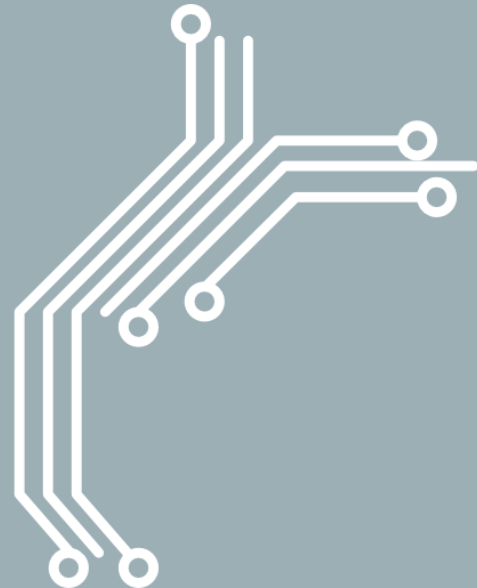


ATARI PUNK CONSOLE + 10 STEP SEQUENCER

MUSHFIQ MAHMUD
ANDREY SKLYAR



WHAT IS IT?

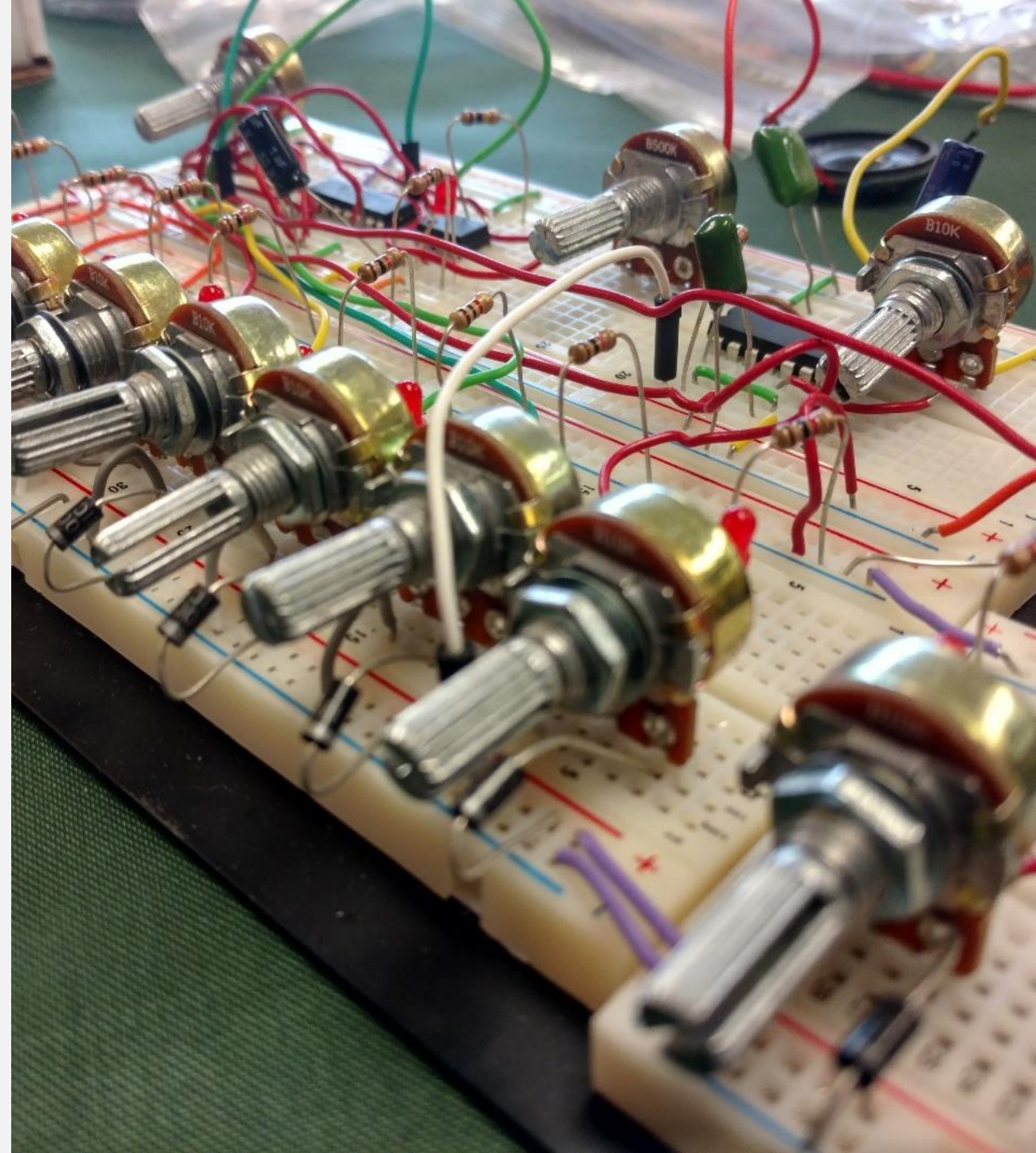
- A tone generator coupled with a 10 step sequencer
- Can generate 10 notes in succession
- Sounds like a MIDI keyboard
- Can be enhanced to use music industry or for creating digital sounds

OVERVIEW

The Atari Punk Console is a tone generator and coupled with a 10 step sequencer, it can generate a sequence of notes in succession. The sound produced sounds very similar to a MIDI keyboard and this can be enhanced to be used in the music industry to create music and digital sounds. We decided to work on this project because it was both fun and practical. The potentiometers on board have differing functions. The ones on the front change the note frequency coming out of the decade counter. At the back, the one on the left changes the frequency of the 555 astable clock pulse generator for the decade counter which makes the notes play quicker. The one in the middle controls the frequency and pulse width of the overall sounds being produced and the one on the right is for volume.

OVERVIEW

- Onboard Potentiometers change frequencies
- Front pots change individual notes
- Back pots change note speed, volume and frequency ranges for all notes

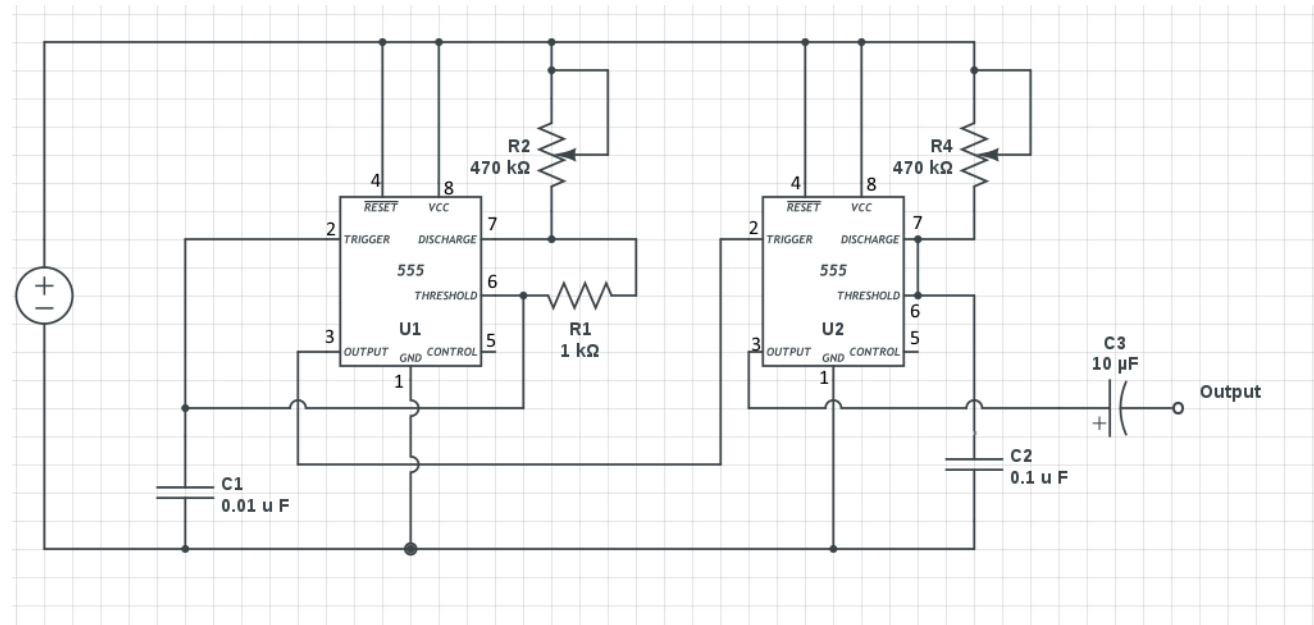


ATARI PUNK CONSOLE

The Atari Punk Console is a circuit that uses two 555 timers. One timer is used as an astable multivibrator to create oscillating square waves that drives another 555 timer as a monostable multivibrator connected to it to generate square waves based on the frequency of the astable 555 but with different time period. The frequency of sound and the time for which each wave lasts can be adjusted using potentiometers. The output of this circuit, that can be connected to a speaker, is a lo-fi sound very much like MIDI. It was popularized by Forrest M. Mims III (Silicon Concepts, 1984) and later Kaustic Machines who coined the name

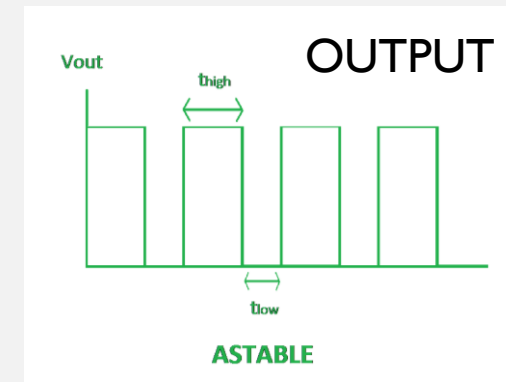
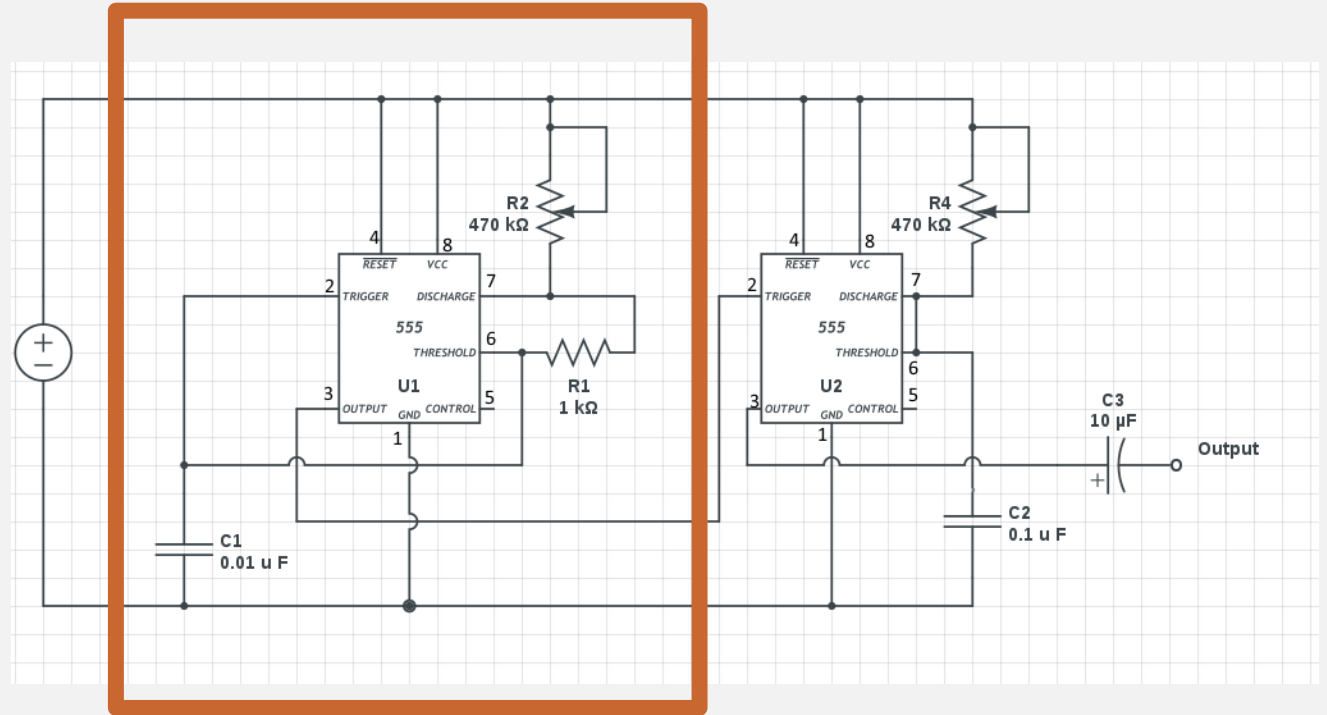
ATARI PUNK CONSOLE

- Circuit that uses two 555 timers.
- One in astable mode
- One in monostable mode



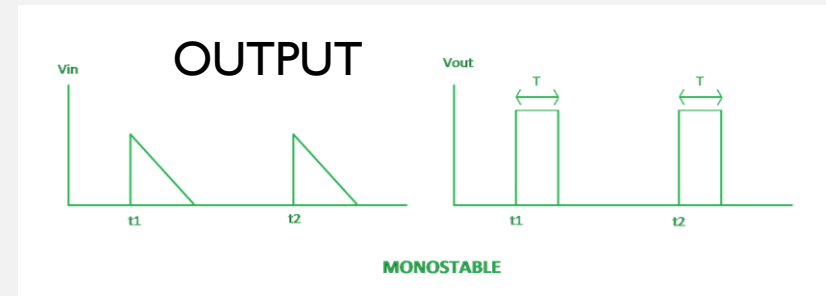
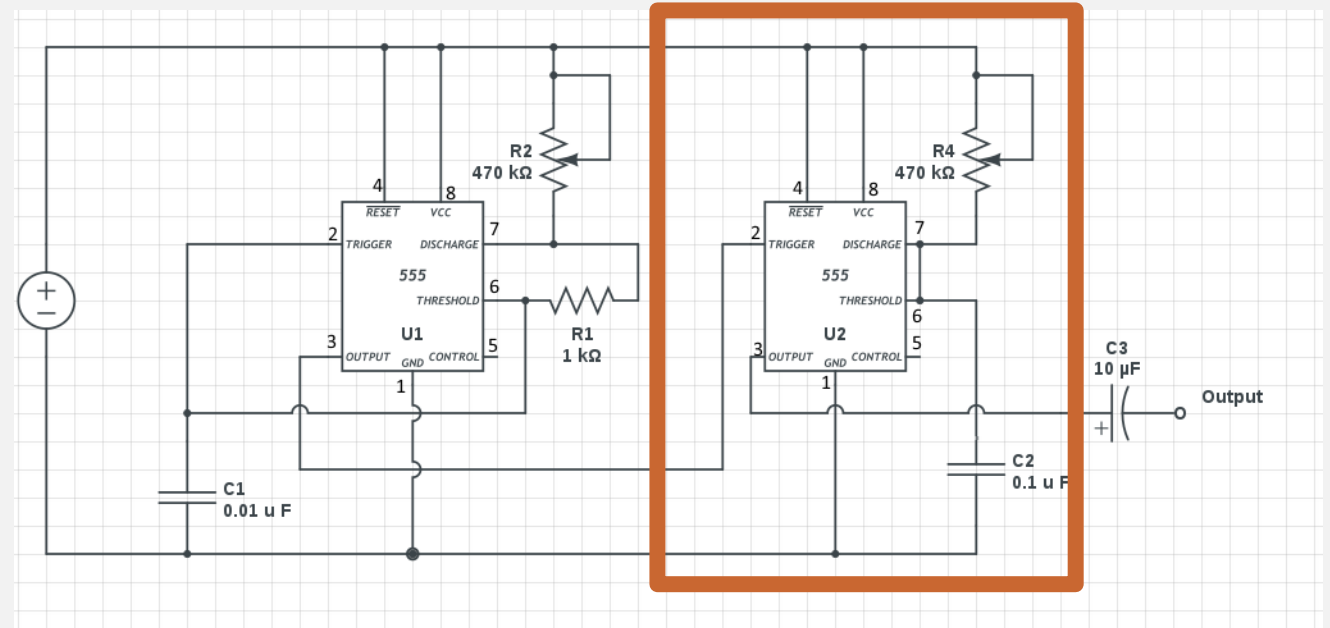
BACKGROUND ON 555 ASTABLE

- An astable multivibrator will create a pulse with a specific duty cycle (ratio of HIGH to LOW) depending on the design. The time variables used throughout this paper is t_{high} for time period of HIGH output and t_{low} for period of LOW output. This circuit does not need any input.
- $t_{\text{HIGH}} = C(R_a + R_b)\ln(2)$
- $t_{\text{LOW}} = CR_b\ln(2)$
- This timer creates a square wave that drives the monostable timer.

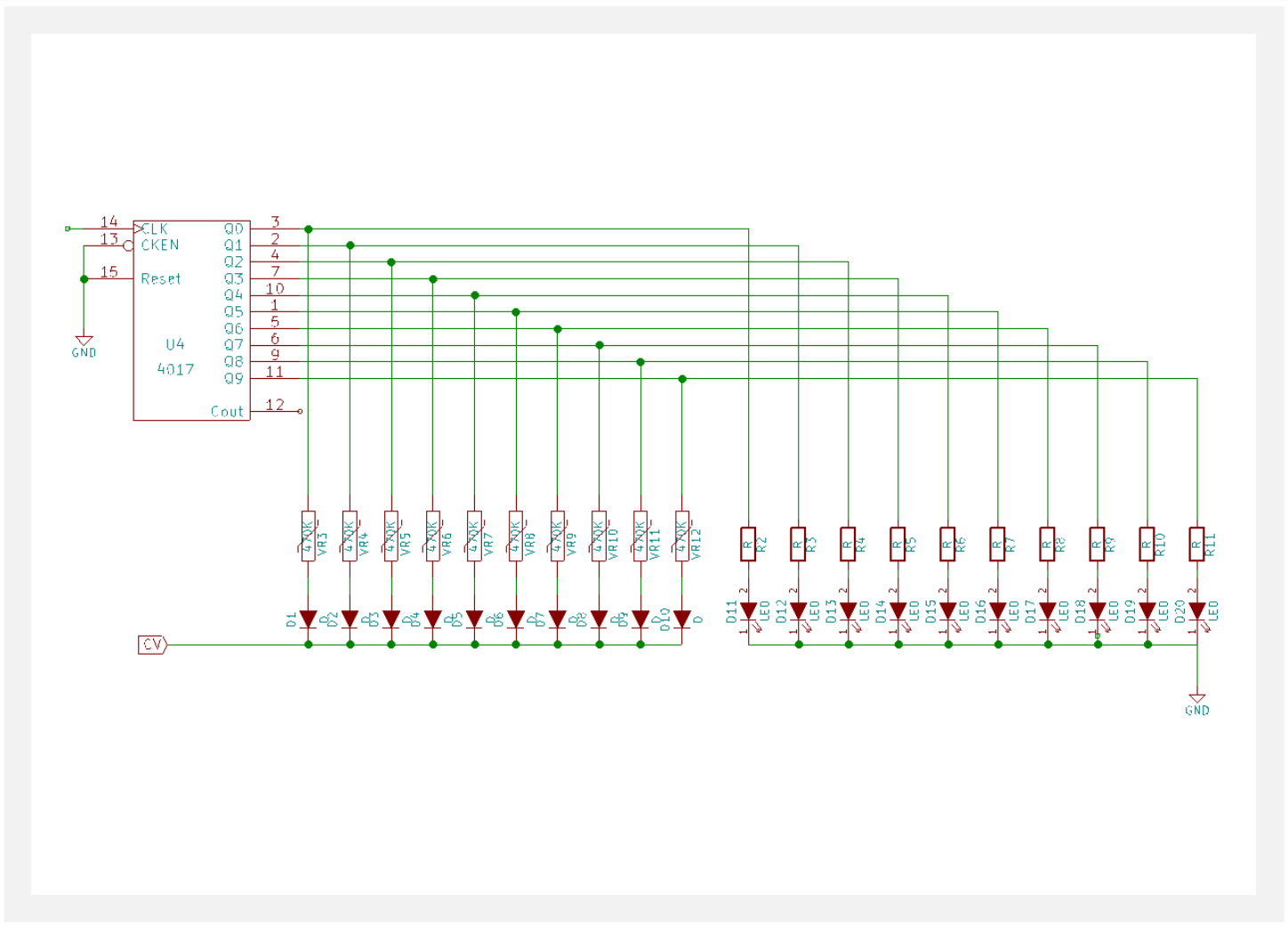


BACKGROUND ON 555 MONOSTABLE MULTIVIBRATOR

- A multivibrator circuit is a switching circuit that can be either ON or OFF for specific time intervals.
- A monostable multivibrator will output a HIGH for a specific time period T when an impulse is inputted into the circuit. The time period will depend on the design of the circuit namely the resistance and capacitance.
- $T = CR_a \ln(3)$

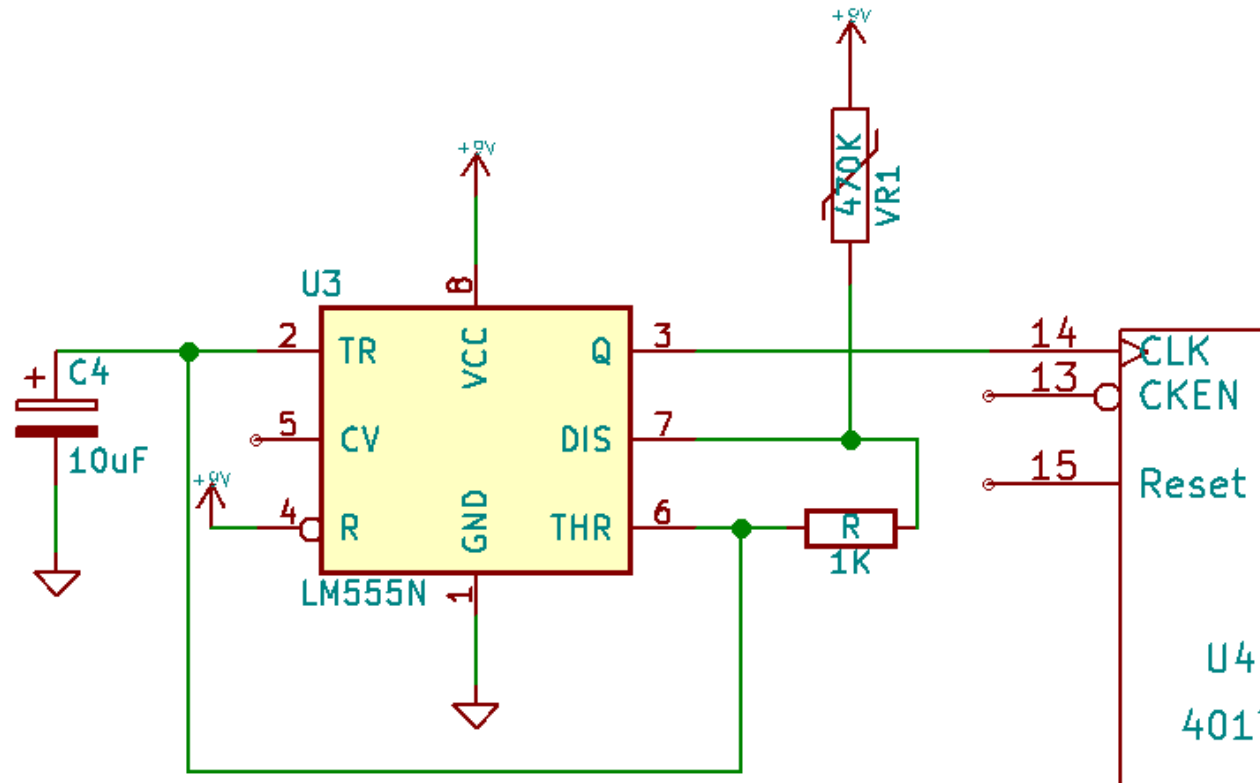


10 STEP SEQUENCER



- The 4017 decade counter counts up from 0 to 9 on every clock pulse
- This is helpful to play 10 distinct musical notes that can be outputted via the Control Voltage (CV) output to any line signal or amplifier.

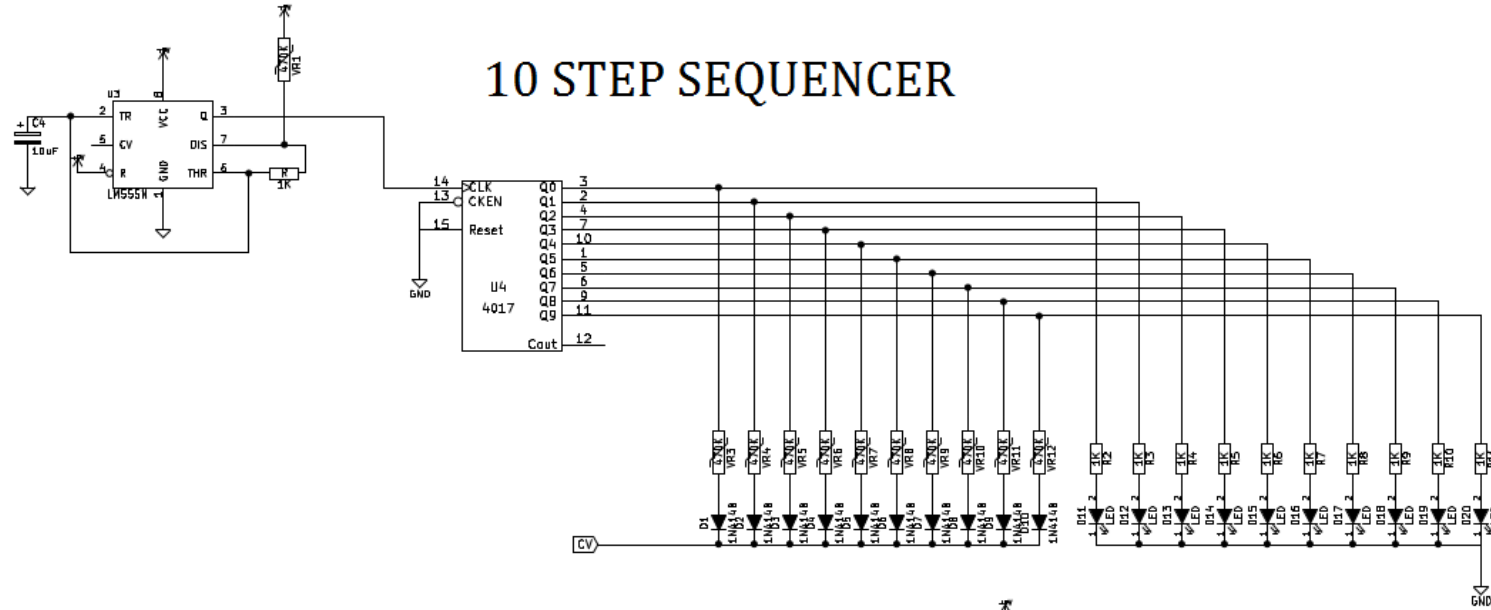
10 STEP SEQUENCER



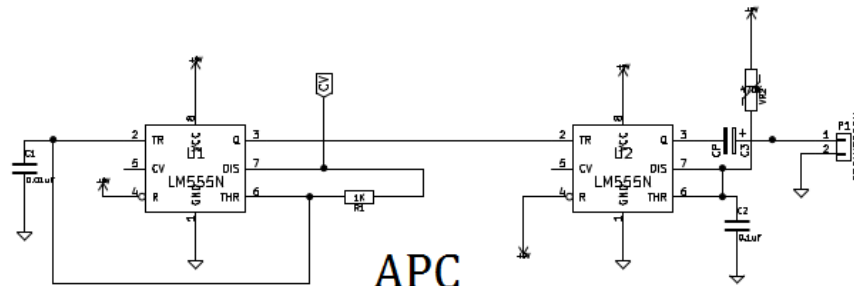
- The clock pulses are created using a 555 timer in the astable mode.
- The frequency of the clock pulses can be controlled via a potentiometer
- This will make the decade counter count faster and thereby the musical notes will be played in quicker succession.

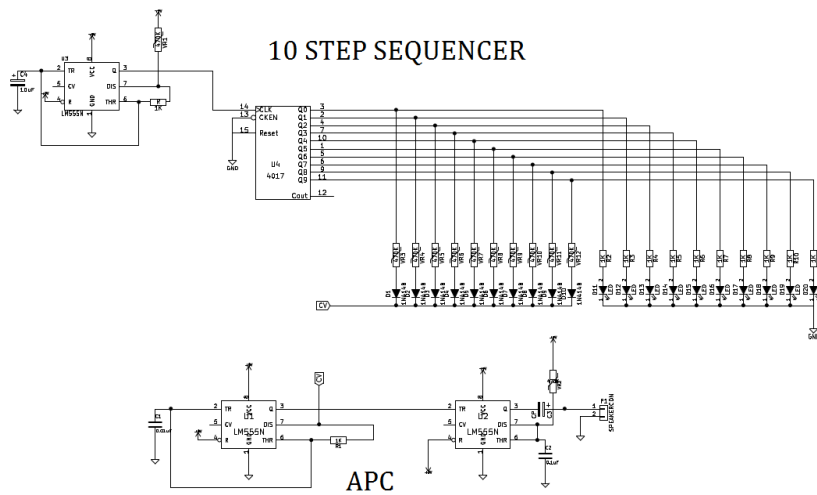
THE COMBINATION

10 STEP SEQUENCER

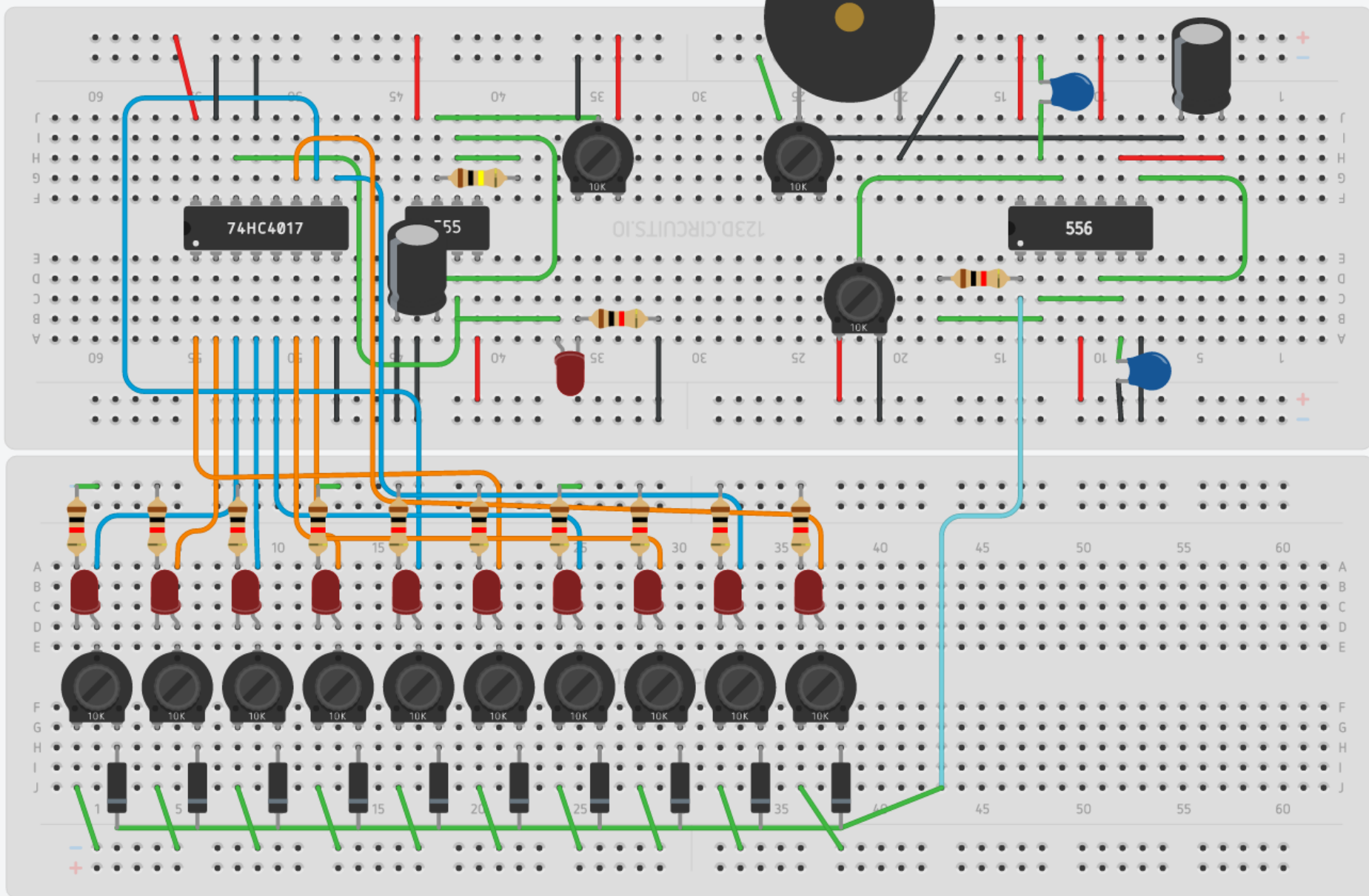


APC





The APC generates the sound and the decade counter takes the sound and outputs 10 different notes and plays them in succession.

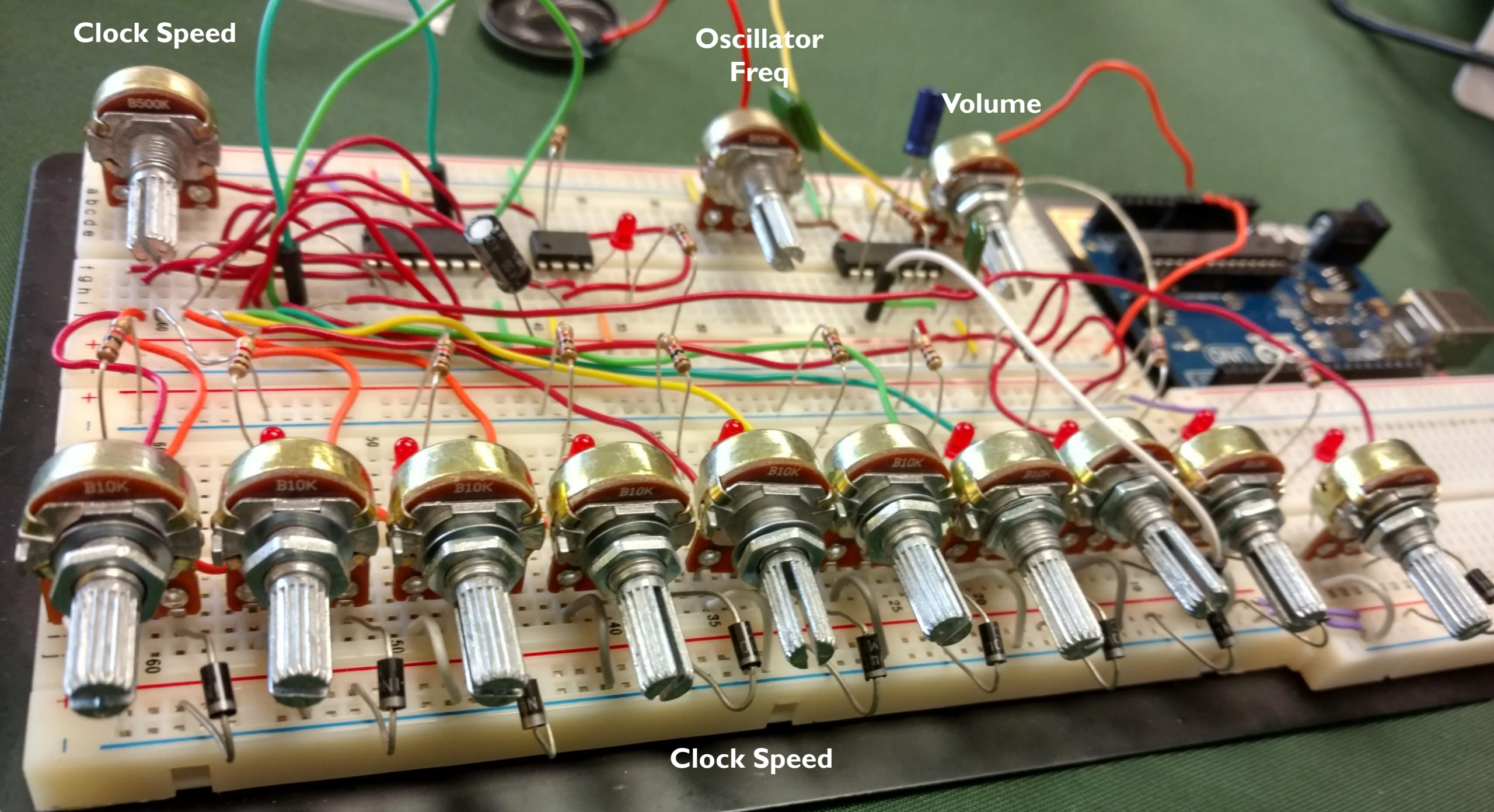


Clock Speed

Oscillator
Freq

Volume

Clock Speed



LIST OF COMPONENTS

- 1 555 timer
- 1 556 dual timer
- Capacitors (0.01 μF , 0.1 μF , 1 μF , 10 μF)
- Resistors (1 k Ω and 100 k Ω)
- 8 Ω Mini Speaker
- CD 4017 Decade Counter
- 4001 Diodes

