GRAB CIRCUIT

G14

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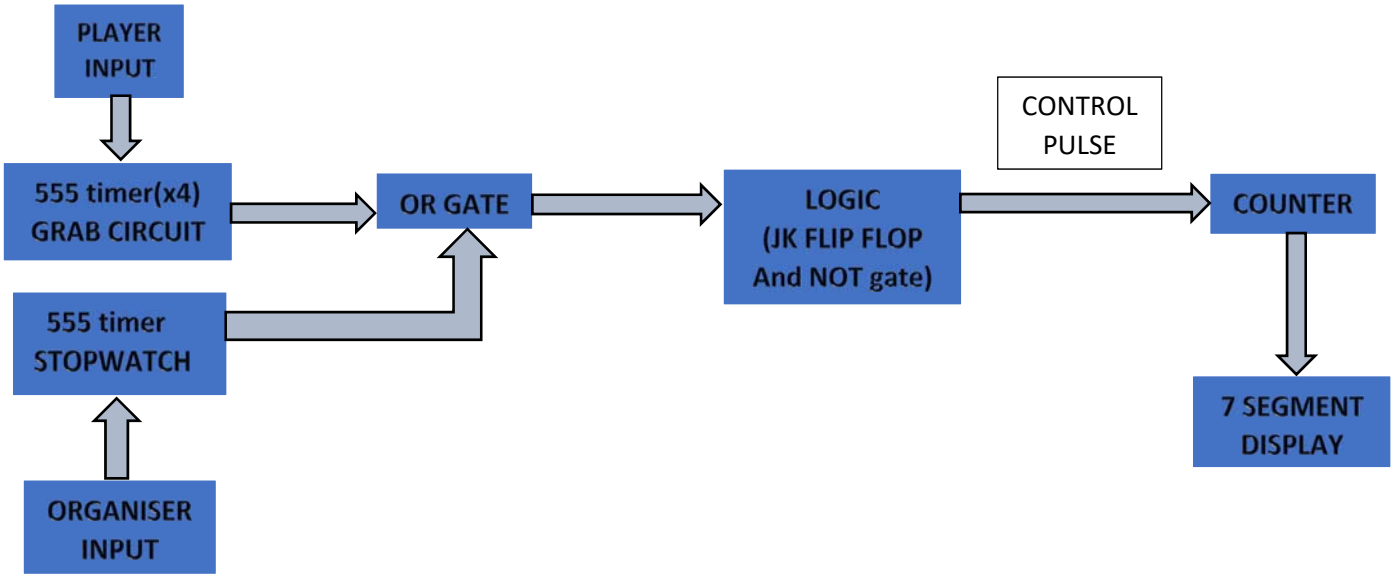
Problem Statement:

There are 4 players, each is given a push button to indicate when he/she is ready with the answer. You have to not only detect who is first, but also display how much time he/she took to operate the button.

Components List:

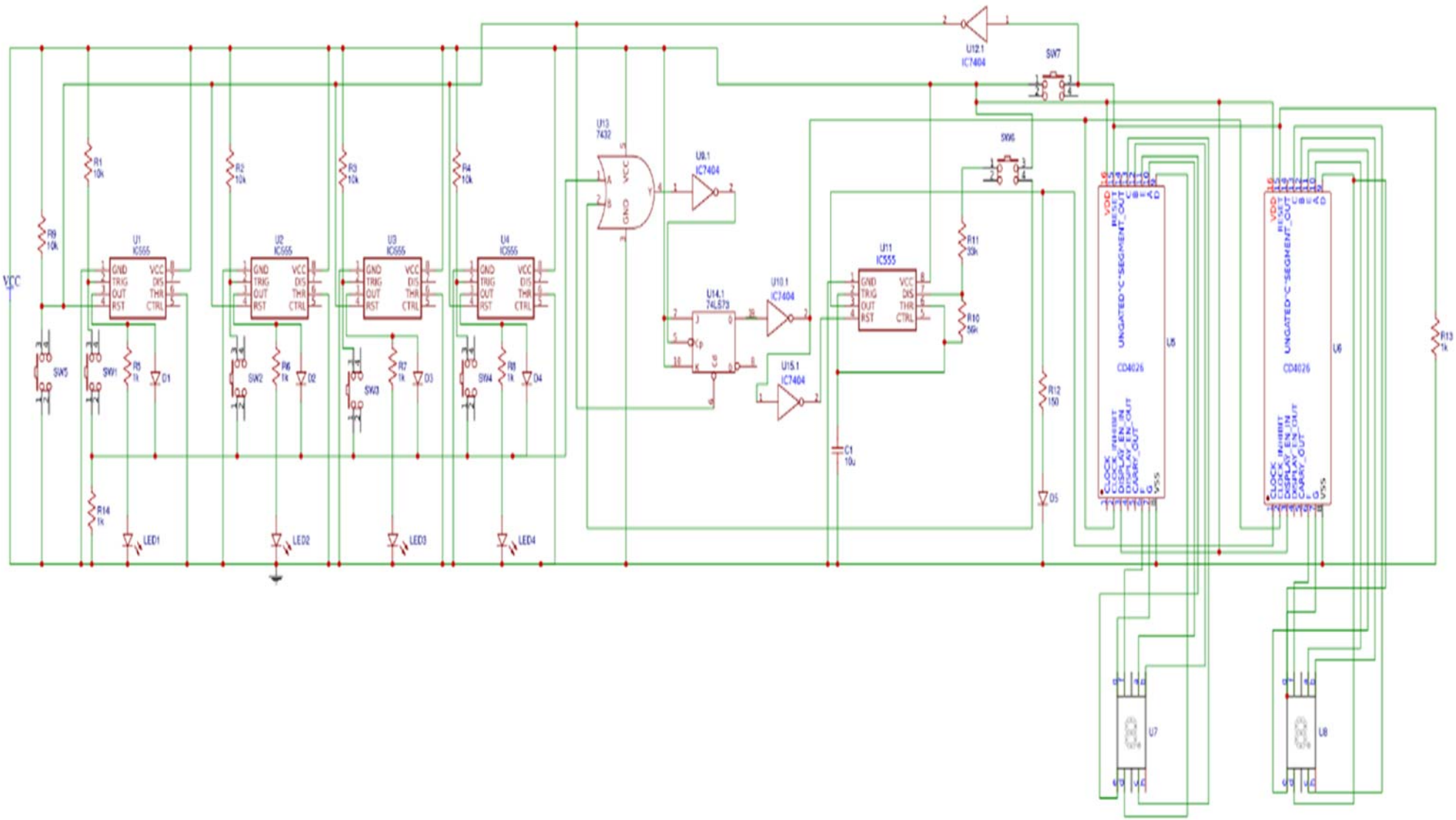
- 5x NE 555 timers
- IC 7432 (OR gate)
- IC 7404 (NOT gate)
- IC 74HC73 (JK flip flop)
- 2x IC CD4026 (Decoder)
- 2x common cathode 7-segment BCD display
- 4x LEDs
- 5x Diodes
- Resistors- 1x 33k, 1x 56k etc.
- Capacitor – 1x 1uF

BLOCK DIAGRAM:



DESCRIPTION OF WORKING:

- Grab circuit:
    - 555 Timer: The trigger of the circuit is connected via a switch to a voltage divider arrangement. In the beginning, the circuit is in reset condition and is waiting for a trigger signal. As soon as the player pushes a button, the output of that timer becomes high and remains high (hence it doesn't allow any other LED to glow) due to the diode and voltage divider arrangement.
    - RESET button: The reset button is connected to the reset of all timers and when the reset button is pushed, the reset pin becomes high and resets all the timer ICs.
- Stopwatch circuit:
    - 555 timer: It works as an astable multivibrator producing a continuous train of clock pulses.
    - IC CD4026: The output of the 555 serves as a clock for the first counter. The carry out of the first is given to the second counter. Hence it works as a decade counter. The output is connected to the 7 segment displays.
- IC 7432(OR gate): It serves as an interface between the grab circuit and stopwatch.
- IC 74HC73 (J-K flip-flop): The output of the flip flop is used to set or reset the clock inhibit pin of both the counters.
- IC 7404(NOT gate): The inverting effect of the gate is used wherever required.



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