READY TO DRIVE SOUND (RTDS)

OBJECTIVE

The objective is to provide a clear and recognizable signal to the driver, enhancing safety and preventing any accidental starts or stops. Ready to Drive Sound imply the auditory signals and cues that indicate a vehicle is prepared for operation.

A Ready to Drive sound circuit typically refers to a pre-assembled or pre-configured electronic circuit designed to produce sound output without requiring additional components or complex setup.

COMPONENTS REQUIED

- Battery (5V)
- Potentiometer (10K ohm)
- Resistor (1K ohm)
- Resistor (390ohm)
- Comparator IC (LM358N)
- SPDT switch
- NAND gate (7400)
- 555 timer
- LED
- Capacitor 10nf and 10uF
- 100K ohm resistor

RULES FOR RTDS

The vehicle must make a characteristic sound, continuously for at least one second and a maximum of three seconds when it enters ready-to-drive mode.

The sound level must be a minimum of 80 dBA and a maximum of 90 dBA, fast weighting in a radius of 2 m around the vehicle. The used sound must be easily recognizable.

No animal voices, song parts or sounds that could be interpreted as offensive will be accepted. The vehicle must not make any other sounds similar to the ready-to-drive sound.

The vehicle is ready to drive as soon as the motor(s) will respond to the input of the APPS.

The RTDS is a non-programmable circuit.

SOFTWARE USED FOR SIMULATION

We are using “Multisim” to simulate the RTDS circuit and show the desired output.

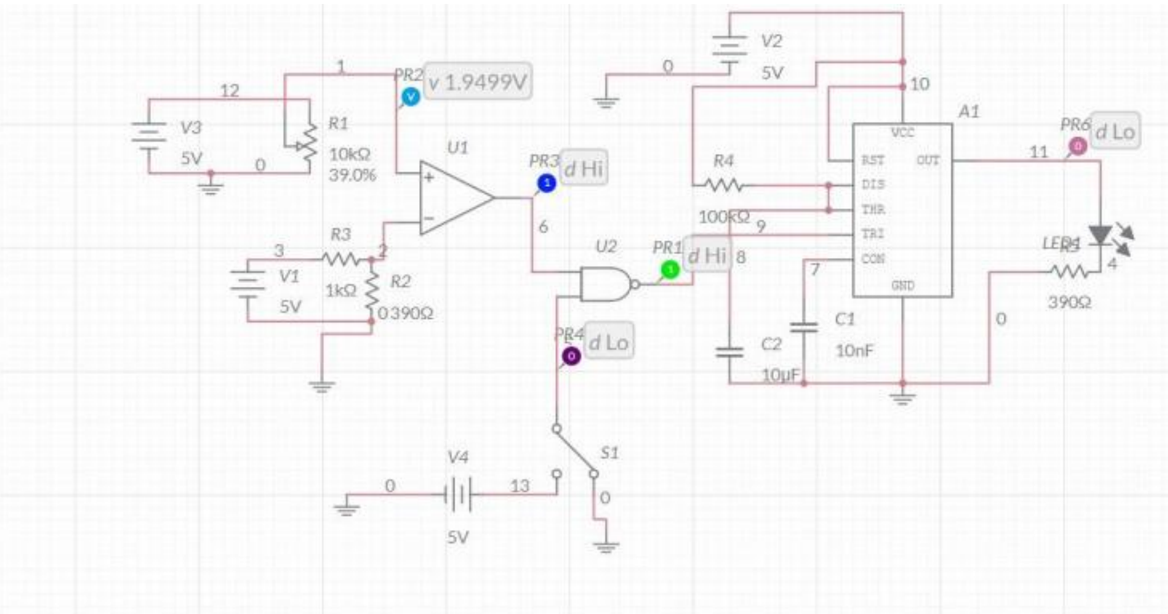
WORKING PRINCIPLE

When we start our car we have to press our brake pedal above 25% and turn on the master switch simultaneously we and as a result the LED** turns ON for 1.1 sec indicating that the vehicle has started.

So to achieve this we have taken the following steps:

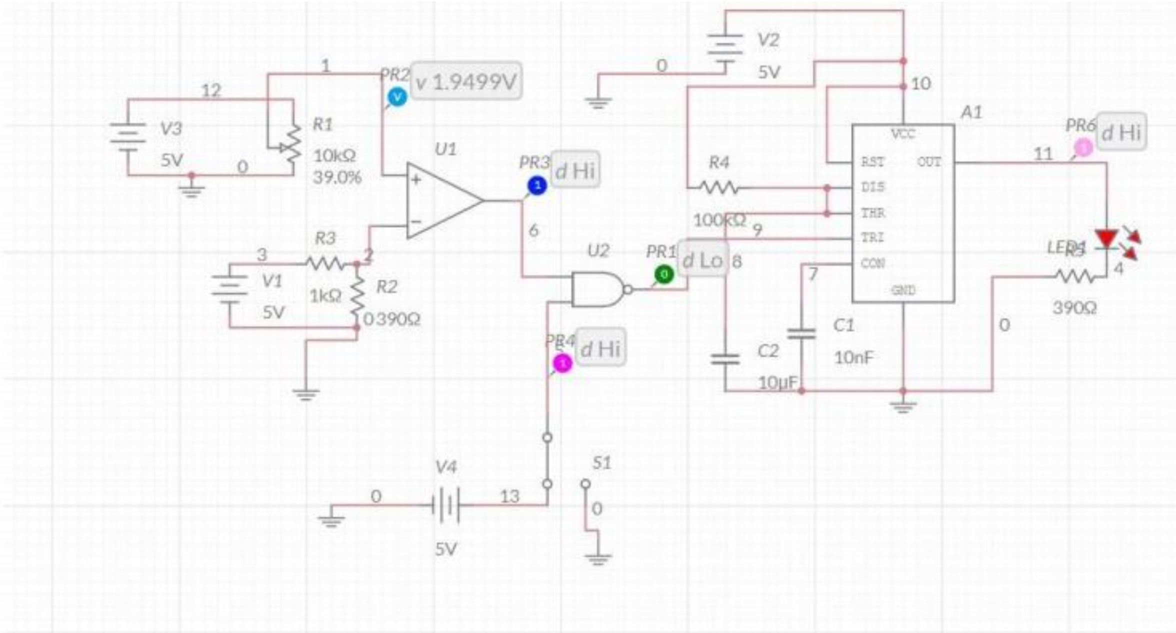
- To get the position of brake pedal we use a potentiometer.
- We have made a voltage divider circuit which gives a voltage output such that it is 25% of the maximum voltage output that the potentiometer can give (i.e 5V in this case).
- Now we need to compare the voltage from the potentiometer and the voltage divider circuit. So we use a LM358N to compare the voltages.
- The output of the voltage divider circuit is connected to the negative terminal of the comparator and positive terminal is connected to potentiometer.
- **Vout=5*(390/390+1000)=1.402 V**
- If the brake is applied above 25% the comparator gives a HIGH signal otherwise it gives a LOW signal.
- Now the output of the comparator and a switch is connected to the NAND gate.
- So when the Comparator gives a HIGH signal and the switch also gives a HIGH signal the NAND gate gives a LOW signal.
- Due to this NEGATIVE pulse the 555timer which is setup in 'Monostable'mode gets triggered and the LED turns on for 1.1 second.
- This time delay can be changed on the basis of the resistor and capacitor connected to 555 timer. **T = 1.1*R * C**
- **T=1.1*100000*(1/100000)=1.1sec.**

** We have used an LED instead to a buzzer just for simulation purpose.



Schema diagram

RESULT



The LED glows for 1.1 sec when the brake pedal is pressed by more than 25% and the Master switch is simultaneously turned ON, indicating that the car has been started.