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## APPLICATION OF IOT SENSORS FOR SPEED AVOIDANCE IN VEHICLES

M Manish

Department of Computer Science and Engineering, Saveetha School of Engineering, Saveetha University, Chennai.

Email: [manishmulinti@gmail.com](mailto:manishmulinti@gmail.com)

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### Abstract:

The intention of this assignment is to design a hallmark device that detects the hump. This indicator is developed by means of the usage of Infrared (IR) and Radio Frequency era by using the usage of this RF based totally hump indicator the extent of accidents happening because of humps may be reduced.

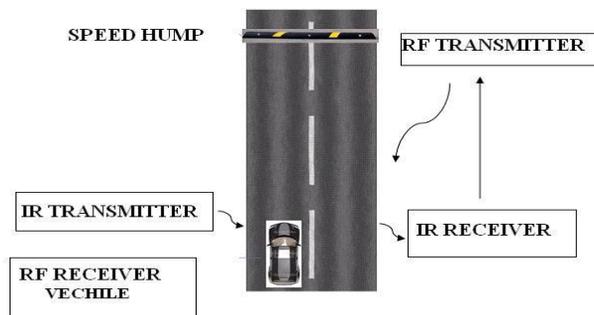
**Keywords:** Hump, RF transmitter, RF receiver, IR transmitter, IR receiver, RS434.

### II. Introduction:

In our everyday lifestyles there are numerous injuries going on due to loss of indication near the hump. To minimize such injuries a device is carried out which suggests the hump in the automobile reaches closer to hump. This machine can reduce price of the injuries. This detector is used to signify the hump immediately in the vehicle. this is carried out via the usage of easy RF transmitter close to the hump and RF receiver in the vehicle. For saving the power fed on by the transmitter an IR gadget is placed close to the hump, so whilst the automobile crosses the IR gadget the RF transmitter close to the hump is activated. The RF receiver in the car receives the alerts and indicates by using speaker. depending upon the timing set within the timer the RF transmitter will transmit the sign. Velocity humps had been added within the previous couple of years in an try to lessen visitors injuries. A hump (additionally called a road hump, or undulation, and pace ramp in Eire) is a rounded site visitors calming device used to lessen car velocity and quantity on residential streets. Humps are positioned across the street to sluggish site visitors and are regularly set up in a chain of numerous humps so that it will save you vehicles from speeding before and after the hump. not unusual speed hump shapes are parabolic, circular, and sinusoidal. The causes of injuries due to humps are specially by using these reasons, loss of sound database and lack of data device primarily based on medical proof. it's miles an approximation that 14

percent of the street accidents arise in particular because of humps. In gift avenue transport systems in India the indication of hump is accomplished with the help of indication forums. the main problem that is confronted right here is that when any automobile collides with the indication board it takes a whole lot time for the board to be replaced, in truth the board will not get replaced. Due to lack of indication accidents may happen, so this system provides a safe and secure indication for the vehicles.

**III. Implementation:** The brief representation block diagram of the project is shown in Figure 1.



**Figure 1 Block diagram of hump indicator.**

The hump indicator is developed by using IR and RF technology. It consists of mainly five blocks. They are

#### **A. IR Transmitter**

The function of IR transmitter is to transmit 38KHz IR signal. This sign can be generated through IC555 astable multivibrator. This pulse is used to force an IR LED which is used to transmit the IR rays to the receiver circuit. The variable trim pot is used for adjusting the accuracy of the output frequency to 38 KHz.

#### **B. IR Receiver**

The IR receiver is the main a part of the control circuit. It includes an IR receiver that is used to stumble on the IR Rays transmitted by using the IR transmitter. whilst a vehicle cuts the IR rays the output of the IR receiver becomes excessive. This sign is in addition used as manipulate signal for the operation of RF transmitter.

#### **C. RF Transmitter**

The RF transmitter is used to transmit waves with frequency of 433MHz

#### **D. RF Receiver**

The RF receiver is installed in the car for hump indication. Frequency of operation is 433MHz. while the vehicle cuts their device the RF transmitter is switched ON based totally at the timing set through the monostable multivibrator.

While the RF transmitter is at the receiver inside the vehicle gets song sign. The song signal indicates that hump is close by and offers warning as go gradual.

#### IV. Circuit Diagram

In this section detailed circuit operation of each block in hump indicator is given.

##### A. IR Transmitter:

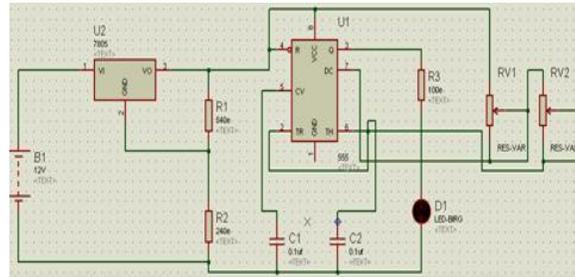


Figure 2: Circuit diagram of IR transmitter.

Figure 2 shows the circuit diagram of IR transmitter. that is designed using an IC555 astable multivibrator used to generate 38 KHz signal. This pulse is used to power an IR LED that is used to transmit the IR rays to the receiver circuit.

The RV1 and RV2 variable trim pot is used for adjusting the accuracy of the output frequency to 38 KHz.

##### B. IR Receiver & RF Transmitter:

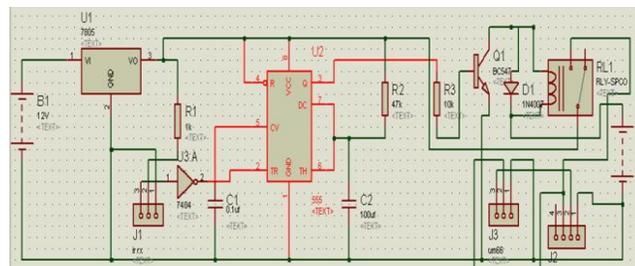
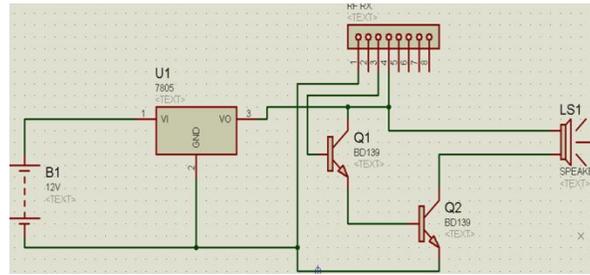


Figure 3: Circuit diagram of IR receiver and RF transmitter.

Figure 3 shows the circuit diagram of IR receiver and RF transmitter. The IR receiver is the principle a part of the control circuit, it consists of an IR receiver which is used to discover the IR Rays transmitted through the IR transmitter. The output acquired from the IR receiver is fed as an enter to an inverter circuit. The output of the inverter is fed as a cause enter to the IC555 timer in monostable mode. According to the output of multivibrator a driving force

Circuit is activated that allows you to turn on the RF transmitter. The transmitter is used that allows you to transmit 433MHz. The transmitter used right here is RS434 that is the effectively to be had in market. Relying upon the timing set within the multivibrator the transmitter is kept on. A track generator IC's output is fed as an input to the RF transmitter to be able to transmit track signals whilst RF receiver is in range with the transmitter.

### C. RF Receiver



**Figure 4: Circuit diagram of RF receiver.**

Figure 4 shows circuit diagram of RF receiver. The RF receiver is mounted within the vehicle. The receiver used here is RS434 that's readily to be had within the marketplace .while the car cuts the IR device the RF transmitter is switched ON primarily based at the timing set by using the monostable multivibrator. When the RF transmitter is at the receiver within the automobile receives music signals. The music sign indicates that hump is close by move slow.

### IV. PCB Layout

A posted Route Board is utilized to routinely assistance and electrically be a portion of digital constituents the use of conductive pathways, or lines, etched from copper pieces laminated onto non-conductive substrate. it's additionally recognized as published Wiring Board or an etched wiring board. A PCB as a layout on a laptop (left) and ambitious out as a board encounter alongside populated additives The board is double reinforced, alongside through-hollow gilding, inexperienced overhaul tolerate, and white silkscreen manufacturing. every single beyond stand through-hole machineries have been utilized.

#### 1. Manufacturing

A PCB as a format on a computer (left) and discovered out as a board encounter alongside populated constituents The board is double reinforced, alongside through-hollow plating, green solder tolerate, and white silkscreen printing. every single floor mount thru-hollow components were used.

#### 2. Patterning (Etching)

A insufficient PCB's are made alongside the resource of inclusive of traces to the naked substrate (or a substrate alongside extremely lean layer of copper).

#### 3. Drilling

Holes or vias, via a PCB are usually drilled alongside puny drill bits made from robust tungsten carbide. Automateddrilling mechanisms present the drilling alongside arrangement grasped via a drill tape or drill document. This

pc – generated documents that encompass of NCD documents or “Execution files” are additionally recognized as numerically manipulated drill. The drill file describes the span and length of every single drilled hollow.

#### **4. Solder Resist**

Areas that have to nowadays not be soldered to could be protected alongside a polymer solder tolerate (solder mask) coating. The solder face up to prevent solder from bridging amid conductors and thereby producing brief circuits. Solder tolerate moreover provides a insufficient protection from the environment.

#### **5. Screen Printing**

Line paintings and textual content can be published onto the beyond surfaces of a PCB via display-printing. at the alike period as locale lets in, the display screen print text can endorse agent designations, switch allocating necessities, seize a gaze at factors, and one in every single of a kind skills functional in amassing, sorting out and servicing the route board. Display print is additionally shouted the silk display, or in a single-sided PCB’s the red print.

#### **6. Testing**

Unpopulated forums can be subjected to a bare-board seize a gaze at wherein every single route connection is tested as correct on the finished board. For immoderate-volume producing, a mattress of pins tester, a fixture or a inflexible needle adapter is utilized to make stroke alongside copper fields or holes on one or both constituents of the board to centers sorting out. A pc will train the mechanical examination constituent to boat a tiny number of present date thru every single link setback on the supplementary suitable stroke elements. A “quick” on a board is plausibly a robust connection in that there have to be no connection.

An “open” is amongst factors that ought to be connected and are not. For tiny or medium number boards, hovering probe and flying-grid testers use transferring check heads to make link alongside the copper/ silver/ gold/ solder fields or holes to confirm the mechanical connectivity of the board beneath check.



## 7. Protection and Packaging

PCBs meant for extreme environments commonly have a conformal coating, this is finished via dipping or spraying afterward the constituents have been soldered. The coat prevents.

Corrosion and leakages currents or shorting due to condensation. The first conformal coats had been wax. Current-day conformal coats are usually dips of dilute answers of silicone rubber, polyurethane, acrylic or epoxy. a little are engineering plastics sputtered undeviatingly to the PCB in a vacuum chamber.

## 8. Safety Certification

Safety stylish UL796 cover concern protection necessity for posted wiring boards to be utilized as additives in gadgets or residence gadget. Checking out evaluation trends that contain flammability, maximum working temperature, mechanical monitoring, warmth deflection and manage aid of stay mechanical ran ran elements. The suitability of the example parameters, temperature and most solder limits shall be ambitious according alongside the applicable surrender-product conception and necessities. The PCB layouts for hump indicator are industrialized alongside the functional resource of employing PROTEL multimedia plan program.

## V. IR Transmitter

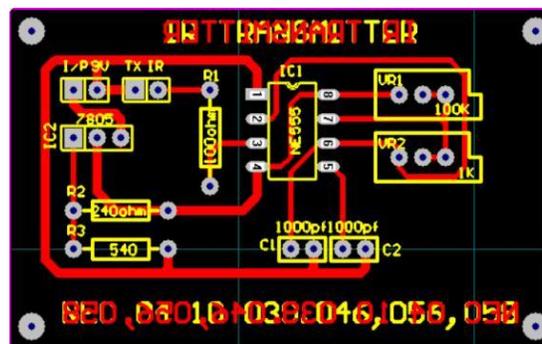


Figure 5: PCB layout for IR transmitter.

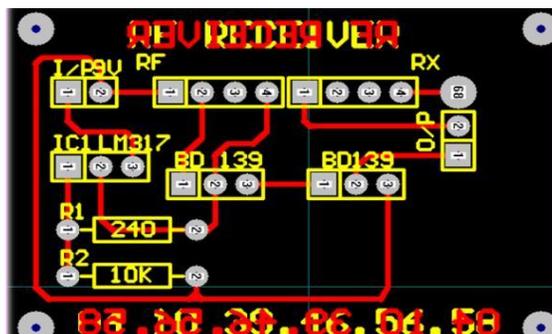


Figure 6: PCB layout for RF Receiver.

## **VI. Advantages**

1. This type of project can reduce the fortunes occurring due to misdetection of humps.
2. The circuit will be very convenient in current traffic systems.
3. This project is cost effective and can be implemented everywhere.

## **VII. Conclusion and Futurescope**

The designed pace hump indicator can indicate the hump for a most distance of 20m. by the usage of this implementation the indication of hump is made extra powerful. This is the device that is suitable to be used in modern-day traffic structures. due to less cost this undertaking may be carried out in each day existence close to the humps. This venture can be progressed by means of routinely reducing the velocity of the automobile while hump is indicated

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