

Ignition Alert Anti-Theft Security System for Motorbikes with Remote Control

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Abstract—There are many vehicle security system are available in the market .but they are just give a siren indication to the user that somebody is try to stolen the vehicle. The major disadvantage of this type of security system is that if the person is far away from the vehicle location and not able to hear the sound of siren at that time theft will easily stolen the vehicle. To overcome this problem here comes a security system that cease ignition system of the vehicle along with siren indication. So by using this device it is very difficult for the thief to steal the vehicle. This device indicate when someone touch it and when any one touch it for more than 3 times it will cease the ignition of the vehicle .And now vehicle will not start till we deactivate the device with remote.

Index Terms— Ignition system of the vehicle, Anti-Theft Security System, Remote Control.

I. INTRODUCTION

To secure our vehicle from thief. To develop the main circuit unit which will connected to the vehicle ignition system. To develop the remote control circuit to unlock the vehicle. Here is an inexpensive electronic motorbike security system with remote control that uses readily available, low cost component. The gadget comprises of base unit which remains fitted inside the vehicle and a remote control handset for activating/deactivating the base unit. The base unit in enable state can be used to set off an alarm device which an unauthorized person tries to gain access to the vehicle. The main parts are divided as follows:

A. REMOTE CONTROL HANDSET

The remote control handset is used to switch on/off the base unit installed inside the vehicle. When push to on switch on the handset is depressed, the circuit wired around a timer IC 555 wired as an astable multivibrator . It works off 9v battery. When remote control switch is pressed, a stable multivibrator built around IC start oscillating at a frequency of about 38 kHz. The signal frequency at output pin 3 of IC is transmitted through two infrared diode.

B. BASE UNIT

When switch is turn on 12v DC from the vehicle to relay and 9v regulator IC 7809, the regulated 9v DC is applied to the front end of the circuit. as a result LED lights up to indicate the standby condition. The IR receiver module 1738 received the signal and activate/deactivate the main circuit which is connected to the vehicle ignition.

II. BRIEF DISCRPTION

(i) Piezoelectric Sensor:-A piezoelectric sensor is a device that uses the piezoelectric effect to measure pressure, acceleration, strain and force.

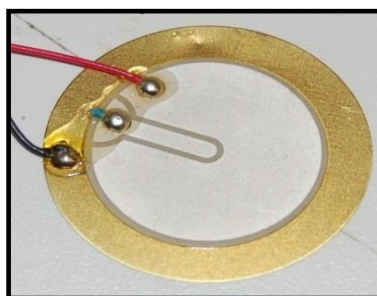


Fig. 1 Piezoelectric Sensor

COMPARATOR TL071:- The JFET-input operational amplifiers in the TL07x series are similar to the TL08x series, with low input bias and offset currents and fast slew rate. The low harmonic distortion and low noise make the TL07x series ideally suited for high-fidelity and audio preamplifier applications. Each amplifier features JFET inputs (for high input impedance) coupled with bipolar output stages integrated on a single monolithic chip. The C-suffix devices are characterized for operation from 0°C to 70°C. The I-suffix devices are characterized for operation from -40°C to 85°C. The M-suffix devices are characterized for operation over the full military temperature range of -55°C to 125°C.

Features:

- 1) Low Power Consumption.
- 2) Wide Common-Mode and Differential Voltage Ranges.
- 3) Low Input Bias and Offset Currents.
- 4) Output Short-Circuit Protection.
- 5) Low Total Harmonic Distortion . . . 0.003% Typ.
- 6) Low Noise $V_n = 18 \text{ nV}/\sqrt{\text{Hz}}$ Typ at $f = 1 \text{ kHz}$.
- 7) High Input Impedance . . . JFET Input Stage.
- 8) Internal Frequency Compensation.
- 9) Latch-Up-Free Operation.
- 10) High Slew Rate . . . 13 V/ μs Typ.
- 11) Common-Mode Input Voltage Range Includes VCC+.

(ii) 555 Timer:- The LM555/NE555/SA555 is a highly stable controller capable of producing accurate timing pulses. With monostable operation, the time delay is controlled by one external resistor and one capacitor. With a stable operation, the frequency and duty cycle are accurately controlled with two external resistors and one capacitor.

Features:

- High Current Drive Capability (200mA).
- Adjustable Duty Cycle.
- Temperature Stability of 0.005%/°C.
- Timing from μSec to Hours.
- Turn off Time Less than 2 μSec .

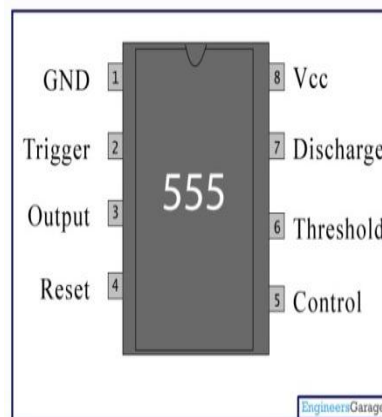


Fig. 2IC 555 Timer

(iii) CD4017 Decade Counter: The CD4017BM/CD4017BC is a 5-stage divide-by-10 Johnson counter with 10 decoded outputs and a carry out bit. The CD4022BM/CD4022BC is a 4-stage divide-by-8 Johnson counter with 8 decoded outputs and a carry-out bit. These counters are cleared to their zero count by a logical "1" on their reset line. These counters are advanced on the positive edge of the clock signal when the clock enable signal is in the logical "0" state. The configuration of the CD4017BM/CD4017BC and CD4022BM/CD4022BC permits medium speed operation and assures a hazard free counting sequence. The 10/8 decoded outputs are normally in the logical "0" state and go to the logical "1" state only at their respective time slot. Each decoded output remains

high for 1 full clock cycle. The carry-out signal completes a full cycle for every 10/8 clock input cycles and is used as a ripple carry signal to any succeeding stages.

Features:

- 1) Wide supply voltage range 3.0V to 15V.
- 2) High noise immunity 0.45 VDD (typ.).
- 3) Low power Fan out of 2 driving 74LS compatibility.
- 4) Medium speed operation.

(iv) Relay Switch: Relays are simple switches which are operated both electrically and mechanically. Relays consist of an electromagnet and also a set of contacts. The switching mechanism is carried out with the help of the electromagnet. There are also other operating principles for its working. But they differ according to their applications. Most of the devices have the application of relays.

The main operation of a relay comes in places where only a low-power signal can be used to control a circuit. It is also used in places where only one signal can be used to control a lot of circuits. The application of relays started during the invention of telephones. They played an important role in switching calls in telephone exchanges. They were also used in long distance telegraphy. They were used to switch the signal coming from one source to another destination. After the invention of computers they were also used to perform Boolean and other logical operations. The high end applications of relays require high power to be driven by electric motors and so on. Such relays are called contactors.

The TSOP 1738 is a member of IR remote control receiver series. This IR sensor module consists of a PIN diode and a pre amplifier which are embedded into a single package. The output of TSOP is active low and it gives +5V in off state. When IR waves, from a source, with a centre frequency of 38 kHz incident on it, its output goes low. Lights coming from sunlight, fluorescent lamps etc. may cause disturbance to it and result in undesirable output even when the source is not transmitting IR signals. A band pass filter, an integrator stage and an automatic gain control are used to suppress such disturbances. TSOP module has an inbuilt control circuit for amplifying the coded pulses from the IR transmitter. A signal is generated when PIN photodiode receives the signals. This input signal is received by an automatic gain control (AGC). For a range of inputs, the output is fed back to AGC in order to adjust the gain to a suitable level. The signal from AGC is passed to a band pass filter to filter undesired frequencies. After this, the signal goes to a demodulator and this demodulated output drives an npn transistor. The collector output of the transistor is obtained at pin 3 of TSOP module. Members of TSOP17xx series are sensitive to different centre frequencies of the IR spectrum. For example TSOP1738 is sensitive to 38 kHz whereas TSOP1740 to 40 kHz centre frequency.

(v) IR LED: An IR LED, also known as IR transmitter, is a special purpose LED that transmits infrared rays in the range of 760 nm wavelength. Such LEDs are usually made of gallium arsenide or aluminum gallium arsenide. They, along with IR receivers, are commonly used as sensors. The appearance is same as a common LED. Since the human eye cannot see the infrared radiations, it is not possible for a person to identify whether the IR LED is working or not, unlike a common LED. To overcome this problem, the camera on a cell phone can be used. The camera can show us the IR rays being emanated from the IR LED in a circuit.



Fig. 3 IR LED

III. WORKING

When somebody touches our vehicles it produce vibrations, these vibrations are detected by piezoelectric crystal, which is placed below the seat or connected to the vehicle body. Then it consist of comparator ,the output of piezo electric crystal is given to comparator then it compare with reference voltage and produce a positive output otherwise it will produce 0 output. The output of the comparator is much enough to start the transistor, and then led connected to the emitter of the transistor. When output of the transistor is given to the 555 timer and it is the property of the 555 timer ,when its pin 2 become high then pin 3 become low and pin 4 and 8 connected to the vcc and pin 1 and 5 is grounded. when pin 3 become high then its is given to the Johnson counter as a clock then counter will start 0 and 1 count output will not work because its output is given to the FET.Then for next count LED will glow ,for 2 LED D3 will glow similarly for clock 3 and 4 D4 and D5 will glow Then it will give feed back to the counter And it will give warning by sairon for 3 Then for next count it will be grounded through transistor. Then full voltage is given to the relay 1 and due to the induction rod will come to it then it will cease the ignition of vehicle.

IV. CIRCUIT DIAGRAM AND PCB LAYOUT

IGNITION ALERT ANTI THEFT SECURITY SYSTEM FOR BIKES

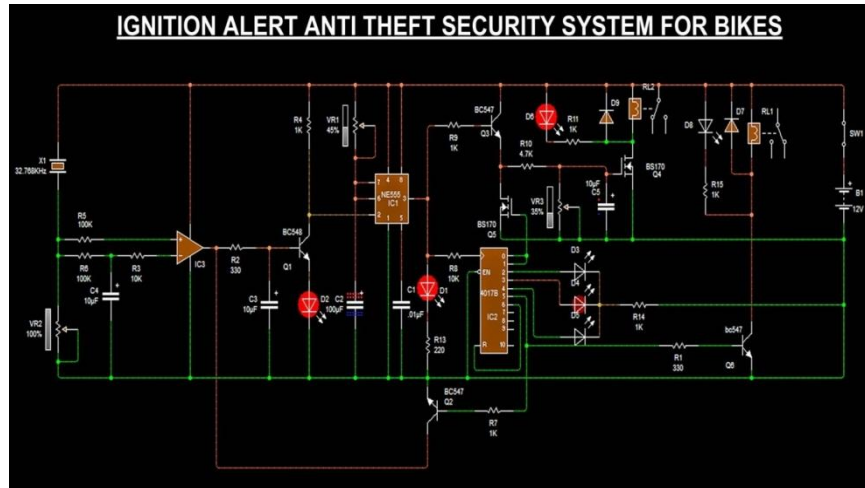


Fig. 4 Circuit Diagram

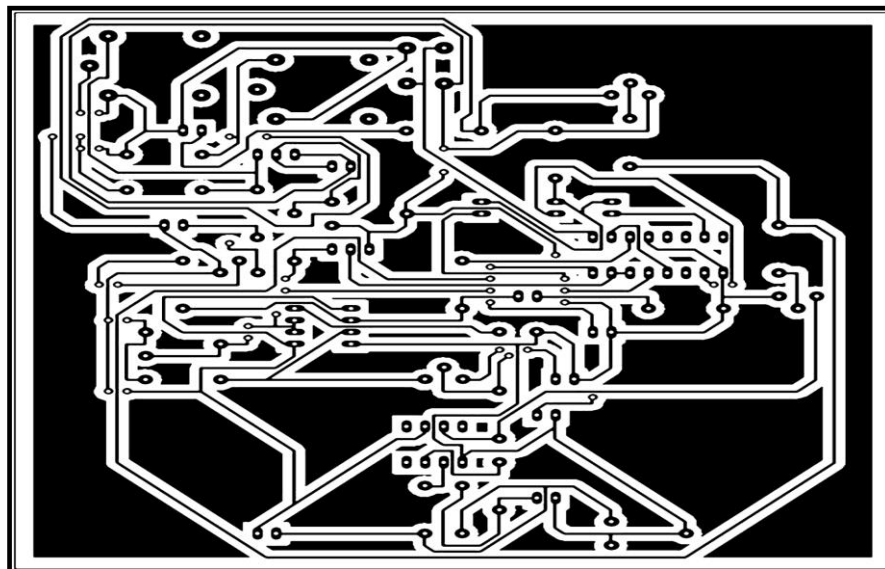


Fig. 5 PCB OF MAIN UNIT



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V. CONCLUSION

This invention provides the better security as it works as alarming system simultaneously with the ignition ceasing system. The simplicity and its economical factor can make it feasible. In other words we can say that this research is commercial level project. It is useful in Two-wheeler systems for safety proposes that's why it is named as Ignition Alert Anti-Theft Security System for Motorbikes with Remote Control. It follows the operation as their name.