Abstract — The era of excessive accidents occur because of the disability of the humans to have control over their cars. What if the car accidents are prevented to its utmost level? There will obviously be a reduction in a death rate of our country. Keeping this social and mutual feeling in mind we introduce you to the project “Automatic Dipper Circuit” which will automatically turn on the dipper light so that the accidents is stopped from causing. The more preventive measures we use in the roadways the lesser lives will be at risk. This circuit will operate right before the major accident would happen and then keep up with the steady state of the care. Initially microcontroller is the main source through which we put up this project to a successful level.

Keywords—LDR, LM358, Microcontroller, Relay, Headlight.

I. INTRODUCTION

The AT89S52 is a low-power, high-performance CMOS 8-bit microcontroller with 8K bytes of in system programmable Flash memory. The device is manufactured using Atmel’s high density no volatile memory technology and is compatible with the industry-standard instruction set and pin out. The on-chip Flash allows the program Memory to be reprogrammed in-system or by a Conventional non-volatile memory programmer. By combining a versatile 8-bit CPU with in-system Programmable Flash on a monolithic chip, the Atmel AT89S52 is a powerful microcontroller which provides a highly-flexible and cost-effective solution to many embedded control applications [1].

The AT89S52 provides the following standard features: 8K bytes of Flash, 256 bytes of RAM, 32 I/O lines, Watchdog timer, two data pointers, three 16-bit timer/counters, a six-vector two-level interrupt architecture, a full duplex serial port, on-chip oscillator, and clock circuitry. In addition, the AT89S52 is designed with static logic for operation down to zero frequency and supports two software selectable power saving modes. The Idle Mode stops the CPU while allowing the RAM, timer/counters, serial port, and interrupt system to continue functioning. The Power-down mode saves the RAM contents but freezes the oscillator, disabling all other chip functions until the next interrupt or hardware reset. Other microcontrollers may serve performance-critical roles, where they may need to act more like a digital signal processor (DSP), with higher clock speeds and power consumption. Other microcontrollers may serve performance-critical roles, where they may need to act more like a digital signal processor (DSP), with higher clock speeds and power consumption.

II. OUR WORK

Vehicles consist of LDR followed by and few other components, where LDR is used as a sensor. LDR senses the light and change its internal resistance according light fall on it, which is further mounted in PVC pipe positioned on the grill of car or in front such that the light fall on the LDR. When light fall on it the resistance decrease and makes output of LDR is analog, to make it into digital op-amp is used then 89s52 low which energized the relay. The relay operates and voltage across the head lamps is reduced. The requirement of headlight is very common during night travel. The same headlight which assists the driver for better vision during night travel is also responsible for many accidents that are being caused. The driver has the control of the headlight which can be switched from high beam (bright) to low beam (dim). The headlight has to be adjusted according to the light requirement by the driver [2].

Headlight beam needs to be lowered, and which dip the headlamp from which beam to a dipped beam. As the dipper unit is well connected to the lighting system of the vehicle. While driving a car in night a problem like many drivers do not dip the head lamps of their vehicles in night while approaching. The several switching operation is used to dip the head light which may distract the concentration.

The entire circuit of “Automatic Dipper using 89S52 microcontroller”.

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III. Block Diagram

Fig. 1 shows the block diagram. The microcontroller based on automatic dipper circuit using 89S52 mc, where 9v battery supply is given to the 7805 regulator which gives 5v constant to the op-amp i.e. lm358, when LDR sensed the light the op-amp convert analog signal to digital signal, the output of lm358 is connected to AT89S52 where program was goes on, that output of microcontroller run on the switches and the N/O contact of the relay which gives the dipper light.

A. Microcontroller: This is the brain of our project CPU (central processing unit). We are going to use a Microcontroller of 89s52 family. The various functions of microcontroller are like:

I. Received the digital data.
II. Port 1.0 is the input of microcontroller.
III. Port 2.0 output pin which turn on switches
IV. Reset input. A high on this pin for two machine Cycles while the oscillator is running resets the device. This pin drives high for 98 oscillator periods after the Watchdog times out.
V. Pin 18, 19 XTAL1 and XTAL2
VI. Pin 31 EA\VPP
VII. Pin 40 Vcc

B. LDR: it is the light sensing device or light detecting resistor. LDR’s are light dependent devices whose resistance is decreased when light falls on it and that is increased in the dark. When a light dependent resistor is kept in dark, its resistance is very high. LDRs or Light Dependent Resistors are very useful especially in light and dark sensor circuits. Sometimes as high as thousands ohms, but when they are irradiated with light resistance drops intensely [3]. When the light level is low the resistance of the LDR is high. This avoids current from flowing to the base of the transistors. Therefore the LED does not light. But, when light shines onto the LDR its resistance falls and current flows into the base of the first transistor and then the second transistor. The LED lights. The preset resistor can be turned up or down to increase or decrease resistance, in this way it can make the circuit more or less sensitive.

C. LM358: this is an operational amplifier which works on 5v dc. In our circuit the using of op-map is that when analogy signal comes from LDR it converted into digital signal.

D. Relay: it is the electrical operated switch. All relays use an electromagnet to mechanically operate a switch, but other operating ideologies are also used, such as solid-state relays[4]. Relays are used where it is necessary to control a circuit by a low-power signal or where several circuits must be controlled by one signal. The first relays were used as long distance telegraph circuits as amplifiers, they repeated the signal coming in from one circuit and re-transmitted it on another circuit. Relays were used widely in telephone exchanges and early computers to perform logical operations.

A type of relay that can handle the high power required to directly control an electric motor or other loads is labelled as a contact. Solid-state relays control power circuits with no moving parts, instead using a semiconductor device to perform switching. Relays with calibrated operating characteristics and sometimes multiple operating coils are used to protect electrical circuits from overload or faults in modern electric power systems these functions are done by digital instruments still called protective relays. In relays there have two operation part i.e. NO and NC contact which is “normally open” and “normally closed”.
**E. BC547 transistor:**
This is an NPN bi-polar junction transistor. A transistor, stands for transfer of resistance, is commonly used to amplify current. A small current at its base controls a larger current at collector & emitter terminals [5]. It is mainly used for amplification and switching purposes. The transistor terminals require a fixed DC voltage to operate in the desired region of its characteristic curves.

**F. Headlight:**
This is the main part which consist dipper and main light. As the dipper unit is connected to the lighting system of the vehicle, the modern lightning system consist of switches, lamps, wiring harness, and fuse or circuit breakers. It may be said that the primary of the headlight design is to produce illumination over considerable distance ahead of the vehicle an enable the driver to drive at reasonable speeds at night with safety [6]. But the provision should also be made that the drivers of other vehicles coming from the opposite direction to not experience a glare. For this purpose a dipped or meeting beam is also provided for maintaining the reasonable speed with safety without alluring the coming driver. To prevent glare to the oncoming driver during particularly misty or foggy conditions the light about the horizontal should be cut off. This is called dipping of the head light beam. In an average car, the lighting system consumes about 70 to 75% of electrical energy at night. In terms of current consuming 25 to 40A at night. There are two types of light source namely, one that emits light and the other that reflects light. The filament of electric lamp is the primary source. While the reflector is known as the secondary source.

**Circuit connection:**

![Circuit connection diagram](image)

Fig shows the PCB layout and circuit connection:

<table>
<thead>
<tr>
<th>Sl/No</th>
<th>Items</th>
<th>Range/specification</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DC Battery</td>
<td>12V, 9v</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Crystal oscillator</td>
<td>12MHZ</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Microcontroller</td>
<td>89S52</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Regulator IC</td>
<td>7805</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>OP-amp</td>
<td>LM358</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>LDR</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Capacitor</td>
<td>10uF, 0.1uF, 33uF</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>Resistor</td>
<td>1k, 5k, 2k</td>
<td>7</td>
</tr>
<tr>
<td>9</td>
<td>Relay</td>
<td>12v DC</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>Transistor</td>
<td>BC547</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>Preset</td>
<td>10K(1/4 watt)</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>Reset switch</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>LED</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>Diodes</td>
<td>IN4007</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>Headlight</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>Connecting wires</td>
<td>-</td>
<td>1set</td>
</tr>
</tbody>
</table>

**Software Requirements:**
- Kiel compiler
- Proteus
IV. CIRCUIT DIAGRAM:

A. Circuit description:
In this circuit 9v battery is given as the supply to the circuit. But since the AT89S52 Microcontroller operates at 5v we have used 7805 regulator IC to keep 5v as the fixed voltage which is given to pins 31 & 40 of Microcontroller [7]. The pin no 3 of LM358 which is the i/p pin of the op-amp is connected to the LDR so whenever it detects the light the o/p of the op-amp will be low and the transistor is switched off. Now the transistor collector will switch on the port P1.0 of the Microcontroller and then the port P1.0 will go to 0 state and it will interrupt the Microcontroller which in turn switches ON the port P2.0 the P2.0 will switch ON the transistor switch and the transistor switches ON the N/O contact of the relay which gives the dipper light. Microcontroller is the brain of a circuit which works to make the circuit switch on, it consist several input and output which also have several port namely port 1, 2, 3, 4 ,but it has different work.

B. Accidents due to Troxler Effect:
As we discussed earlier, there are many accidents due to Troxler effect. Many accidents make a people dies due to overtake the car, hitting a slow moving smaller vehicle by large one.Many accidents occur due to over speed on a highway, through it might be obvious to blame the driver, they claim to have not seen the smaller vehicle approaching. This is the most common example of troxler effect in our day-to-day life [8].

Due to excessive brightness, the driver of the vehicle is blinded. So we unable to notice the smaller vehicle even through it is right in front of him. So this can be avoided if the headlight is dipped. According to this, the graph shown in figure below, gives the detail of the accidents had occur in 2016 in different countries due to high brightness [9].

Fig-1: Accidents report of different countries in 2016

C. Implementation:
The circuit had been constructed and provide the working model [10]. There are few criteria which need to be fulfilled while placing a device in a real vehicle. They are:
- It should be compact and easy to install.
- It should be kept at a safe place, protecting from external environment like dust, rain etc.
- The placing process of this circuit should be in line with the eye of a driver.
- The circuit should have regular supply whenever the headlights are turned ON.

D. Advantages:
- It protects from the accidents.
- Easy to install and low cost.
- Automatically operate.
- Mainly useful in the highways prevents accidents.

IV. CONCLUSION:
The Automatic dipper can perform a great deal in reducing the manual efforts and fatigue of drivers in dipping the headlamp frequently while driving through highway full of moving vehicles. This is very much helpful and useful to the person who drives during night time. Newer and better technologies always come with time and it will help in reducing the manual labour and difficulties in the sector where it is made use. In short it is a device with bright future Like for example the people who comes back home from their workplace after the sun sets. And when the highway will be full of vehicles, trucks, buses and even the two-wheelers. Our project is made for the safety of the people around. The working and implementation of the prototype are discussed in details. Thus the implementation of this
device in every vehicle in future will not only avoid accidents but also provide a safe and a comfortable driving.

V. REFERENCE


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