INTERNSHIP REPORT

A report is submitted in partial fulfilment of the requirement for the Award of Degree of

BACHELOR OF TECHNOLOGY

in

ELECTRONICS & COMMUNICATION ENGINEERING

by

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<u>DECLARATION</u>

We hereby declare that this submission is my own work that, to the best of our knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

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ACKNOWLEDGEMENT

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TOPIC

WATER LEVEL INDICATOR

INTRODUCTION -

The Water Level Indicator employs a simple mechanism to detect and indicate the water level in an overhead tank or any other water container.

In Simple Words Water level Indicator is a device which is used to detect the level of liquid in the tank and help us to save the liquid (ex- water) in overflow condition.

CONSIDER A SITUATION FOR A BETTER UNDERSTANDING -

The house where we live in has an overhead tank which is about 30 feet from the ground level.

We were getting bored going up to the rooftop to check whether the tank has filled or the water level was below to start the pump.

We had to do this again and again. Then we sought for a solution.

We always used to think of the possibilities of how can this problem be tackled in an electronic way.

After years of research and by trial and error, we found one and wanted to put whatever we have done out here so that it may be helpful to someone who has a overhead water tank at their homes.

So we have tried our best efforts to optimise all the resources and have come up with a bright project that could enlight the future generations.

FEATURES –

- *Easy installation.*

- *Low maintenance*

- *Compact elegant design.*

- *Avoid seepage of roofs and walls due to overflowing tanks.*

- *Consume very little energy, ideal for continuous operation.*

- *Shows clear indication of water levels in the overhead tank*

COMPONENTS –

FOLLOWING ARE THE REQUIRED COMPONENTS FOR MAKING WATER LEVEL INDICATOR CIRCUIT:

1.) RESISTORS

2.) TRANSISTORS

3.) DIODE

4.) BUZZER

5.) PCB BOARD

6.) LED

7.) CONNECTING WIRES

8.) 9V DC BATTERY

TRANSISTOR –

A transistor is a semiconductor device used to amplify and switch electronic signals and Electrical Power . It is composed of semiconductor material with at least three terminals for connection to an external circuit. A voltage or current applied to one pair of the transistors terminals changes the current through another pair of terminals. Because the controlled power can be higher than the controlling power, a transistor can amplify a signal. Today, some transistors are packaged individually, but many more are found embedded in integrated circuits.

BUZZER –

- *A buzzer or beeper is an audio signaling device, which may be mechanical, electrochemical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or keystroke.*

- *Piezoelectric:*

A piezoelectric element may be driven by an oscillating electronic circuit or other audio signal source, driven with a piezoelectric audio amplifier. Sounds commonly used to indicate that a button has been pressed are a click, a ring or a beep.

PCB BOARD –

- *A printed circuit board (PCB) mechanically supports and electrically connects electronic components using conductive tracks, pads and other features etched from copper sheets laminated onto a non-conductive substrate .PCBs can be single sided, double sided (or multilayer).*

- *Printed circuit boards are used in all but the simplest electronic products .PCBs require the additional design effort to lay out the circuit, but manufacturing and assembly can be automated.*

Manufacturing circuits with PCBs is cheaper and faster than with other wiring methods as components are mounted and wired with one single part. Furthermore, operator wiring errors are eliminated.
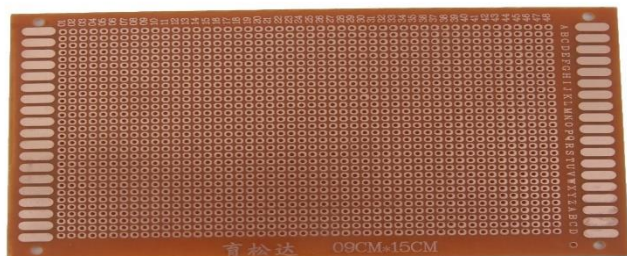
LED –

- *A light-emitting diode (LED) is a two-lead semiconductor light source. It is a pn-junction diode, which emits light when activated. When a suitable voltage is applied to the leads, electrons are able to recombine with electron holes within the device, releasing energy in the form of photons. This effect is called electroluminescence, and the colour of the light corresponding to the energy of the photon is determined by the energy band gap of the semiconductor*

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CONNECTING WIRES –

- *A wire is a single, usually cylindrical, flexible strand or rod of metal. Wires are used to bear mechanical loads or electricity and telecommunications signals. Wires is commonly formed by drawing the metal through a hole in a die or draw plate. Wires gauges come in a various standard sizes, as expressed in terms of a gauge number. The term wire is also used more loosely to refer to a bundle of such strands, as in multi thread wire, which is more correctly termed a wire rope in mechanics, or a cable in electricity.*
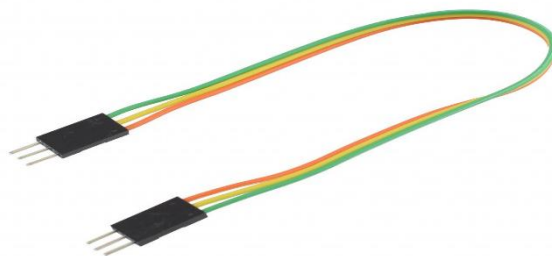
DC POWER SUPPLY –

* An electric battery is a device consisting of one or more electrochemical cells that covert stored chemical energy into electrical energy. Each cell contains a positive terminal, or cathode, and a negative terminal, or anode. Electrolytes allow ions to move between the electrodes and terminals, which allows current to flow out of the battery to perform work.

A battery consists of some number of voltaic cells. Each cell consists of two half-cells connected in series by a conductive electrolyte containing anions and cations. One half-cell includes electrolyte and the negative electrode, the electrode to which anions migrate;the other half cell includes electrodes electrolyte and the positive electrode to which a cations migrate. Redox reactions power the battery. Cations are reduced at the cathode during charging, while anions are oxidized at the anode during discharge. The electrodes are electrically connected by the electrolyte. A separator allows ions to flow between half-cells, but prevents mixing of the electrolytes.

PROJECT DESIGNED PRACTICALLY –
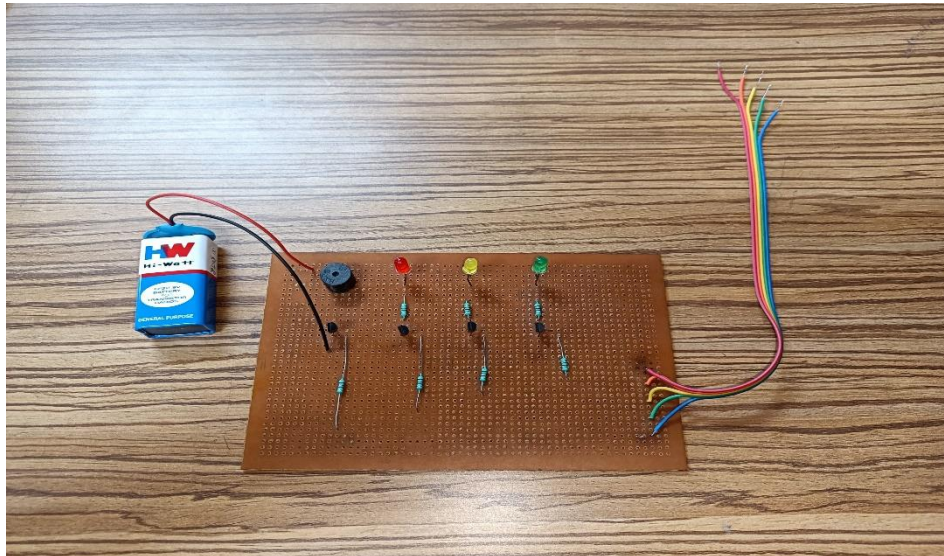
CIRCUIT DIAGRAM –
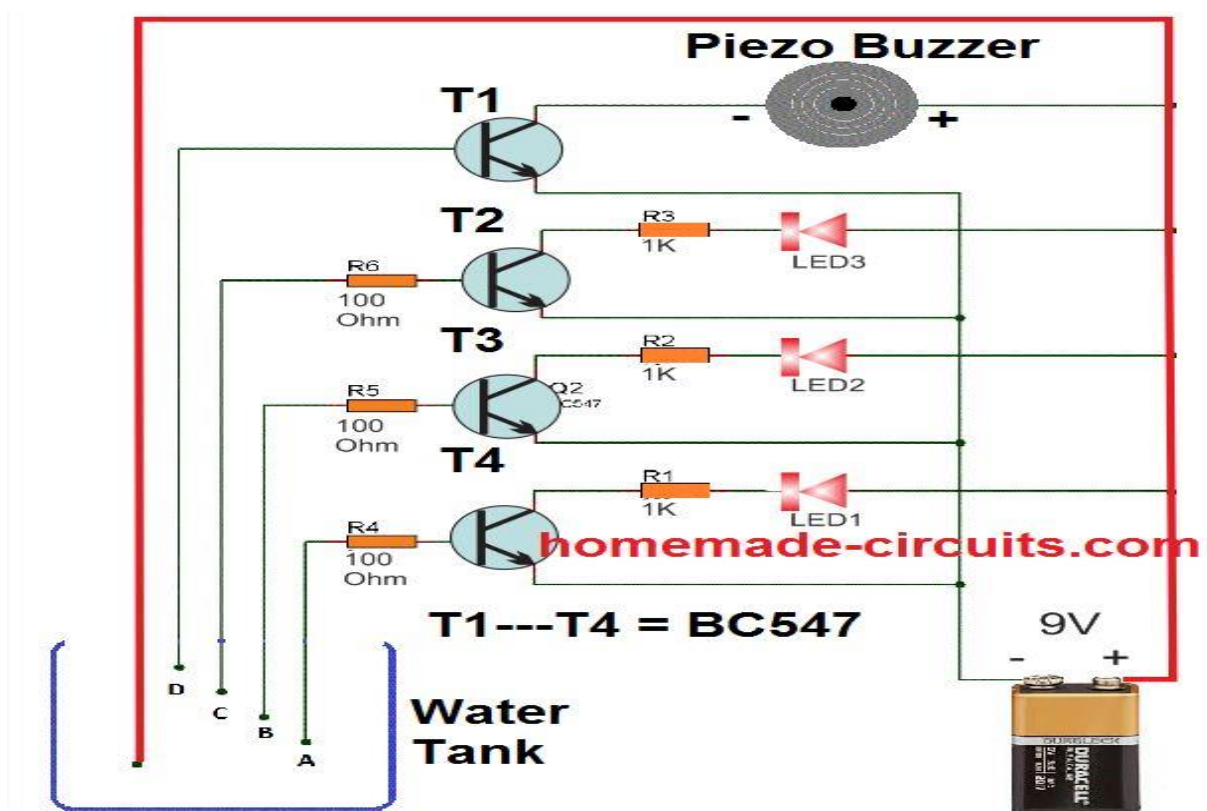
WORKING –

- *The operation of this project is very simple and can be understood easily. In our project water level indicator there are three main conditions:*

- *There is no water available in the source tank.*

- *Intermediate level i.e. either of 3rd to 5th level.*

- *There is sample amount of water available in source tank.*

So let us discuss on the more about these 3 conditions.

Condition 1 -> water is not available –

When the tank is empty there is no conductive path between any of the 3 indicating probes and the common probe (which is connected to 9v+ supply) so the transistor base emitter region will not have sufficient biasing voltage hence it remains in cut off region and the output across its collector will be Vc approximately 9v and thus indicates, the tank is empty.

CONDITION 2 -> INTERMEDIATE CONDITION –

Now as the water starts filling in the tank a conductive path is established between the sensing probes and the common probe and the corresponding transistors get sufficient biasing at their base, they starts conducting and now the outputs will be Vce (i.e. 1.2v-1.8v) approximately which is given to microcontroller. Here the microcontroller is programmed as a priority input encoder which detects the highest priority input and displays corresponding water level in the seven segment display. In this project while the water level reaches the 7th level i.e. last but one level along with display in seven segment a discontinuous buzzer is activated which warns user that tank is going to be a full soon.

CONDITION 3 -> WATER FULL –

- *When the tank becomes full, the top level probe gets the conductive path through water and the corresponding transistor gets into conduction not only displays the level in five segment display but also activates the continuous buzzer by which user can understand that tank is full and can switch off the motor and save water .*

NEED OF WATER LEVEL INDICATOR –

- *Overflow problems*

- *To prevent wastage of energy*

- *To prevent wastage of water*

- *observation*

APPLICATIONS –

- *Now no need to go on the roof to check the water level.*

- *Can be used to measure underground storage of water*

- *Alarm starts ringing as soon as tank becomes full.*

- *It helps to check overflow and wastage of water by warning the person when the tank is about to brim.*

It can also be used to calculate incoming and out going water in large reservoirs.

CONCLUSION –

The Conclusion is simple if we want to save water or any other liquid then we should have a device which can indicate us and force us to don't waste the water .

THANK YOU