

VISVESVARAYA TECHNOLOGICAL UNIVERSITY



MINI PROJECT REPORT ON

“RAIN DETECTOR ”

SUBMITTED BY:

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Under the guidance of
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NEW HORIZON COLLEGE OF ENGINEERING

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CERTIFICATE

Certified that the mini project work entitled “**RAIN DETECTOR**” carried out by **C.ABHINAY KUMAR REDDY(1NH18EC026)** bonafide students of Electronics and Communication Department , New Horizon College of Engineering, Bangalore.

The mini project report has been approved as it satisfies the academic requirements in respect of mini project work prescribed for the said degree.

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Name of Examiner
Date

Signature with

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ACKNOWLEDGEMENT

The satisfaction that accompany the successful completion of any task would be, but impossible without the mention of the people who made it possible, whose constant guidance and encouragement helped us succeed.

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- 1NH18EC026

ABSTRACT

In a world of automation, everyone wants to stay smart and productive. And, the collection of water can also be easily achieved using automation. We are interested in doing this project for different reasons. First, knowing that the rain is intermittent and varies with the season. As a result, it is important to manage and utilize sky rains for irrigation and domestic applications. Second, in communications, the power of the antenna will increase and the signal strength to send or receive signals will increase. This will allow us to predict that the communications sector will reduce the network problem happening and that becoming the worst case in our country. We shall discuss the Rain Alarm project which is of great importance for rainwater harvesting. The circuit helps detect rain by sounding an alarm when sitting inside the house, so that you can take some measures. This totally avoids the unnecessary headaches of keeping an eye on your window in the rainy season to see when it is going to rain. To save time, money and effort, let's start with the process of creating a simple and cost-effective rain alarm circuit as simple as possible. It can be used to alert the farmers when it rains so that the effective use of this rain can be made for high yield of crops.

1.INTRODUCTION

Water is very important resource in every one's life, so proper usage and saving of water is necessary. RAIN WATER DETECTOR is a detector which detects the rain and automatically triggers the alarm and LED will be turned on,

So, here is the small attempt by our group to detect and thereby save rain water so that the underground water reserve can be increased.

Rain detector is a type of detector which detect the rain and alerts by blowing a buzzer. It is used in various applications like irrigation, communication, automobiles. The proposed schematic is reliable and can be constructed at low cost.

Rain water is sensed by the sensor which in turn activates the buzzer.

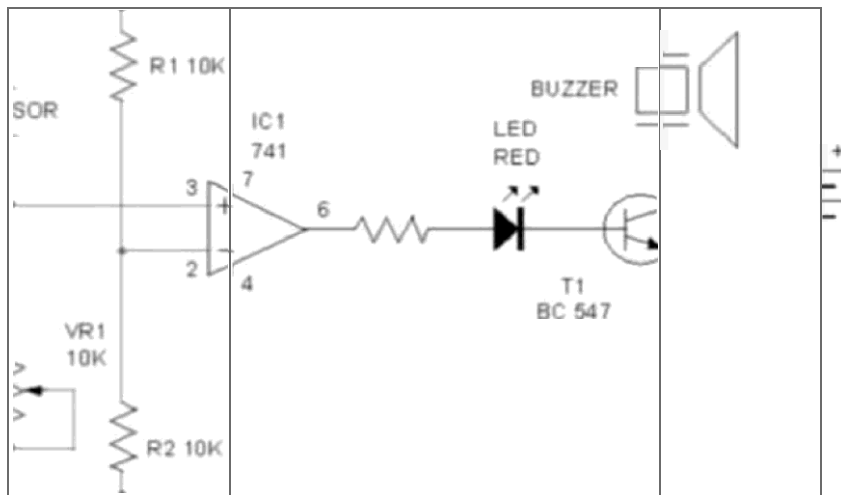
There are the three main components of the project rain sensor, IC 555 timer, Buzzer. The IC 555 timer is in A-stable mode configuration which turn on the buzzer.

The heart of the project is IC 555 timer. Rain Sensor, IC 555 timer, Buzzer are the onscreen heroes and transistors, diodes, resistors, capacitors are the offscreen heroes.

The circuit works primarily on the principle that normal water drives a certain amount of electricity, although rainwater or natural water is not pure. Being able to detect rain through the use of the rain sensor, this circuit can be used in several other areas where you want to detect water.

2.LITERATURE SURVEY

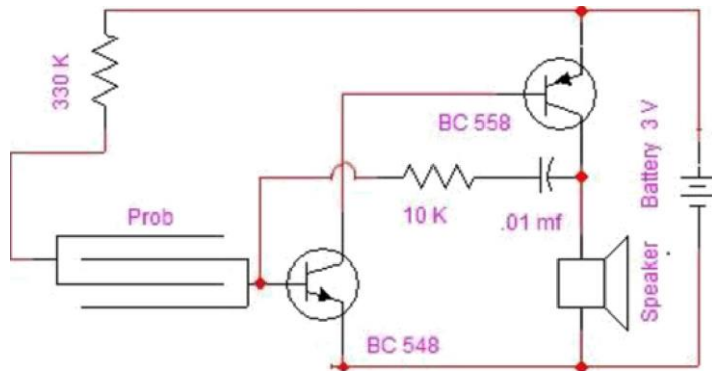
1.RAIN SENSOR USING OP-AMP



Working

In this above project they used Op-Amp 741 as a voltage comparator. The half supplied voltage (4.5) passes through resistors R1 and R2, connected to inverting pin2 of Op-Amp. Its non-inverting input pin3 is connected to Rain Sensor and variable resistor R1. Basically output of voltage comparator is high only when its pin2 gets a lower voltage than pin3. Normally pin3 is low because there is no supply of current from the positive supply, so output remains low. This inhibits transistor T1 to act in cutoff region and buzzer remains off. When the Rain Sensor is wet (rain), current passes through the contacts to the pin3 of the voltage comparator. This higher voltage at pin3 causes the output to go high. LED lights and transistor acts as a switch in saturation region (switch), buzzer then starts beeping to indicate rain.

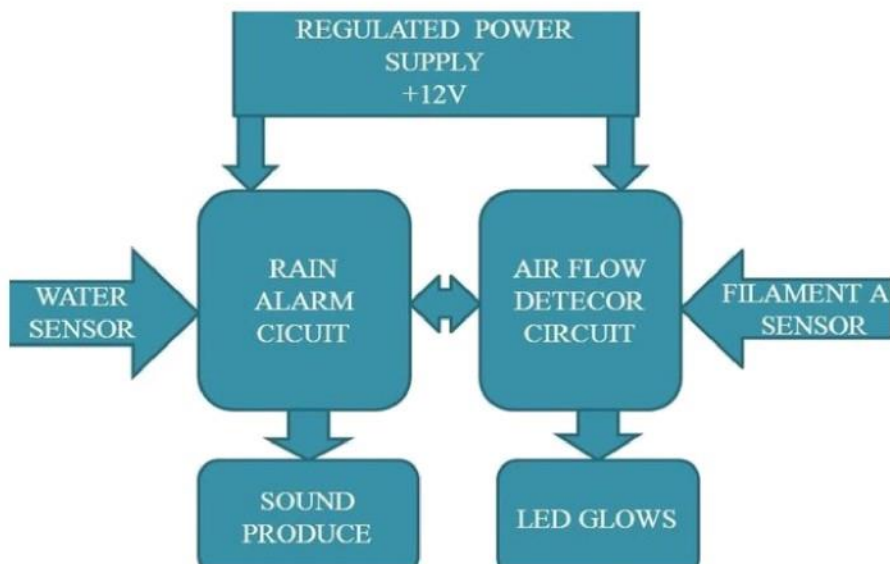
2. RAIN SENSOR USING TRANSISTORS(BC S48, BC558)



Water is a conductor of electricity. When the water is in contact with the probe, a current flows to the base of the NPN transistor (BC548). With the conduction of the NPN transistor, the electron reaches Q2, which is a PNP transistor. The PNP transistor (BC558) is also conducting and the current flows through the speaker. In a loudspeaker, there is an inductive coil that causes movement in one direction and then produces an induced current that is in the opposite direction to that of the current. This pulsed current flows through a capacitor, a resistor and produces the first deactivated transistor BC548 by an inter-well and after that it relaxes to the previous state. This process is repeated again and again until the probe is in contact with water and an oscillation is created in the circuit. The diaphragm of the speakers vibrates and gives a sound. The frequency of the circuit depends on the value of the impedance of the coil, the capacitor and the value of the resistance.

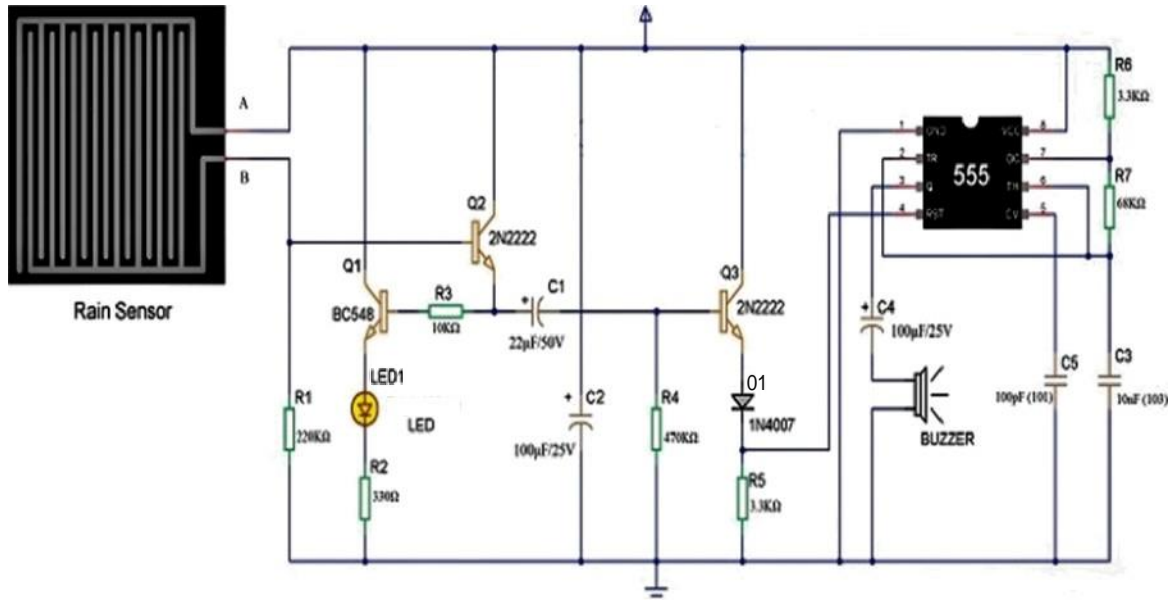
PROPOSED METHODOLOGY

Block diagram of Rain Detector



Before understanding the circuit diagram of project, let us have a rough idea of the rain alarm circuit and its operation using the block diagram. There are main ly two components in the circuits, namely the 555 Timer IC, a rain sensor that plays a fundamental role in the conduction of the circuit. Whenever the rain sensor detects rain, it sends the signal to the 555 Timer IC, which sets to A-Stable mode. The integrated circuit will activate the signal indicating the rain condition.

Circuit diagram



Working principle

1. when rain falls on the sensor, the Aluminum in the sensor starts conducting, the supply is given to the base of the transistor Q2.
2. As a result transistor Q2 will be turned on which in turn activates the transistor Q1, this will turn on LED which is connected to the emitter of the transistor Q1.
3. when the transistor Q2 reaches the saturation level the capacitor C1 is charged and the transistor Q3 will be turned ON, capacitor C1 will be charged by resistor R4.

4. When the transistor Q3 reaches the saturation level, the reset pin will be made positive which is connected to reset pin of Q3 transistor.

5. The IC 555 timer is configured at A-stable mode. as the reset pin is given to positive voltage. it becomes active and pulse signal is generated at the output pin3 of IC 555 timer, this makes the buzzer to activate.

6. capacitor C4, which is connected in between the pin3 and the buzzer, will block the DC signals and make allow only the variations in the signals which makes the buzzer to beep, therefore the diode acts as forward bias.

7. Mostly due to resistor R4 and the capacitor C1 the buzzer starts beeping sound.

8. At sometime the capacitor is completely charged, the transistor Q3 will get in to cut-off region,

As a result, reset pin of IC 555 will not receive any voltage and buzzer stops making sounds.

9. When there is no rain, the aluminum wire on the sensor will not conduct (open circuit). As a result the IC 555 cannot trigger the signal and buzzer cannot sound.

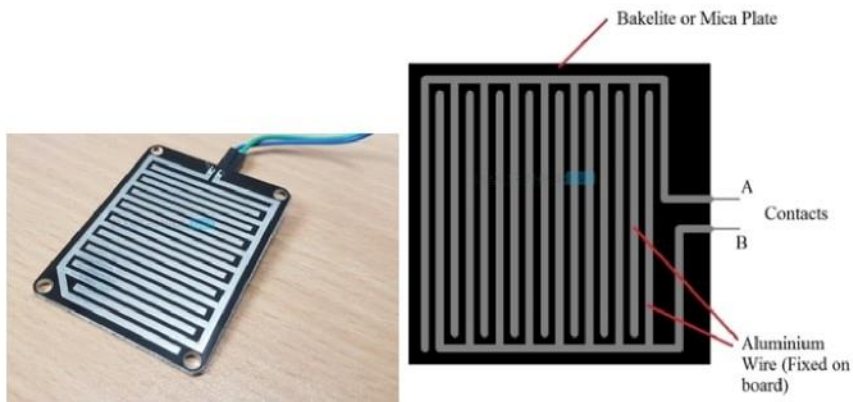
4.

COMPONENTS REQUIRED

S.No	Required Components	Remarks	Quantity
1	Rain sensor		1
2	ICSSSTIMER		1
3	Transistor	BC548 NPN Transistor,2N2222 Transistor	3
4	Diode	1N4007	1
5	Resistor	Quarter watt	68k ohm - 1 3.3K Ohm—2 470k Ohm— 1 10KOhm-1 330 Ohm-1 220k Ohm-1
6	Capacitor	Ceramic and polarized	22U F,100Uf polarized capacitor.10nF,100pF Ceramic capacitor
7	LED	Colored	1
8	Powersupply	12v	1

PROJECT DESCRIPTION

RAIN SENSOR:



It is a simple sensor and an easy-to-use tool for detecting rain. It can act as a simple switch, where the switch is normally open and when it rains, it closes. Although the rainwater sensor is the main component of the circuit. We do not need to go shopping on the market or online. We can do it ourselves by taking the piece of bakelite plate or mica and the aluminum wire.

The bakelite or mica plate must be completely flat and the aluminum cable must be glued to the plate, as shown in the figure below. It must be ensured that there is no space between the cable and the card.

When the rainwater sensor is finished, it must be connected to the circuit and the voltage must pass through the wires. If it does not rain, the resistance between the contacts will be very high because there will be no conduction between the sensor wires.

If it rains, drops of water will fall on the rain sensor, which will form a conductive path between the wires and also reduce the resistance between the contacts.

As a result, the wires on the sensor board will drive and activate the NE555 timer through the transistor circuits. Once the NE555 is activated, the output pin will be high and the beep will activate the alarm.

ICSSSTIMER:

The timer IC 555 was introduced around 1971 by the company Signetics under the name SE555 / NE555 and was called "The Time Machine IC". It offered circuit designers a relatively inexpensive, stable and easy-to-use integrated circuit for monostable and a-stable applications. Since this device was first marketed, many unique and innovative circuits have been developed and presented in various commercial, professional and leisure publications. Over the past decade, some manufacturers have stopped making these timers for reasons of competition or other reasons. However, other companies, such as NTE (a sub-division of Philips) have resumed their activities where some have left.

Although the CMOS version of this IC, such as the Motorola MC14S5, is primarily used, the standard type is still available, but many enhancements and variations have been made to the circuits. But all types are compatible with pin plugs. In this tutorial, the SSS timer is examined in detail, as are its uses, either alone or in combination with other semiconductor devices. This timer uses a labyrinth of transistors, diodes and resistors and, for this complex reason, a more simplified (but precise) block diagram is used to explain the internal organization of 555. The 555, in fig. 1 and FIG. 2 above, is available in two cases, either the round metal housing called "T", or the 8-pin DIP housing better known, "V". About 20 years ago, the type of canister was

1. Ground
2. Trigger
3. Output
4. Reset
5. Control Voltage
6. Threshold
7. Discharge
8. Vcc (+)

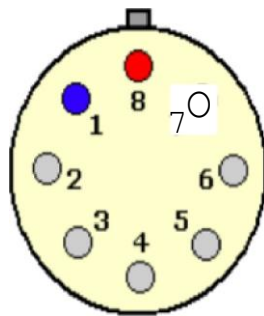
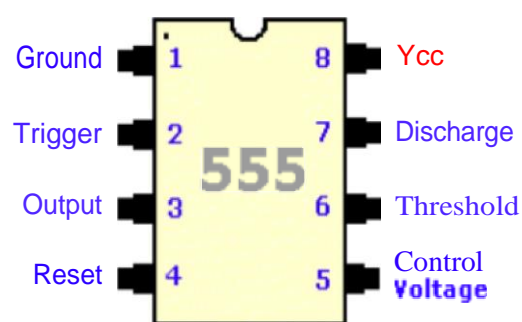
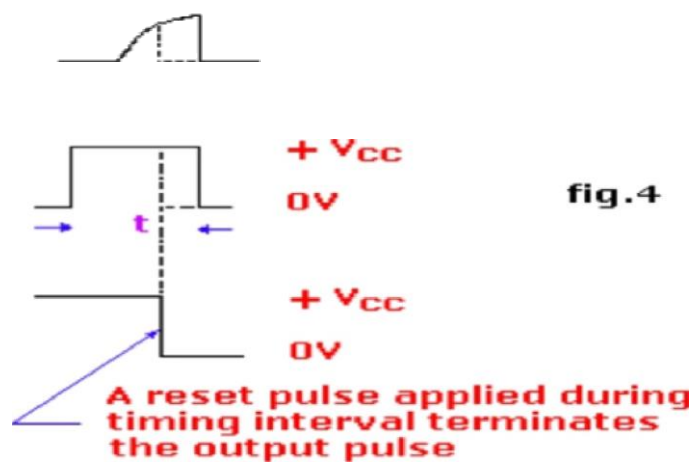
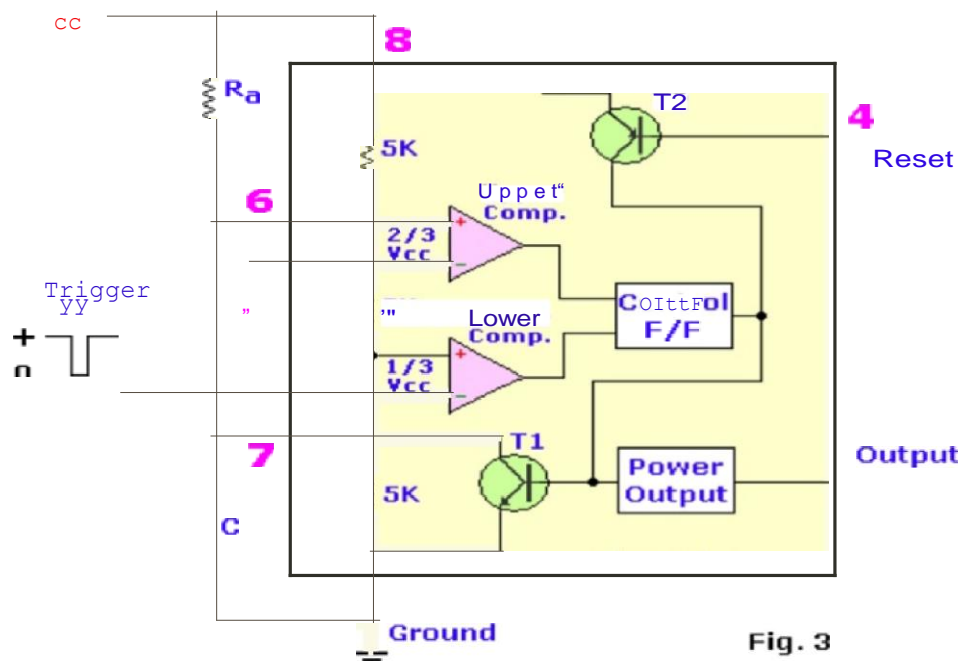


fig. 1. B-pin T package



fip. 2. B-pin package

almost standard (SE / NE types). The 556 timer is a 555 dual version and comes in a 14-pin DIP package, the 558 is a quad version with four 555s also in a 14-pin DIP package.



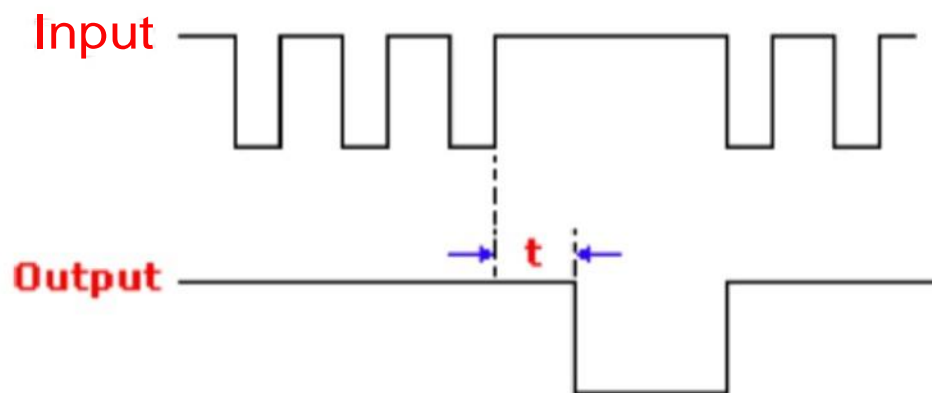
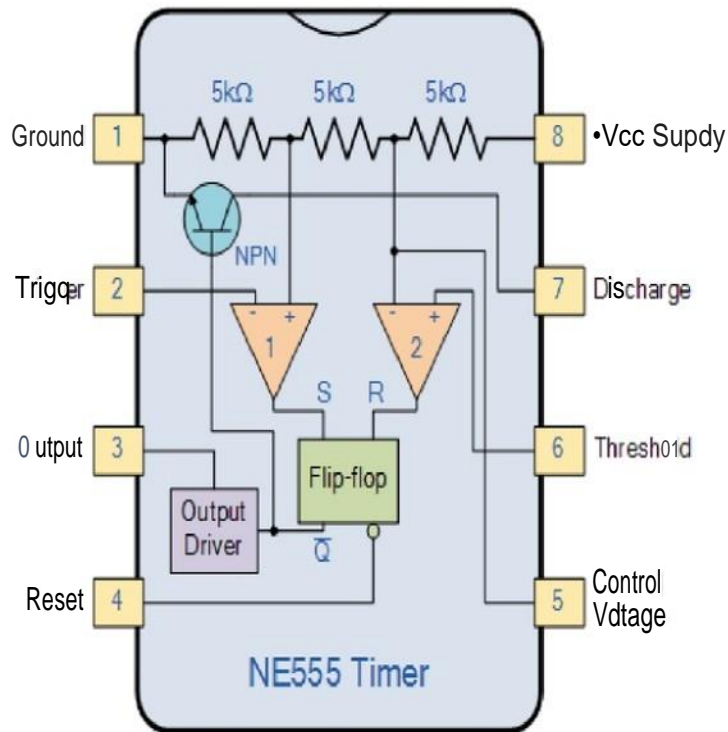


Fig. 4-1



Definition of Pin Functions:

Pin 1 (ground): The ground (or common) pin is the most negative power potential of the device, which is normally connected to the common (ground) circuit when operating from positive supply voltages.

Pin 2 (trigger): This pin is the input of the lower comparator and is used to adjust the latch, which makes the output high. This is the beginning of the time sequence in the monostable operation. The shot is obtained by taking the pin up and down with a voltage of $\frac{1}{3} V_+$ (or, in general, half of the voltage appearing on pin 5). The action of the activation input is level sensitive, allowing the use of slow change rate waveforms, as well as pulses, as activation sources. The trigger pulse must be shorter than the time interval determined by external R & C. If this pin remains low longer, the output will remain high until the trigger input increases again. A caution to observe with the trigger input signal is that it should not be less than $\frac{1}{3} V_+$ for a longer period than the synchronization cycle. If allowed, the timer will be reactivated at the end of the first output pulse. Therefore, when the timer is used in monostable mode with input pulses longer than the desired output pulse width, the input trigger must be effectively shortened by differentiation. The minimum pulse width allowed for activation depends to some extent on the pulse level, but in general if greater than 1 μ S (micro-second), the activation will be reliable. A second precaution concerning the trigger input refers to the storage duration in the lower comparator. This part of the circuit may have normal stopping delays of several microseconds after activation; that is, the lock may still have an activation input during this period after the activation pulse. In practice, this means that the minimum monostable output pulse width must be of the order of 10 in order to avoid possible double activation due to this effect. The voltage range that can safely be applied to the trip pin is between V_+ and ground. A DC current, called the tripping current, must also flow from this terminal to the external circuit. This current is usually 500nA (nano-amp) and will set the upper limit of allowable resistance of pin 2 to earth. For an a-stable configuration operating at $V_+ = 5$ volts, this resistance is 3 megaohms; It can be higher for a higher level of V_+ .

Pin 3 (output): output 555 is from a high current totem stage consisting of transistors Q20 to Q24. Transistors Q21 and Q22 provide a drive for source-type loads, and their Darlington connection provides a high output voltage of about 1.7 volts less than the $V+$ power level used. Transistor Q24 offers the possibility of absorbing the current for low state loads called $V+$ (as typical TTL inputs). The transistor Q24 has a low saturation voltage, which allows it to interact directly with a good noise margin when it performs the current reduction logic. However, the exact output saturation levels vary considerably with the supply voltage, for both high and low states. At a $V+$ of 5 volts, for example, the low state $V_{CE(sat)}$ is typically 0.25 volts at 5 mA. However, when running at 15 volts, it can absorb 200 mA if a 2 volts output voltage level is allowed (the power dissipation must be taken into account in this case, of course). The high state level is typically 3.3 volts at $V+ = 5$ volts; 13.3 volts at $V+ = 15$ volts. The rise and fall times of the output waveform are quite fast, the typical switching times are 100nS. The state of the output pin will always reflect the opposite of the logic state of the latch, which can be seen by examining FIG. 3. Since the lock itself is not directly accessible, this relation can be better explained in terms of the activation Ion conditions. To activate the output in the high state, the activation input is momentarily taken from a higher level to a lower level. [see "Pin 2 - Trigger"]. This causes locking and high output. The performance of the lower comparator is the only way to set the output high. The output can return to a low state by raising the threshold from a lower level to a higher level [see "Pin 6 - Threshold"], which resets the latch. The output can also be reduced by bringing the reset to a low state near the ground [see "Pin 4 - Reset"]. The output voltage available on this pin is approximately equal to the VCC applied to pin 8 minus 1.7Vs.

Pin 4 (reset): This pin is also used to reset the latch and return the output to a low state. The threshold level of the reset voltage is 0.7 volts and a 0.1 mA dissipation current of this pin is required to restart the device. These levels are relatively independent of the $V+$ level of operation; Thus, the reset input is compatible with TTL for any supply voltage. The reset input is a primary function. that is, it will force the output to a low state regardless of the state of the other inputs. Therefore, it can be used to prematurely terminate an output pulse, to block

oscillations from "on" to "off", etc. The delay time between the restart and the output is generally of the order of 0.5 μ s and the minimum width of the reset pulse is 0.5 μ s. However, none of these numbers are guaranteed and may vary from manufacturer to manufacturer. In summary, the reset pin is used to reset the latch that controls the state of output pin 3. The pin is activated when a voltage level between 0 and 0.4 volts is applied to the pin. The reset pin will force the output to a low level, regardless of the state in which the other inputs of the flip-flop are located. When not in use, it is recommended to connect the reset input to V₊ in order to avoid the possibility of false restart.

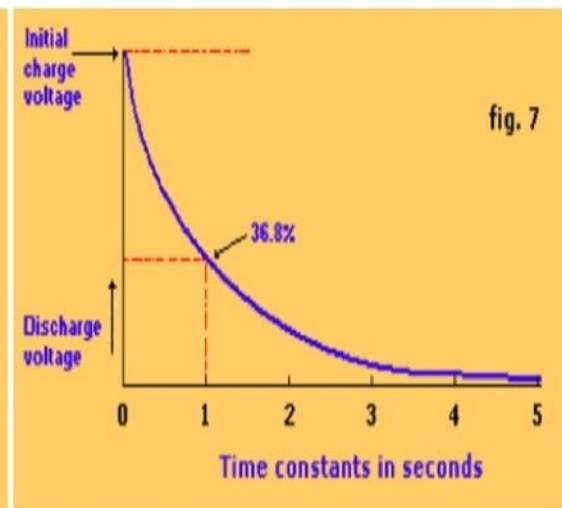
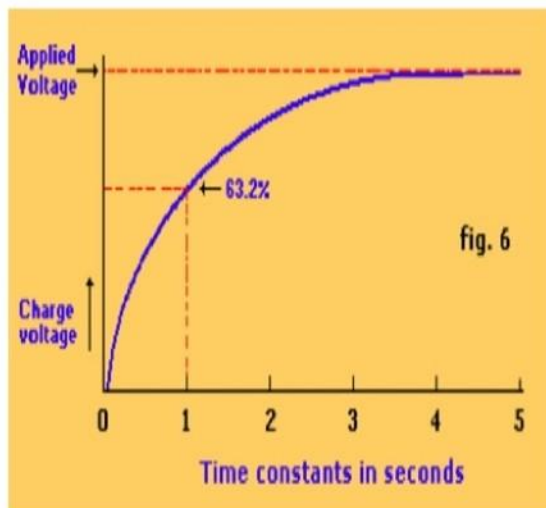
Pin 5 (control voltage): This pin allows direct access to the $\frac{2}{3} V_+$ voltage division point, the reference level of the upper comparator. It also allows indirect access to the lower comparator because there is a 2:1 splitter (R8 - R9) from this point to the lower comparator reference input, Q13. The use of this terminal is a user option, but it allows extreme flexibility by allowing the modification of the period, the restart of the comparator, etc. When timer 555 is used in a voltage controller mode, its voltage operation varies from about 1 volt less than V₊ to 2 volts of mass (although this is not guaranteed). Voltages may safely be applied outside these limits, but must be limited within the V₊ and ground limits for reasons of reliability. By applying a voltage to this pin, it is possible to vary the duration of the device independently of the RC network. The control voltage can vary from 45 to 90% of the VCC in monostable mode, which allows the output pulse width to be controlled independently of RC. When used in a-stable mode, the control voltage can vary from 1.7 V to full VDC. Variable voltage in a-stable mode will produce a modulated frequency (FM) output. If the control voltage pin is not used, it is recommended to ground it with a capacitor of about 0.01 μ F (10nF) for noise immunity because it is an input comparison. This fact is not evident in many 555 circuits since I have seen many circuits with "no-pin-5" connected to anything, but this is the proper procedure. The small ceramic lid can eliminate false activations.

Pin 6 (threshold): Pin 6 is an input of the upper comparator (the other is pin 5) and is used to reset the latch, resulting in low output. The reset through this terminal is made by taking the bottom terminal to a voltage of $\frac{2}{3} V_+$ (the normal voltage on pin 5). The action of the

threshold pin is level sensitive, which allows slow rate of change waveforms. The voltage range that can safely be applied to the threshold pin is between V^+ and ground. A direct current, called the current threshold, must also reach this terminal from the external circuit. This current is generally $0.1 I_{EA}$ and will define the upper limit of total resistance allowed from pin 6 to V^+ . For any synchronization setting that operates at $V^+ = 5$ volts, this resistance is 16 MO. For operation at 15 volts, the maximum resistance value is 20 MW.

Pin 7 (discharge): this pin is connected to the open collector of an NPN transistor (Q14), whose emitter is grounded, so that when the transistor is activated, pin 7 is actually short-circuited to the mass. Generally, the sync capacitor is connected between pin 7 and ground and is discharged when the transistor is turned on. The state of attack of this transistor has a synchronization identical to that of the output stage. It is "on" (low resistance to earth) when the output is low and "off" (high resistance to earth) when the output is high. In the monostable and a-stable time modes, this transistor switch is used to ground the appropriate nodes of the synchronization network. The saturation voltage is generally less than 100 mV (millivolts) for currents of 5 mA or less, and the leakage in the off state is approximately 20 nA (however, these parameters are not specified by all manufacturers). The maximum collector current is internally limited by design, thus eliminating capacitor size restrictions due to the maximum discharge of the pulse current. In some applications, this open-collector output can be used as an auxiliary output terminal, with a current-dissipating capacity similar to that of the output (pin 3).

Pin 8 (V^+): Pin V^+ (also called VCC) is the positive power supply terminal of the timer IC 555. The operating voltage supply range of the 555 is between +4.5 volts (minimum) and +16 volts (maximum). It is specified for operation between +5 volts and +15 volts. The device will operate essentially in the same way in this voltage range without changing the period. In fact, the most significant operating difference is the capacity of the output inverter, which increases for both the current and voltage ranges as the supply voltage increases. The sensitivity of the time interval to the variation of the supply voltage is low, typically 0.1% per volt. There are special and military devices operating at voltages up to 18 V.



555 Timer Bi-stable

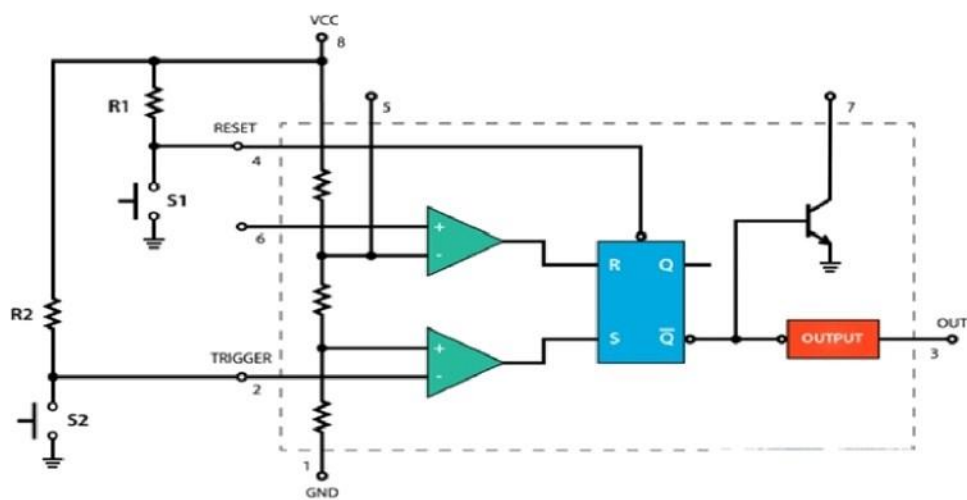


Fig.8

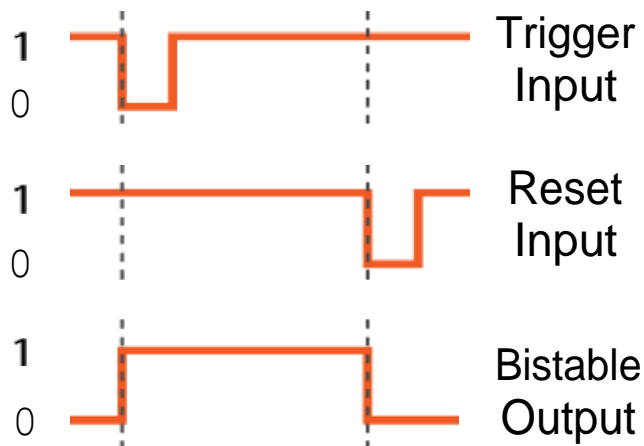
Let's look at an example of the 555 timer running in bi-stable mode. For this, we need two external resistors and two buttons.

The reset and reset pins of the integrated circuit are connected to VCC via the two resistors and are thus always high. Both buttons are connected between these pins and the ground. Therefore, if you hold them down, the input state will be low.

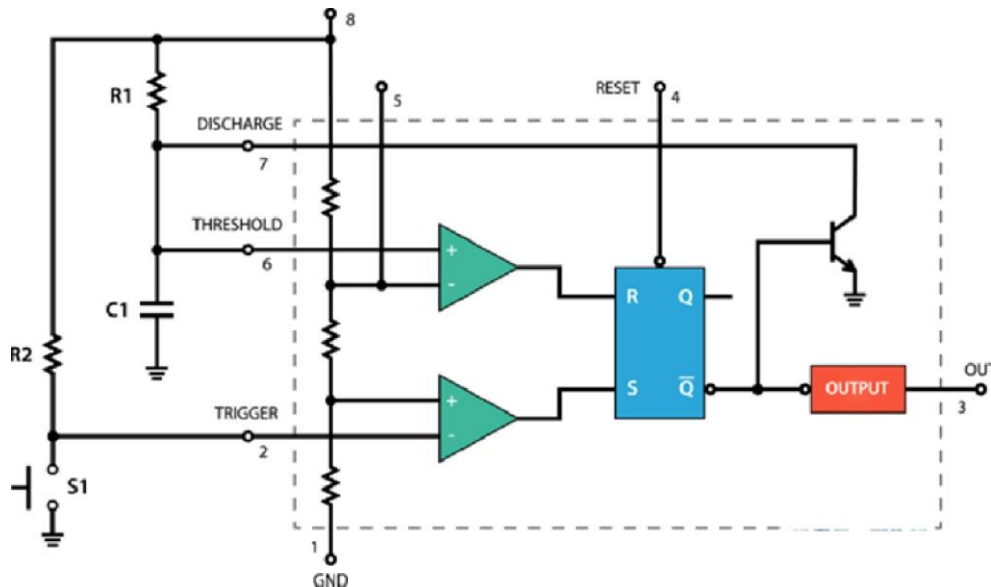
Initially, the two outputs of the comparators are 0, therefore, the output of the flip-flop and the output of the timer 555 are 0.

If we press the Trigger button, the state of the Trigger input becomes Low. The comparator emits a High signal, which causes an output of the low level of the Q bar of the reversal. The exit step will reverse this trend and the final output of the 555 timer will be high.

The output will remain high even if the trigger is not depressed because, in this case, the inputs of the R and S flip-flops will be at 0, which means that the flip-flop will not change the previous state. To make the output low, we have to press the reset button, which resets j and k flip-flops the entire integrated circuit.



555 Timer - Monostable Mode



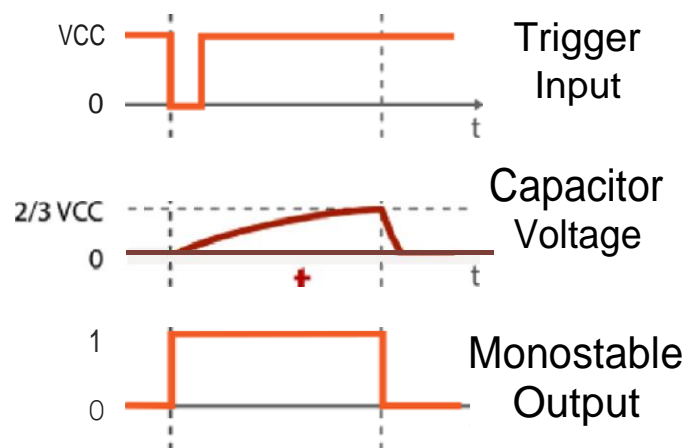
Next, let's see how the 555 timer works in monostable mode. Here is an example of a circuit.

The trigger input is held high by connecting it to VCC via a resistor. This means that the trigger comparator will generate 0 at the S input of the flip-flop. On the other hand, the threshold pin is low and the threshold comparator is also equal to 0. The threshold pin is really low because the Q bar output of the flip-flop is high, which keeps the transistor active. discharge, so that the voltage that comes from the source will be grounded through this transistor.

To change the output status of the 555 timer to the high position, press the trigger pin button. This will set the activation pin to earth or the state of the input will be 0, so the comparator will send 1 to the S input of the flip-flop. This will reduce the output of the Q bar and the output of the timer 555. At the same time, we can note that the discharge transistor is off, so that the capacitor C1 will now start charging through the resistor R1.

The timer 555 will remain in this state until the voltage across the capacitor reaches $2/3$ of the supplied voltage. In this case, the threshold input voltage will be higher and the comparator will send 1 to the input R of the flip-flop. This will bring the circuit to the initial state. The output of the Q bar will become high, which will activate the discharge transistor and will also cause the output of the integrated circuit.

Then, we can note that the time during which the output of the timer 555 is high depends on the time required for the capacitor to charge at $2/3$ of the voltage supplied, and this depends on the values of the capacitor $C1$ and the resistor $R1$. In fact, we can calculate this time with the



$$t = 1.1 \times C1 \times R1$$

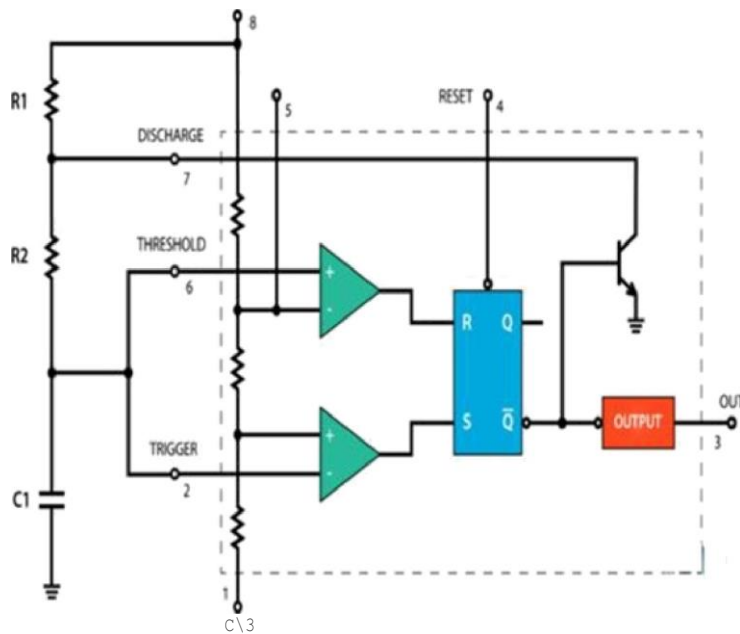
following formula

555 Timer - A-stable Mode

Let's see how the 555 timer works in stable mode. In this mode, the integrated circuit becomes an oscillator or even called Free Running Multi vibrator. It has no stable state and continuously switches between High and Low without applying an external trigger. Here is an example of a 555 timer circuit running in stable mode.

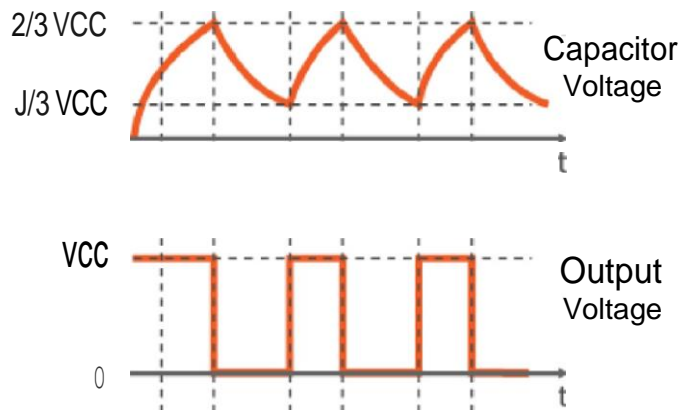
We only need two resistors and one capacitor. The trigger and threshold pins are connected to each other. No external trigger pulse is needed. Initially, the voltage source will begin charging the capacitor through the resistors R1 and R2. During charging of the tripping comparator, 1 is output because the input voltage on the tripping pin is always less than $\frac{1}{3}$ of the supplied voltage. This means that the output Q bar is 0 and the discharge transistor is closed. At this point, the performance of the 555 timer is high.

Rel. putlov again.

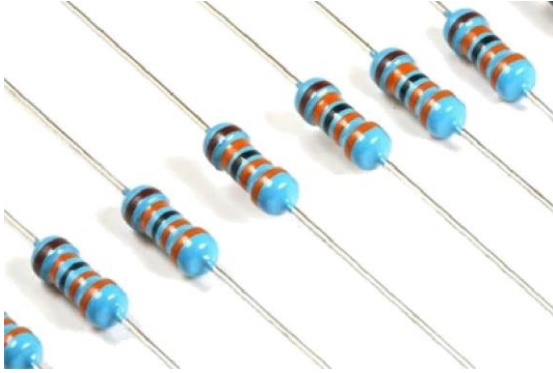


Once the voltage at the terminals of the capacitor reaches $\frac{2}{3}$ of the supplied voltage, the tripping comparator emits 0, but at this stage, it undergoes no modification, the inputs R and S of the flip-flops being equal to 0. The voltage through the capacitor, it will continue to increase and once it has reached $\frac{2}{3}$ of the supplied voltage, the threshold comparator will emit 1 to the R input of the flip-flop. This will activate the discharge transistor and the capacitor will now begin to discharge via resistor R2 and the discharge transistor. At this time, the output of the 555 Timer is low.

During the discharge, the voltage across the capacitor begins to decrease and the threshold comparator starts immediately at the output 0, which makes no change, since the inputs R and S of the flip-flop are now zero. Once the voltage across the capacitor drops to $\frac{1}{3}$ of the supplied voltage, the trigger comparator emits 1. This turns off the discharge transistor and the capacitor starts charging again. Therefore, this process of charging and discharging between $\frac{2}{3}$ and $\frac{1}{3}$ of the supplied voltage will continue to operate on its own, producing a square wave at the output of the timer 555.



RESISTORS:



Resistance is a passive electrical component intended to create resistance in the flow of electric current. In almost all electrical networks and electronic circuits can be found. The resistance is measured in ohms. An ohm is the resistance that occurs when a current of an ampere passes through a resistor with a drop of one volt between its terminals. The current is proportional to the voltage at the ends of the terminal. This relationship is represented by Ohm's law:

formula with ohm law: $R = V / I$

Resistors are used for many purposes. Some examples include electrical current delineation, voltage division, heat generation, matching and load circuits, control gain, and fixed time constants. They are commercially available with resistance values in a range of more than nine orders of magnitude. They can be used as electrical brakes to dissipate the kinetic energy of trains or be less than one millimeter squared for electronics.

CAPACITORS:

A capacitor is a two-component electrical component used to store electrostatic energy. Unlike a resistor, a capacitor does not dissipate energy. Instead, a capacitor stores energy. When a potential difference is created between the conductors, an electric field develops through the dielectric, which causes the charge of a positive charge (+ Q) on a plate and its charge. negative charge (-Q) on the other board. If a battery has been connected to a capacitor for a sufficient period of time, the current can not flow through the capacitor. However, an AC voltage is applied to the capacitor leads, a displacement current can flow.

An ideal capacitor is given by a single constant value for its capacitance. The capacitance is expressed by the relationship between the electric charge (Q) in the conductor and the potential difference (V) between them. The SI unit is FARADIUM (F), which corresponds to a coulomb per volt (1C fV). Typical capacities range from about 1 pF (10⁻¹² F) to 1 mF (10⁻³ F).

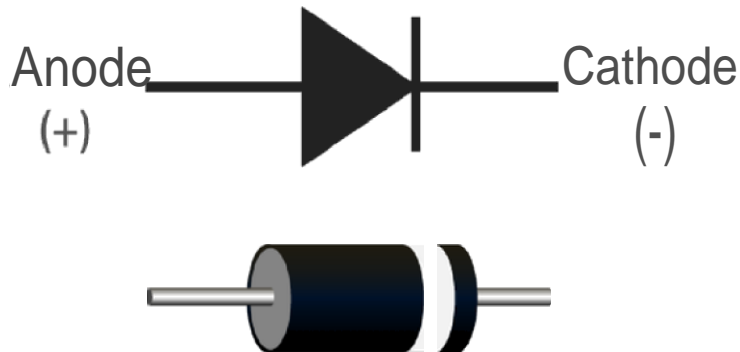
POWERSUPPLY:

A power supply is a device that supplies electric power to electric load. the term is most commonly referred to electric power converts that converts one form of electrical energy to another, though it may also refer to that convert another form of energy (mechanical, chemical, solar) to electrical energy. The regulated power supply is that controls the output voltage or current to a specific value; the controlled value is held nearly.



DIODE:

The diode, an electrical component that allows the current to flow in one direction. In circuit diagrams, a diode is represented by a triangle with a line passing through a vertex. The most common type of diode uses a junction p n. In this type of diode, a material (n) in which the electrons are charge carriers is based on a second material (p) in which the holes (depleted positions of the electrons playing the role of positively charged particles) serve as load carriers its own. interface, a depletion region is formed through which the electrons diffuse to fill the holes on the p side. This stops the extra flow of electrons. When this junction is forward biased (i.e. a positive voltage is applied on the p side), the electrons can easily move in the junction to fill the holes and a current flow in the diode. When the junction is reverse biased (i.e. a negative voltage is applied on the p side), the depletion region widens and the electrons cannot move easily. The current remains very low until it reaches a certain voltage (the cut-off voltage) and the current suddenly increases.



BUZZER:

A buzzer is a small but effective component to add sound functions to the circuit. buzzer is a very compact and small 2-pin structure. it can be easily used component in most electronic applications.

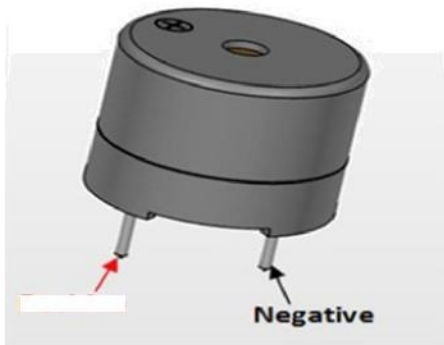
There are two types of buzzers commonly available. The first type is a simple buzzer that, once activated, will produce a continuous Beep sound. the other type is known a ready-to-use buzzer that looks bigger and will beep. Beep Sound is due to internal oscillating circuit present inside. But the one we used in the rain detector is the most used because it can be customized using other circuits to easily adapt to our application.

This buzzer can simply be used when DC power source ranging from 4V to 9V. A single 9V battery can also be used, but it is recommended to use a regulated power supply of + 5V or + 6V DC. The sound is normally associated with a switching circuit to activate or deactivate the sound at the required time and interval.

BUZZER PIN CONFIGURATION

Pin Number	Pin Name	Description
1	Positive	Identified by (+) symbol or longer terminal lead. Can be powered by 6V DC

2	Negative	Identified by short terminal lead. Typically connected to the ground of the circuit
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Transistor:



BC547 is an NPN-transistor normally transistor can be used in two ways for amplification and switch. In this project we commonly used it as switch to amplify the current the transistor should be in active region. The closed switch and open switch conditions can be achieved when the transistor is in saturation (or) cut off region.

BC547 is a common emitter configuration for amplifier for switching application the working of transistor depends on its base signal.

LED:

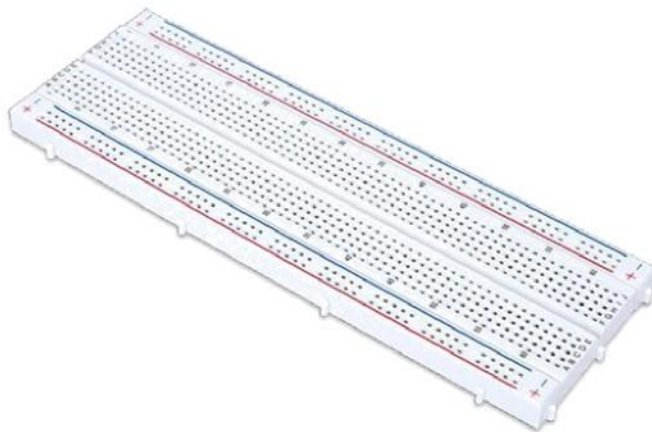


Light Emitting Diode (LED) is a light source that resembles a p-n junction diode.

When the positive current is more than the anode side than the cathode part. Electrons will recombine with holes, during this process there will be release of energy in the form of photons. This phenomenon is known as Electroluminescence and color depends of energy band gap of semiconductor,

BREAD BOARD:

A bread board is a solderless device for temporary prototypes with electronic circuit designs and tests. Most electronic components in electronic circuits can be interconnected by inserting their wires or terminals into the holes and then making wire connections where appropriate.



6.APPLICATIONS

- In irrigation, it will detect the rain and immediately alert the farmer.
- In cars, when the rain sensor detects rain, it immediately activates the windshield wipers and informs the driver.
- In communications, the power of the antenna will increase and the signal strength to send or receive signals will increase.
- In the normal house, using the rain sensor, we can automatically save rainwater. (This can only be done when home automation is complete and the necessary equipment saves rainwater. the rain sensor will detect rain and help turn on the equipment that will automatically save rainwater in different).
- This can also be used if there is also chemical rain. This is very common in industrial areas.

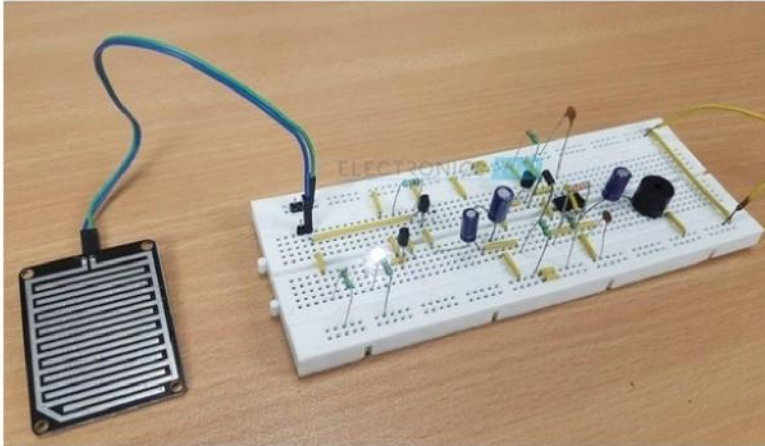
7.CONCLUSION

The rain alarm water detection system will be useful in domestic and industrial applications. even the smallest drops of water trigger the circuit, which gives the user enough time to recover his belongings, close the windows and some cases we can harvest rainwater. The device when properly placed to receive the first set of raindrops can save the harmful goods that were drying in the sun / prevent rain from entering homes, offices.

8.FUTURE SCOPE

These rain detection circuits can be used for many future purposes, such as collecting rainwater, etc. this project can be done in a similar way using Arduino. This will help us in addition to other alarm functions circuit and everything will be automated. By using a more appropriate rain sensor, we can create an accurate automatic rain detection system. By adding a microcontroller-based system, we can implement some safety features for the farmer.

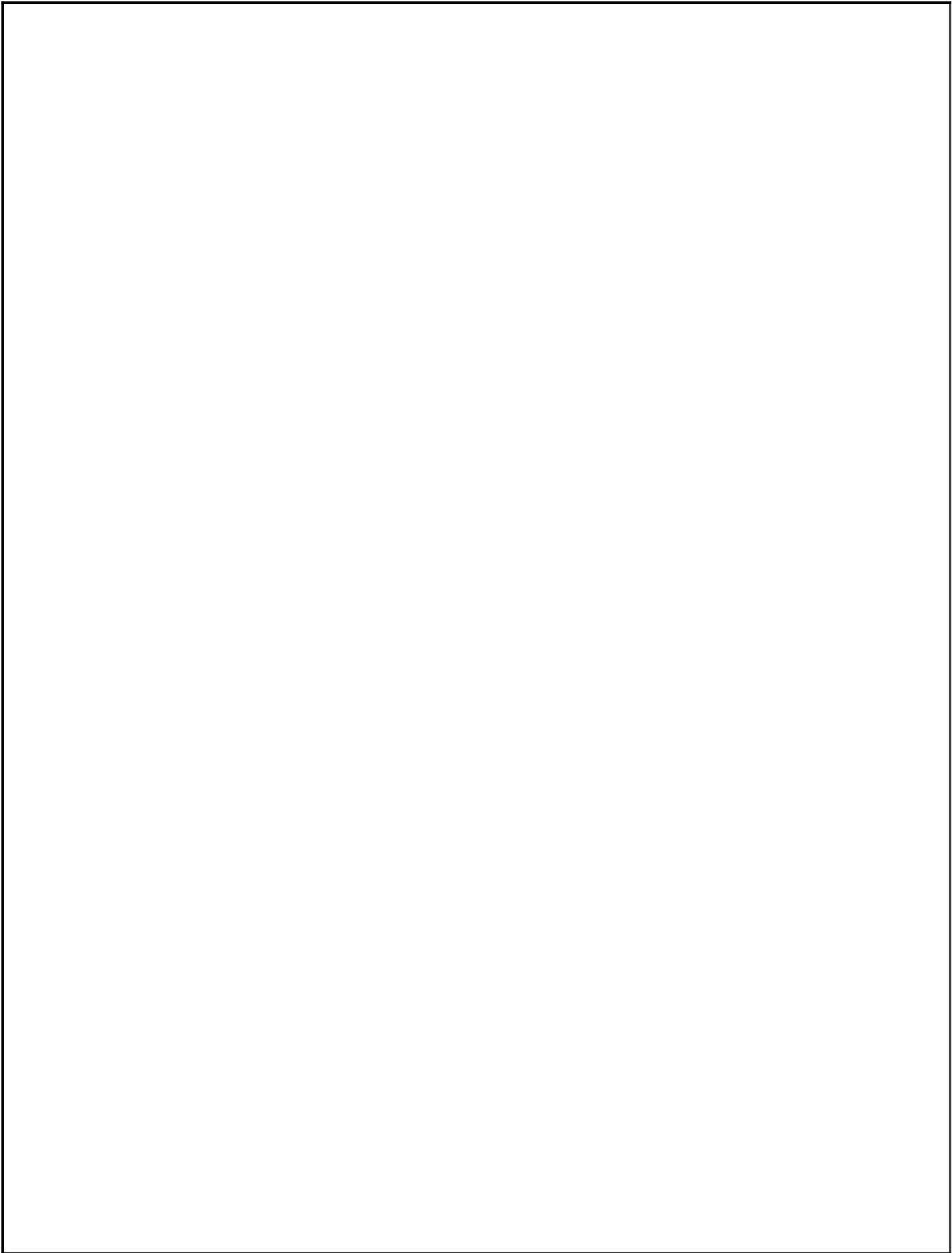
9.RESULT



We had obtained the outcome of the project. As soon as the rain sensor is made contact with the water droplets the LED starts glowing and buzzer starts beeping. After a few moments the water droplets get evaporated and the LED stops glowing and buzzer stops making beep sound.

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