AUTOMATIC RAIN SENSING ALARM

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Abstract: Automatic alarm system can be used in houses, whenever there is rain or if there is some water around the area near alarm system. Electronicbuzzer is very common device that is attached in this system which makes the system work like an alarm .Ultimate goal of project is to detect the rain falling using a rain sensor. We useda555 IC that works like timer, sending pulse as it's signal which is then read by the buzzer accordingly.

***Keywords*—Astable multivibrator, Buzzer, Comparator, IC 555, Rain sensor**

I. INTRODUCTION

This Automatic Rain Sensingalarm Control Circuit can be divided into three parts. First part includes 555 IC in Astable Mode, second part includes Comparator LM358, third part is Rain Detector. For Astable MULTIVIBRATOR, we have used a 555 Timer IC for generating pulse in every 2-3 seconds (depends on capacitor value), means 555 Timer IC is configured in Astable mode. Output of Astable Multivibrator is directly connected to inverting pin of Comparator LM358. Comparator LM358 IC is used here for comparing 555 timer IC's output voltage and reference voltage across comparator's non-inverting terminal, set by using Voltage Divider Circuit (R3 and R4). Two LEDs have been used, one at the output of 555 Astable circuit and other at the output of comparator LM358. A Water Detector or Rain Sensor is used for detecting the water or rain. Output of Astable Multivibrator and Comparator is applied to the BUZZER. Whole circuit can be powered using 5v-12v battery depending upon the application.

II. HARDWARE COMPONENTS

1.IC 555

555 timers IC. The 555 timer IC is an integratedcircuit (chip) used in a variety of timer, pulse generation, and oscillator applications. The 555 can be used to provide time delays, as an oscillator, and as a flip-flop element. Derivatives provide two (556) or four (558) timing circuits in one package

2. BUZZER

3. RAIN SENSOR

A rainsensor or rain switch is a switching device activated by rainfall. It detects or senses the presence of water and gets activated. It can be used to in irrigation as well.

III. WORKING

Working of this Automatic Rain Sensing alarmproject is simple. As we already explained that this circuit has three parts namely AstableMultivibrator, Comparator and Rain Detector. When water drops of rain falls over the Rain Sensor then it will trigger the PNP transistor BC557 and PNP transistor turns ON the power supply of whole circuit and circuit start working until there is water on the Rain Sensor. Now after the power supply has been turned ON, AstableMultivibrator starts oscillating in configured frequency. Now when the output of 555 Timer IC goes HIGH then the comparator LM358 gives LOW output and when the output of 555 IC goes LOW then the Comparator's output goes HIGH. AND by using these two outputs the buzzer beeps if high and similarly it doesn't beep when output is low.

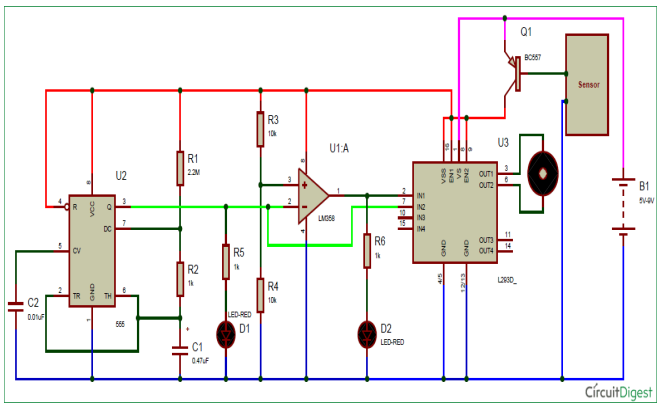
IV. COMPONENTS REQUIRED

- 555 TIMER IC
- TRANSISTOR BC557
- RESISTORS (1K,10K,2.2M)
- CAPACITORS (0.01uF,0.47uF)
- BUZZER
- RAIN SENSOR
- POWER SUPPLY (5-12V)

V. HELPFUL DIAGRAMS

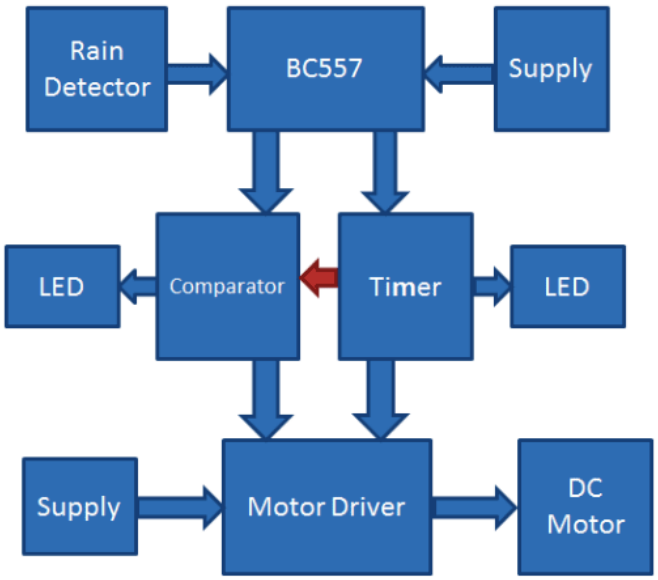
A. Circuit Diagram

The circuit diagram given is used by us to prepare our working model of automatic rain sensing alarm.This can be used for construction and learning purposes.



B. Block Diagram

This block diagram is used for logical explanation and simplified learning of the IC 555's working and automatic rain sensing alarms circuit.



VI. RESULT

Final Analysis

Thus, we can use such a system in houses to know about the arriving rain without checking the sky again and again. This system can be used to detect the rain and work accordingly.

VII. ADVANTAGES

- The manual effort of checking again and again for rain is removed.
- The preparation can be donefor heavy rain as we will know about the rain as soon as a droplet falls on the sensor.

VIII. LIMITATIONS

- It is very sensitive to water. Even a small drop triggers it.
- The dust particle and non-conductive materials cannot be detected and can reduce the efficiency of the rain sensor.

IX. FUTURE SCOPE

- The future scope of this project is to increase the application of such circuits which use IC 555 for easy lifestyle.
- These rain sensing circuits can be used for many future purposes like in rainwater harvesting etc.
- We can similarly make this project using Arduino .It will help us in addition of the more features to the alarm circuit and everything will get automated.

X. CONCLUSION

The conclusion of our paper is that using purely electronic devices, an automatic rain sensing alarm can be made. We conclude that this paper can be used in making of automatic rain sensing alarm.

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