Development of music rhythm based LED's in a circular fashion

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Abstract
In this paper, we present the development of music rhythm based LED's in a circular fashion. This article provides a concise overview of the mini project work that we undertook, which involved the design and development of the Music Rhythm LEDs. The primary goal of our project is to create Music Rhythm LEDs that can be used for DJ lights, disco lights, or lighting during a party and that turn ON and OFF in time with the beats or rhythm of the music. A microphone and BC547 on a PCB can be used to create this Music Rhythm LED's Circuit, which will cause the led to flash in time with the music. The transistor will enhance the electric pulse that the microphone produces when it detects the rhythm of the song, which will cause the linked led to begin flashing. Just a few components are needed to make this very straightforward circuit. An application is implemented realistically when the work comes to a close. The created prototype demonstrates the effectiveness and strength of the invention. The work presented here is the mini-project work of the 2nd sem students of electronics & communication engineering department of dayananda sagar college of engg., bangalore.
Keywords—LED, Display

1. Introduction

A brief introduction about the related work that is being in this introductory note on the development of music rhythm based LED's in a circular fashion. This article gives a brief overview of the mini project work we undertook that involved the creation of the Music Rhythm LEDs. Our project's primary goal is to create Music Rhythm LEDs, which will be used for Disco lights, DJ lights, or lighting at an event and will turn ON and OFF in time with the beats or rhythm of the music. Using a microphone and the BC547 transistor on a PCB, this Music Rhythm LED's Circuit causes the led to blink in time with the music. The attached led will begin blinking as soon as the microphone detects the beat of the music and generates an electric pulse that the transistor amplifies. There are only a few components needed to make this straightforward circuit. The work is completed with the practical implementation of an application. The created prototype demonstrates the invention's effectiveness and power [1].

2. A brief overview of the work

First, the design of the circuit is done, which is carried out as follows. The transistor BC547 is the foundation of the Music Rhythm LED Flash Light. According to the duration and pitch of musical beats or rhythm, these lights flash ON and OFF. These are essentially made to pick up high intensity sounds like bass. As a result, these lights turn on and off in accordance with the beats in high pitch of the song. Here, we use a microphone to turn the musical rhythm into an electric pulse. The BC547 transistor then amplifies the signal. The Fig. 1 gives the circuit diagram of the mini-project work [2].

In the Simple Music Rhythm-operated Dancing Light, a sound signal-picking microphone converts the sound impulses into voltage signals. The amount of sound that strikes the microphone directly relates to the voltage that is created [3].

3. **Approved Proposed Methodologies**
The workings of the mini-project module are shown in Fig. 1. Using a microphone, we translate the musical rhythm into an electric pulse. After that, a BC547 transistor amplifies the signal, which causes a led to blink in time to music. The data flow diagram (DFD) or block diagrammatic block diagram of the music rhythm based LED's is provided in Fig. 2 and may be used as a suggested approach in the work that we are going to apply in our project task. These are linked in accordance with the diagram above and produced the desired results [4].
Transistors for every LED will be individually connected since the intake sound must be amplified. Transistors are utilised because environmental noise may diminish the sound that is used as input. The type of transistor being used is an NPN transistor. When there is no voltage provided to the base of an NPN transistor, it can function as an open switch, and when there is a voltage applied, it can function as a closed switch. Usually, 0.7 volts is sufficient to conduct it completely [5].
In accordance with its polarity, mic must be appropriately conducted in the circuit. We can examine the mic terminals to discover the polarity of the microphone. The negative terminal is the one with three soldering lines. It can be used as an accident-prevention indicator on highways and in the entertainment industry. It can be used for entertainment purposes in bars, at birthday celebrations, and primarily as a highway indicator to reduce accidents. If a person is driving on the highway without headlights, they may cause accidents, but they can be prevented by installing this system in their cars; when this type of music is played, the light blinks so that the road can be seen and the person can also enjoy the music [6].
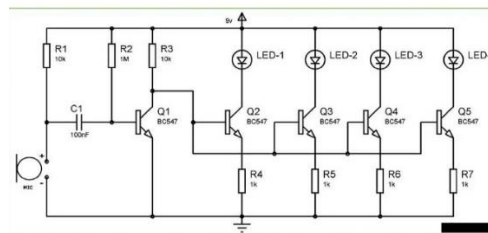
4. Circuit diagram of the design
There are certain limitations of the work, for ex., the prepared circuit depends mostly on the sound that strikes it; if the sound level is below the required level, the project fails is one such limitation. Another limitation is - it also depends on the distance between the input signal and the microphone; if the distance is greater than necessary, the light of the led will undoubtedly dim and the project will fail. We can therefore draw the conclusion that the LED's glow is inversely proportional to the distance between the microphone and the sound waves it receives. LED illumination according to distance between input signal and mic [7].
These are linked in accordance with the diagram above and produced the desired results. Transistors for every LED will be individually connected since the intake sound must be amplified. Transistors are utilised because environmental noise may diminish the sound that is used as input. The type of transistor being used is an NPN transistor. When there is no voltage provided to the base of an NPN transistor, it can function as an open switch, and when there is a voltage applied, it can function as a closed switch. Usually, 0.7 volts is sufficient to conduct it completely. In accordance with its polarity, mic must be appropriately conducted in the circuit. We can examine the mic terminals to discover the polarity of the microphone. The negative terminal is the one with three soldering lines [8].

5. Hardware module developed
The hardware module developed is shown in the Fig. 1. We have designed and developed the Music Rhythm LEDs as part of our mini project effort. Our project's primary goal is to create Music Rhythm

LEDs, which will be used for Disco lights, DJ lights, or lighting at an event and will turn ON and OFF in time with the beats or rhythm of the music. Using a microphone and the BC547 transistor on a PCB, this Music Rhythm LED's Circuit causes the led to blink in time with the music. The attached led will begin blinking as soon as the microphone detects the beat of the music and generates an electric pulse that the transistor amplifies. There are only a few components needed to make this straightforward circuit. The work is completed with the practical implementation of an application.
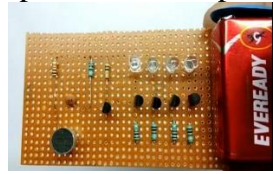

Fig. 1: LED driven by the battery

The finished prototype demonstrates the invention's effectiveness and power. BC547 is the transistor on which the Music Rhythm LED Flashlight is built. According to the duration and pitch of musical beats or rhythm, these lights flash ON and OFF. These are essentially made to pick up high intensity sounds like bass. As a result, these lights turn on and off in accordance with the beats in high pitch of the song. Here, we use a microphone to turn the musical rhythm into an electric pulse. The BC547 transistor then amplifies the signal. The sound impulses are captured and converted into voltage signals by the Simple Music Rhythm controlled dancing light mic. The amount of sound that strikes the microphone directly relates to the voltage that is created by the LED system. Figs 2 & 3 gives the LED driven by battery & the developed hardware [9].
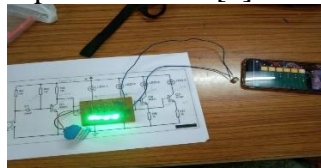

Fig. 2 : Hardware module developed using electronic components

6. Problem Statement Chosen

We chose this subject for our small project because it has a unique benefit, such as the ability to be used as an indicator on highways to prevent accidents and for amusement. It can be used for entertainment purposes in bars, at birthday celebrations, and primarily as a highway indicator to reduce accidents.

Fig. 3 : Rolling display of the project

7. Conclusions

Music rhythm LED circular display was designed, developed & implemented by the team of mini project students. Any highway sign can be an indicator using music Rhythm LED circuits. It can also be utilised as decorations for events like Christmas, festivals, weddings, anniversaries, and birthdays. These are also utilised in bars, nightclubs, party venues, etc [10]. Following is a summary of the outcomes or results of the mini-project work - It is possible to implement the music rhythm led effectively. The microphone can take up low volume noises with greater sensitivity, thus LEDs can also shine to low pitch music. Therefore, by modifying its sensitivity, we may make it more sensitive to react on every beat in the music or less sensitive to react only on high note beats. The mic's ability to detect noises decreases with increasing distance, which also means the led won't light up when it reaches its maximum range. LEDs glow more when the volume is higher at a particular place; when the volume is lower, LEDs glow less frequently.

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