

A Hardware Designing of Automatic Class Room Light Controller with Bidirectional Visitor Counter

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Abstract

Automatic classroom light controller with visitor counter is the representative of the modern counting of the students. With the advent of modern technology it becomes easier for the students as well as teachers to perform their task more efficiently. With the aid of modern technology it has become easier for the students and teachers across the world to get a good grasp of the theoretical as well as practical knowledge. Through technology it has become counting of students and therefore the technology helps us to be conversant of the nuances of any concept. The automatic classroom LIGHT controller is rectification to various problems of student counting. This projects aims to make use of the modern technology for helping the student counting students to easily get access to students valid and invalid. In this project we are building a prototype of smart classroom in which an application would be pivotal for carrying out various operations in classroom.

Keyword: Light, IR, BC 547, CL 100, Microcontroller AT89S52**Introduction**

This system facilitates a bidirectional visitor counter for displaying the number of persons inside the room. When a person enters into the room, an IR beam is obstructed between the IR transmitter and the receiver.

The objective of this project is to make a controller-based model to count number of persons visiting particular room and accordingly light up the room. Here we can use sensor and can know present number of persons.

In today's world, there is a continuous need for automatic appliances with the increase in standard of living, there is a sense of urgency for developing circuits that would ease the complexity of life.

Also if at all one wants to know the number of people present in room so as not to have congestion. This circuit proves to be helpful.

List of Components

Following is the list of components that are necessary to build the assembly of the Digital Speedometer Cum Odometer

- Microcontroller – AT89S52
- IC – 555
- Sensor – TSOP 1738 (Infrared Sensor)
- Disc capacitor – 104,33pF
- Reset button switch
- Rectifier diode – IN4148
- Transistor – BC 547, CL 100

- 7-Segment Display
- Connecting Wires
- Led
- Resisters
- Stepper Motor
- Magnetic sensors

Microcontroller AT89S52

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

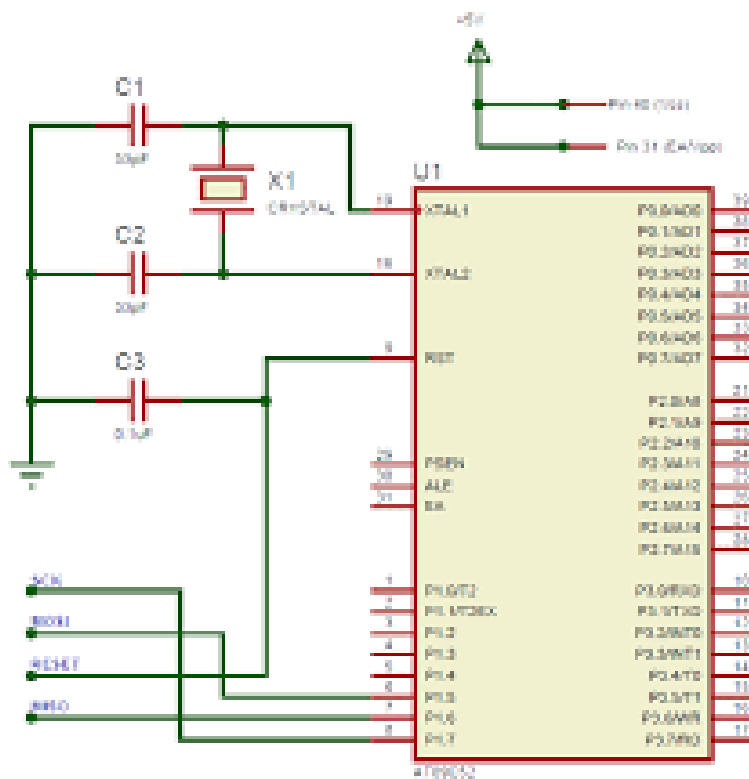


Fig. 1: Microcontroller AT89S52

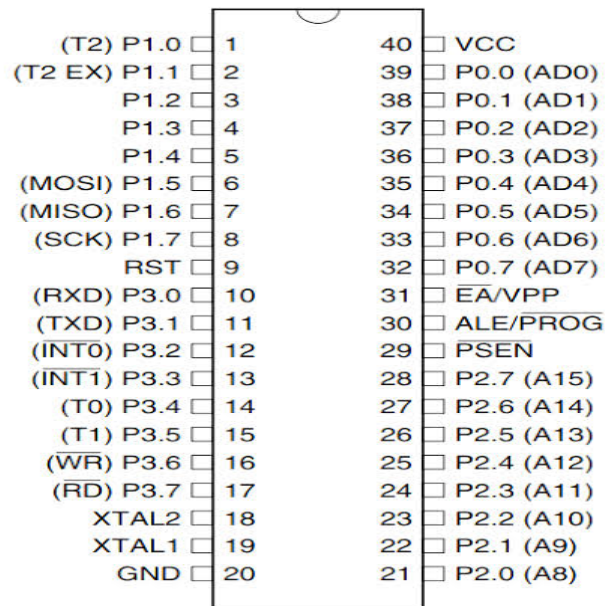


Fig.2: Microcontroller AT89S52

Sensor – TSOP 1738 (Infrared Sensor)

The TSOP17.. – Series are miniaturized receivers for infrared remote control systems

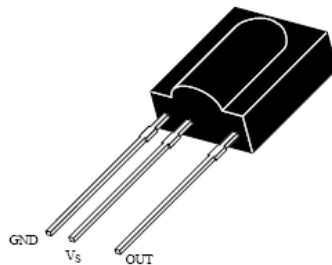


Fig. 3: Infrared Sensor

TSOP17.. is the standard IR remote control receiver series, supporting all major transmission codes

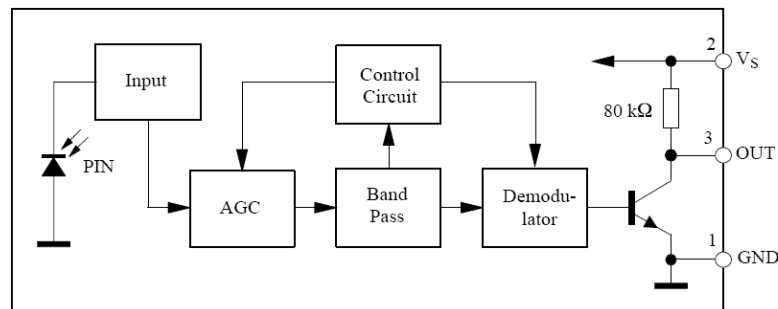


Fig.4: Block Diagram of TSOP 1738

555 (TIMER IC)

The LM555 is a highly stable device for generating accurate time delays or oscillation. Additional terminals are provided for triggering or resetting if desired.

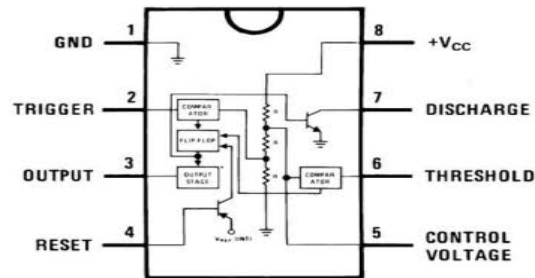


Fig.5: IC (555)

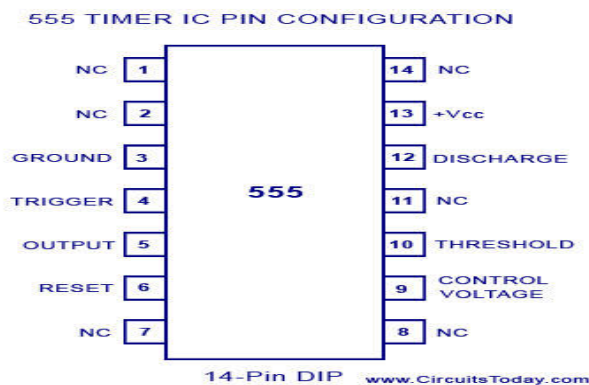


Fig. 6: IC (555)

LTS 542 (7-Segment Display)

The LTS 542 is a 0.52 inch digit height single digit seven-segment display. This device utilizes Hi-eff. Red LED chips, which are made from Gasp on Gap substrate, and has a red face and red segment.

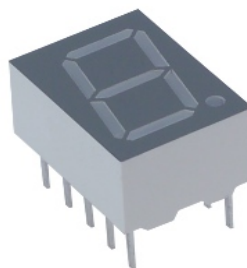


Fig. 7: Segment

LM7805 (Voltage Regulator)

The KA78XX/KA78XXA series of three-terminal positive regulator are available in the TO-220/D-PAK package and with several fixed output voltages, making them useful in a wide range of applications.



Fig. 8: Voltage Regulator

Relay Circuit

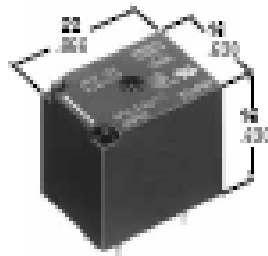


Fig. 9: Relay

A single pole double throw (SPDT) relay is connected to port RB1 of the microcontroller through a driver transistor. The relay requires 12 volts at a current of around 100ma, which cannot provide by the microcontroller. So the driver transistor is added

Reed switches come in two main varieties called normally open (normally switched off) and normally closed (normally switched on). The key to understanding how they work is to realize that they don't just work as an electrical bridge but as a *magnetic* one as well: magnetism flows through them as well as electricity.

Definition of Stepper motor

A stepper motor is an electromechanical device which converts electrical pulses into discrete mechanical movements. The shaft or spindle of a stepper motor rotates in discrete step increments when electrical command pulses are applied to it in the proper sequence. Stepper motors are inexpensive and rugged because they have fewer mechanical parts. They are brushless, easy to position, and are commonly used in automation systems, although they are small low power devices as compared to other motors.

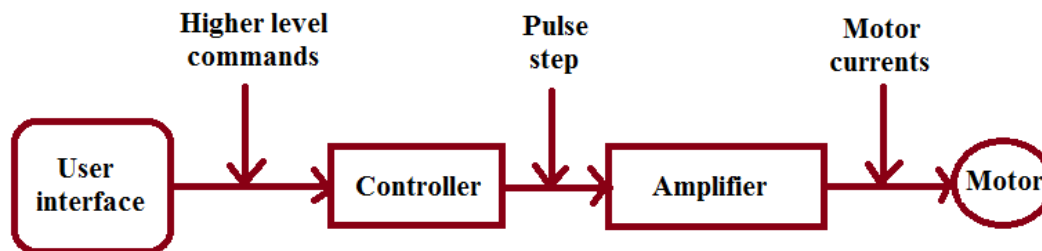


Fig. 10: Block Diagram of Stepper Motor

Working: We started our project by making power supply. That is easy for me but when we turn toward the main circuit, there are many problems and issues related to it, which we faced, like component selection, which components is better than other and its feature and cost wise a We started our project by making power supply. That is easy for me but when I turn toward the main circuit, there are many problems and issues related to it, which are I faced, like component selection, which components is better than other and its feature and cost wise also, then refer the data books and other materials related to its. I had issues with better or correct result, which I desired. And also the software problem. I also had some soldering issues which were resolved using continuity checks performed on the hardware. We had issues with better or correct result, which we desired. And also the software problem. We also had some soldering issues which were resolved using continuity checks performed on the hardware. We started testing the circuit from the power supply. There we got over first trouble. After getting 9V from the transformer it was not converted to 5V and the circuit received 9V. As the solder was shorted IC 7805 got burnt. So we replaced the IC7805.also the circuit part around the IC7805 were completely damaged..with the help of the solder we made the necessary paths.

Result: We started our project by making power supply. That is easy for me but when we turn toward the main circuit, there are many problems and issues related to it, which we faced, like component selection, which components is better than other and its feature and cost wise a We started our project by making power supply. That is easy for me but when I turn toward the main circuit, there are many problems and issues related to it, which are I faced, like component selection, which components is better than other and its feature and cost wise also, then refer the data books and other materials related to its. I had issues with better or correct result, which I desired. And also the software problem. I also had some soldering issues which were resolved using continuity checks performed on the hardware. We had issues with better or correct result, which we desired. And also the software problem. We also had some soldering issues which were resolved using continuity checks performed on the hardware.

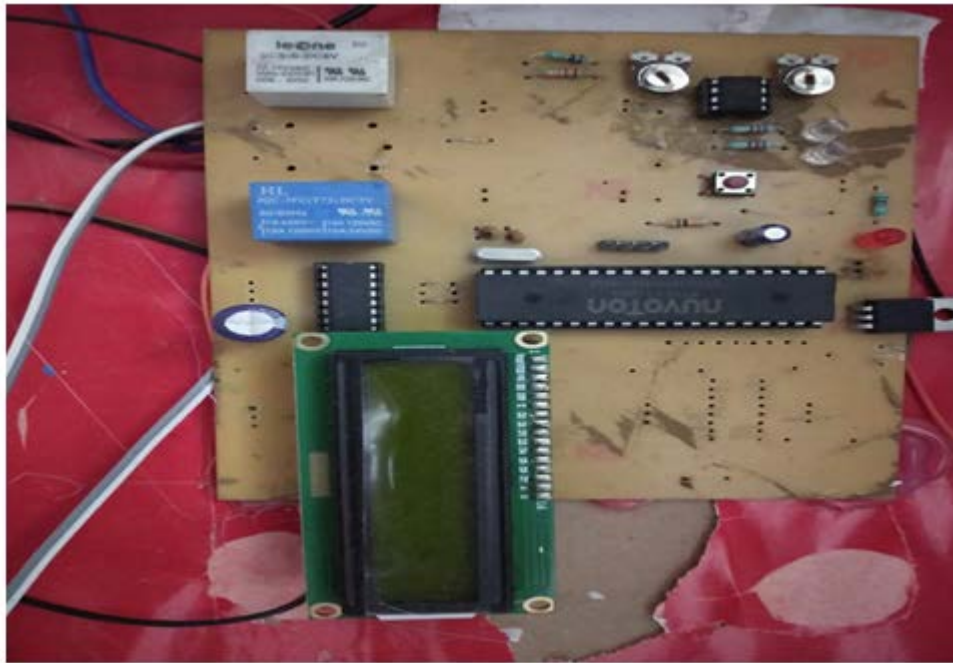


Fig. 11: Designed circuit

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