



DESIGN AND CONSTRUCTION OF AN AUTOMATIC BELL FOR INSTITUTION

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Abstract: The world over the decades has made considerable advancement in automation; automation is employed in homes, industries, commercial and educational sectors. In this work, a microcontroller-based automatic school bell is designed. This circuit uses a programmed microcontroller chip to schedule the school teaching and break periods so that for every start or end of a period a bell is automatically rang. This design finds a tremendous use at primary and secondary school levels where the teaching sections can span over eight periods including breaks. The advantage here is that the bell rings at the start of each period without any human intervention to a great degree of accuracy. The time schedule results are compared with that obtained with a clock, however, some drift is noticed, which is negligible.

Keywords: Automation, microcontroller AT89S52, time selecting unit, break period.

1. INTRODUCTION

In today's life, everyone gives importance to time. Time does not wait for anybody. Everything should be performed in time & accurately. Now a day's school/college bells are manually operated. Hence there is a big question of accuracy. Also there is necessity of manpower and money. Hence here we should use automatic control system, which saves our manpower and money & also highest accuracy. Hence, we have selected the project.

2. CONCEPT

The Project takes over the task of Ringing of the Bell in Colleges. It replaces the Manual Switching of the Bell in the College. It has an Inbuilt Real Time Clock (DS1307 /DS 12c887) which tracks over the Real Time. When this time equals to the Bell Ringing time, then the Relay for the Bell is switched on. The Bell Ringing time can be edited at any Time, so that it can be used at Normal Class Timings as well as Exam Times. The Real Time Clock is displayed on LCD display. The Microcontroller AT89S52 is used to control all the Functions, it gets the time through the keypad and store it in its Memory. And when the Real time and Bell time get equal then the Bell is switched on for a predetermined time. (1)



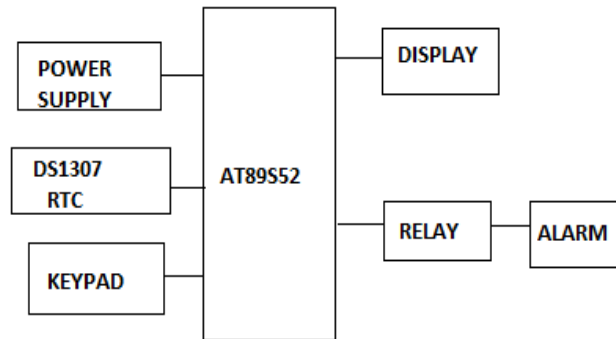


Automatic College Bell

Bell Innovations

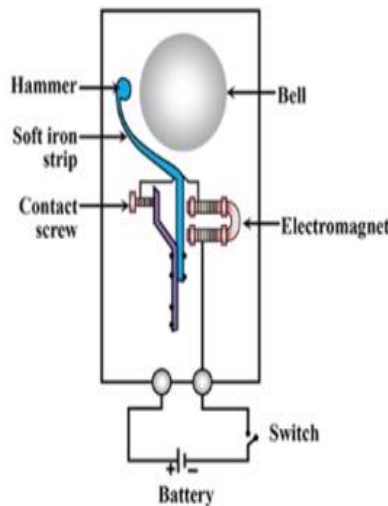
2.1. HARDWARE MODULES

The automatic control system adopted the AT89S52, the principle of the hardware chart as shown in fig.1. The core function modules are power module, RTC, LCD module, MCU, alarm module, keypad.



Block diagram of automatic bell system

When the switch is pushed on, the circuit gets completed and the current starts flowing through the U-shaped electromagnet which creates a magnetic field in the core. This attracts the iron armature. (3) When the armature moves towards the electromagnet, the hammer strikes the gong and the bell rings.



Circuit Diagram of Bell

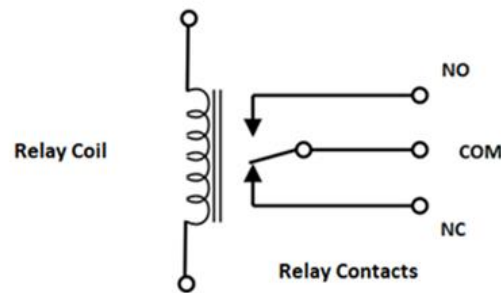
2.2. MICROCONTROLLER

The AT89C51 is a low-power, high-performance CMOS 8-bit microcomputer with 4K bytes of Flash programmable and erasable read only memory (PEROM). The device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the industry-standard MCS-51 instruction set and pin out. (2) The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a versatile 8-bit CPU with Flash on a monolithic chip, the Atmel AT89C51 is a powerful microcomputer which provides a highly-flexible and cost-effective solution to many embedded control applications.

2.3. RELAY

Relay is electro-mechanical device which is used to isolate one electrical circuit from another. It allows a low current control circuit to make or break an electrically isolated high current circuit path. Total isolation is provided by the relay between the triggering source applied to the terminal

and the output. This total isolation is a feature that makes relay different from other integrated circuits and is also important in many digital applications. (4) It is a feature that certain semiconductor switches (e.g. transistors, diodes and integrated circuits) cannot provide. In this circuit a 12V magnetic relay is used. In magnetic relay, insulated copper wire coil is used to magnetize and attract the plunger. The plunger is normally connected to N/C terminal. A spring is connected to attract the plunger upper side. When output is received by relay, the plunger is attracted and the buzzer is on.



Relay

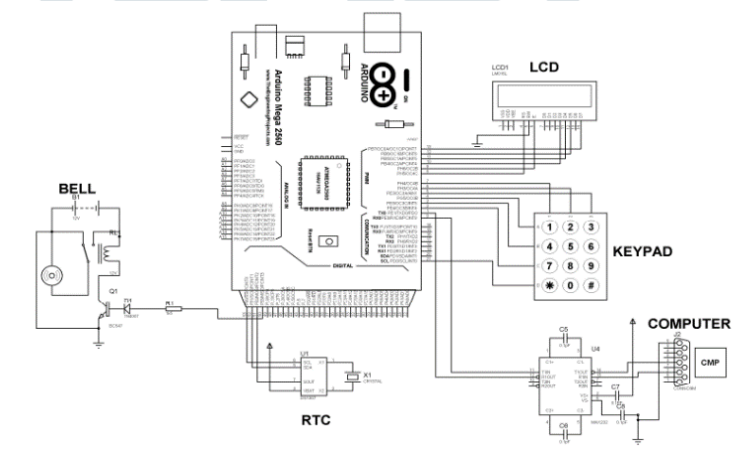
Features/Specs

- Compatible with MCS-51™ Products
- 4K Bytes of In-System Reprogrammable Flash Memory
- Fully Static Operation: 0 Hz to 24 MHz
- Three-level Program Memory Lock
- 128 x 8-bit Internal RAM
- 32 Programmable I/O Lines
- Two 16-bit Timer/Counters
- Six Interrupt Sources
- Programmable Serial Channel
- Low-power Idle and Power-down Modes

2.3. OPERATION

- Switch ON the power
- In Display the real time will display.
- It has an Inbuilt Real Time Clock (DS1307 /DS 12c887) which tracks over the Real Time. When this time equals to the Bell Ringing time, then the Relay for the Bell is switched on.
- If one wants to change the bell time, Input the desire time from the keypad provided. At the set time the buzzer will ring.
- For changing the input time press * followed by # on the keypad and set the bell time.
- One can set many ringing time at a time.
- The input time must be set with respect of RTC.

3. PROPOSED SYSTEM



Circuit diagram of the Automatic College bell

4. APPLICATION & ADVANTAGES

- It can be used in the college, school for bell ringing purpose.
- It can be used in the any type of examination for bell ringing because we can set the ringing time.
- Automatic scheduling of college bell is possible.
- Compact in size so takes less space.
- Time editable facility is available.

5. LIMITATIONS

- The all-ringing time should be given at a time.
- The previous ringing time will remove from the memory itself.
- We have used the 24-hour mode for the input of the ringing time.

6. FUTURE SCOPE & CONCLUSION

The basic design of the Automatic College Bell remains unchanged in its working, though additional functions can be added. This will sound the College Bell at defined periods on each day. The times for each period differ from one college to the next. The basic design allows you to select the best time schedule for each college by briefly pressing one of the push-to-on switches. This instructs the microcontroller to perform the specified task, causing the bell to ring at regular intervals.

7. REFERENCES

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