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### **Fire Accident Avoidance System by using GSM and GPS Technology in Trains**

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#### **ABSTRACT**

The Main Aim of the project is to fight against the fire accidents caused in the train and another important thing is to find where exactly fire accident is caused using GPS, here is the proposed system which not only intimates about the accident along with that allocation sms is sent. Whenever the fire accident occurs any one of the sensors or all the sensors will be activated and will give the signal to the microcontroller. Immediately microcontroller will activate the buzzer to alert the passengers and GSM system is also activated and sends an emergency message to the mobile numbers of the officials, which are already stored in the memory.

**KEYWORDS:** Accident, GSM, GPS, Microcontroller, Buzzer, sensors.

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## 1. INTRODUCTION

Fire on a running train is more dangerous than on a stationary one, since the sensors and the microcontroller and the GSM components are used to prevent this type of harmful effects; here we have used two sensors fire sensor and smoke sensor. Whenever the fire accident occurs these two sensors get activated and send signal to the microcontroller, immediately the microcontroller will activate the buzzer to alert the passengers as well as driver and guard. At the same time it activates the GSM and GPS system to send an emergency situation about the fire and exact location of the train to the mobile numbers of officials which are already stored in the memory, and also activates the motor to open an emergency door and to sprinkle the water<sup>1</sup>.

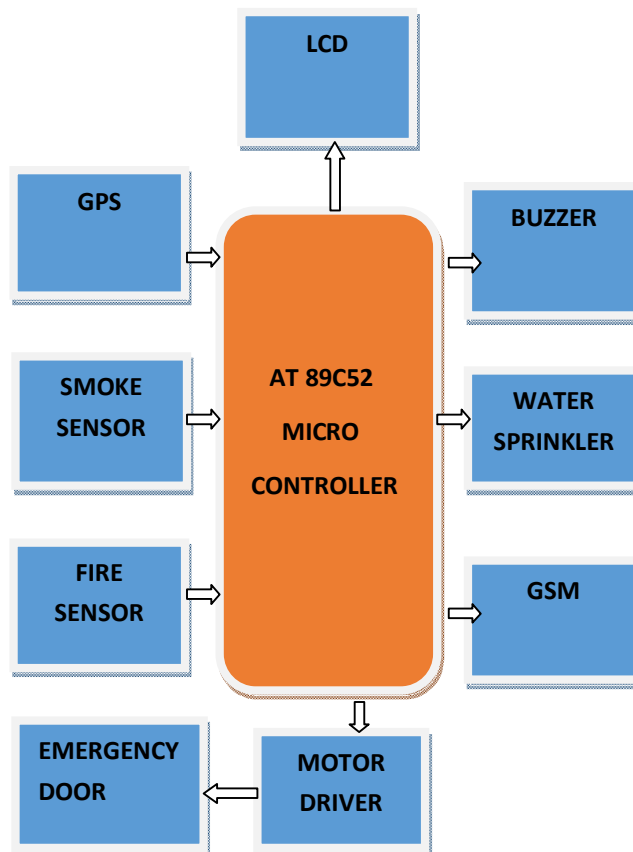


Fig 1. Basic model of the system

## 2. SCHEMATIC DISCRPTION

### 2.1 Microcontroller

Microprocessors and microcontrollers stem from the basic idea<sup>2</sup>. The contrast between a microcontroller and a microprocessor is best exemplified by the fact that most microprocessors have many operational codes for moving data from external memory to the CPU; microcontrollers have one or two operational codes<sup>3</sup>. The microprocessor is concerned with rapid movement of code and data from external addresses to the chip; the microcontroller is concerned with rapid movement of bits within the chip. The microcontroller can function as a computer with the addition of no external digital parts; the microprocessor must have additional parts to be operational. In this system we are taking AT89C52 microcontroller where AT indicates Atmel Company, 89 indicates Flash memory, C means CMOS technology, 52 is the microcontroller series that is used in this system.

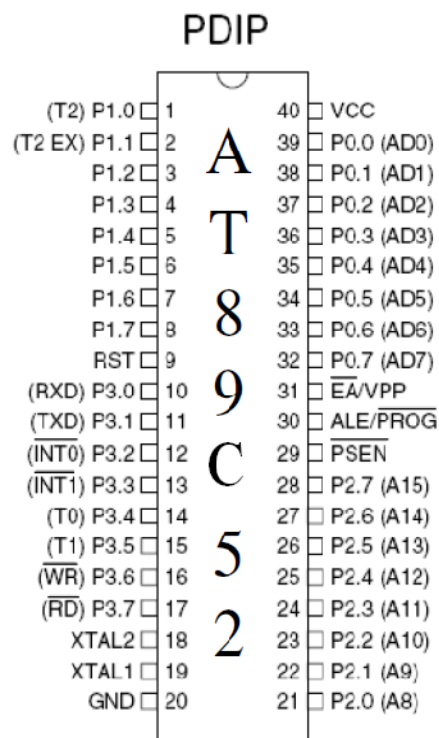


Fig 2. Pin configuration of Microcontroller AT89C52

## 2.2 Fire Sensor

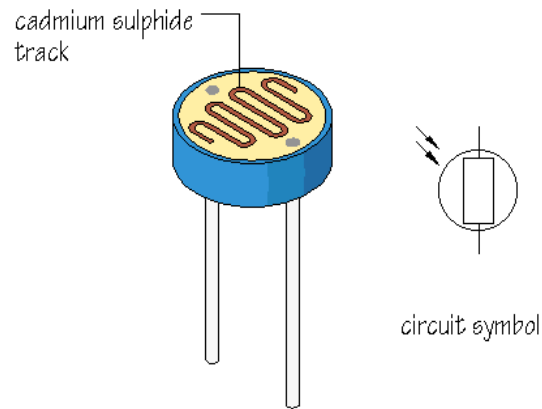


Fig 3. Fire Sensor

Fire sensors circuit exploits the temperature sensing property of an ordinary signal diode IN 34 to detect the heat from fire. At the moment it senses heat, a loud alarm simulating that of fire brigade will be produced. The circuit is too sensitive and can detect a rise in temperature of 10 degree or more in its vicinity<sup>3</sup>.

## 2.3 Smoke Sensor

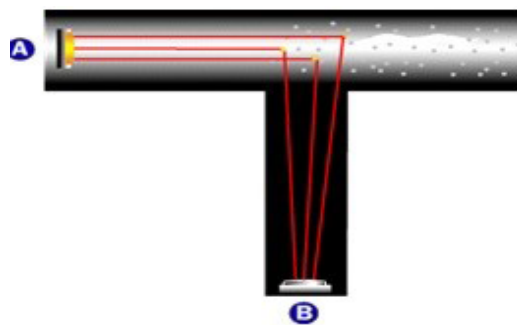


Fig 4. Smoke Sensor

Smoke detector is a device that senses smoke, typically as an indicator of fire. Commercial and residential security devices issue a signal to a fire alarm system, while household detectors, known as smoke alarm, generally issue a local audible or visual alarm from the detector itself<sup>3</sup>.

## 2.4 Buzzer

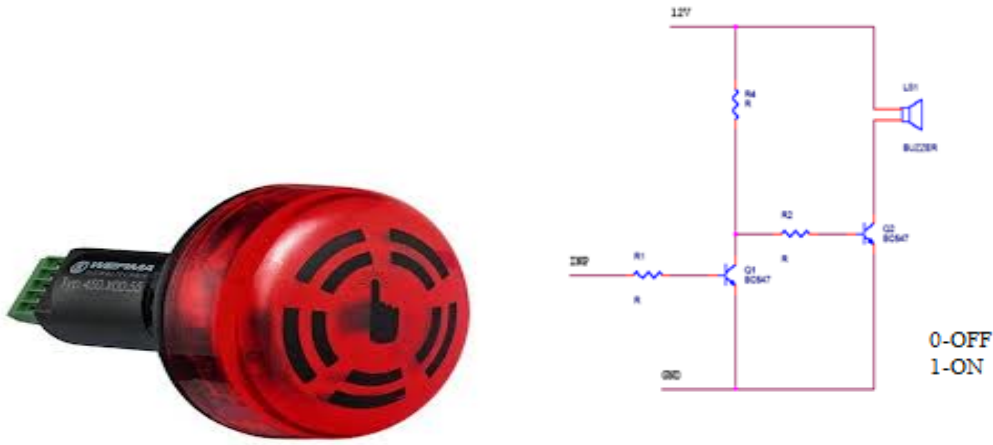


Fig 4. Buzzer circuit

A buzzer or beeper is a signaling device, usually electronic, typically used in automobiles, household appliances such as a microwave oven<sup>6</sup>. It most commonly consists of a number of switches or sensors connected to a control unit that determines if and which button was pushed or a preset time has lapsed, and usually illuminates a light on the appropriate button or control panel, and sounds a warning in the form of a continuous or intermittent buzzing or beeping sound.

## 2.5 Water Sprinkler



Fig 5. Water Sprinkler

Water sprinkler sprinkles the water whenever the fire occurs, its constantly charged with water under pressure, which holds the fire sprinkler valve in the closed position<sup>1</sup>. When a fire sprinkler head is activated water instantly flows on the fire.

## 2.6 GSM

Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication. GSM is the name of a standardization group established in 1982 to create a common European mobile telephone standard that would formulate specifications for a pan-European mobile cellular radio system operating at 900 MHz. A GSM modem is a wireless modem that works with a GSM wireless network.

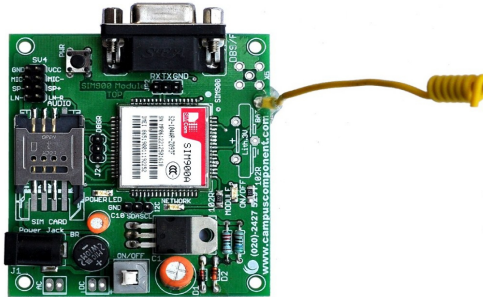


Fig 6. GSM Module

## 2.7 GPS

The global positioning system is a space-based satellite navigation system that provides location and time information in all weather conditions, anywhere on or near the earth where there is an unobstructed line of sight to four or more GPS satellite.

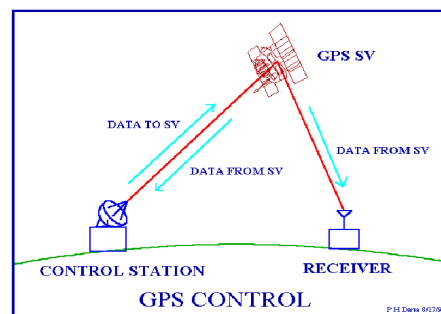


Fig 7. GPS control system

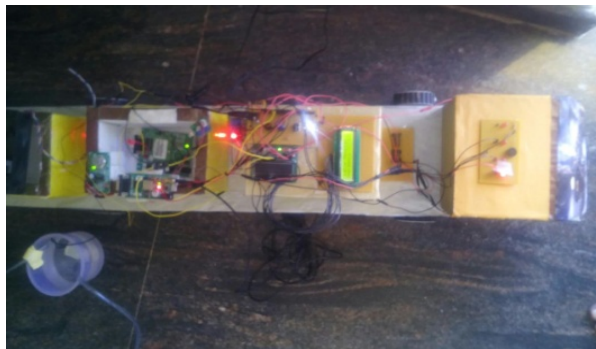
### **3. APPLICATIONS**

Can be used in hospitals, restaurants, office other public places to avoid fire accidents<sup>3</sup>.  
Can be used in vehicles even for accident and theft identification system. Can be used safety system in child monitoring for school<sup>1</sup>.

### **4. RESULT & ANALYSIS**



**Fig 8. Target Board**



**Fig 9. Activated circuit**

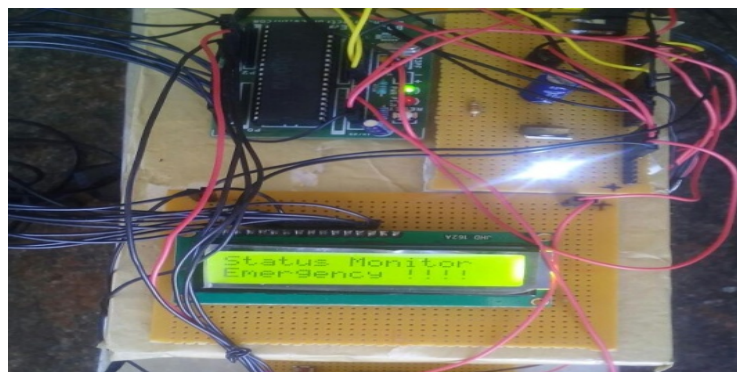




**Fig 10. Initialisation**



**Fig 11. Sensors Activated**



**Fig 12. Sended SMS to mobile by GSM & GPS technology**

## 5. CONCLUSION

Human life which are the most valuable and priceless thing in the world are getting affected due to the delay in the systems used for detection in case of the fire accidents occurring in trains . so, we have proposed a system which uses the modern technologies



such as sensor technology and GSM to reduce the delay in detection of fire accidents and alerting the respective authorities. The proposed system needs a much less power for its operation and is also cheap, so we can reduce the loss caused by fire accidents in trains.

## **6. FUTURE SCOPE**

In future with advent of the wireless sensor technology the system can be made further faster and reliable.

## **7. REFERENCES**

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