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A WARNING SYSTEM FOR DETECTION OF CHILD IN A LOCKED VEHICLE

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ABSTRACT

The system designed here is intended to present an efficient solution to detect the presence of a child in a car seat. It is a kind of warning system that alerts the parents that the child is found to be alone in a car. Driver and passengers, in some situations, may leave the car without taking (forgetting) the child. When a car is turned off with closed windows, temperature inside it will increase rapidly and can be life threatening as the thermoregulatory system of child is weak. Such incidents have been reported worldwide. To avoid such horrible incidents, here this system is developed which detects the presence of a child in a locked car by detecting the voice of crying baby and by sensing the indoor temperature of the car, and in addition to seek the help of a car surrounded people, the public announcing system will be activated automatically to alert the nearby people. GSM technology is used to transmit the information to the concern mobile phone, this can be done automatically when car indoor temperature raises more than 40C.

When the temperature raises more than pre-set value, and when the system detects the sound of crying baby, automatically the system dials the concern mobile number and information will be passed in the form of SMS. In addition, with the help of a voice record cum play back chip interfaced with main processor designed with Arduino uno board, the announcement in the form of "please. help, baby is present in the locked car" will be announced automatically and this announcement repeats continuously until the temperature reduces by less than 40C. When the temperature reduces, this indicates that some one rescued the baby by opening the car door by which announcement will be stopped automatically. Buzzer is also incorporated in the system which will be energized automatically and delivers beep sound until the baby is rescued. LCD is used to display the temperature value and APR33a3 voice record cum play back chip is used to make auto announcement.

Keywords: Detect presence of child in a car, Temperature raises, GSM technology, SMS, Announcement, Buzzer.

I. INTRODUCTION

Many scientists across the world reported about the cases that involving the death of a child in a vehicle. It happens almost every year because of negligence committed by parents who often abandons their children alone in a car. The tragic events happen frequently and it makes every person feel scared and worried. When a driver has safely arrived to their destination, they sometimes forget and overlook the presence of children in the car because of his hasty exit from the vehicle. A baby is susceptible to dehydration and this can cause them go to coma or something worse that will cause succumb to death. So, to avoid incidents like this from ever happen, a vehicle must be equipped with an alarm and sensor that can be placed in the car. If sensor is success to detect the presence of a human body or any movement, it will produce announcement, alerts the parents about it by sending SMS alert and the proposed system does it.

II. METHODOLOGY

Hardware

- Arduino Uno: The Arduino Uno is an open source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Ardino.cc. The board is equipped with sets of digital and analog input/output(I/O) pins that may be interfaced to various expansion boards (shields) and other circuits.

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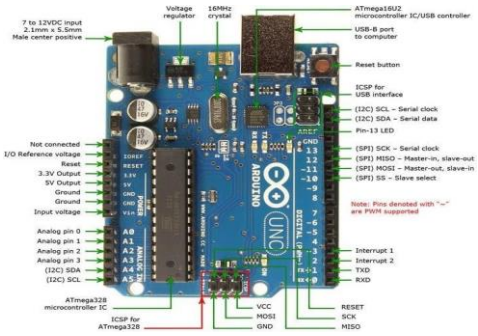
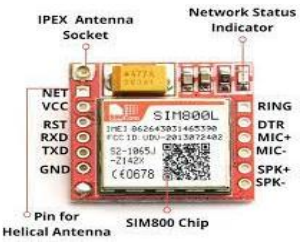


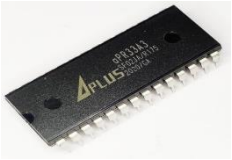
- LM35 Temperature sensor: The LM35 is an integrated circuit sensor that can be used to measure temperature with an electrical output proportional to the temperature (in °C). It can measure temperature more accurately.

- GSM Module: A GSM modem or GSM module is a device that uses GSM mobile telephone technology to provide a wireless data link to a network. GSM modems are used in mobile telephones and other equipment that communicates with mobile telephone networks. They use SIMs to identify their device to



the network.

- APR33A3 Voice record cum playback chip: The device apr33a3 offers true single-chip voice recording, non-volatile storage, and playback capability for 11 minutes. The device supports both random and sequential access of multiple messages. Sample rates are user-selectable, allowing designers to customize their design



for unique quality and storage time needs. Integrated output amplifier, microphone amplifier, A to D and D to A converters greatly simplify system design.

- IC LM386: The LM386 is a power amplifier designed for use in low voltage consumer applications. The gain is internally set to 20 to keep external part count low, but the addition of an external resistor and capacitor between pins 1 and 8 will increase the gain to any value up to 200.

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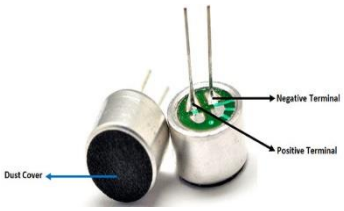
- IC LM324: The LM324 series consists of four independent, high gain, internally frequency compensated operational amplifiers which were designed specifically to operate from a single power supply over a wide range of voltages. Operation from split power supplies is also possible and the low power supply current drain is independent of the magnitude of the power supply voltage.

- Voltage regulator: A voltage regulator is a circuit that creates and maintains a fixed output voltage, irrespective of changes to the input voltage or load conditions. Voltage regulators (VRs) keep the voltages from a power supply within a range that is compatible with the other electrical components.

- Microphone: Microphone is a transducer that converts sound into an electrical signal. Microphones are used in many applications such as telephones, hearing aids, public address systems for concert halls and public events, motion picture production, live and recorded audio engineering, sound recording, two-way radios, megaphones, and radio and television broadcasting.



- Speaker: The purpose of speakers is to produce audio output that can be heard by the listener. Speakers are transducers that convert electromagnetic waves into sound waves. The speakers receive audio input from a device such as a computer or an audio receiver.

- LCD: The liquid crystal display uses the property of light monitoring of liquid crystal and they do not emit the light directly. The Liquid crystal display is a flat panel display or the electronic visual display. With low information, content the LCD' s are obtained in the fixed image or the arbitrary image which are displayed or hidden like present words, digits, or 7 segment display.

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- Buzzer: A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.

- Relay: A relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays. Relays are used where it is necessary to control a circuit by a separate low-power signal, or where several circuits must be controlled by one signal.

- Transformer: Stepdown transformer which converts 220v AC to 12v AC. This transformer used for projects and other sources which needs 12 v supply. The transformer has a primary and secondary. At primary side given input as 220v and secondary side output 12v AC.

Software

Arduino IDE: Arduino Programming

III. MODELING AND ANALYSIS

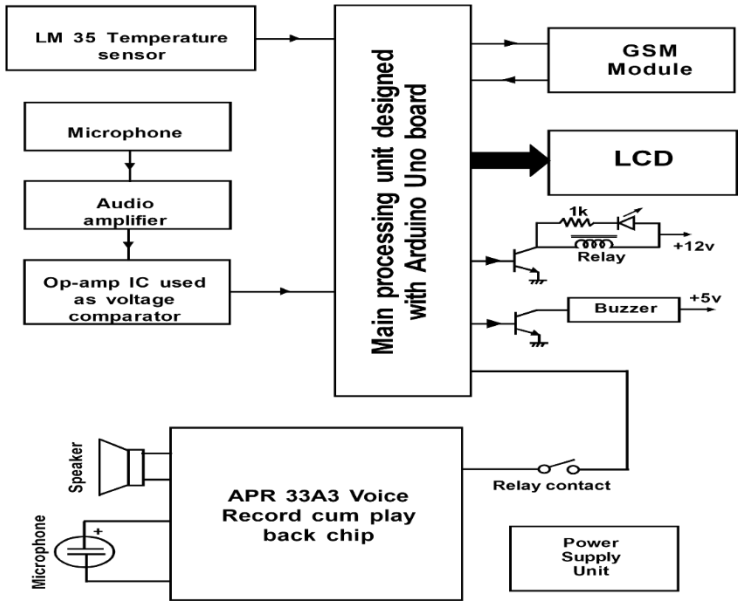

Figure 1: Block Diagram.

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IV. RESULTS AND DISCUSSION

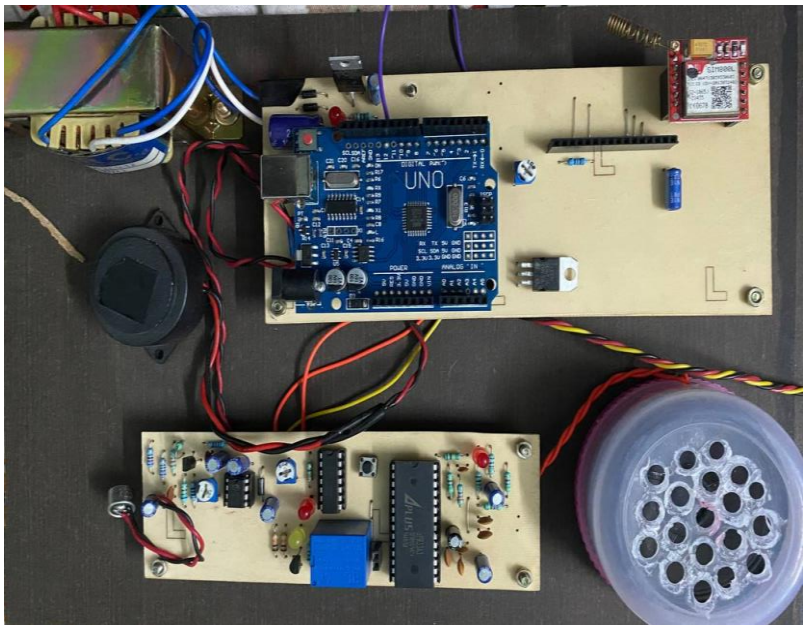

Figure 2: A Warning system for detection child in a locked vehicle

Figure 3: Message to the Phone

V. CONCLUSION

The main objective of this project has been to design a circuit that detects child in locked vehicle and consequently triggers an alarm, alerts the people around the vehicle by speaker announcement to help the child and also send SMS message. These objectives were met since the systems works effectively. Critical situations are solved and addressed quickly.

In this project, an attempt has been done and succeeded to design a warning system for detection of child using temperature sensor, APR33A3 voice record cum playback circuit, microphone and Micro controller Arduino Uno. It will help to save lives. The results obtained from the measurement have shown that the system perform well under all the conditions.

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Above all, we are very much thankful to the management of **ACE Engineering College** whichwas established by the high-profiled intellectuals for the cause of Technical Education in the modern era. We wish that ACE sooner should become a deemed university and produce uncountable young engineers and present them to the modern technical world.

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