High End Security Provider for Women - "Simply Help ME"

[1]**K. V.Rajeshkumar**
Asst.Professor

Department of Electronics & Communication Engineering
Pragati Engineering College,
Near Peddapuram, Surampalem –533 437,E.G.Dist.,A.P.

M.S.R.P.S.BADARINATH

Student(B.Tech)

Department of Electronics & Communication Engineering
Pragati Engineering College,
Near Peddapuram, Surampalem –533 437,E.G.Dist.,A.P.

Abstract - India which sees itself as a promising super power and an economic hub, is still trapped in the clutches of various patriarchal evils like molestations, dowry, crime against women, worst among all is Rape. The atrocities against the women can be now brought to an end with the help of a device called **"Help Me".** This project explains the basic idea underlying **"Help Me"** which is to flash a warning giving an instant location of the distressed victim to the police so that the incident could be prevented and the culprit apprehended. This would help to reduce crime against women. The device, named as **"Help Me – WOMEN SECURITY SYSTEM"** is a safety system specially designed for women in distress. It is a simple and easy to carry device with magnanimous functionality. The basic approach is to intimidate instant location and a distress message to the cops and registered number, so that unfortunate incidents would be averted and to provide real time evidence for swift action against the perpetrators of crime against women.

Key words:
Embedded Systems, 8051 Microcontroller, GSM Modem, GPS ,Voice Recognition circuit, Switch .

INTRODUCTION

The basic approach is to intimidate instant location and a distress message to the cops and registered number through GSM and GPS, so that unfortunate incidents would be averted and to provide real time evidence for swift action against the perpetrators of crime against women

METHODOLOGY TO IMPLEMENT

EMBEDDED - C based code used for this Idea using KEIL software. The developed code is dumped into Microcontroller (8051) IC using MICRO FLASH software. Now the Embedded IC is connected in the PCB to INPUT and OUTPUT terminals. Initially the voice recognition module recognize the voice. when ever voice is recognized it sends signal to the micro controller. Then micro controller sends signals to the GSM module through MAX 232 and sends message to the user. At the same time it also sends the instant location(latitude&longitude) through GPS. Due to Environmental conditions if voice is not recognized then for alternative purpose a manual switch is used.

INTRODUCTION TO EMBEDDED SYSTEMS

Embedded system is application-oriented special computing system which is scalable on both software and hardware. It can satisfy the strict requirement of size, functionality, reliability, cost, and power consumption of the particular application.

Examples: PDAs, Smart Phones, IP Phones and Cameras, Autopilot in airplanes, Missile guidance systems, Microwave oven…

TRENDS IN EMBEDDED MARKET

Indian Embedded market (exclusive of services) is worth US $1 billion with annual growth of 50% Current workforce in India is around 40,000 engineers with a future requirement of 80,000 engineers every year.

Some of the Major Companies:
Intel, General Electric (GE), ATMEL, MOTOROLA, Wipro, Portal Player, Conexant. Many Smaller Companies (Access Control, Smartcard and Biometric Readers, RFID)

EMBEDDED SYSTEMS - DEBUG TOOLS – ICE

In-Circuit Emulators (ICE) is by far the most widely used debug tools for embedded systems. Embedded systems with little or no visibility into the system, pose a challenge to design engineers during the development
ICE offers: Break-point features (Simple and Complex), Single-stepping
Resource editing and viewing

HARDWARE:
Reference Designs
Single board computers
In-circuit emulators - very useful

SOFTWARE:
Compilers
Assemblers
Debuggers
Performance & Diagnostic

COMPONENTS REQUIRED TO IMPLEMENT

MICROCONTROLLER UNIT (AT89S51):

A micro controller is a computer, which consists of on chip or single chip devices. Micro suggests that the device might be used to control objects processes or events. By using a microcontroller one can reduce the number of components used and thus the amount of design work and wiring required for any applications.

8051 MICROCONTROLLER

Fig.1.8051 Microcontroller

THE 8051 FAMILY CHARACTERISTICS:

- 4K Bytes ROM, 128 Bytes RAM
- Two timer/counters (16 bit), a serial port
- 4 general purpose parallel input/output port Interrupt controller.
- The 8051 can address 64K of external data memory and 64K of External program memory.

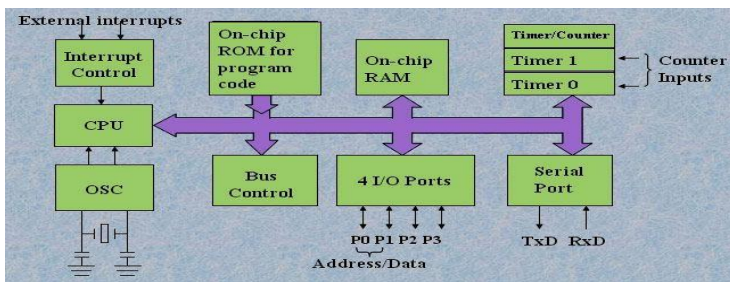### 8051 MICROCONTROLLER ARCHITECTURE:

Fig.2. 8051 Microcontroller Architecture

FEATURES OF AT89S51:
- 8K Bytes of Re-programmable Flash Memory.
- RAM is 256 bytes.
- 4.0V to 5.5V Operating Range.
- Fully Static Operation: 0 Hz to 33 MHz's
- Three-level Program Memory Lock.

- 256 x 8-bit Internal RAM.
- 32 Programmable I/O Lines.
- Three 16-bit Timer/Counters.
- Eight Interrupt Sources.
- Full Duplex UART Serial Channel.
- Low-power Idle and Power-down Modes.
- Interrupt recovery from power down mode.
- Watchdog timer.
- Dual data pointer.
- Power-off flag.
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GLOBAL SYSTEM FOR MOBILE COMMUNICATION (GSM)

INTRODUCTION TO GSM:

Global system for mobile communications (GSM) is the most popular standard for mobile Phones in the world. GSM service is used by over 1.5 billion people across more than 210 Countries and territories. The ubiquity of the GSM standard makes international roaming very common between mobile phone operators, enabling subscribers to use their phones in many parts of the world. GSM differs significantly from its predecessor, in that both signalling and speech channels, as there are digital, which means that it is considered a second generation (2G) mobile phone system. This fact has also meant that data communication was built into the system. From very early on, GSM is an open standard which is currently developed by the 3GPP.

GSM-SIM 900
Features:
- Low power consumption
- Operational temperature:
- Supply voltage:3.4 to 4.5

Fig 3. GSM modem

ABOUT SMS:

SMS stands for short message service. Simply put, it is a method of communication that sends text between cell phones, or from a PC or handheld to a cell phone. The "short" part refers to the maximum size of the text messages: 160 characters (letters, numbers or symbols in the Latin alphabet). For other alphabets, such as Chinese, the maximum SMS size is 70 characters.

Even if we are not talking on our cell phone, our phone is constantly sending and receiving information. It is talking to its cell phone tower over a pathway called a control channel.

The reason for this chatter is so that the cells as we move around. Every so often, our phone and the tower will exchange a packet of data that lets both of them know that everything is OK.
GSM AT Commands:

AT commands are instructions used to control a modem. AT is the abbreviation of ATtention. Every command line starts with "AT" or "at". That's why modem commands are called AT commands. Many of the commands that are used to control wired dial-up modems, such as ATD (Dial), ATA (Answer), ATH (Hook control) and ATO (Return to online data state), are also supported by GSM/GPRS modems and mobile phones. Besides this common AT command set, GSM/GPRS modems and mobile phones support an AT command set that is specific to the GSM technology, which includes SMS-related commands like AT+CMGS (Send SMS message), AT+CMSS (Send SMS message from storage), AT+CMGL (List SMS messages) and AT+CMGR (Read SMS messages).

Note that the starting "AT" is the prefix that informs the modem about the start of a command line. It is not part of the AT command name. For example, D is the actual AT command name in ATD and +CMGS is the actual AT command name in AT+CMGS. However, some books and web sites use them interchangeably as the name of an AT command.
Here are some of the tasks that can be done using AT commands with a GSM/GPRS modem or mobile phone:

Get basic information about the mobile phone or GSM/GPRS modem. For example, Name of manufacturer (AT+CGMI), model number (AT+CGMM), IMEI number (International Mobile Equipment Identity) (AT+CGSN) and software version (AT+CGMR).

Get basic information about the subscriber. For example, MSISDN (AT+CNUM) and IMSI number (International Mobile Subscriber Identity) (AT+CIMI).

Get the current status of the mobile phone or GSM/GPRS modem. For example, mobile phone activity status (AT + CPAS), Mobile network registration status (AT+CREG), radio signal strength (AT+CSQ), battery charge level and battery charging status (AT+CBC).

Establish a data connection or voice connection to a remote modem (ATD, ATA, etc.).

Send and receive fax (ATD, ATA, AT+F*).

Send (AT+CMGS, AT+CMSS), read (AT+CMGR, AT+CMGL), write (AT+CMGW) or delete (AT+CMGD)

SMS messages and obtain notifications of newly received SMS messages (AT+CNMI).

Read (AT + CPBR), write (AT + CPBW) or search (AT + CPBF) phonebook entries. Perform security-related tasks, such as opening or closing facility locks (AT+CLCK), checking whether a facility is locked (AT+CLCK) and changing passwords (AT+CPWD).(Facility lock examples: SIM lock [a password must be given to the SIM card every time the mobile phone is switched on] and PH-SIM lock [a certain SIM card is associated with the mobile phone. To use other SIM cards with the mobile phone, a password must be entered.])

Control the presentation of result codes / error messages of AT commands. For example, you can control whether to enable certain error messages (AT+CMEE) and whether error messages should be displayed in numeric format or verbose format (AT+CMEE=1 or AT+CMEE=2).

Get or change the configurations of the mobile phone or GSM/GPRS modem. For example, change the GSM network (AT+COPS), bearer service type (AT+CBST), radio link protocol parameters (AT+CRLP), SMS center address (AT+CSCA) and storage of SMS messages (AT+CPMS).

Save and restore configurations of the mobile phone or GSM/GPRS modem. For example, save (AT+CSAS) and restore (AT+CRES) settings related to SMS messaging such as the SMS center address.

GLOBAL POSITIONING SYSTEM (GPS)

It 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 satellites. The system provides critical capabilities to military, civil and commercial users around the world. It is maintained by the United States government and is freely accessible to anyone with a GPS receiver.

Fig.4. GPS SYSTEM

Each GPS satellite transmits data that indicates its location and the current time. The distance to the GPS satellites can be determined by estimating the amount of time it takes for their signals to reach the receiver. When the receiver estimates the distance to at least four GPS satellites, it can calculate its position in three dimensions.

VOICE RECOGNITION CIRCUIT

This module could recognize your voice. It receives configuration commands or responds through serial port interface. With this module, we can control the car or other electrical devices by voice. This module can store 15 pieces of voice instruction. Those 15 pieces are divided into 3 groups, with 5 in one group. First we should record the voice instructions group by group. After that, we should import one group by serial command before it could recognize the 5 voice instructions within that group. If we need to implement instructions in other groups, we should import the group first. This module is speaker independent. If your friend speaks the voice instruction instead of you, it may not identify the instruction. Please note that speaker independence requires strictly good MIC. The MIC we supply is not good enough for it to be speaker-independent.
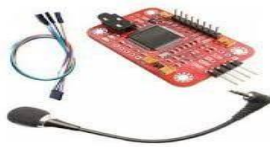

Fig 5: Voice recognition module

Parameters**:**
- Voltage: 4.5-5.5V
- Current: <40mA
- Digital Interface: 5V TTL level UART interface
- Analog Interface: 3.5mm mono-channel microphone connector + microphone pin interface
- Size: 30mm x 47.5mm
- Recognition accuracy: 99% (under ideal environment)

SWITCH

A push button or simply button is a simple switch mechanism for controlling some aspect of a machine or a process. Buttons are typically made out of hard material, usually plastic or metal. The surface is usually flat or shaped to accommodate the human finger or hand, so as to be easily depressed or pushed. Buttons are most often biased switches, though even many un-biased buttons require a spring to return to their un-pushed state.

In industrial and commercial applications, push buttons can be connected together by a mechanical linkage so that the act of pushing one button causes the other button to be released. In this way, a stop button can "force" a start button to be released. This method of linkage is used in simple manual operations in which the machine or process have no electrical circuits for control.
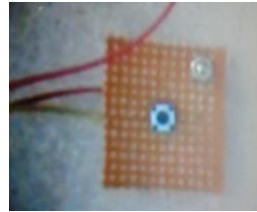

Figure6 : switch

FINAL RESULTS

Thus from our idea we can save the women when they are in distress.
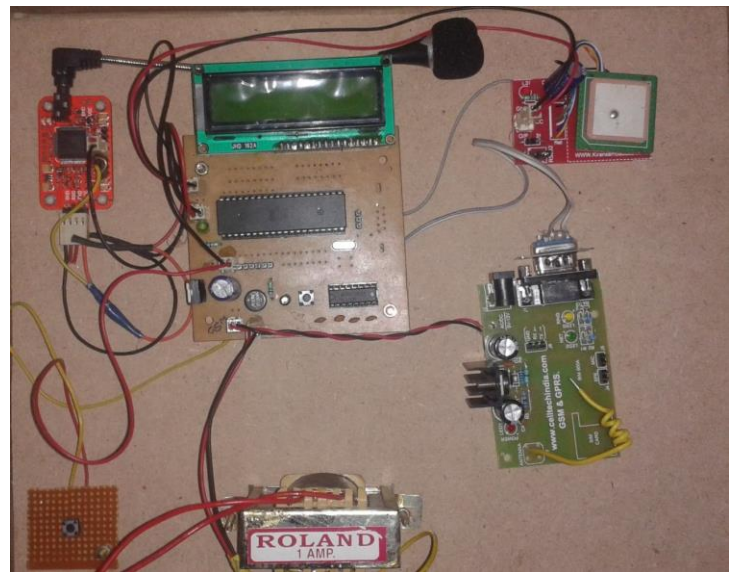

Fig 7: output kit

OUTPUT:

Fig 8: LCD screen

FUTURE SCOPE

The device can be miniaturized so that it could be embedded in jewelleries, mobile phones etc in order to make it a versatile instrument for masses.

It can play a major role in the upcoming projects such as **CCTNS (crime and criminal tracking network and system)** in which all the police records all over India are digitized and all the police station throughout the country will be integrated.

CONCLUSION

The project "High End Security Provider for Women security systems - "Simply Help ME**"** has been successfully designed and tested.It has been developed by integrating features of all the hardware components used. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit. Secondly, using highly advanced IC's and with the help of growing technology the project has been successfully implemented.

REFERENCES

[1] The 8051 micro controller and embedded systems - Md. Ali Mazidi

[2]The 8051 micro controller unit – Ayala

[3]Programming and customizing the 8051 - Myke predko

[4] System Architecture and Design – Rajkamal

Better Embedded System Software - Philip Koopman

[5] Embedded Microcomputer Systems: real time interfacing - Jonathan Valvan

[6] Software Engineering for Real-Time Systems – Jim Cooling

[7]. Jiang Linyiang,Li Hailong and Guo Zhenhua, IEEE "Embedded Laboratory Environment Monitor System", IEEE, WASE International Conference on Information Engineering,pp.197-201 ,2009.

[8]. Christian Tr¨odhandl, Markus Proske, and Wilfried Elmenreich, IEEE "Remote Target Monitoring in Embedded Systems Lab Courses using a Sensor Network",pp.5433-5438,2006,

[9]. Gupta, V. Poursohi, A. Udupi,P. Sun Microsyst. Labs and Menlo Park, CA, USA,IEEE "Sensor. Network: An open data exchange for the web of things".pp.753-755,2010.