ARM7 based Smart bus Passenger-Alert System using GSM with GPS based Location Identification

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***Abstract* - In this paper we present a solution to the main problems faced by passengers who use bus as a means of their transportation. The main reasons for the discomfort are unpredictable bus schedules have made it virtually impossible to estimate the time of arrival at the required destination. This paper present an intelligent real time alarming system which senses the destination location which is taken as input from the passenger. This system also includes android mobile alert application. After the passenger reached the destination, bus system alert the passenger through SMS with android application in passenger mobile and also assisted with alarming system in case of excessive amount of temperature in case of smoke identification which leads to the fire accidents .this asbeen an serios problem in ac buses now adays.**

***Keywords* - Field Programmable Gate Array (FPGA), GPS Receiver, Location Identification, Embedded System.**

I.INTRODUCTION

Unpredictable bus schedules have made it virtually impossible to estimate the time of arrival at the required destination. The main problem about the transportation is the un-certainty of waiting time due to traffic jams. This may lead to a lot of discomfort in identifying when the destination has been reached, especially during the night hours Unfamiliarity with a region also makes it uneasy for passengers to alight the train at the required destination. Country .Alerting system uses GSM and GPRS for sending information, GSM is mostly used as compared to the GPRS. GSM is used to inform the user about exact location of vehicle.

GPS tracking was initially developed for military purposes, but it is now widely used for variety of applications like cars, golf carts and even cell phones, because of its versatility with even smaller dimensions and weights coupled with the availability of solar cell power, these GPS tracking systems can be used in number of applications and
situations. Location identification using GPS has seen a sharp rise owing to its simplicity and increasing affordability of GPS based devices

Embedded Systems are basically computer systems used for a specific purpose. It has a lot of advantages, which are designed to do meet real time performance constraints. This design strategy also allows the system hardware to be simplified and the streamlined make-up of embedded systems allow their components to be less expensive and so costs are reduced. The hardware is usually in the form of small computerized parts in larger devices which serve a general purpose and the program instructions for embedded systems run with limited computer hardware resources, little memory and small or even non-existent keyboard or screen. These systems do not involve the redundant programming as in other system models.

Field Programmable Gate Arrays (FPGAs) offer significant advantages in high performance and low volume applications. They also offer high flexibility in hardware programming and can be easily reconfigured as per the requirements at a particular point of time without much change in the external circuitry FPGA don't feature built-in peripherals, instead, peripherals can be logically programmed. FPGAs are very powerful in this regard, as they contain raw logic gates, and any hardware can be configured into the gates.

Keeping all the above factors quoted in mind, a novel embedded system has been designed to resolve this problem using Field Programmable Gate Arrays (FPGA) and a GPS receiver to alert passengers in bus when the intended destination is reached so that passenger can comfortably alight at the destination.

II. OBJECTIVE AND TOOLS USED

Project Objective: The main objective of this project is to design an system that trigger an alarm in passenger mobile when that particular passenger destination is been reached with help of an android facilitated with GSM and GPS for location identification

Tools Used:

Simulation Software: KEIL IDE is used for design and implementation for the simulation.

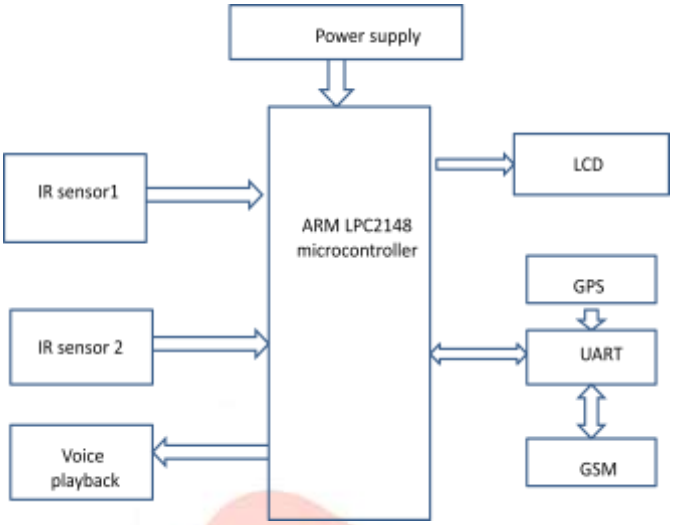
Hardware requirement***:***ARMLPC2148,IRsensor,Gassensor,GPS and GSM.

III. APPROACH AND METHODOLOGY

In this design the input is given by the passenger to device connected to the bus which in turn is linked with the GPS system for the purpose of location identification .Once the destination of the passenger is reached the alarm is triggered in passenger's mobile through an SMS which is done with the help of GSM system.

IV. PROPOSED SYSTEM

A novel embedded system has been designed interfacing a GPS receiver with a host Field ARM LPC2148 board



The embedded system designed and implemented on the FPGA hosted in ARMLPC2148 employes a TSK3000A processor. Fig. 3 is a schematic that describes the major hardware blocks used in the FPGA. The TSK3000A processor is a 32-bit,soft-core, RISC processor and is compatible with the Wishbone bus system. The processor is employed with the other hardware viz. UART, SPI master controller, touch screen pointer context, Thin Film Transistor (TFT) display and SRAM The UART block is a serial communications port (Wishbone-compliant), providing serial communication with hardware handshake and FIFO buffers. The SPI master controller enables communication with multiple slave display, supporting peripherals. The pointer component detects the status of stylus (for touch screen input) and feeds it to the processor. The TFT display controller provides a resolutions of 240x320 and 320x240. This controller also has a timing unit which is capable of generating all required control and timing signals. The SRAM controller provides a simple interface between asynchronous static RAM and a 32-bit processor The required destination is selected by the user by means of an on-board touch screen interface. Once the destination is sensed , an alarm is triggered in passenger mobile through an SMS.

V. HARDWARE IMPLEMENTATION

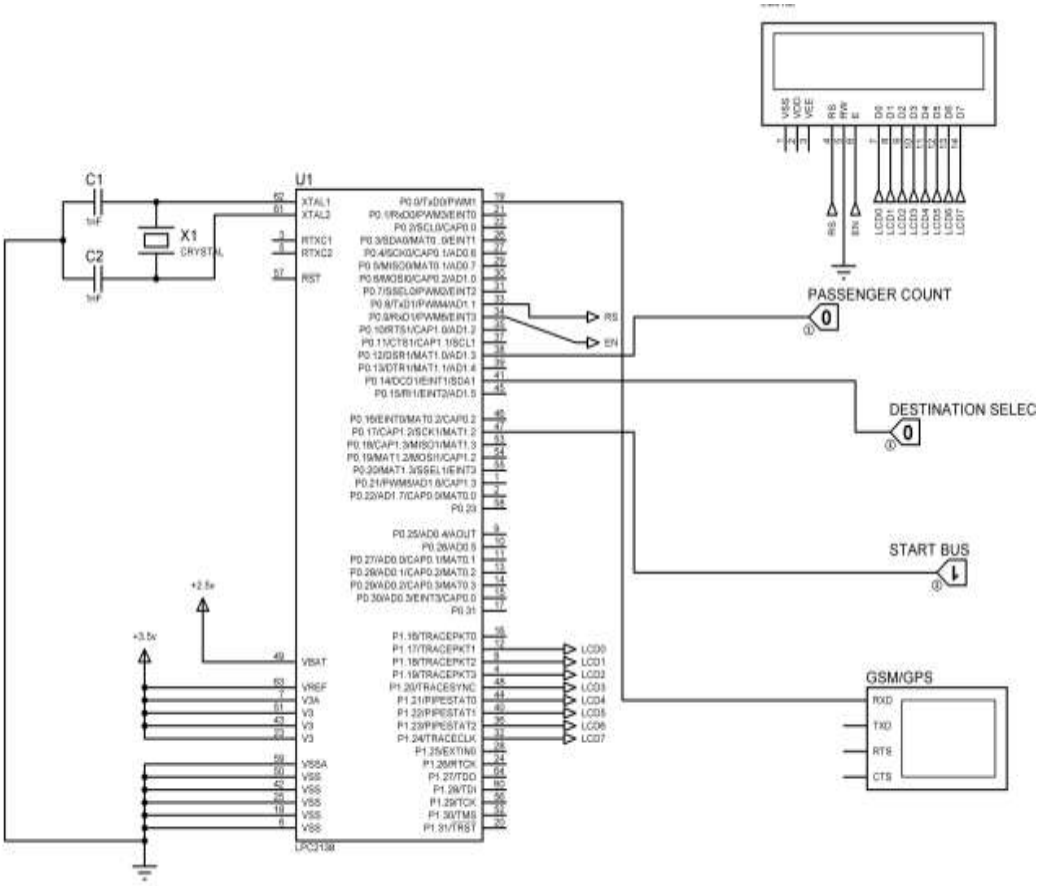
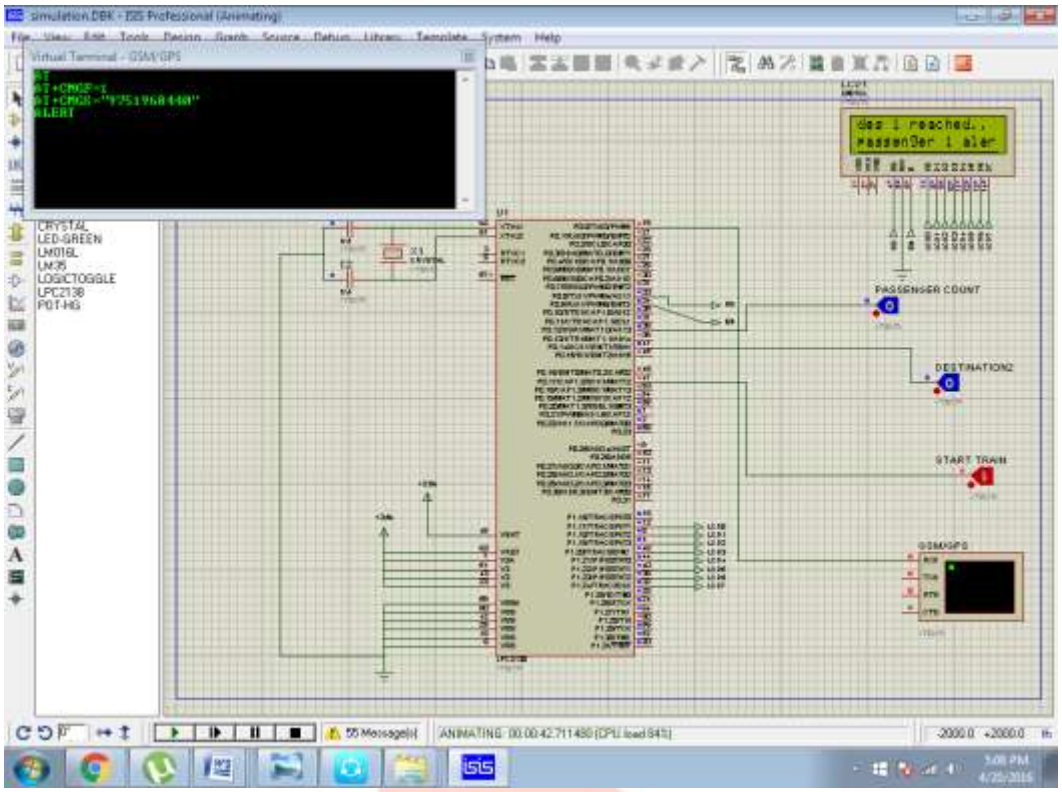


Figure: Circuit diagram

In this circuit diagram, LCD data pins connected from P0.17 to P0.24. RS and RW pins connected as follows P0.8 and P0.9. The GSM module is communicate the microcontroller with mobile phones through UART. To communicate over UART or USART, we just need three basic signals which are namely, RXD (receive), TXD (transmit), GND (common ground). In LPC2148 Primer Board contains two serial interfaces that are UART0 & UART1. Here we are using UART0 (P0.0). The GSM modem is being interfaced with the microcontroller LPC2148 SPI 32-bit interface between the processor and to the P0.12.Destination selection switch connected to P0.14.vechicle start button connected to P0.17.

VI .RESULT



VI.CONCLUSION

The practical implementation and commercialization of this work could possibly help millions of passengers travelling during situations of late hours and unfamiliarity of the region of destination. This system design provides a superior and user friendly interface (TFT display and touch screen) and all the required data is periodically updated on the display. An alarm is raised thus enabling the passenger to have a stress free, comfortable travel without having to worry about the time of reach of the destination, during the journey. This is the prototype we have developed which can be deployed into handset for the better utilization of this system.

REFERENCES

[1] Jacob, R. and Mooney, P. and Corcoran, P. and Winstanley, AC., Model For hapticassisted pedestrian navigation mobile applications, in Proceedings of the 11th International Conference on GeoComputation, UCL, London, England, (2011)
[2] Diravath Chander, M.Venkata Sireesha,"Passenger bus alert system for easy navigation of blind", IJESR, September 2014, Vol-4, 709-715.
[3] G.Lavanya, Preety.W, "Passenger bus alert system for easy navigation of blind", International Conference on Circuits, Power and Computing Technologies, 2013, 978-1-4673-4922-2113.
[4] Perry BD, Morris S, Carcieri S. RFID Technology to Aid in Navigation and Organization for the Blind and Partially Sighted, 2009; 1-52.
[5] Guyennet H, Beydoun K, Felea V. Wireless sensor network system helping navigation of the visually impaired, IEEE international conference on Information and Communication Technologies: from Theory to Applications, version 1, 2011; 1-5.
[7] Jack Loomis M, Roberta Klatzky L. Navigation System for Blind, Massachusetts Institute of Technology 2008; 7(2): 193-203.
[8] Jain PC, Vijaygopalan KP. RFID and Wireless Sensor Networks', Proceedings of ASCNT, CDAC, Noida, India, 2010; 1-11.
[9] Ho L, Moh M, Moh T-S, Walker Z. A Prototype on RFID and Sensor Networks for Elder Health Care, Taylor & Francis Group, LLC, 2007; 314- 317.