

ARM7 Based Automatic Bus Arrival Intimation System

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Abstract—In public city bus transport association has become a major delay issue even with the advancements in the technological generation being upgraded a demand for an updated intimation system was developed which would augment the existing set-up of public city bus transport system. Improvisation over modern trends led us to sculpt the reason of paper on an embedded system based on GSM & RFID technology which will encounter these problems faced during presence/absence of bus at bus station. Buses from the former station will inform the next station and announcement will be made regarding the status of the bus from the former station through a GSM service integrate this idea into trans-receiver stations and announcing the mechanism moving towards it.

Key words: ARM7(Advanced RISC Machine, processor), LPC2148(Microcontroller), LCD (Liquid crystal display), GSM (Global System for mob. comm.), RFID (Radio Freq. Identification), APR (Audio play & record)

I. INTRODUCTION

The system contributes in developing the present transport s/m available to the nation. At various bus stands, there is always a confusion among passengers find their respective route buses at various timings. This confusion can create a turmoil at the bus station. Therefore, to ease the passengers for finding respective buses, a system with automatic intimating the bus arrival is being implemented, which avoids the chaos at bus station.

This system guides the passengers towards their respective buses without any mess and to implement the same, we use an ARM7 microcontroller at the bus station which is stationary part of system, while RFID tags & readers are used to detect the bus at the station entrance. Also LCD, GSM & Voice Module is used at the bus stand for details of respective bus arriving at the bus stand.

- 1) ARM7
- 2) LPC2148
- 3) LCD display
- 4) GSM module
- 5) RFID module
- 6) Voice module

II. PREVIOUS WORKS

Seeing last years of road carrier has not modernized to its full capability. The system used is none other than a traditional one which is operated manually on the bus stations. The modern transport system in bloomed countries comprises of a scheduled time table for the bus arrival. This system established quiet greater efficiency as it helped passengers to know the arrival of their relevant bus.

Although being this system efficient, it had some problems regarding to its functionality and operation. It is not real time based system. The present system also didn't include audio facility in it. Even though all information being revealed

at the bus stopping place, the passengers had a trouble in getting their buses.

III. METHODOLOGY

A. Circuit Description

Automatic Bus Arrival Intimation System consist of LPC2148 microcontroller. Also with SIM900A GSM module, APR33A3 module, RFID reader & RFID tags and 16x2 LCD.

According to the proposed system, from LPC2148, port P 0.0 to P 0.3 are used for RFid tags and GSM module. Port P0.5 to P0.15 are used to interface 16x2 LCD. Port P0.16 to P 0.21 used for combining the voice module.

B. Operational Working

Basic blocks of ABAIS are shown. This circuitry comprises in each of the stations. In the movement bus reaches at station the RFID will read the tag of the bus. All the information of the bus will be displayed on to LCD & announced at the present station.

The time of the departure of the bus from present, the bus will again be read by another RFID reader. After reading the tag the information of the respective bus will be carried to the next station by GSM module. All the information of the bus pass on from the prior station will be displayed and announced at the next station. Here the information will contain the bus path and estimate bus coming in time.

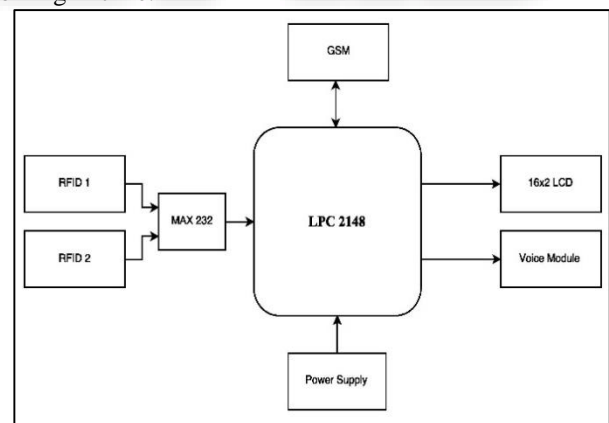


Fig. 1: Functional Block Diagram of ABAIS

IV. HARDWARE AND SOFTWARE DETAILS

A. ARM7 LPC2148 Microcontroller

Advance RISC Machine (ARM7) packs a 32bit processor. The number '7' indicates the version of ARM processor. ARM7 supports three instruction set i.e, 32bit, 16bit and 8bit instruction sets are known as ARM instruction set, thumb and Jazelle instruction set respectively. Jazelle set has support for Java Byte Code.



Fig. 2: ARM7 Microcontroller Board

Least Pin Count (LPC2148) is a 64pin microcontroller. It consists of two ports, Port0 and Port 1. Out of 64 pins on the controller, 48pins are user accessible. These 48pins can be configured as input/output or for other functions.

Port 0 consists of 32 pins, from P0.0 to P0.31. Port 1 consists of 32pins, but out of which only 16pins are user accessible. P1.16 to P1.31 are usable. Remaining 16pins are reserved for on board connections.

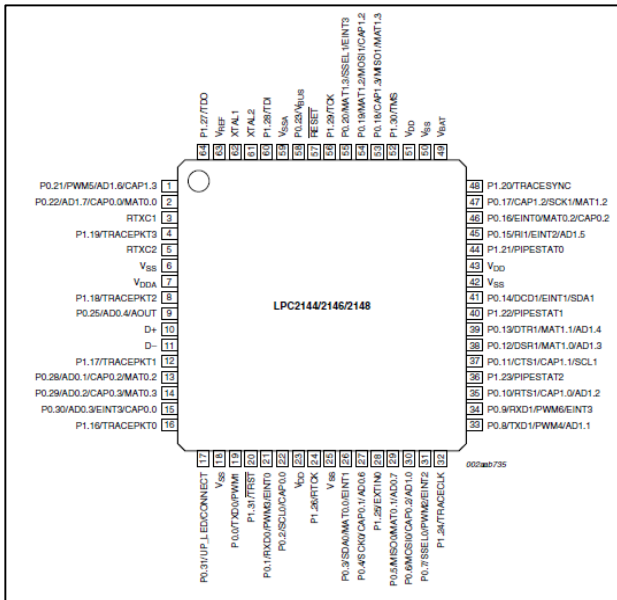


Fig. 3: LPC2148 Pin Diagram

B. GSM and RFID

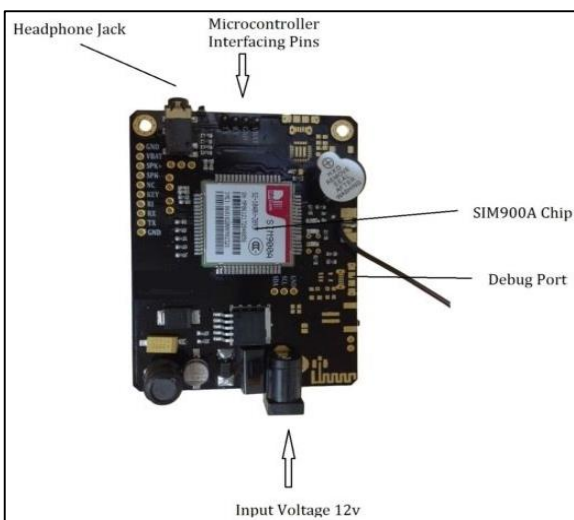


Fig. 4: SIM900A GSM Module

GPRS/GSM modem using USB/GPRS modem SIM900A base dual-band 900/1800MHz GSM. It is connected directly to the USB or UART microcontroller with TTL levels to accept external vtg 5.2Vdc & 4Vdc as input. It has on-board speaker and microphone jack for voice. Can do the basic functions that can be done via normal phone like call, send text, access data via GPRS etc.

C. Voice Module



Fig. 5: APR33A3 Voice Module

A mono chip, highly exhibiting av recording & playback with no external ICs required. Program Developments System is not required. 680seconds (11Min) voice records length in APR33A3 voice module. It is a non-volatile flash memory technology. It consists of built-in audiotape recording microphone amplifier. It comprises of high quality ADC and PWM module. Averagely 1,2,4 or 8 voice messages are reproduced.

D. LCD and Power Supply

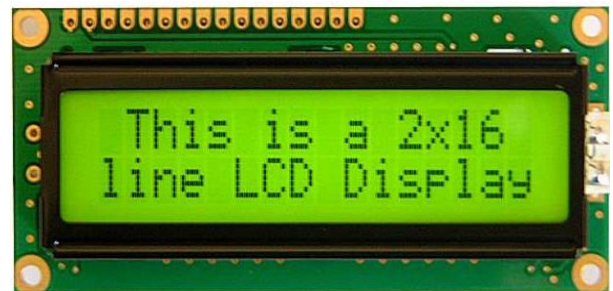


Fig. 6: 16x2 LCD

LCDscreen taken as in electronic display section. It has no restriction for special exhibitions and custom fonts, animations and so on. A 16x2 display means that it can exhibit 16char per line & has 2 lines. In LCD characters are exhibited in 5x7 pixels in a matrix form. LCD has small storage for Cmd & Data. The command reg saves the cmd instruction given to LCD. A cmd inst given to LCD before this decides task like initializing, clearing the screen, setting cursor position and cntrl display etc..The reg data stores data in over LCD displays. The data onto LCD has ASCII value of characters being displayed over the screen.

Power supplies with different voltage specification for various devices with their requirements vary as in so a variable LM317 is used to suffice these need and some

additional included to pull life in GSM as it may grab more power to be on by its side.

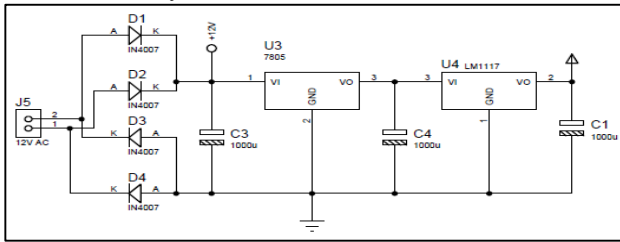


Fig. 7: Power Supply

E. Software

Software used in this system are Keil, Flash Magic, LPC2000 Programming Utility.

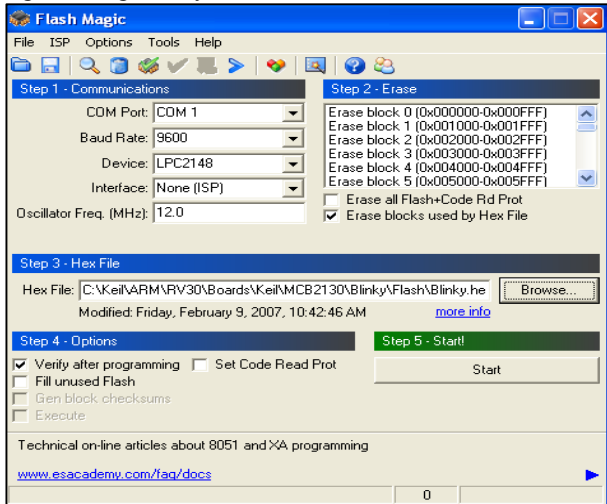
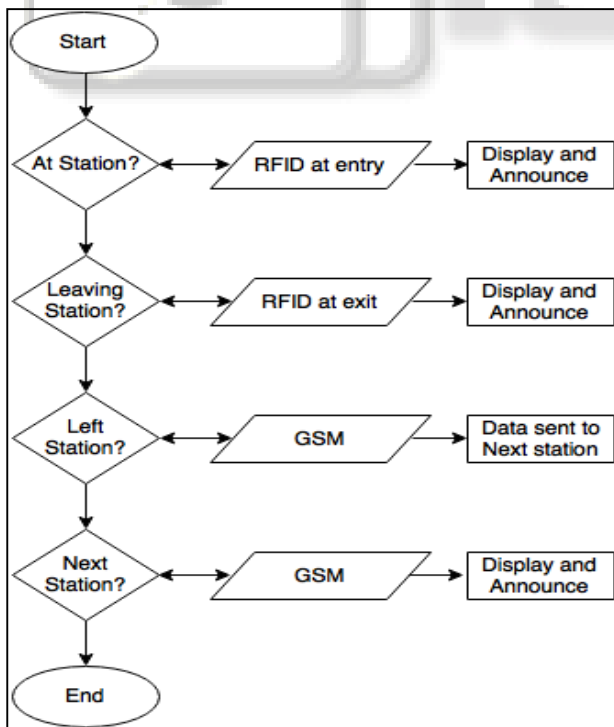


Fig. 8: Flash Magic

F. Data Flow



V. RESULTS

ARM7 does its job of detecting the right identity whether what to do on arrival and whenever the bus leaves guide to next

station about its leaving to next station. Display and announcement happens after acknowledgment received. Stop had its own infotainment. The hindering chaos and waiting was found slowly losing its knees.

VI. CONCLUSION

There may come in an advice for more as it delivers same as railway station system but we have gone way best to greet it with automatic profile for the bus intimation. Also our determined goal of next station announcement got its achieved greatness. The ARM processing and GSM transceiver also RFID for identification makes it complete.

REFERENCES

- [1] G.Raja, D. Naveen Kumar, G.Dhanateja, G.V.Karthik Y. Vijay kumar, "BUS POSITION MONITORING SYSTEM TO FACILITATE THE PASSENGERS", Lingayas Institute of Management and Technology, madalavarigudem, Andhra Pradesh, International Journal of Engineering Science & Advanced Technology, ISSN: 2250-3676, Volume-3, Issue-3, Mar-Apr 2014
- [2] T.Manikandan, G.Kalaiyarasi, K.Priyadarshini, R.Priyanga, "Conductor less Bus Ticketing System Using RFID and Accident Information through GPS and GSM", International Journal of Innovative Science, Engineering & Technology, Vol. 2 Issue 9, September 2015
- [3] N.NANDINI, S.PAVITHRA, G.SINDHUJA, K.SUKANYA, "EMBEDDED BASED PASSENGER INFOTAINMENT SYSTEM", Sri Shakthi Institute of Engineering and Technology, Coimbatore, International Journal of Electrical, Electronics and Data Communication, ISSN (p): 2320-2084, Volume-1, Issue-1, March-2013
- [4] S. L. Bangare, A. D. Kadam, P. S. Bangare, P. V. Katariya, C. A. Khot, N. R. Kankure, "Solutions Concerning Information Systems for Real Time Bus Arrival", International Journal of Engineering and Advanced Technology, ISSN: 2249 – 8958, Volume-2, Issue-3, February 2013
- [5] M.Bhuvaneshwari, S.Sukhumar, N.Divya, S.Kalpanadevi, N.SuthanthiraVanitha, "Knowledge Institute of Technology, Salem, International Journal of Advanced Research in Computer and Communication Engineering, ISSN (Print) : 2319-5940, ISSN (Online) : 2278-1021, Vol. 2, Issue 11, November 2013
- [6] Shital.M.Dharrao, Vijay.D.Choudhary, Kantilal.P. Rane, "Intelligent Bus stand Monitoring and Control Using Combination of GSM, GPS & IR Sensors", North Maharashtra University, Jalgaon, International Journal of Innovative Research in Science, Engineering and Technology, ISSN(Online) : 2319-8753, ISSN (Print) : 2347-671, Vol. 4, Issue 7, July 2015
- [7] Gunjal Sunil N., Joshi Ajinkya V., Gosavi Swapnil C., Kshirsagar Vyanktesh B., "Dynamic Bus Timetable Using GPS", International Journal of Advanced Research in Computer Engineering & Technology, ISSN: 2278 – 1323, Volume 3 Issue 3, March 2014
- [8] S.Madhukar, Dr.N.Anjususan, "Integration of Microcontroller with GPRS and GPS System to Provide

- Passenger Information", Guru Jambheshwar University of Science and Technology, Hisar, SSRG International Journal of Geoinformatics and Geological Science, ISSN: 2393 - 9206, volume X, Issue Y, Month 2014
- [9] Mehmet Altinkaya, Metin Zontul, "Urban Bus Arrival Time Prediction: A Review of Computational Models", International Journal of Recent Technology and Engineering, ISSN: 2277-3878, Volume-2, Issue-4, September 2013
- [10] Madhu Manikya Kumar, K. Rajasekhar, B.Chiranjeevini Kumari, K.Pavani, "Design of Punctuality Enhanced Bus Transportation System Using GSM and Zigbee", BVC Engineering College, Odalarevu, International Journal of Research in Computer and Communication Technology, ISSN (Online) 2278- 5841, ISSN (Print) 2320- 5156, Vol 2, Issue 12, December- 2013
- [11] Andrew Roobert, Dinesh, Vaikundaraman Vignesh, Manoj Kumar, "Automated Vehicle Information system using FPGA", Francis Xavier Engineering College, Tirunelveli, International Journal of Advanced Research Trends in Engineering and Technology, ISSN: 2394-3777 (Print), ISSN: 2394-3785 (Online Vol. II, Special Issue XXV, April 2015 and INTERNATIONAL CONFERENCE ON RECENT ADVANCES IN ENGINEERING, SCIENCE & TECHNOLOGY, April 17, 2015
- [12] Shefali Agrawal, Neha Ahire, Prof. Samadhan Sonavane, "GPS Supported Android Application for City Bus Scheduling and Tracking System", International Journal of Enhanced Research in Management & Computer Applications, ISSN: 2319-7471, Vol. 3 Issue 12, December-2014
- [13] R. Pradeep, Saravana Kumar, V.Goudham, "Cost Effective Bus Intimation System for the Public Using GPS and GSM Technology", Amrita Vishwa Vidyapeetham, Coimbatore, International Journal of Science and Research, ISSN (Online): 2319-7064, Volume 3 Issue 3, March 2014
- [14] Suresh Sankarananayanan, Paul Hamilton, "Mobile Enabled Bus Tracking and Ticketing System", 2014 2nd International Conference on Information and Communication Technology (ICoICT), ISSN:978-1-4799-3580, February 2014
- [15] T.Manikandan, G.Kalaiyarasi, K.Priyadharshini, R.Priyanga, "Conductor less Bus Ticketing System Using RFID and Accident Information through GPS and GSM", JAY SHRIRAM GROUP OF INSTITUTIONS, Tirupur, International Journal of Innovative Science, Engineering & Technology, ISSN 2348 – 7968, Vol. 2 Issue 9, September 2015
- [16] www.nxp.com/documents/user_manual/UM10139.pdf