BUS ARRIVAL INFORMATION SYSTEM FOR PASSENGERS

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Abstract*:* Purpose of our system is to develop such hardware that updates information of the arrival time of incoming bus towards the bus station and display information about vacant seats available in particular bus at the bus station as well as in the bus also, so that passengers who are waiting for bus at bus station and the passengers who are already travelling in particular bus can get idea about current status of running bus. This system also provide an emergency message to the passengers using manual switch in case of such emergency situations like bus failure, traffic jam, or any mechanical problem due to which bus can take longer delay to reach the station. Since according to the status of incoming bus passenger can take decision to wait for particular bus or take any alternate way for their travelling.

Keywords: GSM modem, AVR microcontroller, RFID Card Reader, TSOP sensors and LCD Display.

1. INTRODUCTION:

Public transportation systems are one of the most demanding services in this fastest growing and developing world. And these public transports are becoming most popular and convenient modes for the travelling of passengers because of the safety and their regular time management, since most of the time passengers are preferring public transportation systems such as railways and buses for their travelling.

With the increasing advance technologies and rapid growth in population, burden on public transports are also increasing rapidly as everybody is in hurry to reach their destination point in order to follow their regular time schedule. Also in urban cities most of the passengers complete their journey using bus transportation system.

Even some of the passengers travel daily for educational purpose, job purpose, for business purpose or any other different reasons. But somewhere these passengers are facing problem of delay caused by arrival of bus because of different issues such as traffic, emergencies, mechanical problem and sometimes it may be observed that there will be no vacancies available in bus even though bus arrive with its proper time due to which passenger have to wait for arrival of another bus and hence passenger may spend his valuable time because of the unwanted waiting at the station.

But if the passenger have proper idea about arriving bus and information about vacant seats available in the particular bus then passenger can select proper route and way for his travelling Since in order to meet with challenges our system provides accurate time information of arriving bus that is the minimum possible time required for bus to reach the main station with proper information of vacant seats availability in the particular bus that can helps the passengers to select proper route for their travelling

2. TRANSMITTER AND RECEIVER SECTION:

The system uses AVR microcontroller ATMEGA 328, GSM modem, RFID card reader, TSOP sensors, power supply unit, LCD display and manual switch.

This system is mainly categorized in two sections that consist of Bus module acting as transmitting section and the bus station module acting as receiving section. Communication in between these two modules is done using GSM modem that will simply act as communication media between these transmitting and receiving sections.
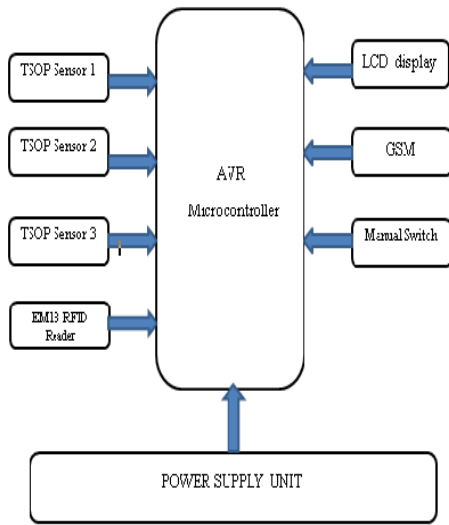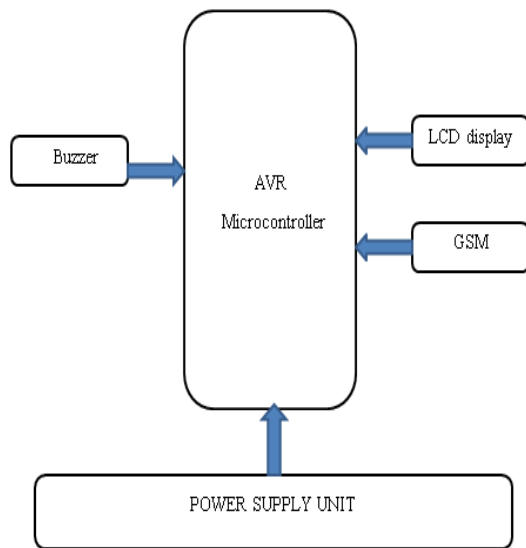
Figure1: BUS MODULE SECTION

Figure2: BUS STATION SECTION

In the entire system, transmitter section that means bus module will estimate minimum time required for the bus to reach the bus station using RFID cards which are placed at each intermediate station between the two main stations. And calculate vacancies available in the bus using TSOP sensors which are placed at the entry and exit door of bus. Since the additional component in the transmitter unit are the RFID cards, TSOP sensors and the manual

switch which are specifically used for indicating arrival time of bus, calculating vacant seats available in the incoming bus and generating emergency message. The transmitting section continuously send this information through GSM modem towards the receiving section that means the main bus station where the bus will arrive in order to display the output performed by the transmitter unit.

RFID CARD Reader: RFID CARD readers are used for identifying the status of bus whenever the bus enter or leave the intermediate stations in between the departing station and the arriving station. RFID card reader will read status of incoming bus and as the bus reaches the station or intermediate station it will send message to the microcontroller.

TSOP sensors: TSOP Sensors are specifically used for counting the passengers who are entering inside the bus and going outside the bus. these are placed at the entry and exit door of the bus. These sensors will be placed at entry and exit door of bus which are connected in pair of series. By estimating presence of passengers inside the bus number of vacancy out of the total available seats are calculated.

Manual Switch: The manual switch is provided in the system which can be pressed by driver or the conductor in case of emergency situations.

AVR Microcontroller: The AVR microcontroller ATMEGA 328 is used in both transmitter and receiver section that can perform all controlling functions. This microcontroller provide sixteen bit timer with 32 k/byte flash program memory, Since execute program with a speed of 1 micro second.

Power Supply Unit: The power supply unit used in both transmitter and receiver section provide 5 to 12 volts constant DC power supply for the operation of transmitter and receiver unit. The power supply unit itself contain the inbuilt adopter that consist step down transformer and the bridge rectifier circuit which convert 230v AC supply into pulsating DC which can be then driven to the voltage regulator IC 7805/ IC 7812 that provide constant DC power supply for the both hardware units.

LCD Display: LCD display device will display the output in both transmitting section as well as in receiving section that indicate arrival time of incoming bus with vacant seats available in bus also an emergency message in case of emergency situation.

3. WORKING:

For arrival time indication standard time will be set between the source terminal from which the bus is departing and the destination terminal where the bus will arrive. This time should be decided depending on maximum speed required for bus to cover the distance between these two terminals. In this system microcontroller clock itself is used to count time duration between these two terminals.

The power supply is made continuously on and the power supply will be given to the circuit through pin no.7 of microcontroller and as soon as bus crosses the distance away from the starting point from which it is departed, the microcontroller will start decrementing the count set between these two terminals. This decrementing count will be continuously transmitted towards the receiver using through pin no.3 that is TX pin of microcontroller using GSM modem of the transmitting section. The status of running bus is continuously received through pin no.2 that is RX pin of microcontroller using RFID card readers which are placed at every intermediate station between these two main stations. At every intermediate station microcontroller count is restarted, and again countdown from intermediate station up to destination terminal is calculated. GSM modem at the receiving section will receive this count through pin no.2 that is RX pin of microcontroller.

For calculating vacancies available in particular bus sensors will be connected in pair of sequence which are mounted at the entry and exit door of bus. Connection to these sensors are given to the microcontroller through ADC pins. As soon as these sensors detect the motion of object from first to last, Microcontroller will increment the count by one which gives indication of entering person into the bus. And as the sensors detect the motion of object from last to first, Microcontroller will start decrementing the count by one which will gives indication of outgoing person from the bus.

For display of emergency message one manual switch is provided whose connection is given to the microcontroller through reset pin. As soon as this switch is pressed logic one will be given to the circuit and an emergency message is forwarded towards the receiver which can indicate that bus can make delay to reach the station.

The higher data pins of LCD display device from D4 to D7 are interfaced with microcontroller in order to display current status of the incoming bus toward the station. According to that passenger can get idea about incoming bus and choose proper way depends on his time management.

4. PCB LAYOUT
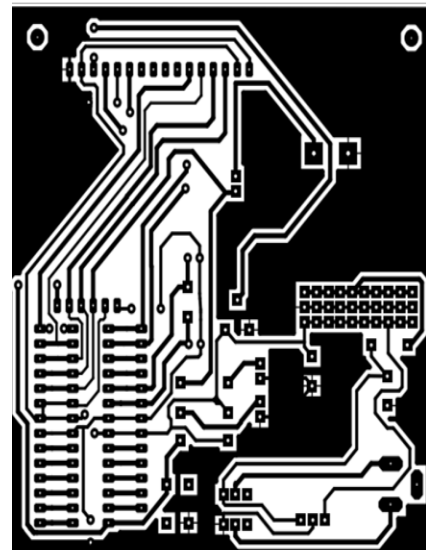
5. CONCLUSION

Considering with rapid growth of population at present and the situation of public transportation, We design a system that display arrival time indication of incoming bus and vacant seats available in the bus so that passenger can take proper root according to his time management. The LCD display placed at arriving bus station and also inside the bus is helpful for the passengers who are travelling inside the bus as well as the passengers who are waiting for incoming bus that gives information of incoming bus reaching towards the station.

6. REFERENCES

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