

BUS PASSENGER ALERT SYSTEM

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Abstract:- This is microcontroller based project. In this project we introduce a new system for bus passenger alert. The device that we make will automatically produce a sound message when we reach each bus station. It will also monitor the speed of the vehicle. If the speed exceeds a particular limit a message will be passed to the RTO office to take the necessary actions.

1. INTRODUCTION

That gentle rocking motion of a train or bus is enough to lull the weariest of travelers off to sleep on a journey, meaning you miss your stop, but now we are introducing a system will apparently now let you set an alarm, which can alert you when you reach your intended destination. An interesting new feature for those lucky to be able to use public transport .An additional feature of speed control of the vehicle is also included in this project effectively.

RF RECEIVER

VOICE RECORD AND PLAY BACK UNIT

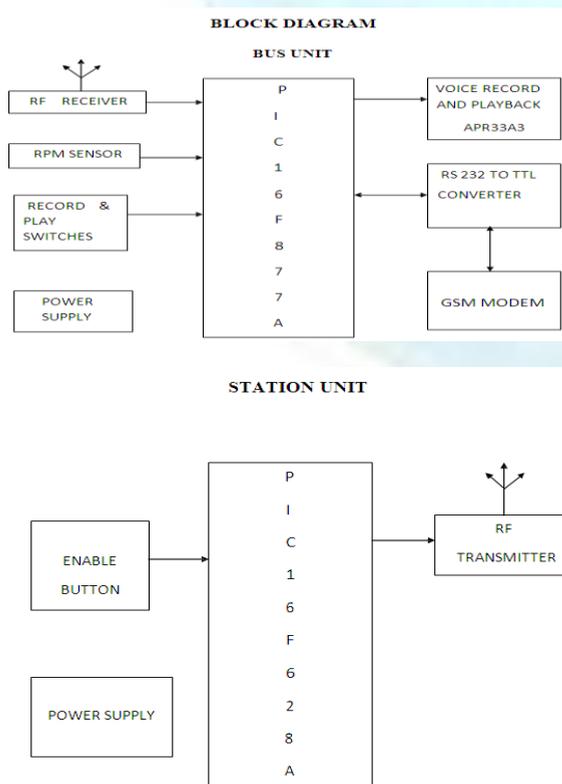
RPM SENSOR

RECORD AND PLAY BACK SWITCHES

RS232 TO TTL CONVERTER

GSM MODEM

POWER SUPPLY



MICROCONTROLLER PIC16F877A:

Our system checks RPM using RPM sensor and inform concerned authority if over speed occurs also the system provides the facility to bus passengers by receiving station information received by wireless receiver. To achieve these things, we used an 8bit Microcontroller as its CPU.

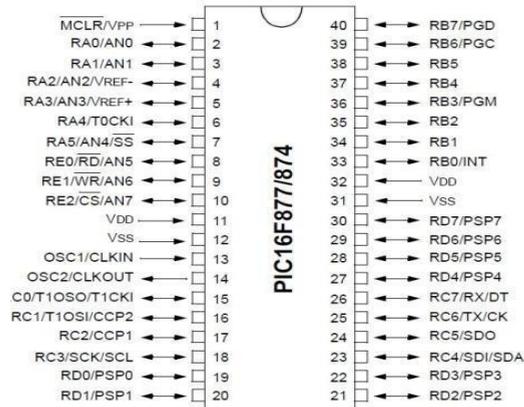
The PIC 16F877A is a low-power, high-performance CMOS 8-bit microcomputer with 8K words of Flash Programmable and Erasable Read Only Memory (PEROM). The device is manufactured using Microchip's high density nonvolatile memory technology and is compatible with its RISC instruction. The on-chip Flash allows the program memory to be reprogrammed in-system .or by a conventional. By combining a versatile 8-bit CPU with Flash on a monolithic chip, the PIC 16F877A is a powerful microcomputer which provides a highly flexible and cost effective solution for many embedded control applications. This is a software controlled system, and it makes use of an 8 bit microcontroller PIC16F877A, is a 40 pin IC having 5 I/O ports (33 I/O pins). It has 14 interrupts, 8 A/D input channel, USART with 9 bit address detection, 8K x14 words Flash Program Memory, 368 x 8 bytes of Data Memory (RAM), and 256 x 8 bytes of EEPROM Data Memory

2. BUS UNIT:

It has 8 sub units they are

PIC 16F877A

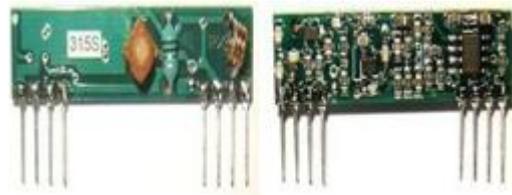
PIN DIAGRAM OF PIC16F877A



RF RECEIVER

Used for receiving station data send by different station units

RECORD AND PLAY BACK SWITCHES



The STT-433 is ideal for short-range remote control application where cost is a primary concern. The receiver module requires no external RF components except for the antenna. It generates virtually no emissions, making FCC and ETSI approvals easy. The super-regenerative design exhibits exceptional sensitivity at a very low cost. A SAW filter can be added to the antenna input to improve selectivity for application that requires robust performance. The manufacturing-friendly SIP style package and low-cost make the STT-433 suitable for high volume application.

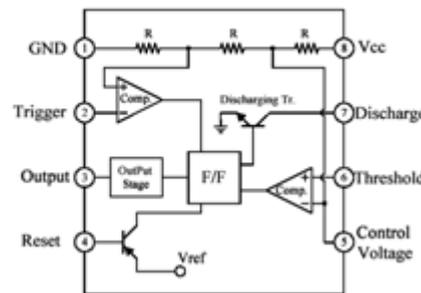
RPM SENSOR

Our microcontroller also measure speed of the vehicle. Speed of a vehicle can be calculate as per below. Speed KM/Hr. = ((wheel rotation per second X wheel perimeter) X60X60)/1000.

Rotation of wheel is already taking in a vehicle for speedometer purpose. Unfortunately, microcontroller cannot measure it directly. To eliminate this problem, we use an optical interrupt circuit. Output of this circuit is pulse stream and is proportional to speed Our speed sensor has two part. IR transmitter LED and IR receiver unit. For great accuracy, our IR receiver is made such that it receives only 38KHz modulator IR signal. This feature rejects all IR rays other than our transmitter. To generate 38KHz modulated IR rays, we used a 555

timer IC as astable multivibrator with an output of 38KHz

Internal Block Diagram



A tactile switch is an on/off electronic switch that is only on when the button is pressed or if there is a definitive change in pressure. Another way to consider it, as momentary make or break switch. As soon as a tactile switches button is released, the circuit is broken. A main area of tactile switches, are tact switches. Tact switches are tactile electromechanical switches for keyboards, keypads, instruments or interface control- panel applications. Tact switches react to user interaction with the button or switch when it makes contact with the control panel beneath. In most cases this is usually a printed circuit board (PCB).

RS232 TO TTL CONVERTER

For connecting GSM modem to our system, an interface circuit known as RS232 interface is needed. The interfacing IC is MAX232

IC MAX232

To allow compatibility among communication equipment made by various manufactures, an interfacing standard called RS232 was set by the Electronics Industries Association (EIA) in 1960. Since the RS232 standard is not suitable with today's microprocessors and microcontrollers, we need a line driver (voltage converter) to convert the RS232 levels to TTL voltage levels that will be acceptable to 8051's TXD and RXD pins. One of such converter is MAX232 from Maxim Corp. On advantage of MAX232 chip is that it uses a +5V power source which is same as the source voltage for 8051. MAX232 converts TTL logic levels to RS232 logic levels and vice versa. In RS232, a 1 is represented by -3V to +25V, while a 0 bit is +3V to +25V, making -3 to +3 undefined. For this reason, to connect any Rs232 to a microcontroller system we must use voltage converters such as MAX232

PIN DIAGRAM OF MAX 232



GSM MODEM

A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. From the mobile operator perspective, a GSM modem looks just like a mobile phone. When a GSM modem is connected to a computer, this allows the computer to use the GSM modem to communicate over the mobile network. While these GSM modems are most frequently used to provide mobile internet connectivity, many of them can also be used for sending and receiving SMS and MMS messages.

POWER SUPPLY

The power supply is the most indispensable part of any project. IC regulators are versatile and relatively inexpensive and are available with features such as current/voltage boosting, internal short circuit current limiting, thermal shutdown and floating operation for high voltage applications. The regulated circuit is used to maintain constant output level. The integrated circuit regulator, sometimes called the three terminal regulators contains the circuitry for reference source error amplitude control device and overload protection all in a single IC chip. The regulator IC here used is L7805. It provides regulated 5V to the controller. Its maximum input voltage is 35V and minimum voltage is 8V. Output is constant 5V. The L7800 series of three-terminal positive regulators is available in TO-220, TO-220FP, TO-3 and D2PAK packages and several fixed output voltages, making it useful in a wide range of applications. These regulators can provide local on-card regulation, eliminating the distribution problems associated with single point regulation. Each type employs internal current limiting, thermal shut-down and safe area protection, making it essentially indestructible. If adequate heat sinking is provided, they can deliver over 1A output current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and current

3. STATION UNIT

Station unit consists of four units

ENABLE BUTTON

MICROCONTROLLER

RF TRANSMITTER

POWER SUPPLY

ENABLE BUTTON

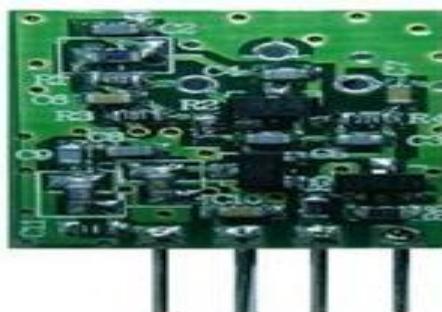
This is simply a self locking switch which enable the microcontroller to transmit the codes.

MICROCONTROLLER

Here we uses a small microcontroller PIC 16F628A. This powerful (200 nanosecond instruction execution) yet easy-to-program (only 35 single word instructions) CMOS FLASH-based 8-bit microcontroller packs Microchip's powerful PIC® architecture into an 18-pin package and is upwards compatible with the PIC16F628, PIC16C62XA, PIC16C5X and PIC12CXXX devices. The PIC 16F628A features 4MHz internal oscillator, 128 bytes of EEPROM data memory, a capture/compare/PWM, a USART, 2 Comparators and a programmable voltage reference that make it ideal for analog/integrated level applications in automotive, industrial, appliances and consumer applications.

RF TRANSMITTER

The STT-433 is ideal for remote control applications where low cost and longer range is required. The transmitter operates from a 1.5-12V supply, making it ideal for battery-powered applications. The transmitter employs a SAW-stabilized oscillator, ensuring accurate frequency control for best range performance



ADVANTAGES

It is a fully automatic system which can be controlled without any human interface. It does not evolves any interactions with the driver and it is user friendly. It is easy to update the routes and stops. By using this system we can handle multiple buses at the same time. Automatic alerts to passenger when vehicle is approaching towards the desired location is made possible.

DISADVANTAGES

One of the drawback of the system is that the bus position cannot be located and bus timings will not be available at station units. Unpredictable traffic conditions will affect the system. Waiting time for bus decides the quality of service. It also requires an early warning system for the approaching transportation vehicles.

4. CONCLUSION

Here we successfully developed BUS PASSENGER ALERT SYSTEM, which indicates the upcoming bus stations and produces a voice alert which helps the passengers to indentify the stations, it also provides a speed regulating system by which the over speed can be detected and a message alert is send to the RTO office. This can be implemented in passenger bus for effective speed regulation and station identifications.

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