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Intelligent Information System For Driver

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ABSTRACT: Many a times the warning sign on the road sides becomes difficult to watch for the drivers and the driver may sometimes miss the warning notes. These warning notes may be speed breaker ahead or narrow bridge or even accident zone etc. This becomes tedious during rainy seasons and at nights. Sometimes the boards may be so dirty and the driver may not read anything and even if he tries to read it with a wide eye there is a chance for the drive to lose concentration on the road. For this a portable unit is placed inside the vehicles and it communicates with the roadside systems at all times. So the position of each vehicle can be very easily known by the roadside system and also the system has all the details of roads and emergency station such as hospitals stored in it. So whenever the information is needed such information is automatically passed on to the vehicle from roadside system and the driver in the vehicle can get a clear idea of the contents received. The microcontroller used is a high Speed PIC microcontroller for fault free operation. It has a variety of advantages over conventional old microcontrollers such as RISC architecture, larger memory word, fast operation and a host of inbuilt features such as ADC, communication protocols etc.,. A GPS system is placed along with the microcontroller. The GPS system gives the exact position of the vehicle by giving out its latitude and longitude. The microcontroller at all times receives the information and displays the information using the dedicated LCD display. Further the same is used to announce to the driver about the hurdles such as speed breakers. This voice alerting system helps the drivers to concentrate on the road without even worrying about the sign boards near the road.

KEYWORDS: RISC, GPS, LCD, PIC, ADC.

I. INTRODUCTION

In this paper implementation of an add-on interaction system for vehicle is implemented using wireless portable unit. The system consists of a vehicle to roadside communication, vehicle to emergency station communication which is based on PIC processor. The system is focused to increase the safety level of a vehicle, a compact embedded electronic units implementing a voice output module unit, GPS module, LCD module. The driver to roadside interaction

is based on an audio interaction as well as video interaction at vehicle.

Existing System

- In the existing system we have to look at the sign boards for direction.
- Drivers will not be aware of speed breakers at night.

Proposed System

- A portable unit is placed inside the vehicles and it communicates with the roadside systems at all times.
- A voice announcement is given to the driver about the hurdles such as speed breakers.

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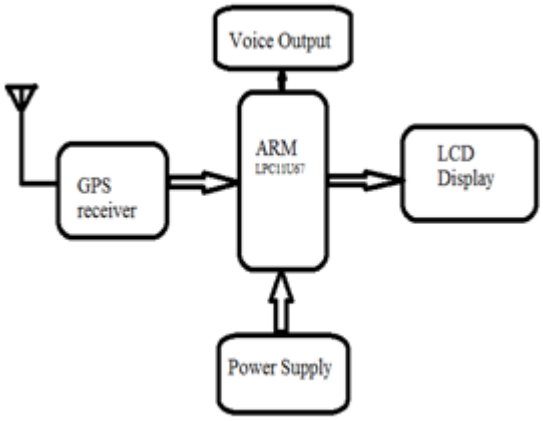
II. SYSTEM IMPLEMENTATION



A. Voice output module:

In voice output module we are using the serial peripheral interface for transfer the data from PIC processor, voice processor for audio and amplifier for amplified the audio and speaker to deliver the audio speech.

The voice output module is a completely assembled and easy to use in GPS location. GPS will communicate with the roadside and the voice output module gives the output in audio. It receives the output from PIC through serial peripheral interface and amplified the voice and it will deliver from the speaker.

B. GPS receiver:

A Global Positioning System navigation device is a device that accurately calculates geographical location by receiving information from GPS satellite. The GPS system gives the exact position of vehicle by giving out its latitude and longitude. GPS receiver will transmit the data to PIC processor through universal asynchronous receiver and transmitter.

Transmitting and receiving through GPS is better than RF because of many reasons. Firstly, GPS will track the position through satellite. Next, turn-by-turn navigation directions to a human in charge of a vehicle or vessel via text or speech. Maps, including streets maps, displayed in human readable format via text or in a graphical format.[1]

C. LCD Module:

In LCD module we are using the SPI, LCD controller and LCD display. Serial peripheral interface is the single data bus which transfers the data from PIC processor to LCD module. LCD controller will control the group of LCD such that 128 or many more and it will display the roadside information.
LCD will take input from processor through serial peripheral interface and it will show the visualization of roadside.

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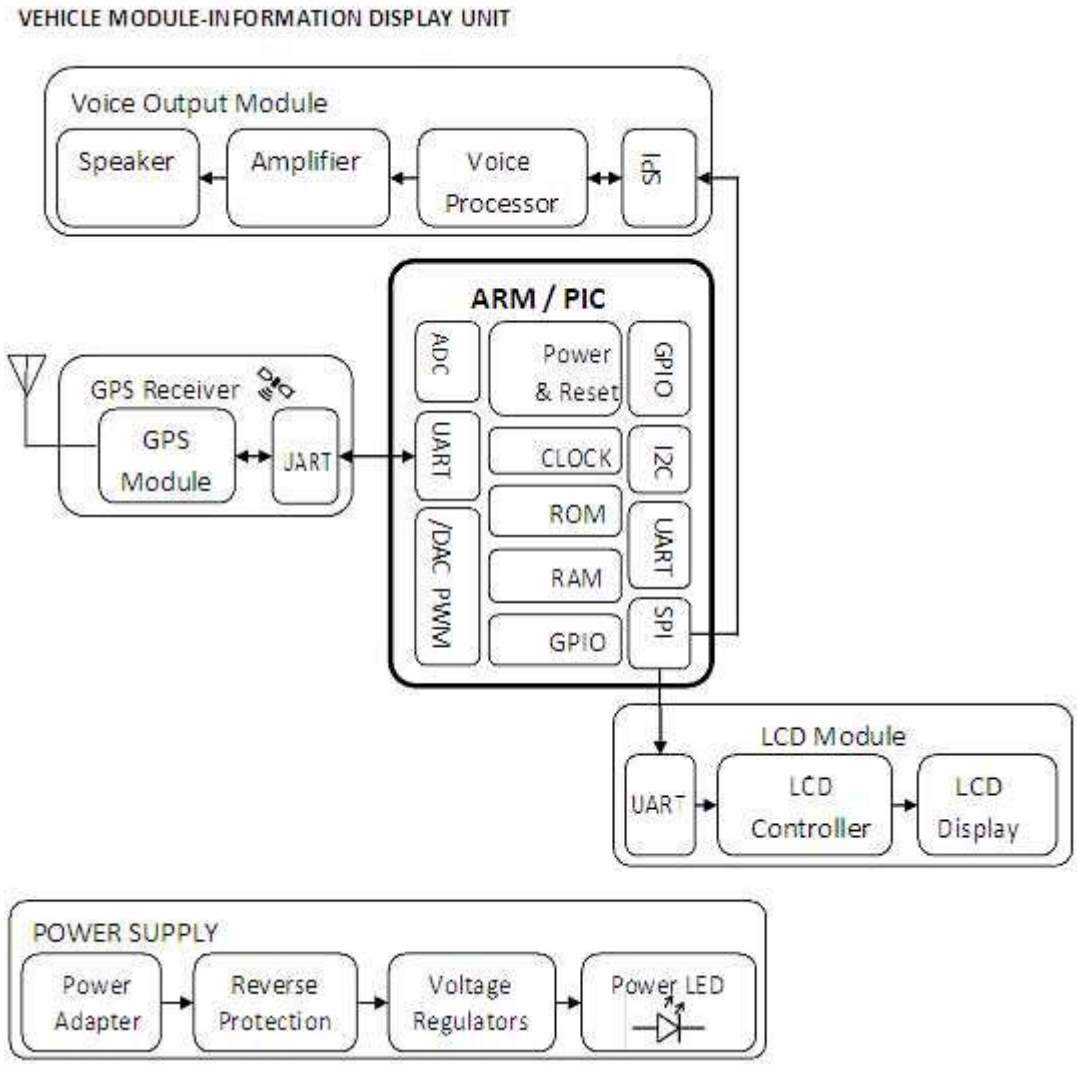

D. Power supply:

In power supply module we are using power adapter which gives the required voltage reverse protection for protect the loss of power voltage regulator to regulate the voltage and power led to indicate the power supply.[2]
Power supply will take the power from the vehicle battery.

E. Controller

This development has made it possible to store hundreds of thousands of transistors into one chip. That was a prerequisite for production of microprocessors, and the first computers were made by adding external peripherals such as memory, input-output lines, timers and other. Further increasing of the volume of the package resulted in creation of integrated circuits. These integrated circuits contained both processor and peripherals.

III. SYSTEM DESCRIPTION

UART stands for the Universal Asynchronous Receiver/Transmitter. In asynchronous transmitting, teletype-style UARTs send a "start" bit, five to eight data bits, least-significant-bit first, an optional "parity" bit, and then one, one and a half, or two "stop" bits. The start bit is the[3]

opposite polarity of the data-line's idle state. The stop bit is the data-line's idle state, and provides a delay before the

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next character can start. (This is called asynchronous start-stop transmission). In mechanical teletypes, the "stop" bit was often stretched to two bit times to give the mechanism more time to finish printing a character. A stretched "stop" bit also helps resynchronization. The parity bit can either make the

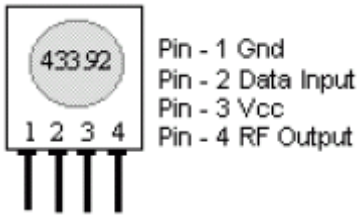
number of "one" bits between any start/stop pair odd, or even, or it can be omitted. Odd parity is more reliable because it assures that there will always be at least one data transition, and this permits many UARTs to resynchronize.

In *synchronous* transmission, the clock data is recovered separately from the data stream and no start/stop bits are used. This improves the efficiency of transmission on suitable channels since more of the bits sent are usable data and not character framing. An asynchronous transmission sends nothing over the interconnection when the transmitting device has nothing to send; but a synchronous interface must send "pad" characters to maintain synchronism between the receiver and transmitter. The usual filler is the ASCII "SYN" character. This may be done automatically by the transmitting device. USART chips have both synchronous and asynchronous modes.[4]

RF TRANSMITTER AND RECEIVER

The TWS-434 and RWS-434 are extremely small, and are excellent for applications requiring short-range RF remote controls. The transmitter module is only 1/3 the size of a standard postage stamp, and can easily be placed inside a small plastic enclosure.TWS-434: The transmitter output is up to 8mW at 433.92MHz with a range of approximately 400 foot (open area) outdoors. Indoors, the range is approximately 200 foot, and will go through most walls.....[6]

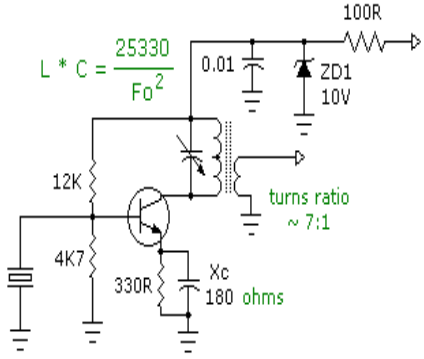
The TWS-434 transmitter accepts both linear and digital inputs can operate from 1.5 to 12 Volts-DC, and makes building a miniature hand-held RF transmitter very easy. The TWS-434 is approximately the size of a standard postage stamp.



TWS-434 Pin Diagram

CRYSTAL OSCILLATOR

A crystal oscillator is an electronic circuit that uses the mechanical resonance of a vibrating crystal of piezoelectric material to create an electrical signal with a very precise frequency. This frequency is commonly used to keep track of time (as in quartz wristwatches), to provide a stable clock signal for digital integrated circuits, and to stabilize frequencies for radio transmitters/receivers



A CRYSTAL OSCILLATOR

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Design Principles Of Crystal Oscillators

Crystal Oscillators are usually, fixed frequency oscillators where stability and accuracy are the primary considerations. For example it is almost impossible to design a stable and accurate LC oscillator for the upper HF and higher frequencies without resorting to some sort of crystal control.[5]

IV. SINGLE-CHIP VOICE RECORDING & PLAYBACK DEVICE

A. General Description:

The APR96 0 device offers true single-chip voice recording, non-volatile storage and playback capability for 40 to 60 seconds. The device supports both random and sequential access of multiple messages. Sample rates are user-selectable, allowing designers to customize their design for unique quality and storage time needs. Integrated output amplifier, microphone amplifier, and AGC circuits greatly simplify system design. The device is ideal for use in portable voice recorders, toys, and many other consumer and industrial applications.[7]

APLUS integrated achieves these high levels of storage capability by using its proprietary analog/multilevel storage technology implemented in an advanced Flash non-volatile memory process, where each memory cell can store 256 voltage levels. This technology enables the

B. Functional Description:

The APR96 0 block diagram is included in order to give understanding of the APR9600 internal architecture. At the left hand side of the diagram are the analog inputs. A differential microphone amplifier, including integrated AGC, is included on-chip for applications requiring its use. The amplified microphone signal is fed into the device by connecting the Ana Out pin to the Ana In pin through an external DC blocking capacitor. Recording can be fed directly into the Ana In pin through a DC blocking capacitor, however, the connection between Ana In and Ana Out is still required for playback. The next block encountered by the input signal is the internal anti-aliasing filter. The filter automatically adjusts its response according to the sampling frequency selected so Shannon's Sampling Theorem is

satisfied. After anti-aliasing filtering is accomplished the signal is ready to be clocked into the memory array.[9]

This storage is accomplished through a combination of the Sample and Hold circuit and the Analog Write/Read circuit. These circuits are clocked by either the Internal Oscillator or an external clock source. When playback is desired the previously stored recording is retrieved from memory, low pass filtered, and amplified as shown on the right hand side of the diagram. The signal can be heard by connecting a speaker to the SP+ and SP- pins. Chip-wide management is accomplished through the device control block shown in the upper right hand corner. Message management is controlled through the message control block represented in the lower center of the block diagram. More detail on actual device application can be found in the Sample Applications section. More detail on sampling control can be found in the Sample Rate and Voice Quality section. More detail on message management and device control can be found in the Message Management section.[8]

APR9600 device to reproduce voice signals in their natural form. It eliminates the need for encoding and compression, which often introduce distortion.

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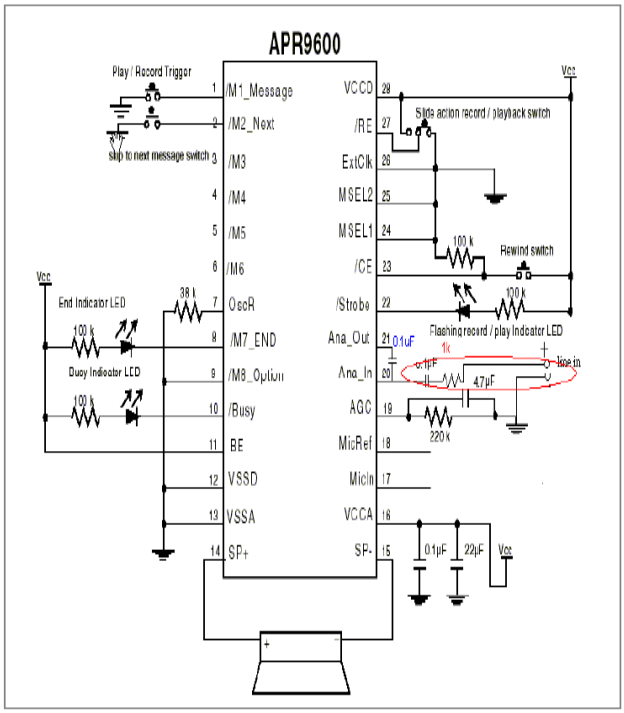
Line-In Type Recording Circuit



V. OUTPUT DISCUSSION

In this paper the implementation of an optimal driving system by using wireless communication. Whenever we are driving a vehicle, if we want go to left side, just say left then left indicator is glow through GPS communication. After we want to stop the indicator, just say stop, then the indicator will off. Left, right, stop all are record in the vehicle section using voice recognition unit. When we are in traffic, sometimes traffic signals are not visible. Using this technique we can eliminate that problem. In the traffic signal we place one GPS module. In the vehicle section GPS, LCD are there. Suppose traffic signal is in green color- then green is display on the vehicle's LCD. Similarly remaining colors are also display on the vehicle.[10]

VI. CONCLUSION

In this proposed paper implementation of an add-on Interaction system for a vehicle-to-driver, vehicle-to-speed Breaker and vehicle to traffic signal, Based on Wireless Communication and further the same is used to announce to the driver about the hurdles such as speed breakers. This voice alerting system helps the drivers to concentrate on the road without even worrying about the sign boards near the road. By using this we can eliminate accidents.

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